

SPANTEC[™]
MAKING
BUILDING
EASY

BOXSPAN[®] RESIDENTIAL UPPER FLOOR GUIDE
Non Cyclonic up to N3 Wind Class

Upper Floors → Joists → Bearers

BOXSPAN[®]

STRONG, STRAIGHT, TRUE

HALINA ENGINEERS PTY LTD

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Our Reference **3333-05-SL01_A**

Tuesday, 29 November 2022

STRUCTURAL DESIGN CERTIFICATION

Structural Assessment of Spantec Boxspan Span Tables

Standard Residential Publication – November 2022

This assessment has been certified by the undersigned for the structural selection programs and span tables as described in Spantec Boxspan Span Tables: Standard Residential.

I consider that the guideline complies with the following structural provisions on the National Construction Code of Australia (NCC) 2022:

- Volume Two, Steel Frame, Part 3.4.2.

The assessment considered the following:

- 1) The design programs to determine the values of beam load width, beam spacing, member span and connection capacity to calculate the span tables in the publication, comply with generally accepted engineering principles and these following Australian Standards:
 - AS1170.0:2002 Structural Design Actions - Part 0: General Principles
 - AS1170.1:2002 Structural Design Actions - Part 1: Permanent Imposed and other Actions.
 - AS1170.2-2021: Wind Actions
 - AS4055-2021: Wind Loads for Housing.
 - AS4600:2018 Cold-Formed Steel Structures.
 - AS3566.1-2002 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.
 - AS1397: 2011 - Steel Sheet and Strip Hot Dipped Zinc Coated or Aluminium/Zinc Coated.

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- 2) The design capacities of Bending (**Mb**), Shear (**Vv**) and Bearing (**Rb**) have been determined in accordance with engineering calculations, laboratory testing and Australian Standard AS4600 Cold Formed Steel Structures.
- 3) The ultimate limit strength and serviceability limits of the Boxspan members have been determined using AS1170.0-2002, AS4600-2018 and testing results of Spantec.
- 4) The wind actions for strength and serviceability limits have been determined using AS1170.2-2021 (Wind Actions) and AS4055-2021 (Wind Loads for Housing).

This certification may be considered as “Evidence of Suitability” under the National Construction Code of Australia (NCC), Volume One Clause A2.2 Performance Solutions. 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 duties and responsibilities. The tables describe many different structures and any specific structure should be fully described with geometry and loading.

The span tables are part of a system with included the Spantec Boxspan Brackets and Fixing.

The system can be considered complete for its intended purpose provide that:

- Connections, fixings and details are in accordance with system specifications, documentation and drawings which must be verified by the certifier.
- Supporting structural is stable, able to withstand the wind uplift, beam reactions and separately certified.
- The beams are installed in accordance with the designs and professional building standards.

If you have any further enquiries regarding this matter, please do not hesitate to contact the undersigned.

