SPANTEC™

MAKING BUILDING EASY

BOXSPAN® RESIDENTIAL DECK GUIDE

Non Cyclonic up to N3 Wind Class

Decks → Joists → Bearers

BOXSPAN®

STRONG, STRAIGHT, TRUE

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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, Streel 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 CPEng NER4188792 PE0001349 RPEQ24385
PRE-0000735 DEP-0000876
Principal Structural Engineer/Director

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 deck 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.

EZIPIER BENEFITS

- Certified and engineered.
- Cast iron designed top and base providing maximum strength and corrosion resistance.
- Three components consisting of a base plate, post and adjustable head.
- Large product range, including post to handrail and roof.
- True adjustability, before and after your deck is built.
- Ezipier is offset to enable a flush finish to the building line making it a neater finish for builders.
- Ezipier suits three standard post sizes, 75x75x2, 90x90x2, 89x89x3.5.
- Post material available in 1, 2, 4 and 8 metre lengths for flexibility.
- Clear termite inspection point that does not protrude past the building line.
- Non-combustible, perfect bushfire solution.

JOISTS
SUPPORTING DECKS MORE THAN 1m ABOVE GROUND

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

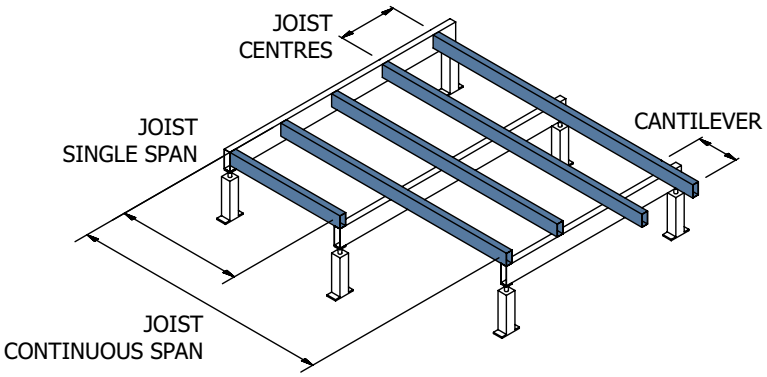


Table 5	MAXIMUM FLOOR JOIST SPAN (m)								
BOXSPAN SECTION	SINGLE SPAN			CONTINUOUS SPAN			CANTILEVERED SPAN		
	FLOOR JOIST CENTRES (mm)								
	400	450	600	400	450	600	400	450	600
B100-12	2.48	2.38	2.20	2.77	2.50	2.27	1.33	1.28	1.03
B100-16	2.73	2.60	2.41	3.03	2.78	2.53	1.46	1.40	1.27
B150-16	3.48	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.

