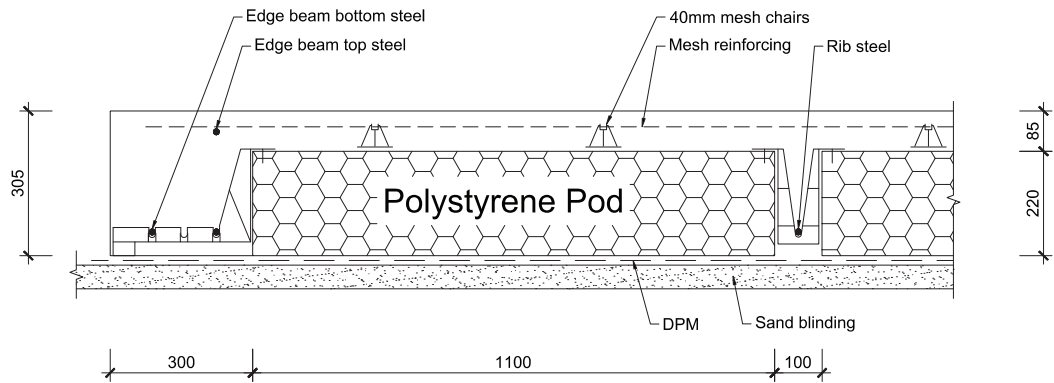


### 3.11.2 Free Joints

Where the length of the floor exceeds 30m a free joint shall be provided as detailed in Section 1, Figure 12. Movement, shrinkage and thermal, will occur over this joint so it shall be positioned to minimize the impact of this movement on floor coverings and wall elements.

Where the bottom of the RibRaft® is not flat (for example the floor incorporates a step down), free joints shall be provided if the distance from the step down to edge of slab exceeds 15m.

Figure 10 Detailed Section



### 3.12 Removal of Formwork

The formwork shall not be removed prior to 12 hours after the slab has been finished. No installation loads are to be placed on the system before adequate curing has taken place.

### 3.13 Masonry Veneer

Where the building is to be clad with masonry veneer, the rebate in the edge beam shall be waterproofed with a bituminous sealer due to the possibility of ponding of water. Firth recommends a Flintcote® or equivalent coating on both the vertical and horizontal faces of the rebate.

### 3.14 Landscaping/Paving

Landscaping and/or paving adjacent to the slab shall be kept as a minimum the specified distance below finished floor level as required by NZS 3604:2011. The landscaping shall allow for large trees to be kept sufficiently away from the edge of the slab. This is to prevent the tree roots from disturbing the soil moisture conditions under the slab. As a guide, trees should be as far away from the edge of the slab as they are tall when fully grown.

### 3.15 Ongoing Maintenance

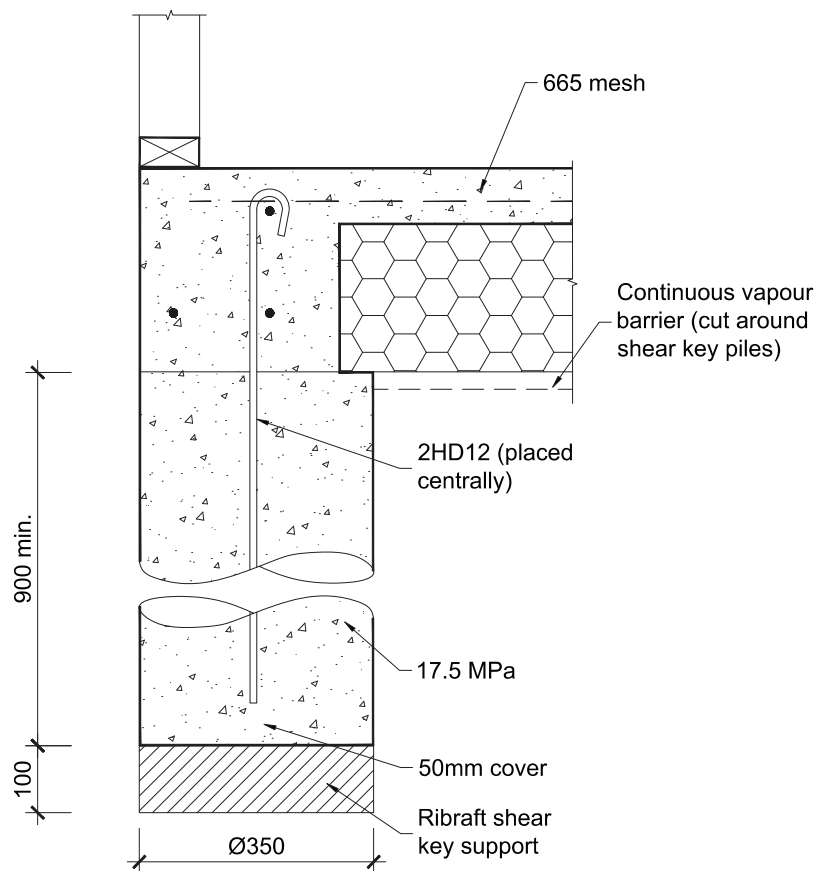
The building owner shall ensure that the ground surrounding the system be maintained so that the integrity of the system is not jeopardised. In other words, at no time shall the ground immediately adjacent to the system be allowed to settle away to expose the underside of the slab.

#### 4.0 SHEAR KEYS

Shear keys, if required, shall be provided to conform to the requirements of Section 1 of this Manual. Holes for the shear keys shall be drilled at least 1000mm deep. Into the bottom of each hole a RibRaft® Shear Key Support shall be placed. Every precaution shall be taken to ensure that the shear key support is laid level and at the base of the hole. The minimum depth of concrete placed on the support shall be 900mm. Refer to Figure 11 for construction details.

The connection steel (2HD12 Grade 500E) shall be secured in place and held during pouring to ensure the bars are correctly located. The concrete for the shear keys can be placed separately to the rest of the floor and shall be finished level to the top of the sand blinding layer, or poured in one pour with the RibRaft® floor. If poured separately the top surface of the shear key shall be finished rough to ensure a good join to the Firth Raftmix concrete in the system and the DPM shall be neatly cut around the shear keys.

Figure 11 Shear Pile Construction Detail



## SECTION: VERIFICATION

# 3

### 1.0 DESIGN

Verification that the design complies with the structural limitation outlined in this Manual is the responsibility of the designer, and shall be confirmed by the Building Control Authority issuing the Building Consent. Solutions outside the limitations outlined in this Manual will require specific engineering design.

### 2.0 CONSTRUCTION

The RibRaft® foundation system has been designed to accommodate structures complying with the non specific design standards NZS3604 or NZS4229. With these types of structures the Building Control Authority specifies the inspections required and often conducts these. A similar construction verification process shall be applied to the RibRaft® system.

To assist inspection the following check list has been prepared for structures complying with the limitation:

#### PRE-POUR INSPECTION CHECK LIST

- GOOD GROUND CONFIRMED AS PER NZS3604, CLAUSE 3.1.3. OR SCALA OR SHEAR VANES TESTS CONFIRM ADEQUATE BEARING CAPACITY.

---

- VEGETATION, TOPSOIL, ORGANIC OR DELETERIOUS MATERIAL REMOVED.

---

- PROXIMITY TO SLOPE-GROUND SURFACE IS ALWAYS ABOVE DASH LINE SHOWN IN FIGURE 1.

---

- SHEAR PILES (WHERE REQUIRED) IN PLACE AND REINFORCEMENT PROTRUDING.

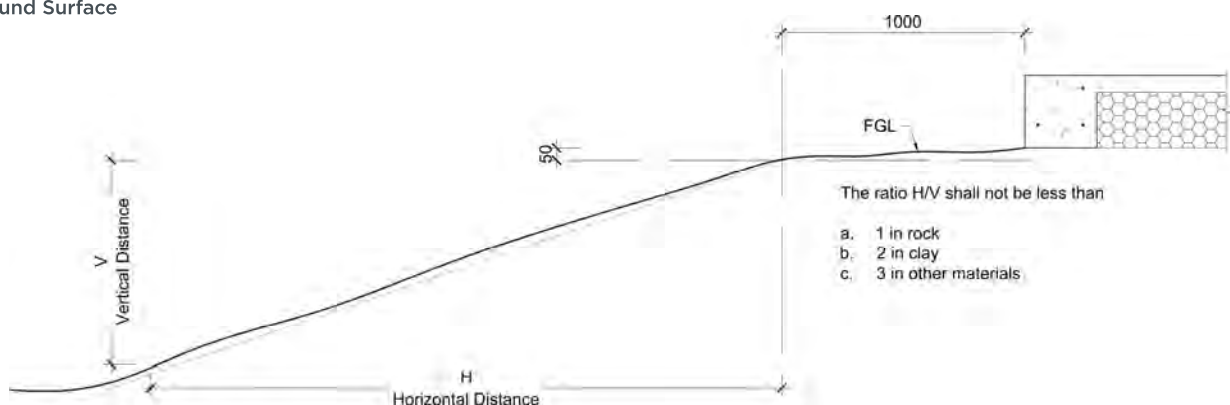
---

- FORMATION AREA EXTENDS AT LEAST THE DEPTH OF GRANULAR FILL BEYOND BUILDING FOOTPRINT.

---

- STEPS IN THE FORMATION ARE DETAILED IN ACCORDANCE WITH THIS MANUAL.

Figure 1  
Relationship of  
RibRaft® To Sloping  
Ground Surface



## PRE-LAYOUT INSPECTION CHECK LIST: DAMP PROOF MEMBRANE IN PLACE

PERIMETER FOUNDATION	<input type="radio"/>	WIDTH 300MM <sup>(1)</sup>
	<input type="radio"/>	REINFORCEMENT 2 X HD12 BOTTOM, 1 X HD12 TOP
	<input type="radio"/>	FIRTH SUPPLIED SPACER USED AT 1.2M MAXIMUM CENTRES
INTERNAL RIBS	<input type="radio"/>	WIDTH 100MM
	<input type="radio"/>	REINFORCEMENT 1 X HD12
	<input type="radio"/>	FIRTH SUPPLIED SPACER, MAX SPACING OF ONE PER POD OR PART POD
LOAD BEARING RIBS	<input type="radio"/>	WIDTH 300MM
	<input type="radio"/>	REINFORCEMENT 2 X HD12 BOTTOM
	<input type="radio"/>	FIRTH SUPPLIED SPACER, MAX SPACING OF ONE PER POD OR PART POD
PODS	<input type="radio"/>	FIRTH SUPPLIED RIBRAFT® POD
MESH	<input type="radio"/>	40MM CHAIRS, 1.2M MAX CENTRES, MIN TWO PER POD OR ONE PER PART POD
	<input type="radio"/>	MESH IN PLACE AND 665 OR SE62
	<input type="radio"/>	MESH LAPS OVERLAP OF OUTERMOST CROSSWIRE = MESH SPACING + 50MM
REINFORCEMENT	<input type="radio"/>	2 X HD12 BARS 1.2M LONG PROVIDED AT RE-ENTRANT CORNERS
	<input type="radio"/>	LAPS FOR 12MM REINFORCEMENT MINIMUM OF 720MM
CONCRETE	<input type="radio"/>	COVER TO PODS MINIMUM OF 85MM OR 110MM IF INFLOOR HEATING USED.
	<input type="radio"/>	FIRTH RAFTMIX ORDERED
SERVICE PENETRATIONS	<input type="radio"/>	NO REINFORCEMENT (WITH EXCEPTION OF MESH) CUT TO ALLOW PASSAGE OF SERVICE PIPES. REFER CLAUSE 6.3 OF SECTION 1 FOR EXCEPTIONS
	<input type="radio"/>	PIPES WRAPPED WITH MINIMUM 6MM THICKNESS OF IMPERMEABLE COMPRESSIBLE MATERIAL WHERE IN CONTACT WITH CONCRETE
	<input type="radio"/>	DIAMETER/SIZE OF PENETRATIONS AS PER TABLE 6, SECTION 1 OF THIS MANUAL

(1) At locations of service penetrations the width of the perimeter foundation maybe locally increased. Refer Figure 14 Section 1 for details.



## CONCRETE & MASONRY PRODUCTS: A SUSTAINABLE BUILDING OPTION & SOLUTION

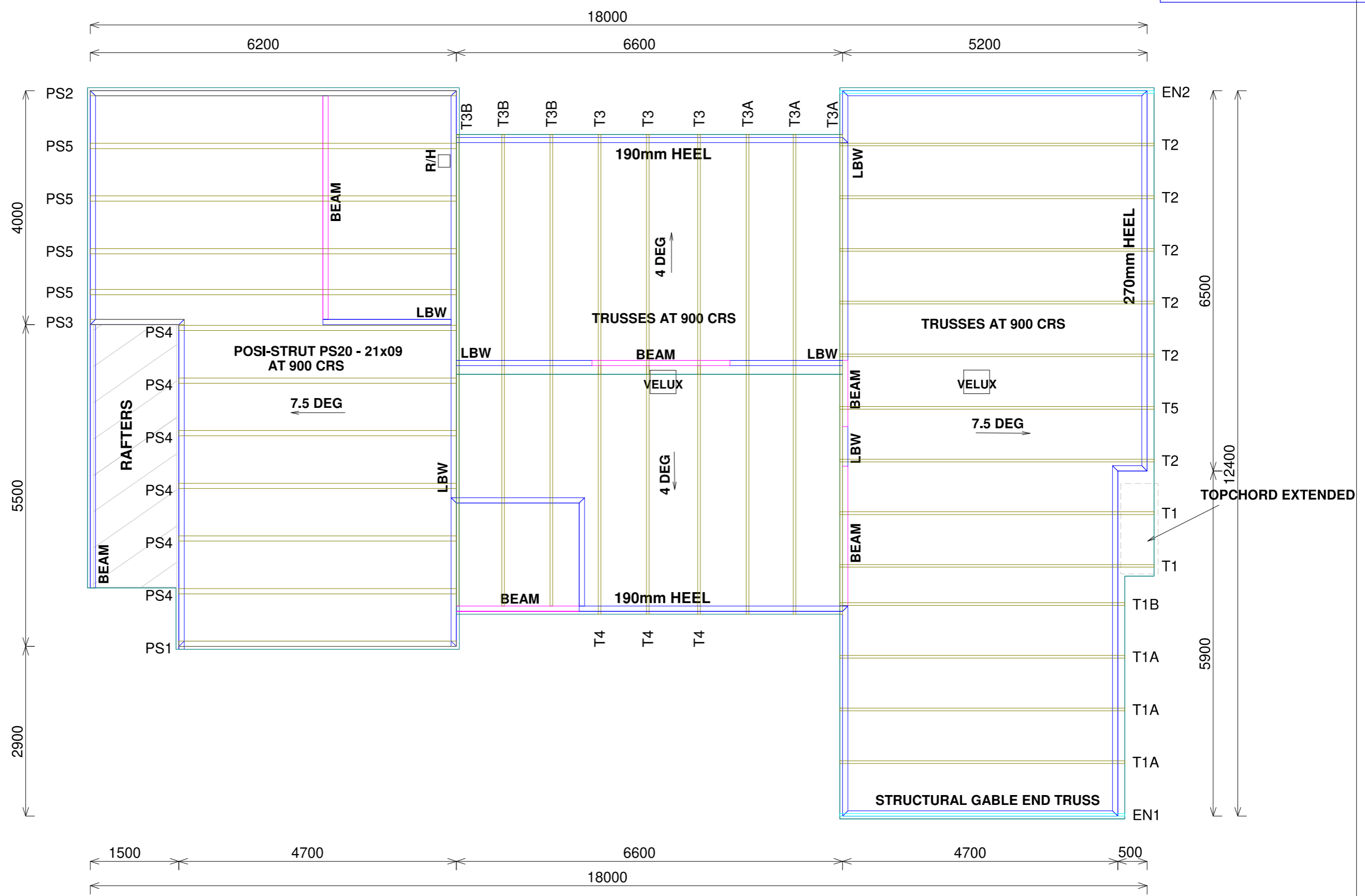
- ✓ Environmentally compliant manufacturing plants
- ✓ Surplus water and some aggregates recycled
- ✓ Low transport impacts
- ✓ Leftover concrete returned from construction sites
- ✓ Passive solar heated thermal mass makes completed buildings more energy-efficient
- ✓ Most wash water returned from construction sites
- ✓ Highly durable, low maintenance buildings and no rot
- ✓ High degree of noise control
- ✓ Inherent fire resistance
- ✓ Overall longer effective building life
- ✓ Demolished concrete can be recycled as hard fill or aggregate

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**0800 FIRTH 1** (347841)  
**FIRTH.CO.NZ**

Layout is null and void if trusses not supplied by PlaceMakers



Site Address :  
 Dan and Suki Green  
 Lot 6, Anderson Park  
 Waikanae, Kapiti Coast

Sheet Title :  
**For Building Consent  
 Buildable Truss Layout**

Date : Jun 17, 2020  
 Drawn : Nhi Huynh  
 Scale : 1: 100  
 System : MiTek 20/20

Job Details:  
 Roof Pitch : 4 & 7.5 Deg  
 Roof Material : Longrun Iron .55mm  
 Ceiling Material : Gib Board 13mm  
 Wind Zone : Very High  
 Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
 Roof Live Load : 0.250kPa  
 Floor Live Load : kPa  
 Wind Speed : 50.0 m/s



Job Title :  
**BL188515**

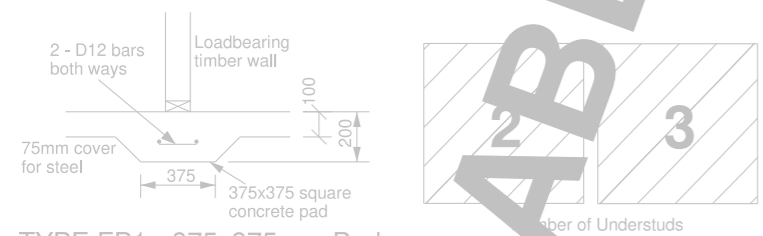
Sheet :  
**1**

Revision Number :

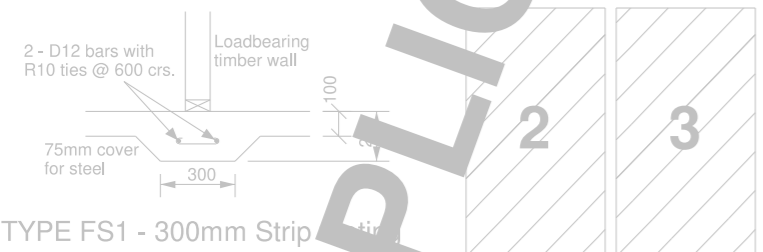
PrimeCad v4.7.301

Layout is null and void if trusses not supplied by PlaceMakers

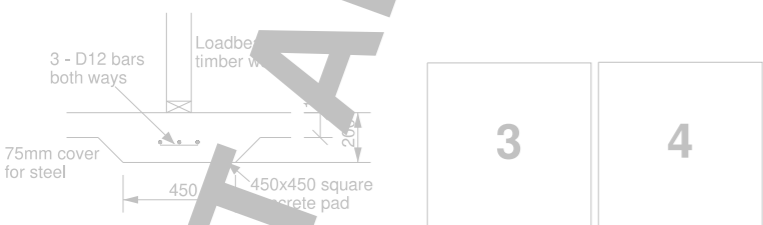
# Slab Thickening Details



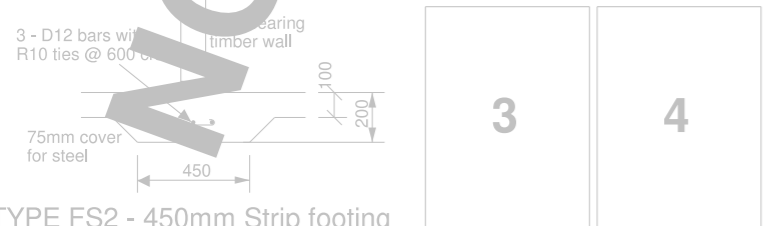
TYPE FP1 - 375x375mm Pad



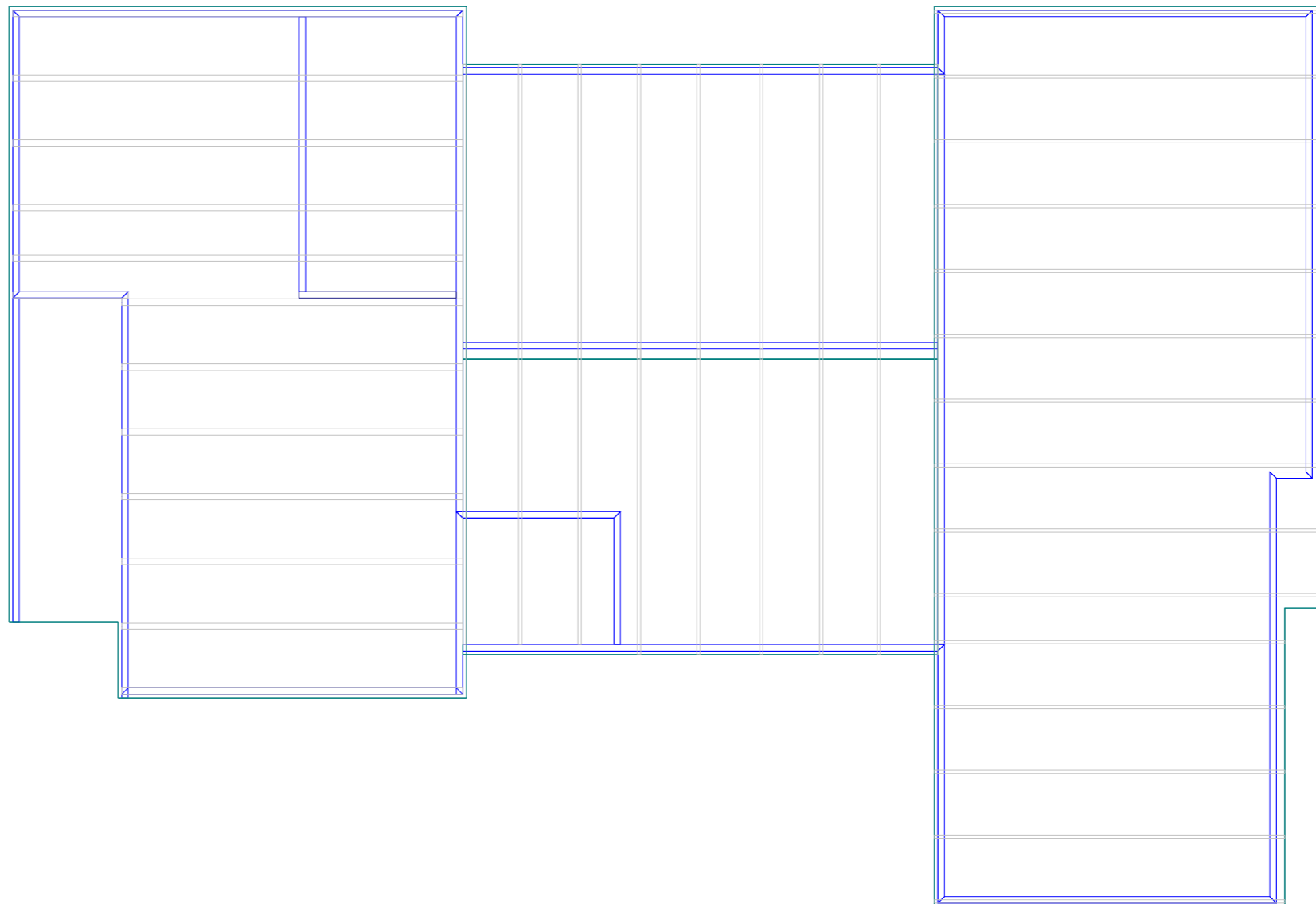
TYPE FS1 - 300mm Strip



TYPE FP2 - 450x450mm Pad



TYPE FS2 - 450mm Strip footing



**NOTES:**

- All point loads exceeding 8.0kN are indicated.
- All walls shown to be considered load bearing.
- Refer to Rib-raft floor design for slab thickening.



Site Address :  
 Dan and Suki Green  
 Lot 6, Anderson Park  
 Waikanae, Kapiti Coast

Sheet Title :  
**For Building Consent  
 Slab Thickening**  
 Date : Jun 17, 2020 Drawn : Nhi Huynh  
 Scale : 1: 100 System : MiTek 20/20

Job Details:  
 Roof Pitch : 4 & 7.5 Deg  
 Roof Material : Longrun Iron .55mm  
 Ceiling Material : Gib Board 13mm  
 Wind Zone : Very High  
 Roof Snow Load : 0.000 kPa

Truss Centres : 900 mm  
 Roof Live Load : 0.250kPa  
 Floor Live Load : kPa  
 Wind Speed : 50.0 m/s

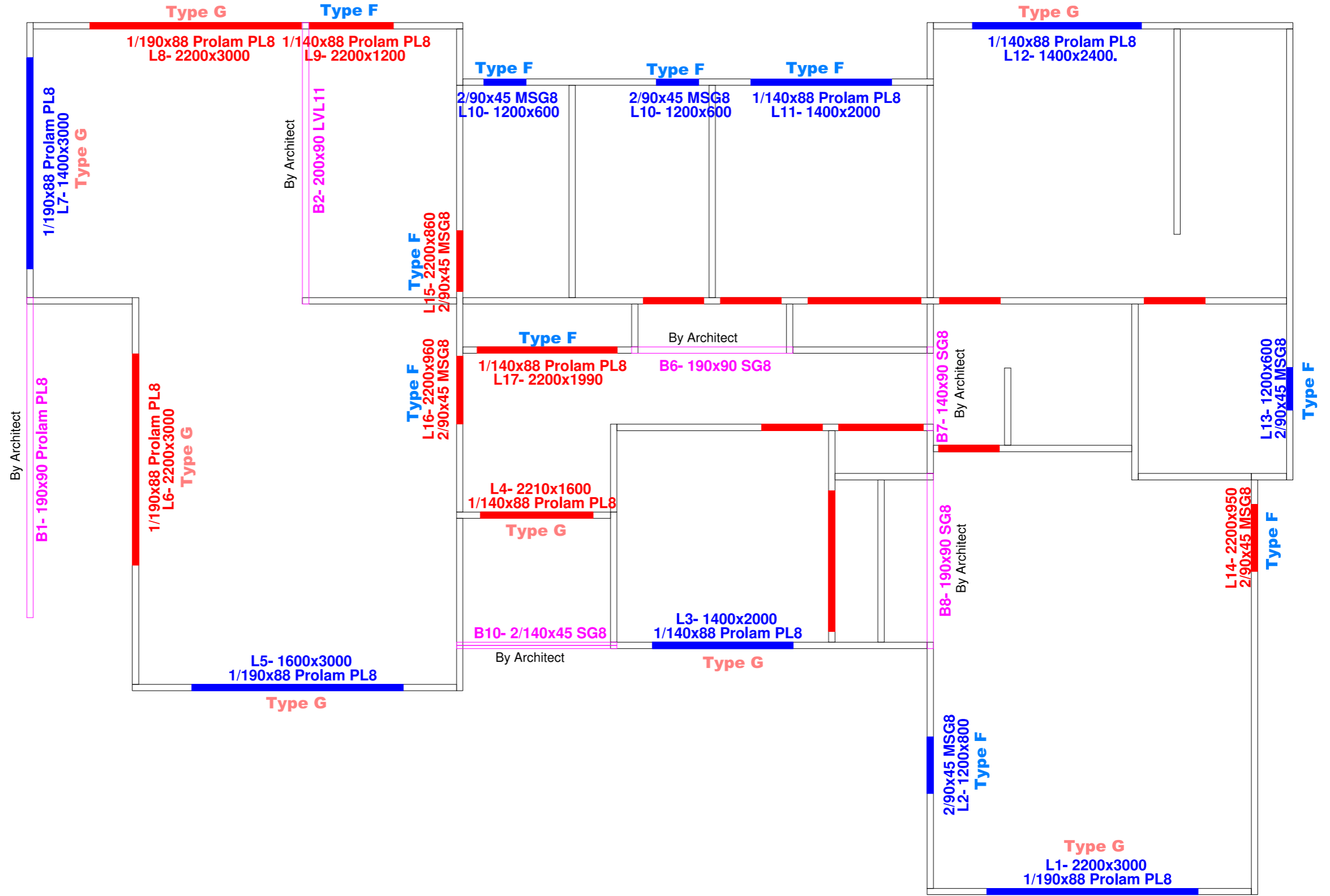


Job Title :  
 BL188515  
 Sheet :  
 2  
 Revision Number :

Layout is null and void if trusses not supplied by PlaceMakers

# Lintel Fixing Details

- TYPE E**  
1.4kN
- TYPE F**  
4.0kN
- TYPE G**  
7.5kN
- TYPE H**  
13.5kN



**NOTES:**  
 Refer to:  
 Lintel Fixing Schedule 01/2018  
 pages 73 & 74, Structural Fixings  
 On-site Guide for Building Code  
 Compliance 2018 Edition  
  
 (Alternative to NZS 3604:2011  
 Table 8.14 & Figure 8.12)

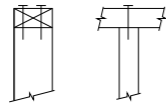
	Site Address : Dan and Suki Green Lot 6, Anderson Park Waikanae, Kapiti Coast	Sheet Title : <b>For Building Consent                  Lintel Fixing</b>	Job Details: Roof Pitch : 4 & 7.5 Deg Roof Material : Longrun Iron .55mm Ceiling Material : Gib Board 13mm Wind Zone : Very High Roof Snow Load : 0.000 kPa	Truss Centres : 900 mm Roof Live Load : 0.250kPa Floor Live Load : kPa Wind Speed : 50.0 m/s		Job Title : BL188515
	Date : Jun 17, 2020 Scale : 1:100	Drawn : Nhi Huynh System : MiTek 20/20	PrimeCad v4.7.301	Sheet : 3 Revision Number :		

# Stud to top plate fixing details

Type A is minimum fixing required unless specified otherwise

**FIXING TYPE A**  
0.7kN

2/90x3.33 plain steel wire nails driven vertically into stud.

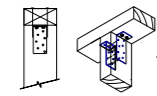


**FIXING TYPE B**  
4.7kN

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.

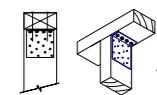
Plus 2x LUMBERLOK CPC40

AND



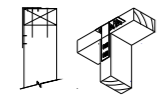
OR

Plus LUMBERLOK 6 kN Stud Anchor (CPC80)



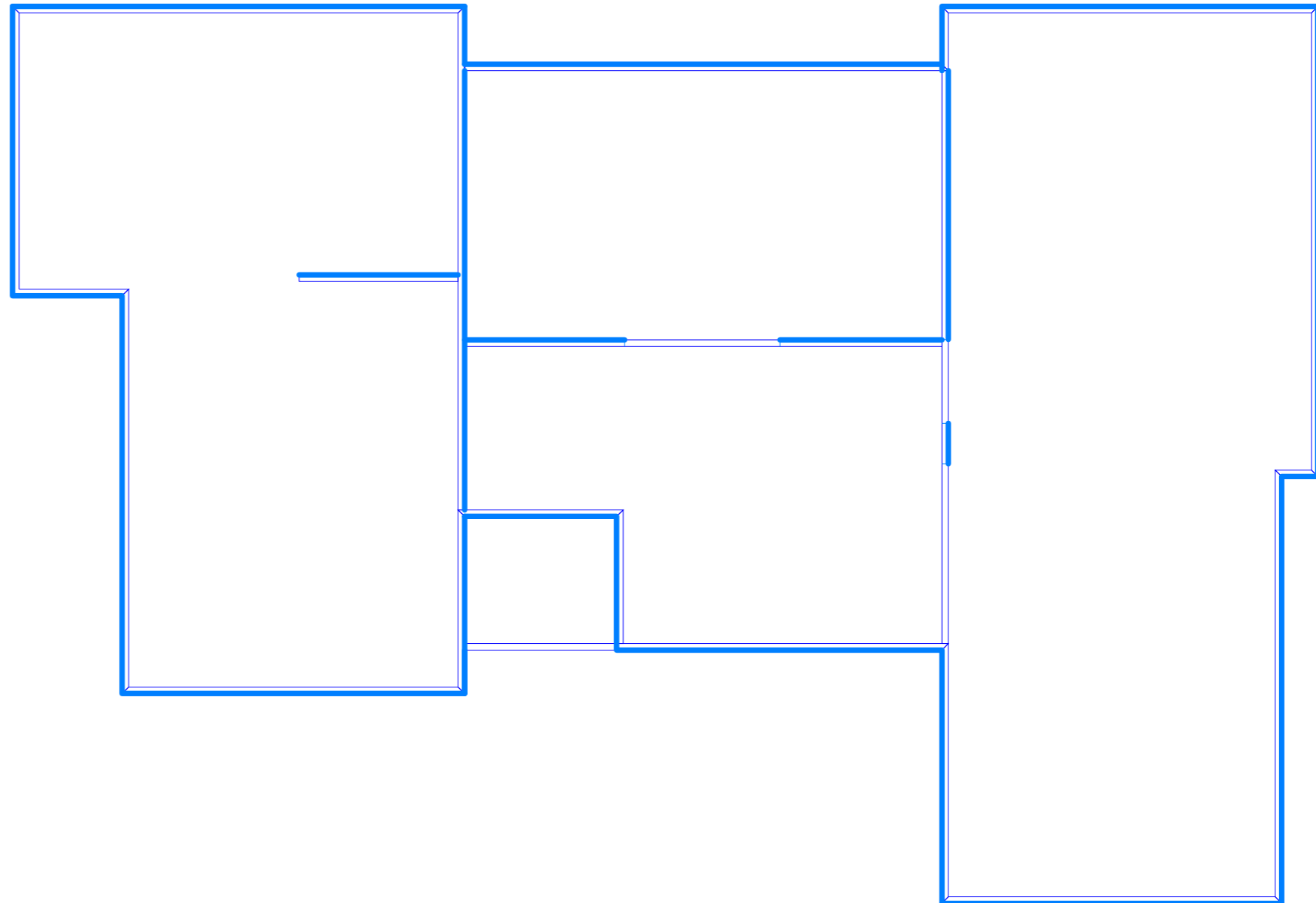
OR

Plus LUMBERLOK Stud Strap (One face only)



Recommended for internal wall options to avoid lining issues.

Layout is null and void if trusses not supplied by PlaceMakers



**NOTES:**

Refer to:  
 LUMBERLOK Wall Fixing Chart - Stud to Top Plate Fixing Schedule 09/2011

(Alternative to NZS3604:2011 Table 8.18)

PrimeCad v4.7.301



Site Address :  
 Dan and Suki Green  
 Lot 6, Anderson Park  
 Waikanae, Kapiti Coast

Sheet Title :  
**For Building Consent  
 Stud To Top Plate Fixing**  
 Date : Jun 17, 2020 Drawn : Nhi Huynh  
 Scale : 1: 100 System : MiTek 20/20

Job Details:  
 Roof Pitch : 4 & 7.5 Deg  
 Roof Material : Longrun Iron .55mm  
 Ceiling Material : Gib Board 13mm  
 Wind Zone : Very High  
 Roof Snow Load : 0.000 kPa














Truss Centres : 900 mm  
 Roof Live Load : 0.250kPa  
 Floor Live Load : kPa  
 Wind Speed : 50.0 m/s

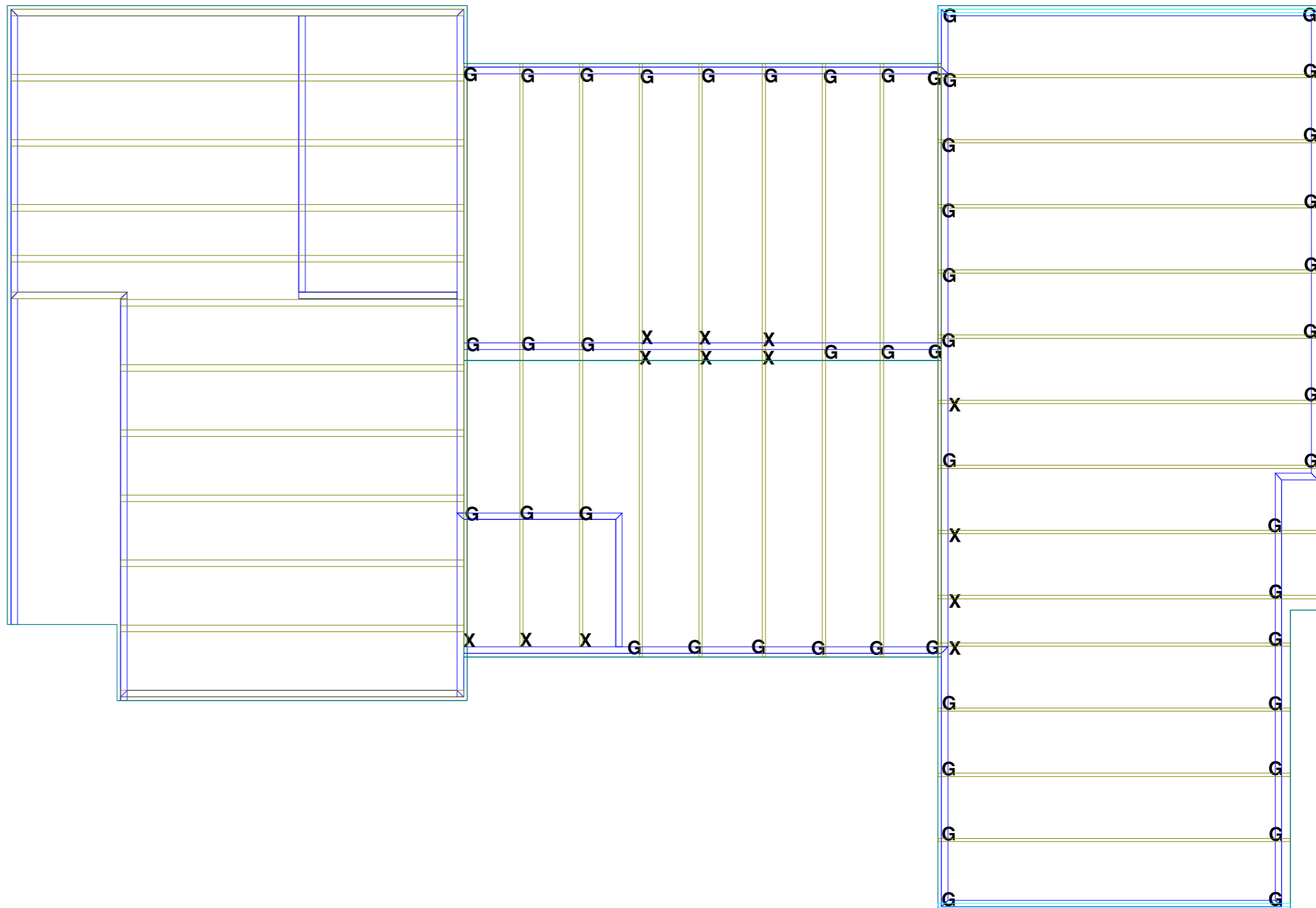


Job Title :  
**BL188515**  
 Sheet :  
**4**  
 Revision Number :

# Truss Fixings

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-  X - LUMBERLOK JH47x90 Joist Hanger
-  Z - LUMBERLOK JH47x120 Joist Hanger
-  P - LUMBERLOK JH47x190 Joist Hanger
-  E - LUMBERLOK JH95x165 Joist Hanger
-  O - Pair of LUMBERLOK CT200 Ceiling Ties
-  H - LUMBERLOK CT400 Cyclone Tie
-  B - LUMBERLOK CT600 Cyclone Tie
-  M - Pair of LUMBERLOK Multi Grips
-  NP - LUMBERLOK Nailon Plate
-  N - LUMBERLOK N21 Diagonal Cleat
-  W - Pair of LUMBERLOK CPC40 Cleats
-  K - LUMBERLOK TTP 16kN Truss to Top Plate set
-  G - LUMBERLOK TTP 9kN Truss to Top Plate set



**NOTES:**

All other areas must have at the minimum  
 2/ 90x3.15mm skew nails + 2 wire dogs (4.7kN)  
 for truss to top plate connections.

Refer to:  
 LUMBERLOK Timber Connectors Characteristic  
 Loadings Data brochure 03/4

	Site Address : Dan and Suki Green	Sheet Title : <b>For Building Consent Truss Fixings</b>	Job Details: Roof Pitch : 4 & 7.5 Deg Roof Material : Longrun Iron .55mm Ceiling Material : Gib Board 13mm Wind Zone : Very High Roof Snow Load : 0.000 kPa	Truss Centres : 900 mm Roof Live Load : 0.250kPa Floor Live Load : kPa Wind Speed : 50.0 m/s		PrimeCad v4.7.301 Job Title : BL188515 Sheet : <b>5</b> Revision Number :
	Lot 6, Anderson Park Waikanae, Kapiti Coast	Date : Jun 17, 2020 Scale : 1: 100	Drawn : Nhi Huynh System : MiTek 20/20			

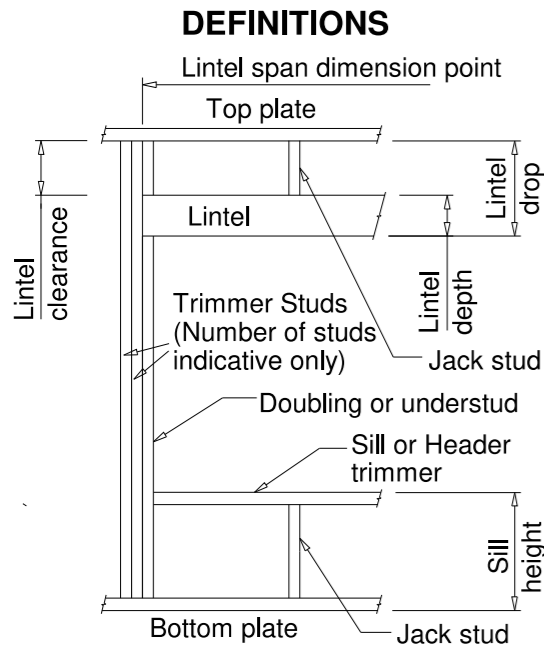
## LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

### NOTE:

- ★ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist horizontal loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011

### SELECTION CHART FOR LINTEL FIXING

Lintel Span	Loaded Dimension (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone				Heavy Roof Wind Zone				
		L	M	H	VH/EH	L	M	H	VH/EH	
1.0	2.0	E	E	E	F	F	E	E	E	F
	3.0	E	E	F	F	F	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F
	5.0	F	F	F	G	G	E	E	F	F
	6.0	F	F	F	G	G	E	E	F	F
1.2	2.0	E	E	F	F	F	E	E	F	F
	3.0	E	E	F	F	F	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F
	5.0	F	F	F	G	G	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
1.5	2.0	E	E	F	F	F	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
2.0	2.0	E	F	F	F	G	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
2.4	2.0	E	F	F	F	G	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
3.0	2.0	E	F	F	F	G	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
3.6	2.0	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
4.2	2.0	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
	6.0	F	F	G	G	H	E	E	F	F
4.5	2.0	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	3.4	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
4.8	2.0	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	3.2	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
5.1	2.0	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	3.5	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F
5.4	2.0	F	F	G	G	H	E	E	F	F
	2.8	F	F	G	G	H	E	E	F	F
	3.0	F	F	G	G	H	E	E	F	F
	4.0	F	F	G	G	H	E	E	F	F
	5.0	F	F	G	G	H	E	E	F	F



### Lintel Supporting Girder Trusses:

Roof Tributary Area	Light Roof Wind Zone			Heavy Roof Wind Zone		
	L, M, H	VH	EH	L, M, H	VH	EH
8.6 m²	G	G	H	G	G	H
11.6 m²	G	H	H	G	G	H
12.1 m²	G	H	H	G	H	H
15.3 m²	H	H	-	G	H	H
19.1 m²	H	-	-	G	H	-
20.9 m²	H	-	-	H	H	-
21.8 m²	H	-	-	H	-	-
34.3 m²	-	-	-	H	-	-

- Notes:
- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by Lintel)
  - 2) Assumed girder truss is at mid-span or middle third span of lintel
  - 3) Use similar fixings for both ends of lintel
  - 4) All other cases require specific engineering design.

### LINTEL FIXING OPTIONS

#### TYPE E 1.4kN

#### TYPE F 4.0kN

#### TYPE G 7.5kN

#### TYPE H 13.5kN

# MiTek New Zealand Limited



Correspondence from : **AUCKLAND**  
40 Neales Road, East Tamaki 2013  
PO Box 58-014, Botany 2163  
**Phone: 09 274 7109**  
**Fax: 09 274 7100**

**CHRISTCHURCH**  
14 Pilkington Way, Wigram 8042  
PO Box 8387, Riccarton 8440  
**Phone: 03 348 8691**  
**Fax: 03 348 0314**

MiTek 20/20 Engineering 4.7.301.0

www.mitekznz.co.nz  
Printed: 12:28:32 17 Jun 2020

## PRODUCER STATEMENT for MiTek 20/20<sup>®</sup> TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**  
TO: **Placemakers National Estimating Unit (NEU)**  
IN RESPECT OF: **MiTek<sup>®</sup> Truss Designs**

This producer statement covers the MiTek 20/20<sup>®</sup> truss design and the structural performance of the GANG-NAIL<sup>®</sup> connector plate for the job reference **BL188515** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20<sup>®</sup> truss design program has been developed by MiTek New Zealand Limited for the design of MiTek<sup>®</sup> timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20<sup>®</sup> are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clause B1 of the New Zealand Building Code.

**On behalf of MiTek New Zealand Limited,** and subject to:

- i) All proprietary products meeting their performance specification requirements
- ii) The provision of adequate roof bracing and overall building stability
- iii) Correct selection and placement of GANG-NAIL connector plates
- iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
- v) The design being undertaken by the accredited fabricator under the terms of the software licence
- vi) Timber is graded to the requirements of NZS 3603:1993
- vii) Minimum timber treatment for these MiTek<sup>®</sup> trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003

**I believe on reasonable grounds** that the trusses, if constructed in accordance with the MiTek 20/20<sup>®</sup> truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than \$500,000.

**On behalf of MiTek New Zealand Limited,** **Date: Wednesday, 17 June 2020**

A handwritten signature in black ink, appearing to read 'In Ling Ng'.