Yours faithfully

HALINA ENGINEERS PTY LTD

Ha Nguyen

BE(Hons) PhD MIEAust CEng NER4188792 PE0001349 RPEQ24385

PRE-0000735 DEP-0000876

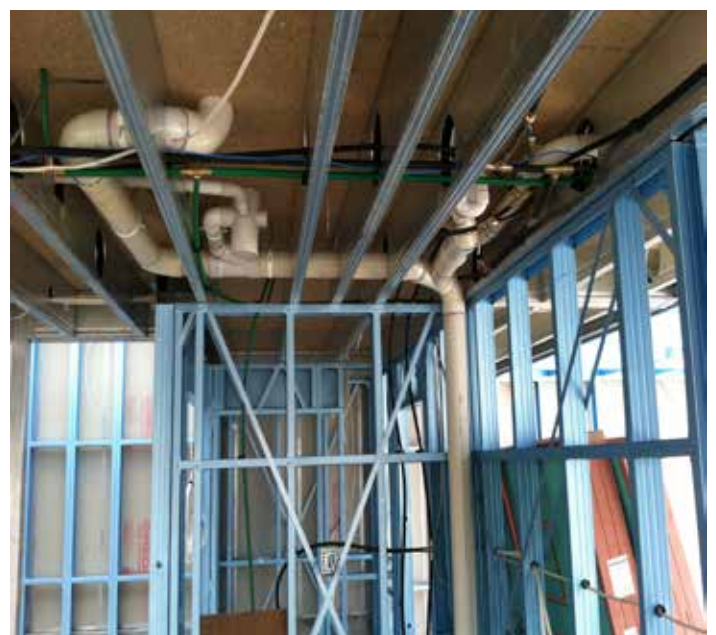
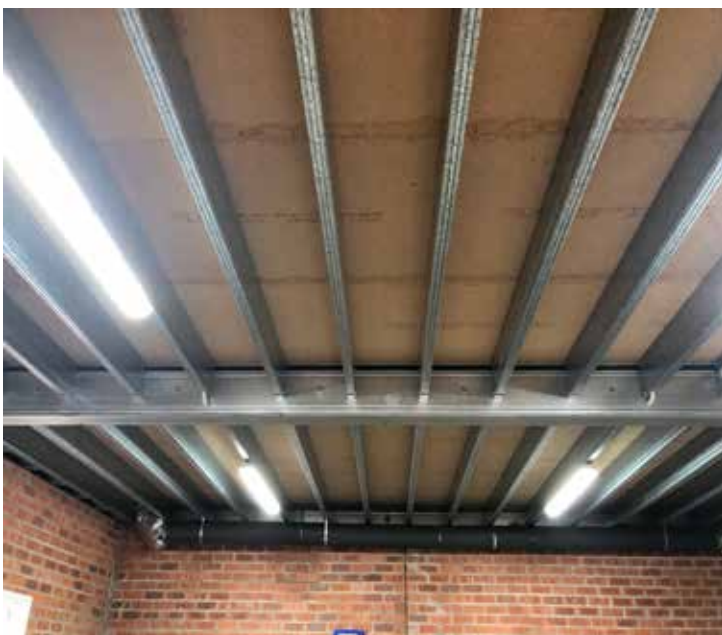
Principal Structural Engineer/Director

29/11/2022

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BOXSPAN BENEFITS

- Certified and engineered.
- Australian manufactured from BlueScope coil.
- Strong, straight and true to size.
- All Boxspan beams are dimensionally accurate providing a dead level upper floor frame.
- Box like shape provides simple assembly of brackets.
- Cut to size or available in standard lengths.
- Large in-house stock control.
- Greater spans.
- All products are galvanised for increased durability.
- Associated bracket range.
- Light weight.
- Will not warp, twist or rot.
- Simple installation.
- Manufactured lengths of up to 12 metres.
- Beams sizes ranging from 100x50 to 250x50.



JOISTS
SUPPORTING UPPER FLOORS

- 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.

