



BOXSPAN®

Joists | Bearers | Rafters | Lintels | Roof beams

BOXSPAN® Product Guide

Fully integrated solutions

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Structural Assessment of Spantec Systems BOXSPAN® Residential Span Tables Publication - January 2016

This assessment has been certified by Spantec's Engineer for the structural design spreadsheets and span tables as described in Spantec Systems publication **BOXSPAN® Residential Span Tables - January 2016** and consider that they comply with the following structural provisions on the National Construction Code of Australia (NCC) 2019:

- Volume One, Structural Provisions - Part B1.4
- Volume Two, Steel Framing - Part 3.4.2

The assessment considered the following

- The design spreadsheets to determine the values of frame spacing, member span, and connection capacity to populate the span tables in this publication comply with generally accepted engineering principles and the following Australian Standards:
 - AS/NZS 1170.0- 2002 Structural design actions – Part 0: General Principles
 - AS/NZS 1170.1- 2002 Structural design actions – Part 1: Permanent Imposed and other actions
 - AS 4055-2012 Wind Loads for Housing
 - AS/NZS 4600- 2018 Cold-Formed Steel Structures
 - AS 3566.1-2002 Self drilling screws for the building and construction industries – Part 1 General requirements and mechanical properties
 - NASH Standard: 2005 Residential and low-rise steel framing – Part 1: Design criteria
- The design capacities of: Shear (Vv), Compression (Nc), Tension (Nt), Bearing (Rb); and connection capacities have been determined in accordance with Australian Standards AS/NZS 4600:2018 – Cold-formed steel structures and AS 3566.1:2002 – Self drilling screws for the building and constructions industries – Pat 1: General requirements and mechanical properties
- For wind loading Serviceability wind speeds have a default minimum value as presented in AS 4055-2012 Wind loads for housing
- The scope of this structural assessment considers design wind pressures for Non-Cyclonic Areas only

This certification may be considered as "Evidence of Suitability" under the National Construction Code of Australia (NCC) 2019, Volume One Clause A2.2 Performance Solution. Information in the Spantec Systems publication not specifically referenced in this certification is outside the scope of this assessment. This certification does not relieve other parties of their responsibilities.

Peter J. Barreca
Civil & Structural Engineer
BE, MIE Aust CPEng N° 353640
Spantec Systems Pty. Ltd

These Boxspan® Residential Span Tables provide detailed product, design and typical installation information. The information in this guide can be used for the design of sub-floors, second storey floors, and a number of roof types and beams including lintels.

BOXSPAN - STEEL BEAMS USED IN AUSTRALIAN BUILDING FOR OVER 30 YEARS

Boxspan® is a roll formed beam manufactured from two interlocked "C" shaped sections of high tensile, zinc coated steel, which provide a rectangular profile resembling traditional timber. Unlike timber, the high-tensile steel and hollow section produces a strong and long spanning beam, which will not twist or sag with time. This unique system provides the benefits of a full protective zinc coating on the inside and outside of the beam.

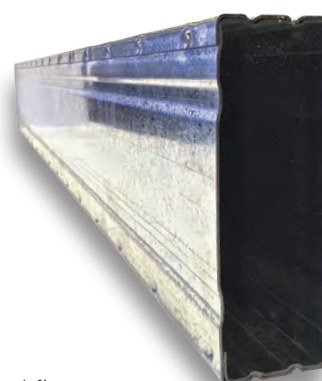
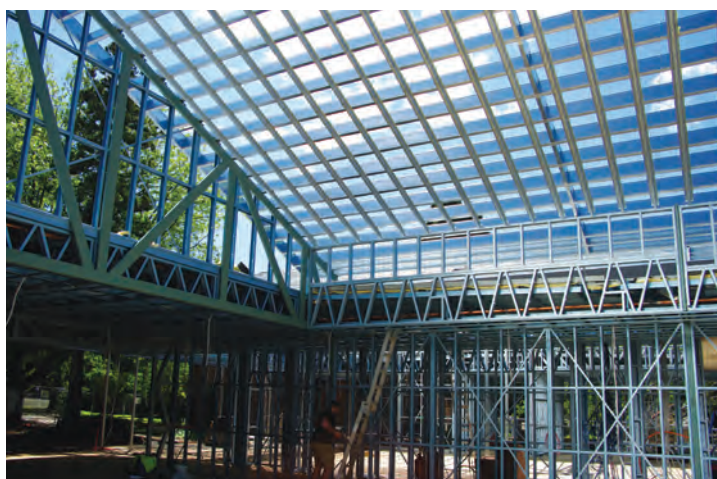
Boxspan® has the unique qualities of having a double thickness flange and a single thickness web that effectively puts the strength where it needs to be. The beam is strong, easy to use and has high torsional stability, unlike some other steel profiles.

Boxspan is manufactured in a range sizes from 100 x 50 mm to 250 x 50 mm, ensuring that an economical beam selection can be obtained for each project.

The beams are produced to controlled tolerances to the required length up to 12m or can be easily cut on site if necessary. The extensive range of brackets and accessories available with Boxspan makes it easy to use and a simple substitute for timber.

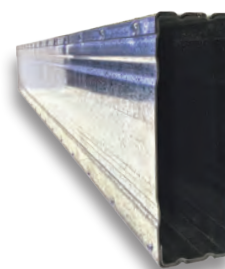
The Benefits of using Boxspan

- **Minimal maintenance**, galvanized inside and out.
- **Rolled to exact lengths**, minimal waste produced.
- **Won't rot, twist or shrink**, steel is a stable, durable product that is not permanently affected by the environment.
- **Straight and true to size**, manufactured to tight tolerances.
- **Termites won't eat it**, will not attract or harbor termites and no on-going chemical treatments required.
- **Lightweight**, the efficient use of steel allows a strong beam to be produced from thin steel sheet.
- **Easy to install**, an extensive range of brackets ensures easy fixing in a large range of applications.
- **Non-combustible**, steel is a non-flammable material and ideal for construction in bushfire prone areas.



BOXSPAN

Boxspan® light structural steel beam is a cold formed structural 'box-section' manufactured from two high tensile zinc coated 'C'– sections which are interlocked together by a patented staking process on the top and bottom flanges to form a rigid rectangular hollow section.



IDENTIFICATION

Boxspan members are identified by the marking system as follows.

Product Description (Boxspan: B)	Depth of section (mm)	Material Gauge Total thickness of metal at the Flange. 2 x Base Metal Thickness (BMT) x 10
B	100	20

Other variations of Boxspan beams with prefixes are: (XB: Boxspan Z450 Coating, SB: Smart Bearer)

DIMENSIONS

The dimensions and mass of Boxspan members are shown in the tables that follow.

Boxspan Section	Dimensions D x W (mm)	Base Material Thickness BMT (mm)	Mass (kg/m)
B100-12	100 x 50	0.60	2.13
B100-16	100 x 50	0.80	2.80
B150-16	150 x 50	0.80	3.50
B150-20	150 x 50	1.00	4.32
B200-16	200 x 50	0.80	4.11
B200-20	200 x 50	1.00	5.10
B250-20	250 x 50	1.00	5.91

BOXSPAN SECTION PROPERTIES - AS/NZS 4600:2005

Boxspan Section	Depth	Width	Web Thickness	Mass	Effective Area	Effective section modulus	Yield strength	Second moment of area	Nominal section moment capacity	Nominal shear capacity of web	Nominal bearing capacity ⁽¹⁾	Nominal bearing capacity ⁽²⁾
	D	W	BMT	m	Ae	Zex x 103	Fy	Ix x 106	□Ms	□Vv	□Rb(1)	□Rb(2)
	(mm)	(mm)	(mm)	(kg/m)	(mm ²)	(mm ³)	(MPa)	(mm ⁴)	(kNm)	(kN)	(kN)	(kN)
B100-12	100	50	0.6	2.13	268.9	8.46	550	0.421	4.27	12.04	8.17	7.80
B100-16	100	50	0.8	2.8	358.5	11.28	550	0.562	5.79	26.61	13.12	12.80
B150-16	150	50	0.8	3.5	438.5	19.47	550	1.457	9.88	19.00	13.49	12.80
B150-20	150	50	1.0	4.32	548.1	24.33	550	1.821	12.55	36.80	19.97	18.92
B200-16	200	50	0.8	4.11	518.5	29.04	550	2.901	14.28	9.75	13.49	12.80
B200-20	200	50	1.0	5.1	648.1	36.30	550	3.626	18.47	18.89	19.97	18.92
B250-20	250	50	1.0	5.91	747.7	49.90	550	6.228	24.53	14.47	19.97	18.92

BOXSPAN MATERIAL SPECIFICATION

Boxspan light structural steel beams are made from zinc coated high tensile grade G550 steel complying with the AS 1397:2011 (AS1397/G550 Z450). Base metal thicknesses (BMT) of the products are: 0.60mm; 0.80mm and 1.00mm.

COATING SPECIFICATION

Boxspan is rolled from sheet metal with zinc coating of Z450 (or equivalent). The Z450 coating relates to a minimum zinc coating in accordance with AS 1397:2011 (g/m² = grams of zinc per m²).

The Building Code of Australia provides guidance on the minimum coating class required for cold-formed steel members with regards to the surrounding environmental conditions (i.e., industrial or coastal). The designer shall approve the adequacy of the coating for the intended use of Boxspan.

MANUFACTURING TOLERANCES

The tolerances for Boxspan members are within the manufacturing tolerance requirements outlined in Appendix D of the NASH Standard, Residential and Low-rise Steel Framing, Part 1: Design Criteria 2005.

BRACKETS

Spantec produce a range of brackets that allow a very large number of floor and roof configurations to be assembled. The arrangement of the brackets are outlined in the 'Connection & Installation Details' section.

The brackets are supplied to suit the different Boxspan depths as well as a range of angles and roof pitches.

BRACKET MATERIAL SPECIFICATION

Boxspan structural brackets are made from zinc coated G2 grade steel complying with (AS1397/G2 Z450) and AS/NZS 1365:1996. Base metal thicknesses (BMT) of the brackets range from 0.9mm – 1.55mm.

COATING SPECIFICATION

The brackets are rolled from sheet metal with the zinc coating of Z450 (or equivalent). The Z450 coating relates to a minimum zinc coating in accordance with AS 1397:2011.

The Building Code of Australia provides guidance on the minimum coating class required for cold-formed steel members with regards to the surrounding environmental conditions (i.e., industrial or coastal). The designer shall approve the adequacy of the coating for the intended use of Boxspan.

Hot dipped galvanized brackets are also available for fixing Boxspan with higher zinc coating.

FASTENERS

Spantec supply a range of fasteners for bracket fixing and fixing to structural steel. The class of finish on the screws shall comply with requirements of AS 3566.1:2002 or other applicable standard. The fastener type and quantity required for the connection type are shown in a table with the connection detail.

The screws in the Connection Details section are the minimum size for the quantity shown. A larger screw size with the same head type may be substituted.

Description	Application	Class of Finish
12-14x20mm Hex Head self drilling screw (Tek screw)	To connect brackets to Boxspan	Class 3 (AS 3566)
10-16x16mm Wafer Head self drilling screw (Tek screw)		
12-24x20mm Hex Head self drilling screw (3-5mm thickness)	To connect brackets to structural steel	Class 3 (AS 3566)
12-24x32mm Hex Head self drilling screw (4-10mm thickness)		
12-14x75mm Hex Head self drilling screw (Tek screw)	Long fixing screws to laminate beams and to fix to brackets from one side only.	Class 3 (AS 3566)

1. These span tables have been prepared for a range of flooring and roofing applications in non-cyclonic wind regions using Boxspan® steel beams and brackets produced by Spantec Systems Pty Ltd.
2. This Design Notes section shall be read in conjunction with Boxspan Residential Span Tables – Non Cyclonic Areas publication.
3. Spantec Boxspan and connection components, comply with the following Australian Standards:
 - AS 1397:2011 Steel sheet and strip – Hot dipped zinc-coated or aluminium/zinc-coated
 - AS 3566.1:2002 Self drilling screws
4. The design of Boxspan and connection components, comply with the following Australian Standards:
 - AS/NZS 1170.0:2002 Structural design actions – Part 0: General principles
 - AS/NZS 1170.1:2002 Structural design actions – Part 1: Permanent imposed and other actions
 - AS/NZS 1170.2:2011 Structural design actions – Part 2: Wind actions
 - AS 4055:2012 Wind loads for housing
 - AS/NZS 4600:2005 Cold-formed steel structures
 - NASH Standard, Residential and Low-rise Steel Framing, Part 1: Design Criteria 2005
5. The connection details shall be in accordance with the details in this publication. For the complete range of connections please refer to Spantec.com.au website or speak with Spantec's Technical department.
6. The loads to determine the span tables in the Spantec publication – Boxspan Residential Span Tables – Non Cyclonic Areas are as follows:

FLOOR LOADS

- Dead Loads: 0.75kPa (includes the weight of either particle board and carpet or up to 15mm compressed FC sheet with tiles and including Boxspan beams only).
- Dead Loads: 1.1kPa (includes the weight of either 75mm aerated concrete panels or up to 18mm compressed FC sheet with tiles and including Boxspan beams only).
- Live Loads: 1.5kPa for internal residential floor loads and deck floor loads that are no greater than 1m above ground. 2.0kPa for external deck floor loads greater than 1m above ground level.

ROOF LOADS

- Dead Loads: 0.20kPa, 0.40kPa (includes the weight of the roof (sheeting & flashings) and Boxspan beams only).
 - Dead Loads: 0.15kPa (includes the weight of plasterboard ceiling and Boxspan beams only).
 - Live Loads: 0.25kPa (non trafficable roof). The span tables have NOT considered the 1.4kN maintenance loading and propping and crawl boards are recommended when accessing the roof.
 - Wind Loads: Wind classes in accordance with AS4055:2012 and wind pressures in accordance with AS1170.0:2002 and AS1170.2:2011.
7. The maximum height of single storey construction allowed for in the Boxspan span tables shall be in accordance with AS/NZS 1170.2:2011 requirements.
 8. These span tables do not take into account the design, certification or structural adequacy of any:
 - Existing foundation
 - New foundation
 - Connection to the foundation
 - Connection to the existing structure
 - Structural adequacy of the structure to support additional floor and or roof loads

The builder/owner is to ensure that the necessary approvals (certifications) are obtained for the structure from a structural engineer or other relevant parties.

The builder/owner should also ensure the requirements of local authorities and government regulations are addressed.

9. Proprietary items supplied by others shall be installed in accordance with the manufacturer's specification.
10. The span tables have been prepared for attached 1 side and free-standing, 4 sides open or 3 sides open/1 enclosed sides pitched roofs that are 'Empty Under' ($\leq 50\%$ blocking) in accordance with AS/NZS 1170.2:2011 requirements. For other awning arrangements, use the 'Awning Selection Tables' section to determine type and reduction factor.
11. The designer shall ensure that the Boxspan protective coating (Z450 or equivalent) meets acceptable construction practice (steel framing) reference NCC 3.4.2.1 & 2. Z450 (or equivalent) coating is available on most products should a higher coating be required.