BEARERS
SUPPORTING DECKS MORE THAN 1m ABOVE GROUND

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

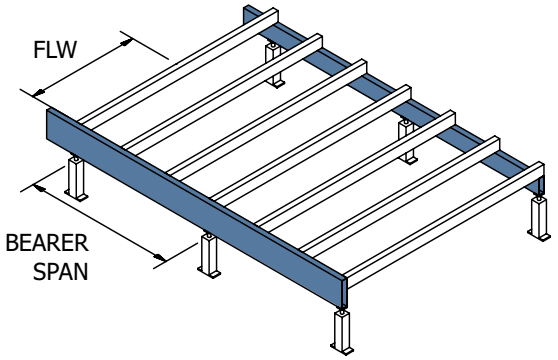
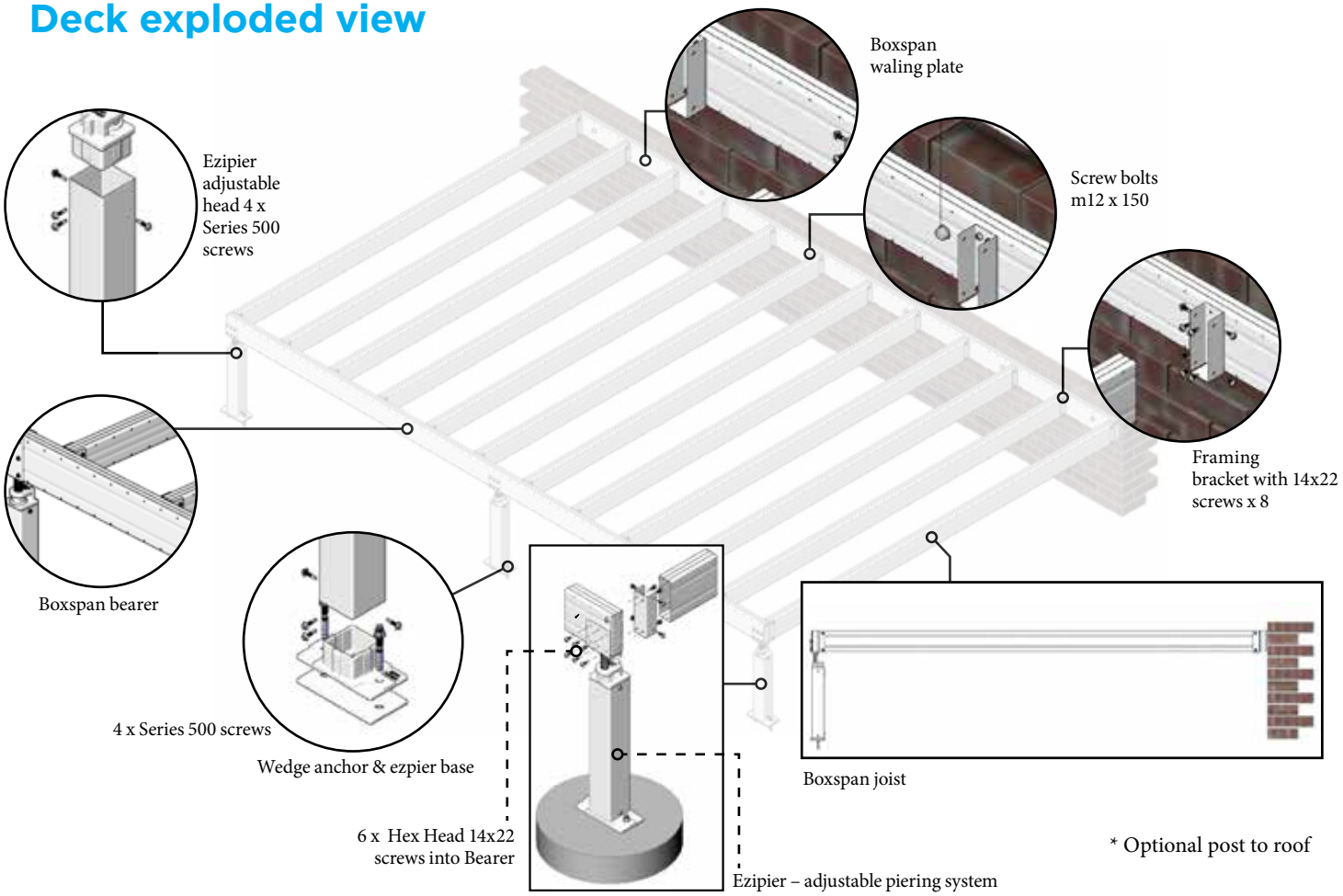


Table 6	MAXIMUM BEARER SPAN (m)										
BOXSPAN SECTION	FLOOR LOAD WIDTH – FLW (m)*										
	0.9	1.2	1.5	1.8	2.1	2.4	3.0	3.6	4.2	4.8	5.4
	SINGLE SPAN**										
B100-16	2.15	1.95	1.81	1.70	1.62	1.55	1.44	1.35	1.28	1.23	1.18
B150-16	2.94	2.67	2.48	2.33	2.21	2.12	1.97	1.85	1.76	1.68	1.62
B150-20	3.15	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

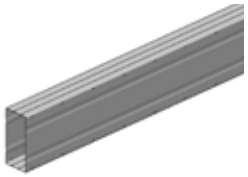
* FLW: refer to page 4 for floor load width calculations.

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

Deck exploded view

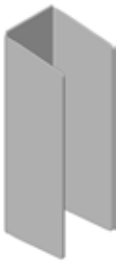


Connections



Boxspan
Bearer & joist

Framing bracket
Connects joist to bearer



Internal end cap
Blocks bearer ends

Ezipier
Adjustable steel pier

Screw for Ezipier
Series 500
12-24 X 32

Screw for Boxspan
14-14 X 22

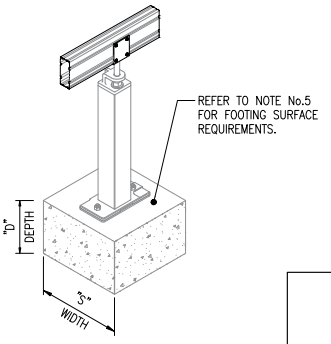
Screw bolt
M12 x 150
attach Boxspan to brick