BEARERS
SUPPORTING UPPER FLOORS

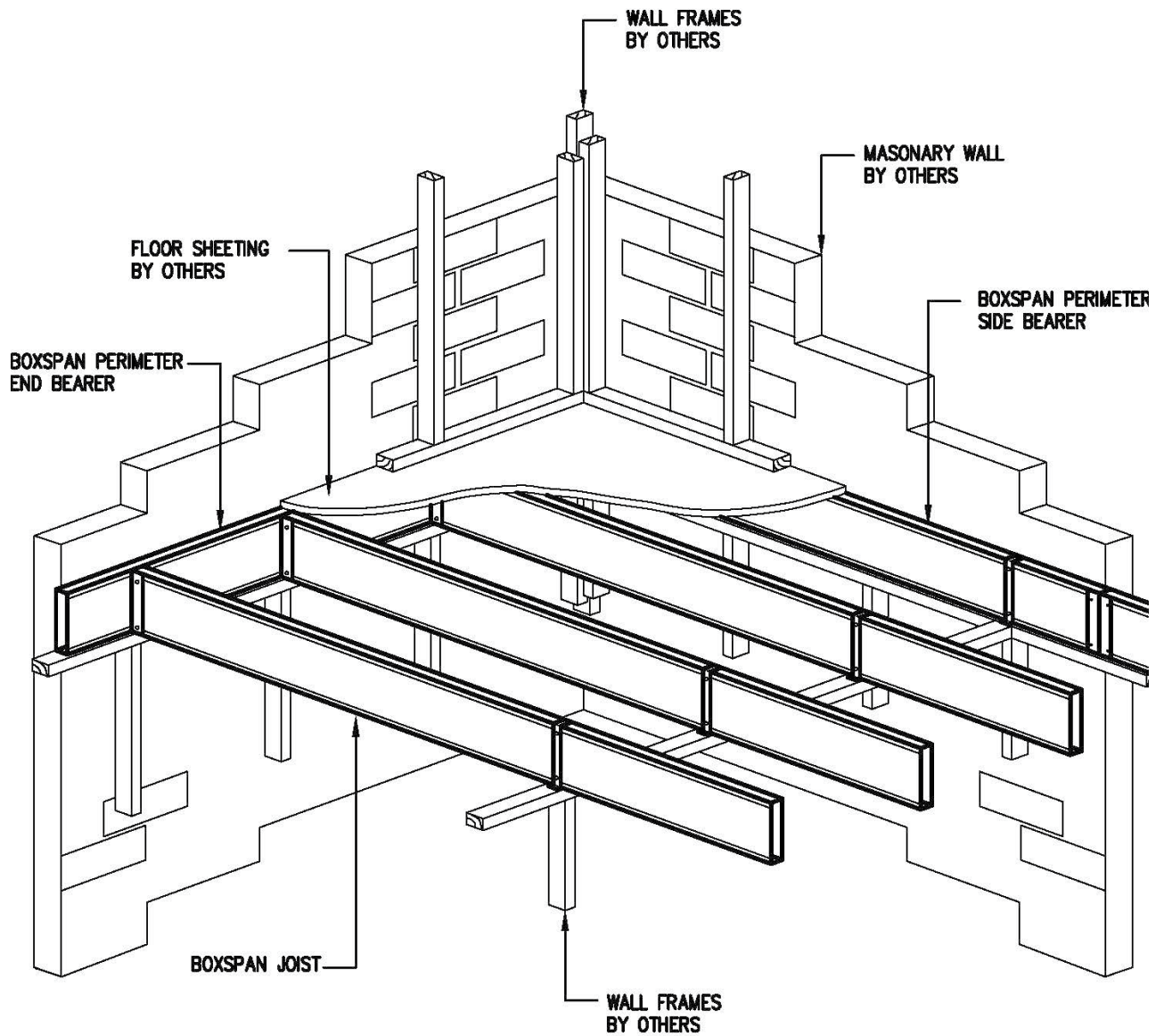
- 15mm compressed FC sheeting + tiles
- Live Load: **2.0kPa**
- Dead Load: **0.75kPa**