SPANS

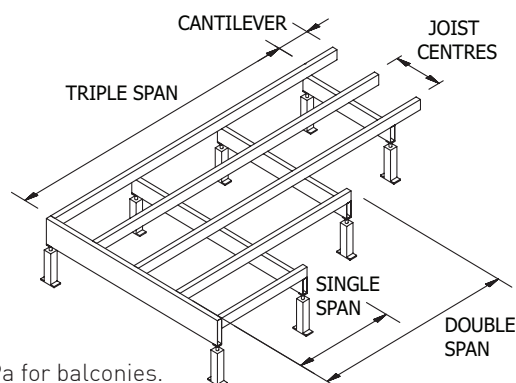
The tables in this publication refer to three types of spans. See diagram on the right. For a member to be in continuous span the smallest span must be greater than 80% of the other span/s or equal to them. Under no circumstances should there be a join unsupported.

SPACING/CENTRES

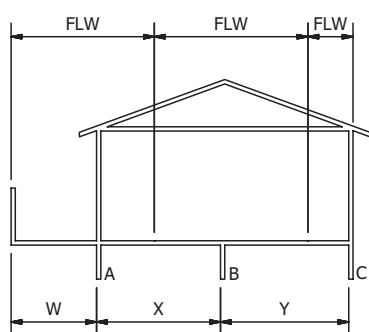
Span tables for floor joists, rafters and ceiling joist are determined using their spacing (centre to centre) to determine their respective spans. Please refer to spacing diagram above each table.

CANTILEVER

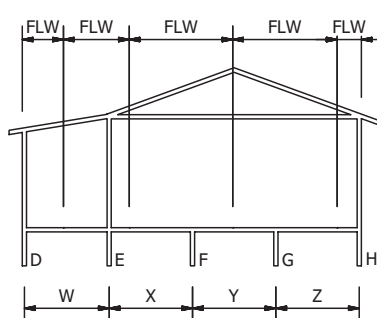
Cantilevered joists have been designed to support a live load of 3.0kPa for balconies. Care is to be taken by the builder to ensure total weather protection to prevent moisture entering the building. As a rule the back span of the member shall not be less than 2 x the cantilevered span.



FLOOR LOAD WIDTHS



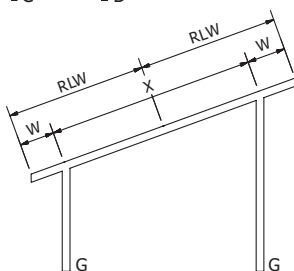
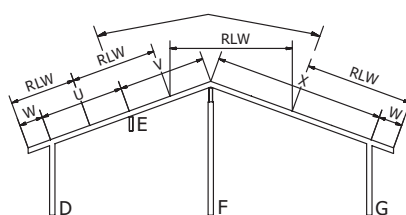
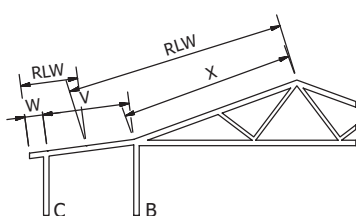
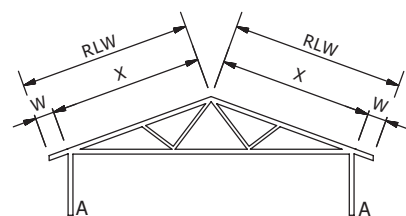
Floor with cantilevered balcony



Floor with verandah roof & deck

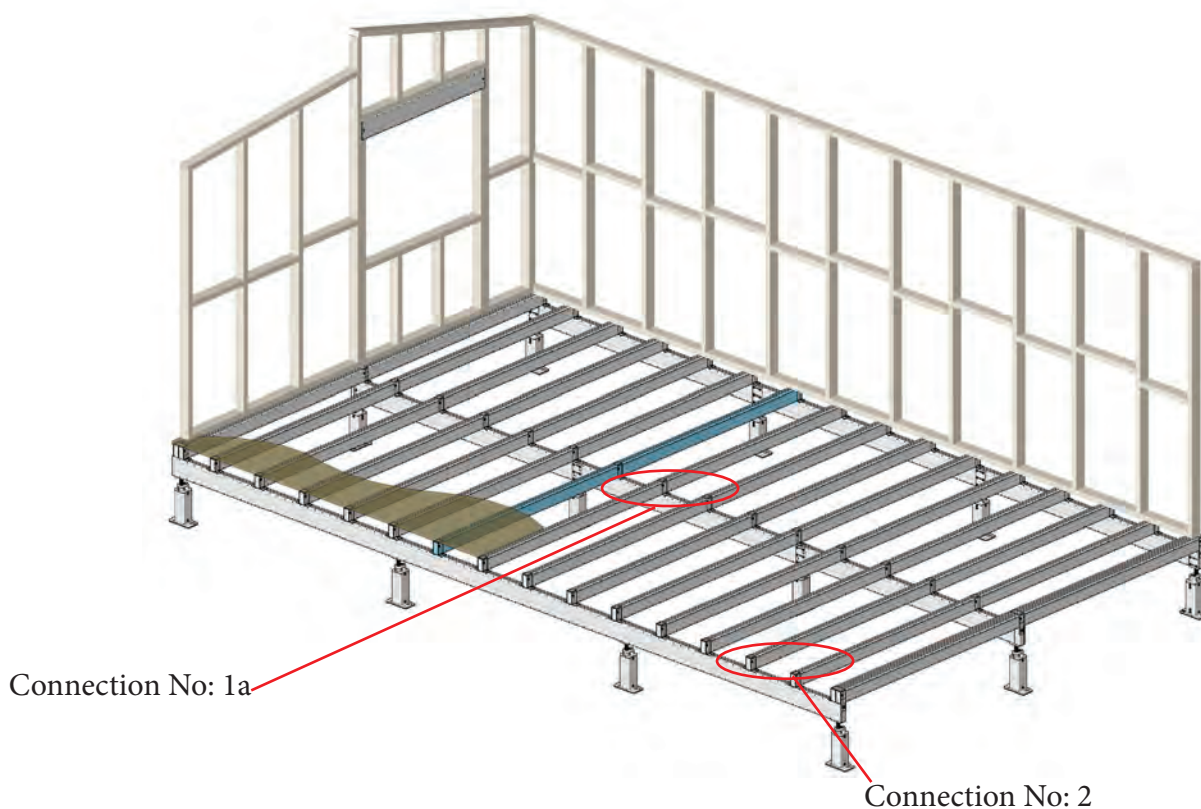
BEARER	FLW CALCULATION
A	$FLW = (X \times 0.375) + W$
B	$FLW = 1.25 \times \frac{(X + Y)}{2}$
C	$FLW = Y \times 0.375$
D	$FLW = \frac{W}{2}$
E	$FLW = (X \times 0.4) + \frac{W}{2}$
F	$FLW = 1.1 \times \frac{(X + Y)}{2}$
G	$FLW = 1.1 \times \frac{(Y + Z)}{2}$
H	$FLW = 0.4 \times Z$

ROOF LOAD WIDTHS

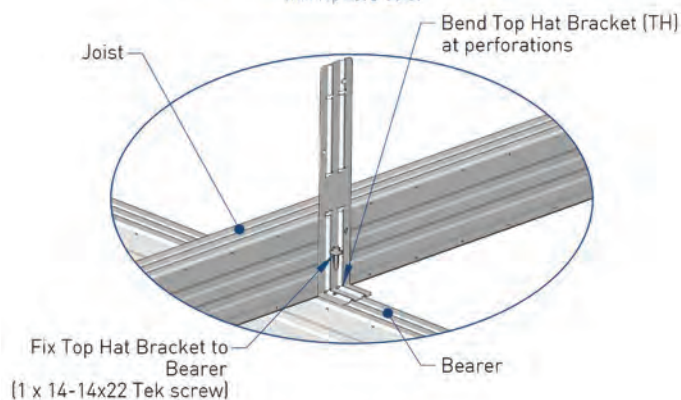


WALL	RLW CALCULATION
A	$RLW = X + W$
B	$RLW = X + \frac{Y}{2}$
C	$RLW = W + \frac{Y}{2}$
D	$RLW = W + \frac{U}{2}$
E	$RLW = \frac{(U + V)}{2}$
F	$RLW = \frac{(V + X)}{2}$
G	$RLW = W + \frac{X}{2}$

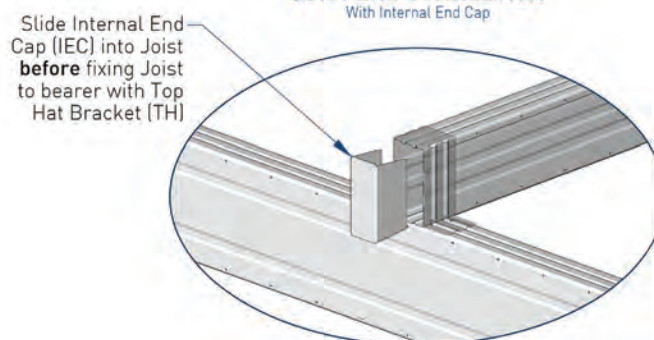




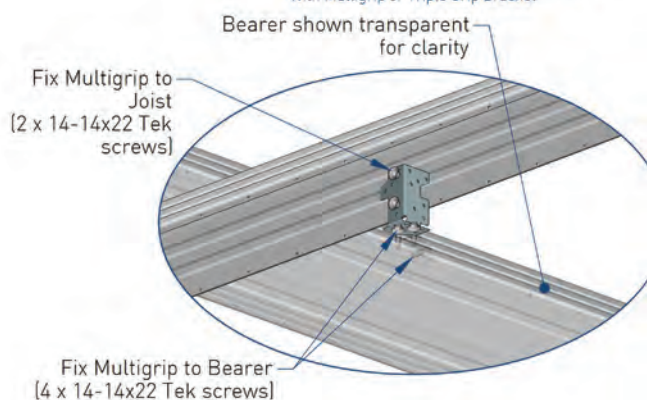
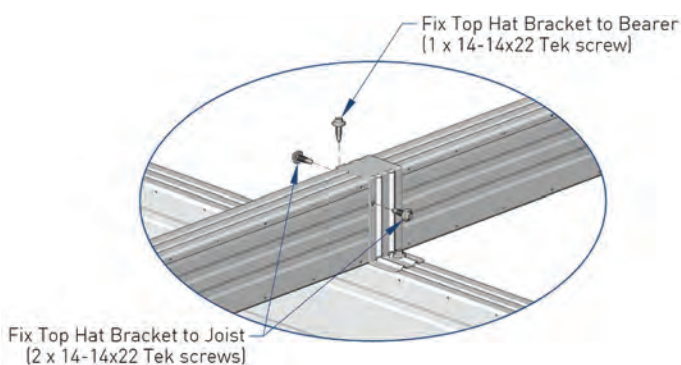
Connection No: 1a
JOIST OVER BEARER CONNECTION
With Top Hat Bracket

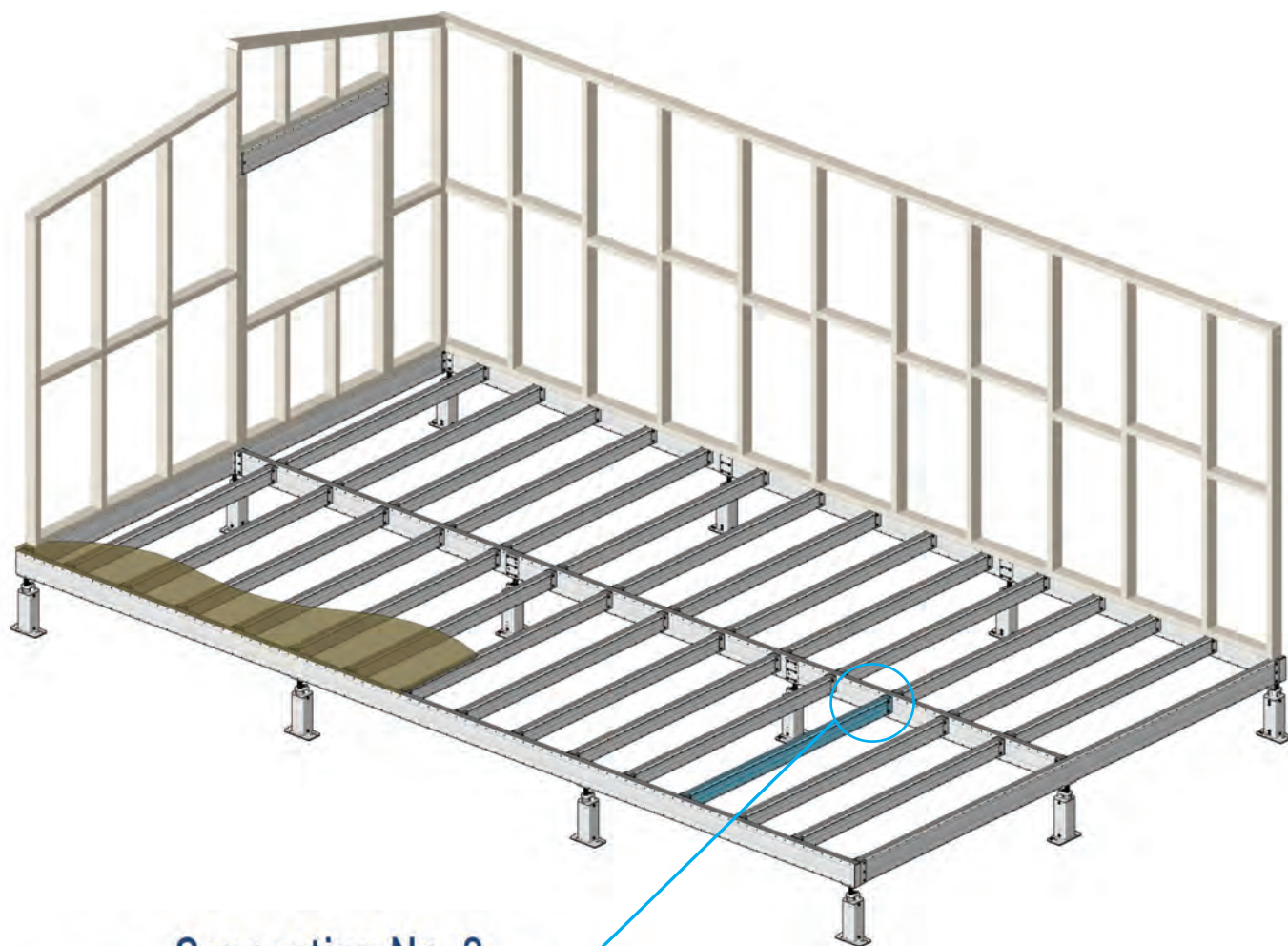


Connection No: 2
JOIST END CONNECTION
With Internal End Cap

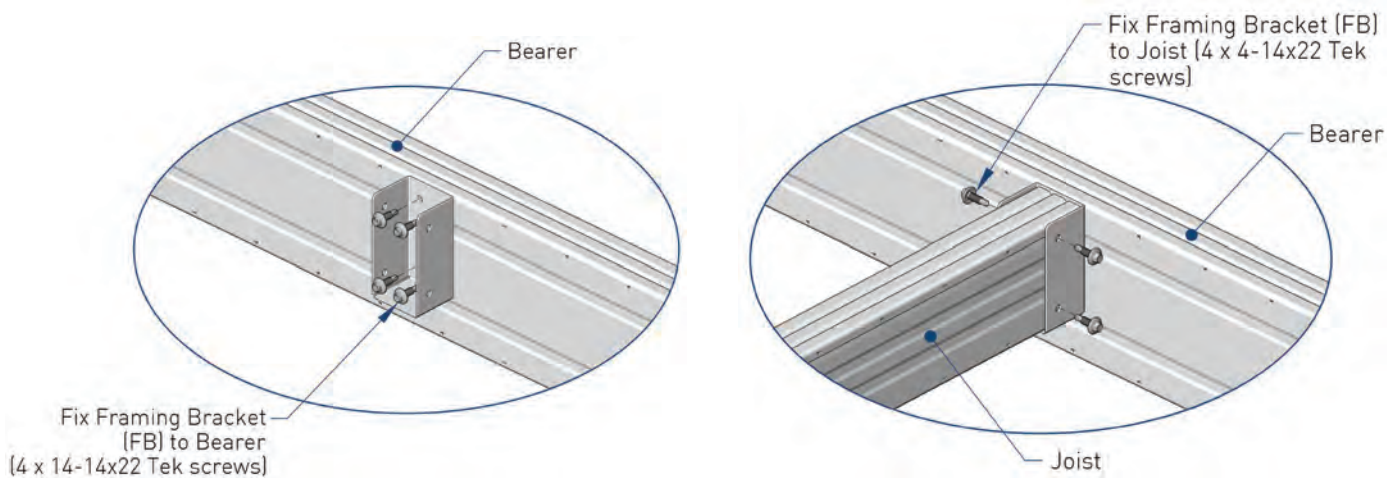


Connection No: 1b
JOIST OVER BEARER CONNECTION
With Multigrip or Triple Grip Bracket