Wedge anchor
Fix Ezipier to footing

Ezispanner
Adjust pier & deck frame

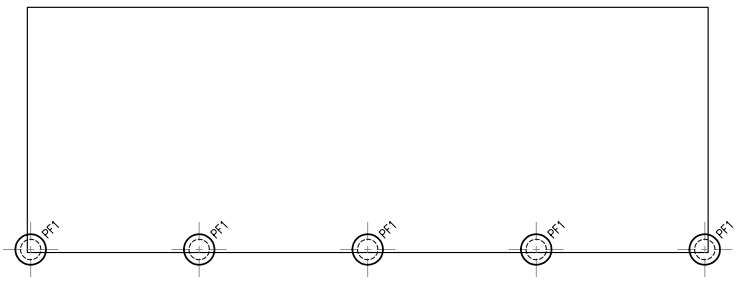
Ezibrace
Cross brace for added strength

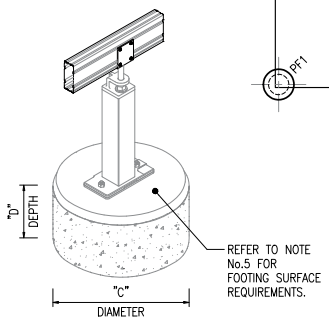
Footings



PF1 DETAIL
(SQUARE FOOTING)

EZIDECK SQUARE CONCRETE PAD FOOTING SIZE (See Footing Notes)			
SITE/SOIL CLASSIFICATION (SEE NOTE 10)	"S" Width (mm)	"D" Depth (mm)	QTY per Pier 20kg bags of concrete
CLASS A & S	400	400	6.9
CLASS M	400	500	8.8





PF1 DETAIL
(CIRCULAR FOOTING)

EZIDECK CIRCULAR CONCRETE PAD FOOTING SIZE (See Footing Notes)			
SITE/SOIL CLASSIFICATION (SEE NOTE 10)	"C" Diameter (mm)	"D" Depth (mm)	QTY per Pier 20kg bags of concrete
CLASS A & S	450	400	6.9
CLASS M	450	500	8.6

NOTES:
1. FOOTINGS ARE DESIGNED USING THE FOOTING AND SLAB CODE AS2870 AND THE NCC VOL 2.

2. THE MINIMUM ALLOWABLE BEARING CAPACITY OF THE SOIL SHALL BE 100kPa (kN/sqm) IN ACCORDANCE WITH NCC TABLE 3.2.5.2 NOTE 5.

3. THE DESIGN PARAMETERS ARE:
– DEAD LOAD 0.75 kPa, CONSISTS OF TIMBER DECKING BOARDS OR TILE ON FC SHEET.
– LIVE LOAD 2.0 kPa, IN ACCORDANCE WITH AS1170.1 LOADING CODE.
– THE DECK STRUCTURE HAS BEEN DESIGNED FOR A MAXIMUM N3 (W41) WIND CLASSIFICATION FOR NORMAL WIND TO AS2055 WIND LOAD ON HOUSING.

4. FOOTINGS CONSIST OF N25 STRENGTH MASS CONCRETE (NORMAL CONCRETE WITH 25 MPa COMPRESSIVE STENGTH AT 28 DAYS AS PER AS3600 CONCRETE CODE, EXPOSURE CATEGORY ASSUMED A1).