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

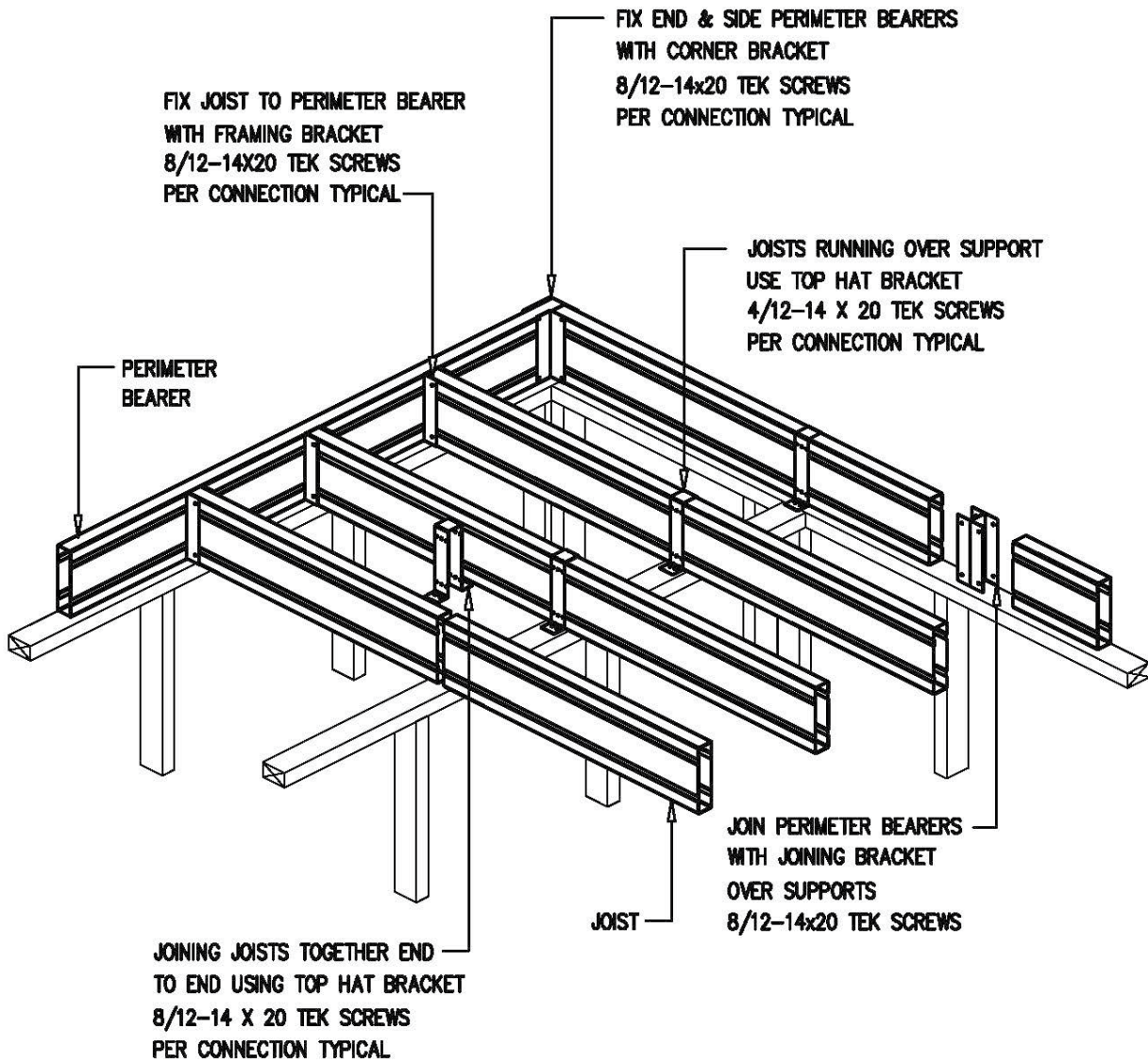
* FLW: refer to page 4 for floor load width calculations.

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

**MONOPLANE FLOOR SYSTEM OVERVIEW
(BRICK VENEER CONSTRUCTION)**

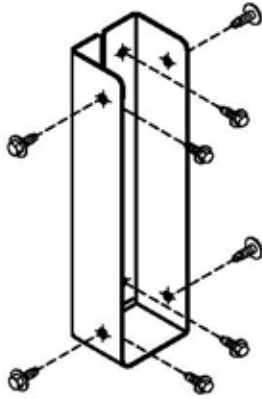


MONOPLANE FLOOR SYSTEM
(FLOOR MEMBER ARRANGEMENT)