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)  
**TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited**

**Placemakers National Estimating Unit (NEU)**

Fabricator Design Statement : Page 1

Job: BL188515

Client: David Reid Homes (Kapiti) Ltd  
Phone:

Site: Dan and Suki Green

Description:  
Building Consent No.:  
MITek 20/20 Engineering 4.7.301.0

Lot 6, Anderson Park  
Waikanae, Kapiti Coast

Phone:

MITek New Zealand Limited

Printed: 12:28:32 17 Jun 2020

**MITEK FABRICATOR DESIGN STATEMENT**

This statement is issued by MiTek accredited fabricator **Placemakers National Estimating Unit (NEU)**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

**MITek 20/20® TRUSS DESIGN DATA**

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

**Job Details**

Importance Level : 2

Design Working Life : 50 years

**Roof Truss**

Timber Group: NEU-H1.2

Pitch: 4 & 7.5 deg

Nominal Overhang: 50 & 120 mm

**Roof**

Material: Longrun Iron .55mm

**Ceiling**

Material: Gib Board 13mm

**Wind**

Area: Very High (50.0 m/s )

Dead Load: 0.210 kPa

Dead Load: 0.200 kPa

Pressure Coeff: Cpe = varies; Cpi = -0.30, 0.20

Restrains: 900 mm centres

Restrains: 600 mm centres

Live Load: Qr = 0.250 kPa

Live Load: Qc = 1.400 kN

Qc = 1.100 kN

The minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003. The timber for these MiTek® trusses shall be graded to the requirements of NZS 3603:1993. Proprietary fixings and timber connectors shall be selected in accordance with NZS3604:2011 Section 4 - Durability.

**MITek® Truss List**

Legend: \* = detail only, ? = input only, Fxx = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required  
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
EN1	1	4700	7.500	900	T1A	3	4700	7.500	900
EN2	1	5200	7.500	900	T1B	1	4610	7.500	900
PS1	1	4740	7.500	900	T2	6	5200	7.500	900
PS2	1	6254	7.500	900	T3	3	3810	4.000	900
PS3	1	1604	7.500	900	T3A	3	8100	4.000	900
PS4	6	4740	7.500	900	T3B	3	8010	4.000	900
PS5	4	6254	7.500	900	T4	3	4200	4.000	900
T1	2	4610	7.500	900	T5	1	5110	7.500	900

Total quantity : 40

The computer design input has been carried out by:



Signed: .....

Date: ...Wednesday, 17 June 2020....

Name of Detailer: .....Nhi Huynh.....

Qualifications and Title:.....

On behalf of:

Placemakers National Estimating Unit (NEU)  
25 Vickery St, Te Rapa, Hamilton,  
Phone:

MiTek Beam v1.10 June 2011

Date: Wednesday, 17 June 2020  
 Job Number BL188515  
 Job Name Dan and Suki Green  
 Client David Reid Homes (Kapiti) Ltd.  
 Calculated By Nhi Huynh

Roof Weight light + ceiling  
 Wind Zone very high (50.0 m/s)  
 Snow Load 0 kPa

Beam Details

Beam Label	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
Beam Span (mm)	3000	800	2000	1600	3000	3000	3000	3000	1200	600
Roof Span "S" (mm)	1000	4700	4200	4200	1000	4740	4060	1000	1000	3900
Overhang (mm)	50	50	50	50	50					50
Wall Type	Low weight - 0.57kPa				Low weight - 0.57kPa			Low weight - 0.57kPa		Low weight - 0.57kPa
Wall Height (mm)	1310				1210			1210	1210	
Floor Live load	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Floor Span "F" (mm)										

MiTek Bearing Reactions

1.4G										
1.2G + 1.6Qr										
1.2G + 1.6Qc										
0.9G + W (From Left)										
0.9G + W (From Right)										
0.9G + W (Along Ridge)										
1.2G + Quf + 1.2S										

Point Load 1

Girder Span (mm)										
Setback (mm)										
Location (mm)										

Point Load 2

Girder Span (mm)										
Setback (mm)										
Location (mm)										

Point Load 3

Girder Span (mm)										
Setback (mm)										
Location (mm)										

Beam Status	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
Beam Material	PROLAM PL8	MSG8/VSG8	PROLAM PL8	PROLAM PL8	PROLAM PL8	PROLAM PL8	PROLAM PL8	PROLAM PL8	PROLAM PL8	MSG8/VSG8
Beam Size	190x90	2/90x45	140x90	140x90	190x90	190x90	190x90	190x90	140x90	2/90x45
Beam Deflection	3.82mm	0.31mm	1.84mm	0.75mm	3.6mm	4.1mm	3.51mm	3.52mm	0.23mm	0.08mm
Beam Length	3000	800	2000	1600	3000	3000	3000	3000	1200	600

MiTek Beam v1.10 June 2011

Date: Wednesday, 17 June 2020  
 Job Number BL188515  
 Job Name Dan and Suki Green  
 Client David Reid Homes (Kapiti) Lt  
 Calculated By Nhi Huynh

Roof Weight light + ceiling  
 Wind Zone very high (50.0 m/s)  
 Snow Load 0 kPa

Beam Details

Beam Label	L11	L12	L13	L14	L15	L16	L17
Beam Span (mm)	2000	2400	600	950	860	960	1990
Roof Span "S" (mm)	3900	1000	5200	4610	2280	4740	6250
Overhang (mm)	50	50	120	620			
Wall Type		Low weight - 0.57kPa					
Wall Height (mm)		1210					
Floor Live load	NA	NA	NA	NA	NA	NA	NA
Floor Span "F" (mm)							

MiTek Bearing Reactions

1.4G							
1.2G + 1.6Qr							
1.2G + 1.6Qc							
0.9G + W (From Left)							
0.9G + W (From Right)							
0.9G + W (Along Ridge)							
1.2G + Quf + 1.2S							

Point Load 1

Girder Span (mm)							
Setback (mm)							
Location (mm)							

Point Load 2

Girder Span (mm)							
Setback (mm)							
Location (mm)							

Point Load 3

Girder Span (mm)							
Setback (mm)							
Location (mm)							

Beam Status	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY	OKAY
Beam Material	PROLAM PL8	PROLAM PL8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	MSG8/VSG8	PROLAM PL8
Beam Size	140x90	140x90	2/90x45	2/90x45	2/90x45	2/90x45	140x90
Beam Deflection	1.71mm	3.69mm	0.11mm	0.76mm	0.2mm	0.64mm	2.62mm
Beam Length	2000	2400	600	950	860	960	1990

Job No: BL188515  
Job Name: Dan and Suki Green

Client: David Reid Homes (Kapiti) Ltd.  
Building Consent No:

Site: Lot 6, Anderson Park

**DESIGN STATEMENT**  
**MiTek Beam Program v1.11 September 2017**

**Certification of MiTek Beam Program v1.11 September 2017**

The MiTek Beam Program v1.11 September 2017 has been developed by MiTek New Zealand Ltd for the design of these beams: Timber, Glulam, GANGLAM and GANG-NAIL FLITCH BEAMS. The beam designs calculated by this program are prepared using sound and widely accepted engineering principles, and in accordance with Compliance Documents of the New Zealand Building Code and Verification Method B1/VM1 to satisfy the requirements of Clause B1 of the Building Code. We believe on reasonable grounds that these beams for the proposed building, if constructed in accordance with the drawings, specifications and other documents provided will comply with the relevant provisions of the NZ Building Code. This is subject to all proprietary products meeting their performance specification requirements; the provision of adequate bracing and fixings; and the correct input of design data carried out by suitably trained personnel. This document may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

**Summary of MiTek Beam Program v1.11 September 2017 Data and Output**


<b>Roof</b>		<b>Wind</b>		<b>Wall</b>	
Weight:	light + ceiling	Area/Speed:	very high (50.0 m/s)	Type:	Low weight - 0.57kPa
Dead Load:	0.45 kPa				
Live Load:	0.25 kPa	<b>Snow</b>		<b>Floor</b>	
		Area:	0 kPa	Live Load:	NA

**Beam List**

Opening Label	Beam Material	Beam Size	Beam Length	Design Status	Opening Label	Beam Material	Beam Size	Beam Length	Design Status
L1	PROLAM PL8	190x90	3000	OKAY					
L2	MSG8/VSG8	2/90x45	800	OKAY					
L3	PROLAM PL8	140x90	2000	OKAY					
L4	PROLAM PL8	140x90	1600	OKAY					
L5	PROLAM PL8	190x90	3000	OKAY					
L6	PROLAM PL8	190x90	3000	OKAY					
L7	PROLAM PL8	190x90	3000	OKAY					
L8	PROLAM PL8	190x90	3000	OKAY					
L9	PROLAM PL8	140x90	1200	OKAY					
L10	MSG8/VSG8	2/90x45	600	OKAY					
L11	PROLAM PL8	140x90	2000	OKAY					
L12	PROLAM PL8	140x90	2400	OKAY					
L13	MSG8/VSG8	2/90x45	600	OKAY					
L14	MSG8/VSG8	2/90x45	950	OKAY					
L15	MSG8/VSG8	2/90x45	860	OKAY					
L16	MSG8/VSG8	2/90x45	960	OKAY					
L17	PROLAM PL8	140x90	1990	OKAY					

GANGLAM plating details indicated with RD (regular duty plating), HD (heavy duty plating) and SHD (super heavy duty plating)

The design input has been carried out by:

Signed:  .....

Date: 17/6/2020

Name of Computer Operator: Nhi Huynh

Qualifications and Title:

Company:



# BOWMAC<sup>®</sup>

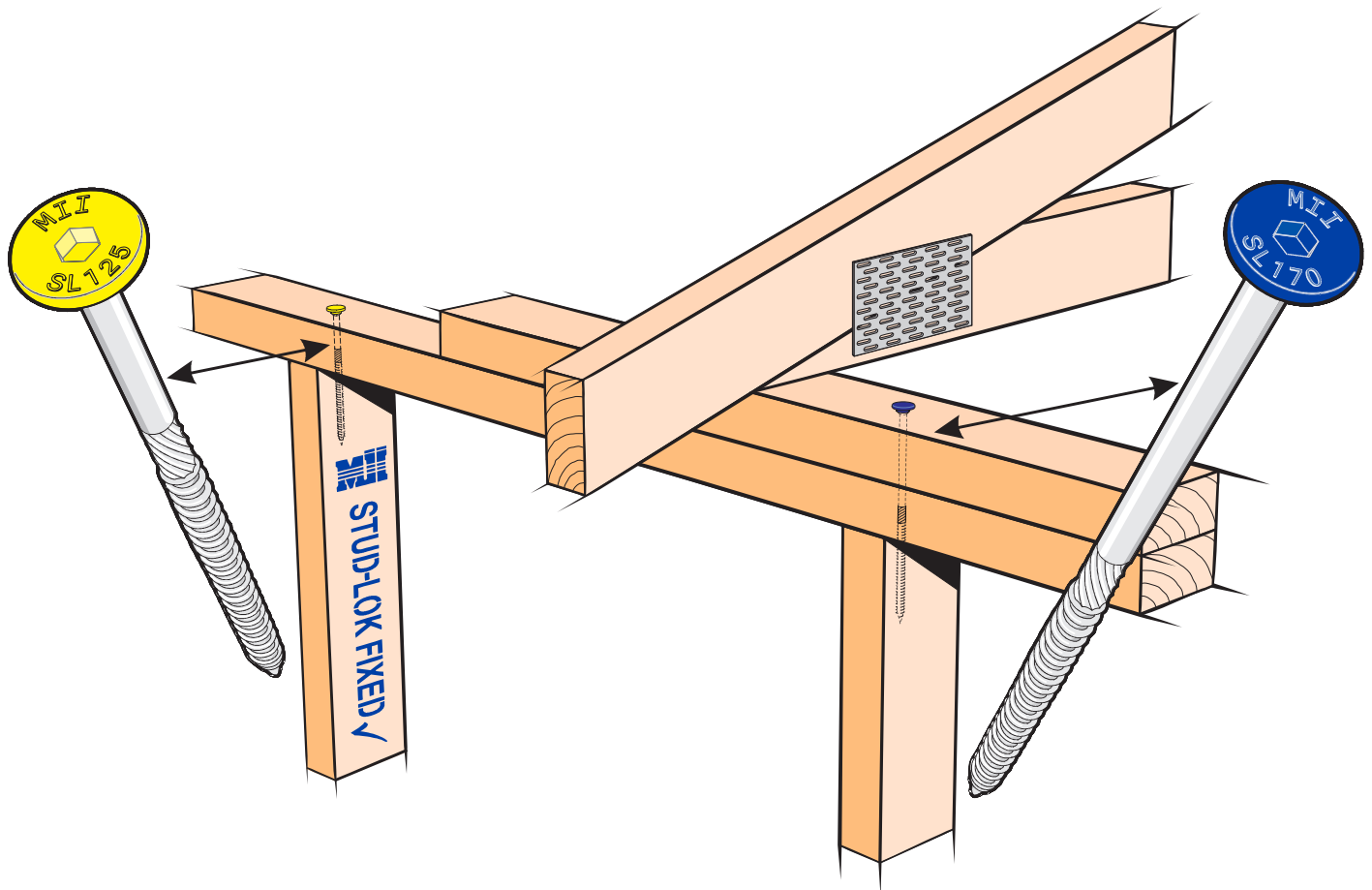
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Kapiti Coast District Council  
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11/2017

235

## STUD-LOK

Provides a solution for top plate to stud fixings for residential timber frame buildings



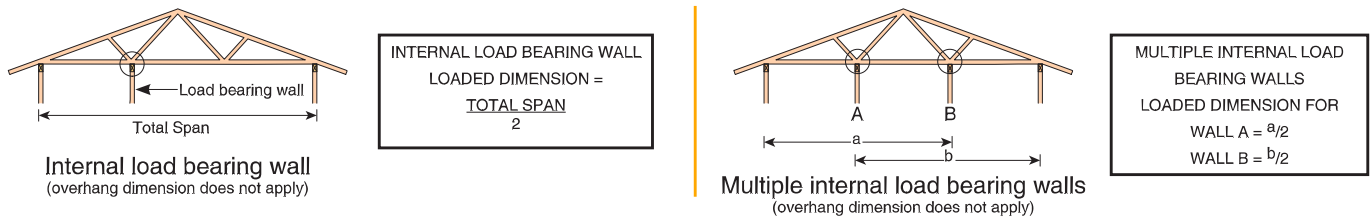
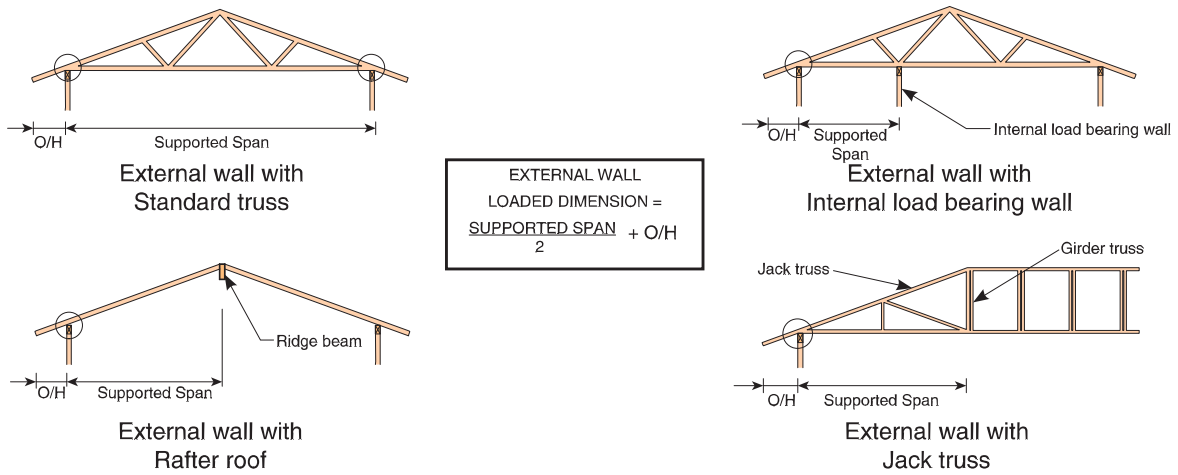
- ★ Complies with fixing requirements in Section 8 NZS 3604:2011
- ★ The BOWMAC<sup>®</sup> STUD-LOK forms an integral part of the MiTek Truss & Frame design and layout
- ★ Available in 2 lengths allowing for connections from stud to single top plate (SL125) and stud to double top plates (SL170)
- ★ Applied in the factory
- ★ Is a completely internal connection avoiding any clashes with wall linings

- NOTE:** ★ The STUD-LOK fixing is designed to resist vertical loads only.  
 ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.  
 ★ The STUD-LOK connections assume that the correct choice of rafter/truss fixings have been made.  
 ★ Wall framing arrangements under girder trusses are not covered in this schedule.  
 ★ All timber selections are as per NZS 3604:2011 and include LVL8 timber grades.

## DOUBLE TOP PLATES DEFINITION



## LOAD DIMENSION DEFINITION



## FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

Wind Zones L, M, H, VH, EH as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
4.0	3.0	2.0	2N	2N	SL	SL	SL	2N	2N	SL	SL	SL
5.0	3.8	2.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
6.0	4.5	3.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
7.0	5.3	3.5	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
8.0	6.0	4.0	2N	SL	SL	SL	SL	2N	2N	SL	SL	SL
9.0	6.8	4.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
10.0	7.5	5.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
11.0	8.3	5.5	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL
12.0	9.0	6.0	SL	SL	SL	SL	SL	2N	2N	SL	SL	SL

2N = 2/ 90mm x 3.15 dia. nails

SL = Single STUD-LOK  
 plus 2/ 90mm x 3.15 dia. nails

**NOTE:**  
 To calculate the number of STUD-LOK fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.

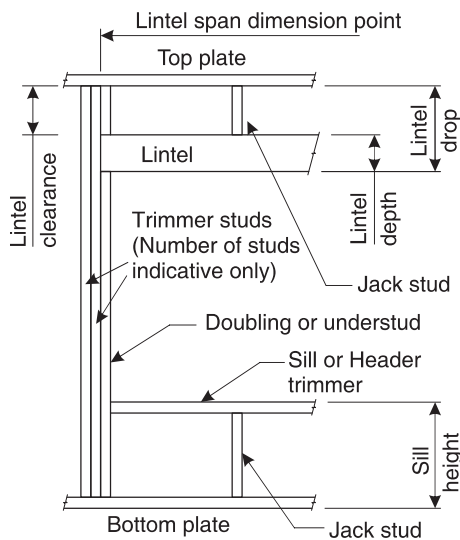


## LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

### NOTE:

- ★ All fixings are designed for vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist horizontal loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ All fixings assume bottom plate thickness of 45mm maximum. Note: TYLOK options on timber species.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011.

### DEFINITIONS



### Lintel Supporting Girder Trusses:

Roof Tributary Area	Light Roof				Heavy Roof			
	Wind Zone				Wind Zone			
	L, M, H	VH	EH	L, M, H	VH	EH		
8.6 m <sup>2</sup>	G	G	H	G	G	H		
11.6 m <sup>2</sup>	G	H	H	G	G	H		
12.1 m <sup>2</sup>	G	H	H	G	H	H		
15.3 m <sup>2</sup>	H	H	-	G	H	H		
19.1 m <sup>2</sup>	H	-	-	G	H	-		
20.9 m <sup>2</sup>	H	-	-	H	H	-		
21.8 m <sup>2</sup>	H	-	-	H	-	-		
34.3 m <sup>2</sup>	-	-	-	H	-	-		

#### Notes:

- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
- 2) Assumed girder truss is at mid-span or middle third span of lintel
- 3) Use similar fixings for both ends of lintel
- 4) All other cases require specific engineering design

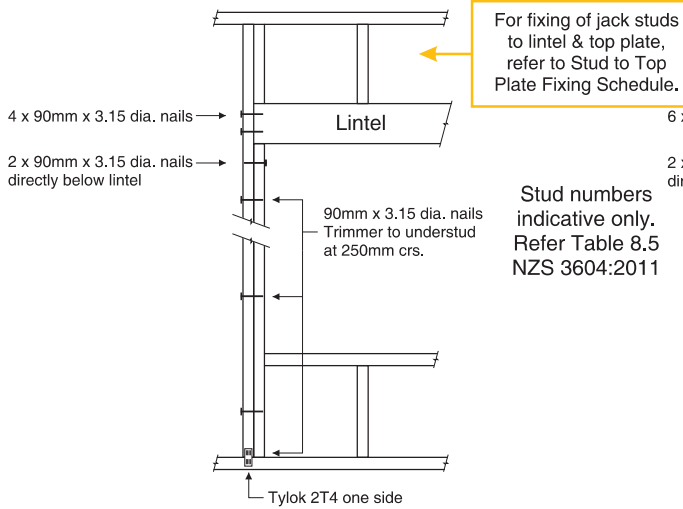
### SELECTION CHART FOR LINTEL FIXING

Lintel Span	Loaded Dimension (See Fig. 1.3 NZS 3604:2011)	Light Roof					Heavy Roof				
		Wind Zone					Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
0.7	2.0	E	E	E	E	F	E	E	E	E	E
	3.0	E	E	E	F	F	E	E	E	E	F
	4.0	E	E	F	F	F	E	E	E	F	F
	5.0	E	F	F	F	G	E	E	F	F	F
	6.0	E	F	F	G	G	E	E	F	F	G
0.9	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	E	F	F	F	E	E	F	F	F
	5.0	E	F	F	F	G	E	E	F	F	F
	6.0	E	F	F	G	G	E	E	F	F	G
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	E	F	F	F	E	E	F	F	F
	4.0	E	F	F	F	G	E	E	F	F	G
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	F	F	G	G	H	E	E	F	G	G
1.5	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	E	F	F	F	G	E	E	F	F	F
	4.0	E	F	F	G	G	E	E	F	F	G
	5.0	F	F	G	G	H	E	E	F	G	G
	6.0	F	F	G	H	H	E	E	F	G	H
2.0	2.0	E	F	F	F	G	E	E	F	F	F
	3.0	E	F	F	G	G	E	E	F	F	G
	4.0	F	F	G	G	H	E	E	F	G	G
	5.0	F	F	G	H	H	E	E	F	G	H
	6.0	F	G	G	H	H	E	F	G	H	H
2.4	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	G	H	E	E	F	G	G
	4.0	F	F	G	H	H	E	E	F	G	H
	5.0	F	G	G	H	H	E	F	G	H	H
	6.0	F	G	H	H	-	E	F	G	H	H
3.0	2.0	E	F	F	G	G	E	E	F	F	G
	3.0	F	F	G	H	H	E	E	F	G	H
	4.0	F	G	G	H	H	E	F	G	H	H
	5.0	F	G	H	H	-	E	F	G	H	H
	6.0	F	G	H	-	-	E	F	G	H	-
3.6	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	F	G	H	H	E	F	G	G	H
	4.0	F	G	H	H	-	E	F	G	H	H
	5.0	F	G	H	-	-	E	F	G	H	-
	6.0	G	H	H	-	-	E	F	H	-	-
4.2	2.0	F	F	G	G	H	E	E	F	G	G
	3.0	F	G	H	H	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	H	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
4.5	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.4	F	G	H	H	-	E	F	G	H	-
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
4.8	2.0	F	F	G	H	H	E	E	F	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.2	F	G	H	H	-	F	F	G	H	-
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
6.0	G	H	-	-	-	E	F	H	-	-	

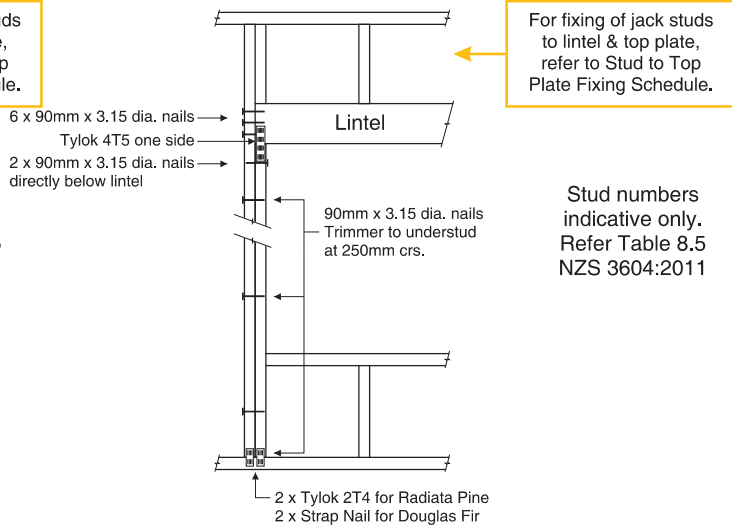


# LINTEL FIXING OPTIONS

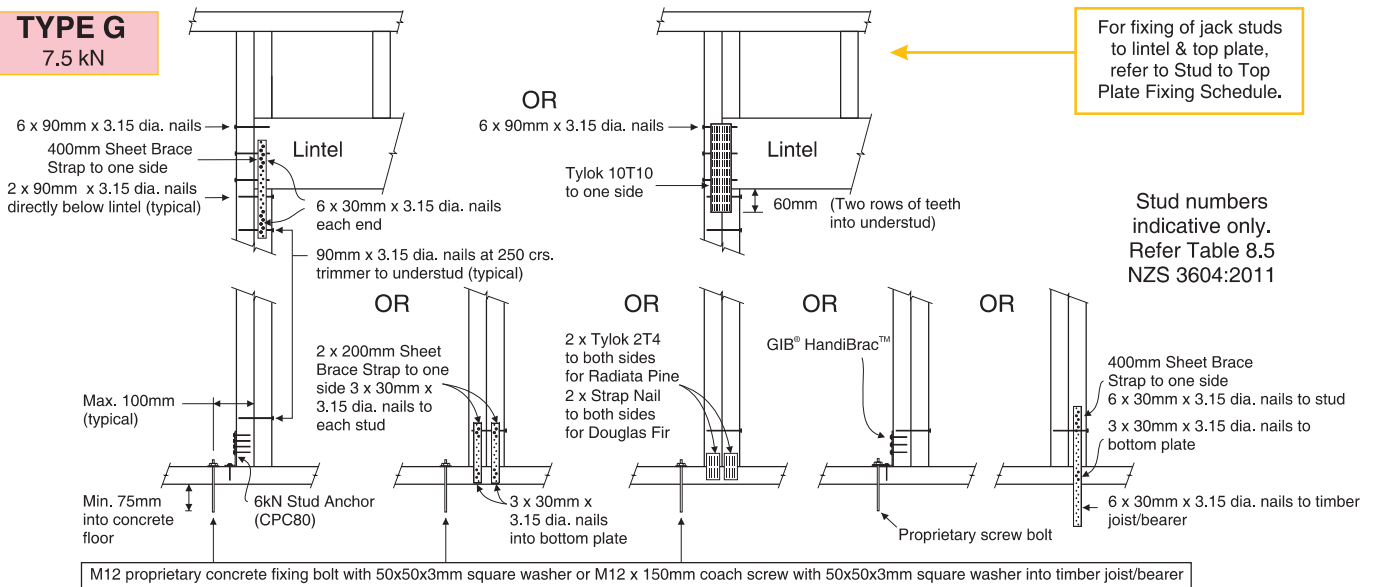
## TYPE E 1.4 kN



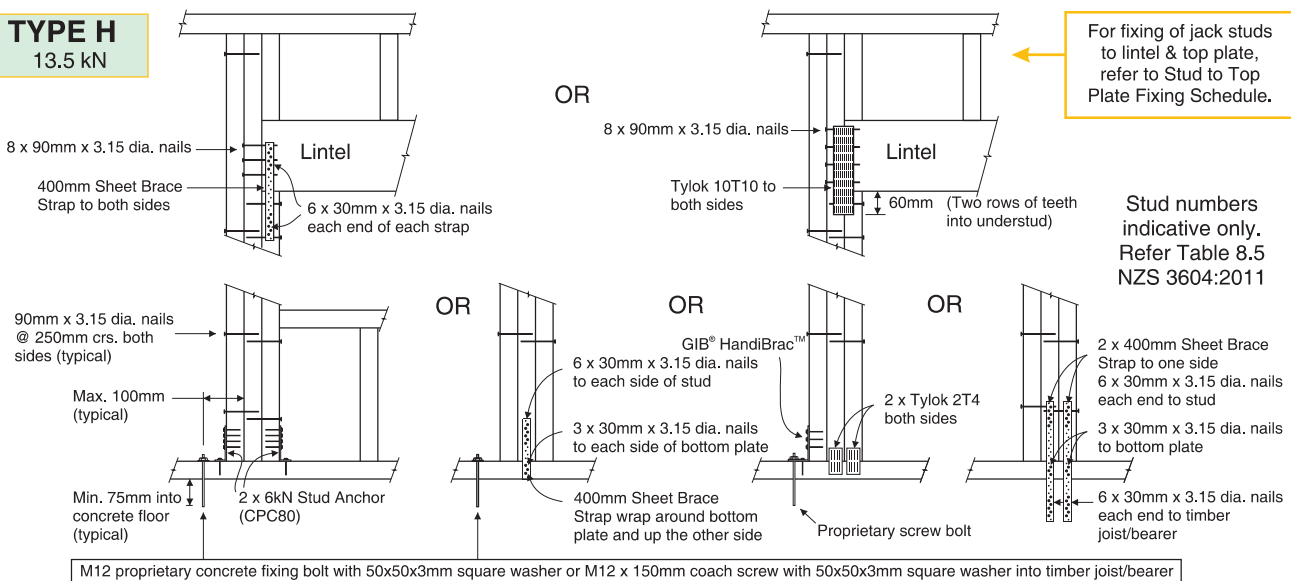
## TYPE F 4.0 kN



## TYPE G 7.5 kN



## TYPE H 13.5 kN



**| Meets NZS 3604:2011 Requirements | 90 x 45 Bottom Plate |**
**Bottom Plate Durability**

Fixing Requirements				Installation		
Bottom Plate Location	Bottom Plate Fixing Requirement	Concrete Strength (min.)	Floor Edge Type	Max Spacing	Fastener	Min Edge Distance (FROM OUTERFACE)
External Wall	NZS3604:2011	17.5 MPa	Concrete	900 mm	12120BPAG <sup>*1</sup> OR T12140GH <sup>*1</sup>	55 mm
			Masonry Block	600 mm		
	Proprietary Bracing Systems (15 kN)	17.5 MPa	Concrete	900 mm	AS12150GH + RPBA	
			Masonry Block	600 mm		
Internal Wall	NZS3604:2011	17.5 MPa	N/A	900 mm	12120BPAG <sup>*1</sup> OR T12140GH <sup>*1</sup>	N/A
				600 mm	8x75 Drive Pin & Washer	N/A
	Proprietary Bracing Systems (15 kN)	17.5 MPa	N/A	900 mm	12120BPAG <sup>*1</sup> + RPBA OR T12140GH <sup>*1</sup> + RPBA	N/A



HD875 DRIVE PIN



AS12150GH ANCHOR



12120BPAG ANCHOR

**Ramset Bracing Anchor (RPBA)**
**Advantages**

- Ease and speed of installation
- No checking of timber frame to ensure flush fitting of board
- The RPBA is a one piece anchor for either side of stud
- Slotted hole on bottom of bracket provides some flexibility in bolt & bracket position
- Installed prior to fixing of gypsum wallboard
- Easy inspection

The Ramset Bracing Anchor is sold as a set of 2.

Each set includes the following components;

- 2 Each Ramset Bracing Anchor
- 14 Each Tek screws

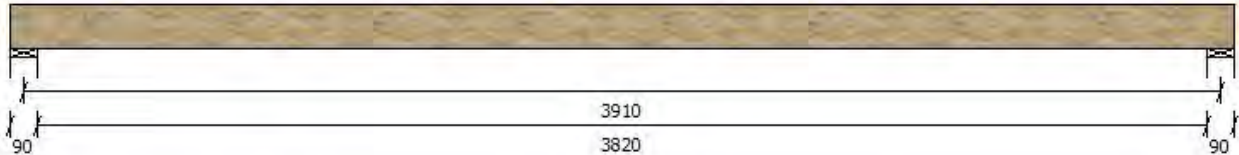
Fixings into timber or concrete floor to be purchased separately





**Job Number:**  
**Job Description:**  
**Run by: Shasthri Herath**  
**Licence: Basic User(No certificate req'd)**  
**Company: AD Architecture**  
**Phone: 042985662**

## Engineering Report



### Section BM02, Roof Beam Design

#### Use 200x90 LVL 11

#### Min. end bearing length = 45mm

This LVL product is set up as a generic LVL, and not specific to any manufacturer. It has been created to match the majority of LVL "grades" available on the market. You should check your target LVL manufacturer's specifications to ensure that substitution over this generic LVL product is acceptable.

#### DIMENSIONAL DETAILS:

Span type is Single Span for a design length of 3910 mm

Theoretical spans are calculated as centrelines of supports, using the entered support widths and distances between supports.

Supported rafter/truss spacing is 900mm, and RLW = CLW = 3010mm.

#### DESIGN DETAILS:

Roofing material of Metal Sheet (20)

Roof pitch of 7.5 deg

Wind Classification for this project is High

Snow Load Classification for this project is NoSnow (Snow load not required)

Ceiling material of 13mm P'Board (20)

Design ultimate wind pressure is 1.162 kPa

Design serviceability wind pressure is 0.821kPa

#### SECTION DETAILS (200x90 LVL 11 )

Durability Class = 4

Depth = 200mm, Width = 90mm

Creep Factor (j2) = 1.5

EMC (average moisture content) = 15%

Gross Area = 18000sq mm

Mom Inertia.major = 60.000x10<sup>6</sup> mm<sup>4</sup>

Elasticity = 11000MPa

Rigidity = 550MPa

Bending Stress = 33.56597MPa

Tension Stress = 24.78279MPa

Bearing Parallel = 35MPa

Weight = 10.260 kg/m

Minimum Allowed j2 = 1

Structure in a high temperature area = NO

Shear Area = 12000sq mm

Shear Stress = 5MPa

Compression Stress = 38MPa

Bearing Perpendicular = 10MPa

#### ENGINEERING DATA:

##### Members:

Member	O/A Length	X1-coord	Y1-coord	X2-coord	Y2-coord
1	3910	0	0	3910	0

##### Restraints:

Top Restraint	Bottom Restraint	Side Restraint
900mm	unrestrained	unrestrained

**Wind Coefficients:**

Uplift Strength	DownDrag Strength	Uplift Deflection	DownDrag Deflection
0.99	0.63	0.99	0.63

**Allowable Deflections:**

Load Case Type	Span Ratio	Fixed value mm
Full Permanent Load	L/300	20
Functional Permanent	L/300	20
Floor Live Load	L/300	20
Long Term Snow Load	L/300	n/a
Short Term Snow Load	L/300	n/a
Long Term Roof Load	L/400	n/a
Short Term Roof Load	L/250	n/a
Wind Uplift	L/150	n/a
Sensory Wind Load	n/a	n/a
Wind Downward	L/150	n/a
Dynamic Floor Load	n/a	n/a

**Load Case Data:**

Case	Name	Type	Symbol
0	Self Weight	Dead Load	G
1	Dead Load	Dead Load	G
2	0.25kPa Roof Live Load	Full Roof Live Load	Qr
3	g44x1.1kN Live Load at centre of M1	Concentrated Roof Live Load	Qrconc
4	1.15kPa Wind Uplift	Wind Uplift Load	Wu
5	0.81kPa Wind Uplift (Deflection)	Wind Uplift for deflection	Wu
6	0.73kPa Wind Downdrag	Wind Downward Load	Wd
7	0.52kPa Wind Downdrag (Deflection)	Wind Downward for deflection	Wd

**Load Combinations for Maximum Strength:**

Combine	Combination Name	Load Case	Multiplier
1	1.35G Only	0	1.35
		1	1.35
2	1.2G + 1.5Qr	0	1.20
		1	1.20
		2	1.50
3	1.2G + 1.5Qrconc on M1	0	1.20
		1	1.20
		3	1.50
4	0.9G + Wup	0	0.90
		1	0.90
		4	1.00
5	1.2G + Wdn	0	1.20
		1	1.20
		6	1.00

**Load Combinations for Maximum Deflection:**

Combine	Combination Name	Load Case	Multiplier	Creep Applies
6	G Only	0	1.00	true
		1	1.00	true
7	0.7Qr	2	0.70	false
		3	1.00	false
8	1Qrconc on M1			false
9	Wup Only	5	1.00	false
10	Wdn Only	7	1.00	false

**Member Distributed Loads:**

Load Case	Member Number	Start Load (kN/m)	Start Location (mm)	Finish Load (kN/m)	End Location (mm)
0	All	-0.101	From Start	-0.101	To Finish
1	All	-1.374	From Start	-1.374	To Finish
2	All	-0.752	From Start	-0.752	To Finish
4	All	3.461	From Start	3.461	To Finish
5	All	2.448	From Start	2.448	To Finish
6	All	-2.203	From Start	-2.203	To Finish
7	All	-1.558	From Start	-1.558	To Finish

**Member Concentrated Loads:**

Load Case	Member Number	Applied for Maximum	Load Value (kN)	At Location (mm)
3	1	Bending/Deflection	-1.100	1955

**Member Actions - Strength Properties:**

Mem Num	Combination Name	Comb'n K1	Axial (kN)	Bending Moments (kN.m)				End Shears (kN)	
				Left End	Right End	Internal	At	Left Shear	Right Shear
1	1.35G Only	0.60	0.000	0.000	0.000	-3.803	1955	3.204	-3.204
	1.2G + 1.5Qr	1.00	0.000	0.000	0.000	-5.538	1955	4.666	-4.666
	1.2G + 1.5Qrconc on M1	1.00	0.000	0.000	0.000	-4.994	1955	3.673	-3.673
	0.9G + Wup	1.00	0.000	0.000	0.000	4.079	1955	-3.437	3.437
	1.2G + Wdn	1.00	0.000	0.000	0.000	-7.590	1955	6.395	-6.395

**Member Actions - Serviceability Properties:**

Member Number	Load Combination Name	Combin j2	Bending Deflection	Check Deflection	Upper Limit
1	G Only	1.5	-10.2	10.2	13.0
	0.7Qr	1.0	-2.4	2.4	15.6
	1Qrconc on M1	1.0	-2.1	2.1	15.6
	Wup Only	1.0	11.3	11.3	26.1
	Wdn Only	1.0	-7.2	7.2	26.1

**Support Reactions - Strength Combinations Only: (Limit state values)**

Support Number	Vertical Reaction (kN)	Load Duration	Load Combination
1	3.891	Permanent	1.35G Only
2	3.891		
1	5.665	Medium-term	1.2G + 1.5Qr
2	5.665		
1	4.284	Medium-term	1.2G + 1.5Qrconc on M1
2	4.284		
1	-4.173	Medium-term	0.9G + Wup
2	-4.173		
1	7.765	Medium-term	1.2G + Wdn
2	7.765		

**Load Case Symbols - Legend:**

Load combinations are made up of one or more load cases, where the loads are combined together to simulate the actual situation for the member or structure. These load values, for Limit State Design, may also be multiplied by a factor to increase, or decrease, the effect of the individual load case in the combination. The following symbols are used in this report to represent particular load groups or types of loads:

G	Dead Load or any permanent load applied for the entire structure life
Qfperm	Permanent component or Floor Live Load, or Long Term Gamma factor x Live Load (refer AS1170.1)
Qf	Floor Live Load - Distributed
Qfconc	Floor Live Load - Concentrated - main spans
Qfcant	Floor Live Load - Concentrated - balcony line load
Qr	Roof Live Load - Distributed
Qrconc	Roof Live Load - Concentrated
Sn	Snow Load
Wu	Wind Uplift
Sn	Wind Downdrag
Sn	Wind Horizontal - or Lateral wind load, eg for wall studs, wind beams, etc
Dyn	Dynamic Load applied for 'floor bounce' - concentrated

**Maximum Performance Statistics - Timber Code Report**

Design Action	Design Value	Control Value	Pass/Fail	Stress Ratio %	Location	Load Combination
Moment (kN.m)	7.590	19.133	Pass	39.7	Member 1, Centre	1.2G + Wdn
Shear (kN)	6.395	57.000	Pass	11.2	Member 1, Left end	1.2G + Wdn
Reaction Bearing (kN)	7.765	76.950	Pass	10.1	Member 1, Left end	1.2G + Wdn
Deflection - variable (mm)	10.2	13.0	Pass	78.2	Member 1, Centre	G Only
Deflection - fixed value (mm)	10.2	20.0	Pass	51.0	Member 1, Centre	G Only
Support Crushing (kN)	7.765	34.800	Pass	22.3	Support 1	1.2G + Wdn



# PROLAM SUMMARY

Customer/Project: 20018  
Physical Address: Lot 6 Anderson Park  
Designer: Shasthri Herath, AD architecture  
5 Kodex Place , Paraparaumu 5032  
E: shasthri@adarchitecture.nz P: 0228822012

## BMO1

### Prolam Verandah Beams

Building Type	House	Roof Weight	Light with Ceiling
Timber	Pine, Machined	Roof Load	0.40 kPa
Treatment	H3.2	Live Load	0.25 kPa uniform 1.10 kN concentrated
Visual	Yes	Wind Zone	Very High (50.0 m/s)
Exposed	Yes	Snow Region	Region N1
Roof Pitch	8 °	Altitude	0 m
Roof Span	1.50 m	Ground Snow Load	0.00 kPa
Lintel Span	4.50 m	Roof Snow Load	0.00 kPa

### Use Prolam PLVL8H3-200100 190 x 88mm PL8

Capacity Ratio	2.1
Long Term Deflection	2.7 mm
Max. Bearing Reaction	3.4 kN
Load Combination	1.2G + 1.5Qpoint
Minimum Bearing Length	35 mm
Uplift Fixing Requirements	3.5 kN Characteristic Load

## PRODUCER STATEMENT



Tasman Consulting Engineers Limited has been engaged by Prowood to provide design services for the development of the Prolam Online calculator.

The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS1170:2002, NZS3603:1993 and NZS3604:2011 using the timber properties for GL8, GL12 and GL17 glulam and LVL15.

I believe on reasonable grounds that the above design will meet the requirements of clauses B1/VM1 of the Building Code Documents.

*David King*

**David King**

ME (civil, MIPENZ CPEng (no 145511) IntPE

For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050

27 November 2020

**283 Waiwhero Rd PO Box 413 Motueka New Zealand Phone 03 526 7436 Fax 03 526 7437**

**Email: [info@prowoodnz.com](mailto:info@prowoodnz.com) • [www.prolamnz.com](http://www.prolamnz.com)**



**PROLAM**<sup>®</sup> products are manufactured to the requirements of AS/NZS 1328.1:1998 Glue Laminated Structural Timber, and AS/NZS 1491:1996 Finger Jointed Structural Timber under an approved quality system based on the ISO 9000 series of standards. As such if the product is used in accordance with **PROLAM**<sup>®</sup> product literature, it will meet the durability clauses of the New Zealand Building Code B2.

#### Subfloor Applications:

- ☒ **PROLAM**<sup>®</sup> may be used where approved practices for clearance and ventilation are used.

#### External Use:

- ☒ **PROLAM**<sup>®</sup> is recommended for weather exposed applications if sealed and maintained in accordance with **PROLAM**<sup>®</sup> literature.

#### Preservative Treatment:

- ☒ **PROLAM**<sup>®</sup> Beams are CCA H3.2 treated as defined by NZS 3640:2003, for weather exposed applications, such as verandah beams, deck bearers, and subfloor applications.
- ☒ **PROLAM**<sup>®</sup> Posts are CCA H5 treated as defined by NZS 3640:2003 for in-ground and weather exposed applications, such as deck piles, verandah posts and similar applications.

#### Storage of **PROLAM**<sup>®</sup>:

- ☒ To ensure **PROLAM**<sup>®</sup> remains straight and true at the time of installation, follow the below recommendations:
  1. Store under cover so that it remains dry until installation.
  2. Stack clear of the ground for good ventilation.
  3. Stack on bearers to keep flat and straight.

#### Branded **PROLAM**<sup>®</sup>:

- ☒ **PROLAM**<sup>®</sup> is branded for your protection. Look-alike materials may not perform to the standard of **PROLAM**<sup>®</sup>. For your protection do not accept unauthorized substitution



# INFORMATION SHEET

## MACROCARPA

**Common names:** Macrocarpa, Monterey Cypress

**Botanical name:** *Cupressus macrocarpa*

### APPEARANCE AND DESCRIPTION:

- Macrocarpa is a low- to medium-density softwood that looks and works like kauri.
- Macrocarpa can be used both structurally and decoratively.
- The heartwood is golden brown and has a speckled lustre, which is rare in timber.

### PERFORMANCE CHARACTERISTICS

#### Durability:

- Both the heartwood and sapwood of macrocarpa are naturally borer resistant (*Anobium*) for interior housing purposes.
- The heartwood is moderately durable for above-ground purposes, but the sapwood is non-durable.
- The timber cannot be pressure treated with copper, chromium and arsenic (CCA), but sapwood can be boron diffusion treated to resist insects (but not decay).

### MECHANICAL PROPERTIES:

Density at 12 percent moisture content	543 kg/m <sup>3</sup>
Modulus of elasticity	5.79 GPa
Bending strength	87.8 MPa
Compression strength parallel to the grain	44.6 MPa
Shear strength parallel to the grain	12.7 MPa
Side hardness (refers to indentation)	3.44 kN
End hardness	4.50 kN
Tangential shrinkage – green to 12 percent moisture content	3.3%
Radial shrinkage – green to 12 percent moisture content	1.6%

### MACHINING:

Macrocarpa has a fine grain and machines and sands well to give a high-quality finish.

### GLUING AND COATING CONSIDERATIONS:

Macrocarpa, when dry, will accept a variety of paints, oils, two pot resins and varnishes.

## INFORMATION SHEET – MACROCARPA (CONTD)

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### **SUSTAINABILITY:**

- Macrocarpa supplied in New Zealand is grown within New Zealand as an exotic tree. Most timber comes from farm shelterbelts. The species is also developing as a plantation crop.
- Supplies of good-quality timber are increasing, either milled to specific requirements, or available from specialist suppliers as finished products.
- Supply of timber milled to larger sizes is limited in certain parts of the country, and sizes larger than 150 x 50 mm can be difficult to source.