Connection No: 3 JOIST INTO BEARER CONNECTION With Framing Bracket



JOISTS

SUPPORTING FLOOR LOADS ONLY
(OR DECKS LESS THAN 1m ABOVE GROUND)

- Live Load: **1.5kPa**
- Dead Load: **0.75kPa**

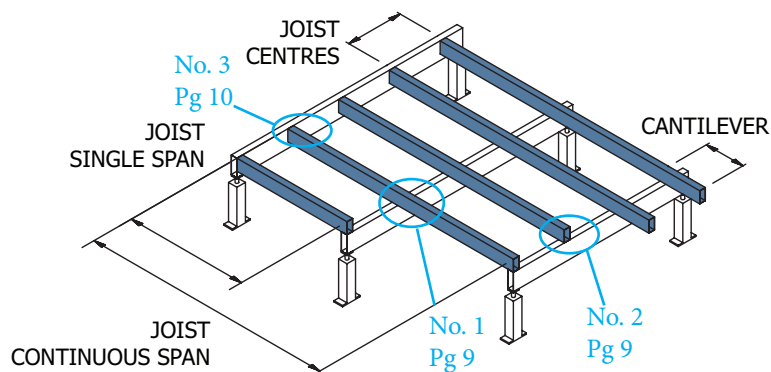


Table 1										MAXIMUM FLOOR JOIST SPAN (m)								
BOXSPAN SECTION	SINGLE SPAN			CONTINUOUS SPAN			CANTILEVERED SPAN											
	FLOOR JOIST CENTRES (mm)																	
	400	450	600	400	450	600	400	450	600									
B100-12	2.48	2.39	2.17	2.77	2.50	2.27	1.33	1.28	1.03									
B100-16	2.73	2.63	2.39	3.03	2.78	2.53	1.46	1.40	1.27									
B150-16	3.48	3.35	3.04	4.30	4.14	3.76	2.06	1.98	1.67									
B150-20	3.74	3.55	3.22	4.62	4.44	4.03	2.22	2.13	1.94									
B200-16	4.54	4.37	3.97	5.62	5.30	4.82	2.68	2.50	2.13									
B200-20	4.87	4.69	4.26	6.02	5.78	5.25	2.89	2.78	2.52									
B250-20	5.96	5.73	5.21	7.37	6.84	6.22	3.54	3.40	3.09									

Spans governed by dynamic performance

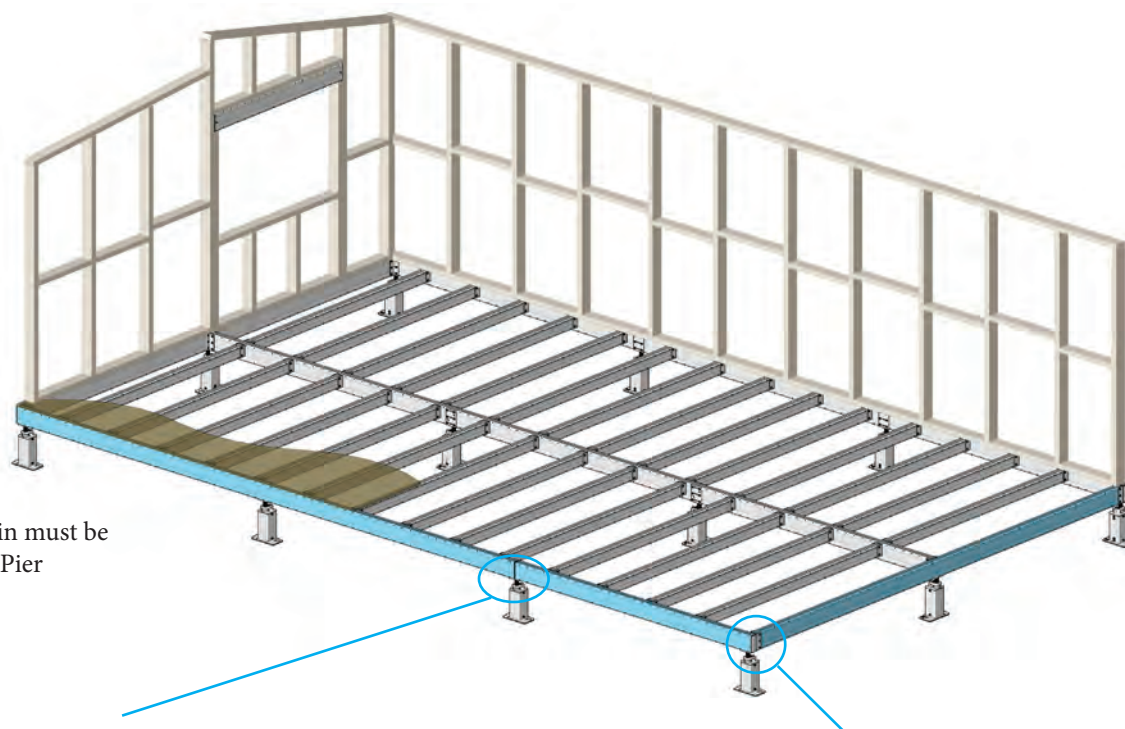
FLOOR PERFORMANCE

Suspended floor frame performance can be subjective based on the end user's perception. In order to satisfy the large majority of users it is noted that:

1. The maximum allowable spans have been designed to meet the strength and serviceability limits specified in NASH Standard, Residential and Low-rise Steel Framing, Part 1: Design Criteria 2005.
2. In some cases spans calculated by the above criteria have been reduced based on testing carried out at a NATA approved testing laboratory and extensive field testing carried out over more than 20 years.

Should a stiffer floor be required joist spans or joist spacing can be reduced or mid span blocking introduced. It is noted that floor carrying higher distributed loads (such as floor tiles or aerated concrete floors panels) or supporting non load bearing walls will be stiffer than floors carrying lower loads.

Floors will not reach their peak performance until carrying design dead loads. This includes, in particular, loads applied by internal and external walls including plasterboard and (for upper floors) ceilings fixed below.

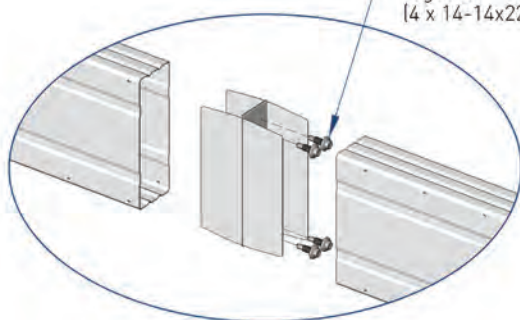


Note: Bearer join must be supported by a Pier

Connection No: 4 BEARER JOIN CONNECTION

With 2 Internal End Caps

Fix Internal End Caps (IEC) together
[4 x 14-14x22 Tek screws]

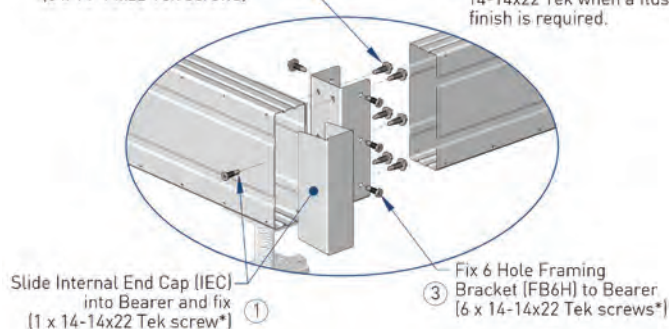


Connection No: 5 BEARER CORNER CONNECTION

With Internal End Cap and 6 Hole Framing Bracket

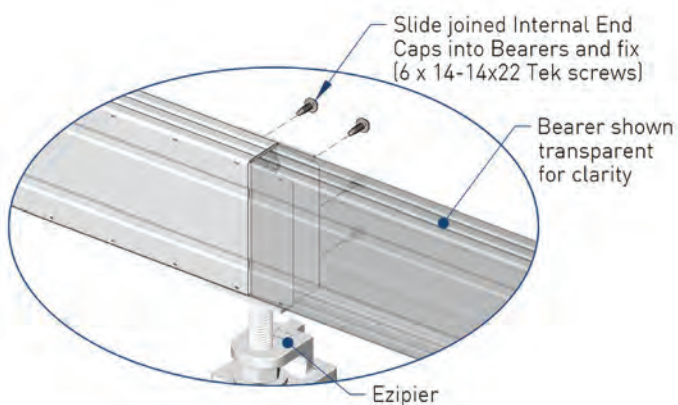
Fix 6 Hole Framing Bracket (FB6H) thru Pier Head and into Bearer
[6 x 14-14x22 Tek screws]

*The M6-1.0x22 Pancake Head Tek is optional and can be used to replace the 14-14x22 Tek when a flush finish is required.



Slide Internal End Cap (IEC) into Bearer and fix
[1 x 14-14x22 Tek screw*]

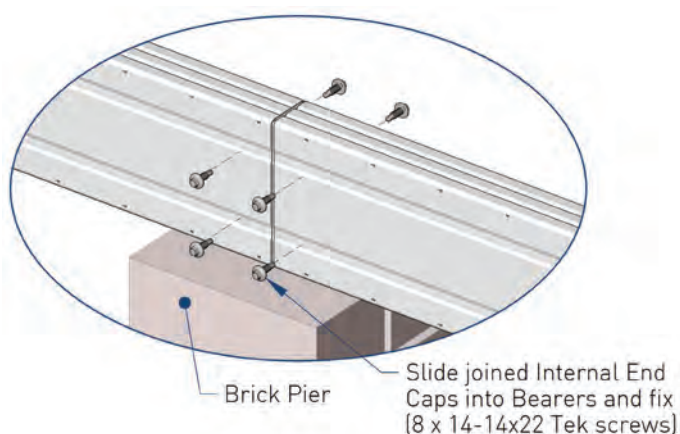
Fix 6 Hole Framing Bracket (FB6H) to Bearer
[6 x 14-14x22 Tek screws*]



Slide joined Internal End Caps into Bearers and fix
[6 x 14-14x22 Tek screws]

Bearer shown transparent for clarity

Ezipier



Brick Pier

Slide joined Internal End Caps into Bearers and fix
[8 x 14-14x22 Tek screws]

*The M6 Pancake Head Tek is optional and can be used to replace the 14-14x22 Tek when a flush finish is required.

BEARERS

SUPPORTING FLOOR LOADS ONLY
(OR DECKS LESS THAN 1m ABOVE
GROUND)

- Live Load: **1.5kPa**
- Dead Load: **0.75kPa**

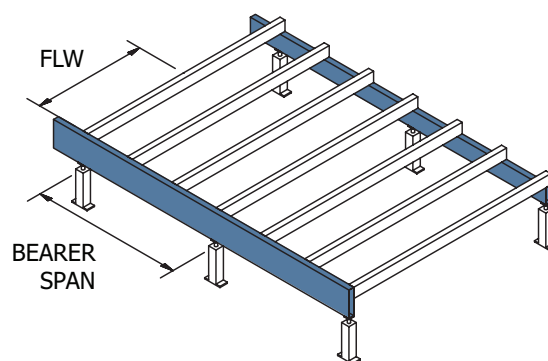


Table 2 MAXIMUM BEARER SPAN (m)											
BOXSPAN SECTION	FLOOR LOAD WIDTH – FLW (m)*										
	0.9	1.2	1.5	1.8	2.1	2.4	3.0	3.6	4.2	4.8	5.4
SINGLE SPAN**											
B100-16	2.36	2.15	1.99	1.87	1.78	1.7	1.58	1.49	1.41	1.35	1.3
B150-16	3.23	2.94	2.73	2.57	2.44	2.33	2.16	2.04	1.93	1.85	1.78
B150-20	3.47	3.15	2.93	2.75	2.62	2.5	2.32	2.19	2.08	1.99	1.91
B200-16	4.06	3.69	3.42	3.22	2.91	2.55	2.04	1.7	1.46	1.28	1.13
B200-20	4.35	3.95	3.67	3.45	3.28	3.14	2.91	2.74	2.6	2.47	2.2
B250-20	5.21	4.73	4.39	4.14	3.93	3.76	3.03	2.52	2.16	1.89	1.68
2/B100-16	2.97	2.7	2.51	2.36	2.24	2.15	1.99	1.87	1.78	1.7	1.64
2/B150-16	4.07	3.7	3.43	3.23	3.07	2.94	2.73	2.57	2.44	2.33	2.24
2/B150-20	4.37	3.97	3.69	3.47	3.29	3.15	2.93	2.75	2.62	2.5	2.41
2/B200-16	5.11	4.64	4.31	4.06	3.85	3.69	3.42	3.22	2.91	2.55	2.27
2/B200-20	5.48	4.98	4.62	4.35	4.13	3.95	3.67	3.45	3.28	3.14	3.02
2/B250-20	6.56	5.96	5.54	5.21	4.95	4.73	4.39	4.14	3.93	3.76	3.36
CONTINUOUS DOUBLE SPAN**											
B100-16	3.16	2.65	2.26	1.97	1.76	1.59	1.33	1.13	0.97	0.85	0.75
B150-16	3.74	3.02	2.55	2.21	1.93	1.69	1.35	1.13	0.97	0.85	0.75
B150-20	4.65	3.87	3.3	2.89	2.57	2.32	1.95	1.65	1.42	1.24	1.1
B200-16	4.09	3.27	2.7	2.25	1.93	1.69	1.35	1.13	0.97	0.85	0.75
B200-20	5.26	4.27	3.61	3.14	2.78	2.48	1.98	1.65	1.42	1.24	1.1
B250-20	5.67	4.56	3.84	3.3	2.83	2.48	1.98	1.65	1.42	1.24	1.1
2/B100-16	3.99	3.62	3.36	3.16	2.91	2.65	2.26	1.97	1.76	1.59	1.45
2/B150-16	5.46	4.96	4.26	3.74	3.34	3.02	2.55	2.21	1.93	1.69	1.5
2/B150-20	5.86	5.32	4.94	4.65	4.26	3.87	3.3	2.89	2.57	2.32	2.12
2/B200-16	6.77	5.52	4.69	4.09	3.63	3.27	2.7	2.25	1.93	1.69	1.5
2/B200-20	7.35	6.68	5.98	5.26	4.7	4.27	3.61	3.14	2.78	2.48	2.2
2/B250-20	8.8	7.59	6.48	5.67	5.05	4.56	3.84	3.3	2.83	2.48	2.2
CONTINUOUS TRIPLE SPAN**											
B100-16	2.92	2.65	2.46	2.22	1.98	1.79	1.50	1.28	1.10	0.96	0.85
B150-16	3.99	3.41	2.87	2.49	2.19	1.92	1.54	1.28	1.10	0.96	0.85
B150-20	4.29	3.89	3.62	3.25	2.90	2.62	2.20	1.88	1.61	1.41	1.25
B200-16	4.61	3.69	3.07	2.56	2.19	1.92	1.54	1.28	1.10	0.96	0.85
B200-20	5.38	4.81	4.07	3.54	3.13	2.81	2.25	1.88	1.61	1.41	1.25
B250-20	6.39	5.15	4.33	3.75	3.22	2.81	2.25	1.88	1.61	1.41	1.25
2/B100-16	3.68	3.34	3.10	2.92	2.77	2.65	2.46	2.22	1.98	1.79	1.63
2/B150-16	5.03	4.57	4.24	3.99	3.76	3.41	2.87	2.49	2.19	1.92	1.71
2/B150-20	5.40	4.91	4.56	4.29	4.07	3.89	3.62	3.25	2.90	2.62	2.39
2/B200-16	6.32	5.74	5.28	4.61	4.10	3.69	3.07	2.56	2.19	1.92	1.71
2/B200-20	6.78	6.16	5.71	5.38	5.11	4.81	4.07	3.54	3.13	2.81	2.50
2/B250-20	8.11	7.37	6.84	6.39	5.69	5.15	4.33	3.75	3.22	2.81	2.50