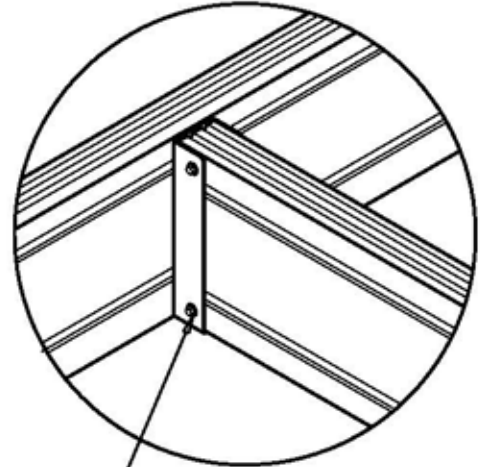


FRAMING BRACKET (FB)

(FOR FIXING JOISTS TO BEARERS PERPENDICULAR TO EACH OTHER)



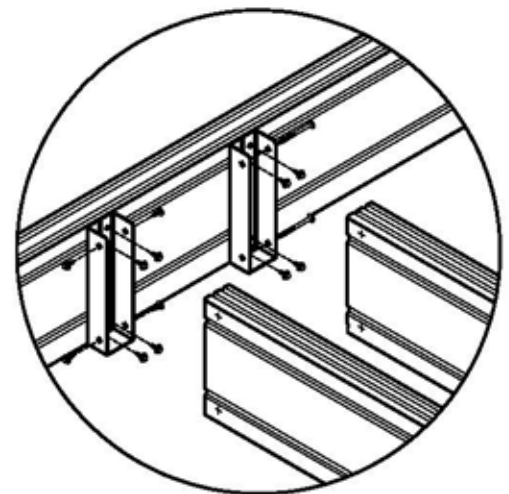
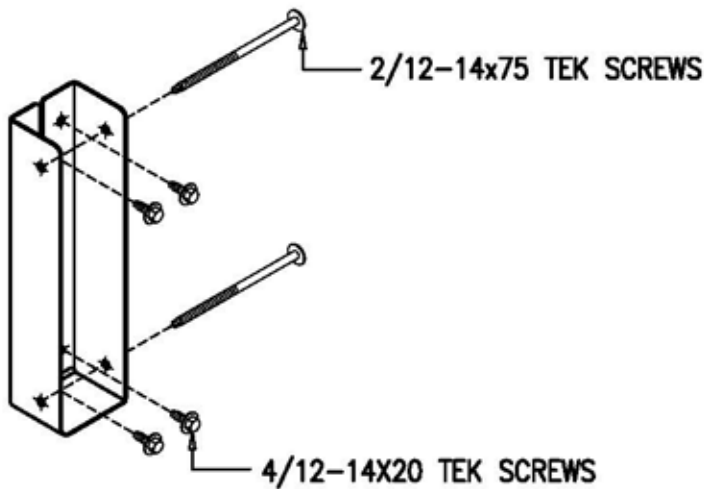
FB100
FB150
FB200
FB250