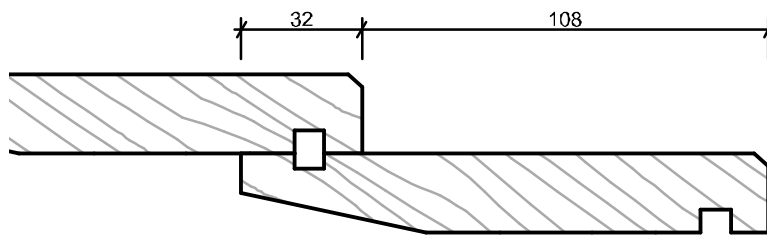
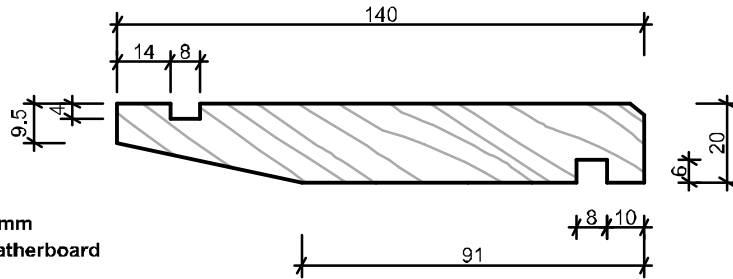
**For suppliers of Macrocarpa, visit the vendor's database on the NZ Wood website:**  
[www.nzwood.co.nz](http://www.nzwood.co.nz)

**Or contact your local branch of the New Zealand Farm Forestry Association:**  
[www.nzffa.org.nz](http://www.nzffa.org.nz)

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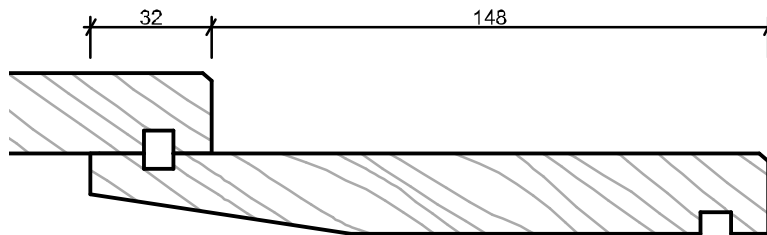
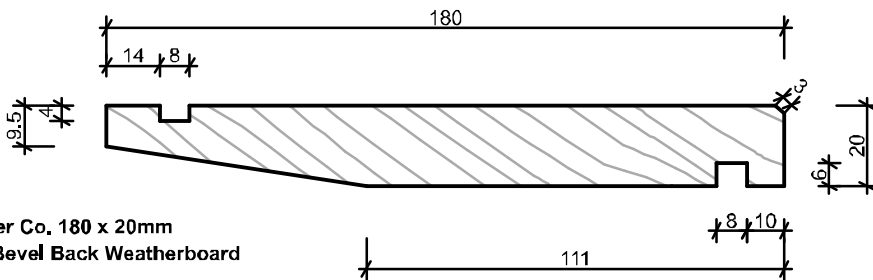
**NT61(140)**

NZ Natural Timber Co. 140 x 20mm  
 NZ Macrocarpa Bevel Back Weatherboard



**NT81(180)**

NZ Natural Timber Co. 180 x 20mm  
 NZ Macrocarpa Bevel Back Weatherboard

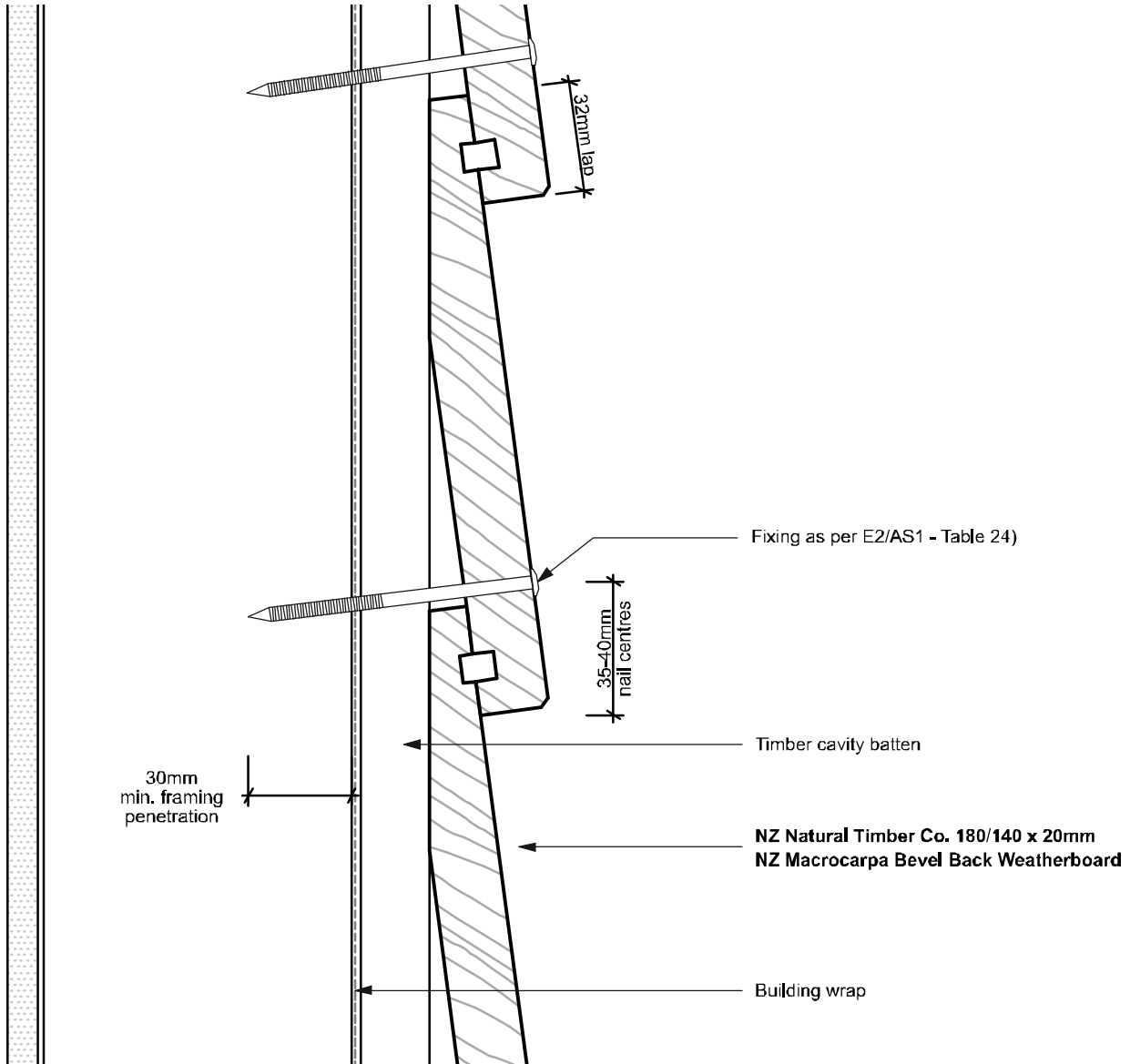


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Weatherboard Profile</b>		<b>01</b>

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**FIXING NOTES**

**Weatherboards**

**Stainless Steel Fixings**

Rosehead A/G 100 x 4.0mm

Rosehead A/G 75 x 3.15mm

Rosehead A/G 60 x 3.15mm

Rosehead A/G 38 x 3.15mm

**Silicone Bronze Fixings**

Rosehead A/G 100 x 4.0mm

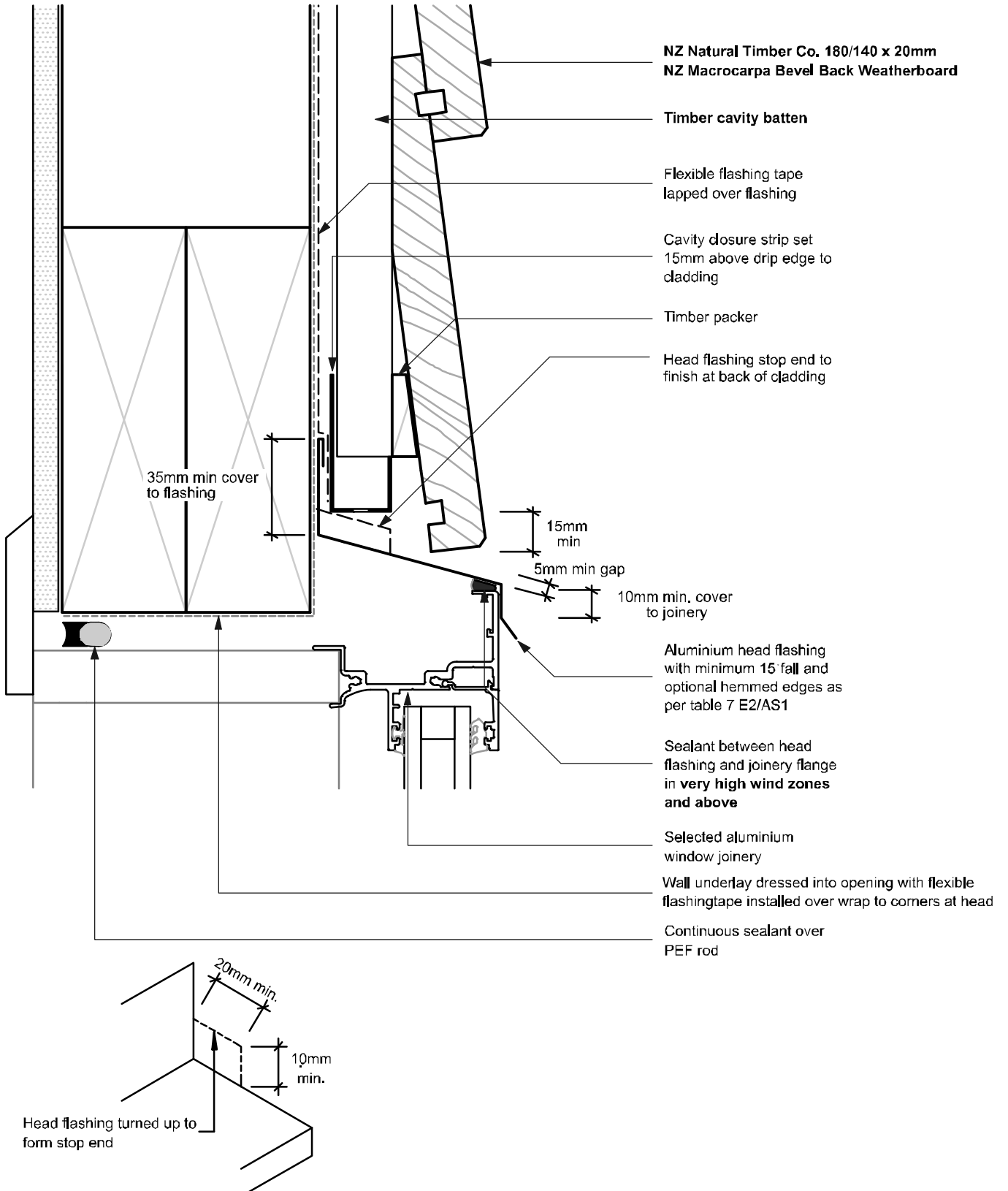
Rosehead A/G 75 x 3.25mm

Rosehead A/G 60 x 3.25mm

Rosehead A/G 38 x 3.25mm

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Detail Cavity Fix</b>	<b>02</b>	

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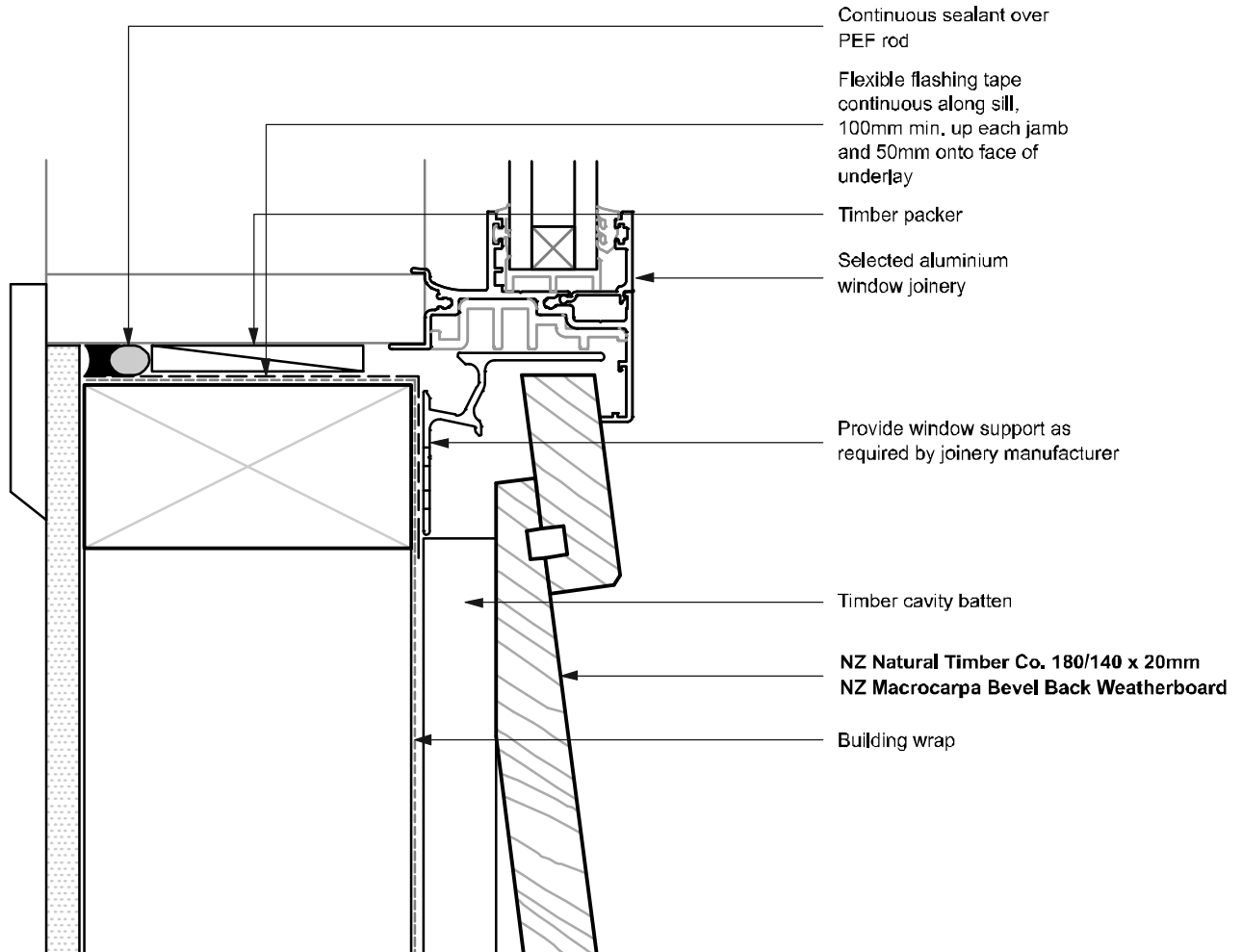


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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Window Head Detail</b>	<b>03</b>	

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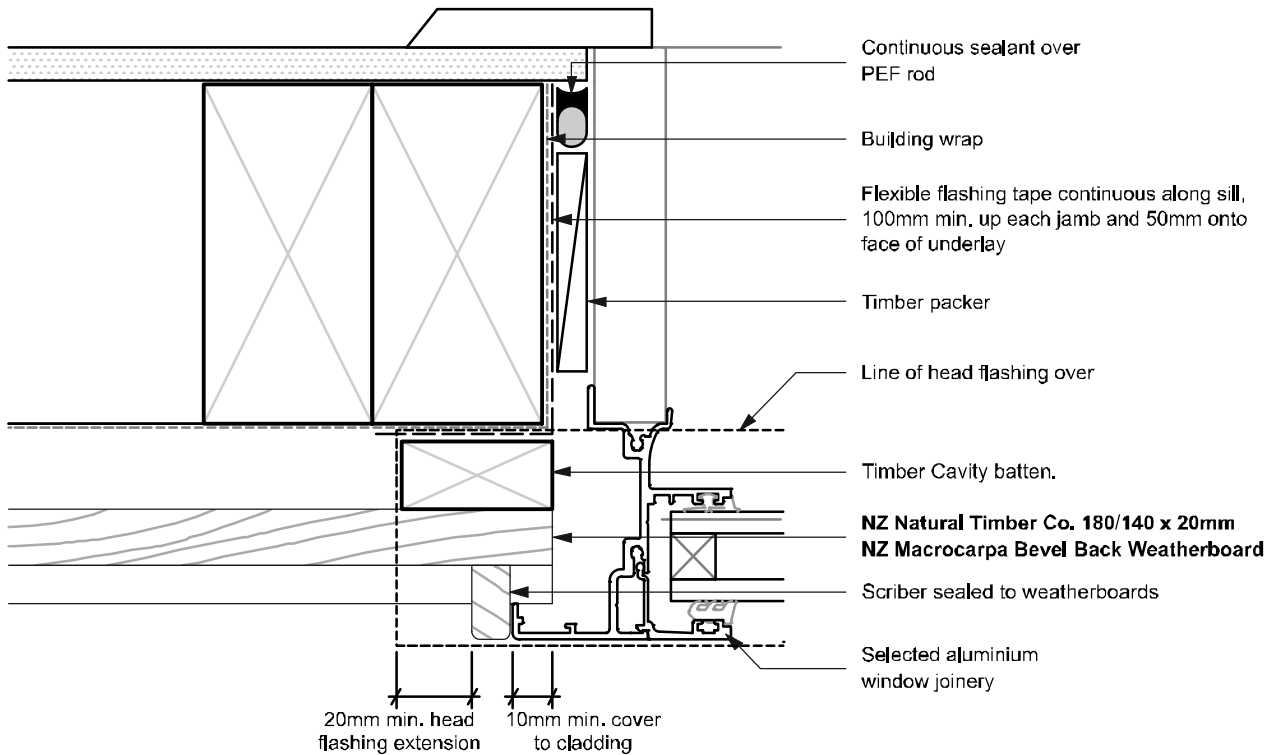


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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING	<b>Window Sill Detail</b>	<b>04</b>

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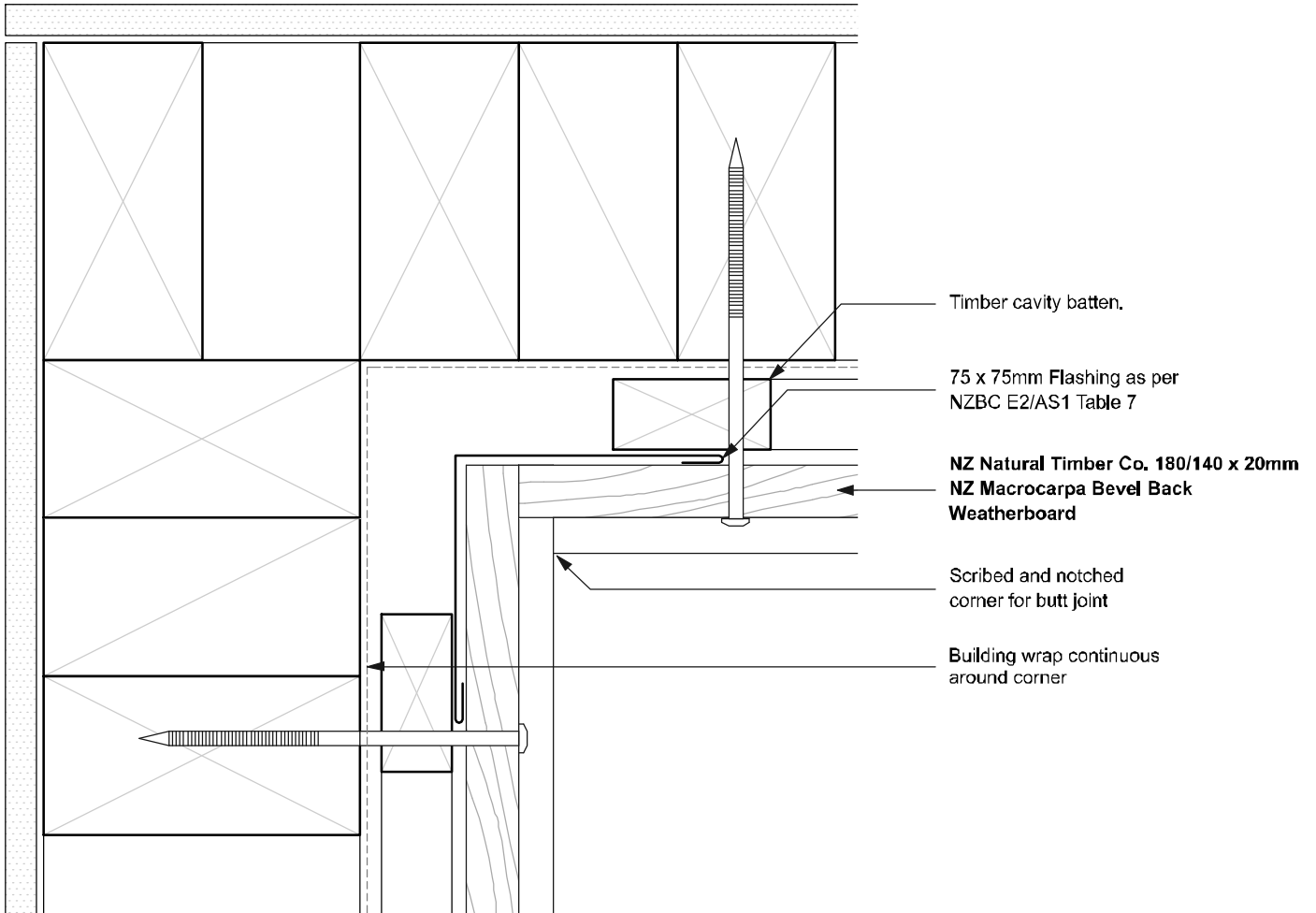


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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Window Jamb Detail</b>	<b>05</b>	

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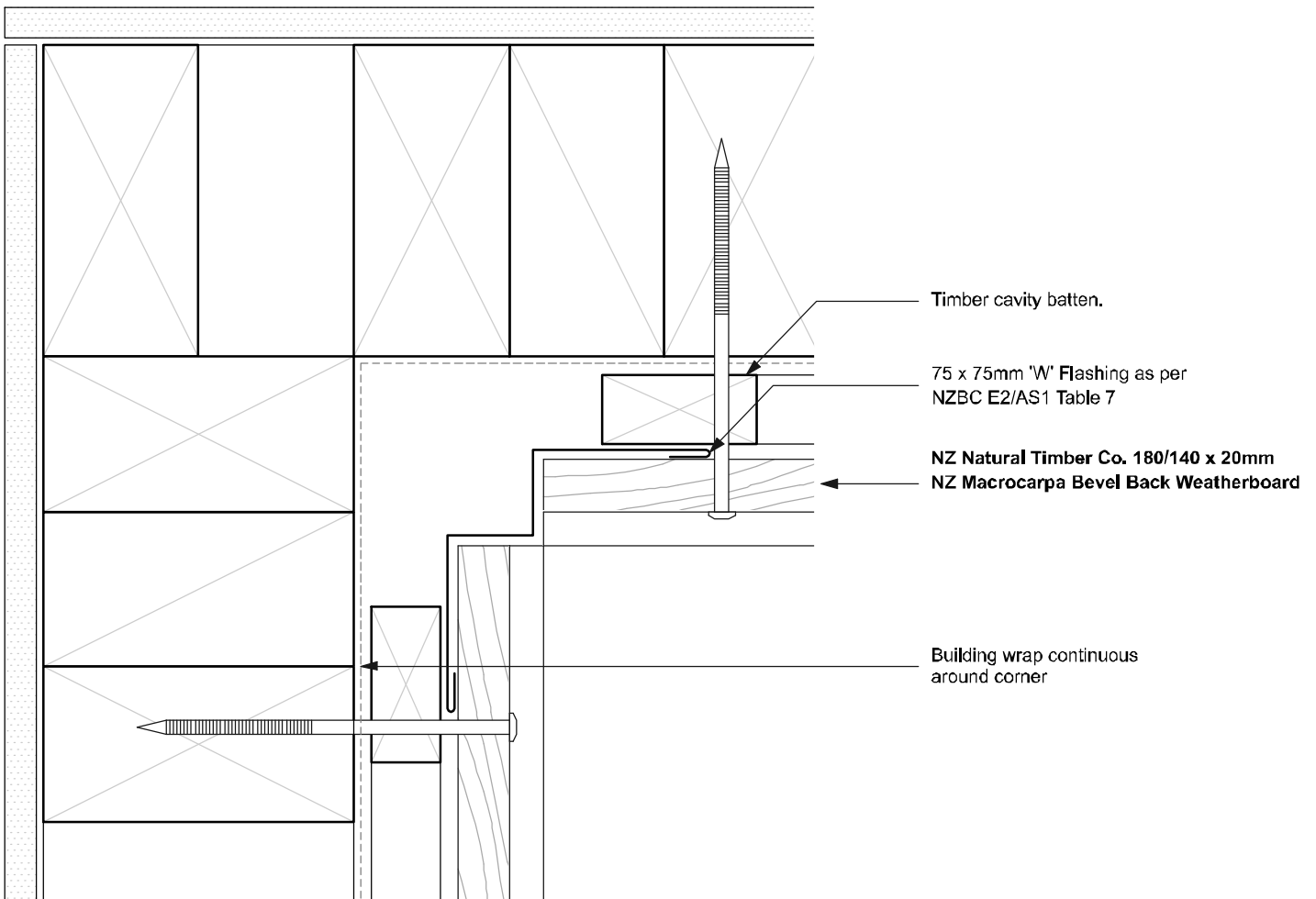


**NOTES**

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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Internal Corner Butt Joint</b>	<b>06</b>	

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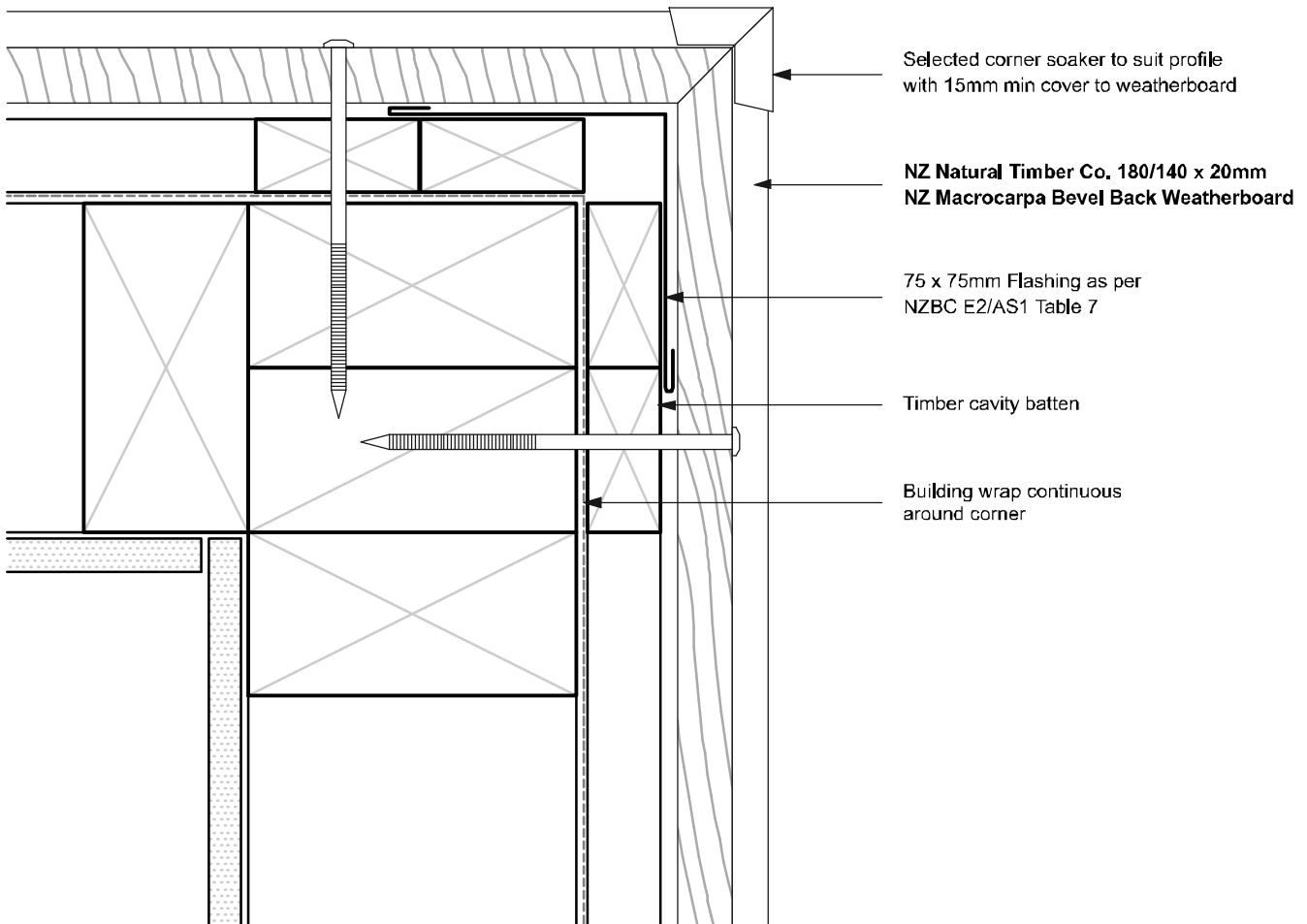


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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Internal Corner Fillet</b>	<b>07</b>	

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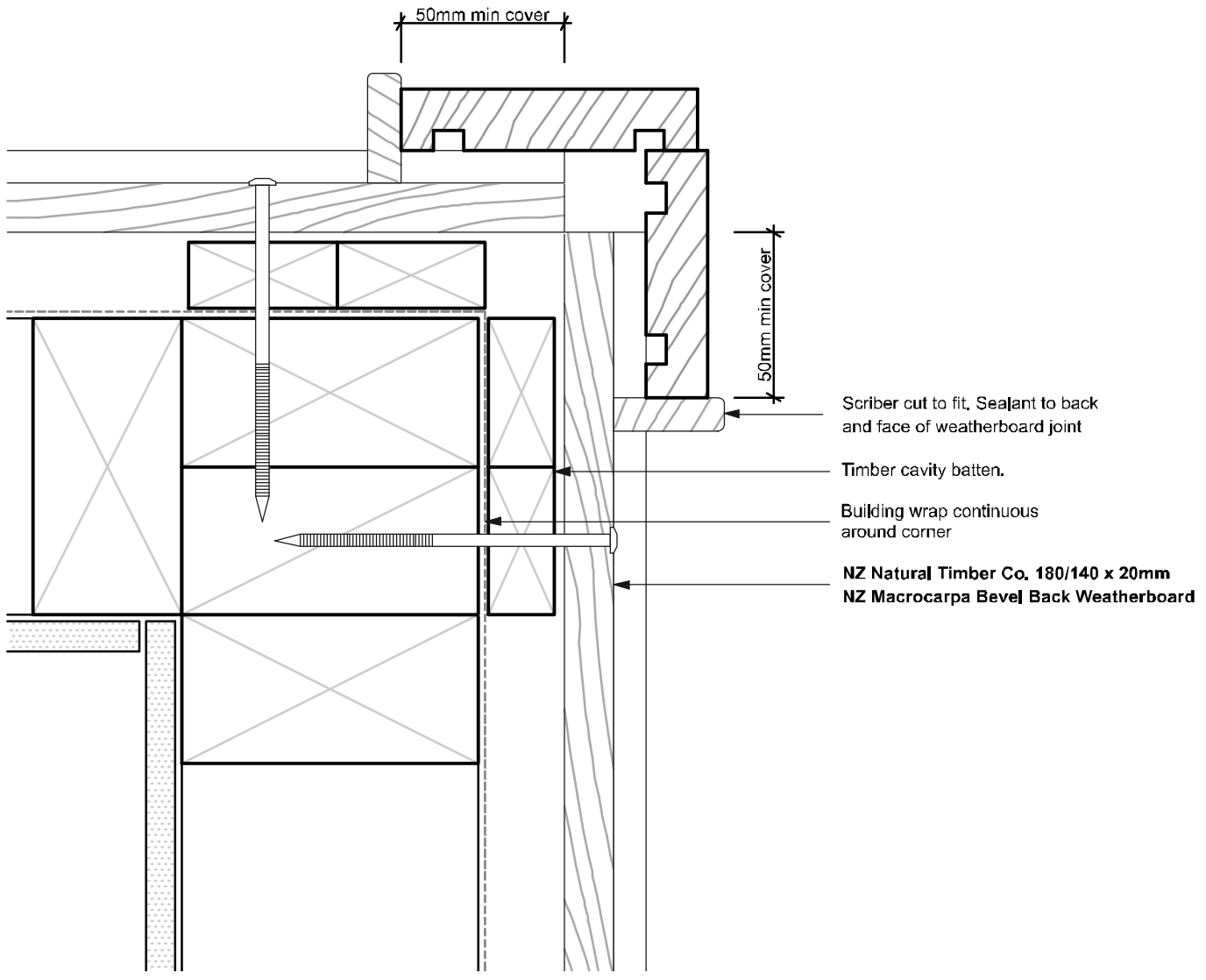


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<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>External Corner Soaker</b>		<b>08</b>

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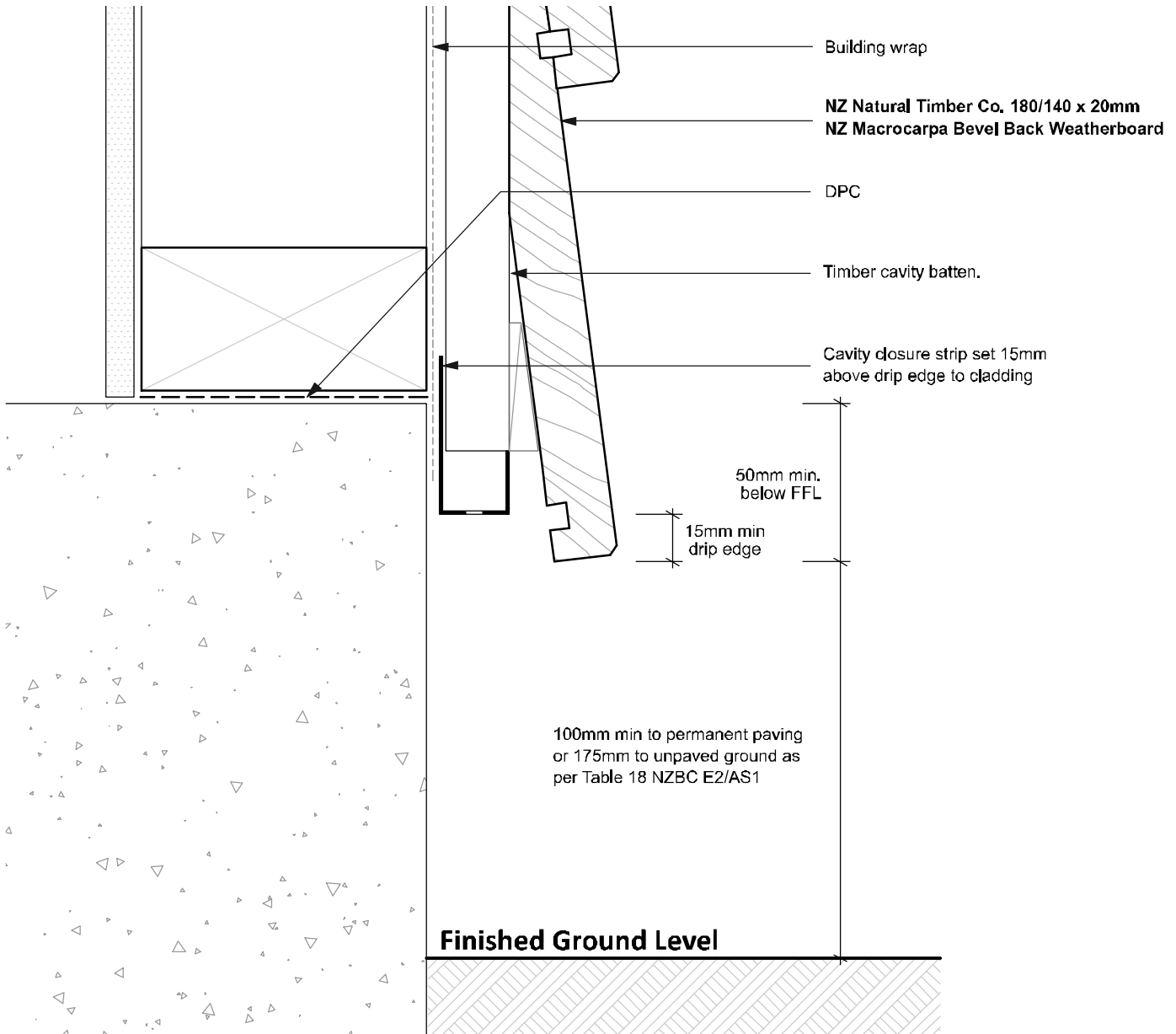


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>External Corner Boxed</b>		<b>09</b>

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	

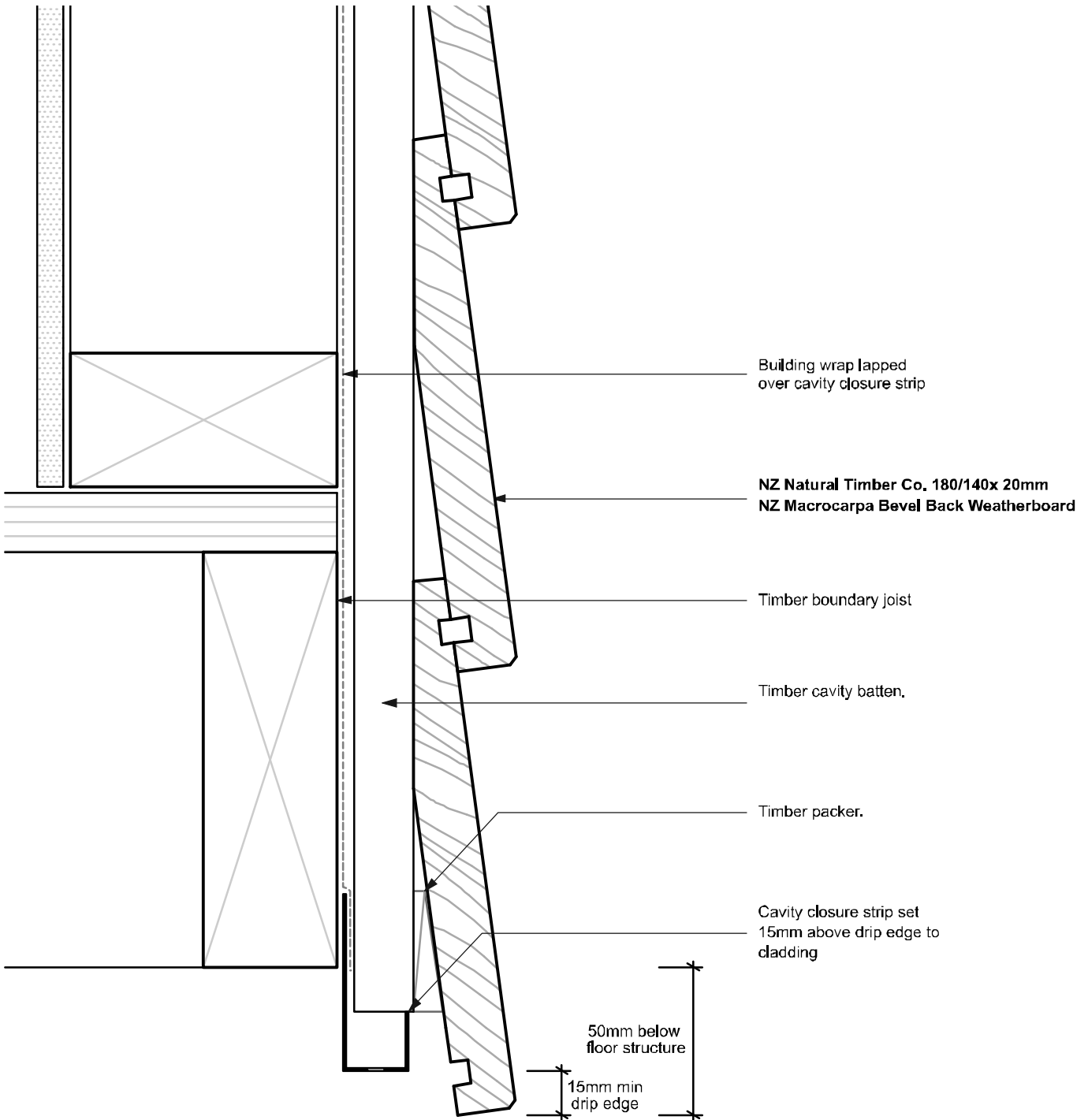


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Base of Wall - Concrete</b>		<b>10</b>

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	

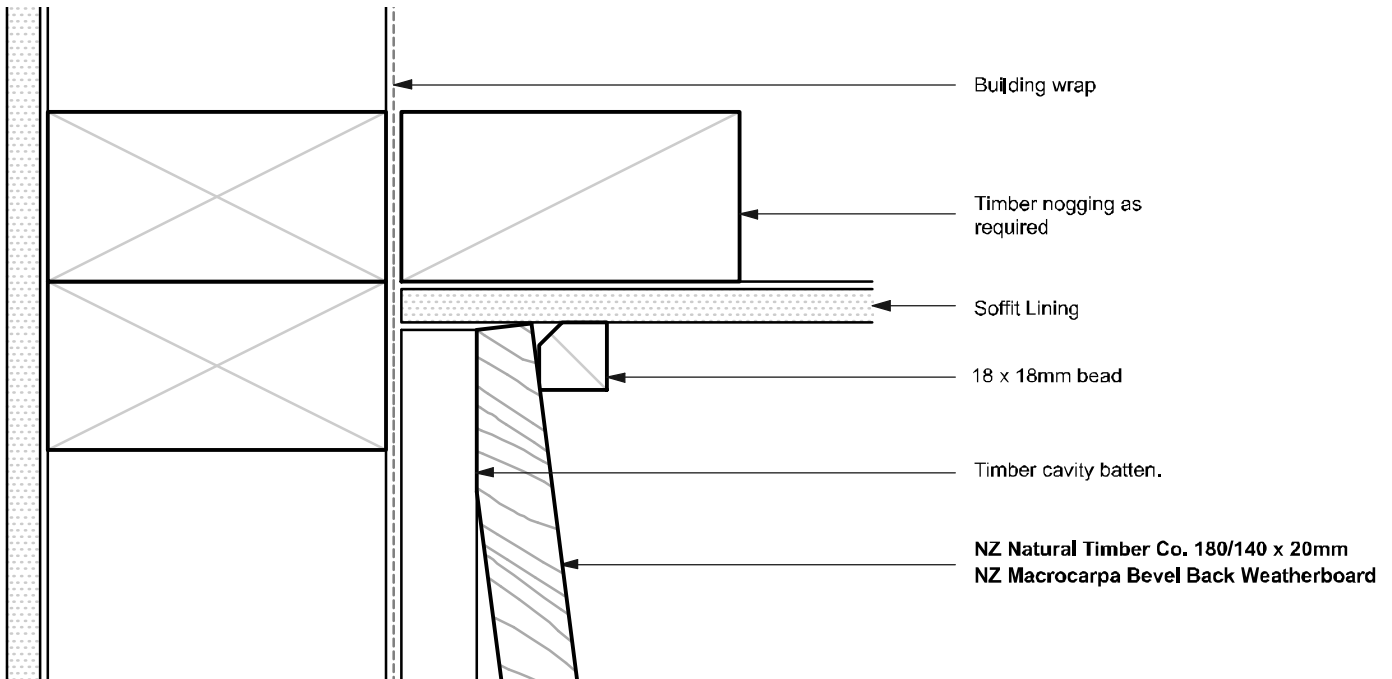


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>	SCALE <b>1:2 @ A4</b>
DRAWING <b>Base of Wall - Timber</b>	<b>11</b>

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		☰
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	FULL SERVICE

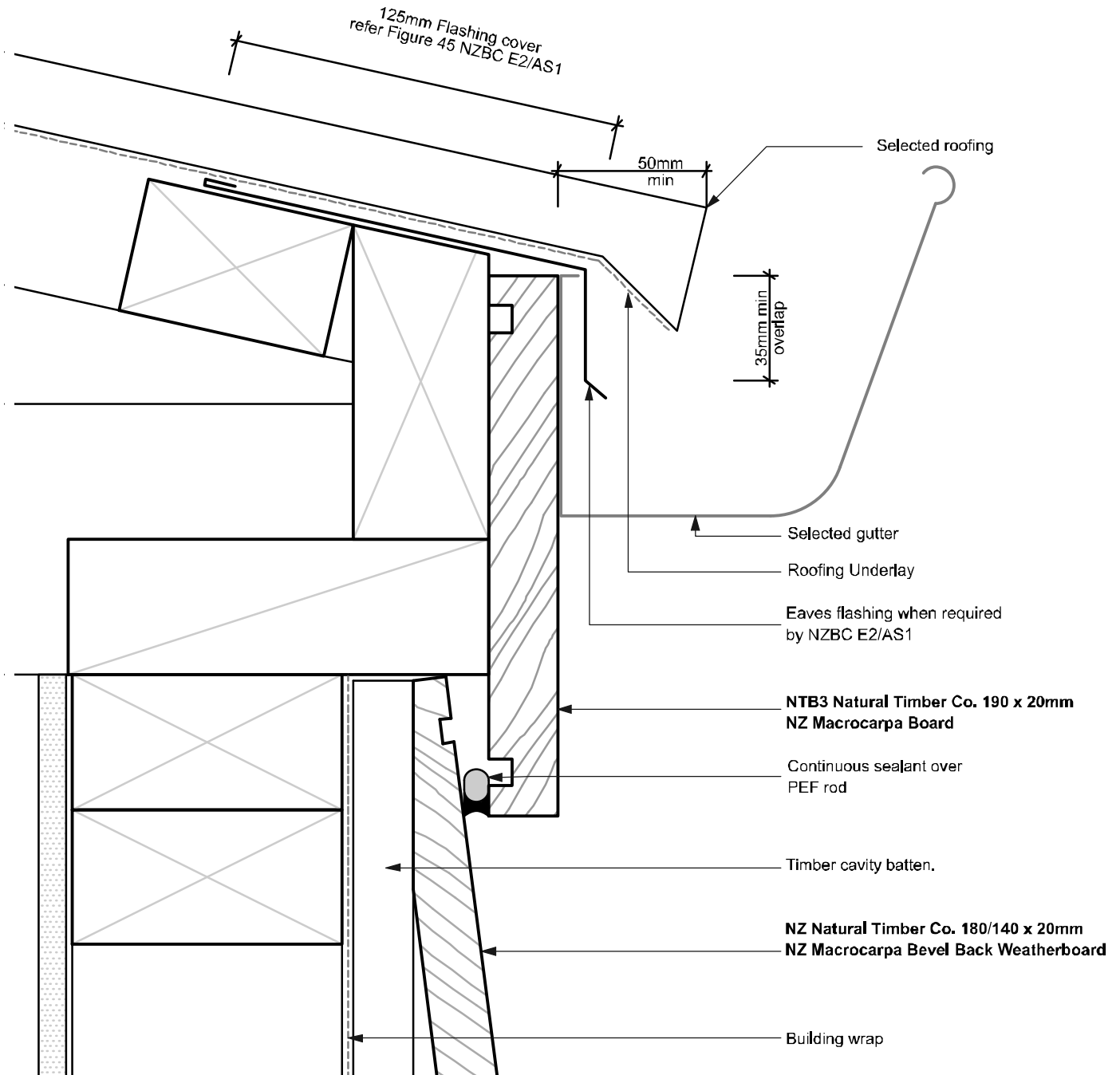


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Soffit Detail Overhang</b>	<b>12</b>	