* FLW: refer to page 4 for floor load width calculations. ** Bearer Span: refer to page 4 for bearer span definitions.

BEARERS

SUPPORTING FLOOR LOADS & LOAD BEARING WALLS (SINGLE STOREY - SHEET ROOF)

- Roof Mass: **40kg**
- Wall: **0.45kPa @ 2.7m ht**
- Live Load: **1.5kPa**
- Dead Load: **0.75kPa**

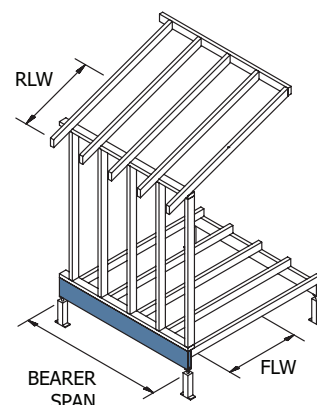


Table 3		MAXIMUM BEARER SPAN (m)															
BOXSPAN SECTION	ROOF LOAD WIDTH – RLW (m)***																
	2				4.5				6				8				
	FLOOR LOAD WIDTH – FLW (m)*																
	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	
SINGLE SPAN**																	
B100-16	1.58	1.52	1.38	1.28	1.44	1.40	1.29	1.22	1.38	1.34	1.25	1.18	1.31	1.28	1.21	1.14	
B150-16	2.16	2.08	1.89	1.75	1.97	1.92	1.77	1.66	1.89	1.84	1.72	1.62	1.80	1.75	1.65	1.57	
B150-20	2.32	2.23	2.02	1.88	2.12	2.06	1.90	1.79	2.03	1.97	1.84	1.74	1.93	1.88	1.77	1.68	
B200-16	2.71	2.61	2.12	1.61	2.48	2.40	1.86	1.46	2.37	2.31	1.74	1.39	2.25	2.09	1.60	1.29	
B200-20	2.91	2.80	2.54	2.36	2.66	2.58	2.39	2.24	2.54	2.48	2.31	2.18	2.42	2.36	2.22	2.11	
B250-20	3.48	3.35	3.04	2.40	3.18	3.09	2.77	2.17	3.05	2.96	2.58	2.06	2.89	2.83	2.37	1.92	
2/B100-16	1.99	1.91	1.74	1.61	1.66	1.61	1.49	1.40	1.74	1.69	1.58	1.49	1.65	1.61	1.52	1.44	
2/B150-16	2.72	2.62	2.38	2.21	2.27	2.20	1.86	1.46	2.38	2.32	2.16	2.04	2.26	2.21	2.08	1.97	
2/B150-20	2.92	2.81	2.55	2.37	2.67	2.59	2.40	2.25	2.55	2.49	2.32	2.19	2.43	2.37	2.23	2.12	
2/B200-16	3.42	3.28	2.98	2.77	3.12	3.03	2.80	2.63	2.99	2.91	2.71	2.56	2.84	2.77	2.61	2.48	
2/B200-20	3.34	3.52	3.20	2.97	3.35	3.25	3.01	2.82	3.20	3.12	2.91	2.75	3.04	2.97	2.80	2.66	
2/B250-20	4.39	4.22	3.83	3.56	4.01	3.89	3.60	3.38	3.84	3.74	3.48	3.29	3.65	3.56	3.35	3.18	
CONTINUOUS DOUBLE SPAN**																	
B100-16	2.07	1.83	1.37	1.07	1.77	1.59	1.24	0.97	1.63	1.48	1.15	0.92	1.48	1.36	1.06	0.86	
B150-16	2.32	2.04	1.40	1.07	1.95	1.70	1.24	0.97	1.75	1.55	1.15	0.92	1.54	1.38	1.06	0.86	
B150-20	3.02	2.68	2.01	1.57	2.59	2.33	1.81	1.42	2.38	2.17	1.69	1.35	2.16	1.98	1.55	1.26	
B200-16	2.40	2.04	1.40	1.07	1.95	1.70	1.24	0.97	1.75	1.55	1.15	0.92	1.54	1.38	1.06	0.86	
B200-20	3.29	2.90	2.06	1.57	2.80	2.49	1.81	1.42	2.56	2.27	1.69	1.35	2.26	2.03	1.55	1.26	
B250-20	3.49	2.99	2.06	1.57	2.85	2.49	1.81	1.42	2.56	2.27	1.69	1.35	2.26	2.03	1.55	1.26	
2/B100-16	2.67	2.56	2.32	1.90	2.44	2.36	2.11	1.76	2.33	2.27	2.01	1.69	2.21	2.16	1.88	1.60	
2/B150-16	3.65	3.47	2.62	2.12	3.33	3.04	2.37	1.94	3.10	2.83	2.25	1.84	2.82	2.59	2.10	1.71	
2/B150-20	3.92	3.76	3.39	2.78	3.58	3.47	3.09	2.58	3.42	3.33	2.94	2.47	3.25	3.18	2.75	2.34	
2/B200-16	4.29	3.78	2.81	2.14	3.65	3.29	2.47	1.94	3.36	3.05	2.31	1.84	3.04	2.77	2.12	1.71	
2/B200-20	4.91	4.72	3.71	3.01	4.49	4.29	3.37	2.79	4.30	4.00	3.19	2.67	3.98	3.67	2.99	2.51	
2/B250-20	5.88	5.26	3.95	3.14	5.08	4.59	3.57	2.84	4.69	4.27	3.38	2.69	4.25	3.91	3.10	2.51	
CONTINUOUS TRIPLE SPAN**																	
B100-16	1.95	1.88	1.55	1.22	1.78	1.73	1.40	1.10	1.71	1.66	1.31	1.04	1.62	1.53	1.20	0.97	
B150-16	2.62	2.30	1.59	1.22	2.21	1.93	1.40	1.10	1.99	1.76	1.31	1.04	1.75	1.57	1.20	0.97	
B150-20	2.87	2.75	2.26	1.78	2.62	2.54	2.05	1.61	2.51	2.44	1.92	1.53	2.38	2.24	1.76	1.43	
B200-16	2.73	2.32	1.59	1.22	2.21	1.93	1.40	1.10	1.99	1.76	1.31	1.04	1.75	1.57	1.20	0.97	
B200-20	3.59	3.27	2.34	1.78	3.16	2.83	2.06	1.61	2.90	2.58	1.92	1.53	2.57	2.30	1.76	1.43	
B250-20	3.94	3.39	2.34	1.78	3.24	2.83	2.06	1.61	2.91	2.58	1.92	1.53	2.57	2.30	1.76	1.43	
2/B100-16	2.46	2.36	2.15	1.99	2.25	2.18	2.02	1.89	2.15	2.09	1.95	1.84	2.04	2.00	1.88	1.78	
2/B150-16	3.36	3.23	2.94	2.39	3.07	2.98	2.68	2.20	2.94	2.86	2.54	2.09	2.80	2.73	2.37	1.95	
2/B150-20	3.61	3.47	3.15	2.93	3.30	3.20	2.96	2.78	3.16	3.07	2.87	2.71	3.00	2.93	2.76	2.62	
2/B200-16	4.22	4.06	3.19	2.43	3.86	3.71	2.81	2.20	3.69	3.45	2.62	2.09	3.43	3.14	2.41	1.95	
2/B200-20	3.34	4.35	3.95	3.40	4.14	4.01	3.72	3.14	3.96	3.86	3.60	3.01	3.76	3.68	3.37	2.85	
2/B250-20	5.42	5.21	4.46	3.56	4.96	4.81	4.03	3.23	4.74	4.62	3.82	3.06	4.51	4.40	3.53	2.85	

* FLW: refer to page 4 for floor load width calculations. ** Bearer Span: Refer to page 4 for bearer span definitions. *** RLW: refer to page 4 for roof load width types.

BEARERS

SUPPORTING FLOOR LOADS & LOAD BEARING WALLS (SINGLE STOREY - TILED ROOF)

- Roof Mass: **90kg**
- Wall: **0.45kPa @ 2.7m ht**
- Live Load: **1.5kPa**
- Dead Load: **0.75kPa**