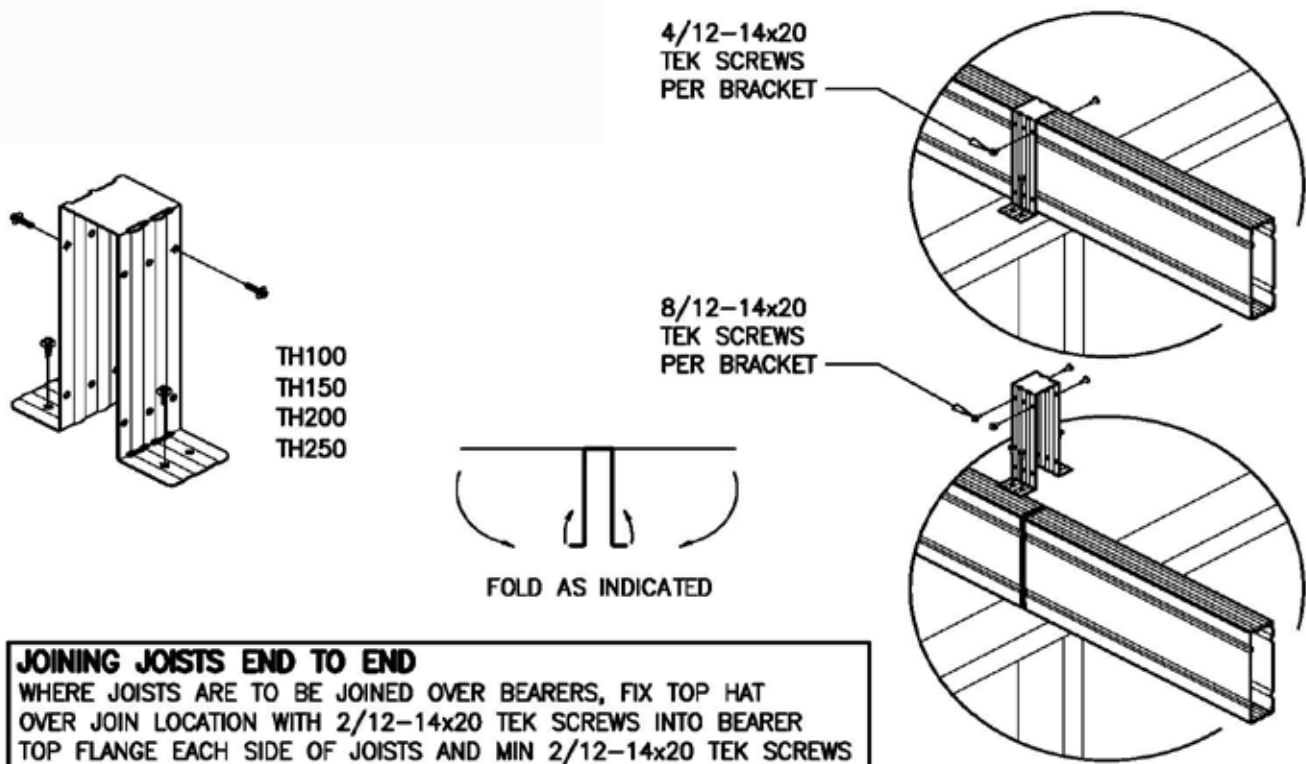
8/12-14x75 TEK SCREWS

FRAMING BRACKET (FB – SINGLE SIDE FIXING)