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	

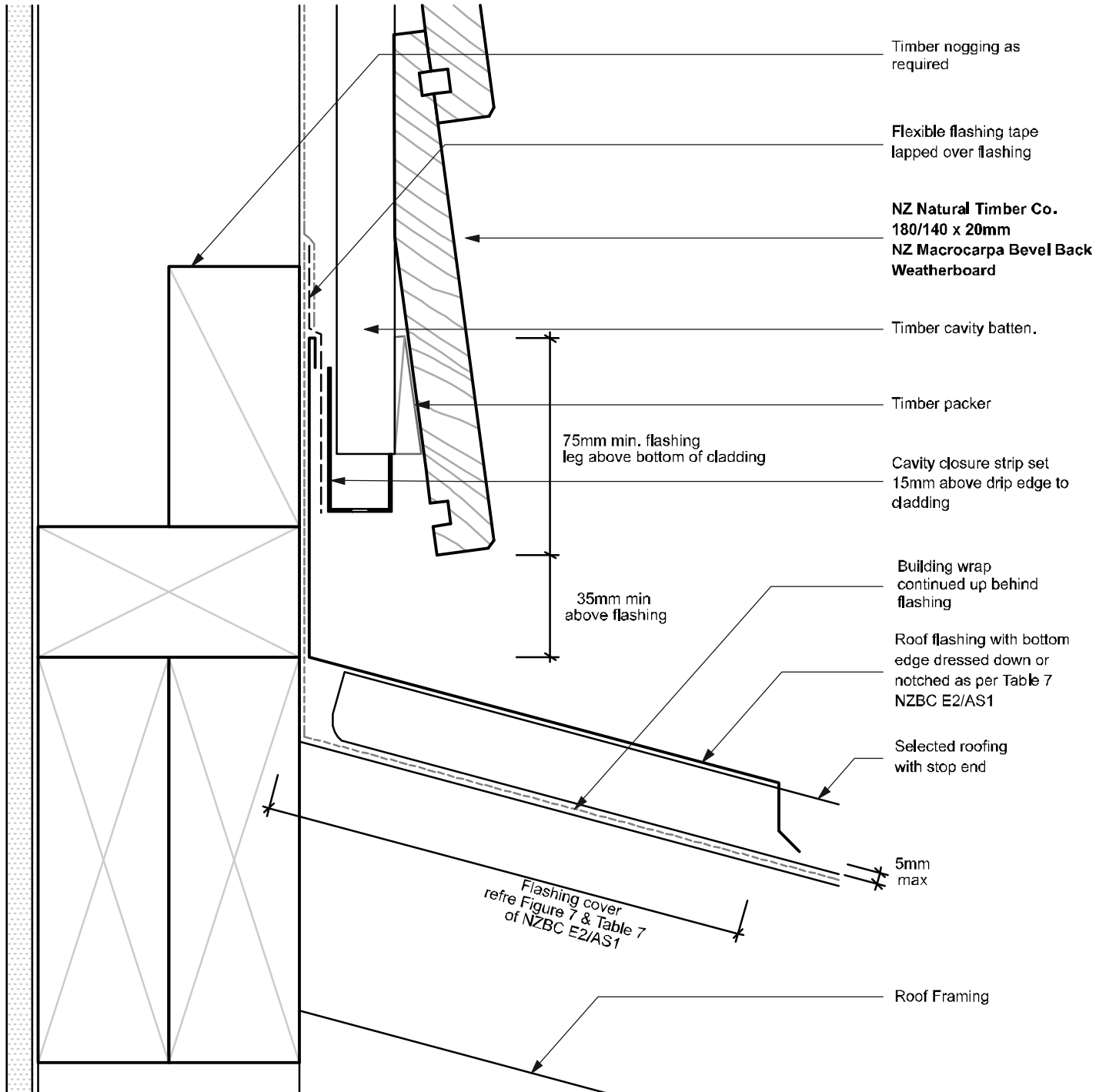


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Eaves Detail</b>		<b>13</b>

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	

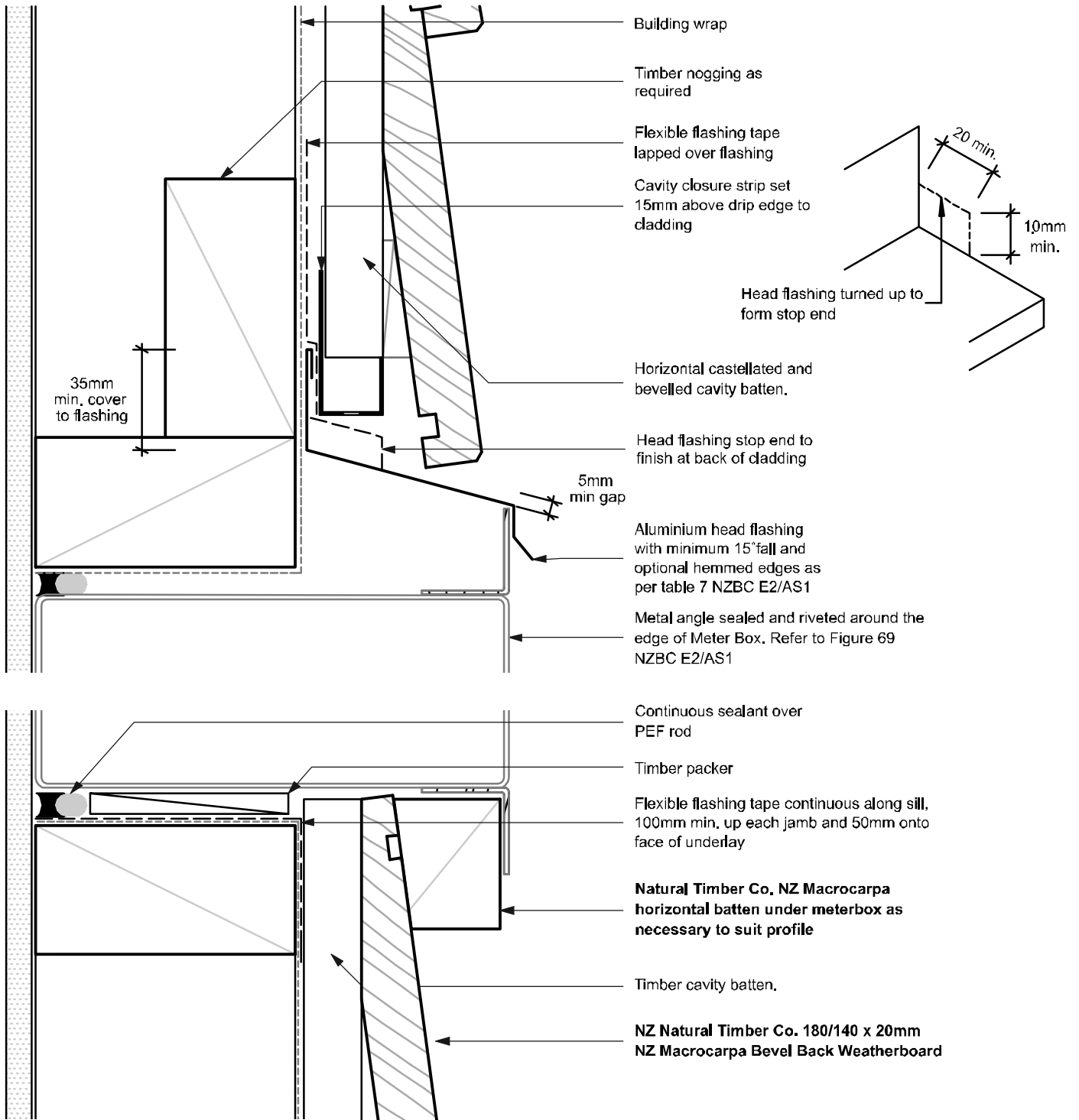


**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Roof/Wall Junction Detail</b>		<b>14</b>

	SUSTAINABLE BESPOKE TIMBERS - COMMERCIAL & RESIDENTIAL		
	WWW.NZNATURALTIMBER.CO.NZ SALES@NZNATURALTIMBER.CO.NZ - PHONE 0800NZTIMBER	SHOWROOM 51 COMMERCE ST WHANGAREI 0110 NEW ZEALAND	



**NOTES**

- All nail fixings pre-drilled min. 1mm diameter smaller than the nail gauge.
- All NZ Natural Timber Co. timber products to be pre-coated and cut ends and edges and all fresh cut surfaces double coated and sealed before fixing.
- All corner flashings to be 75 x 75mm to suit all wind zones. All flashings to have hemmed edges to NZBC E2/AS1.
- Avoid contact in seaspray zones or corrosion zone D between CCA treated timber and metal flashings. Refer NZBC E2/AS1 Table 21

<b>NT-MC.02 Bevelback Weatherboard System. Cavity Fix</b>		SCALE <b>1:2 @ A4</b>
DRAWING <b>Meter Box Detail</b>		<b>15</b>



# Combining style with performance



“Strandboard offers a wide range of flooring options”





## A beautiful relationship... style with performance

Strandboard is a high-density substrate, which blends practical and creative elements together for a variety of uses in residential and commercial applications. When you need to cover large areas quickly and provide a more rigid floor surface, choose Strandboard™ Tongue and Groove to give an excellent base for tiles, carpet or vinyl. Or use Strandboard Square Edge when a clear finish is required. With Strandboard, you'll experience the benefits of timber, providing warmth underfoot and a forgiving surface. Often, Strandboard is used effectively on decorative wall panels, ceilings and stairway construction.

## Exceptional performance

Strandboard's high density means it is known as second to none for impact resistance. However, its low weight to density ratio makes it a lighter and stronger sheet flooring product well accepted by the market. It's made from timber flakes rather than chips, so the product has strength and durability built into the panel during manufacture. So it's the perfect choice for commercial applications. Create a robust finish with a rich ambiance for heavy traffic areas such as bars, retail showrooms and gyms.

## The key to your success

Strandboard is the key to success in saving time, money and your reputation. Available in a range of sheet sizes and thicknesses, there is a Strandboard size to suit, making your projects cost effective and quick to install. The sheets can be nailed or screwed directly onto joists or an existing substrate. Strandboard's manufacturing process is highly innovative and carried out under rigorous quality control conditions. This enables our customers to have peace of mind in guaranteed performance delivery.

## Innovate with confidence

For an enviable, stunning result on floors, walls and ceilings or stairways, simply complete with a stain or colour wash of your choice. The colour will dramatically enhance the decorative nature of Strandboard, providing an affordable way to create a variety of looks, from urban cool to sophisticated chic.

## What others have to say

"Strandboard's striking textured appearance looks stunning when it is colour washed and used for ceilings. We specified colour washed Strandboard for the Textilia and Athena showrooms, with another prime consideration being the efficiency of the span size we could obtain from the sheets."

Kerry Avery, Avery Team Architecture Ltd, Auckland

"We're in the business of building robust and impact resilient floors to take on the rigorous activities of all indoor sports. The finished result with Strandboard always looks great and our clients are impressed with the structural performance, as well as the durability of the surface."

Peter Fonda, Grand Aarow Sports Floors, Brisbane



“Use Strandboard with confidence for the ultimate result everytime”

## Technical information

### Applications:

- Strandboard™ Square Edge and Strandboard Tongue and Groove are suitable for installation in residential, commercial and industrial buildings as a single or double sheet flooring material.
- Strandboard Square Edge and Strandboard Tongue and Groove can be used as post laid flooring over timber or steel joists, as an overlay to concrete or wooden floors, for staircase construction or general industrial shelving or packaging.
- Strandboard Square Edge can be used as ceiling, wall panelling or as a decorative overlay.
- Strandboard meets the requirements of NZS 3604 : 2011 for sheet flooring when installed in accordance with the installation instructions.
- When Strandboard is specified for sports floors, contact JNL for specific details.

## Strandboard product specifications

### Sheet sizes:

Product Type	Sheet Size (mm)	Pack Weight (kg)
Strandboard Square Edge	3600 x 2400 x 20	1184kg
	3600 x 1200 x 20	1184kg
	2400 x 1200 x 20	1776kg
Strandboard Tongue & Groove (White Tongue)	3600 x 1200 x 20	1184kg
	2400 x 1200 x 20	1776kg
Superstrand (H3.1) Square Edge	3600 x 2400 x 20	1184kg
	2400 x 1200 x 20	1776kg
Superstrand (H3.1) Tongue & Groove (Green Tongue)	3600 x 1200 x 20	1184kg
	2400 x 1200 x 20	1776kg
Strandboard Square Edge Overlay	3600 x 1200 x 9	1331kg
	2400 x 1200 x 9	0888kg
	3600 x 1200 x 12	1776kg
	2400 x 1200 x 12	1184kg

### Panel Tolerance:

Length:	±0.5mm
Width:	±0.5mm
Thickness:	±0.25mm
Squareness:	The difference between the measured diagonals is no greater than 1.5mm



### Design considerations:

- Strandboard™ Square Edge and Strandboard Tongue and Groove must not be used as a substrate for decking or flooring membranes or in a spa-pool and sauna rooms. In addition, Strandboard Tongue and Groove must not be used as an uncovered floor solution.

### Exposure to weather:

- The recommended maximum period of exposure to weather is 8 weeks for Strandboard; 12 weeks for Superstrand.
- This includes anytime the product is unprotected eg: during transport, site storage or construction period.

# Technical Information



**BRANZ Appraised**  
Appraisal No.664 [2016]

## BRANZ-appraised

Strandboard is BRANZ-appraised (refer No.664).  
For full details and a downloadable pdf, go to  
[www.jnl.co.nz](http://www.jnl.co.nz).



## Environmentally sound

Strandboard is certified to both ISO 9001 Quality and ISO 14001 Environmental Standards.

Juken New Zealand has attained Forest Stewardship Council® (FSC®) Chain of Custody (COC), verifying that the Pinus Radiata used in Strandboard is from a responsibly managed forest resource. Ask for our FSC® – certified products.

## Storage & handling

- Avoid damage to Strandboard face and edges.
- Always stack Strandboard horizontally, supported by gluts at 1200 mm maximum centres, laid on a flat, level and dry surface.
- For short term storage on site, protect STRANDBOARD from direct weather exposure with tarpaulins or similar.
- To prevent moisture build up under covers, ensure there is proper air circulation around the pack to maintain its dry state.
- Minimise exposure to weather and rain.
- Dry out after exposure to wetting.

## Installation

For specifically designed applications, installation should be in accordance with NZS 3603. For non-specifically designed applications, Strandboard should be installed in accordance with NZS 3604.

- If using a clear finish later, keep the panel clean to avoid stains (e.g. soil, plaster glue, paint, nails, timbers).
- For Strandboard FAQ's, please refer to the Juken NZ website.

## After installation

- To ensure moisture can evaporate freely do not apply sealers, tape or other impervious materials to unfinished panels while exposed.
- Occasionally individual Strandboard flakes may lift. Sanding at time of finishing will restore the board's surface.

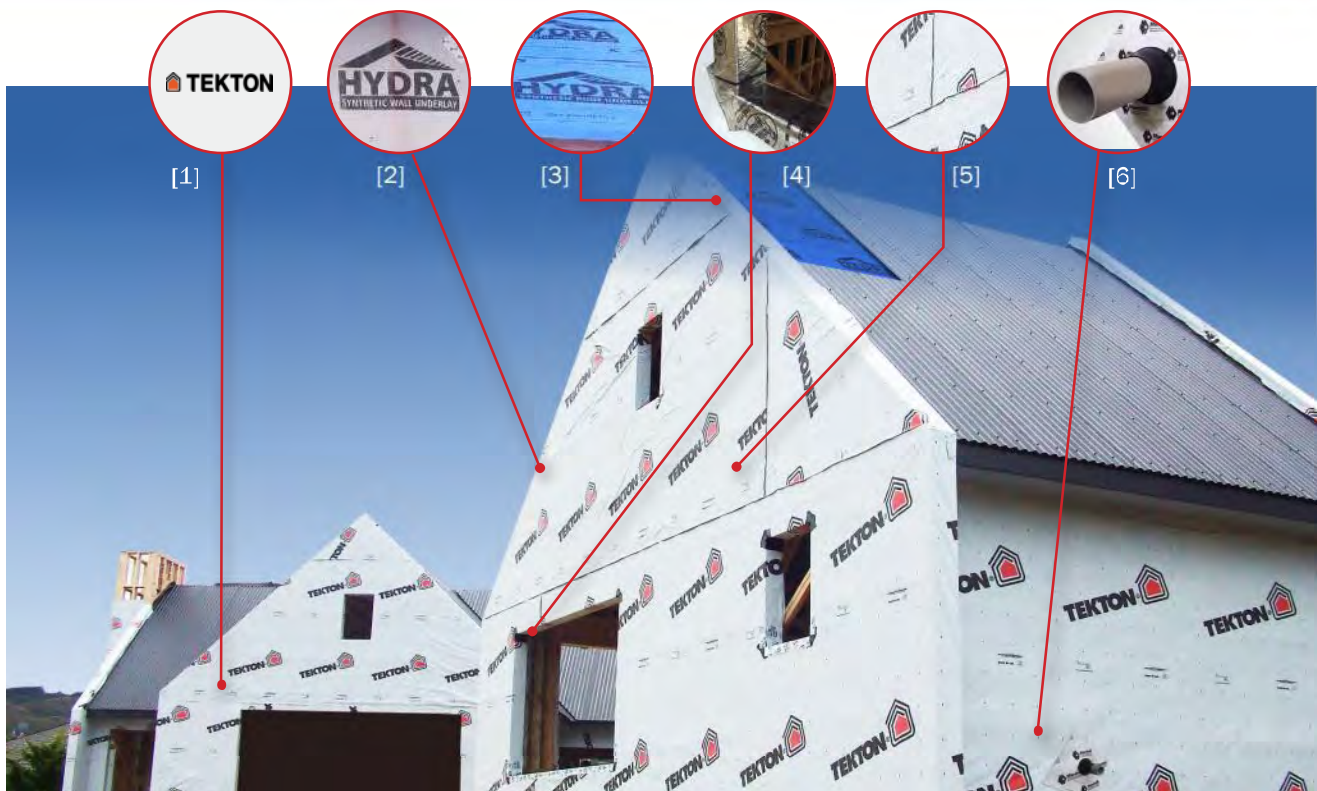


**For General Enquiries**  
+64 9 373 3933  
**Postal**  
PO Box 1450 Auckland 1140  
New Zealand  
**email** [info@jnl.co.nz](mailto:info@jnl.co.nz)  
**www** [www.jnl.co.nz](http://www.jnl.co.nz)

Other JNL products include STRANDBOARD and SUPERSTRAND



## MARSHALL WEATHERIZATION SYSTEM



**ONE SYSTEM, ONE SPECIFICATION, ONE SUPPLIER**

The Marshall Weatherization System provides a complete weatherproof construction envelope, delivered by a single supplier. Marshall Innovations can now offer the specifier a single point of contact, and a complete technical specification to simplify the design process, backed by a 50-year durability warranty.

**The full system consists of:**

- [1] TEKTON WALL UNDERLAY
- [2] HYDRA WALL UNDERLAY
- [3] HYDRA ROOF UNDERLAY
- [4] SUPER-STICK OR PROSILL TAPE
- [5] TEKTON SEAM TAPE
- [6] TRADE-SEAL

## BENEFITS

- Full system that combines a range of respected products to form a secure construction envelope
- Ability to switch between HYDRA Wall Underlay and Tekton Wall Underlay
- Highly compatible product integration
- Can be exposed to UV and weather for up to 60 days
- A system that combines superior strength, water hold-out and flexibility with ease of installation
- Meets the requirements of the New Zealand Building Code (NZBC) Clause B2 Durability and Clause E2 External Moisture



# PRODUCT TECHNICAL STATEMENT



## Tekton Weatherization System

BRANZ Appraised 621 ( 2014)

Issuing Authority	Marshall Innovations Ltd.
PTS Version & Date	PTS Version 01/2015
Name of manufacturer and building product / system	Manufacturer's: PGI: Tekton Building Wrap ProtectoWrap: SUPER-STICK Building Tape / One Piece Sill Tape Eisedicht: TradeSeals
Product Description	The Tekton® Weatherization System consists of Tekton® Building Wrap, SUPER-STICK Building Tape or One Piece Sill Tape, Tekton Seam Tape & TradeSeals. The system is used behind wall cladding systems and around framed joinery openings as a secondary weather resistant barrier.
Scope	The Tekton® Weatherization System has been appraised for use on buildings within the following scope: <ul style="list-style-type: none"> <li>constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1 or,</li> <li>constructed with steel framing subject to specific engineering design, with the building height and floor plan area in accordance with scope limitations of NZBC Acceptable Solution E2/AS1; and,</li> <li>with absorbent wall claddings directly fixed to frame complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay and a flexible flashing system; or,</li> <li>with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay or a rigid wall underlay with flexible underlay over and flexible flashing system; or,</li> <li>with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,</li> <li>situated in NZS 3604 Wind Zones up to and including Very High where the flexible wall underlay is directly fixed to the frame, and up to and including Extra High where the underlay is used over rigid wall underlays.</li> </ul>
Conditions & Limitations	The system must be installed in accordance with the specifications and latest technical information and must comply with all relevant clauses of the NZBC regulations and standards Tekton cannot be used with direct fix non-absorbent claddings. Tekton can only be exposed to UV for 60 days.
Warranties	All products used in the Tekton Weatherization System are warranted to be free of defect in manufacture for a period of fifteen years. This warranty is limited to replacement of the products only. Marshall Innovations (the distributor) is not liable for incorrect installation or any accidental or wilful damage.
Design & Installation Instructions	Please refer to Tekton Weatherization Technical Specification for full details of installation.



# PRODUCT TECHNICAL STATEMENT

Design & Installation Instructions cont..	<a href="http://www.mwnz.com/pdf_downloads/2_Tekton%20Weatherization%20System%20Spec_Oct2014.pdf">http://www.mwnz.com/pdf_downloads/2_Tekton%20Weatherization%20System%20Spec_Oct2014.pdf</a> Tekton Weatherization System must be installed by or under the guidance of an Licensed Building Practitioners
Compliance with the New Zealand Building Code	Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. The Tekton® Weatherization System meets this requirement. Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Tekton® Weatherization System contributes to exterior walls meeting this requirement. Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Tekton® Weatherization System meets this requirement and will not present a health hazard to people. This is an Appraisal of an Alternative Solution in terms of New Zealand Building Code compliance.
Quality assurance	ProtectoWrap Meets IAPMO Standards PGI ISO9001 Eisedicht
Product support	Marshall Innovations - 0800 776 9727 <a href="http://www.mwnz.com">www.mwnz.com</a>





# MC700

## MC700 EXPLAINED

The MC700 Roofing and External Wall Cladding system comprises:

- › A long run steel sheet with a 5 rib assymetrical trapezoidal
- › Associated design and installation information

Metalcraft fabricates the MC700 sheets from steel manufactured by New Zealand Steel. This steel is supplied with different protective coatings which are designed to withstand conditions in specific New Zealand Corrosion Zones. Refer to NZ Steel's Environmental Categories Brochure at [www.nzsteel.co.nz/technical-resources](http://www.nzsteel.co.nz/technical-resources) for details.

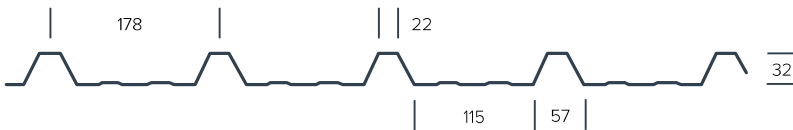
MC700 is available in the following NZ Steel branded products:

- › Colorsteel® Endura®
- › Galvsteel®
- › Colorsteel® Maxx®
- › Zinalume®

In the following sizes:

- › Thicknesses: 0.4mm and 0.55mm
- › Width: Cover = 710mm Sheet = 785mm

And with the following profile dimensions:



## PURPOSE

Metalcraft Roofing supply the MC700 system as a horizontal and vertical external wall cladding, and for roofs with a defined minimum pitch of 3 degrees.

## SCOPE OF USE

Metalcraft Roofing supply the MC700 Roofing and External Wall Cladding system for use on commercial and residential buildings within the following scope:

### LOCATION:

- › In wind zones:
  - › Up to and including Extra High as defined by NZS-3604:2011.
  - › Subject to specific engineering, if the engineer has satisfied themselves that the product, pitch and fixings will meet the conditions.
- › In all climate zones as defined by NZS-3604:2011, subject to the limitations set out below (see limitations overleaf).
- › On buildings located within 1m of the relevant boundary, in respect of fire spread only.

### BUILDING:

- › On new buildings that have been designed and constructed to comply with the NZ Building Code (NZBC) using timber or steel framing.
- › On existing buildings using timber and steel framing where the designer and installer have satisfied themselves that the building is suitable for the intended building work.
- › In conjunction with a vapour permeable building wrap that has a permeability of 36g/m<sup>2</sup>/day of a vapour resistance of no more than 500MNs/g.
- › In conjunction with a potable water collection system.



VERSION: V2.1

NOTE: Uncontrolled in printed format.

DATE: 28/03/2019

Name: Frances Charles  
Position: National Sales & Marketing Mgr

Signed on behalf of: Metalcraft Roofing.

Metalcraft  
Roofing

Digitally signed by  
Metalcraft Roofing  
Date: 2019.03.28  
10:13:41 +13'00'

By signing this pass™ the signatory confirms that, in respect of the subject of this pass™, the company has met their s14G obligations under the Building Act 2004.

### FURTHER INFORMATION

For further product assistance please contact:

[www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)

To find your nearest Metalcraft Roofing branch visit [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)



## LIMITATIONS OF USE

### LOCATION:

- MC700 may be used as a roof cladding system in exposure zones B, C & D as defined in Sec 4, NZS3604:2011. For use in "Microclimatic considerations," (as defined in Sec 4.2.4) refer to Metalcraft Roofing.
- MC700 may be used as a wall cladding system in exposure zones B & C. Where MC700 is to be used in exposure Zone D, then only Colorsteel® Endura® or Colorsteel® Maxx® may be used.

### BUILDING:

- Where MC700 is used in an insulated building in conjunction with steel framing, a thermal break is required.
- Contact with other materials must be in accordance with Table 21 (E2/AS1), or compatible with the The New Zealand Metal Roofing Manufacturers Association Inc (NZMRM) Code Of Practice.
- Building height and design wind speed is limited by the MC700 design load span tables (refer to: [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)).
- Where it is used as a roof cladding, MC700 sheet lengths of ≤ 40m must be installed on a roof with a minimum pitch of 3°. MC700 sheet lengths of > 40m but ≤ 60m must be installed on a roof with a minimum pitch of 4°.
- When used horizontally or vertically as a wall cladding, MC700 must always be installed in conjunction with a drained cavity.

## PERFORMANCE CLAIMS

If designed, installed and maintained in accordance with all Metalcraft Roofing requirements, the MC700 Roofing and External Cladding system will comply with or contribute to compliance with the following provisions of the New Zealand Building Code:

## USEFUL INFORMATION

- Refer to [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz) for information relating to:
- Technical information, drawings and specification.
  - Specification of the correct fasteners.
  - Care and maintenance.
  - The Metalcraft Roofing warranty.

## NZ STEEL ASSURANCE

As the manufacturer of the steel from which MC700 is fabricated, NZ Steel provides assurance that the steel:

- Has been manufactured in accordance with AS 1397-2001.
- Is coated in accordance with AS/NZS 2728:2013, or galvanized in accordance with AS/NZS 2312.2:2014.

## SOURCES OF INFORMATION:

- MBIE Acceptable Solutions
- AS/NZS-1397:2001 "Steel sheet and strip—Hot-dip zincoated or aluminium/zinc-coated"
- NZ Metal Roof and Wall Cladding Code of Practice (NZMRM) (V2.2)
- AS/NZS-1170:2004 "Structural design actions"
- AS/ NZS-2728:2013 "Prefinished/pre-painted sheet metal products for interior and exterior building applications"

## CONTACT INFORMATION

To find your nearest Metalcraft Roofing branch visit [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)

NZBC Clause	Basis of compliance	
	Means of compliance	Relevance
<b>B1 Structure</b> B1.3.1, B1.3.2, B1.3.3 (a, b, c, d, g, i)	<b>ACCEPTABLE SOLUTION</b> <b>B1/AS1</b>	<ul style="list-style-type: none"> <li>AS/NZS 1397:2011</li> <li>AS/NZS 1170:2002 (span tables)</li> </ul>
<b>B2 Durability</b> B2.3.1 (b)	<b>ACCEPTABLE SOLUTION</b> <b>B2/AS1</b>	<ul style="list-style-type: none"> <li>Coated in accordance with AS/NZS 2728:2013. (NZ Steel claim) cited in E2/AS1</li> </ul>
<b>C3 Fire Affecting Areas Beyond the Fire Source</b> C3.4(a), C3.5, C3.7 (a)	<b>ACCEPTABLE SOLUTION</b> <b>C/AS2-C/AS7</b> <ul style="list-style-type: none"> <li>Metals are non-combustible</li> </ul>	<ul style="list-style-type: none"> <li>ISO5660 BRANZ (FH 6102-TT, dated 3/1/2017) (Material Group 1-5)</li> <li>Steel non-combustible (refer para 5.8 C/AS2-C/AS7)</li> </ul>
<b>E2 External Moisture</b> E2.3.1, E2.3.2, E2.3.7 (a-c)	<b>ACCEPTABLE SOLUTION</b> <b>E2/AS1</b>	<ul style="list-style-type: none"> <li>NZMRM Code of Practice (v2.2)</li> </ul>
<b>F2 Hazardous Building Materials</b> F2.3.1	<b>ALTERNATIVE SOLUTION</b> <ul style="list-style-type: none"> <li>ColorCote safety data sheet</li> </ul>	<ul style="list-style-type: none"> <li>Coating system is inert once dry</li> </ul>

Other performance claims	Basis of compliance	
	Means of compliance	Relevance
MC700 Roofing and External Cladding system will not contaminate potable water	<ul style="list-style-type: none"> <li>AS/NZS 4020:2005</li> </ul>	<ul style="list-style-type: none"> <li>Claimed by manufacturer: NZ Steel</li> <li>BRANZ statement that metal roof suitable refer: <a href="http://www.level.org.nz/water/watersupply/mains-or-rainwater/harvesting-rainwater/">http://www.level.org.nz/water/watersupply/mains-or-rainwater/harvesting-rainwater/</a></li> </ul>

To find your nearest Metalcraft Roofing branch visit [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)

# VENT OVER FASCIA VENTILATOR G1200N

## DESCRIPTION

The G1200N Over Fascia Vent is designed to discreetly ensure a positive airflow into the roof space between the roof membrane and the fascia board.

## FEATURES

- Free airflow of 10,000mm<sup>2</sup> per linear metre.
- Releases hot air from roof voids and eliminates condensation.
- Forms part of a passive ventilation system that works year round with no moving parts or energy consumption.
- Easy to install.
- Not visible as hidden by spouting/gutter.
- Insect proof - 4mm vents prevent ingress of nesting insects.

## SCOPE OF USE

- Suitable for roof pitches >15°.
- Compatible with timber or metal fascia.
- Suitable for new builds or renovations.
- Should be used in conjunction with the VENT Roll Panel Vent (G502) to ensure continuous and unimpeded airflow past the insulation.
- To be used as part of proprietary ventilation system.

## WARRANTY

- 30 years

## MAINTENANCE

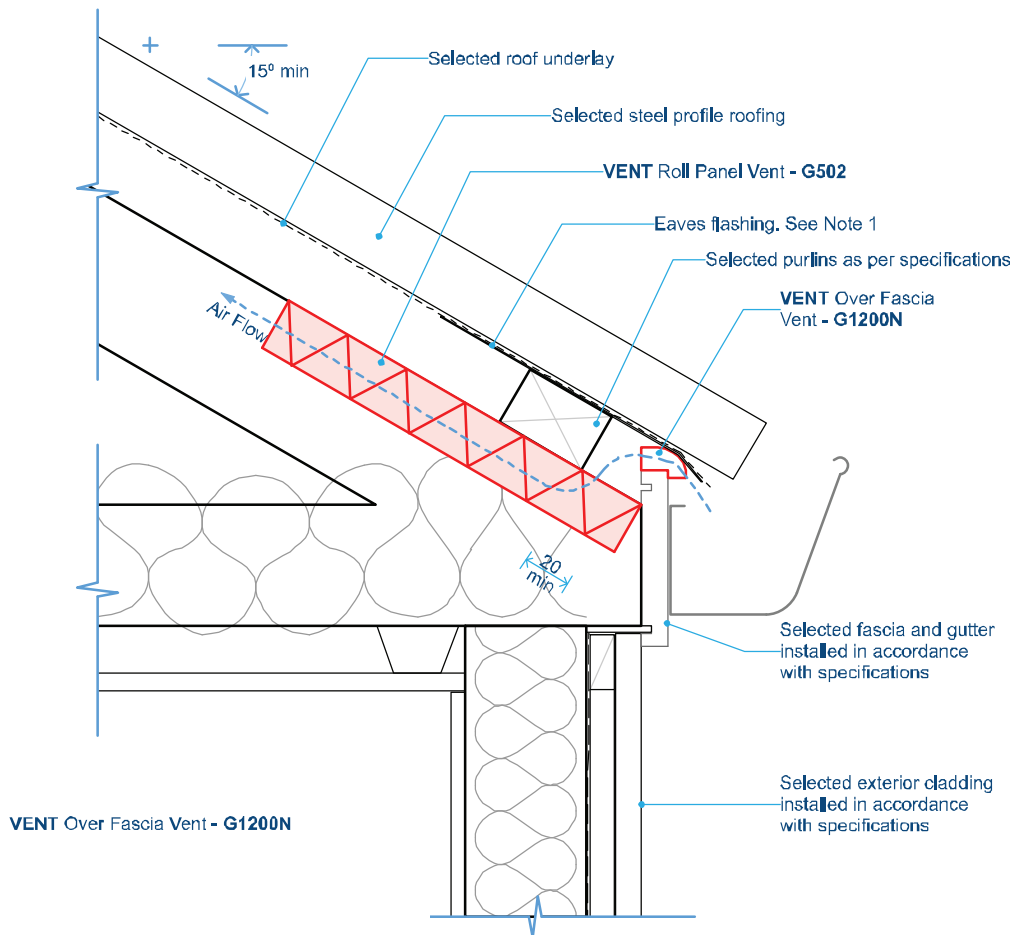
- No maintenance requirements.

## INSTALLATION

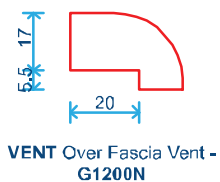
1. The G1200N Over Fascia Ventilator should be nailed or screwed to the top of the fascia board through the fixing holes provided along the full length of the eaves as shown.
2. For technical assistance contact the VENT technical team

# VENT OVER FASCIA VENTILATOR G1200N

**Fig A: Trussed Roof Application - No Eaves**

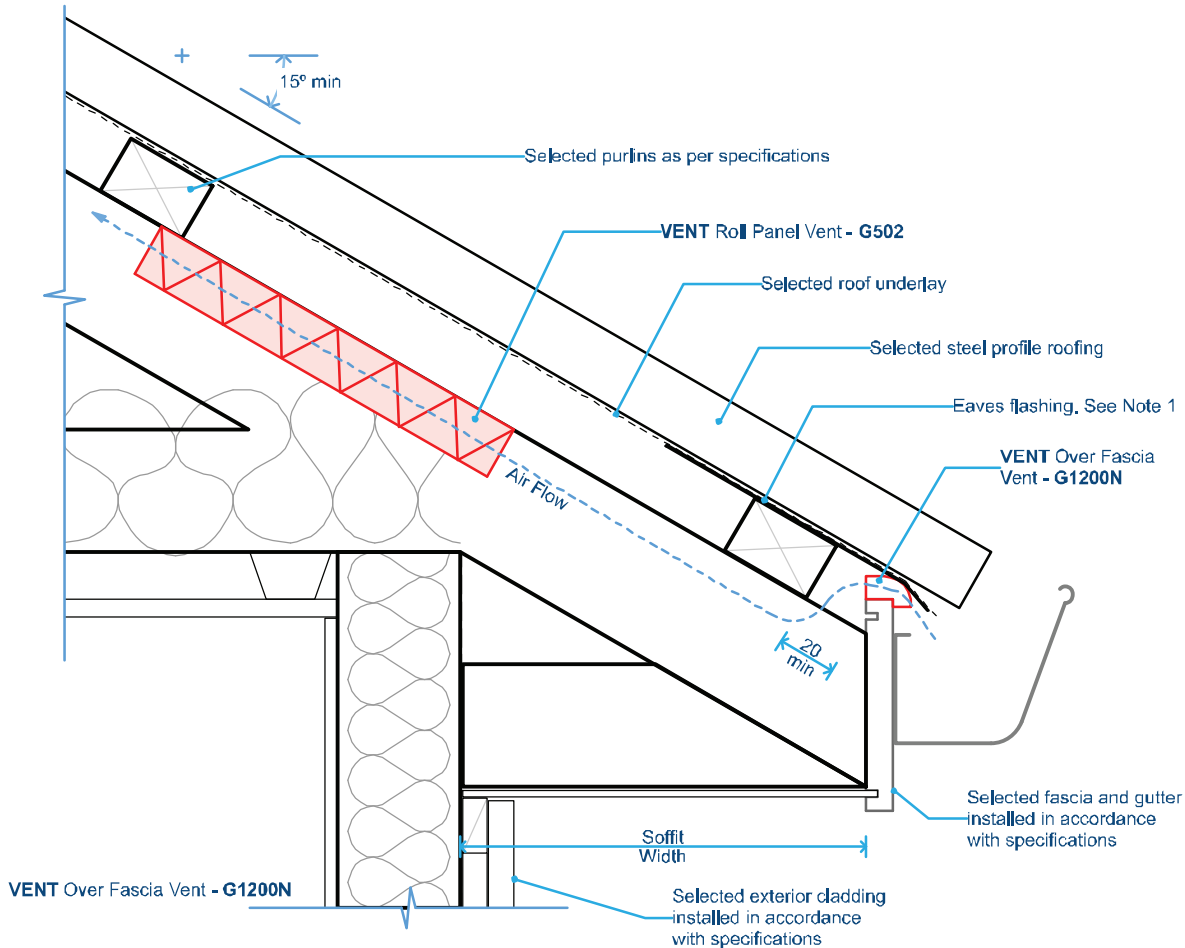


**Fig B: Product Dimensions**

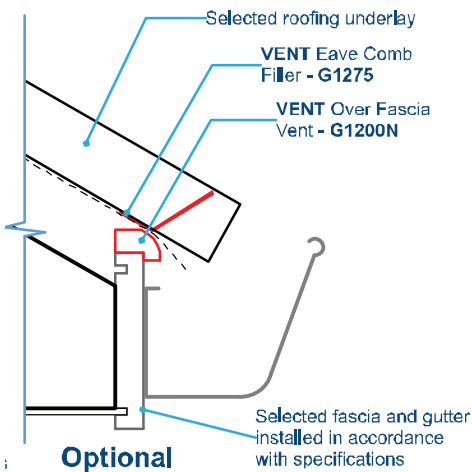


# VENT OVER FASCIA VENTILATOR G1200N

**Fig C: Trussed Roof Application - With Eaves**



**Fig D: VENT Over Fascia Vent G1200N fitted with VENT Eaves Comb Filler G1275**



*Note: Diagrams are for guidance purposes only. The overall design is the responsibility of the designer as there are often other factors to consider.*

# VENT SETTING THE FASCIA HEIGHT

## G1200N

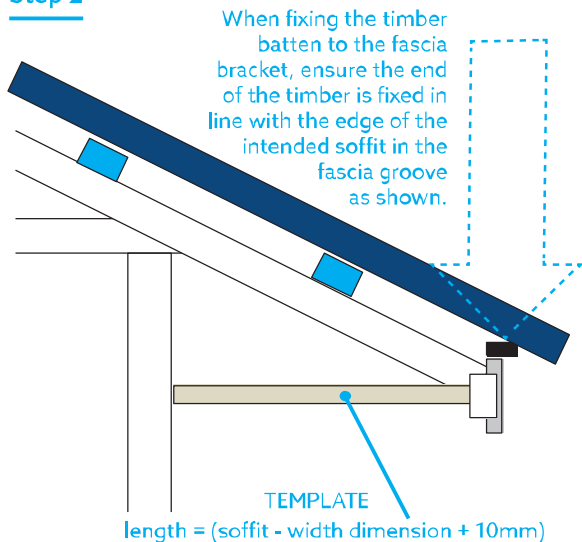
### FOR BUILDERS & ROOFERS

#### Step 1 – Construct a Template

1. Cut a short section of fascia and attach a similar length of the proposed G1200N Over Fascia Vent over the top.
2. Attach proposed fixing plate to fascia.
3. Fix a length of timber batten (the width of the proposed soffit board +10mm) to the fixing plate

**Step 2** – Temporarily fix 2 roof purlins (light blue) over the trusses and lay a straight edge (dark blue) over the top to establish the finished fascia/vent height.

#### Step 2



The template example shown is for a 600mm wide soffit board. Consequently the timber batten is cut at 610mm and fixed to the fascia fixing plate as illustrated.

The template is then butted to the external wall frame, lifted horizontally up to the underside of the straight edge and the fixing plate can then be marked onto the truss end as shown in step 2.

Your fascia height is now set.

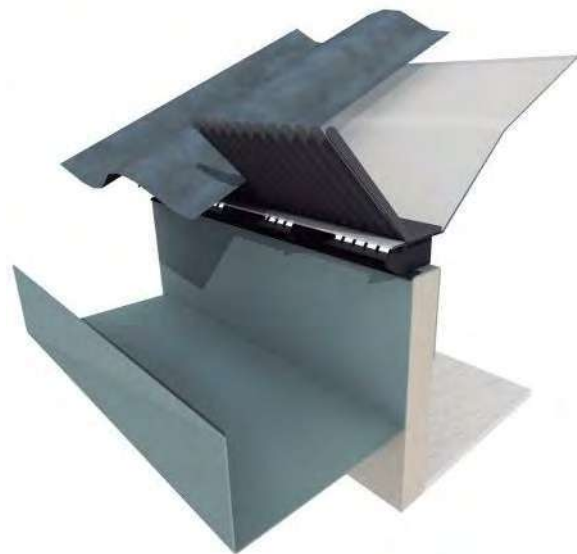
*Note: For skillion roofs with a VB20 Ventilated batten fixed over the purlin, the fascia height will be raised by 20mm.*

### FOR ARCHITECTS

- **15+° cold roof**  
Fascia height to drop by 18mm to allow for G1200N VENT Over Fascia Vent.



**Eaves comb filler G1275  
+ Over Fascia Ventilator G1200N**



*Note: Diagrams are for guidance purposes only. The overall design is the responsibility of the designer as there are often other factors to consider.*

# VENT APRON VENT AB20

## DESCRIPTION

The VENT AB20 is a Polypropylene Ventilated Apron Batten which enables warm air to escape from the lower roof void (Fig A) or as a barge vent for skillion mono pitch roof types (Fig B).

The AB20 has an adhesive and flexible aluminium flashing which is designed to form to most cladding profiles, preventing water ingress on any pitch roof.

## FEATURES

- Free airflow of 8,000mm<sup>2</sup> per linear metre.
- Releases hot air from roof voids and eliminates condensation.
- Easy to install - manufactured in 1200mm lengths for easy handling.
- Not visible when covered with flashing (NB: flashing not included).
- Insect proof - 4mm vents prevent ingress of nesting insects.

## SCOPE OF USE

- Compatible with roof cladding profiles with a trough depth of <38mm. For trough depths >38mm, an AB20DT (Deep Trough) should be used.
- Suitable for new builds or renovations.
- To be used as part of proprietary ventilation system.

## APPRAISALS

- BRANZ appraisal No. 979 [2017].

## WARRANTY

- 30 years.

## MAINTENANCE

- No maintenance requirements.

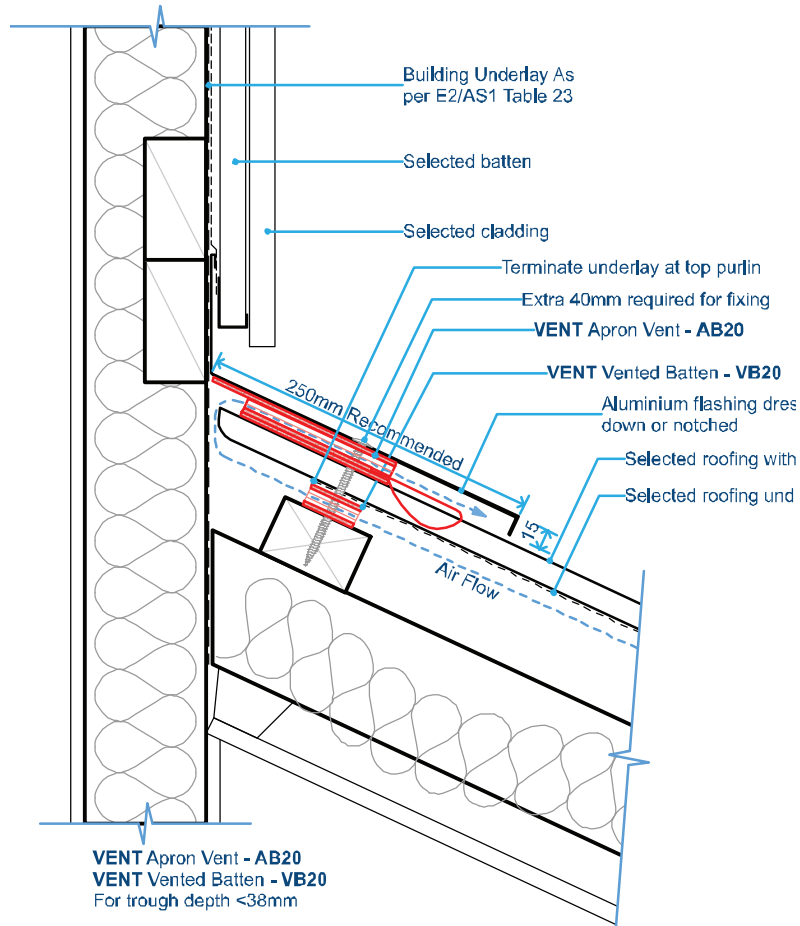
## INSTALLATION

1. The AB20 is placed over the top of the roof cladding.
2. The protective paper is removed from the underside of the flashing tape which is then moulded to the shape of the roof cladding.
3. Additional fixing screw length is required to accommodate 20mm thickness of the AB20.
4. Remove all moisture and dust from the roof cladding before dressing down the aluminium soft edge.
5. The aluminium soft edge can be notched as required to suit the roofing profile.
6. Care should be taken when dressing down the aluminium soft edge. Between 17mm and 25mm contact with the trough is required, depending on the cladding profile.
7. Minimum working temperature to dress down the soft edge flashing is +5°.
8. Soft edge flashing temperature resistance: -40° to +90°.
9. The apron or barge flashing sits over the top of the AB20 and fixed as shown in Figs A & B.
10. Flashings can exceed 200mm minimum requirement in order to conceal soft edge of apron vent.
11. Compatibility of the AB20 and the chosen ridge capping system should be checked with the roofing manufacturer supplying the ridge capping.
12. For technical assistance contact the VENT technical team.