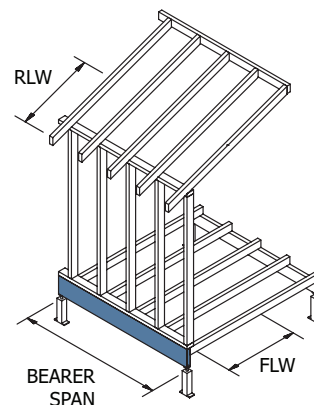


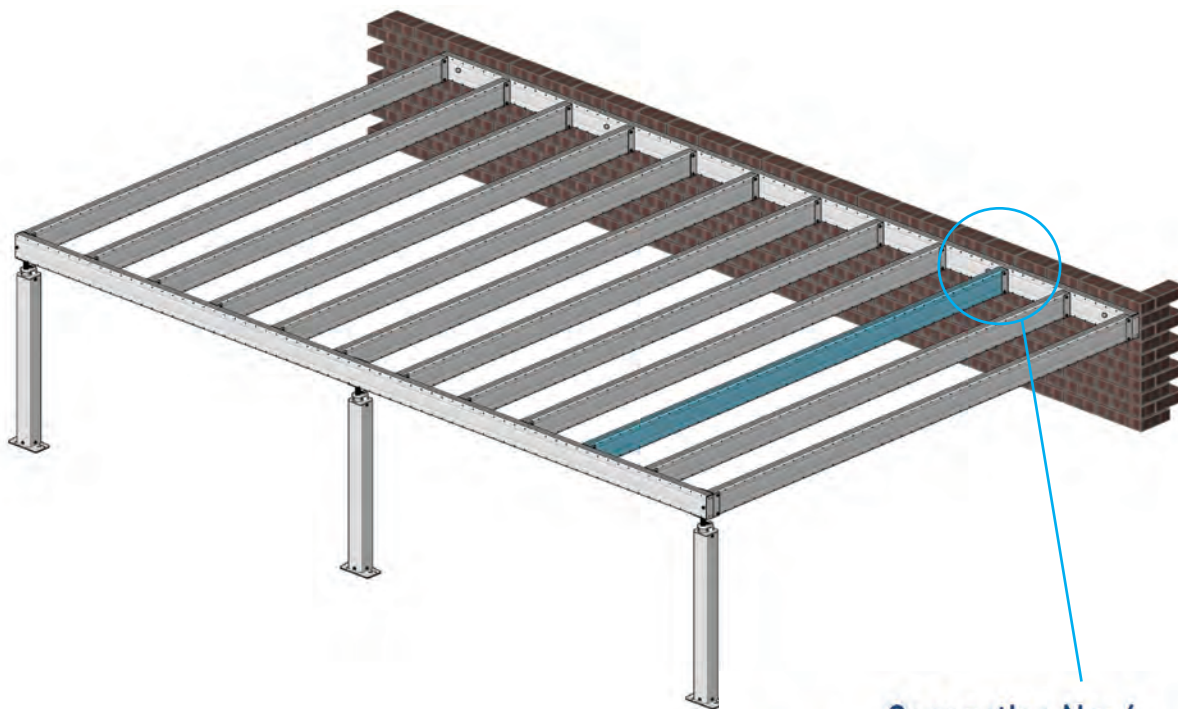
Table 4 MAXIMUM BEARER SPAN (m)																
BOXSPAN SECTION	ROOF LOAD WIDTH – RLW (m)***															
	2				4.5				6				8			
	FLOOR LOAD WIDTH – FLW (m)*															
	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0
SINGLE SPAN**																
B100-16	1.44	1.40	1.36	1.29	1.25	1.23	1.20	1.16	1.17	1.16	1.14	1.10	1.10	1.08	1.07	1.04
B150-16	1.97	1.92	1.86	1.77	1.71	1.68	1.65	1.59	1.61	1.58	1.56	1.51	1.50	1.48	1.46	1.43
B150-20	2.12	2.06	2.00	1.90	1.84	1.80	1.77	1.71	1.73	1.70	1.67	1.62	1.61	1.59	1.57	1.53
B200-16	2.48	2.40	2.28	1.86	2.06	1.87	1.72	1.47	1.75	1.61	1.49	1.30	1.46	1.36	1.28	1.13
B200-20	2.66	2.58	2.51	2.39	2.31	2.26	2.22	2.14	2.17	2.13	2.10	2.03	2.02	1.99	1.97	1.92
B250-20	3.18	3.09	3.00	2.77	2.76	2.71	2.55	2.18	2.59	2.39	2.22	1.93	2.16	2.02	1.89	1.68
2/B100-16	1.82	1.76	1.63	1.53	1.58	1.54	1.46	1.40	1.48	1.46	1.39	1.33	1.38	1.36	1.31	1.27
2/B150-16	2.49	2.41	2.23	2.10	2.16	2.11	2.00	1.91	2.03	1.99	1.90	1.83	1.89	1.87	1.80	1.73
2/B150-20	2.67	2.59	2.40	2.25	2.32	2.27	2.15	2.05	2.17	2.14	2.04	1.96	2.03	2.00	1.93	1.86
2/B200-16	3.12	3.03	2.80	2.63	2.71	2.65	2.51	2.40	2.54	2.50	2.39	2.19	2.37	2.34	2.25	1.94
2/B200-20	3.35	3.25	3.01	2.82	2.91	2.85	2.70	2.57	2.73	2.68	2.56	2.46	2.55	2.51	2.42	2.34
2/B250-20	4.01	3.89	3.60	3.38	3.48	3.41	3.23	3.08	3.27	3.21	3.07	2.95	3.05	3.01	2.89	2.80
CONTINUOUS DOUBLE SPAN**																
B100-16	1.77	1.59	1.45	1.24	1.34	1.24	1.14	0.97	1.16	1.07	0.99	0.86	0.97	0.90	0.85	0.75
B150-16	1.95	1.70	1.51	1.24	1.37	1.24	1.14	0.97	1.16	1.07	0.99	0.86	0.97	0.90	0.85	0.75
B150-20	2.59	2.33	2.13	1.81	1.97	1.82	1.67	1.43	1.70	1.57	1.45	1.27	1.42	1.32	1.24	1.10
B200-16	1.95	1.70	1.51	1.24	1.37	1.24	1.14	0.97	1.16	1.07	0.99	0.86	0.97	0.90	0.85	0.75
B200-20	2.80	2.49	2.22	1.81	2.00	1.82	1.67	1.43	1.70	1.57	1.45	1.27	1.42	1.32	1.24	1.10
B250-20	2.85	2.49	2.22	1.81	2.00	1.82	1.67	1.43	1.70	1.57	1.45	1.27	1.42	1.32	1.24	1.10
2/B100-16	2.44	2.36	2.11	1.76	2.11	2.07	1.77	1.52	1.98	1.90	1.61	1.41	1.76	1.67	1.45	1.28
2/B150-16	3.33	3.04	2.37	1.94	2.57	2.38	1.95	1.60	2.26	2.12	1.73	1.45	1.93	1.80	1.50	1.29
2/B150-20	3.58	3.47	3.09	2.58	3.10	3.04	2.59	2.22	2.91	2.77	2.36	2.06	2.57	2.44	2.12	1.87
2/B200-16	3.65	3.29	2.47	1.94	2.74	2.48	1.95	1.60	2.32	2.14	1.73	1.45	1.93	1.80	1.50	1.29
2/B200-20	4.49	4.29	3.37	2.79	3.64	3.38	2.80	2.35	3.21	3.01	2.53	2.12	2.78	2.63	2.20	1.89
2/B250-20	5.08	4.59	3.57	2.84	3.87	3.59	2.85	2.35	3.40	3.13	2.53	2.12	2.83	2.64	2.20	1.89
CONTINUOUS TRIPLE SPAN**																
B100-16	1.78	1.73	1.64	1.40	1.52	1.40	1.29	1.11	1.32	1.22	1.13	0.98	1.10	1.02	0.96	0.85
B150-16	2.21	1.93	1.72	1.40	1.55	1.41	1.29	1.11	1.32	1.22	1.13	0.98	1.10	1.02	0.96	0.85
B150-20	2.62	2.54	2.40	2.05	2.22	2.06	1.89	1.62	1.93	1.78	1.65	1.44	1.61	1.50	1.41	1.25
B200-16	2.21	1.93	1.72	1.40	1.55	1.41	1.29	1.11	1.32	1.22	1.13	0.98	1.10	1.02	0.96	0.85
B200-20	3.16	2.83	2.52	2.06	2.28	2.07	1.89	1.62	1.93	1.78	1.65	1.44	1.61	1.50	1.41	1.25
B250-20	3.24	2.83	2.52	2.06	2.28	2.07	1.89	1.62	1.93	1.78	1.65	1.44	1.61	1.50	1.41	1.25
2/B100-16	2.25	2.18	2.02	1.89	1.95	1.91	1.81	1.72	1.83	1.80	1.72	1.59	1.71	1.68	1.62	1.44
2/B150-16	3.07	2.98	2.68	2.20	2.67	2.61	2.21	1.82	2.50	2.39	1.96	1.65	2.19	2.05	1.71	1.46
2/B150-20	3.30	3.20	2.96	2.78	2.86	2.81	2.66	2.51	2.69	2.64	2.52	2.32	2.51	2.47	2.38	2.11
2/B200-16	3.86	3.71	2.81	2.20	3.11	2.82	2.21	1.82	2.64	2.43	1.96	1.65	2.19	2.05	1.71	1.46
2/B200-20	4.14	4.01	3.72	3.14	3.59	3.52	3.16	2.67	3.37	3.32	2.87	2.41	3.13	2.97	2.50	2.14
2/B250-20	4.96	4.81	4.03	3.23	4.30	4.05	3.24	2.67	3.84	3.56	2.88	2.41	3.22	3.00	2.50	2.14

* FLW: refer to page 4 for floor load width calculations. ** Bearer Span: Refer to page 4 for bearer span definitions. *** RLW: refer to page 4 for roof load width types.

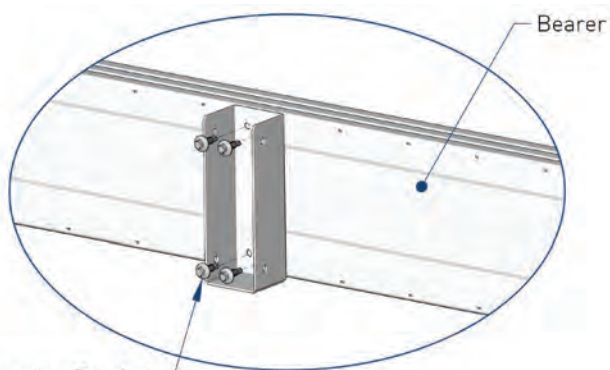


RESIDENTIAL DECK

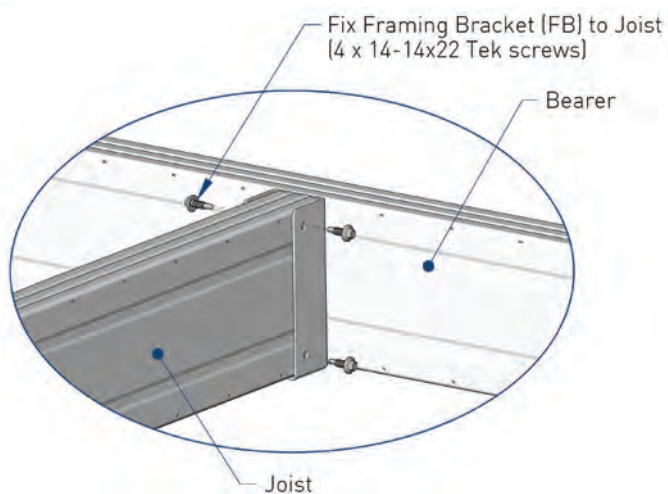




Connection No: 6
JOIST INTO BEARER CONNECTION
 With Framing Bracket



Fix Framing Bracket
 (FB) to Bearer
 (4 x 14-14x22 Tek
 screws)



Fix Framing Bracket (FB) to Joist
 (4 x 14-14x22 Tek screws)

JOISTS

SUPPORTING DECKS MORE THAN 1m ABOVE GROUND

- Live Load: **2.0kPa**
- Dead Load: **0.75kPa**

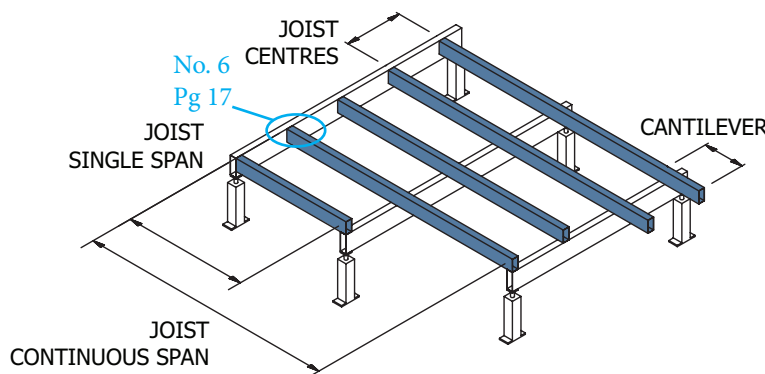


Table 5		MAXIMUM FLOOR JOIST SPAN (m)							
BOXSPAN SECTION	SINGLE SPAN			CONTINUOUS SPAN			CANTILEVERED SPAN		
	FLOOR JOIST CENTRES (mm)								
	400	450	600	400	450	600	400	450	600
B100-12	2.48	2.38	2.20	2.77	2.50	2.27	1.33	1.28	1.03
B100-16	2.73	2.60	2.41	3.03	2.78	2.53	1.46	1.40	1.27
B150-16	3.48	3.35	3.04	4.30	4.14	3.76	2.06	1.98	1.67
B150-20	3.74	3.55	3.22	4.62	4.44	4.03	2.22	2.13	1.94
B200-16	4.69	4.47	4.13	5.62	5.30	4.82	2.68	2.50	2.13
B200-20	5.03	4.63	4.43	6.02	5.78	5.25	2.89	2.78	2.52
B250-20	6.03	5.74	5.31	7.37	6.84	6.22	3.54	3.40	3.09

Spans governed by dynamic performance

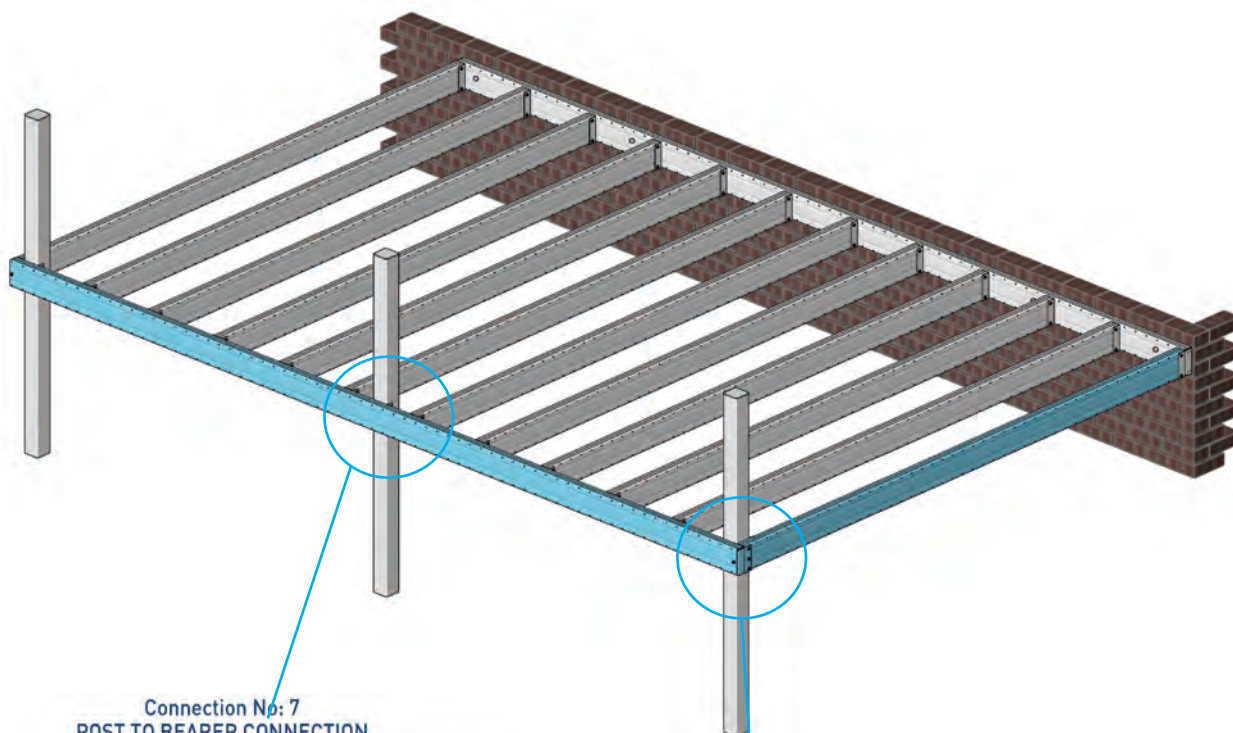
FLOOR PERFORMANCE

Suspended floor frame performance can be subjective based on the end user's perception. In order to satisfy the large majority of users it is noted that:

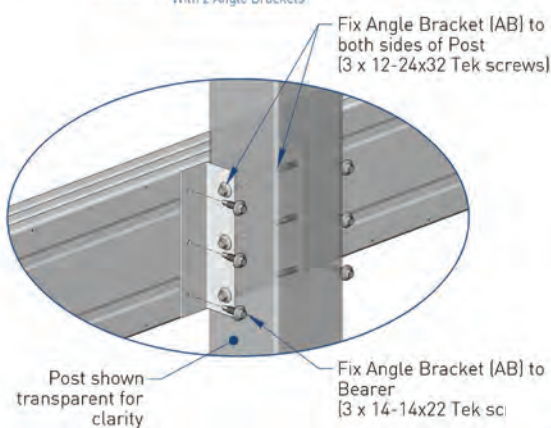
1. The maximum allowable spans have been designed to meet the strength and serviceability limits specified in NASH Standard, Residential and Low-rise Steel Framing, Part 1: Design Criteria 2005.
2. In some cases spans calculated by the above criteria have been reduced based on testing carried out at a NATA approved testing laboratory and extensive field testing carried out over more than 20 years.

Should a stiffer floor be required joist spans or joist spacing can be reduced or mid span blocking introduced. It is noted that floor carrying higher distributed loads (such as floor tiles or aerated concrete floors panels) or supporting non load bearing walls will be stiffer than floors carrying lower loads.

Floors will not reach their peak performance until carrying design dead loads. This includes, in particular, loads applied by internal and external walls including plasterboard and (for upper floors) ceilings fixed below.