5. PAD FOOTING MUST BE ELEVATED ABOVE FINISHED GROUND LEVEL AND SLOPED TO EXCLUDE WATER AND DEBRIS.

6. FOOTINGS MUST BE INTO NATURAL SOIL. THIS DESIGN DOES NOT COVER UNCOMPACTED FILL.

7. SITE CLASSIFICATION SHOULD BE DONE BY A SUITABLY QUALIFIED BUILDER OR ENGINEER.

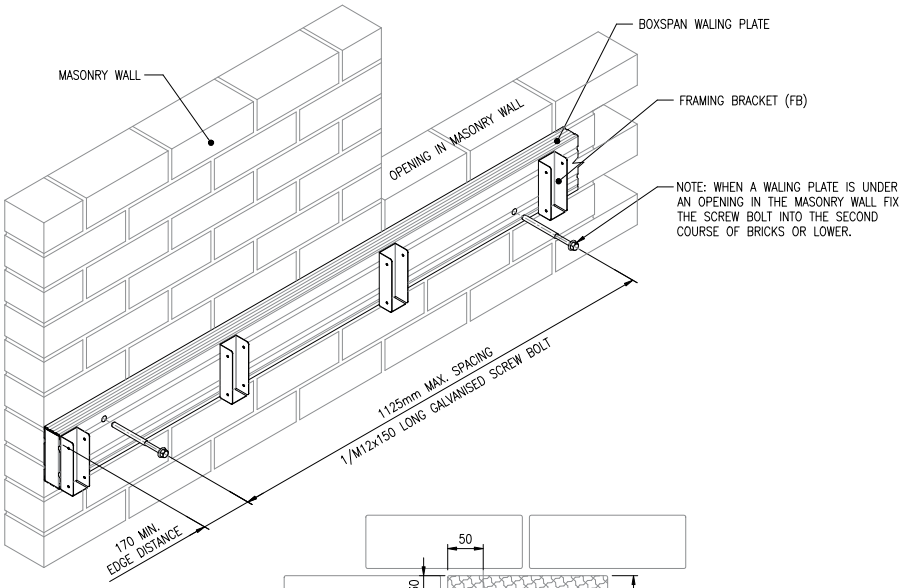
8. FOOTINGS CAN BE SQUARE OR CIRCULAR AND THE SIZES IN THE TABLE ARE MINIMUMS AND COMPLY WITH THE NCC VOL 2 CLAUSE 3.2.5.6

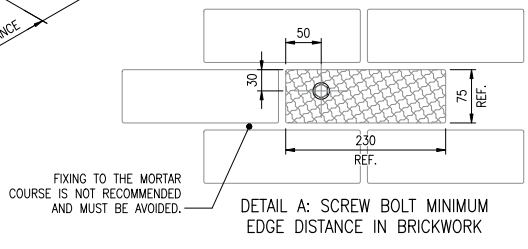
9. THESE FOOTINGS HAVE NOT BEEN DESIGN TO SUPPORT AN AWNING OR ROOM OVER THE DECK.

10. THE SITE/SOIL CLASSIFICATION IS DEFINED IN AS2870 AS FOLLOWS:
CLASS A – MOSTLY SAND AND ROCK SITES WITH LITTLE OR NO MOVEMENT FROM MOISTURE CHANGES.
CLASS S – SLIGHTLY REACTIVE CLAY SITES WITH ONLY SLIGHT GROUND MOVEMENT FROM MOISTURE CHANGES.
CLASS M – MODERATELY REACTIVE CLAY SITES, WHICH CAN EXPERIENCE MODERATE GROUND MOVEMENT FROM MOISTURE CHANGES.

11. CALCULATIONS FOR CONCRETE VOLUMES ARE BASED ON A 20kg HAS A VOLUME OF 0.00925 CUBIC METRES.

Fixing to an existing structure





DETAIL A: SCREW BOLT MINIMUM EDGE DISTANCE IN BRICKWORK

NOTE: ONLY USE ONE SCREW BOLT PER BRICK

NOTES:
1. THIS CHART IS FOR USE WITH MASONRY WALLS THAT HAVE BEEN DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH AS3700 MASONRY CODE.

2. IT IS THE BUILDERS RESONSIBILITY TO CONFIRM THAT THE MASONRY STRUCTURE IS IN GOOD, RESONABLE CONDITION.

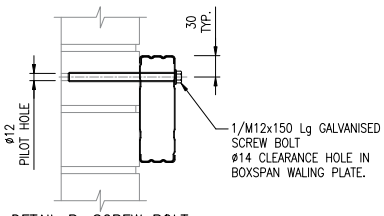
3. THE ENGINEERING IS FOR JOINING A FLOOR FRAME TO A BRICK OR CORE FILLED BLOCK WALL. THE MAXIMUM FASTENER SPACING SHALL BE 1125mm.

4. DO NOT OVERTIGHTEN SCREW BOLTS ONTO BOXSPAN, MAINTAIN A MINIMUM WALING PLATE WIDTH OF 48mm.

5. SCREW BOLTS SHALL BE M12x150 GALV. SEE PICTURE BELOW.

6. DO NOT USE AN IMPACT TOOL TO TIGHTEN SCREW BOLTS.

7. POSITION WALING PLATE/BEARER ON WALL AND MARK POSITION OF HOLES TO MEET THE REQUIREMENTS OF DETAIL: A



DETAIL B: SCREW BOLT INSTALLATION

HINT: USE HOLES IN WALING PLATE/BEARER AS A TEMPLATE FOR LOCATING HOLES IN BRICKWORK. THIS WILL ENSURE HOLES ALWAYS LINE UP.

SPANTEC™

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