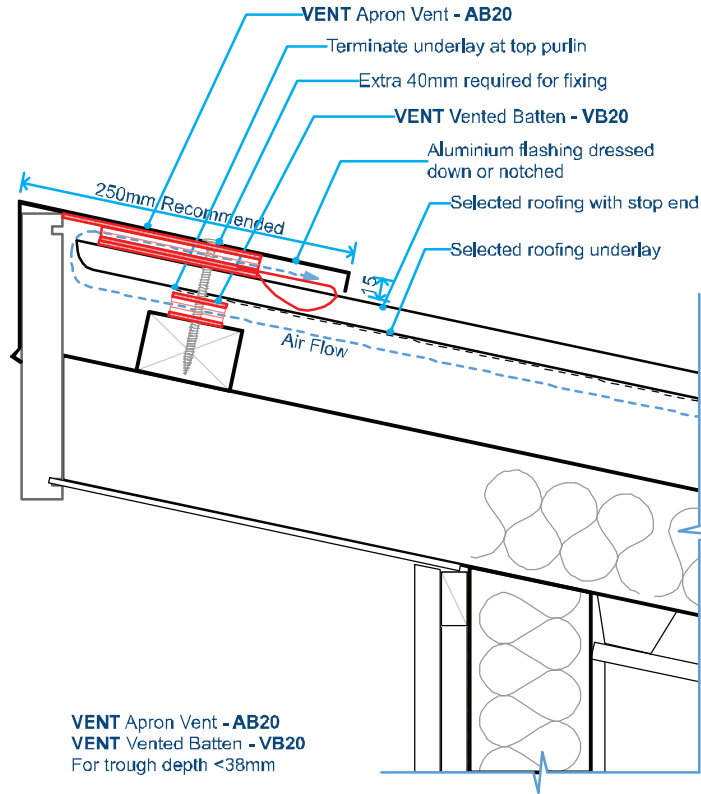
# VENT APRON VENT AB20

Fig A: Skillion Roof Abutment Application

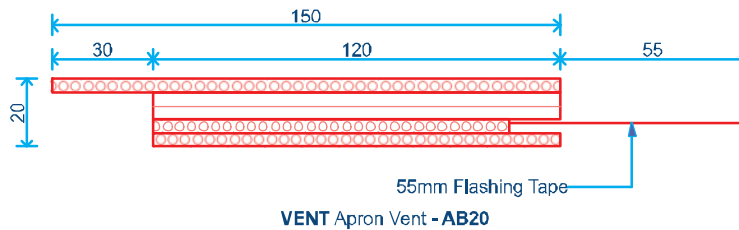


# VENT APRON VENT AB20

**Fig B: Skillion Roof Barge Application**



**Fig C: Dimensions**



Note: Diagrams are for guidance purposes only. The overall design is the responsibility of the designer as there are often other factors to consider.



## PRODUCT TECHNICAL STATEMENT

# DriStud FRU 38

## Fire Retardant, Self Support, Synthetic Roof Underlay

DriStud FRU 38 is a fire retardant, self-support, synthetic roof underlay. It is a micro porous, water resistant film that is laminated to two layers of non-woven spun-bonded polyolefin. DriStud FRU 38 is designed to be used as an underlay beneath roof claddings to assist with the weather tightness of buildings. It is available in 220gsm.

### USE

DriStud FRU 38 is intended for use on buildings designed in accordance with NZS 3604:2011 paragraph 1.1 and in wind zones up to and including 'Extra High'.

DriStud FRU 38 is designed to be used as a replacement for standard kraft paper roof underlay. It can be installed over both timber and steel framing to ensure a dry roof cavity. DriStud FRU 38 can be used under:

Masonry tiles

Metal tiles

Profiled metal roof claddings

However, DriStud FRU 38 must not span more than 1200mm between adjacent supports.

DriStud FRU 38 may be direct fixed with absorbent cladding and non-absorbent cladding. It can also be direct fixed with metallic cladding.

### CONDITIONS & LIMITATIONS

Where Codemark is to be relied upon, then all conditions of that certificate must be met. These are:

1. Must be installed in accordance with the DriStud FRU 38 Installation Guide Rev 1.
2. DriStud FRU 38 may be installed over timber and steel roof framing.
3. The certificate covers the use of DriStud FRU 38 under: Masonry tiles, Terracotta tiles, metal tiles, Profiles metal claddings, slate and composite panels.
4. DriStud FRU 38 can span up to 1200mm between adjacent supports. Where the span exceeds 1200mm a corrosion resistant mesh or alternative i.e. plastic strapping must be used.

Irrespective TCL Hunt recommends that all conditions of the certificate are met.

### INSTALLATION

DriStud FRU 38 must be installed in accordance with the DriStud FRU 38 Installation Guide Rev 1.

### MAINTENANCE

DriStud FRU 38 does not require any maintenance but when exposed through removal of roofing materials, it is recommended that the underlay be inspected and any damaged areas repaired or replaced.

### STORAGE & TRANSPORTATION

DriStud FRU 38 rolls must be stored in a clean, dry place and must be protected from damage and weather. DriStud FRU 38 must not be exposed to UV light for more than 7 days.

### QUALITY ASSURANCE

The manufacture of DriStud FRU 38 is ISO9001:2008 certified by Q.A. International Certification Limited (No. QAIC/KR/6001-A) on 20 January 2015.

TCL Hunt is also ISO9001:2008 certified by International Certifications (No. C32413) on 5 December 2013.



Distributed by TCL Hunt  
7 Fisher Crescent, Mt. Wellington  
Auckland, New Zealand

Revision A  
September 2015

For further information please visit [www.dristud.co.nz](http://www.dristud.co.nz) or call 0800 DRISTUD (374 7883).

## PRODUCT TECHNICAL STATEMENT

# DriStud FRU 38

## Fire Retardant, Self Support, Synthetic Roof Underlay

### NZBC CLAUSES

If designed, installed and maintained in accordance with all TCL Hunt requirements, DriStud FRU 38 will comply with the following performance criteria of the NZ Building Code:

B1.3.1

B1.3.2

B1.3.3 (a), (h)

B2.3.1 (a)

B2.3.2 (b)

C3.4 (c)

F2.3.1

And will contribute to compliance for:

E2.3.1

E2.3.2

E2.3.7 (a), (b), (c)

Technical Data: NZS 2295:2006 Pliable, Permeable Building Underlays

	Property	Test Method	Requirement	Results
1	Water Vapour Resistance	ASTM E96 Procedure B	$\leq 7\text{MN s/g}$	Pass
2	Absorbancy	AS/NZS 4201: Part 6	$\geq 150\text{ g/m}^2$	Pass
3	Air Permeance	BS ISO 5636-5:2003		0.043 $\mu\text{m/Pa.s}$
4	Water Resistance	AS/NZS 4201.4:1994	$\geq 100\text{mm H}_2\text{O}$	Pass
5	Flammability	AS 1530.2:1993	FR Index $\leq 5$	FR Index 1
6	Mechanical	ASTM D882	Tensile Strength	MD: 6.88 KN/m CD: 5.84 KN/m
7	Edge Tear Resistance	TAPPI T470	Edge tear strength	MD: 351 N CD: 302 N

### WARRANTY

Please refer to DriStud website [www.dristud.co.nz](http://www.dristud.co.nz) for more information on warranty and disclaimer.

### FURTHER INFORMATION

Contact 0800 DRISTUD (0800 374 7883)

[www.dristud.co.nz](http://www.dristud.co.nz)

*Test results may be available upon request, providing the information is not commercially sensitive.*



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For further information please visit [www.dristud.co.nz](http://www.dristud.co.nz) or call 0800 DRISTUD (374 7883).



A division of  TCLHunt

## DriStud FRU 36 Installation Guide

### ***Fire Retardant, Self-Support, Synthetic Roof Underlay***

#### **GENERAL**

DriStud FRU 36 is a Fire Retardant, Self-Supporting Synthetic Roof Underlay intended to be used as an alternative to conventional kraft based roof underlays. DriStud FRU 36 can be used where both heavy weight and/or self-support roof underlay is specified. Once installed it creates a secondary protective weather resistant layer for roof framing (truss or rafter) and provides an air-impermeable layer behind the roof cladding; these layers are essential elements required in the moisture management system for Roofs.

DriStud Roof Underlays can be installed to all roof framing (Timber or Steel) on new buildings that comply with the NZ Building Code. When installing DriStud Roof Underlays to an existing building; the structure must be assessed and confirmed by the designer and installer that the product is adequate for the required job.

**WIND ZONES:** Suitable in Wind Zones up to and including “Extra High” as defined in Section: 5, NZS 3604: 2011.

#### **OVERLAPS / SUPPORT**

Printed imagery on all DriStud Roof Underlays must be facing outward with the minimum amount of overlaps as possible. When overlapping is unavoidable with both vertical and horizontal applications; a minimum lap of 150mm is required. Upper sheets must be lapped over the lower sheets to ensure water is shed to the outer face of the underlay. DriStud FRU 36 must not span more than 1.2m between adjacent supports.

#### **INSTALLATION**

DriStud FRU 36 will provide temporary weather protection for up to 7 Days and can be exposed to wet weather during installation. DriStud FRU 36 must be supported on netting or safety mesh if used:

- On Roof Pitches less than 10° with vertical installation
- If the support spacing is greater than 1200mm.

*It is recommended that DriStud FRU 36 is supported when it is used under dark coloured Profiled Metal Cladding.*

#### **ROOF PITCHES**

**>10°:** If installing on a roof with a pitch greater than 10° then DriStud roof underlays may be installed either horizontally or vertically.

**≤10°:** If the roofs pitch is less than 10° self-support roof underlays can be installed horizontally and vertically.

For vertical installation under 10° pitch roof, DriStud FRU36 must be installed over a supporting netting or equivalent system on a minimum side lap of 150 mm. The netting and underlays must be installed flat and taut to ensure condensation will drain to the gutter. If any doubts vertical laps are recommended to be sealed with 75mm wide DriStud Cool window flashing tape or DriStud Joining tape to ensure it.

*As an alternative solutions, DriStud FRU36 may run horizontally with the higher layers sitting on top of the lower layers down to roof pitches of minimum 3° without supporting netting. The underlay has to be installed flat and taut to ensure condensation will drain to the gutter.*

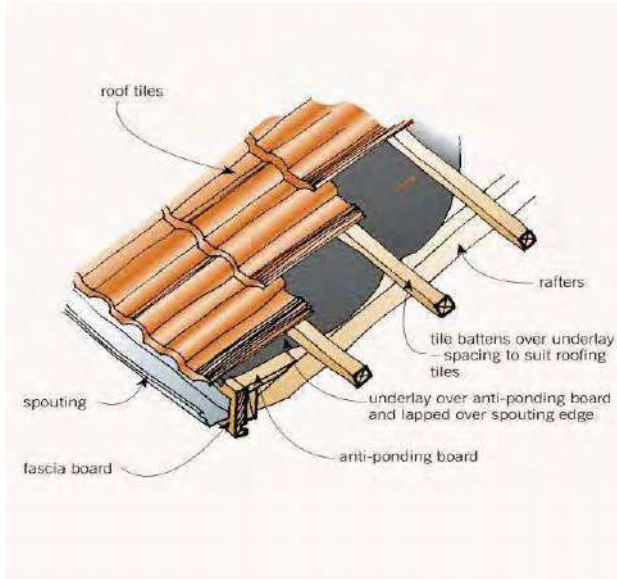
At the eaves, the roof underlay should be laid over the top of the fascia and project 20-30 mm into the gutter.

## FIXINGS

DriStud FRU36 must be fixed at maximum 300mm centres to all framing members with either 6-8mm staples or 20mm long large head clouts, or proprietary underlay fixings. If metal roof cladding is directly fixed straight onto the underlay, its fixings can replace the underlay fixing requirements.

## LONG RUN PROFILED METAL ROOF CLADDING

DriStud FRU 36 must be installed over the purlins by fixing to the purlins on both edges by the roof fastenings. For horizontal laying, underlay must fit tightly and be lap-taped around all penetrations to provide drainage for condensation, and be free of tears, rips and punctures. The purlin spacing must be 150mm less than the width of the underlay. If it exceeds this spacing it must be laid vertically.



## CONCRETE AND METAL TILE ROOF CLADDING

DriStud FRU 36 must be installed under the battens but over the rafters/top truss chords. Anti-ponding boards should be installed at the eaves to prevent the underlay sagging with a minimum fall of 5°.

## DESIGN RECOMMENDATIONS

- Have a minimum air gap of 25mm between the underlay and any insulation.
- Use sufficient ventilation to minimize condensation.
- Use air gap between the metal cladding and synthetic underlays where possible.

## Who can install DriStud Roofing Underlays?

Where DriStud roof underlays are used for new construction or in connection with a building consent the work should be undertaken or supervised by a Licensed Building Practitioner (LBP) where restricted building work applies. Alternatively, the installer shall have the suitable skills when installing DriStud roof underlays.

## Maintenance

DriStud roof underlays do not require any maintenance but when exposed through removal of roof cladding, the underlays must be inspected and any damaged areas repaired or replaced.

## Safety

- The installer shall take all precautions to reduce work hazards.
- The installer of DriStud roof underlays is required to comply fully with Health and Safety in Employment Act 2002.
- Appropriate clothing, safety footwear and hand and face protection must be used in all cases.
- Safety scaffold and barriers must comply with the requirements of the Health and Safety in Employment Act 2002

## Warranty

TCL Hunt Ltd warrants that all DriStud roof underlays will be free from manufacturing defects. Upon receiving of DriStud roof underlays, it is recommended that a visual check is made. Where defects are observed, these will be replaced at the discretion of TCL Hunt, provided that they are returned to point of purchase.

If installed in accordance with TCL Hunt installation requirements, TCL Hunt warrants that DriStud roof underlays will comply with all relevant provisions of the NZ Building Code. DriStud FRU 36 roof underlay will have a serviceability life equal to that of the roof cladding provided that:

- the balance of the external wall is installed in accordance with the NZ Building Code, and,
- all necessary maintenance is undertaken in respect of the external wall system.

# Dektite Premium

## The versatile solution

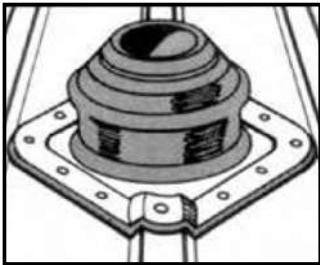
BC200896  
Received by  
Kapiti Coast District Council  
7/12/20

- ✓ Most extensive range of Dektites for flashing penetrations 0 - 510mm, available in black and grey EPDM and silicone red for high temperatures.
- ✓ Designed to enable practically any pipe flashing operation to be carried out within minutes, simple to install and very effective.
- ✓ The low profile cone not only looks good but provides a generous internal clearance, so even the steepest roofs are handled with ease.
- ✓ Suitable for flashing pipes that penetrate wall claddings.
- ✓ Can also be used to flash square penetrations. Just add 30% to the pipe diameter and trim the cone to suit.

- ✓ EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently.
- ✓ Silicone withstands temperatures from -60°C to 200°C and up to 250°C intermittently.

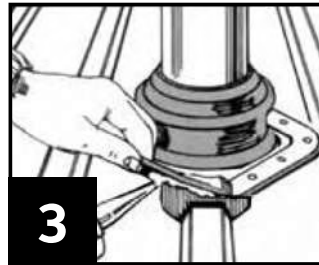


## Installation Instructions:

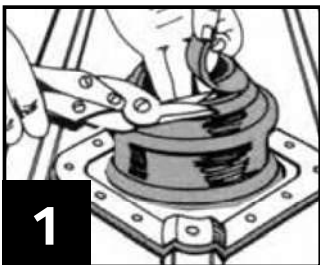


### NOTE:

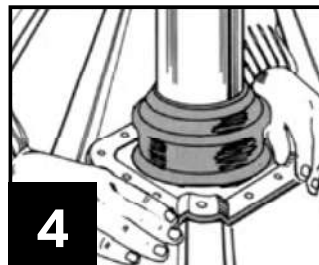
For more effective drainage, always fit the Dektite on the diamond or bias.  
Dektites are suitable for flashing pipes that penetrate wall claddings.



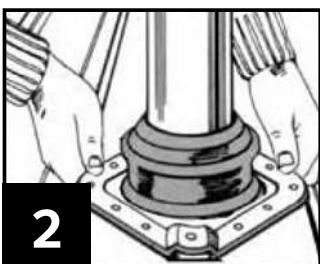
Apply a neutral cure 100% silicone sealant (roof and gutter approved) to the underside of the Dektite by turning back the flexible flange.



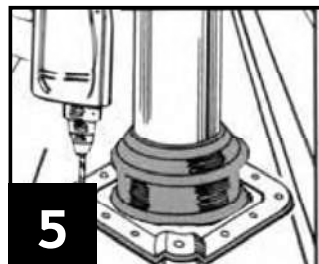
Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips. Where required, support cut sections of sheet with additional framing.



Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



Slide Dektite flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



Fasten using self drilling washered screws or sealed rivets. Fit fasteners progressively outward in opposing pairs to avoid gaps.

# Dektite Premium

The versatile solution

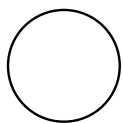
CODE: BLACK EPDM	CODE: GREY EPDM	CODE: RED SILICONE	BASE (MM)	PIPE (MM)	ROOF PITCH
DFE10MB			71 x 71	0-20	Up to 60°* See foot note
DFE100B	DFE100G		100 x 100	0-35	
DFE100BS*		DFE200RES	100 x 100	0-35	
DFE101B	DFE101G		139 x 139	5-55	Up to 45°* See foot note
DFE101BS*		DFE201RES	139 x 139	5-55	
DFE102BA	DFE102GA	DFE202REA	181 x 181	50-70	
DFE103B	DFE103G	DFE203RE	218 x 218	5-127	
DFE104B	DFE104G	DFE204RE	279 x 279	75-175	
DFE105B	DFE105G	DFE205RE	309 x 309	100-200	
DFE106B	DFE106G	DFE206RE	363 x 363	125-230	
DFE107B	DFE107G	DFE207RE	456 x 456	150-300	
DFE108B	DFE108G	DFE208RE	495 x 495	170-355	
DFE109B	DFE109G	DFE209RE	680 x 680	230-508	

\* DFE100BS and DFE101BS both have multiple cable nipples



## Can a Dektite flash a square pipe? **YES!**

100mm Round



Circumference = 314mm

100mm Square



Perimeter = 400mm

**Difference = Approx. 30%**

Therefore, to suit square pipes/stanchions add 30% to the diameter of the pipe and cut accordingly.

**100mm x 30% = 130mm  
to suit a square**

NOTE: Refer to page 7 for guide to Dektite square penetrations from 20mm - 125mm.

# VELUX Sun Tunnels



(TWR pictured)



## Time-Saving design

The VELUX Sun Tunnel has been designed with our Flexi Loc™ system that makes installation faster and easier than ever before.

The VELUX flexible (TWF), rigid (TWR) and flat-roof (TCR) Sun Tunnels provide installation flexibility. Rigid tunnels deliver a straight shaft of light directly to the room below. Flexible tunnels can be used when obstructions in the roof cavity prevent the use of rigid Sun Tunnels.

## Versatile, tubular-shaft

VELUX Sun Tunnels are ideal for flooding natural light into small areas; such as corridors, hallways, walk-in wardrobes or spaces where it's not possible to install traditional skylights. The unit comes with an outer skylight that sits flat on the roof. Internally, a discrete white ceiling-mounted diffuser with 'EdgeGlow'‡ technology spreads light evenly over an area of up to 9m².

The VELUX low-pitched rigid Sun Tunnel (TCR) can be installed on flat roofs with a pitch of 0°–60°. Custom flashing made by roofer is required. (Not supplied by VELUX).



BRANZ Appraised  
Approved No.070\_2017

WORLD-CLASS QUALITY



LOAD TESTED  
(NZ3C Clause B1)



DURABILITY  
(NZ3C Clause B2)



WEATHERTIGHTNESS  
(NZ3C Clause E2)



SAFETY GLAZING  
(NZ3C Clause F2)

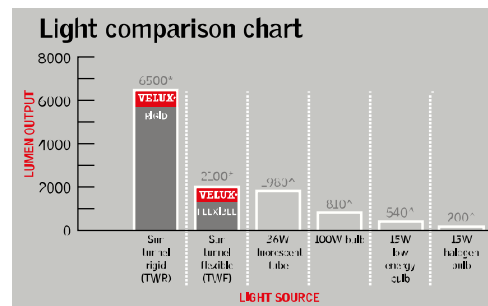


ENERGY EFFICIENCY  
(NZ3C Clause H1)



NATURAL LIGHT  
(NZ3C Clause G7)

NB: BRANZ appraised scope does not cover custom flashing.



Light transmittance of VELUX Sun Tunnels depends on parameters such as sky conditions (cloudy/sunny), direction of sunlight, orientation and length of Sun Tunnel. VELUX Sun Tunnels in this chart have been tested with a 1 metre shaft, on a 15° roof pitch in summer, at noon on a sunny day using a photometer. (TWR rigid tunnel emits 140 lumens when measured on a cloudy winter's day).

^ The graph features 60% of total lumen value for these light sources – relying for light at absorber when mounted in a lamp or fixture. (Lumen values represent an average for Australian manufactured products).

\*Data source: VELUX Daylight Laboratory – Greenville, South Carolina, USA.

‡ Excludes TCR.

**TWF**

Flexible Tunnel



- Minimum distance from ceiling to roof 0.1m
- Standard length 1.5m
- Not extendable

**TWR**

Rigid Tunnel



- Minimum distance from ceiling to roof 0.9m
- Standard length 1.7m
- Extendable to 6m using ZTR extensions

**TCR**

Rigid Tunnel (Flat/low-pitch roof)



- Minimum distance from ceiling to roof 0.9m
- Standard length 1.15m
- Extendable to 6m using ZTR extensions

Technical information	TWF FLEXIBLE	TWR RIGID	TCR LOW PITCH
Rooftop glazing – 4mm toughened glass	✓	✓	-
Integrated flashing & apron for tiled or profiled metal roofs	✓	✓	-
Installation pitch 15°– 60°	✓	✓	-
Installation pitch 0°– 60°	-	-	✓
Shaft or tunnel diameter 350mm	✓	✓	✓
Standard tunnel length	1.5m	1.7m	1.15m
Extension kit ZTR OK14 (1180m in length). Max overall tunnel length 6.0m	-	✓	✓
'Stay clean' coating reduces cleaning frequency	✓	✓	-

Sun Tunnel packages come complete with:

- Choice of highly reflective rigid or flexible tunnel (350mm diameter, lengths vary).
- Dual-layered ceiling diffuser – spreads light over an area of up to 9m<sup>2</sup>.
- Interior diffuser design with 'EdgeGlow,' a clear ring on the diffuser's edge.
- Outer polyurethane cappings with integrated flashings for tiled/profiled metal roofs (TWF/TWR only).
- 'Stay clean' coating on glass exterior reduces cleaning frequency (TWF/TWR only).
- 4mm toughened glass (TWF/TWR only).
- TCR requires custom flashing made by roofer. (Not supplied by VELUX).



**Quicker assembly time**

VELUX Flexi Loc™ system reduces tunnel assembly time significantly. The Rigid light tunnel is easy to work with; gives room for movement and adjustment while providing installation stability by locking the pieces into place. (TWR/TCR only).



**No need to enter the attic or loft**

The roof module with removable sash ensures quick and easy installation from the outside. Drop the light tunnel into place from the roof. There's no need to enter the attic or loft; the light tube is easy to install in tight spaces where attic access is not possible. (TWF/TWR only).



**Easy to install and clean**

The VELUX Sun Tunnel is easy to install thanks to the threaded pane. When you're finished, simply screw the diffused pane into place. And, as an added bonus, it's easy to clean as it can be unscrewed and cleaned as needed.

**Construction**

TWR/TWF: Easy to install, the skylight has an integrated polyurethane frame and flashing, together with flexible aluminium apron.

TCR: Acrylic dome with aluminium frame.

The flexible TWF can be used to circumvent obstructions in the roof cavity, while the TWR/TCR utilises two 45° elbows for most direct 'line-of-sight' applications. Standard shaft lengths can be extended with the addition of the rigid extension kit ZTR OK14 (1180mm long).



**BRANZ Appraised**

Appraisal No. 970 [2017]

## VELUX SUN TUNNELS



Appraisal No. 970 [2017]

### BRANZ Appraisals

Technical Assessments of products for building and construction.



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## Product

- 1.1 Velux Sun Tunnels are for use on roofs of buildings to provide natural light into interior spaces within buildings. Velux offer four models of Sun Tunnels - TWF that features flexible internal ducting, TWR, TLR and TCR which use rigid ducting. All models are suitable for roof pitches between 15° and 60°, however the TCR model can be used at pitches between 0° and 60°. Some models can also be used to provide ventilation.

## Scope

- 2.1 Velux Sun Tunnels (TWF, TWR and TLR) have been appraised for use on buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan area; and,
  - with roof structures designed and constructed to meet the requirements of the NZBC; and,
  - with pitched roof cladding types and profiles specified in E2/AS1; and,
  - with a roof pitch between 15° and 60°; and,
  - situated in NZS 3604 Wind Zones, up to and including Extra High.
- 2.2 Velux Low-Pitch Sun Tunnels (TCR) have been appraised for use on buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan area; and,
  - with roof structures designed and constructed to meet the requirements of the NZBC; and,
  - for use on flat or nominally flat roofs making use of membrane roof systems; and,
  - with a roof pitch between 0° and 60°; and,
  - situated in NZS 3604 Wind Zones, up to and including Extra High.
- 2.3 Velux Sun Tunnels must be installed in accordance with the Technical Literature supplied by Velux New Zealand Ltd.

## Building Regulations

### New Zealand Building Code [NZBC]

3.1 In the opinion of BRANZ, Velux Sun Tunnels, if designed, used, installed, and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC.

**Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.3. Velux Sun Tunnels meet the requirements for loads arising from snow, wind and impact [i.e. B1.3.3 (g), (h) and (j)]. See Paragraphs 8.1 to 8.3.

**Clause B2 DURABILITY:** Performance B2.3.1 (b), 15 years. Velux Sun Tunnels meet this requirement. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1 and E2.3.2. Velux Sun Tunnels meet these requirements. See Paragraph 11.1.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. and F2.3.3 (a). Velux Sun Tunnels meet these requirements and will not present a health hazard to people and are unlikely to cause injury to people.

**Clause G7 NATURAL LIGHT:** Performance G7.3.1 and G7.3.2. Velux Sun Tunnels will contribute to meeting these requirements. See Paragraph 14.1.

**Clause H1 ENERGY EFFICIENCY:** Performance H1.3.1 and H1.3.2E. Velux Sun Tunnels will contribute to meeting these requirements. See Paragraph 15.1.

## Technical Specification

4.1 Velux Sun Tunnels are complete roof to ceiling skylight systems.

4.2 Velux Sun Tunnels [TWF, TWR and TLR] incorporate a square external roof window with integral flashings suitable for use with profiled metal and tiled roofing. The interior component of Velux Sun Tunnels comprises a ceiling mounted frosted acrylic double-glazed diffuser with white ceiling trim ring. The roof window is connected to the ceiling diffuser with either a flexible [TWF] or a rigid [TWR and TLR] highly reflective aluminium light transmission tunnel. The rigid aluminium 'light-tunnel' is made up of straight and adjustable-angle tube sections to allow passage through the roof-space.

4.3 The Velux TCR Sun Tunnel incorporates a light-capture dome above roof level attached to a highly reflective aluminium light transmission tunnel providing light to the interior via a diffuser unit mounted on the ceiling below. The rigid aluminium 'light-tunnel' is made up of straight and adjustable-angle tunnel sections to allow passage of light through the roof-space.

4.4 The minimum ceiling to roof distance is 400 mm for the TWF models and 900 mm for the TWR, TLR and TCR models.

4.5 The Velux Sun Tunnel models covered by the Appraisal are:

#### Sun Tunnel Models:

- TWF OK14: 350 mm diameter tube.
- TWR OK10: 250 mm diameter tube.
- TWR OK14: 350 mm diameter tube.
- TLR OK14: 350 mm diameter tube.
- TCR O14: 350 mm diameter tube.

4.6 Velux Sun Tunnels TWF, TWR and TLR all use a single pane of 4 mm toughened glass to the exterior, which has a coating that is designed to reduce the buildup of dirt and ease cleaning. Sun Tunnel TCR features an acrylic dome to the exterior. All Sun Tunnels use an acrylic double-glazed diffuser designed to be fixed to the ceiling.

4.7 Velux Sun Tunnels TWF, TWR and TLR all feature an integrated proprietary flashing system suitable for a variety of roofing types. Flashings and roof detailing for the Velux Low-Pitch Sun Tunnels [TCR] must be specifically designed and is outside the scope of the appraisal and will need to be considered by the designer at the time of preparing design documentation.

## Handling and Storage

- 5.1 Handling and storage of all components of Velux Sun Tunnels is under the control of the Sun Tunnel installer. Components must be kept dry and under cover at all times. Care must be taken to avoid surface damage to the window components and flashings during the installation process.

## Technical Literature

- 6.1 Refer to Velux New Zealand Ltd for details of the current Technical Literature for Velux Sun Tunnels. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### General

- 7.1 Velux Sun Tunnels are for use on roofs of buildings to provide natural light into interior spaces within buildings. Velux offer four models of Sun Tunnels. The TWF model features flexible internal ducting and the TWR, TLR and TCR models use rigid ducting. All models are suitable for roof pitches between 15° and 60°, however the TCR model can be used at pitches between 0° and 60°.
- 7.2 Velux Sun Tunnels are suitable for most existing timber framed roofs. For such installations, it is important that the roof structure is checked by a suitably qualified person for structural adequacy and suitability of the existing roof cladding.
- 7.3 When installed on new roofs, whenever possible the installation should be carried out concurrently with the roof cladding installation.

### Structure

#### Wind

- 8.1 Velux Sun Tunnels are suitable for use in NZS 3604 Wind Zones up to and including Extra High.

#### Snow

- 8.2 Velux Sun Tunnels are suitable for use in areas where buildings are designed for a 1kPa snow loading.

#### Point Loads

- 8.3 Velux Sun Tunnels have not been tested for point loads from AS/NZS 1170 because the size of the Sun Tunnels would not require a point load to be applied.

### Durability

#### Serviceable life

- 9.1 Velux Sun Tunnels are expected to have a serviceable life of at least 15 years, provided they are maintained in accordance with this Appraisal and the Technical Literature.
- 9.2 On exposure to the weather, the coil coated aluminium may gradually lose the original surface finish. A faster reduction in both surface finish and overall serviceable life can be anticipated in severe industrial, geothermal and marine exposures.

#### Maintenance

- 9.3 The exterior glazing surfaces of Velux Sun Tunnels can only be cleaned from the exterior of the building.
- 9.4 The glazing and external surfaces of Velux Sun Tunnels can be cleaned using a mild, non-abrasive glass cleaner along with a soft brush or other non-abrasive applicator to maintain the surface appearance. Solvent-based cleaners must be avoided when cleaning the acrylic dome on the TCR model as they may damage the surface.

- 9.5 The interior diffuser pane of the Velux Sun Tunnels can be cleaned from the inside. Before cleaning, the diffuser can be removed according to the installation instructions. Solvent-based cleaners must be avoided when cleaning the plastic interior components as it may damage the surface.
- 9.6 Keep all leaves clear from around Sun Tunnels. Make sure all exposed fasteners are secure. Inspect cladding and flashing for excessive wear or scratches on the cladding finish. Scratches in the cladding finish may be fixed with touch up paint available through Velux. Damaged claddings or flashings should be replaced as soon as they are detected.

### Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Velux Sun Tunnels from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 11.1 Velux Sun Tunnels when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

### Internal Moisture

- 12.1 Experience has shown that in normal domestic or similar applications, ceiling mounted double-glazed acrylic diffusers do not pose a significant risk of condensation when correctly installed.

### Ventilation

- 13.1 Velux Sun Tunnel models TWR DK14 and TWF DK14 can be fitted with the Velux ZTV ventilation adaptor which is available from Velux New Zealand Limited. It allows the connection of any in-line mechanical ventilation device so extract ventilation can be provided without the need for additional roof penetrations. The Velux Sun Tunnel, when fitted with the ventilation adaptor, will contribute to the compliance of a building with NZBC Clause G4. Consideration must be given to the 'mechanical ventilation' required for a particular space by the designer. NZBC Acceptable Solution G4/AS1 provides guidance on required ventilation.

### Natural Light

- 14.1 Velux Sun Tunnels all contain transparent apertures that will contribute to the compliance of a building with NZBC Clause G7. Consideration of the amount of illuminance provided by the Sun Tunnel for a particular space will depend on a wide range of factors unique to each installation – e.g. room size, position, sun orientation, angle, etc. The use of Velux Sun Tunnels to supplement natural light from other sources is an Alternative Solution to G7.

### Energy Efficiency

- 15.1 Velux Sun Tunnels have R-values that satisfy the minimum requirements for skylights, all exceeding R 0.31 m<sup>2</sup>K/W as specified in NZBC Verification Method H1/VM1 and NZBC Acceptable Solution H1/AS1. Where the total area of skylights exceeds 1.5 m<sup>2</sup> or 1.5% of the total roof area [whichever is the greater] the calculation or modelling methods of NZS 4218 must be used for building designs.

## Installation Information

### Installation Skill Level Requirements

- 16.1 The installation of Velux Sun Tunnels must be completed by installers trained by Velux New Zealand Ltd or by competent, experienced tradespersons with an understanding of roof window installation and weathertightness details.

### System Installation

- 17.1 Installation must be completed in accordance with instructions given in the Velux Sun Tunnels installation instructions and this Appraisal.

### Health and Safety

- 18.1 There are no particular health and safety issues relating to the installation or use of Velux Sun Tunnels. Installers must however observe safe working practices for working on roofs and at heights.

## Basis of Appraisal

The following is a summary of the technical investigations carried out:

### Tests

- 19.1 Velux Sun Tunnels have been subjected to dynamic weather resistance testing by a NATA (National Association of Testing Authorities) registered laboratory in Australia.

### Investigations

- 20.1 Velux Sun Tunnels have been assessed for resistance to impact loads, snow loads and resistance to wind pressures (non-cyclonic regions). These assessments have been reviewed by BRANZ and were found to be satisfactory.
- 20.2 An assessment was made of the durability of Velux Sun Tunnels by BRANZ.
- 20.3 The window units have been assessed for thermal resistance by BRANZ experts.
- 20.4 Site visits have been carried out by BRANZ to assess fit for purpose and the practicability of installation, and to assess in service performance.
- 20.5 Weathertightness detailing of the Velux Sun Tunnels has been assessed by BRANZ and found to be satisfactory. Instructions for installation of units and associated flashing components for different roof types have also been reviewed and found to be satisfactory.
- 20.6 The Technical Literature for Velux Sun Tunnels has been examined by BRANZ and found to be satisfactory.

### Quality

- 21.1 The manufacture of Velux Sun Tunnels has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of UES (Uniform Evaluation Service) Evaluation Report Number 199 which covers quality aspects associated with Velux Sun Tunnel TCR model. BRANZ has also taken note of ETA Denmark European Technical Assessment ETA-19/0764 of 14/10/2015 which covers Velux Sun Tunnel models TWF, TWR, TLR and Velux Flashings.
- 21.2 The quality of materials, components and accessories supplied to the market is the responsibility of Velux New Zealand Ltd.
- 21.3 Quality of installation on site of Velux Sun Tunnel components and accessories is the responsibility of the installer.
- 21.4 Designers are responsible for building design, and specification of natural lighting and ventilation systems.
- 21.5 Building owners are responsible for any required maintenance of Velux Sun Tunnel in accordance with the advice of Velux New Zealand Ltd.

### Sources of Information

- AS 4285: 1995 Skylights.
- AS/NZS 1170.0: 2002 Structural design actions - Permanent, imposed and other actions.
- NZS 3604: 2011 Timber Framed Buildings.
- NZS 4218: 2009 Thermal Insulation - Housing and small buildings.
- NZS 4223.4: 2016 Code of practice for glazing in buildings - Dead, wind and snow loading.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 7, 01 January 2017).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



In the opinion of BRANZ, **Velux Sun Tunnels** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Velux New Zealand Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Velux New Zealand Ltd:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions;
  - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Velux New Zealand Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Velux New Zealand Ltd** or any third party.

For BRANZ



**Chelydra Percy**  
Chief Executive

Date of Issue:  
23 June 2017



**BRANZ Appraised**  
Appraisal No. 621 [2014]

## THE TEKTON® WEATHERIZATION SYSTEM

**Appraisal No. 621 [2014]**

This Appraisal replaces BRANZ  
Appraisal No. 621 [2008] issued  
8 October 2008.

Amended 15 March 2018



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



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## Product

1.1 The Tekton® Weatherization System consists of Tekton® Building Wrap, One Piece Sill Tape, Super Stick Tape or Protecto Sill System [flexible flashing tapes], Tekton Seam Tape and TRADE-SEAL. The system is used behind wall cladding systems and around framed joinery openings as a secondary weather resistant barrier for walls.

## Scope

- 2.1 The Tekton® Weatherization System has been appraised for use on buildings within the following scope:
- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
  - constructed with steel framing subject to specific engineering design, with the building height and floor plan area in accordance with scope limitations of NZBC Acceptable Solution E2/AS1; and,
  - with absorbent wall claddings directly fixed to frame complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay and a flexible flashing system; or,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity complying with NZBC Acceptable Solution E2/AS1 or covered by a valid BRANZ Appraisal that specifies a flexible wall underlay or a rigid wall underlay with flexible underlay over and flexible flashing system; or,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
  - situated in NZS 3604 Wind Zones up to and including Very High where the flexible wall underlay is directly fixed to the frame, and up to and including Extra High where the underlay is used over rigid wall underlays.

## Building Regulations

### New Zealand Building Code [NZBC]

3.1 **In the opinion of BRANZ, the Tekton® Weatherization System if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

**Clause B2 DURABILITY:** Performance B2.3.1 [a] not less than 50 years, B2.3.1 [b] 15 years and B2.3.2. The Tekton® Weatherization System meets this requirement. See Paragraphs 9.1 - 9.2

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. The Tekton® Weatherization System contributes to exterior walls meeting this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. The Tekton® Weatherization System meets this requirement and will not present a health hazard to people.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

## Technical Specification

4.1 System components supplied by Marshall Innovations Limited are as follows:

- **Flexible wall underlay** - Tekton® Building Wrap is a synthetic breather-type building membrane available in rolls 2740 mm wide and 37 m long or 1370 mm wide and 37 m long. The product is manufactured from coated spun bonded polypropylene.
- **Flexible flashing tape [1]** - Super Stick is a multi-layered silver polyester faced, copolymer, self-adhesive tape. The tape is supplied in rolls of 75 mm x 22.86 m, 150 mm x 22.86 m and 230 mm x 22.86 m.
- **Flexible flashing tape [2]** - Protecto Sill System comprises Protecto Wrap Detail Tape, Protecto Wrap Sill Tape and Protecto Tak spray on primer. Both the tapes are based on modified SBS rubberised asphalt and Protecto Tak is a solvent based spray on adhesive primer. Protecto Wrap Detail Tape is supplied as a 150 mm wide, 15 m long and 1.0 mm thick roll, Protecto Wrap Sill Tape is supplied as a 50, 150, 200 mm wide, 30 m long and 0.5 mm thick roll and Protecto Tak is supplied in 369 g can.
- **TRADE-SEAL** is an EPDM sleeve bonded to a carrier material of spun-bonded high density polyethylene film 150 micron thick. The carrier material is backed with a self-adhesive layer. The TRADE-SEAL is available with various diameter EPDM sleeve sizes to accommodate different size wall penetrations.
- **Adhesive tape** - Tekton Seam Tape is a thin polypropylene joining adhesive tape, available in rolls 48 mm wide and 50 m long.

## Handling and Storage

5.1 All products must be kept clean and dry at all times prior to use by storing under cover so that they are protected from the weather and damage. Rolls of Tekton® Building Wrap must be stored on end.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Tekton® Weatherization System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### Timber and Steel Framing

- 7.1 Studs must be provided at maximum 600 mm centres. Dwargs must be fitted flush between studs at maximum 1200 mm centres.

### General

- 7.2 The Tekton® Weatherization System is intended for use behind wall cladding systems and at joinery openings as a secondary defence against water penetration into framing cavities and is intended for use as an alternative to conventional wall underlays.
- 7.3 The system will also provide a degree of temporary weather protection during construction. However, it will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed-in, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 7.4 The Tekton® Weatherization System is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c]. Refer to Table 1.
- 7.5 TRADE-SEAL when used with Tekton® Building Wrap, provides an alternative solution to the pipes and services penetrations specified in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.3 and Figure 68.

**Table 1: NZBC E2/AS1 Table 23 Requirements**

NZBC ES/AS1 Table 23 Wall Underlay Properties	Property Performance Requirement	Actual Property - Tekton® Building Wrap
Absorbency	$\geq 100 \text{ g/m}^2$	Classified as non-absorbent (see Paragraph 7.7)
Vapour Resistance	$\leq 7 \text{ MN s/g}$	1.15 MN s/g
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	$\geq 6$ and $\leq 9$	9.78 [Note 1]
Shrinkage	$\leq 0.5\%$	0.10%
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 228 N Cross direction = 186 N Tensile strength: Machine direction = 4.4 kN/m Cross direction = 3.9kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	$\geq 0.1 \text{ MN s/m}^3$

**Note 1:** Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlays performance, or the performance of other materials.

- 7.6 The Tekton® Weatherization System is suitable for use under wall cladding as a wall underlay system as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that it must not be used with non-absorbent wall claddings in direct fixed installations. Tekton® Weatherization System is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay system as called up in NZS 2295, Table 2.4 on steel framed buildings.

- 7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- 7.8 When the Tekton® Weatherization System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate [generally at least one week] prior to the installation of the system.

### Structure

- 8.1 The Tekton® Weatherization System is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

### Durability

#### Serviceable Life

- 9.1 The system meets code compliance with NZBC Clause B2.3.1 [a], not less than 50 years where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 [b], 15 years where the cladding durability requirement is 15 years. This is provided the system is not exposed to the weather for a total time of more than 60 days. The products also must not be exposed to the weather or UV light at any time in service.
- 9.2 The exterior cladding must be maintained weathertight at all times for the Tekton® Weatherization System to have a serviceable life equal to that of the cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 The Tekton® Weatherization System has an AS 1530 Part 2 flammability index of 0 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.17.8 [b], for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings. .

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Tekton® Weatherization System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 12.1 The system is used to assist the control of moisture behind wall claddings by ensuring moisture which may occasionally penetrate the wall cladding is directed back to the exterior of the building.
- 12.2 The system is suitable for use with wall claddings complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal, and where exposed up to, and including Extra High winds as defined by NZS 3604.

## Installation Information

### Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by a competent tradesperson with an understanding of the wall underlays and weatherization system installation.

### System Installation

- 14.1 The system must be installed in accordance with NZBC Acceptable Solution E2/AS1, or when used with BRANZ Appraised wall claddings, in accordance with any instructions given in the Appraisal, along with the instructions given in the Technical Literature.
- 14.2 Tekton® Building Wrap building wrap must be fixed first to the external face of the timber or steel wall framing over all openings in the framing then cut and dressed into all sides of the openings.
- 14.3 Openings are dressed with lengths of Super Stick or Protecto Sill System Tapes where required and adhered to the Tekton Building Wrap. The tape is 'fanned' around the corners onto the face of the Tekton Building Wrap and folded over the outside edge of the opening framing. All surfaces must be clean and dry prior to the installation. *[Please Note: Super Stick requires two layers on the sill.]*
- 14.4 Any other components of the cladding system or joinery installation, such as sill trays, other flashings or seals should be installed as instructed by the cladding or joinery manufacturer. Note that these components, including cladding systems and joinery have not been assessed and are outside the scope of this Appraisal.

### Inspections

- 14.5 The Technical Literature must be referred to during the inspection of Tekton® Weatherization System installations.

### Basis of Appraisal

The following is a summary of the technical investigations carried out:

#### Tests

- 15.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.
- 15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421.
- 15.3 Tests have been carried out on Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes in accordance with ICC Evaluation Service Criteria for Flashing Materials, AC148 [2001]. The results have been reviewed by BRANZ experts and found to be satisfactory.
- 15.4 Peel adhesion testing of Protecto Wrap Detail Tape, Super Stick and Protecto Wrap Sill Tapes, Tekton Seam Tape and TRADE-SEAL on the Tekton® Building Wrap has been completed by BRANZ.

#### Other Investigations

- 16.1 Durability opinions have been given by BRANZ technical experts.
- 16.2 Practicability of installation has been assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature from Marshall Innovations Ltd has been examined by BRANZ and found to be satisfactory.

#### Quality

- 17.1 The manufacture of products covered by this Appraisal has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certifications covering quality aspects associated with these products.
- 17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the Tekton® Weatherization System into their design in accordance with the instructions of Marshall Innovations Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

### Sources of Information

- AC 148 [2001] Acceptance criteria for flashing materials ICBO Evaluation Service Inc. July 2001
- AS 1530.2: 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp - cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- BS 6538-3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

### Amendments

#### Amendment No. 1, dated 15 March 2018.

This Appraisal has been amended to remove One Piece Sill Tape.



In the opinion of BRANZ, **The Tekton® Weatherization System** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

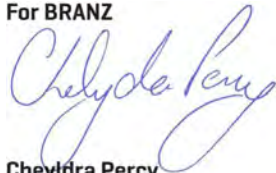
The Appraisal is issued only to **Marshall Innovations Limited**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the technical literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Marshall Innovations Limited:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions.
  - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Marshall Innovations Limited**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Marshall Innovations Limited** or any third party.

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For BRANZ



**Cheydra Percy**

Chief Executive

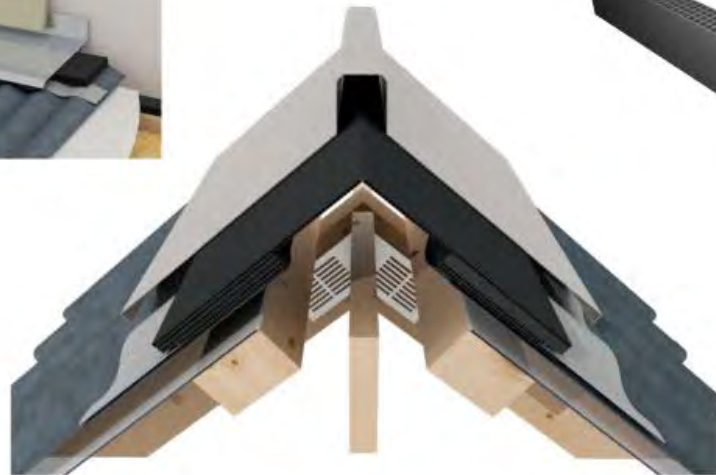
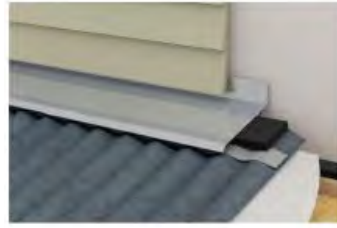
Date of Issue:

11 December 2014



**BRANZ Appraised**  
Appraisal No. 979 [2017]

## ROOF VENTILATION PRODUCTS



**Appraisal No. 979 (2017)**

Amended 06 December 2018

### BRANZ Appraisals

Technical Assessments of products for building and construction.