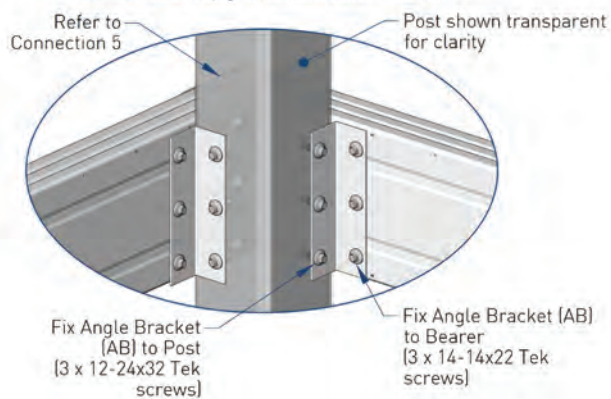


Connection No: 7
POST TO BEARER CONNECTION
With 2 Angle Brackets



Connection No: 8
CORNER POST TO BEARERS CONNECTION

With 2 Internal End Cap, 6 Hole Framing Bracket and two Angle Brackets
Refer to Connection 5 page 10 for Bearer Corner Connection



BEARERS

SUPPORTING DECKS MORE THAN 1m ABOVE GROUND

- Decking boards
- 15mm compressed FC sheeting + tiles
- Live Load: **2.0kPa**
- Dead Load: **0.75kPa**

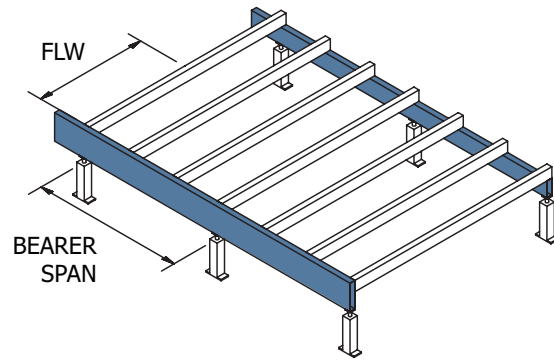
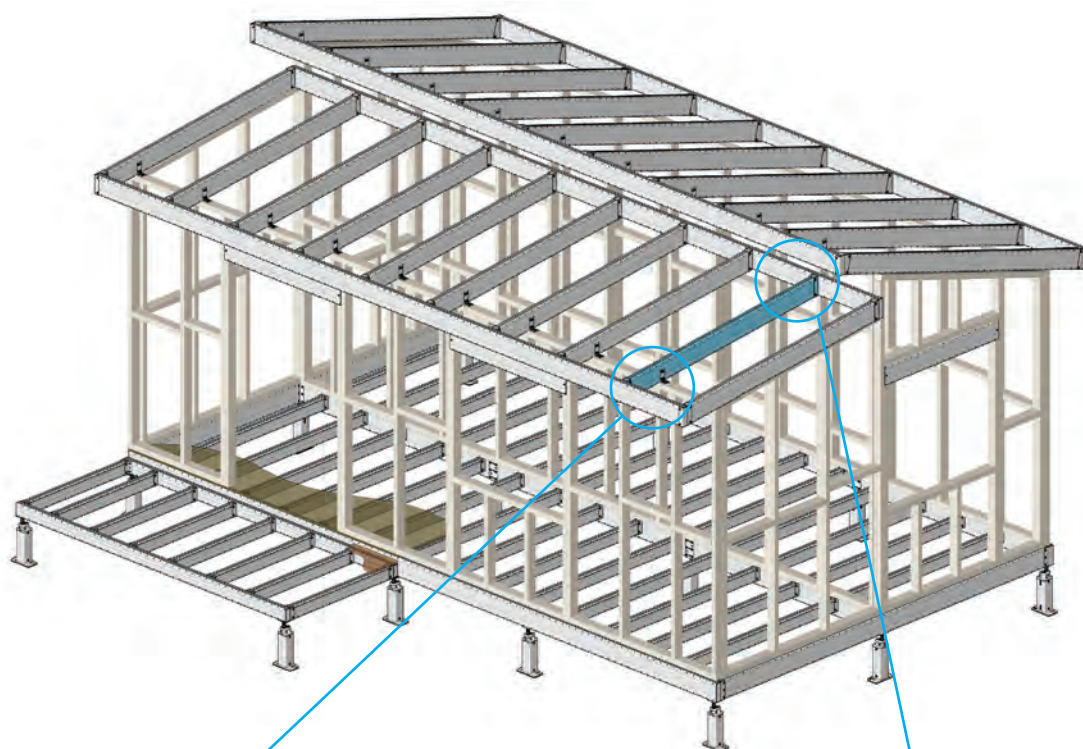


Table 6 MAXIMUM BEARER SPAN (m)											
BOXSPAN SECTION	FLOOR LOAD WIDTH – FLW (m)*										
	0.9	1.2	1.5	1.8	2.1	2.4	3.0	3.6	4.2	4.8	5.4
SINGLE SPAN**											
B100-16	2.15	1.95	1.81	1.70	1.62	1.55	1.44	1.35	1.28	1.23	1.18
B150-16	2.94	2.67	2.48	2.33	2.21	2.12	1.97	1.85	1.76	1.68	1.62
B150-20	3.15	2.86	2.66	2.50	2.38	2.27	2.11	1.99	1.89	1.80	1.73
B200-16	3.69	3.35	3.11	2.75	2.36	2.06	1.65	1.38	1.18	1.03	0.92
B200-20	3.95	3.59	3.33	3.14	2.98	2.85	2.65	2.49	2.29	2.00	1.78
B250-20	4.73	4.30	3.99	3.76	3.50	3.06	2.45	2.04	1.75	1.53	1.36
2/B100-16	2.70	2.46	2.28	2.15	2.04	1.95	1.81	1.70	1.62	1.55	1.49
2/B150-16	3.70	3.36	3.12	2.94	2.79	2.67	2.48	2.33	2.21	2.12	2.04
2/B150-20	3.97	3.61	3.35	3.15	2.99	2.86	2.66	2.50	2.38	2.27	2.19
2/B200-16	4.64	4.22	3.92	3.69	3.50	3.35	3.11	2.75	2.36	2.06	1.83
2/B200-20	4.98	4.53	4.20	3.95	3.76	3.59	3.33	3.14	2.98	2.85	2.74
2/B250-20	5.96	5.42	5.03	4.73	4.50	4.30	3.99	3.76	3.50	3.06	2.72
CONTINUOUS DOUBLE SPAN**											
B100-16	2.80	2.28	1.93	1.68	1.49	1.34	1.09	0.91	0.78	0.68	0.61
B150-16	3.20	2.57	2.16	1.82	1.56	1.37	1.09	0.91	0.78	0.68	0.61
B150-20	4.09	3.33	2.82	2.46	2.18	1.97	1.60	1.34	1.15	1.00	0.89
B200-16	3.47	2.74	2.19	1.82	1.56	1.37	1.09	0.91	0.78	0.68	0.61
B200-20	4.51	3.64	3.07	2.65	2.29	2.00	1.60	1.34	1.15	1.00	0.89
B250-20	4.84	3.87	3.21	2.67	2.29	2.00	1.60	1.34	1.15	1.00	0.89
2/B100-16	3.62	3.29	3.06	2.80	2.51	2.28	1.93	1.68	1.49	1.34	1.22
2/B150-16	4.96	4.30	3.66	3.20	2.85	2.57	2.16	1.82	1.56	1.37	1.22
2/B150-20	5.32	4.84	4.49	4.09	3.67	3.33	2.82	2.46	2.18	1.97	1.78
2/B200-16	5.83	4.73	4.00	3.47	3.08	2.74	2.19	1.82	1.56	1.37	1.22
2/B200-20	6.68	6.03	5.15	4.51	4.03	3.64	3.07	2.65	2.29	2.00	1.78
2/B250-20	7.99	6.53	5.55	4.84	4.30	3.87	3.21	2.67	2.29	2.00	1.78
CONTINUOUS TRIPLE SPAN**											
B100-16	2.65	2.41	2.18	1.90	1.68	1.52	1.24	1.04	0.89	0.78	0.69
B150-16	3.61	2.90	2.44	2.07	1.78	1.55	1.24	1.04	0.89	0.78	0.69
B150-20	3.89	3.54	3.18	2.77	2.46	2.22	1.82	1.52	1.30	1.14	1.01
B200-16	3.92	3.11	2.49	2.07	1.78	1.55	1.24	1.04	0.89	0.78	0.69
B200-20	4.89	4.10	3.46	3.00	2.60	2.28	1.82	1.52	1.30	1.14	1.01
B250-20	5.45	4.37	3.64	3.04	2.60	2.28	1.82	1.52	1.30	1.14	1.01
2/B100-16	3.34	3.03	2.82	2.65	2.52	2.41	2.18	1.90	1.68	1.52	1.38
2/B150-16	4.57	4.15	3.86	3.61	3.21	2.90	2.44	2.07	1.78	1.55	1.38
2/B150-20	4.91	4.46	4.14	3.89	3.70	3.54	3.18	2.77	2.46	2.22	2.02
2/B200-16	5.74	5.21	4.51	3.92	3.47	3.11	2.49	2.07	1.78	1.55	1.38
2/B200-20	6.16	5.59	5.19	4.89	4.54	4.10	3.46	3.00	2.60	2.28	2.02
2/B250-20	7.37	6.70	6.22	5.45	4.85	4.37	3.64	3.04	2.60	2.28	2.02

* FLW: refer to page 4 for floor load width calculations.

** Bearer Span: refer to page 4 for bearer span definitions.



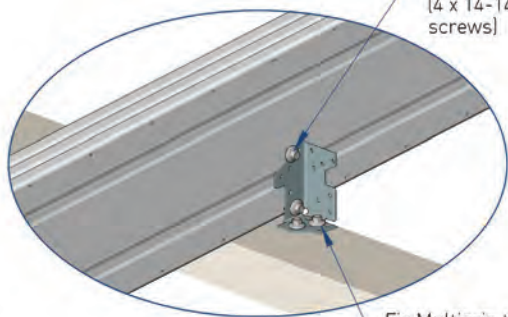


Connection No: 9a RAFTER TO TOP PLATE CONNECTION

With Multigrip or Triple Grip

Fix Multigrip to Rafter
(4 x 14-14x22 Tek screws)

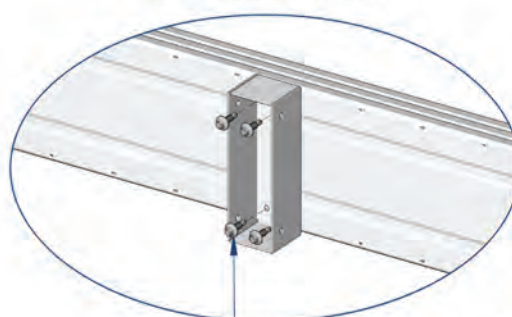
Fix Multigrip to top plate
(4 x 12g Timber screws)



Connection No: 10 RAFTER TO ROOF BEAM CONNECTION

With Architectural Framing Bracket 7°

Fix Architectural Framing
Bracket 7° (AFB7°) to roof beam
(4 x 14-14x22 Tek screws)



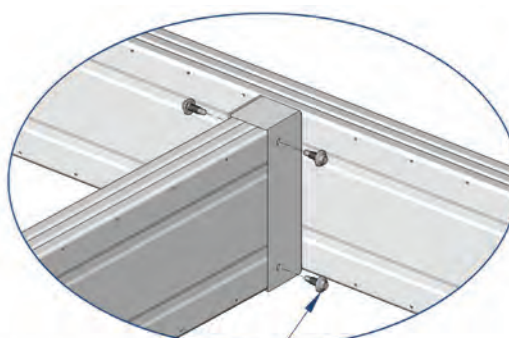
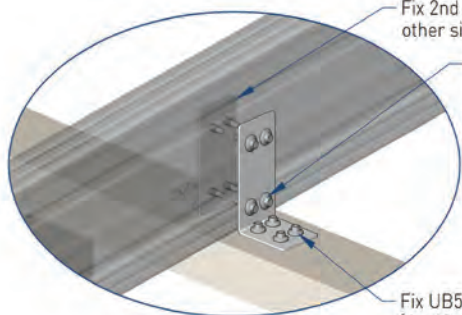
Connection No: 9b RAFTER TO TOP PLATE CONNECTION

With 2 UB50 Brackets

Fix 2nd UB50 to
other side of rafter

Fix UB50 to Rafter
(4 x 14-14x22 Tek screws)

Fix UB50 to top plate
(4 x 12g Timber screws)



Fix Architectural Framing
Bracket 7° to Rafter
(4 x 14-14x22 Tek screws)

RAFTERS

- Roof Live Load: **0.25kPa**
- Terrain: **Suburban Sheltered**
- Wind Class: **N3**

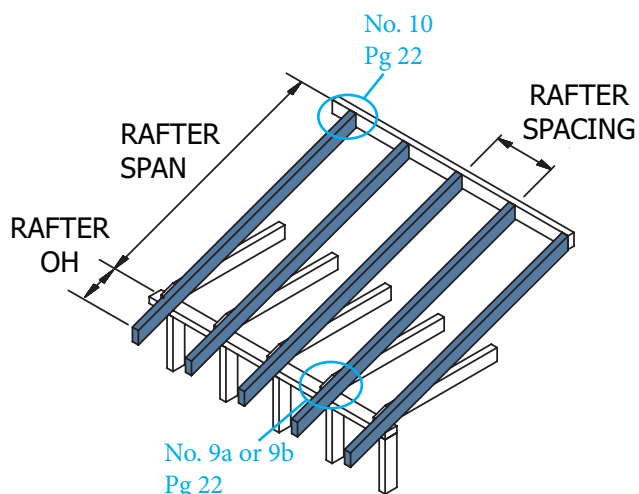


Table 16 MAXIMUM RAFTER SPAN (m)

BOXSPAN SECTION	SINGLE SPAN						CONTINUOUS SPAN					
	RAFTER SPACING (m)						RAFTER SPACING (m)					
	0.45	0.6	0.9	1.2	1.5	1.8	0.45	0.6	0.9	1.2	1.5	1.8
SHEET ROOF & CEILING 40kg/m ²												
B100-12	4.62	4.23	3.73	3.41	3.17	2.99	6.19	5.67	5.00	4.56	4.25	4.01
B100-16	5.01	4.61	4.07	3.72	3.47	3.27	6.72	6.18	5.46	4.99	4.65	4.39
B150-16	6.77	6.24	5.53	5.06	4.72	4.46	9.08	8.37	7.41	6.79	6.33	5.92
B150-20	7.19	6.65	5.91	5.42	5.06	4.78	9.64	8.91	7.92	7.26	6.78	6.40
B200-16	8.41	7.77	6.90	6.32	5.90	5.57	11.21	9.86	8.18	7.14	6.42	5.88
B200-20	8.92	8.26	7.36	6.76	6.32	5.97	11.96	11.07	9.87	9.06	8.23	7.54
B250-20	10.58	9.82	8.77	8.06	7.53	7.12	14.09	12.46	10.40	9.10	8.20	7.52
TILED ROOF & CEILING 90kg/m ²												
B100-12	3.59	3.28	2.88	2.62	2.43	2.29	4.82	4.40	3.86	3.51	3.26	3.07
B100-16	3.93	3.59	3.15	2.87	2.67	2.51	5.26	4.81	4.22	3.85	3.58	3.37
B150-12	4.89	4.46	3.92	3.57	3.32	3.13	6.43	5.60	4.60	4.00	3.58	3.27
B150-16	5.34	4.88	4.29	3.91	3.64	3.43	7.15	6.54	5.75	5.25	4.88	4.48
B150-20	5.70	5.22	4.60	4.20	3.91	3.68	7.65	7.00	6.17	5.63	5.24	4.94
B200-16	6.66	6.10	5.37	4.90	4.56	4.30	8.66	7.57	6.24	5.43	4.87	4.45
B200-20	7.11	6.52	5.75	5.25	4.89	4.61	9.53	8.75	7.71	6.97	6.25	5.72
B250-20	8.47	7.78	6.87	6.27	5.84	5.51	10.99	9.64	7.97	6.95	6.24	5.71

MAXIMUM RAFTER OVERHANG (m)