FOR FIXING JOISTS TO BEARERS WHEN AND ACCESS IS DIFFICULT

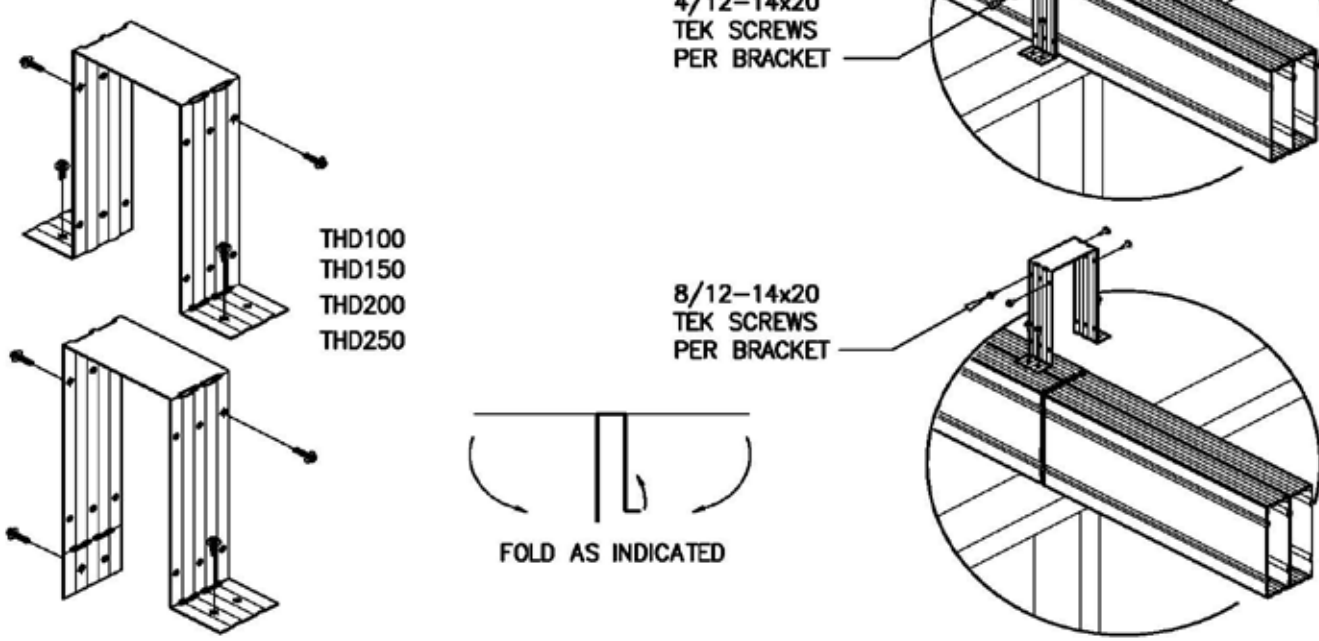


TOP HAT BRACKET (TH)
(FOR FIXING OF JOIST TO WALL FRAMES UNDER)

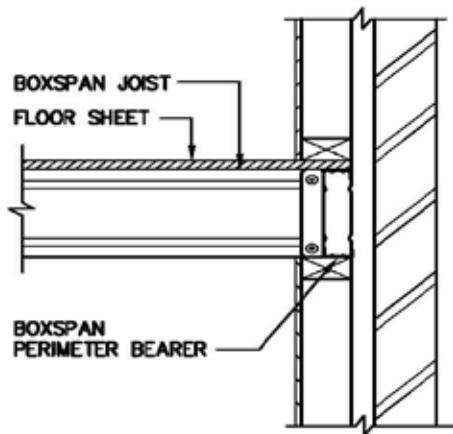


JOINING JOISTS END TO END
WHERE JOISTS ARE TO BE JOINED OVER BEARERS, FIX TOP HAT OVER JOIN LOCATION WITH 2/12-14x20 TEK SCREWS INTO BEARER TOP FLANGE EACH SIDE OF JOISTS AND MIN 2/12-14x20 TEK SCREWS INTO WEB OF EACH SIDE OF JOISTS

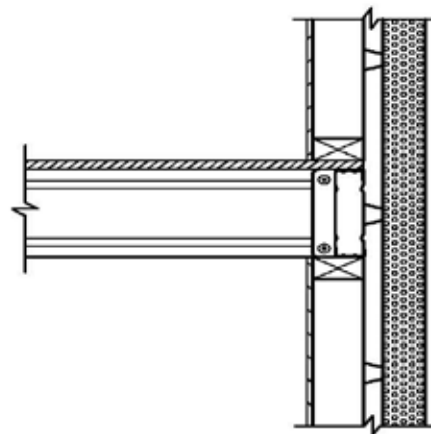
TOP HAT DOUBLE BRACKET (THD)
FOR FIXING DOUBLE JOISTS TO WALLN FRAMES UNDER



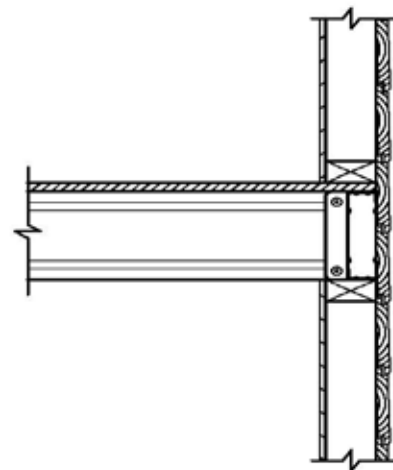
**PERIMETER CONSTRUCTION DETAILS
(FOR UPPER FLOOR MONOPLANE SYSTEMS)**



BRICK VENEER



HEBEL FRAME



CLAD FRAME

SPANTEC™

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