### Blue Building Solutions Limited T/A VENT

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## Product

- 1.1 Roof Ventilation Products consist of a range of extruded battens and vents for use in pitched and skillion roof construction. The Roof Ventilation Products, when used together, will form a system to assist with the ventilation of the roof space.
- 1.2 The following Roof Ventilation Products are covered by this Appraisal:
  - VENT Ventilated Roof Batten [VB20] - polypropylene ventilated batten used to create airflow.
  - VENT Ridge Vent [RV10P and RV10DT] - used at ridge to release air from the roof void.
  - VENT Ventilated Apron Batten [AB20 and AB20DT] - polypropylene ventilated batten used at barge/abutment to allow air to escape from the lower roof void.

## Scope

- 2.1 Roof Ventilation Products have been appraised for use as non-structural roof battens and vents for use with pitched and skillion roof construction on buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
  - with profiled metal roof cladding; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 Building designers are responsible for incorporation of Roof Ventilation Products into their design for weathertightness and detailing of junctions.

## Building Regulations

### New Zealand Building Code [NZBC]

3.1 In the opinion of BRANZ, Roof Ventilation Products if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

**Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. Roof Ventilation Products meet the requirements for loads arising from gravity loads, wind and impact [i.e. B1.3.3 (b), (h) and (j)]. See Paragraphs 8.1 to 8.3

**Clause B2 DURABILITY:** Performance B2.3.1 (b), 15 years and B2.3.2. Roof Ventilation Products meet these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. Roof Ventilation Products will contribute to meeting this requirement. See Paragraphs 12.1 - 12.3.

**Clause E3 INTERNAL MOISTURE:** Functional Requirement E3.2 (c). Roof Ventilation Products will contribute to meeting this requirement.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Roof Ventilation Products meets this requirement and will not present a health hazard to people.

## Technical Specification

4.1 System components and accessories supplied by VENT are:

- **VENT Ventilated Roof Batten [VB20]** - manufactured from extruded polypropylene. The battens are cut after extruding to a finished size of approximately 40 mm wide by 20 mm thick and provide a ventilation opening area of approximately 18,000 mm<sup>2</sup> per lineal metre. The VENT Ventilated Roof Battens are coloured black and are supplied in 1,800 mm long lengths.
- **VENT Ridge Vent** - manufactured from extruded polypropylene with an aluminium based conformable, soft edge flashing along the bottom edges. The VENT Ridge Vents are coloured black with a grey flashing and are supplied in 1,200 mm long lengths and provide a ventilation opening area of approximately 8,000 mm<sup>2</sup> per lineal metre.
  - **RV10P** - the vents are cut after extruding to a finished size of approximately 520 mm wide [including the flashing] by 20 mm thick. RV10P are suitable for trough depths that are less than 38 mm.
  - **RV10DT** - the vents are cut after extruding to a finished size of approximately 560 mm wide [including the flashing] by 20 mm thick. RV10DT are suitable for trough depths that are between 38 mm and 60 mm.
- **VENT Ventilated Apron Batten** - manufactured from extruded polypropylene with an aluminium based conformable, soft edge flashing on the bottom edge. The VENT Ventilated Apron Battens are coloured black with a grey flashing and are supplied in 1,200 mm long lengths and provide a ventilation opening area of approximately 8,000 mm<sup>2</sup> per lineal metre.
  - **AB20** - the battens are cut after extruding to a finished size of approximately 180 mm wide [including the flashing] by 20 mm thick. AB20 are suitable for trough depths that are less than 38 mm.
  - **AB20DT** - the battens are cut after extruding to a finished size of approximately 230 mm wide [including the flashing] by 20 mm thick. AB20 are suitable for trough depths that are between 38 mm and 60 mm.

4.2 System components and accessories supplied by the building contractor are:

- VENT Ventilated Roof Batten fixings - 40 x 2.5 mm hot-dip galvanised flat head nails, or hot-dip galvanised or stainless steel finishing brads at approximately 400 mm centres.

## Handling and Storage

- 5.1 Handling and storage of the Roof Ventilation Products, whether on or off site, is under the control of the building contractor. The Roof Ventilation Products must be protected from direct sunlight and physical damage, and should be stored flat and under cover.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Roof Ventilation Products. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### General

- 7.1 Roof Ventilation Products can be used to provide passive ventilation of the roof space. The design of the roof ventilation system is subject to specific design and is the responsibility of the designer.
- 7.2 Roof Ventilation Products are for use with profile metal roof claddings in accordance with NZBC Acceptable Solution E2/AS1 Paragraph 8.4 or to a specific design. Roof fixings must take into account the thickness of the products for roof fixing penetration into the supporting structure.
- 7.3 The VENT Ventilated Roof Batten provides a path for passive air flow over the top of structural battens and purlins. It is most suited for skillion roofs and commercial buildings.
- 7.4 The VENT Ridge Vent provides ventilation at roof ridges.
- 7.5 The VENT Ventilated Apron Batten provides ventilation at roof barge and abutments.
- 7.6 For further design guidance, refer to roof ventilation articles in BRANZ Publications: BUILD 148, BUILD 151, BUILD 152, BUILD 155, and BUILD 158.

### Structure

- 8.1 The VENT Ventilated Roof Batten must be considered as non-structural roof battens only.

### Impact Resistance

- 8.2 The VENT Ventilated Roof Battens have adequate resistance to impact loads likely to be encountered in normal residential and commercial use. The battens also have adequate resistance to compressive loads likely to be encountered during fixing of the claddings. They will withstand normal foot traffic and the function of the product will not be impaired by such traffic.

### Wind Zone

- 8.3 The Roof Ventilation Products are suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

### Durability

- 9.1 The Roof Ventilation Products are required to meet the performance requirements of NZBC Clause B2.3.1 [b] 15 years.

### Serviceable Life

- 9.2 The Roof Ventilation Products will have a durability equivalent to that of the roof cladding to meet code compliance with NZBC Clause B2.3.2 provided the cladding system is maintained in accordance with this Appraisal and the Roof Ventilation Products are continually protected from UV light.

### Maintenance

- 10.1 No maintenance is required for Roof Ventilation Products. Regular checks, at least annually, must be made of the roof cladding, flashings and penetrations to ensure they are maintained weathertight and continue to perform their function, to ensure that water will not penetrate the cladding.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Roof Ventilation Products from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 12.1 The Roof Ventilation Products must only be used under long run metal roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1.
- 12.2 The Roof Ventilation Products, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Acceptable Solution E2/AS1.
- 12.3 The detailing of the roof cladding system including junctions is the responsibility of the building designer. These details have not been assessed as part of this Appraisal.

### Internal Moisture

- 13.1 The Roof Ventilation Products will contribute to the control of internal moisture by providing passive air flow. The building designer is responsible for the design of roof space ventilation.

## Installation Information

### Installation Skill Level Requirements

- 14.1 Installation must always be carried out in accordance with the Roof Ventilation Products Technical Literature and this Appraisal by, or under the supervision of, a License Building Practitioner (LBP) with the relevant Licence Class.

### System Installation

#### Roof Underlay Installation

- 15.1 The selected building underlay must be installed in accordance with the underlay manufacturer's instruction prior to the installation of the VENT Ventilated Apron Batten, VENT Ridge Vent, and over the VENT Ventilated Roof Battens.

#### Roof Cladding

- 15.2 Profile metal roof cladding, including flashings and stop ends are in accordance with NZBC Acceptable Solution E2/AS1 Paragraph 8.4 or to a specific design. Roof cladding fixing penetrations into supporting timber must be in accordance with NZBC Acceptable Solution E2/AS1 or specific design.

#### VENT Ventilation Roof Batten

- 15.3 The battens may be cut on site with a knife, hand saw or drop saw.
- 15.4 The battens must be installed under the building underlay to the purlins. The battens can be temporary fixed with the adhesive backing. The battens must be fixed in place with 40 x 2.5 mm galvanised flat head nails or galvanised stainless steel finishing brads at approximately 400 mm centres.

#### VENT Ridge Vent

- 15.5 The vent may be cut on site with a knife, hand saw or drop saw.
- 15.6 Lay vent on roof centrally over the roof apex with the flashing tape to either side.
- 15.7 Temporary fix the vent in place with tape or screws at each corner ensuring the underside of the vent is flat against the roof.

#### VENT Ventilated Apron Batten

- 15.8 The VENT Ventilated Apron Batten is placed over the top of the roof cladding. The protective paper is removed from the underside of the flashing tape and the vent will adhere to the cladding surface. The apron/barge flashing sits over the top of the VENT Ventilated Apron Batten.

### Inspections

- 15.9 The Technical Literature must be referred to during the inspection of Roof Ventilation Products installations.

### Health and Safety

- 16.1 There are no specific health and safety requirements for Roof Ventilation Products, however safe use and handling procedures for the components that make up the cladding system must be followed in accordance with the requirements of the relevant manufacturer's Technical Literature.

## Basis of Appraisal

The follow is a summary of the technical investigations carried out:

### Tests

- 17.1 The following testing has been completed by BRANZ:
- The Roof Ventilation Products were heat aged and compressed to assess the durability performance of the products.

### Other Investigations

- 18.1 A durability opinion has been given by BRANZ technical experts.
- 18.2 The practicability of installation of the Roof Ventilation Products has been assessed by BRANZ and found to be satisfactory.
- 18.3 The Technical Literature, including installation instructions for the Roof Ventilation Products have been examined by BRANZ and found to be satisfactory.

### Quality

- 19.1 The manufacture of the Roof Ventilation Products have been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 19.2 The quality of supply to the market is the responsibility of Blue Building Solutions T/A VENT.
- 19.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems, building underlays, flashing tapes, airseals and cladding system in accordance with the instructions of the designer.
- 19.4 The quality of the installation, handling and storage on site of the Roof Ventilation Products is the responsibility of the installer.

## Sources of Information

- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- BUILD 148 June/July 2015 Ventilation dries attic space.
- BUILD 151 December 2015/January 2016 Roof space moisture.
- BUILD 152 February/March 2016 Passive roof ventilation.
- BUILD 155 August/September 2016 Vents in skillion roofs.
- BUILD 158 February/March 2017 Airflow through ceilings.
- Ministry of Business, Innovation and Employment Record of Amendments – Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

## Amendments

### **Amendment No. 1, dated 06 December 2018.**

This Appraisal has been amended to update the width of the VENT Ventilated Roof Batten and to include VENT Ridge Vent RV10DT and VENT Ventilated Apron Batten AB20DT.



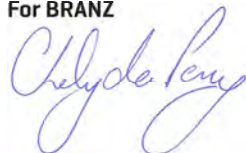
In the opinion of BRANZ, **Roof Ventilation Products** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Blue Building Solutions Limited T/A VENT**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Blue Building Solutions Limited T/A VENT**:
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  - c) any guarantee or warranty offered by **Blue Building Solutions Limited T/A VENT**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Blue Building Solutions T/A VENT** or any third party.

For BRANZ



**Chelydra Percy**

Chief Executive

Date of Issue:

02 November 2017



## BRANZ Appraised

Appraisal No. 764 [2017]

## SHADOWCLAD® VENTILATED CAVITY CLADDING SYSTEM

Appraisal No. 764 [2017]

This Appraisal replaces BRANZ  
Appraisal No. 764 [2011]

Amended 5 September 2018



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



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## Product

- 1.1 Shadowclad® Ventilated Cavity is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The system consists of Shadowclad® sheets, timber cavity battens, flashings and accessories and is finished with either an acrylic paint system, penetrating, or film forming stain.
- 1.3 Shadowclad® Ventilated Cavity incorporates a primary and secondary means of weather resistance [first and second line of defence] against water penetration by separating the cladding from the external wall frame with a nominal 20 mm drained cavity.

## Scope

- 2.1 Shadowclad® Ventilated Cavity has been appraised as an external wall cladding for buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
  - constructed with timber framing complying with the NZBC; and,
  - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High; and,
  - with a building height of ≤ 10 m and at a distance of ≥ 1.0 m to the relevant boundary.
- 2.2 Shadowclad® Ventilated Cavity has also been appraised as an external wall cladding for specifically designed buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
  - constructed with timber framing complying with the NZBC; and,
  - situated in specific design wind pressures up to a maximum design differential ultimate limit state [ULS] of 2.5 kPa; and,
  - with a building height of ≤ 10 m and at a distance of ≥ 1.0 m to the relevant boundary.
- 2.3 Shadowclad® Ventilated Cavity is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. [The Appraisal of Shadowclad® Ventilated Cavity relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.]

## Building Regulations

### New Zealand Building Code [NZBC]

3.1 In the opinion of BRANZ, Shadowclad® Ventilated Cavity, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

**Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. Shadowclad® Ventilated Cavity meets the requirement for loads arising from self-weight, wind, impact and creep [i.e. B1.3.3 (a), (f), (j) and (q)]. See Paragraphs 9.1 – 9.3.

**Clause B2 DURABILITY:** Performance B2.3.1 (b), 15 years, and B2.3.2. Shadowclad® Ventilated Cavity meets these requirements. See Paragraphs 10.1 - 10.5.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. Shadowclad® Ventilated Cavity meets this requirement. See Paragraphs 14.1 - 14.5.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Shadowclad® Ventilated Cavity meets this requirement and will not present a health hazard to people.

## Technical Specification

4.1 System components and accessories supplied by Carter Holt Harvey Woodproducts New Zealand are as follows:

### Shadowclad® Sheets

- Shadowclad® sheets are nominal 12 mm thick structural plywood sheets manufactured from New Zealand pinus radiata veneers. They are 1216 mm wide and either 2440 mm or 2745 mm long. They have a textured surface finish on the exposed face.
- Shadowclad® sheets are available as either Shadowclad® Natural or Shadowclad® Ultra finish. Shadowclad® Natural is an uncoated panel for use with penetrating stains, film forming stains and paints. Shadowclad® Ultra has a factory applied powder coat exterior primer for use with paints and film forming stain topcoats. Shadowclad® Ultra is not suitable for use with penetrating stains.
- Shadowclad® Natural and Shadowclad® Ultra are both available as Texture and Texture Groove surface finish. Texture Groove has 9 mm wide by 5 mm deep grooves at 150 mm centres running vertically down the outside face of the sheet.
- Shadowclad® Natural sheets are available as Hazard Class H3.1 treated only. Shadowclad® Ultra sheets are available in either H3.1 or H3.2 CCA treated.

### Shadowclad® Accessories

- Shadowclad® flashings:** horizontal 'Z' flashing, inter-storey 'Z' flashing, internal 90° angle, internal 'W' angle, large internal 'W' angle, external box angle, large external box angle and flat flashing for vertical negative detail. Shadowclad® flashings are available in extruded aluminium and folded stainless steel.
  - Cavity vent strip:** manufactured from aluminium or stainless steel, available in 3600 mm lengths.
- 4.2 Accessories used with Shadowclad® Ventilated Cavity which are supplied by the building contractor are:
- Shadowclad® sheet fixings:** 60 x 2.8 mm hot-dip galvanised or ring shank stainless steel flat head nails, 8 gauge x 65 mm AS 3566 Corrosion Class 4 mechanically zinc plated wood screws or 8 gauge x 65 mm stainless steel wood screws. *[Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680].*
  - Exterior Battens:** 65 mm wide x 18 mm thick timber batten, dressed or bandsawn, treated to Hazard Class H3.1 and with 6 x 6 mm weathergrooves.
  - Cavity battens:** nominal 45 mm wide x 20 mm thick or 75 mm wide x 20 mm thick merchant grade timber treated to Hazard Class H3.1.

- **Cavity batten fixings:** 40 x 2.5 mm hot-dip galvanised or stainless steel ring shank flat head nails.
- **Flexible wall underlay:** wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlay.
- **Rigid wall underlay:** sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Brush on timber preservative:** brush on timber preservatives as listed in the Technical Literature for Shadowclad® Ventilated Cavity.
- **Flexible flashing tape:** flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.1.1, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Window and door trim cavity air seal:** air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Joinery head flashings:** folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Flexible sealant:** sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.

#### Finishing System Specification

- 4.3 Paint and stain systems are not supplied by Carter Holt Harvey Woodproducts New Zealand and have not been assessed by BRANZ and are therefore outside the scope of this Appraisal.
- 4.4 All exposed faces, including top edges at sills and all bottom edges of Shadowclad® sheets must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730, or at least two coats of a film forming or penetrating stain to protect the Shadowclad® and give the desired finish colour to the exterior walls.

*[Note: For Shadowclad®, Carter Holt Harvey Woodproducts New Zealand recommends using paints and stains with a Light Reflective Value (LRV) of greater than or equal to 50%.]*

## Handling and Storage

- 5.1 Handling and storage of all materials supplied by Carter Holt Harvey Woodproducts New Zealand or the building contractor, whether on-site or off-site, is under the control of the building contractor. Shadowclad® sheets must be stacked flat, clear of the ground on at least three evenly spaced timber bearers. They must be kept dry at all times either by storing within an enclosed building or under cover when stored externally. Care must be taken to avoid damage to edges, ends and the primed surfaces.
- 5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Shadowclad® Ventilated Cavity. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### Framing

#### Timber Treatment

- 7.1 Timber wall framing behind Shadowclad® Ventilated Cavity must be treated as required by NZBC Acceptable Solution B2/AS1.

#### Timber Framing

- 7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 800 mm centres.
- 7.3 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of cavity battens and Shadowclad® Ventilated Cavity.
- 7.4 Timber wall framing and cavity battens must have a maximum moisture content of 20% at the time of the cladding application. *[Note: If Shadowclad® is fixed to framing with a moisture content of greater than 20% problems may occur at a later date due to excessive timber shrinkage.]*

### General

- 8.1 When Shadowclad® Ventilated Cavity is used for specifically designed buildings up to 2.5 kPa design differential ULS wind pressure, only the weathertightness aspects of the cladding and maximum framing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.
- 8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1000 mm<sup>2</sup> per lineal metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 [b].
- 8.3 The ground clearance to finished floor levels as set out in NZS 3604 must be adhered to at all times. At ground level, paved surfaces such as footpaths must be kept clear of the bottom edge of the cladding system by a minimum of 100 mm, and unpaved surfaces by 175 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Table 18.
- 8.4 At balcony, deck or roof/wall junctions, the bottom edge of Shadowclad® Ventilated Cavity must be kept above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.
- 8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.
- 8.6 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the cavity and the flashing to the opening.
- 8.7 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. These details have not been assessed and are outside the scope of this Appraisal.

### Inter-storey Junctions

- 8.8 Inter-storey junctions must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 [b].

## Structure

### Mass

- 9.1 The mass of Shadowclad® Ventilated Cavity is approximately 6.6 kg/m<sup>2</sup> at equilibrium moisture content. The system is therefore considered a lightweight cladding in terms of NZS 3604.

### Impact Resistance

- 9.2 Shadowclad® Ventilated Cavity has good resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to Shadowclad® Ventilated Cavity when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

### Wind Zones

- 9.3 Shadowclad® Ventilated Cavity is suitable for use in all Building Wind Zones of NZS 3604, up to and including Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa design differential ULS wind pressure where buildings are specifically designed.

## Durability

- 10.1 Shadowclad® Ventilated Cavity meets the performance requirements of NZBC Clause B2.3.1 [b], 15 years for the Shadowclad® and flashings when used as a non-structural cladding installed in accordance with the Technical Literature.
- 10.2 Shadowclad® is envelope preservative treated. Where sheets are cut, all cuts must be coated with a brush on timber preservative specified in the Technical Literature for Shadowclad® Ventilated Cavity. Failure to correctly apply preservative to these areas may negatively affect the durability of the cut sheets.

### Serviceable Life

- 10.3 Shadowclad® Ventilated Cavity installations finished with penetrating stain or non-penetrating film forming stain, are expected to have a serviceable life of at least 15 years provided they are maintained in accordance with this Appraisal. *[Note: This opinion only covers serviceability with regards to structural and weathertightness performance. It does not cover appearance, which may deteriorate significantly, especially when proper and regular maintenance is not carried out.]*
- 10.4 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604, Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. It is recommended that Shadowclad® sheets be fixed with stainless steel fasteners in these situations.
- 10.5 When using CCA treated Shadowclad®, aluminium extrusions must be coated in accordance with the requirements of NZBC E2/AS1, Table 20, and are not suitable for use in NZS 3604 Corrosion Zone D. When used with CCA treated Shadowclad®, horizontal Z-flashings must be manufactured from stainless steel in all Corrosion Zones.
- 10.6 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert a mildly corrosive atmosphere into an aggressive environment for fasteners. The fixing of Shadowclad® sheets in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

## Maintenance

- 11.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.
- 11.2 Regular cleaning [at least annually] of the paint coating is required to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent. Paint systems must be recoated at approximately 7 – 10 yearly intervals in accordance with the paint manufacturer's instructions. Penetrating and non-penetrating stains must be recoated every 2 – 3 years in accordance with the stain manufacturer's instructions.
- 11.3 Annual inspections must be made to ensure that all aspects of the cladding system, including the selected finishing system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the relevant manufacturer's instructions.
- 11.4 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the system. *[Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Shadowclad® Ventilated Cavity installations.]*

## Control of External Fire Spread

- 12.1 Shadowclad® Ventilated Cavity is suitable for use on buildings with an SH Risk Group classification, a building height of ≤ 10 m and at a distance of ≥ 1.0 m to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.

## Prevention of Fire Occurring

- 13.1 Separation or protection must be provided to Shadowclad® Ventilated Cavity from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

## External Moisture

- 14.1 Shadowclad® Ventilated Cavity, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.
- 14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.
- 14.3 Shadowclad® Ventilated Cavity allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.
- 14.4 The details given in the Technical Literature for weather sealing are based on the principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.
- 14.5 Shadowclad® Ventilated Cavity, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirements for junctions, penetrations, etc to remain weather resistant.

## Internal Moisture

- 15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

## Water Vapour

- 15.2 Shadowclad® Ventilated Cavity is not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

## Installation Information

### Installation Skill Level Requirements

- 16.1 Installation must always be carried out in accordance with the Shadowclad® Ventilated Cavity Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

### Shadowclad® Ventilated Cavity Installation

#### Wall Underlay and Flexible Sill and Jamb Tape Installation

- 17.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturers' instructions prior to the installation of the cavity battens and the rest of the Shadowclad® Ventilated Cavity system. Flexible wall underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid underlay materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the wall underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

#### Cavity Batten Installation

- 17.2 The cavity battens must be installed over the wall underlay to the wall framing at maximum 300 mm horizontal centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres.
- 17.3 Cavity battens are fixed in place with 40 x 2.5 mm hot-dip galvanised or stainless steel ring shank flat head nails at 300 mm centres when over studs or plates, and to the top and bottom plates and dwangs when between studs.

#### Shadowclad® Sheet Installation

- 17.4 Shadowclad® sheets may be cut on site by power or hand saw. Holes and cut-outs may be formed by using a hole saw.
- 17.5 Shadowclad is envelope preservative treated. Where sheets are cut, all cuts must be coated with a brush on timber preservative specified in the Technical Literature for Shadowclad® Ventilated Cavity. Failure to correctly apply preservative to these areas may negatively affect the durability of the cut sheets.
- 17.6 Shadowclad® sheets must be dry prior to installation. Before the sheets are installed, cut edges must be sealed with a brush-on timber preservative. The bottom edges and back of the Shadowclad® sheets to a height of 150 mm must be primed or stain coated at ground level and where the sheets are installed above apron flashings on roofs.
- 17.7 Shadowclad® sheets must be installed starting at the bottom of the wall. The bottom of the Shadowclad® sheets must overhang the bottom plate by a minimum of 50 mm.
- 17.8 Before the Shadowclad® sheets are installed, the corner detail must be prepared to suit the

selected option, e.g. external box angle or boxed corner. The necessary flashings must be installed before commencing sheet fixing.

- 17.9 The Shadowclad® sheets are fixed with 60 x 2.8 mm hot dip galvanised or ring shanked stainless steel flat head nails, or 8 gauge x 65 mm mechanically zinc plated or stainless steel wood screws at 150 mm centres around the edge of the sheets starting at the corners and at 300 mm centres in the body of the sheet. The fasteners must be no closer than 7 mm to the sheet edges, and on the rebated edge the fasteners must be inside the weather groove.

#### **Aluminium Joinery Installation**

- 17.10 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 – 10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

#### **Finishing**

- 17.11 The coating manufacturer's instructions must be followed at all times for application of the paint or stain finish. Shadowclad® Sheets must be painted or stained as soon as practicable following fixing and must be clean and dry before commencing. If Shadowclad® sheets are exposed to the weather for more than 3 months, the surfaces must be washed with a mild detergent solution to remove any dirt, dust, mould or sea spray prior to coating. Allow the recommended drying time between coats and follow the temperature limitations for application.
- 17.12 Coatings should be applied by brush to ensure adequate coating film build is achieved. Application via roller or spray is not recommended.

#### **Inspection**

- 17.13 The Technical Literature must be referred to during the inspection of Shadowclad® Ventilated Cavity installations.

#### **Health and Safety**

- 18.1 Cutting of Shadowclad® sheets must be carried out in well ventilated areas and eye and hearing protection must be worn.
- 18.2 Safe use and handling procedures for the components that make up Shadowclad® Ventilated Cavity are provided in the relevant manufacturer's Technical Literature.

### **Basis of Appraisal**

The following is a summary of the technical investigations carried out:

#### **Tests**

- 19.1 The following testing has been completed by BRANZ:
- BRANZ expert opinion on NZBC E2 code compliance for Shadowclad® Ventilated Cavity was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Shadowclad® Ventilated Cavity details were tested to E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, vertical and horizontal Shadowclad® joints, internal and external corners. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for cavity-based plywood claddings.
  - Wind face load and fastener slip testing for Shadowclad® Ventilated Cavity. BRANZ determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements given in the Technical Literature were confirmed as suitable for timber framed walls.

## Other Investigations

- 20.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 20.2 The performance and testing of plywood wall cladding products in New Zealand and Australia has been considered, including the structural and weathertightness performance, durability and non-hazardous nature.
- 20.3 Site inspections have been carried out by BRANZ to examine the practicability of installation.
- 20.4 The Technical Literature for Shadowclad® Ventilated Cavity has been examined by BRANZ and found to be satisfactory.

## Quality

- 21.1 The manufacture of Shadowclad® has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 21.2 The quality of materials, components and accessories supplied by Carter Holt Harvey Woodproducts New Zealand is the responsibility of Carter Holt Harvey Woodproducts New Zealand. The quality control system for the manufacture of Shadowclad® has been assessed and registered as meeting the requirements of AS/NZS 2269 by the Engineered Wood Products Association of Australasia, and ISO 9001 by Telarc SAI.
- 21.3 The quality control system for the timber treatment of Shadowclad® has been assessed and registered as meeting the requirements of theASUREQuality Timber Treatment Programme for treated timber by the New Zealand Timber Preservation Council Inc., Licence Number 46 for CCA treatment by Carter Holt Harvey and Licence Number 149 for H3.1 LOSP treatment by North Sawn Treatment BOP Ltd.
- 21.4 Quality of installation on site of components and accessories supplied by Carter Holt Harvey Woodproducts New Zealand and the building contractor is the responsibility of the installer.
- 21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing solutions and joinery, wall underlays, flashing tapes, cavity battens, airseals and Shadowclad® sheets in accordance with the instructions of Carter Holt Harvey Woodproducts New Zealand.
- 21.6 Building owners are responsible for the maintenance of Shadowclad® Ventilated Cavity in accordance with the instructions of Carter Holt Harvey Woodproducts New Zealand.

## Sources of Information

- AS 3730: 2006 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2012 Plywood - Structural.
- AS/NZS 4680: 2006 Hot-dip galvanized [zinc] coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

## Amendments

### Amendment No.1, dated 5 September 2018.

This Appraisal has been amended to include the timber preservative treatment.



In the opinion of BRANZ, the **Shadowclad® Ventilated Cavity Cladding System** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Carter Holt Harvey Woodproducts New Zealand**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Carter Holt Harvey Woodproducts New Zealand:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions;
  - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Carter Holt Harvey Woodproducts New Zealand**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Carter Holt Harvey Woodproducts New Zealand** or any third party.

For BRANZ

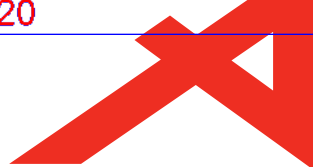


**Chelydra Percy**

Chief Executive

Date of Issue:

21 September 2017



## BRANZ Appraised

Appraisal No. 664 [2016]

## STRANDBOARD™ FLOORING

### Appraisal No. 664 [2016]

This Appraisal replaces BRANZ  
Appraisal No. 664 [2009]



### BRANZ Appraisals

Technical Assessments of products  
for building and construction.



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## Product

- 1.1 Strandboard™ Flooring is an engineered woodpanel flooring material for the interior flooring of residential and commercial buildings.
- 1.2 Strandboard™ Flooring is available as Strandboard™ and Strandboard™ T&G, a tongue and groove system.

## Scope

- 2.1 Strandboard™ Flooring has been appraised for use as sheet flooring material on suspended timber-framed floors that have been designed and constructed in accordance with NZS 3604 Section 7.
- 2.2 Strandboard™ Flooring has also been appraised for use as an overlay on concrete slab-on-ground floors, suspended concrete floors and suspended timber floors.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Strandboard™ Flooring, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

**Clause B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4. Strandboard™ Flooring meets the requirements for loads arising from self-weight, imposed gravity loads arising from use, earthquake, wind and impact [i.e. B1.3.3 (a), (b), (f), (h), and (j)]. See Paragraphs 8.1 - 8.8.

**Clause B2 DURABILITY:** Performance B2.3.1 (a) not less than 50 years, and B2.3.1 (b) 15 years. Strandboard™ Flooring meets these requirements. See Paragraphs 9.1 - 9.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Strandboard™ Flooring meets this requirement. See Paragraphs 13.1 and 13.2.

## Technical Specification

### Strandboard™ Sheets

- 4.1 Strandboard™ sheet flooring is manufactured from strands of radiata pine. The wood strands are bonded with a pMDI resin and contain a mineral wax-based water repellent throughout the thickness of the sheet. At manufacture, the sheets have an average density of 680 kg/m<sup>3</sup> and average moisture content of 10%. The sheets are identified by the product name printed on one face.
- 4.2 Strandboard™ sheet flooring material is a wood based high density board which has a plain wood colour. Strandboard™ is square edged and has a nominal thickness of 20 mm or 12 mm. Strandboard™ T&G is 20 mm nominal thick, with the long edges factory grooved with a 4.5 mm wide and 9.5 mm deep slot, and fitted on one side with a rigid opaque white polypropylene tongue. This forms a tongue and groove [shear key] joint between adjacent sheets.
- 4.3 Strandboard™ Flooring is manufactured to the following tolerances:
- Thickness ±0.2 mm.
  - Length and width ±1.5 mm.
  - Squareness 0.5 mm/m.
  - Sheet edges 1.0 mm/m maximum deviation from the line.
- 4.4 The product is available as set out in Table 1.

**Table 1: Product Range**

Strandboard™ Product Range	
Sheet Sizes [mm]	Approximate Weight per Sheet [kg]
3600 x 2400 x 20	118
3600 x 1200 x 20	59
2400 x 1200 x 20	39
3600 x 1200 x 12	35
2400 x 1200 x 12	24
3600 x 800 x 20*	39

\*T&G Only.

### Accessories

- 4.5 Accessories used with Strandboard™ Flooring which are supplied by the contractor are:
- Fixings - hot dip galvanised or stainless steel 60 mm x 2.8 mm annular grooved flooring nails or 50 mm x 8g screws that comply with AS 3566.1, for fixing Strandboard™ to timber framing.
  - Adhesive - BRANZ Appraised adhesive suitable for adhering timber sheet material to timber framing or concrete as required.

## Handling and Storage

- 5.1 Strandboard™ Flooring must not be stored on wet concrete floors. Sheets must always be block-stacked on bearers at maximum 1200 mm centres. For short-term storage, sheets must be protected from the weather with a breather-type cover which is supported clear of the sheet surface on battens, so that air can circulate freely around the stack.
- 5.2 For long-term storage, Strandboard™ Flooring must be stored inside in well-ventilated, dry conditions.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Strandboard™ Flooring. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### General

- 7.1 Strandboard™ Flooring may be used as pre-laid or post-laid flooring for suspended timber floors designed to Section 7 of NZS 3604, and as a flooring overlay to concrete slab-on-ground floors and suspended concrete or timber floors.
- 7.2 For timber framed floors the 20 mm Strandboard™ Flooring must be used. When used as an overlay on concrete slab-on-ground floors or suspended concrete or timber floors, Strandboard™ Flooring may be either 12 mm or 20 mm thick.
- 7.3 When flooring is pre-laid, care must be taken in the planning and construction stages to ensure the building is closed in within the maximum exposure period of 8 weeks. If this is unlikely, then the flooring must be post-laid.
- 7.4 An expansion gap of 10 mm is required between sheets at 20 m intervals. A minimum 10 mm clearance must be provided between sheet edges and fixed objects such as bottom plates, columns, abutting concrete etc.
- 7.5 For timber framed systems, the use of a construction adhesive is recommended by BRANZ, in conjunction with mechanical fasteners to help eliminate floor system movement, which could result in the undesirable generation of noise [squeaking]. The use of adhesives for fixing Strandboard™ Flooring in this application is outside the scope of this Appraisal.

### Strandboard™ T&G Diaphragm Floors

- 7.6 Where Strandboard™ T&G is used for diaphragm floors, the joist spacing supporting the Strandboard™ Flooring must be no greater than 450 mm centres. Strandboard™ T&G sheets must be laid with the long edges perpendicular to the joists and the short edges coincident with the joists. The nailing pattern to be used in fixing these sheets down must be in accordance with the Technical Literature.

### Sub Floor Ventilation

- 7.7 Where Strandboard™ Flooring is laid over a subfloor framing system, all timber and flooring must be protected against damage from ground water moisture in accordance with all the requirements of NZS 3604, Section 6. Cross-flow ventilation around the full perimeter of the building must be provided in accordance with the relevant requirements of NZS 3604, Paragraph 6.14. In calculating the required number of vents, only the open unobstructed area of each vent unit shall be taken into account. Hot-air, steam systems, and relief or overflow pipes must not vent or drain into subfloor areas. To allow for adequate ventilation and access, a minimum clearance of 550 mm between the surface of the ground and the underside of the Strandboard™ floor is required.

### Concrete Floors

- 7.8 Concrete slab-on-ground floors, where Strandboard™ Flooring is to be used as a flooring overlay, must be constructed using protective damp-proof membranes in accordance with NZS 3604, Section 7.5. The concrete surface must not deviate by more than 5 mm over 3 m. In addition, the substrate must be sound, dust free and dry. The relative humidity of air at the concrete surface must not exceed 75% prior to installation. Relative humidity must be determined in accordance with BRANZ Bulletin No. 506. It is important that where a construction joint exists in a concrete slab, a joint must also be formed in the flooring directly above.

### Finishing

- 7.9 Strandboard™ Flooring must be finished by sealing of the surface or finishing with a three-coat polyurethane coating system or other floor covering, as detailed in the Technical Literature, before occupancy.

### Wet Areas

- 7.10 The design of Strandboard™ Flooring in wet areas must be undertaken in conjunction with the Technical Literature, NZS 3604, Paragraph 4.3.4 and NZS 3602, Table 1.
- 7.11 Wet areas are spaces where sanitary fixtures and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:
- Water Splash – these are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
  - Shower Areas [Spaces] – these are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.
- 7.12 Where Strandboard™ Flooring is used in shower areas, a waterproof membrane system specified for use with timber panel flooring must be used to protect the Strandboard™. The waterproof membrane must comply with AS/NZS 4858 or be covered by a valid BRANZ Appraisal. Other water splash areas must be protected by impervious floor coverings in accordance with NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1.
- 7.13 A floor waste is recommended where accidental flooding is possible. Floor wastes must be installed in accordance with the requirements of Acceptable Solution E3/AS1, Paragraph 2.2 or Acceptable Solution G13/AS1, Paragraph 3.4.

### Exposure

- 7.14 Due to rain wetting before closing in, it may be possible for the moisture content of the pre-laid sheets to temporarily exceed the 18% level given in NZBC Acceptable Solution E2/AS1 Paragraph 10.2.(c). Under normal circumstances, when used and installed as required by this Appraisal and the Technical Literature, this level of temporary wetting of Strandboard™ is acceptable.

## Structure

### Density

- 8.1 Strandboard™ and Strandboard™ T&G sheets have a density of approximately 660 kg/m<sup>3</sup>.

### Loads

- 8.2 Strandboard™ Flooring 20 mm thick will support loads of up to 1.5 kPa in buildings built within the scope of NZS 3604 with maximum floor joist spacing of 600 mm centres. Strandboard™ Flooring 20 mm thick will support loads up to 3 kPa for all other non-domestic flooring applications built within the scope of NZS 3604 with maximum floor joist spacing of 450 mm centres. The maximum point load allowed is 2.5 kN for both Strandboard and Strandboard T&G.
- 8.3 Timber floors built outside the scope of NZS 3604 have not been assessed and are outside the scope of this Appraisal. These floors must be subject to specific design and Juken New Zealand Limited must be consulted for relevant design information, strength and stiffness.
- 8.4 The installation of Strandboard™ Flooring over steel floor joists has not been assessed and is outside the scope of this Appraisal. Juken New Zealand Limited must be consulted for relevant design information using these floor systems.
- 8.5 For typical NZS 3604 applications pre-laid over supports at the above spacings, the stiffness of the sheets will still be acceptable after exposure to the weather for 8 weeks for Strandboard™ Flooring. Post-laying of sheets avoids any loss in stiffness which may occur as a result of weathering.

### Structural Diaphragms

- 8.6 Strandboard™ Flooring has been appraised for use as a sheet material for diaphragms to resist lateral loads in NZS 3604 buildings. Such diaphragms must be detailed as required by Clause 7.3 of NZS 3604 and the Technical Literature. Screw fixing must not be used for diaphragm floors.

### Heat

- 8.7 Over-floor heating systems may be used with Strandboard™ Flooring provided it is not subjected to a temperature exceeding 35°C.
- 8.8 Strandboard™ Flooring must not be subjected to temperatures exceeding 50°C for prolonged periods.

### Durability

- 9.1 Strandboard™ Flooring meets the performance requirements of NZBC Clause B2.3.1 [a], not less than 50 years where the floor is a structural diaphragm or it is installed under structural walls, and the performance requirements of NZBC Clause B2.3.1 [b], at least 15 years in other situations.

### Serviceable Life

- 9.2 Flooring systems based on Strandboard™ Flooring can be maintained in a serviceable condition for at least 50 years, provided that:
- When pre-laid, the flooring has not been exposed to the weather for a period greater than 8 weeks.
  - Appropriate measures have been taken to ensure the moisture content of the flooring is controlled in accordance with the provisions of NZBC Acceptable Solutions E2/AS1 and E3/AS1, the Technical Literature and this Appraisal.
  - The flooring has not been exposed to further weathering, or subjected to water immersion, e.g. flooding, or to sub-zero temperatures while in a wet condition.
- 9.3 When sheets are used as a floor overlay fixed directly over concrete floors and the sheets do not perform any structural function [i.e. support loads], the NZBC does not require a minimum serviceable life for the covering. However, where slab-on-ground floors are permanently protected from ground moisture in accordance with NZS 3604, Section 7.5, a serviceable life of over 50 years is still possible.

### Maintenance

- 10.1 Adequate subfloor ventilation must be maintained by ensuring vegetation or other obstructions are kept away from vents in perimeter foundation walls. Where ground vapour barriers exist they must be maintained in a serviceable and effective condition.
- 10.2 In wet areas, impervious floor coverings [or waterproof membranes] must be maintained to ensure water cannot penetrate through to the Strandboard™ Flooring. Any floor wastes must be installed and maintained so as to remain unobstructed, drain to the outside of the building, and prevent Strandboard™ Flooring from becoming wet.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Strandboard™ Flooring from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.
- 11.2 The serviceable life of the product may be affected if the surface temperature exceeds 50°C for long periods. Fuel-burning appliance manufacturers must therefore be consulted to ascertain the clearances or protection required to ensure that a 50°C surface temperature is not exceeded. Clearances specified in NZBC Acceptable Solutions C/AS1 – C/AS6 Part 7 may not be sufficient for some appliances.

### Fire Affecting Areas Beyond the Fire Source

- 12.1 Strandboard™ Flooring can be used as flooring in Risk Group SH dwellings, which have no specific fire requirements under the NZBC.
- 12.2 For Risk Groups other than SH surface finish requirements for floors are given in NZBC Acceptable Solutions C/AS2 – C/AS6 Paragraph 4.17.3.

### Hazardous Building Materials

- 13.1 The adhesive used to manufacture Strandboard™ Flooring contains no formaldehyde. The amount of formaldehyde emitted by the Strandboard™ Flooring is significantly less than similar flooring materials manufactured using melamine urea formaldehyde type adhesives. Formaldehyde emissions from Strandboard™ meet the E zero classification when tested in accordance with AS/NZS 4266.16.
- 13.2 The level of formaldehyde emission will decrease with time. After installation, emission levels will be controlled by ventilation together with the sealing of the surface or finishing with a three-coat polyurethane system, or the use of coverings such as tiles, vinyl or carpets with foam or rubber underlays. Covering or sealing of the sheets must be carried out before the building is occupied.

### Energy Efficiency

- 14.1 For the purposes of calculating the building performance index of the building envelope [refer NZBC H1.3.2] the R-value of Strandboard™ 20 mm sheets should be taken as 0.17 m<sup>2</sup>K/W.

## Installation Information

### Installation Skill Level Requirements

- 15.1 Installation must always be carried out in accordance with the Strandboard™ Flooring Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

### General

- 16.1 General installation of Strandboard™ Flooring must be in accordance with the Technical Literature and the provisions of this Appraisal.
- 16.2 It does not generally matter which way up the Strandboard™ sheets are laid. If the floor is to be finished with a clear finish, then all of the Strandboard™ sheets should be laid with the printed face down.
- 16.3 Sheets must be supported at all edges and ends, which may require additional blocking to be installed. Strandboard™ T&G Flooring does not need blocking under the tongue and groove joint.
- 16.4 Each sheet must span at least two floor joist spans [i.e. be continuous over three joists], except at floor edges where infill sheets may be required.
- 16.5 The moisture content of the floor framing timber must not exceed 18% when Strandboard™ Flooring is installed.
- 16.6 Strandboard™ Flooring must be fixed with 60 x 2.8 mm hot-dipped galvanised or stainless steel, annular grooved flooring nails, or 50 x 8g screws [non-diaphragm applications only] at 150 mm centres around the perimeter of the sheets, and at 300 mm centres at intermediate supports. Nails may be power or hand driven but must be parallel with, and no closer than 10 mm to the edge of the sheet.
- 16.7 Where Strandboard™ T & G Flooring is to be used as a diaphragm floor then fixing must be in accordance with the Technical Literature. This type of flooring system requires the supporting joists to be at no more than 450 mm centres.
- 16.8 Where used as an overlay to timber substrates, the moisture content of the substrate must not exceed 15%.
- 16.9 Existing timber floor substrates must be re-punched and then coarse sanded flat prior to fixing the sheets in place.
- 16.10 When used as an overlay on timber substrates or as a second layer over a pre-laid single layer, sheets must be fixed with mechanical fasteners or adhesive with fasteners, ensuring that sheet joints do not coincide with joints in the substrate.
- 16.11 Where used as an overlay to T & G timber flooring, the joints in the Strandboard™ Flooring must not coincide with the joints in the T & G flooring.

- 16.12 Where used as an overlay to concrete, the concrete surface must not deviate by more than 5 mm over 3 m. In addition, the substrate must be sound, dust free and dry. The relative humidity of air at the concrete surface must not exceed 75% prior to installation. Relative humidity must be determined in accordance with BRANZ Bulletin No.506. As a general guide for new concrete slabs, one month of drying time must be allowed for each 25 mm thickness of concrete.
- 16.13 When used as an overlay on concrete, sheets must be bonded using a full spread of approved adhesive [see the Technical Literature].
- 16.14 Continuously-laid bottom plates to walls in pre-laid situations must be cut away at openings as soon as possible, in order to allow ponded water to drain or be removed.
- 16.15 Protection required to prevent damage to the floorings during other construction processes must be provided in a manner which allows sheets exposed to the weather to dry quickly. For this reason temporary weather protection such as plastic sheeting or liquid sealers must not be used directly on sheet surfaces.

### Finishing

- 17.1 Covering or sealing of the Strandboard™ Flooring must be carried out after the building is fully closed-in but before it is occupied. Details for finishing are provided in the Technical Literature.
- 17.2 Covering or sealing must not be carried out until the moisture content of the flooring is less than 15%.
- 17.3 Some coating and adhesive manufacturers may require lower moisture contents for optimum performance when their products are used on Strandboard™ Flooring. The instructions of these manufacturers must be followed when their products are used on Strandboard™ Flooring.

### Health and Safety

- 18.1 Exposure to wood dust may cause irritation to the respiratory system and skin and may cause sensitisation resulting in asthma, and by skin contact resulting in dermatitis. A dust mask and eye protection must be worn when working with Strandboard™ Flooring. Work areas must be ventilated and kept clean. Machinery used must be fitted with dust extractors. Off cuts, shavings and dust must be disposed of in accordance with the requirements of local authorities.

### Basis of Appraisal

The following is a summary of the technical investigations carried out:

#### Tests

- 19.1 The change in the physical properties of the Strandboard™ Flooring, such as modulus of rupture, modulus of elasticity, internal bond strength, thickness swell and surface water absorption after natural weathering have been determined by BRANZ.
- 19.2 The density, modulus of rupture, modulus of elasticity, internal bond, and deflection under concentrated load [stiffness] of Strandboard™ Flooring have been determined by BRANZ.
- 19.3 Strength capacity and deflection under concentrated load [stiffness] of Strandboard™ Flooring exposed to the weather for 8 weeks, have been determined by BRANZ.
- 19.4 The thermal resistance of Strandboard™ Flooring has been determined by BRANZ.
- 19.5 Formaldehyde emission levels have been determined by testing by Juken New Zealand Limited to AS/NZS 4266.16. The results of these tests have been reviewed by BRANZ and found to be satisfactory.

#### Other Investigations

- 20.1 The Technical Literature for Strandboard™ Flooring has been reviewed by BRANZ and found to be satisfactory.