BOXSPAN SECTION	RAFTER SPACING (m)						RAFTER SPACING (m)					
	0.45	0.6	0.9	1.2	1.5	1.8	0.45	0.6	0.9	1.2	1.5	1.8
	SHEET ROOF & CEILING 40kg/m²						TILED ROOF & CEILING 90kg/m²					
B100-12	2.45	2.28	2.06	1.91	1.71	1.55	2.02	1.88	1.70	1.58	1.49	1.40
B100-16	2.63	2.45	2.21	2.06	1.95	1.85	2.17	2.02	1.83	1.70	1.61	1.53
B150-16	3.34	3.11	2.81	2.61	2.47	2.34	2.75	2.56	2.32	2.16	2.04	1.95
B150-20	3.53	3.29	2.97	2.76	2.61	2.50	2.91	2.71	2.45	2.28	2.16	2.06
B200-16	3.97	3.69	3.34	3.10	2.94	2.66	3.27	3.04	2.75	2.56	2.42	2.31
B200-20	4.19	3.90	3.53	3.28	3.10	2.97	3.46	3.22	2.91	2.71	2.56	2.45
B250-20	4.80	4.47	4.04	3.76	3.55	3.40	3.96	3.69	3.33	3.10	2.93	2.80

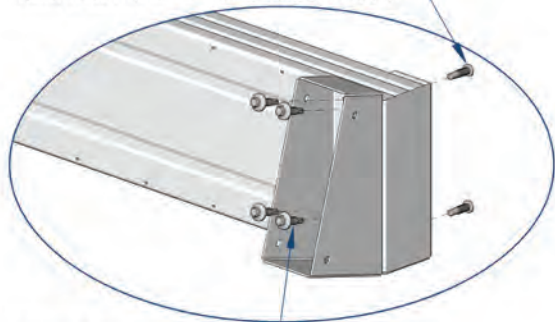
ADDITIONAL ROOF CONNECTIONS

Connection No: 11 CORNER CONNECTION

With Architectural Framing Bracket 0° & Architectural Framing Bracket 7°-22°

Fix Architectural Framing Bracket 0° to Roof Beam (2 x 14-14x22 Tek screws*)

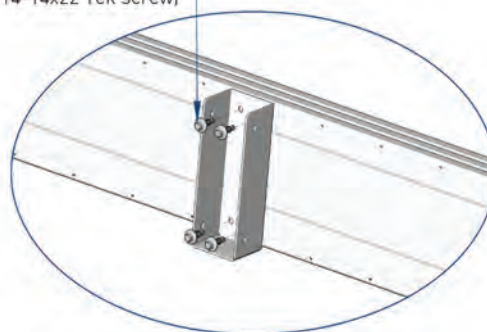
Fix Architectural Framing Bracket 7-22° to Roof Beam (4 x 14-14x22 Tek screws)



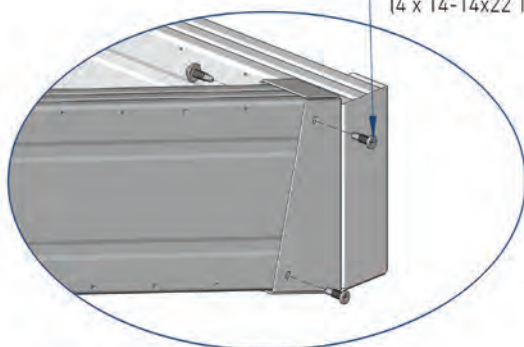
Connection No: 13 PURLIN TO RAFTER CONNECTION

With Framing Bracket 4 Hole

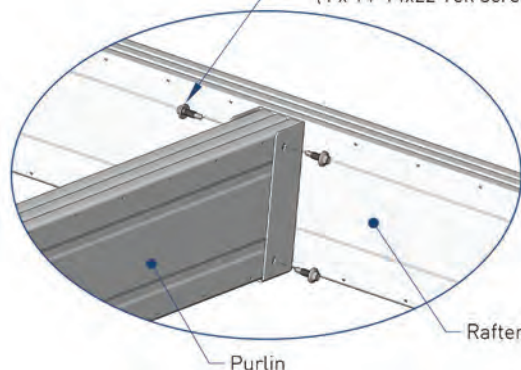
Fix Framing Bracket 4 Hole (FB4H) to Rafter (4 x 14-14x22 Tek screw)



Fix Architectural Framing Bracket 7-22° to Rafter (4 x 14-14x22 Tek screws*)



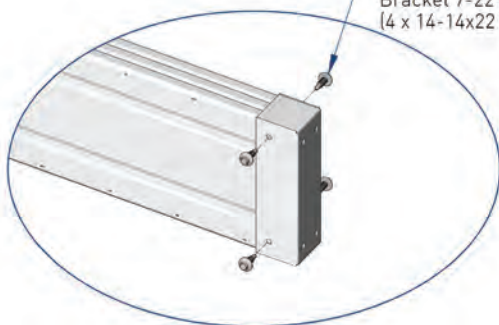
Fix Framing Bracket 4 Hole (FB4H) to Purlin (4 x 14-14x22 Tek screws)



Connection No: 12 RAFTER END CONNECTION

With Architectural Framing Bracket 7-22°

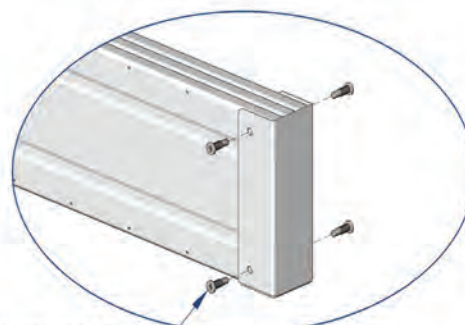
Fix Architectural Framing Bracket 7-22° to Rafter (4 x 14-14x22 Tek screws)



Connection No: 14 ROOF BEAM END CONNECTION

With Architectural Framing Bracket 0°

Fix Architectural Framing Bracket 0° to Roof Beam (4 x 14-14x22 Tek screws*)



*The M6 Pancake Head Tek is optional and can be used to replace the 14-14x22 Tek when a flush finish is required.

RIDGE & INTERMEDIATE BEAMS

- Roof Live Load: **0.25kPa**
- Terrain: **Suburban Sheltered**
- Wind Class: **N3**

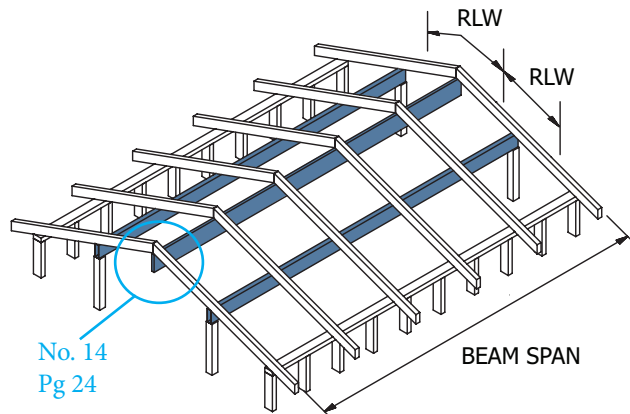
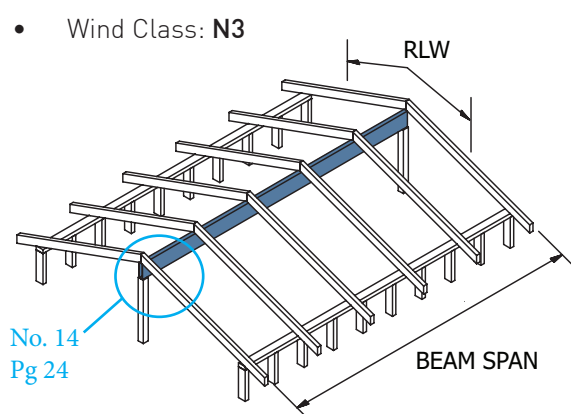


Table 17

MAXIMUM BEAM SPAN BETWEEN SUPPORTS (m)

BOXSPAN SECTION	SINGLE SPAN							CONTINUOUS SPAN						
	ROOF LOAD WIDTH RLW (m)***							ROOF LOAD WIDTH RLW (m)***						
	2.0	3.0	4.0	5.0	6.0	8.0	9.0	2.0	3.0	4.0	5.0	6.0	8.0	9.0
SHEET ROOF & CEILING 40kg/m ²														
B100-16	3.16	2.77	2.53	2.35	2.21	2.01	1.93	4.24	3.72	3.38	3.10	2.83	2.46	2.32
B150-16	4.31	3.78	3.45	3.20	3.02	2.74	2.64	5.62	4.61	4.00	3.58	3.28	2.84	2.68
B150-20	4.62	4.06	3.70	3.44	3.24	2.95	2.84	6.19	5.44	4.83	4.33	3.96	3.43	3.24
B200-16	5.39	4.74	4.31	4.01	3.78	3.44	3.25	5.59	4.59	3.98	3.57	3.26	2.83	2.67
B200-20	5.78	5.08	4.63	4.31	4.06	3.70	3.56	7.17	5.89	5.12	4.59	4.19	3.64	3.43
B250-20	6.89	6.07	5.53	5.15	4.85	4.42	4.19	7.15	5.88	5.11	4.58	4.19	3.63	3.43
2/B100-16	3.94	3.47	3.16	2.94	2.77	2.53	2.43	5.28	4.65	4.24	3.95	3.72	3.38	3.26
2/B150-16	5.36	4.72	4.31	4.01	3.78	3.45	3.32	7.18	6.33	5.62	5.04	4.61	4.00	3.78
2/B150-20	5.73	5.06	4.62	4.30	4.06	3.70	3.56	7.67	6.78	6.19	5.77	5.44	4.83	4.56
2/B200-16	6.68	5.90	5.39	5.02	4.74	4.31	4.15	7.79	6.42	5.59	5.02	4.59	3.98	3.76
2/B200-20	7.14	6.32	5.78	5.39	5.08	4.63	4.46	9.57	8.23	7.17	6.44	5.89	5.12	4.83
2/B250-20	8.50	7.53	6.89	6.43	6.07	5.53	5.33	9.91	8.20	7.15	6.42	5.88	5.11	4.82
TILED ROOF & CEILING 90kg/m ²														
B100-16	2.43	2.13	1.93	1.80	1.69	1.54	1.48	3.26	2.85	2.59	2.34	2.13	1.85	1.74
B150-16	3.32	2.90	2.64	2.45	2.31	2.10	2.02	4.25	3.48	3.02	2.70	2.47	2.14	2.02
B150-20	3.56	3.12	2.84	2.64	2.48	2.26	2.17	4.77	4.18	3.65	3.26	2.98	2.58	2.44
B200-16	4.15	3.64	3.31	3.07	2.89	2.63	2.53	4.23	3.46	3.01	2.69	2.46	2.13	2.01
B200-20	4.46	3.91	3.56	3.30	3.11	2.83	2.72	5.44	4.46	3.87	3.46	3.16	2.74	2.59
B250-20	5.33	4.67	4.25	3.95	3.72	3.38	3.25	5.43	4.45	3.86	3.46	3.16	2.74	2.58
2/B100-16	3.05	2.67	2.43	2.26	2.13	1.93	1.86	4.08	3.58	3.26	3.03	2.85	2.59	2.46
2/B150-16	4.15	3.64	3.32	3.08	2.90	2.64	2.54	5.56	4.88	4.25	3.81	3.48	3.02	2.85
2/B150-20	4.45	3.91	3.56	3.31	3.12	2.84	2.73	5.97	5.24	4.77	4.44	4.18	3.65	3.44
2/B200-16	5.19	4.56	4.15	3.86	3.64	3.31	3.18	5.93	4.87	4.23	3.79	3.46	3.01	2.83
2/B200-20	5.57	4.89	4.46	4.15	3.91	3.56	3.42	7.46	6.26	5.44	4.87	4.46	3.87	3.65
2/B250-20	6.65	5.84	5.33	4.96	4.67	4.25	4.09	7.58	6.24	5.43	4.86	4.45	3.86	3.64

*** RLW: refer to page 4 for roof load width types.

CEILING JOISTS

- Dead Load: **0.25kPa**
- Terrain: **Suburban Sheltered**
- Wind Class: **N3**

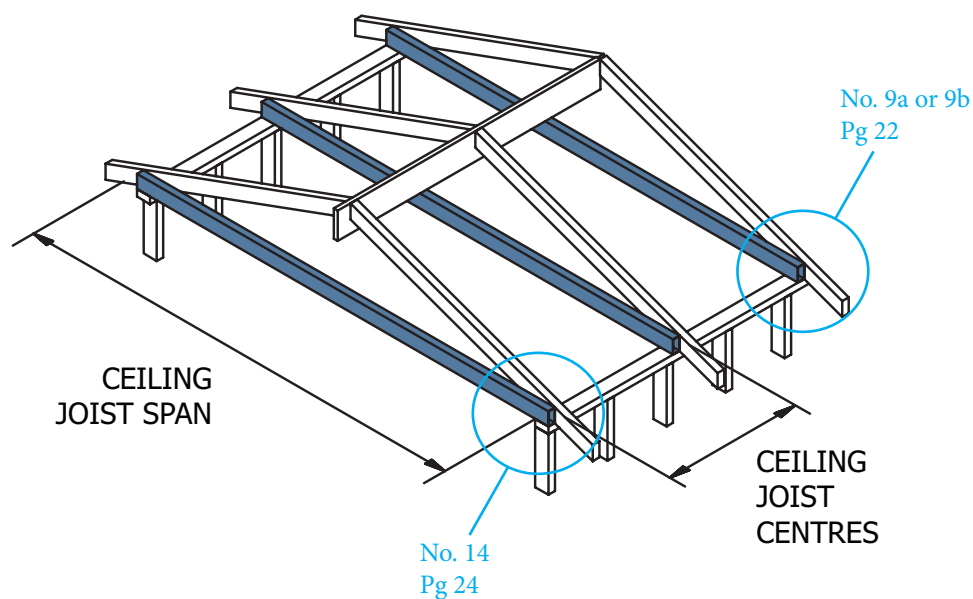
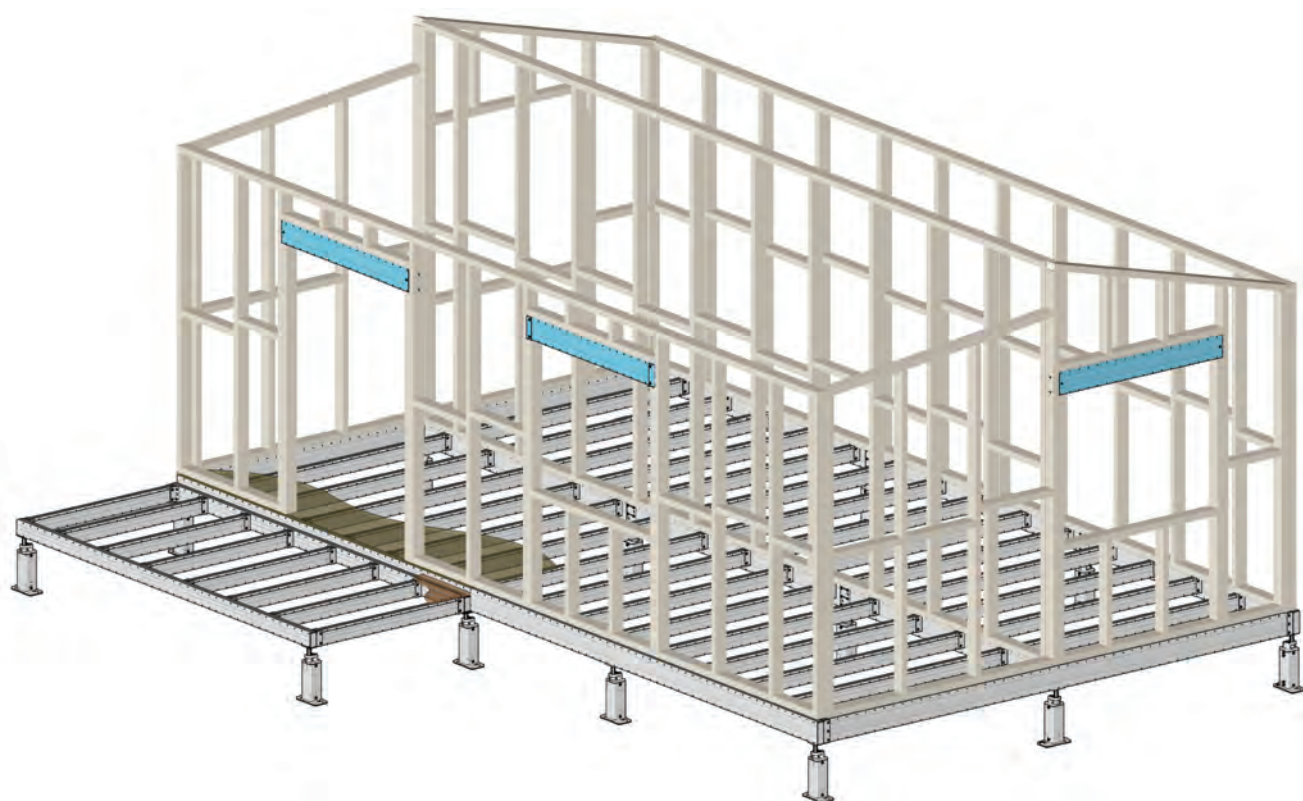
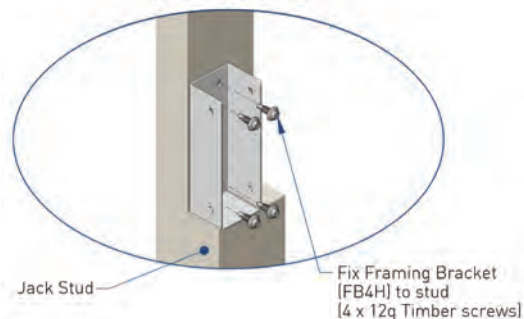