### Quality

- 21.1 The manufacture of Strandboard™ Flooring has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.
- 21.2 The quality management systems of Juken New Zealand Ltd - Triboard Mill, Kaitaia have been assessed and registered by SGS as meeting the requirements of ISO 9001: 2008.
- 21.3 Juken New Zealand Limited is responsible for the quality of the product supplied.
- 21.4 Quality of installation of the product on site is the responsibility of the installer.
- 21.5 Maintenance of the flooring system is the responsibility of the building owner.

### Sources of Information

- AS 3566.1: 2002 Self-drilling screws for the building and construction industries.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 4266.16: 2004 Reconstituted wood based panels – Methods of test. Method 16: Formaldehyde emission – Dessicator method.
- AS/NZS 4858: 2004 Wet area membranes.
- BRANZ Bulletin No. 506 Laying Solid Timber Strip Flooring on Concrete Slabs.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



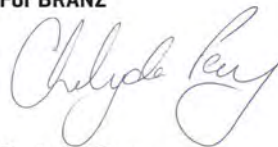
In the opinion of BRANZ, **Strandboard™ Flooring** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Juken New Zealand Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the Technical Literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. **Juken New Zealand Ltd:**
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions.
  - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by **Juken New Zealand Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Juken New Zealand Ltd** or any third party.

For BRANZ



**Chelydra Percy**

Chief Executive

Date of Issue:

25 November 2016

## SPECIFICATION CONTRACT DOCUMENTATION

To be referenced in association with the specification of the work to be done and materials to be used in carrying out the works shown on the accompanying drawings

# New House

## Project Specification

Lot 6 , Anderson Park, Waikanae, New Zealand

Project Ref: 20018

Printed: 22 November 2020



**masterspec**

Specification built using Masterspec software  
Project ID: 211047 - 192332

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Shadowclad Installation manual	10



# **INSTALLATION INSTRUCTIONS & OWNERS GUIDE**

## **RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS**

### **Congratulations for choosing a Rheem Water Heater**

It is important that you take a few minutes  
to read this booklet as it may save you  
time and trouble later.

If you require any further information or your  
water heater needs to be serviced, please contact the  
Rheem Service Department on 0800 657 335,  
or the nearest service center  
Or visit [www.rheem.co.nz](http://www.rheem.co.nz)

### **Important to the Installer**

Do not leave this booklet inside the element cover  
after installation

Please leave the booklet with the water heater's  
owner

## IMPORTANT INFORMATION

### GENERAL

- The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.
- This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

## ABOUT YOUR WATER HEATER

### Q. DOES THE WATER QUALITY AFFECT THE WATER HEATER?

- A. Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please refer to page 6.**

### Q. HOW HOT SHOULD THE WATER BE?

- A. All models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments. For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a stored temperature setting of not less than 60°C. A tempering valve set at a maximum of 55°C must be used on domestic wet areas.

### Q. HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

- A. Refer to the installation requirements on page 4.

### Q. HOW LONG WILL THE WATER HEATER LAST?

- A. There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 7).

The life of the water heater may be extended by arranging for an authorised person to inspect the anode and replace it, if required.

The suggested time after installation when the anode should be inspected is:

Vitreous Enamel 8 years

Optima 10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 6).

## HOW THE WATER HEATER WORKS

### SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and, as a result, a small amount of water is discharged from the cold water expansion valve.

### NON-SIMULTANEOUS ELEMENT MODELS


The two heating elements are wired for non-simultaneous operation, so that only one heating unit can operate at a time. The bottom heating unit is usually connected to an off-peak (overnight) supply and the top heating unit to a continuous supply. **The red link wire must be removed from the terminal block during installation if two separate power supplies are to be used.** Leaving the link in place ensures both elements operate correctly with a single power supply.

The basic operation is as follows: when the water temperature at the top of the water heater has reached the set temperature, the thermostat switches the top element off. This creates a circuit to the bottom heating element by switching the neutral.

### SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be mounted on top of the water heater.

Also fitted to the water heater is a thermostat, which incorporates an over-temperature thermal cut-out device.

 **Warning:** The operation of the thermal cut-out indicates a possible dangerous situation. The thermostat and thermal cut-out is to only be adjusted or reset by an authorised service person.

These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

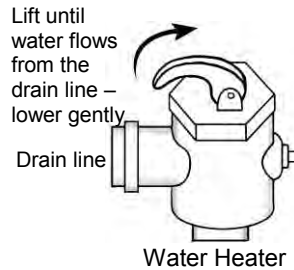
## REGULAR CARE

### MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF (TPR) VALVE:

The easing lever (see diagram. 1) on the TPR valve should be operated regularly to remove lime deposits and verify that it is not blocked. **It is very important that you raise and lower the lever gently.**

**⚠ Warning:** To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater over-pressurising.

#### DIAGRAM 1



If water does not flow freely from the drain line or the valve fails to completely close and water continues to be discharged, contact the Rheem Service Department, phone **0800 657 335**, or the nearest Rheem Service Centre (look in the Yellow Pages under "Plumbers").

### GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

## SAVE A SERVICE CALL

**CHECK THE ITEMS BELOW BEFORE MAKING A SERVICE CALL. YOU MAY BE CHARGED FOR SERVICE IF THE FAULT IS NOT RELATED TO THE WATER HEATER MANUFACTURE OR PARTS SUPPLIED WITH THE WATER HEATER BY RHEEM.**

### WATER DISCHARGING FROM EXPANSION CONTROL VALVES

It is normal for the cold water expansion valve and the temperature and pressure relief valve to discharge a small quantity of water during the heating cycle. If either of these valves discharge more than a bucket full of water in 24 hours, one of the following may be the cause.

- **Continuous dribble**  
Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.
- **Heavy flow of hot water until the water is cold – then stops while the water reheats**  
Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre or [www.rheem.co.nz](http://www.rheem.co.nz) to arrange an inspection.
- **A steady flow of water (often at night)**  
This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

### NOT ENOUGH HOT WATER (or no hot water)

- **Is the electricity turned on?**  
Check the switch marked 'water heater' at the switchboard and the water heater isolating switch.  
Check the fuse or circuit breaker marked 'water heater'.

*WHERE THE WATER HEATER IS CONNECTED TO AN OFF PEAK (NIGHT RATE) ELECTRICAL TARIFF, THE SUPPLY MAY NOT BE AVAILABLE AT CERTAIN TIMES OF THE DAY.*

- **Do you have the correct size heater for your requirements?**  
Refer to the sizing guide in the Rheem sales literature or the Rheem website.
- **Is one outlet (especially the shower) using more hot water than you think?**  
Carefully review the family's hot water usage and if necessary, check the shower flow rate. For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute (mixed hot and cold). This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.
- **Ensure the thermostat setting is appropriate. Note, some models require an authorised person to make electrical thermostat adjustments.**

### HIGH ELECTRICITY BILLS

- **Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.**
- **Is either of the expansion valves discharging too much water?**

- **Is one outlet (especially the shower) using more hot water than you think?**
- **Is there a leaking hot water pipe, dripping hot water tap, etc?**  
Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

## INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply wiring to the water heater.

The water heater must be installed by a certified person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements. Note that no warranty costs will be payable where the water heater is located in a position that does not comply with the Rheem water heater installation instructions or relevant statutory requirements, where the unit is installed in a position that does not allow safe or ready access, the cost of that access shall not be payable (refer to "Rheem Warranty" on page 7).

- **WATER HEATER LOCATION**

Water heaters with a galvanised outer casing are only suitable for indoor installations, whereas water heaters with a painted casing are suitable for both indoor and outdoor installations.

Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. (Typical clearances are: TPR valve removal 135 mm, Element Cover and Element Removal 400 mm). Also, you must be able to read the information on the rating plate and if possible, leave headroom of one water heater length so the anode can be inspected or replaced.

- **CONNECTION SIZES**

- Hot and Cold water connections: RP  $\frac{3}{4}$  / 20.
- Relief valve connection: RP  $\frac{1}{2}$  / 15.

- **INLET/OUTLET CONNECTIONS**

A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. All connection sockets on the water heater are parallel threaded and therefore tapered brass nipples must be used to ensure watertight connections. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.

- **NON RETURN VALVE**

A non return valve must be installed on the cold water line to the water heater.

- **PIPE SIZES**

The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.


- **COLD WATER EXPANSION VALVE**

A cold water expansion valve must be fitted to the cold water line to the water heater.

- **TEMPERATURE AND PRESSURE RELIEF VALVE**

When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the off-centre socket. Do not use a wrench on the valve body – use the spanner flats provided. Drain the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, preferably over a gully trap.

In some setups or circumstances, such as if freezing could occur, an air break must be provided in the drain within 300 mm of the TPR valve, refer to the New Zealand Building Code - Clause G12 for requirements and acceptable solutions for the running of hot water drain line(s).

 **Warning: The drain line from the TPR valve must be in copper.** A Rheem mains pressure water heater must **not** be installed and operated without a suitable (valve that complies with AS 1357.1) temperature and pressure relief valve. Under no circumstances block the outlet of this valve or its drain pipe.

- **WATER SUPPLY PRESSURE**

Maximum permitted mains water pressure - refer product label and Table 5.2 AS/NZS 3500.4. Note inlet pressure control valve is required where maximum permitted mains pressure is likely to be exceeded.  
Minimum inlet pressure: 60 kPa

- **PRESSURE LIMITING/REDUCING VALVE**

If the water supply pressure exceeds the requirements of Table 5.2 AS/NZS 3500.4, a pressure limiting valve with a maximum setting of 500 kPa is to be fitted in the installation.

- **SAFE TRAY AND SEISMIC RESTRAINTS**

The water heater must be installed with a properly drained safe tray where there is the possibility of water damage to furniture, carpets or building. All water heaters must be restrained to protect against seismic forces. (Refer to the Zealand Building Code for acceptable solutions.)

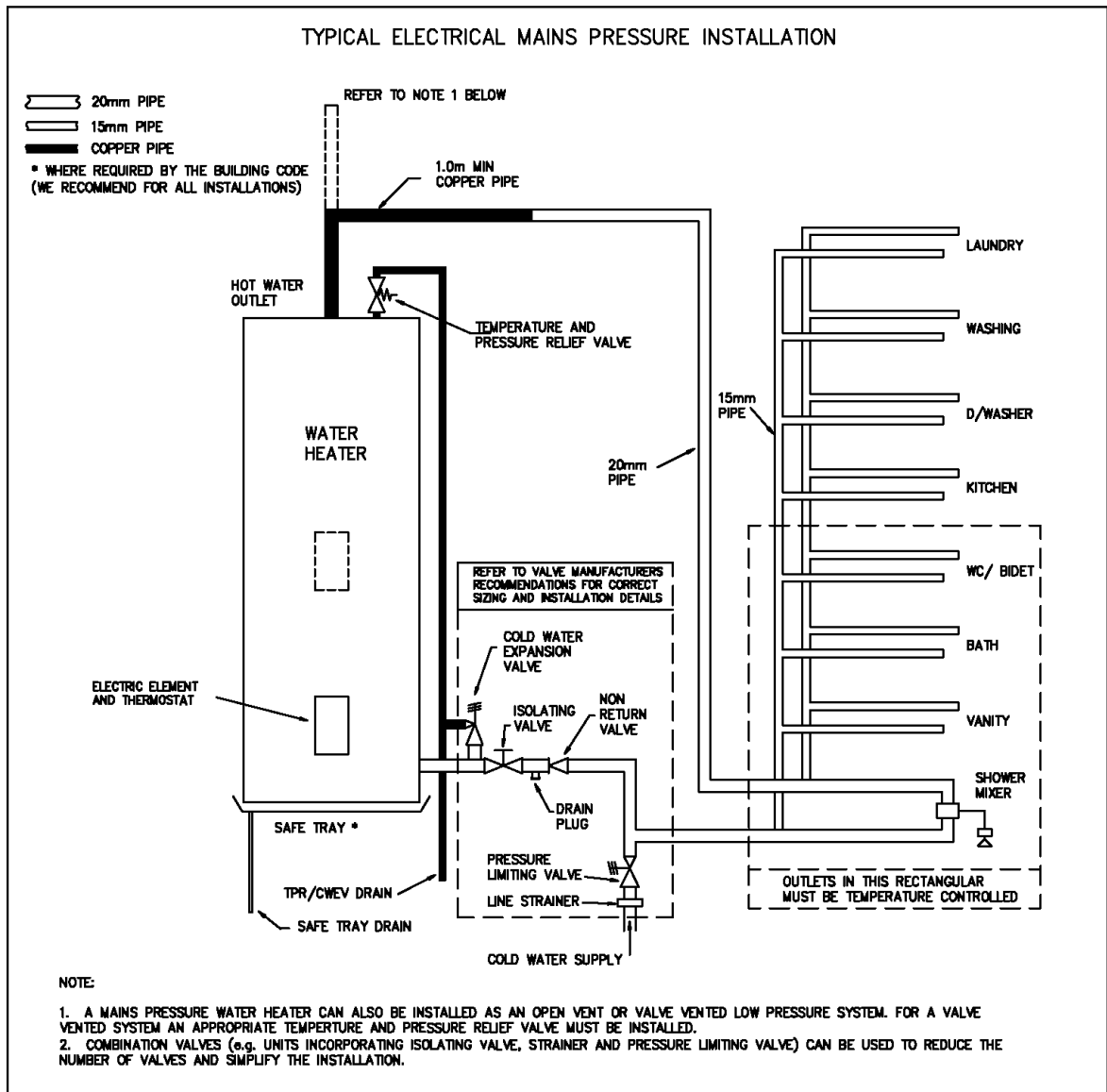


DIAGRAM 2:

## CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm plain to screw adaptor. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. For details, refer to the wiring diagram on the inside of the element cover. **A separate heating element earth wire is not required because the element earths by the thread of the element boss or the flange being in contact with the element socket.**

## COMMISSIONING

### TO FILL AND TURN ON THE WATER HEATER

**Warning:** The power supply to the water heater must not be switched on until the water heater is filled with water and an "earth continuity test", as outlined in Annex A of AS/NZS 60335.1 has been carried out. Failure to do so will damage the element and shorten its life and may create a dangerous situation.

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

### TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.


## DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
- Close the cold water isolation valve.
- Operate the relief valve easing lever to release the pressure in the water heater.
- Drain the water heater through the drain valve or plug.
- Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain

## WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

### WATER SUPPLY CHEMISTRY

Water quality can have a detrimental effect on water heater operation, components and life expectancy and may affect the warranty.

 **Warning:** *This water heater must be installed in accordance with advice given to be covered by the Rheem warranty.*

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. This water heater must only be connected to a water supply which complies with these specifications for the Rheem warranty to apply. If you are unsure of your water chemistry you may be able to obtain information from your local water supply authority or you can contact Rheem and we will provide you with contact details of a suitable agency capable of testing your water for compliance with Rheem standards. Water quality tests must be carried out at the owner's cost.

### HARSH WATER AREAS

Rheem water heaters are designed for use in areas where the Total Dissolved Solids (TDS) content of the water supply is less than 2500 mg/L.

In areas where the TDS exceeds 600 mg/L it is possible the standard magnesium anode fitted to the water heater, may be excessively active. To alleviate this, the magnesium anode should be replaced with an aluminium anode. Where the TDS of the water is less than 40 mg/L, such as when the water has been deionised or is from an alpine supply, a high potential anode should be used. The changing of anodes must be carried out by a plumber or qualified service person.

### CAUTION

If your water supply has a TDS greater than 600 mg/L and the anode has not been changed, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (e.g. automatic washing machines and dishwashers) which are connected to the hot water supply.


The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flames near the tap whilst it is turned on. Any hydrogen gas will be dissipated as indicated by an unusual spurting of the water from the tap. Once the water runs freely again any hydrogen in the system will have been released.

### SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating unit should be used (contact your local Rheem Service Department or an authorised service person).

Scaling water is water that containing levels of calcium carbonate (total hardness in excess of 200 mg/litre at any time when the water heater is operating) Scaling water can block and prevent the pressure & temperature relief valve from operating, resulting in damage to the water heater storage cylinder and water components. A cold water expansion control valve must be fitted where in all areas with scaling water to assist in preventing blockage of the pressure and temperature relief valve.

 **Warning:** *Failure to install an expansion control valve where scaling water conditions occur may result in the water storage cylinder failing or under certain circumstances over pressurising.*

To avoid damage to the storage cylinder and components Rheem strongly recommends scaling water be treated before entering the water heater by fitting appropriate water filters, conditioners, etc – refer to your local water authority for information on water in your area. A build up of white sediment on the hot taps or shower rose can be indicative of scaling water. Contact Rheem if this condition is observed.

**Warning:** *Damage caused by scaling water can affect the Rheem warranty.*

The Rheem warranty of this water heater will not cover resultant faults on components, including storage tank, due to the effects of sludge and/or sediment as a result of connection to a water supply from silted or untreated sources, i.e. springs, dams, bores, rivers or town supplied from a bore.

**WATER HEATERS NOT INSTALLED IN ACCORDANCE WITH THE ABOVE ADVICE WILL NOT BE COVERED BY THE RHEEM WARRANTY.**

## RHEEM WARRANTY

### Mains Pressure Electric Water Heater Product Warranty New Zealand Only

In addition to your legal right, in New Zealand Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective unit or part of it, which has failed due to faulty manufacture on the following terms and conditions:

#### 1. THE RHEEM WARRANTY – GENERAL

- 1.1 This warranty is given in respect of sales in New Zealand by Rheem New Zealand Limited of 475 Rosebank Road.
- 1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the unit subject to the terms of the Rheem warranty in New Zealand – contact your Rheem Service Centre on 0800 657 335.
- 1.3 For details about this warranty, you can contact your Rheem Service Centre in New Zealand on 0800 657 335.
- 1.4 The terms of this warranty are set out in section 2 and apply to units manufactured after 1<sup>st</sup> July 2016.
- 1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to units manufactured after the date specified in the subsequent version.

#### 2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

- 2.1 The decision of whether to repair or replace a faulty component is at Rheem New Zealand Limited's sole discretion.
- 2.2 Where a failed component or unit is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem warranty.
- 2.3 Where the unit is installed outside the boundaries of a metropolitan area, defined by Rheem as further than 25 km from a Rheem service centre, the cost of transport, insurance and travelling between the Rheem service centre and the installed site shall be the owner's responsibility.
- 2.4 Where the unit is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors, walls, roofs or trap doors and the cost of any special equipment to bring the unit to floor or ground level or to a serviceable position is not covered by this warranty.
- 2.5 This warranty only applies to the original and genuine Rheem unit in its original installed location and any genuine Rheem replacement parts. It does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the unit, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.
- 2.6 The Rheem warranty does not cover faults that are a result of:
  - a) Accidental damage to the unit or any component, for example Acts of God such as floods, storms, fires, lightning strikes and the like and Third party acts or omissions.
  - b) Misuse or abnormal use of the unit.
  - c) Installation or use not in accordance with the Owner's Guide and Installation Instructions, New Zealand Building Code requirements or with relevant statutory and local requirements including failure to install a properly drained safe tray where required by the owners guide and installations.
  - d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions, or poor water quality outside the limits specified in the owners guide and installation instructions.
  - e) Repairs, attempts to repair or modifications to the unit by a person other than Rheem Service or a Rheem Accredited Service Technician.
  - f) Faulty plumbing or faulty power supply.
  - g) Failure to maintain the unit in accordance with the Owner's Guide and Installation Instructions.
  - h) Transport damage.
  - i) Fair wear and tear from adverse conditions (for example, corrosion).
  - j) Cosmetic defects.
- 2.7 If you require a call out and we find that the fault is not covered by the Rheem warranty, you are responsible for Rheem Service Centre call out costs. If you wish to have the relevant component repaired or replaced by Rheem that service will be at your cost.
- 2.8 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims however arising including under contract or tort for damage to furniture, carpet, walls, foundations or any other consequential loss or incidental expenses either directly or indirectly due to leakage from Rheem unit, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure.
- 2.9 This warranty excludes to the extent permissible all implied warranties set out in the sale of goods act 1908 (New Zealand) and all guarantees set out in the consumers guarantees act 1933 (New Zealand) to the extent that the goods are acquired for the purpose of resupply in trade consumption in the course of a process of production or manufacture or repairing or treating in trade other goods or fixtures on land.

### 3. WHAT IS COVERED BY THE RHEEM WARRANTY FOR THE UNITS DETAILED IN THIS DOCUMENT

3.1 The following Warranty terms apply for all Rheem Water Heaters manufactured after 1st June 2018. Rheem will repair or replace a faulty component of your unit if it fails to operate in accordance with its specifications as follows:

Warranty Cover	The period from date of installation, in which the fault must appear, in order to be covered		*Domestic use is defined as; when the appliance is installed in a single family domestic dwelling.
What components are covered	Domestic use*	Non-domestic use*	What coverage you receive

#### Low & Mains Pressure

#### Years

\*\* (Excludes Optima)

Warranty Cover	Domestic use*	Non-domestic use*	What coverage you receive
All components	1	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only - Vitreous Enamel (Thermostat setting must be below 70°C)	10	3	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

#### Optima

#### Years

Warranty Cover	Domestic use*	Non-domestic use*	What coverage you receive
All components	3	1	Repair or replacement of failed component, or if necessary, replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	5	1	Repair or replacement of the complete water heater, free of charge, including labour.
Cylinder only (Thermostat setting must be below 70°C)	12	5	Repair or replacement of the complete water heater, free of charge. Installation and labour cost are the responsibility of the owner.

### 4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

- 4.1 To be entitled to make a claim under this warranty you need to:
- Be the owner of the unit or have consent of the owner to act on their behalf.
  - Contact Rheem New Zealand Limited Service Department without undue delay after detection of the defect and, in any event, within the applicable warranty period.
  - Return the faulty component or unit as directed by the Rheem New Zealand Limited Service Department.
- 4.2 You are **not** entitled to make a claim under this warranty if your unit:
- Does not have its original serial numbers or rating labels.
  - Is not installed in New Zealand.

### 5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

- 5.1 If you wish to make a claim under this warranty, you need to:
- Contact Rheem New Zealand on 0800 657 335 and provide owner's details, address of the unit, a contact number and date of installation of the unit or if that's unavailable, the date of manufacture and serial number (from the rating label on the unit).
  - A Rheem service centre will arrange for the unit to be tested and assessed on-site.
  - If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the unit in accordance with this warranty.
- 5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

**RHEEM SERVICE DEPARTMENT**  
475 Rosebank Road, Avondale, Auckland

www.rheem.co.nz

FOR SERVICE TELEPHONE  
Phone: 0800 657 335  
Fax: 09 829 0222  
or visit www.rheem.co.nz for your nearest  
Rheem Service Centre

SHADOWCLAD®  
STRUCTURAL  
Natural  
GROOVE

SHADOWCLAD®  
STRUCTURAL  
Natural  
TEXTURE

SHADOWCLAD®  
STRUCTURAL  
Ultra  
GROOVE

SHADOWCLAD®  
STRUCTURAL  
Ultra  
TEXTURE

SHADOWCLAD®  
FLASHINGS

# SHADOWCLAD® SPECIFICATION & INSTALLATION GUIDE

FOR CAVITY CONSTRUCTION

MAY 2018

# shadowclad<sup>®</sup>

## CAVITY CONSTRUCTION

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## 1.0 SHADOWCLAD® PRODUCT RANGE

Manufactured in New Zealand by Carter Holt Harvey® (CHH) Woodproducts, Shadowclad® panels are suitable for use as an exterior wall cladding when using H3 treated panels or as an internal wall or ceiling lining when using untreated panels.

Shadowclad is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural. All Shadowclad products carry Engineered Wood Products Association of Australasia (EWPAA) Joint Accreditation System – Australia and New Zealand (EWPAA/JAS-ANZ) certification.

Shadowclad has been BRANZ appraised as a cladding material for cavity wall construction. To view the BRANZ Appraisal No. 764 (2017) visit [www.shadowclad.co.nz](http://www.shadowclad.co.nz).

For specific information regarding the use of Shadowclad with weatherboard, solid plaster or brick vertical junctions refer to the Shadowclad Specification and Installation Guide for mixed cladding systems on cavity construction.

Our other plywood products:

- For specific information on plywood as a rigid air barrier, and/or bracing, refer to the current Ecoply® Barrier Specification and Installation Guide.
- For information relating to Ecoply® structural plywood and applications other than exterior cladding, refer to the current Ecoply Specification and Installation Guide.

These are all available for download from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz).

The Shadowclad for cavity construction BRANZ Appraisal No. 764 (2017) does not cover:

- Shadowclad® used as an interior lining.
- Handiply® Utilityclad™ plywood products.
- Shadowclad in direct fix cladding applications.

Shadowclad products must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage. This Shadowclad Specification and installation guide for cavity construction contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Shadowclad products. However, to the maximum extent permitted by law, CHH assumes no legal liability to you in relation to this information.

*The information contained in this document is current as at May 2018. It is your responsibility to ensure you have the most up to date information available.*

*The information contained in this publication relates specifically to Shadowclad® structural plywood products manufactured by CHH Woodproducts and must not be used with any other plywood manufacturer's products no matter how similar they may appear.*

*Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Shadowclad structural plywood products is not appropriate, and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the NZBC.*

## 1.1 TECHNICAL INFORMATION & CAD DETAILS

When specifying or installing any Shadowclad® product visit [www.shadowclad.co.nz](http://www.shadowclad.co.nz) or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

For buildings containing mixed cladding solutions with Shadowclad refer Shadowclad Specification and Installation Guide for mixed cladding systems on cavity construction.

**Having trouble installing Shadowclad®? Visit [www.shadowclad.co.nz](http://www.shadowclad.co.nz) or download the Shadowclad APP to view the installation animations of common Shadowclad junctions.**

## 1.2 PRODUCT DESCRIPTION & RANGE

Shadowclad structural plywood panels are manufactured from radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

Shadowclad is available in panel sizes 2440/2745 x 1216mm (to provide 1200mm cover) and features a unique textured (bandsawn) appearance which also helps to diffuse UV rays for increased aesthetic performance when exposed to weather.

Shadowclad is available as a Textured or Grooved profile and in either Natural or Ultra finishes.

### Shadowclad® Natural

Shadowclad Natural is an uncoated panel suitable for use with penetrating stains, film forming stains and paint systems. If Shadowclad is left uncoated or is clear coated in exterior applications the long term aesthetics of the board will be significantly reduced. While the product will meet NZBC Clauses B2 and E2 durability and weathertightness requirements for cladding, a high visual appearance will not be achieved in the long term.

### Shadowclad Ultra

Shadowclad Ultra features a factory applied exterior grade performance coating suitable for use with most paint and film forming stain systems. Using a unique powder coating process on the panel face and edges means Ultra panels can be immediately

top coated on site, eliminating (in most cases) the need for expensive and time consuming wet primers.

CHH Woodproducts recommends the use of Shadowclad Ultra where suitable paint or film forming stains are being used.

Shadowclad Ultra features:

- High 60-80 microns film build, can be up to 2-3 times thicker than traditional wet primers.
- Continuous powder coated surface forms an effective moisture barrier for a drier more consistent painting surface.
- Saves time and money as traditional wet primers are not normally required.
- Panel surface, edges and bottom 150mm of sheet factory coated for increased panel durability.
- Once installed Shadowclad® Ultra can be exposed to weather for up to 3 months prior to application of finishing coats.
- Low volatile organic compound (VOC) primer coating.

Shadowclad Ultra is available H3 treated for use as an exterior cladding. It is available H3.1 LOSP treated for residential and commercial applications or H3.2 CCA if required. H3.2 CCA treatment is only available in the Ultra finish and is not available with Natural finish products.

Shadowclad Ultra is not suitable for use with penetrating stains. The selection, application and maintenance of coatings is the responsibility of the building owners and the professionals that they engage. For advice on specific coating systems and their suitability for use with Shadowclad Ultra, always refer to the coating manufacturer.

**Table 1: Surface Finishes**




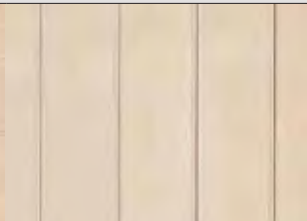
Natural		Ultra	
Texture	Groove	Texture	Groove
			
Shadowclad® Natural is an uncoated panel suitable for staining and painting. Untreated panels can be clear coated for internal, dry applications.		Shadowclad Ultra features a performance coated surface ready for top coating saving time and money when using paints and film forming stains. It is suitable for use in exterior applications only.	

Table 2: Shadowclad® Product Range

	Texture	Groove
<b>Finish</b>	Natural or Ultra	Natural or Ultra
<b>Sheet Length</b>	2440 and 2745mm	2440 and 2745mm
<b>Width (Overall)</b>	1216mm	1216mm
<b>Width (Effective)</b>	1200mm	1200mm
<b>Cover/Width Tolerance</b>	+/- 1mm	+/- 1mm
<b>Nominal Thickness</b>	12mm	12mm
<b>Weight (kg/m<sup>2</sup>)</b>	6.6	6.6
<b>R-value (m<sup>2</sup>.C/W)</b>	0.104	0.104
<b>Groove Profile</b>	N/A	9mm wide, 5mm deep at 150mm centres
<b>Edge Profile</b>	Ship lap with weather groove	Ship lap with weather groove
<b>Treatment Available</b>	<ul style="list-style-type: none"> <li>• H3.1 LOSP (Azole)</li> <li>• H3.2 CCA (Ultra finish only)</li> <li>• Untreated – internal dry applications (Natural finish only)</li> </ul>	<ul style="list-style-type: none"> <li>• H3.1 LOSP (Azole)</li> <li>• H3.2 CCA (Ultra finish only)</li> <li>• Untreated – internal dry applications (Natural finish only)</li> </ul>

### Shadowclad® Exterior Flashing Range

Manufactured from extruded aluminium or folded from 0.5mm thick G304 stainless steel, the Shadowclad® flashings range is purpose designed to complement Shadowclad panels used in exterior applications.

Independently tested for weathertightness and compliant with Table 20 of E2/AS1, Shadowclad flashings achieve 50 year durability in all NZS 3604 exposure zones including zone D (sea spray).

**Note: Stainless steel fasteners should not have contact with or pierce aluminium flashings. Where stainless steel fasteners are to pierce flashings stainless steel flashings should be used.**

The range includes internal and external angles, Horizontal and inter-storey 'Z' flashings and a cavity base closure.

Aluminium horizontally installed flashings come in 3600mm lengths and vertically installed angles are available in 3000mm and 6000mm lengths - refer Table 4. Stainless Steel flashings are available in 3000mm lengths - refer Table 5.

The information, details and performance statements provided in this guide are based on Shadowclad plywood panels and Shadowclad flashings being used together as a system. CHH Woodproducts does not recommend that Shadowclad plywood panels be installed with non-CHH Woodproducts flashings. Flashings not supplied by CHH Woodproducts must, as a minimum, comply with E2/AS1 specifications and be compatible for use with H3.1 LOSP or H3.2 CCA treated plywood. It is the Designer's responsibility to ensure that any non-CHH Woodproducts flashings are fit for purpose and

compatible with Shadowclad products and any other building materials or components of the exterior wall.

### Aluminium Flashing Finishes

Shadowclad aluminium flashings are available in either natural anodised finish (silver colour) or powder coated (range of colours available via [www.shadowclad.co.nz](http://www.shadowclad.co.nz)) for immediate installation or in mill finish for powder coating in alternative colours.

### Exterior Flashings & H3.2 CCA Treated Shadowclad

Exposure Zone B & C

H3.2 CCA treated Shadowclad in exposure zones B and C (where flashings are exposed to weather) must use mill finished flashings which must be powder coated to the desired colour or use stainless steel flashings.

H3.2 CCA treatment contains copper. As such, some form of isolation between aluminium flashings and H3.2 CCA treated panels such as powder coating of the flashings is required. Refer to Table 21 "Compatibility of Materials in Contact" in E2/AS1 for more information.

Exposure Zone D (Sea Spray)

In exposure zone D (sea spray) flashings exposed to weather must be stainless steel for H3.2 CCA treated Shadowclad.

H3.2 CCA Treated Shadowclad®

Uncoated aluminium flashings are not permitted to be in direct contact in any zone with H3.2 CCA treated Shadowclad under any circumstances.

Table 3: Flashing Durability for Shadowclad

Sheet Finish	Treatment	Exposure Zone (refer to section 4 of NZS 3604)	Flashing Material/Finish required
Shadowclad® Natural/ Ultra	H3.1 LOSP	Zones B and C	Aluminium Anodised, Aluminium Powder coated, or Stainless Steel
		Zone D (Sea spray)	Stainless Steel*
Shadowclad Ultra	H3.2 CCA	Zones B and C	Stainless Steel#
		Zone D (Sea spray)	Stainless Steel

\* Aluminium Powder Coated flashings may be used in Exposure Zone D where they are not pierced by Stainless Steel fasteners. Where stainless steel fasteners are to pierce flashings stainless steel flashings should be used.

# Aluminium Powder Coated flashings may be used in Exposure Zones B and C where they are not pierced by Stainless Steel fasteners. Where stainless steel fasteners are to pierce flashings stainless steel flashings should be used.

Table 4

## Aluminium

## Shadowclad® Flashings Range

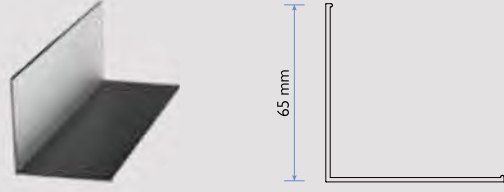
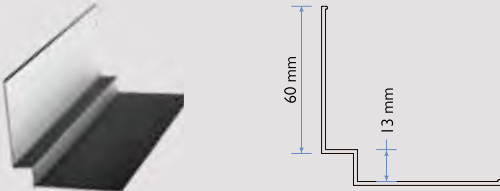
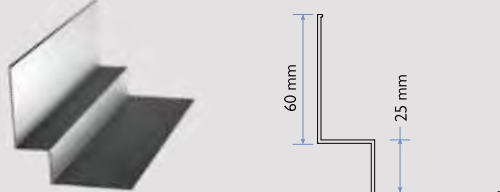
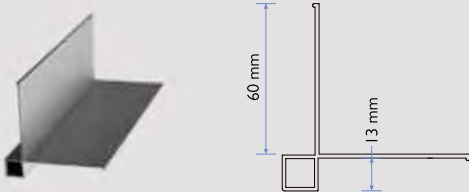
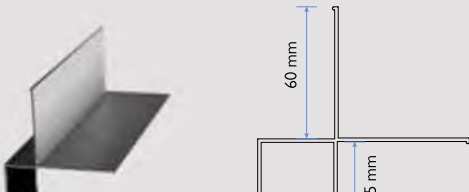
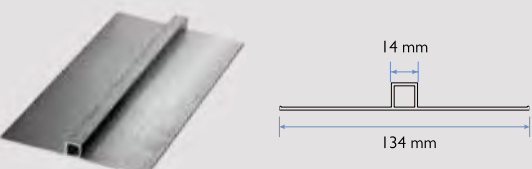
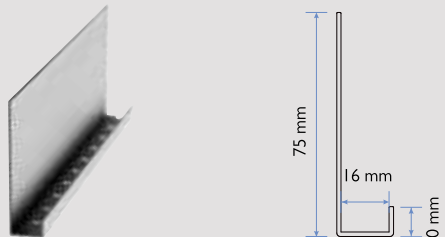
Flashing	Line Drawing	Description	Finish Available	Length (mm)
Internal 90° Angle		Back flashing for internal corners	Natural Anodised	3000 or 6000
Internal 'W' Angle		'W' back flashing for internal corners providing a flush finish with panels (13mm x 13mm)	Natural Anodised, Colour Powder Coated or Mill	3000 or 6000
Large Internal 'W' Angle		'W' back flashing for internal corners (25mm x 25mm) <b>Design Tip:</b> Use a Large 'W' where a flush junction between the Horizontal 'Z' flashing and corner flashing is desired	Natural Anodised, Colour Powder Coated or Mill	3000 or 6000
External Box Angle		Box corner for external corners providing a flush finish with panels	Natural Anodised, Colour Powder Coated or Mill	3000 or 6000
Large External Box Angle		Box corner for external corners (25mm x 25mm) <b>Design Tip:</b> Use Large External Box where a flush junction between the Horizontal 'Z' flashing and corner flashing is desired	Natural Anodised, Colour Powder Coated or Mill	3000 or 6000
Vertical Top Hat		Vertical sheet joint flashing	Natural Anodised, Colour Powder Coated or Mill	3000 or 6000
Cavity Base Closure		Restricts vermin from accessing the cavity space	Natural Anodised	3600

Table 4

Aluminium

Shadowclad® Flashings Range

Flashing	Line Drawing	Description	Finish Available	Length (mm)
Horizontal 'Z' Flashing		Horizontal 'Z' flashing for horizontal joints between panels	Natural Anodised, Colour Powder Coated or Mill	3600
Inter-Storey 'Z' Flashing		Horizontal 'Z' flashing for horizontal joints between panels when limiting continuous cavities to a height of two storeys or 7 metres	Natural Anodised, Colour Powder Coated or Mill	3600
Horizontal 'Z' Back Flashing		Back flashing for junction of butt jointed Horizontal 'Z' flashing	Mill	300
Inter-storey 'Z' Back Flashing		Back flashing for junction of butt joint 'Z' Flashing inter-storey	Mill	300

For the current range of Colour Powder Coated options please visit [www.shadowclad.co.nz](http://www.shadowclad.co.nz).

Table 5

Stainless Steel

Shadowclad® Flashings Range

Flashing	Line Drawing	Description	Finish Available	Length (mm)
Internal 90° Angle		Back flashing for internal corners	Stainless Steel	3000
Large Internal 'W' Angle		'W' back flashing for internal corners (25mm x 25mm)	Stainless Steel	3000
Large External Box Angle		Box corner for external corners (25mm x 25mm)	Stainless Steel	3000
Cavity Base Closure		Restricts vermin from accessing the cavity space	Stainless Steel	3000

Table 5

Stainless Steel

Shadowclad® Flashings Range

Flashing	Line Drawing	Description	Finish Available	Length (mm)
Horizontal 'Z' Flashing		Horizontal 'Z' flashing for horizontal joints between panels	Stainless Steel	3000
Inter-Storey 'Z' Flashing		Horizontal 'Z' flashing for horizontal joints between panels when limiting continuous cavities to a height of two storeys or 7 metres	Stainless Steel	3000

## 1.3 BUILDING MATERIALS FOR USE WITH SHADOWCLAD® (EXTERIOR CLADDING)

**Table 6: Materials Available from CHH Woodproducts**

	Description	Treatment	Size/Length
<b>Frame Flashing Tape<sup>1</sup></b>	For a secure and permanent seal of all Ecoply® Barrier openings (Use in conjunction with Sill Tape)	-	150mm/200mm x 30m
<b>Sealing Tape<sup>1</sup></b>	For a secure and permanent seal of all Ecoply Barrier vertical joints	-	60mm x 30m
<b>Sill Tape<sup>1</sup></b>	One piece stretchable sill tape for window and door sills. 2 rolls per box	-	150mm/200mm x 20m
<b>Ecoply® Barrier<sup>1</sup></b>	Rigid Air Barrier System	H3.2 CCA	2440mm/2745mm x 1200mm
<b>Cavity Batten</b>	45 x 20mm (nominal)	H3.1 LOSP	Random
<b>Flashings</b>	Aluminium and stainless steel flashings range	Refer Tables 4 and 5	Refer Tables 4 and 5

1. Please refer to the Ecoply® Barrier Specification and Installation Guide for more information.

### Building Materials Supplied by Other Manufacturers

- Fasteners (i.e. nails or screws) in accordance with Table 9: Fastener Lengths for Shadowclad® fixing.
- Building underlay compliant with Table 23 of E2/AS1.
- Window/door head flashings supplied by window joinery company.
- Paint in accordance with paint manufacturer's recommendations (refer to 5.3 Coating Selection for more details).

## 1.4 PRESERVATIVE TREATMENT

Shadowclad® is available either H3 treated for use as an exterior cladding or untreated (Natural finish products only) for interior wall and ceiling linings. H3 treated Shadowclad is treated in accordance with AS/NZS 1604.3 with the standard treatment for Shadowclad panels being H3.1 LOSP (Azole). H3.2 CCA treatment is available for Shadowclad Ultra panels if required.

**Shadowclad® is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative in accordance with the relevant manufacturer's instructions. Holdfast® Metalex® Concentrated Timber Preservative Clear (Holdfast® Metalex® Clear) is recommended. Failure to properly apply preservative to cut edges will negatively affect the durability of the cut panels.**

### H3.1 LOSP Treatment

H3.1 LOSP treatment is the standard treatment for Shadowclad panels as it does not discolour the panel surface and does not

use water in the treatment process allowing panels to remain at uniform dimensions.

When coating H3.1 LOSP treated plywood some residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

Mechanical fasteners are required to fix H3.1 LOSP treated Shadowclad to framing. Do not glue Shadowclad to frames.

### H3.2 CCA Treatment

H3.2 CCA uses water during the treatment process and may leave panel surfaces with a slight green colour. For this reason H3.2 CCA treatment is available only in the Shadowclad Ultra finish.

**Table 7: Preservative Treatment Options**

	Untreated	H3.1 LOSP (Azole)	H3.2 CCA
<b>Preservative Carrier</b>	N/A	Light organic oil (white spirits)	Water
<b>Colour</b>	Natural	Natural	Green
<b>Fungicide</b>	Heat treated dry wood	Propiconazole and Tebuconazole	Copper
<b>Insecticide</b>	Heat treated dry wood	Permethrin	Arsenate
<b>Other Chemicals</b>	N/A	Butyl Oxitol (co-solvent to assist active stability)	Chrome (to fix preservative in water)
<b>Mouldicide</b>	N/A	IPBC	Copper (limited efficiency)
<b>Notes</b>	Plywood for dry interior use, supplied ex mill at <15% moisture content	Solvent does not affect dimensions. Solvent smell disappears when exposed to air flow	Dried after treatment to average 18% moisture content
<b>Applications (Refer NZ3602)</b>	Interior dry protected	Exterior (service performance subject to detailing and coatings used)	Exterior (service performance subject to detailing and coatings used)

## 1.5 SUSTAINABILITY

Shadowclad® is manufactured from radiata pine. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Shadowclad is manufactured in New Zealand at CHH Woodproducts Tokoroa plywood mill.

Shadowclad is available Forestry Stewardship Council (FSC) (SCS-COC-001316) certified upon request.

## 1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, every sheet of Shadowclad plywood has the following information marked on the back:

- Brand name: e.g. SHADOWCLAD®.
- Intended application: e.g. STRUCTURAL.
- Glue bond: e.g. A BOND.
- Formaldehyde emission class: e.g. E0.
- Australasian Standard: e.g. AS/NZS 2269:2012.
- Treatment Standard (if applicable) e.g. AS/NZS 1604.3:2012.
- Date and time of manufacture: e.g. 01/12/15 12:34:56.
- The Engineered Wood Products Association of Australasia (EWPA) brand and mill number: e.g. 911 (Tokoroa mill).

### Treated Example

SHADOWCLAD® STRUCTURAL A BOND  
E0 AS/NZS 2269.0:2012  
AS/NZS 1604.3:2012 400 64 H3 E LO SP  
RETREAT CUTS PAT 01/12/15 12:23:45



### Untreated Example:

SHADOWCLAD STRUCTURAL A BOND  
E0 AS/NZS 2269.0:2012  
UNTREATED – FOR INTERNAL USE  
ONLY PAT 01/12/15 12:23:45



## 2.0 DESIGN CONSIDERATIONS

### 2.1 DESIGN RESPONSIBILITY

Design responsibility lies with the building owner and the professionals that they engage. The specifier for the project must ensure that the details in the specification for their individual projects are appropriate for the intended application. The specifier must also ensure that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature. It is the specifier's responsibility to ensure that non-CHH products are fit for purpose, and compatible with Shadowclad products.

Good detailing which avoids moisture or dust accumulation on the sheet surface can help increase durability and aesthetics. Roof overhangs contribute to performance as they offer shade and will protect walls from rain and dust. Trims should be bevelled to shed moisture and flashings should be detailed with gaps that do not trap water at the panel edges.

### 2.2 LITERATURE SCOPE

Shadowclad can be used for those structures which fall within the scope of Acceptable Solution E2/AS1 - External Moisture. Shadowclad is recommended for a drained and ventilated cavity, where the cladding is fixed onto timber battens fixed over the timber frame and building underlay.

Shadowclad is not recommended where a risk score >20 in accordance with E2/AS1 is established.

### 2.3 CODE COMPLIANCE

Shadowclad on a cavity wall system is tested in accordance with E2/VM1 and AS/NZS 4284 "Testing of Building Facades" for compliance with the NZBC Clause E2 - External Moisture.

### 2.4 SITE & FOUNDATIONS

The site on which the building is situated must comply with the Acceptable Solution E1/AS1 of the Approved Document for the NZBC Clause E1 - Surface Water.

## 2.5 GROUND CLEARANCES

The bottom edge of each Shadowclad® sheet must be a minimum of 50mm above decks and verandahs, 100mm above paved ground and a minimum of 175mm above unprotected ground.

Shadowclad must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604 and E2 - External Moisture. Maximum distance from the bottom of the sheet to the fixing shall not exceed 75mm.

For garage door openings, refer Paragraph 9 "Openings to garages" in Acceptable Solution E2/AS1.

## 2.6 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design and site exposure.

Wall construction design must effectively manage moisture, accounting for both the interior and exterior environments of the building. This is particularly important in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled.

Where a deck is attached to the building and the Shadowclad extends below the deck to cover the framing, keep decking clear of the Shadowclad surface and detail to avoid moisture entrapment.

All wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate Shadowclad flashings for waterproofing. Materials, components and the installation used to manage moisture in framed wall construction must, at a minimum, comply with the requirements of the NZBC.

## 2.7 WIND LOADING

Shadowclad is suitable for use in all wind zones up to and including extra high (55m/s) as defined by NZS 3604 and specific

design wind pressures up to design differential ultimate limit state (ULS) of 2.5kPa.

## 2.8 DURABILITY

The durability level applicable to Shadowclad is dependent upon the application and coating applied. Detailing, treatment and installation methods need careful consideration to satisfy the requirements of the NZBC.

### Internal Linings – 50 Year Durability

Untreated Shadowclad used in dry, interior situations will meet the requirements for 50 year minimum durability if coated or uncoated.

### Exterior Cladding – 15 Year Durability

**CHH Woodproducts does not recommend Shadowclad® is left uncoated when used as an exterior cladding.**

The NZBC Clause B2 requires claddings to achieve a minimum structural durability level of 15 years.

Shadowclad coated with stains or paints (regardless of colour choice) will meet this requirement. If using dark colours (colours with an LRV of less than 50%) homeowners should expect an increased level of coating maintenance over the life of the cladding than would normally be expected where lighter colours are used.

**Using dark colours with an LRV of less than 50% and failure to adequately maintain the surface coating of the cladding increases the risk of aesthetic related issues such as face checking.**

### Additional Notes:

For further advice on coatings refer to section 5.0: Coating and Application – Exterior Cladding.