Table 18		MAXIMUM CEILING JOIST SPAN (m)							
BOXSPAN SECTION	SINGLE SPAN				CONTINUOUS SPAN				
	CEILING JOIST CENTRES (mm)				CEILING JOIST CENTRES (mm)				
	450	600	900	1200	450	600	900	1200	
B100-12	5.50	5.00	4.37	3.97	7.37	6.70	5.85	5.32	
B100-16	6.02	5.47	4.78	4.34	8.07	7.33	6.41	5.82	
B150-16	8.24	7.49	6.54	5.94	11.05	10.04	8.77	7.97	
B150-20	8.84	8.03	7.02	6.38	11.86	10.77	9.41	8.55	
B200-16	10.34	9.40	8.21	7.46	13.87	12.60	11.01	10.00	
B200-20	11.09	10.08	8.80	8.00	14.87	13.51	11.81	10.73	
B250-20	13.28	12.07	10.54	9.58	17.81	16.18	14.14	12.84	



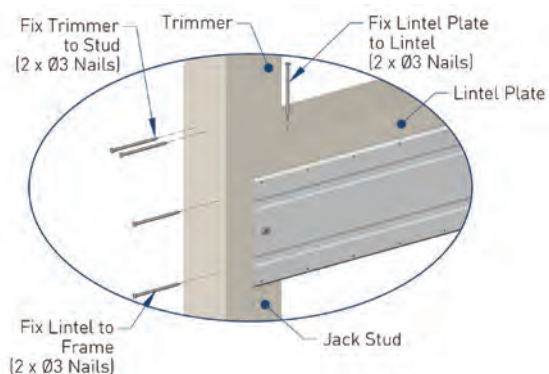
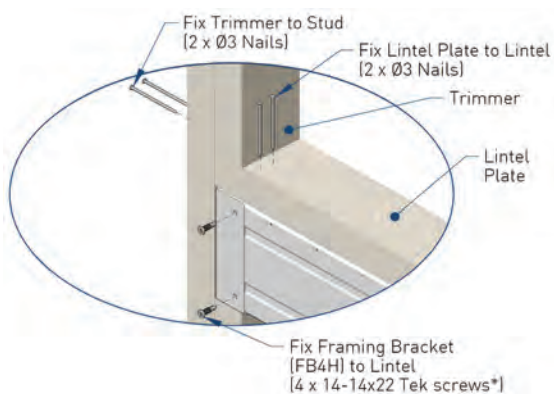
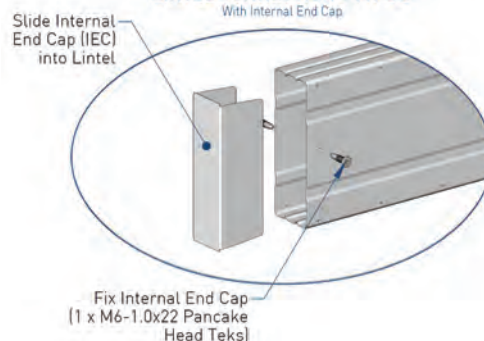
LINTEL CONNECTION - TYPE 1

With Framing Bracket & Hole



LINTEL CONNECTION - TYPE 2

With Internal End Cap



LINTELS

SUPPORTING ROOF LOADS ONLY

- Eave Overhang: **550mm**
- Max Deflection: **5mm**
- Wind Class: **N3**

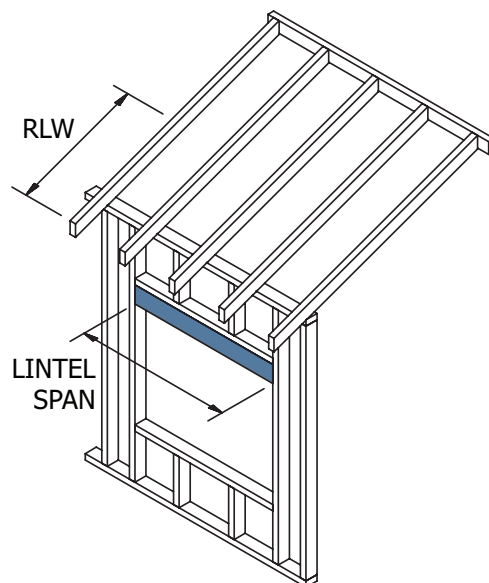


Table 13		MAXIMUM SINGLE SPAN (m)						
BOXSPAN SECTION	ROOF LOAD WIDTH – RLW (m)***							
	1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0
SHEET ROOF & CEILING 40kg/m ²								
B100-16	2.76	2.49	2.32	2.19	2.09	2.01	1.89	1.80
B150-16	3.48	3.15	2.93	2.77	2.64	2.54	2.39	2.27
B150-20	3.67	3.32	3.09	2.92	2.79	2.68	2.52	2.40
B200-16	4.12	3.72	3.47	3.28	3.13	3.01	2.83	2.69
B200-20	4.34	3.93	3.65	3.46	3.30	3.18	2.99	2.84
B250-20	4.95	4.48	4.18	3.95	3.78	3.63	3.41	3.25
2/B150-20	4.31	3.91	3.65	3.45	3.30	3.18	2.99	2.85
2/B200-20	5.09	4.62	4.31	4.09	3.91	3.76	3.54	3.37
2/B250-20	5.79	5.27	4.92	4.67	4.46	4.30	4.04	3.85
TILED ROOF & CEILING 90kg/m ²								
B100-16	2.33	2.08	1.92	1.81	1.73	1.66	1.55	1.48
B150-16	2.94	2.62	2.43	2.29	2.18	2.10	1.96	1.86
B150-20	3.10	2.77	2.56	2.42	2.30	2.21	2.07	1.97
B200-16	3.48	3.11	2.88	2.71	2.58	2.48	2.18	1.96
B200-20	3.67	3.28	3.04	2.86	2.73	2.62	2.46	2.33
B250-20	4.19	3.75	3.47	3.27	3.12	3.00	2.81	2.56
2/B150-20	3.66	3.28	3.04	2.87	2.73	2.63	2.46	2.34
2/B200-20	4.33	3.88	3.60	3.39	3.24	3.11	2.92	2.77
2/B250-20	4.94	4.43	4.11	3.88	3.70	3.56	3.33	3.17

*** RLW: refer to page 4 for roof load width types.

LINTELS

SUPPORTING GIRDER TRUSS

- Truss Centres: **600mm**
- Eave Overhang: **550mm**
- Max Deflection: **5mm**
- Wind Class: **N3**

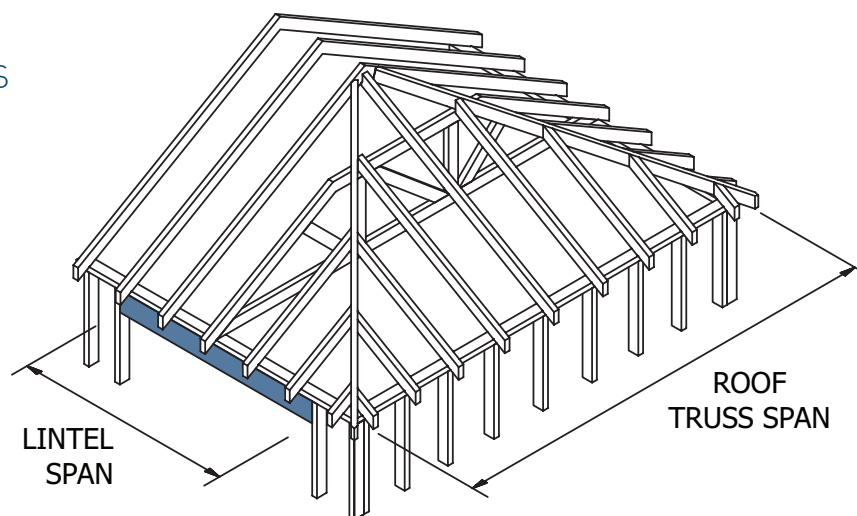


Table 14

MAXIMUM SINGLE SPAN (m)

BOXSPAN SECTION	SHEET ROOF & CEILING – 40Kg/m ²				TILED ROOF & CEILING – 90Kg/m ²			
	ROOF TRUSS SPAN (m)				ROOF TRUSS SPAN (m)			
	6.0	8.0	10.0	12.0	6.0	8.0	10.0	12.0
B100-16	1.99	1.86	1.76	1.68	1.64	1.53	1.44	1.38
B150-16	2.51	2.35	2.22	2.13	2.07	1.93	1.82	1.74
B150-20	2.65	2.48	2.35	2.25	2.18	2.03	1.93	1.84
B200-16	2.97	2.78	2.63	2.52	2.45	2.28	2.16	1.97
B200-20	3.14	2.93	2.78	2.66	2.59	2.41	2.28	2.18
B250-20	3.59	3.35	3.18	3.04	2.96	2.76	2.61	2.50
2/B150-20	3.14	2.94	2.78	2.67	2.59	2.42	2.29	2.19
2/B200-20	3.72	3.48	3.30	3.16	3.07	2.86	2.71	2.59
2/B250-20	4.25	3.97	3.77	3.61	3.51	3.27	3.10	2.96

LINTELS

SUPPORTING ROOF & SINGLE STOREY FLOOR LOADS

- Roof Live Load: **0.25kPa**
- Wall: **0.45kPa @ 2.7m Ht**
- Eave Overhang: **550mm**
- Floor Live Load: **1.5kPa**
- Floor Dead Load: **0.75kPa**
- Max Deflection: **5mm**

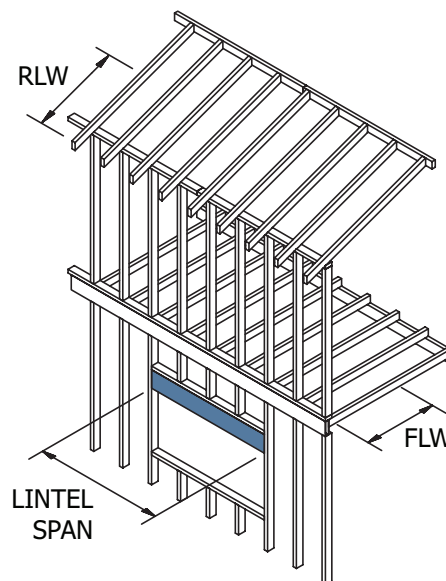


Table 15

MAXIMUM SINGLE SPAN (m)

BOXSPAN SECTION	ROOF LOAD WIDTH – RLW (m)***															
	2				4.5				6				8			
	FLOOR LOAD WIDTH – FLW (m)*															
	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0	0.9	1.2	2.1	3.0
	SHEET ROOF & CEILING 40kg/m²															
B100-16	2.15	2.07	1.89	1.71	1.96	1.90	1.78	1.62	1.87	1.83	1.73	1.58	1.78	1.75	1.67	1.52
B150-16	2.72	2.61	2.31	1.95	2.47	2.40	2.15	1.86	2.37	2.31	2.07	1.81	2.25	2.21	1.98	1.74
B150-20	2.87	2.76	2.52	2.35	2.61	2.54	2.37	2.24	2.50	2.44	2.30	2.19	2.38	2.33	2.22	2.11
B200-16	3.22	2.91	2.35	1.99	2.86	2.63	2.19	1.89	2.68	2.49	2.11	1.84	2.49	2.34	2.01	1.77
B200-20	3.40	3.26	2.99	2.57	3.09	3.00	2.81	2.44	2.96	2.89	2.73	2.37	2.82	2.76	2.60	2.29
B250-20	3.88	3.73	3.06	2.60	3.53	3.43	2.86	2.47	3.38	3.25	2.75	2.40	3.22	3.05	2.63	2.31
	TILED ROOF & CEILING 90kg/m²															
B100-16	1.92	1.87	1.76	1.61	1.69	1.66	1.60	1.46	1.60	1.58	1.53	1.39	1.51	1.50	1.43	1.31
B150-16	2.43	2.37	2.12	1.84	2.14	2.10	1.87	1.67	2.02	1.97	1.76	1.59	1.87	1.80	1.63	1.49
B150-20	2.56	2.50	2.35	2.22	2.26	2.22	2.13	2.02	2.14	2.11	2.04	1.92	2.02	2.00	1.94	1.81
B200-16	2.79	2.57	2.16	1.87	2.29	2.17	1.90	1.70	2.10	2.00	1.79	1.61	1.90	1.83	1.66	1.52
B200-20	3.04	2.96	2.78	2.42	2.67	2.63	2.46	2.19	2.53	2.50	2.31	2.09	2.39	2.37	2.15	1.96
B250-20	3.47	3.36	2.81	2.44	2.99	2.83	2.48	2.21	2.74	2.61	2.33	2.10	2.48	2.39	2.17	1.98

* FLW: refer to page 4 for floor load width calculations. *** RLW: refer to page 4 for roof load width types.