## 2.9 TEXTURED VS. SMOOTH FINISHED PLYWOOD AS EXTERIOR CLADDING

Structurally, some smooth faced plywood products may meet the requirements of E2/AS1 however in CHH Woodproducts opinion smooth faced plywood does not retain a high visual appearance when directly exposed to weathering.

Where a high visual appearance is desired (such as exterior cladding) CHH Woodproducts recommends the use of Shadowclad rather than smooth faced plywood.

Shadowclad features a textured (bandsawn) face which reduces the visibility of natural face checking which can occur in any wood based product which has been exposed to weather for a prolonged period.

Face checks are not considered a manufacturing fault as they are part of a natural process and are merely an indication that it is time to re-apply the surface coating on the product.

## 2.10 HEALTH & SAFETY

Shadowclad® should be installed and used as per the Safety Data Sheet (SDS) which can be downloaded from [www.shadowclad.co.nz](http://www.shadowclad.co.nz).

Always wear safety glasses or non-fogging goggles when cutting Shadowclad panels and flashings.

If wood dust exposures are not controlled when machining (sawing, routing, planing, drilling etc.) a class P1 or P2 replaceable filter or disposable face piece respirator should be worn.

Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

## 2.11 STORAGE & HANDLING

### Shadowclad® Panels:

- Keep Shadowclad® panels dry.
- Store under cover.
- Handle and stack with care to avoid damage.
- Stack flat; clear of ground, on at least three evenly spaced bearers.
- Store in well-ventilated areas away from sources of heat, flames or sparks.

### Shadowclad Flashings:

- Keep dry. Should a shipment of Shadowclad flashings arrive in a wet condition, they should be immediately dried before storing.
- When storing flashings avoid contact with other metals which may cause scratches or marks. The use of shelving or racks faced with dry wood is recommended.
- Keep away from caustics, nitrates and acids.

## 3.0 INSTALLATION – INTERIOR LININGS

The use of untreated Shadowclad is acceptable under NZS 3604, NZBC for internal wall and ceiling linings where NZS 3602 allows the use of untreated plywood.

For detailed installation advice for plywood used as an internal lining refer to the Internal Linings Technical Bulletin, which is available to be downloaded from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz).

## 4.0 INSTALLATION – EXTERIOR CLADDING

### 4.1 FRAMING – DURABILITY

Refer to NZBC Acceptable Solution B2/AS1 “Durability”. External timber framing must be treated to a minimum H1.2 treatment. For timber treatment and allowable moisture content,

refer to NZS 3602 as well as framing manufacturer’s literature (e.g. Laserframe®). The current Laserframe Product Guide can be downloaded from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz).

### 4.2 FRAMING – CONSTRUCTION

Use kiln dried framing such as Laserframe in accordance with timber framing manufacturer’s specifications and treated in accordance with NZS 3602. The current Laserframe Product Guide can be downloaded from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz).

Timber frame sizes and set out must comply with NZS 3604 (or specifically designed to NZS 3603) and with stud and nog centres and timber width required by this specification.

All Shadowclad® sheet edges must be fully supported by framing.

- Studs must not exceed 600mm centres.
- Nogs must be provided at a maximum of 800mm centres.
  - When using vertical cover battens nogs at maximum 600 centres.
- An extra stud is required at internal corners for ventilated cavities.
- Refer to NZS 3602 for moisture content requirements as a guide, frame and cavity batten moisture content should be no greater than 20%.
- Framing must be kept as dry as possible at all times.
- Single spans of Shadowclad® should not exceed 600mm (e.g. below windows or balustrades).

### 4.3 PREPARATION – BUILDING UNDERLAY & RIGID AIR BARRIER

The use of building underlay compliant with Table 23 of E2/AS1 or an alternative solution rigid air barrier must be provided over framing prior to the installation of exterior cladding.

- Barriers to air flow are required.
- Rigid air barriers are required in extra high wind zones and above.

- Rigid air barriers are also required in high wind zones and above for Ministry of Education school properties.

For more information on rigid air barriers refer to the current Ecoply® Barrier Specification and Installation Guide which can be downloaded from [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz).

### 4.4 PREPARATION – CAVITY CONSTRUCTION

#### Cavity Construction

A Shadowclad cavity base closure must be installed at the bottom of all walls and above window heads, this provides vermin proofing to ventilation openings. The holes in the cavity base closure must be kept clear to enable ongoing drainage and ventilation of the cavity.

#### Cavity Battens

Cavity battens provide an air space between the frame and the sheet and are considered a “packer” when installed in accordance with Acceptable Solution E2/AS1.

The battens must be fixed over the building underlay or a rigid air barrier.

All timber battens must: be nominal 20mm thick (between limits of 18mm and 25mm in thickness); at least the same width as the stud; and minimum H3.1 LOSP treated in accordance with NZS 3640.

Polystyrene battens **must not** be used with H3.1 LOSP treated Shadowclad panels, as they may melt in contact with solvents.

Battens must be fixed over the building underlay/rigid air barrier to all studs, as follows.

If studs are at 600mm centres:

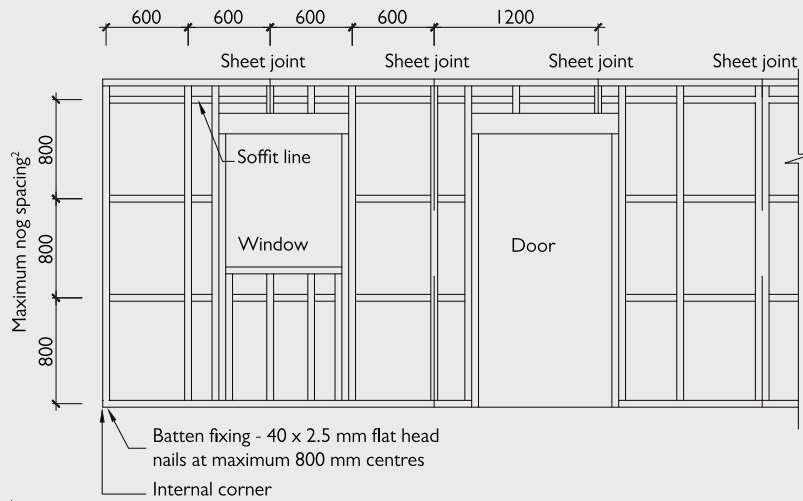
- Battens must be fixed vertically at 300mm centres (i.e. a batten on studs and one in between the two studs fixed to top and bottom plates and nogs).
- Battens fixed to studs are to support Shadowclad and restrain building underlay and insulation from bulging into the cavity.
- The Shadowclad must not be fixed to these cavity battens where there is no framing behind them.

If studs are at 400mm centres battens may be fixed on studs only.

Horizontal battens must be used at the top of the wall to block the top of the cavity from venting into the roof space.

Cavity spacers (i.e. short pieces of cavity batten) may be used to support the bottom sheet edge (or provide intermediate support where required e.g. above window openings) but must allow water drainage to the outside. The cavity spacers must be fixed at a 5° minimum slope with a 50mm minimum air gap at either side.

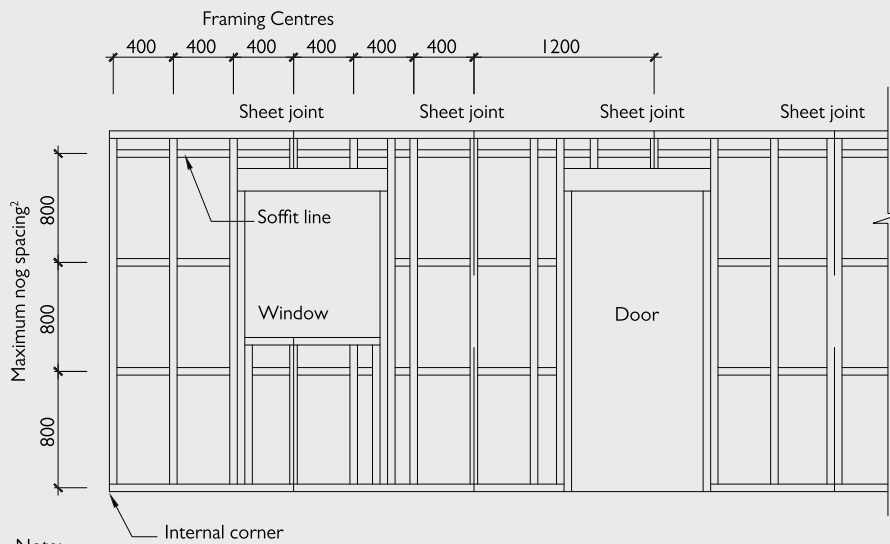
### SC001: Typical Framing Setout (without Battens) Studs at 600 Centres



Note:

1. Single spans of Shadowclad® must not exceed 600 mm (e.g. below windows or on balustrades)
2. When using vertical cover battens, nogs at maximum 600 centres

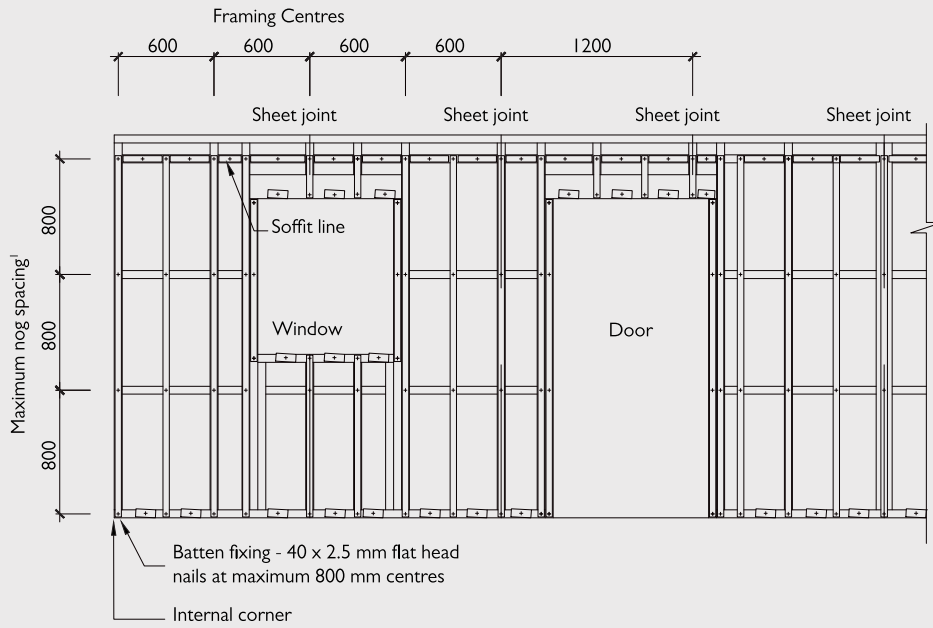
### SC001A: Typical Framing Setout (without Battens) Studs at 400 Centres



Note:

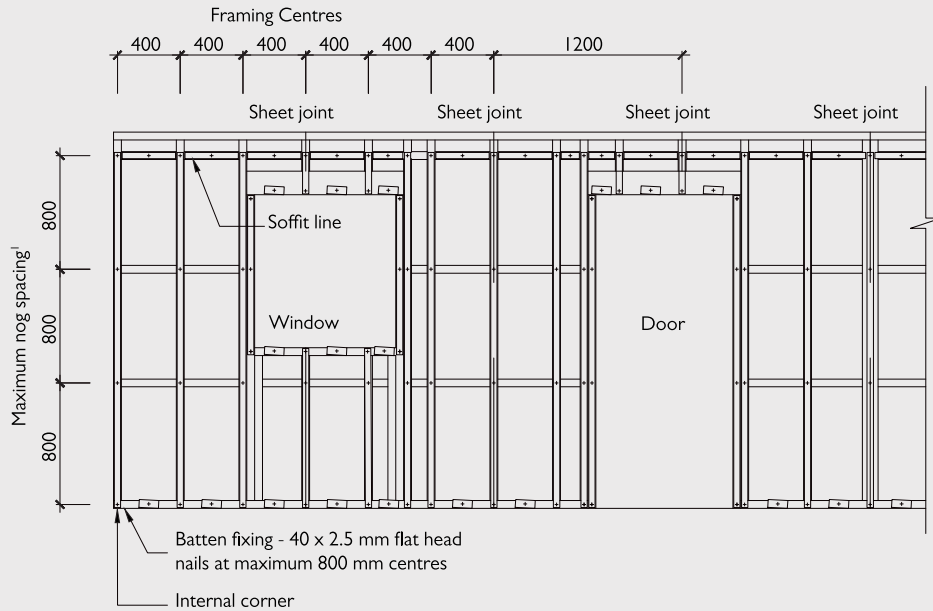
1. Single spans of Shadowclad must not exceed 600 mm (e.g. below windows or on balustrades)
2. When using vertical cover battens, nogs at maximum 600 centres

SC002: Typical Framing Setout (with Battens) Studs at 600 Centres



Note:  
1. When using vertical cover battens nogs at maximum 600 centres

SC002A: Typical Framing Setout (with Battens) Studs at 400 Centres



Note:  
1. When using vertical cover battens nogs at maximum 600 centres

## 4.5 SHEET LAYOUT

A sheet layout should form part of architectural drawings and be used from the basis of stud/framing layout.

- Sheet edges must be supported by the framing.
- Sheets are designed to be vertically fixed. **Do not fix sheets horizontally.**
- When laying up on to framing, start at framing corners and work across the wall.

- All treated Shadowclad® panels are envelope preservative treated. Where sheets are cut, edges **must** be coated with a brush on timber preservative such as Holdfast® Metalex® Clear.
- Cut edges **must** be placed at the top of the sheet to avoid rain drips soaking in to cut end grains.
- Priming the bottom edges and the back (rear) of the sheets to a height of 150mm is required.
  - Shadowclad® Ultra sheets are coated on the rear to a height of 150mm (minimum) to meet this requirement.

## 4.6 FIXINGS – FASTENER DURABILITY

**Table 8: Fastener Durability for Shadowclad®**

Finish	Treatment	Exposure Zone (Refer to Section 4 of NZS 3604)	Material Required
Shadowclad® Natural/Ultra	H3.1 LOSP	Zones B and C	Minimum hot dipped galvanised or better
		Zone D (sea spray)	Stainless Steel
Shadowclad Ultra	H3.2 CCA	All Zones	Stainless Steel

## 4.7 FIXINGS – FASTENER SIZE & LAYOUT

**Table 9: Fastener Lengths for Shadowclad**

Minimum Fastener Length and Size (Cavity Fix)	
Nails in Timber	60 x 2.8mm
Screws in Timber	8g x 65mm

Shadowclad® **must** be nailed or screwed to timber as per below:

- Use flat head (full round head) nails or rose head nails with timber framing. Rose head nails should be considered where a more decorative fastener is desired.
- Standard fixing pattern: fasten sheet edges at 150mm centres and within the panel on all supports at 300mm centres.
- Do not fix to battens that are not installed over studs as the nails will puncture the building wrap.
- Fasten no closer than 7mm to sheet edges except on edge with top lap (weather groove lap), **do not nail through top lap.**
- Fasten Ship lap joints independently to ensure natural sheet expansion is not restricted.
- When using a rigid air barrier the Shadowclad fastener lengths should be increased by the thickness of the panel to ensure required fastener pull out loadings are achieved.
- Drive nails and screws flush.
- Do not nail through the grooves in Shadowclad Groove panels.

### Power Driven Fastening

- Best practice is to hand drive nails as better control of nail depth is achieved.
- Paslode Impulse Nailers may be used to fire power driven nails. Refer to Paslode for suitable fasteners as per the minimum lengths stated in Table 9.
- Do not overdrive nails into the sheet.

### Fixings at Vertical Sheet Join

Shadowclad Sheets must be fastened off independently to each other. SC006A and SC008A show specific fastener locations to accommodate the Ship lap joint. For Shadowclad Texture and Shadowclad Groove respectively fasten underlap 13mm from sheet edge, with overlap fasten 23mm from sheet edge as detailed.

## 4.8 INSTALLATION TOOLS FOR SHADOWCLAD®

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Correct installation and maintenance of Shadowclad® is necessary to ensure that compliance with the New Zealand Building Code, durability, structural integrity and weathertightness are maintained. CHH Woodproducts are proud to introduce two installation tools to compliment the Shadowclad Specification and Installation Guides. These products are an extension of the Specification and Installation Guides and are available by contacting CHH Woodproducts directly via [www.shadowclad.co.nz](http://www.shadowclad.co.nz) or by calling 0800 326 759.

### **Shadowclad® sITe APP**

The Shadowclad sITe APP is a tool for all building practitioners to aid in the installation of Shadowclad in accordance with the CHH Woodproducts Specification and Installation Guides. The APP includes a context sensitive Key Design Points and Installation Checklist, access to all current literature, installation details, maintenance and other key installation requirements.

### **Shadowclad Stick**

The Shadowclad Stick is an installation tool for Shadowclad. This tool removes the need for builders to develop their own 'jigs' to aid in ensuring that critical clearances, nail spacing's, etc. are applied during the installation of Shadowclad sheets.

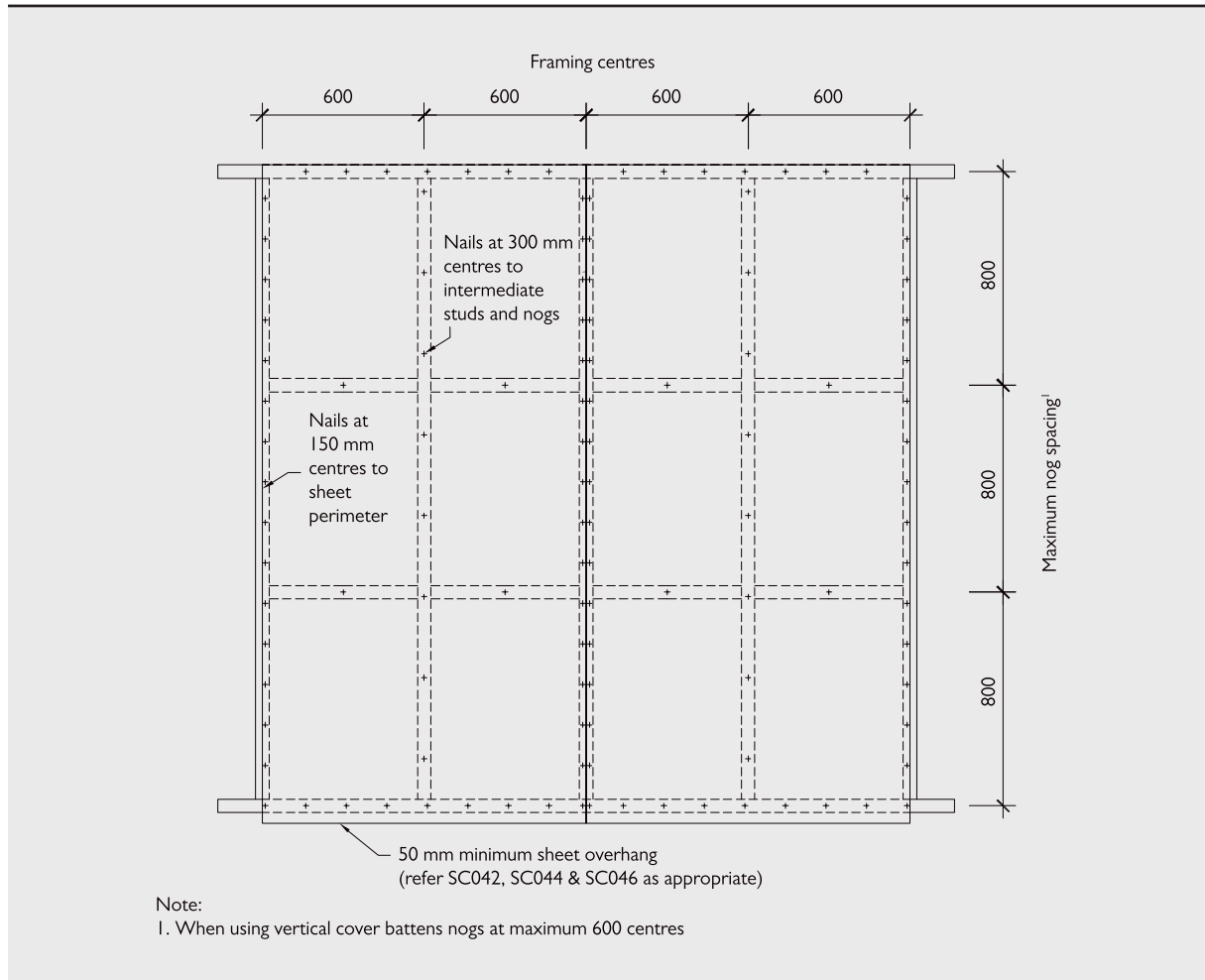
## 4.9 SHADOWCLAD® KEY INSTALLATION & DESIGN POINTS

The following tasks are provided to installers to point out key installation and design factors when used as an exterior cladding. These do not detract from the requirements to read and understand this literature as a whole.

Task	Tick when checked
<b>Prior to Specification and Installation</b>	
Read the Shadowclad® Specification and Installation Guide in its entirety	<input type="checkbox"/>
<b>Framing Plan</b>	
Framing setout drawings to suit Shadowclad fixing and installation guidelines	<input type="checkbox"/>
<b>Sheet Cuts</b>	
Coat all sheet cuts with a preservative timber treatment such as Holdfast® Metalex® Clear	<input type="checkbox"/>
After applying Holdfast® Metalex® Clear, apply the surface coating (e.g. paint or stain) to cut edges	<input type="checkbox"/>
Place uncut edge to bottom	<input type="checkbox"/>
<b>Fastener Material Type</b>	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones and with H3.2 CCA treated Shadowclad Ultra)	<input type="checkbox"/>
<b>Sheet Fastener Pattern</b>	
Around sheet edge – maximum 150mm centre spacing	<input type="checkbox"/>
Within sheet body – maximum 300mm centre spacing	<input type="checkbox"/>
<b>Horizontal Sheet Joints</b>	
Minimum 9mm separation gap between sheets above all Horizontal 'Z' flashings	<input type="checkbox"/>
Prime the bottom of the sheet edge and 150mm up the back (rear) of the sheets	<input type="checkbox"/>
50mm strip of neutral cure silicon sealant or stop ends at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings	<input type="checkbox"/>
Back flashings or 150mm overlap to all flashing butt joints	<input type="checkbox"/>
<b>Expansion Gaps Between Sheets (Vertical Sheet Joints)</b>	
Texture Profile Sheets - 2mm gap between vertical edges of sheets	<input type="checkbox"/>
Groove Profile Sheets - 9mm gap (i.e. full groove space) between vertical edges of sheets	<input type="checkbox"/>
Note: Expansion gaps required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
<b>Ground Clearances</b>	
Paved/Sealed Ground - minimum 100mm distance from the ground to sheet bottom	<input type="checkbox"/>
Broken Ground - minimum 175mm distance from the ground to sheet bottom	<input type="checkbox"/>
Prime the bottom of the sheet 150mm up the back (rear) of the sheet	<input type="checkbox"/>

Refer to the current Shadowclad® Specification and Installation Guide for full installation specifications and suggested details.

## SC003: Shadowclad® Fastener Layout (Studs at 600 Centres Shown)



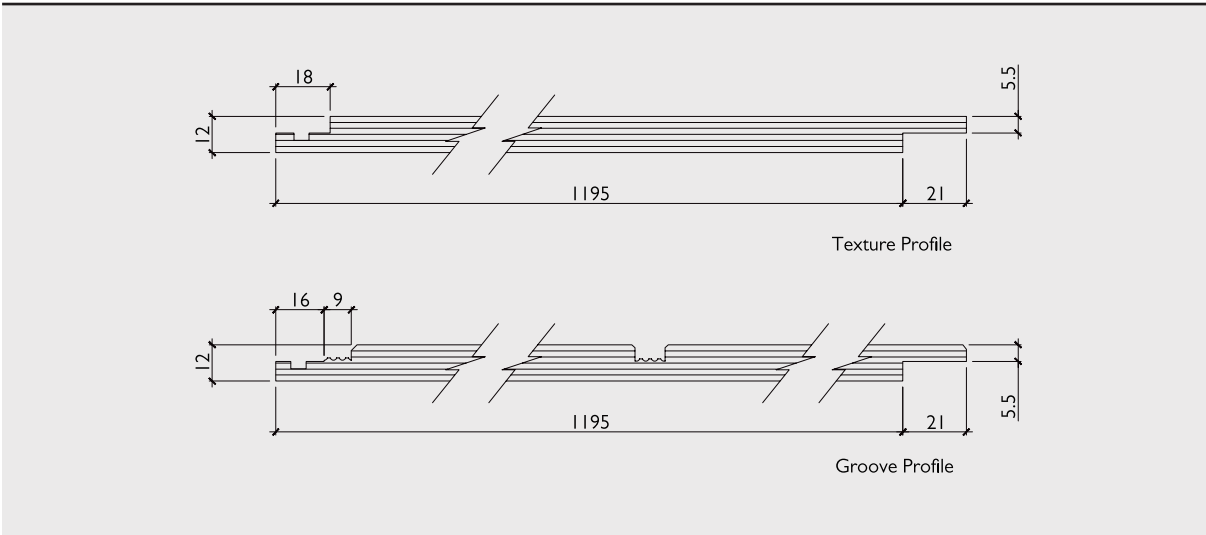
## 4.10 VERTICAL SHEET JOINTS

Shadowclad® sheets have a built-in Ship lap joint and weather groove on the long edges of all sheets.

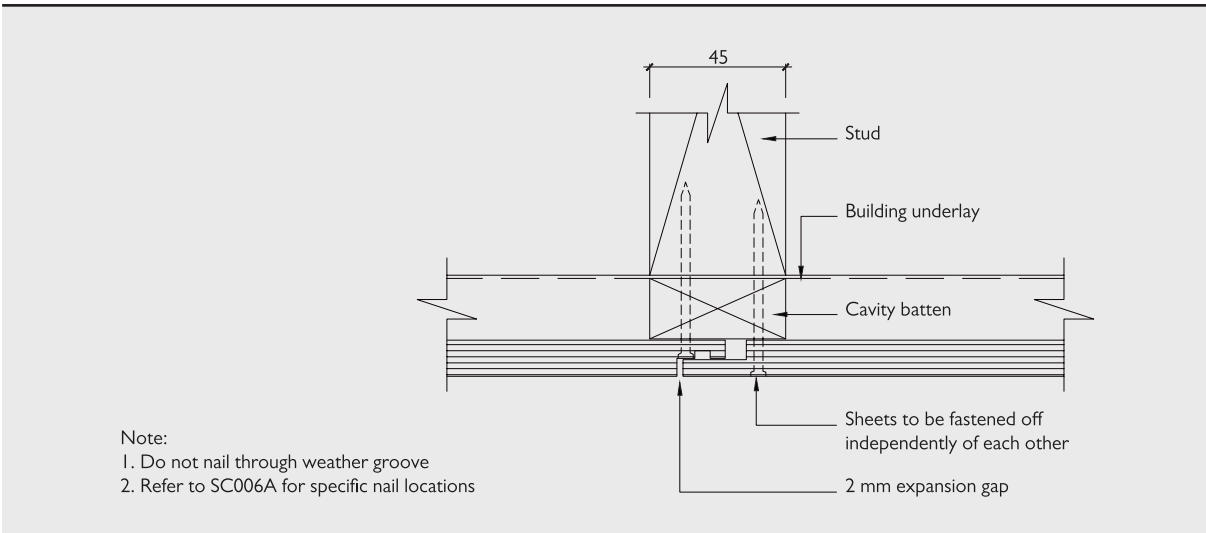
When installing Shadowclad Groove profile sheets, use a 9mm temporary spacer in the groove alongside Ship lap joint to establish correct expansion gap.

**Shadowclad® is envelope preservative treated. Where sheets are cut, ends must be coated with a brush on timber preservative in accordance with the relevant manufacturer's instructions. Holdfast® Metalex® Clear is recommended. Failure to properly apply preservative to cut edges will negatively affect the durability of cut panels.**

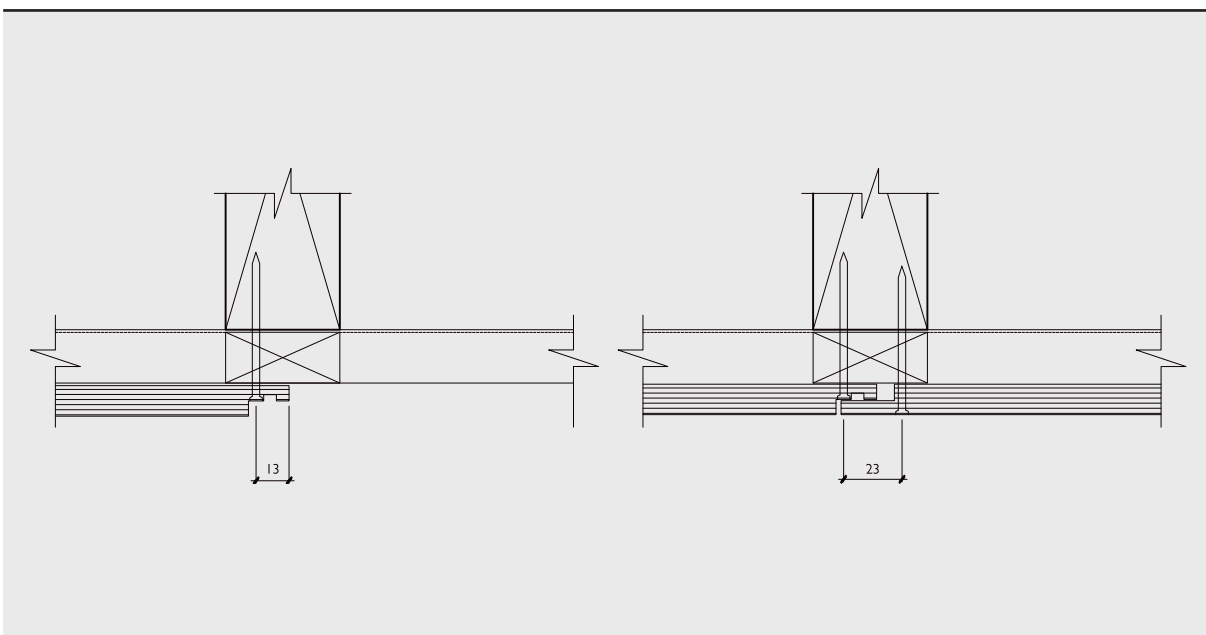
SC004: Shadowclad® Texture and Groove Sheet Dimensions



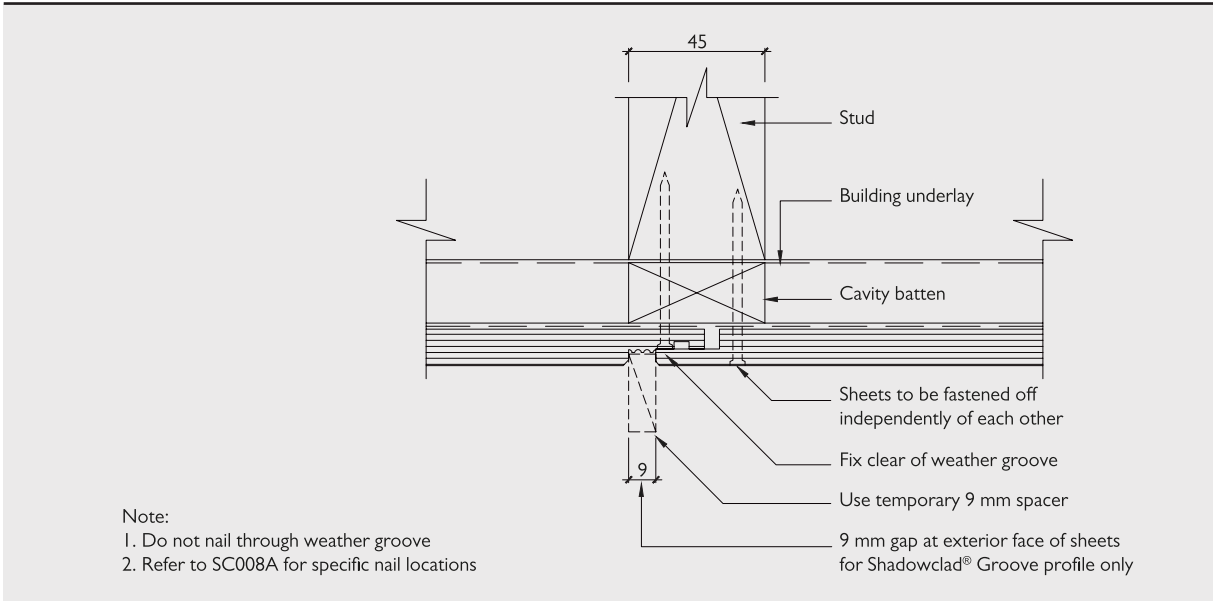
SC006: Shadowclad Texture Vertical Joint (Cavity)



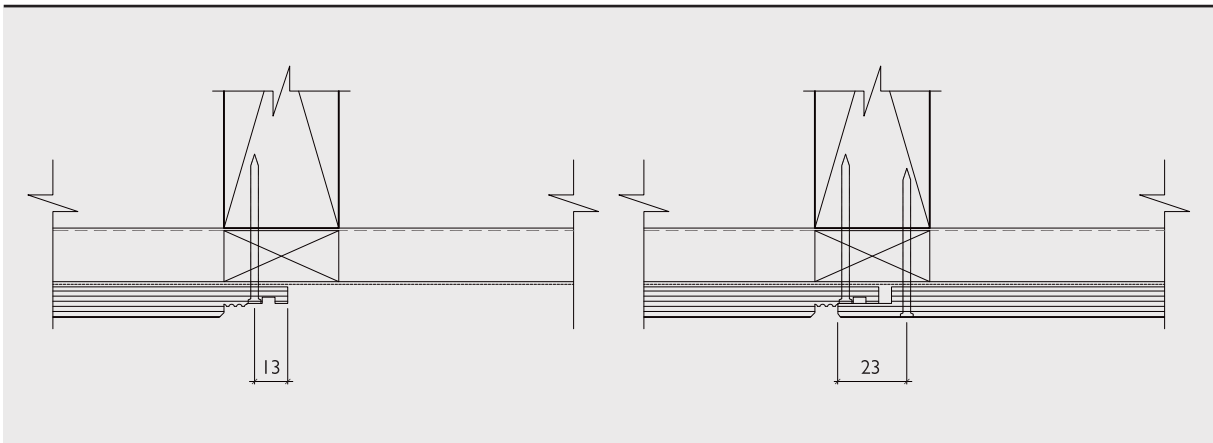
SC006A: Shadowclad Texture Vertical Joint Fastener Locations (Cavity)



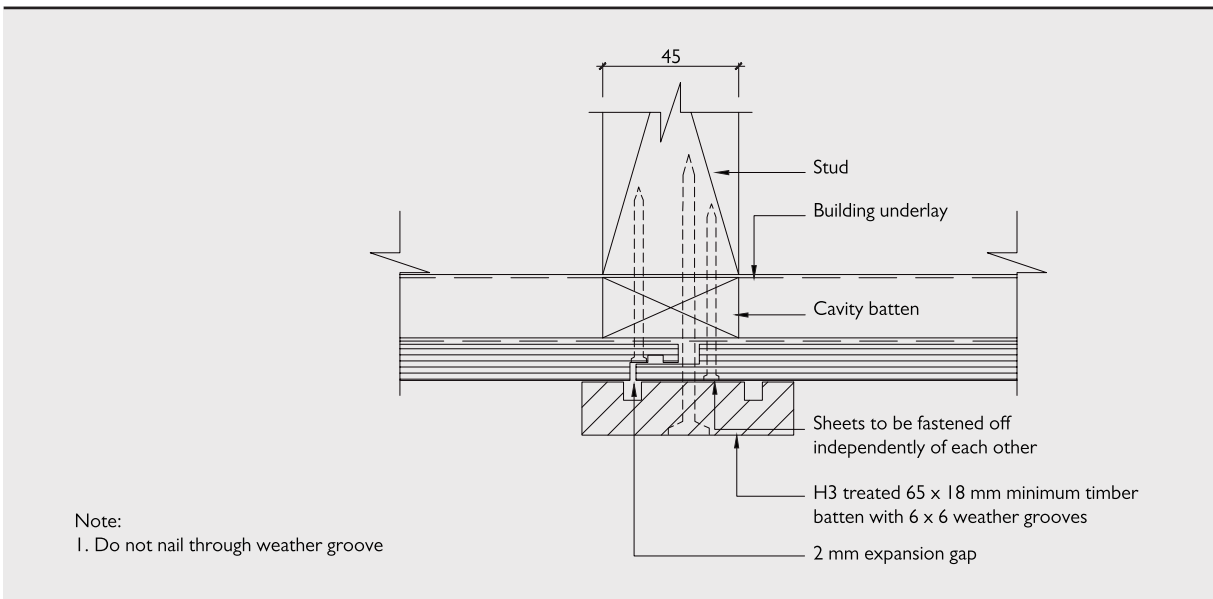
**SC008: Shadowclad® Groove Vertical Joint (Cavity)**



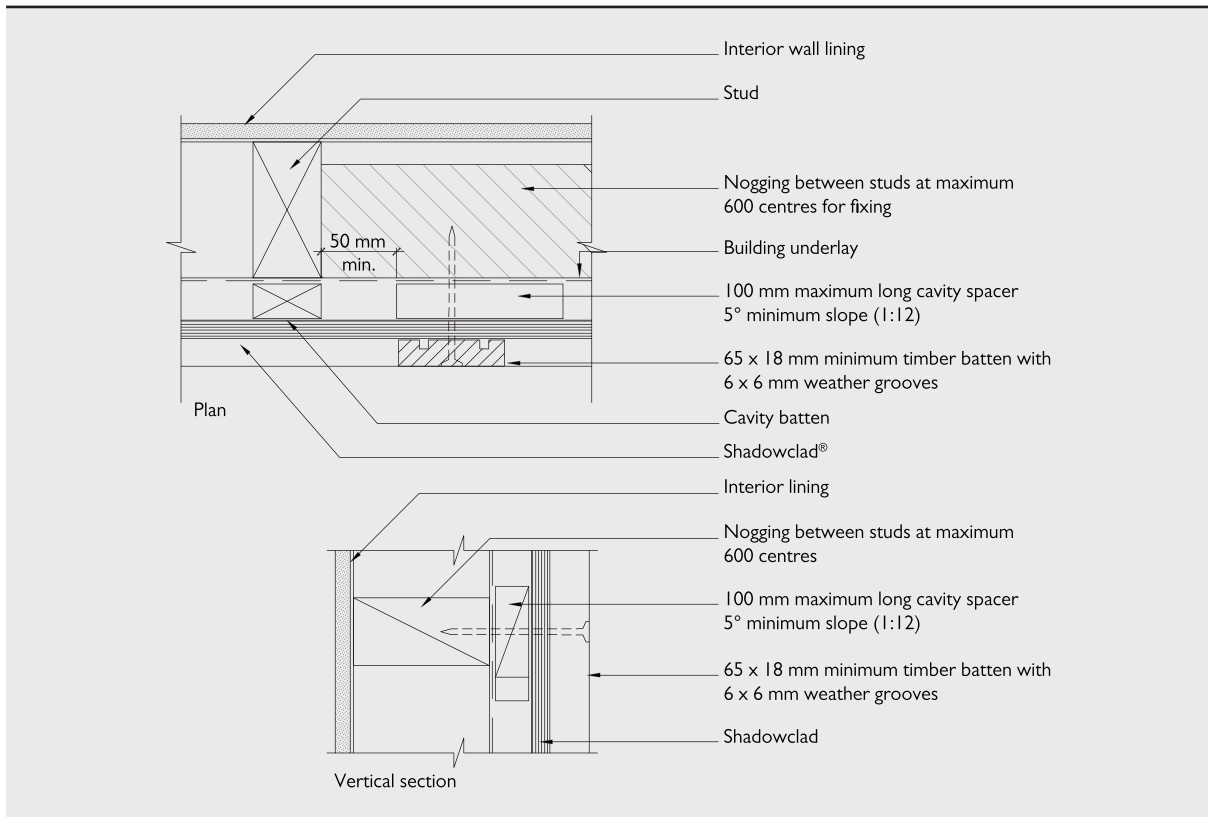
**SC008A: Shadowclad Groove Vertical Joint Fastener Locations (Cavity)**



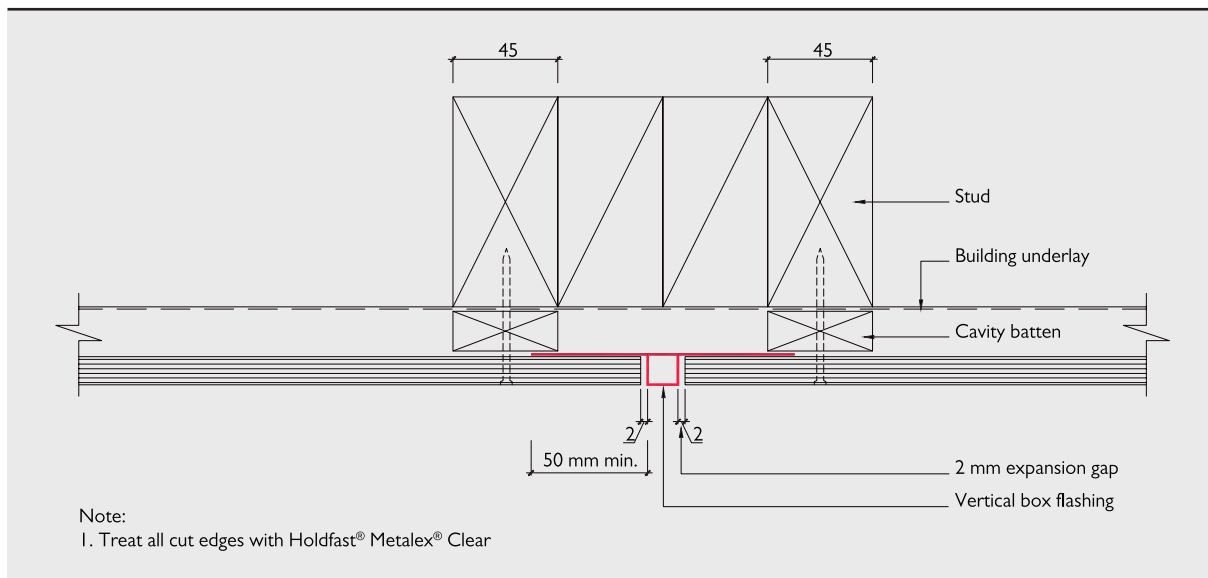
**SC010: Shadowclad Vertical Joint with Optional Cover Batten (Cavity)**



### SC012: Shadowclad® Nogging for Vertical Cover Batten Between Studs (Cavity)



### SC014: Shadowclad Vertical Joint with Top Hat Flashing (Cavity)



## 4.1.1 HORIZONTAL SHEET JOINTS

At floor joist level a horizontal joint must be provided to accommodate the movement resulting from timber joist shrinkage and settlement.

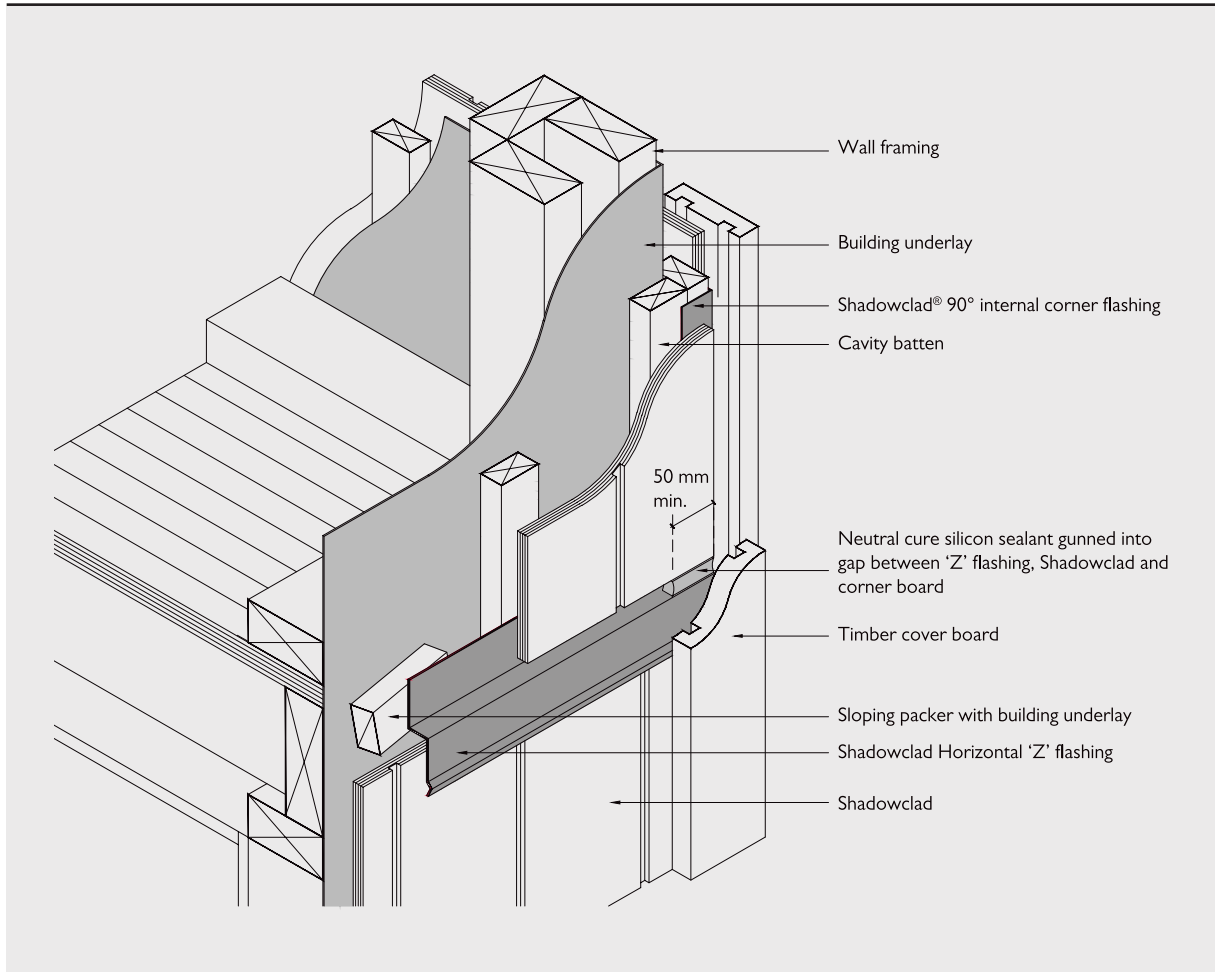
A Shadowclad® Horizontal 'Z' flashing should be used for horizontal sheet joints.

Acceptable Solution E2/AS1 requires drained cavities to be limited to a height of two storeys.

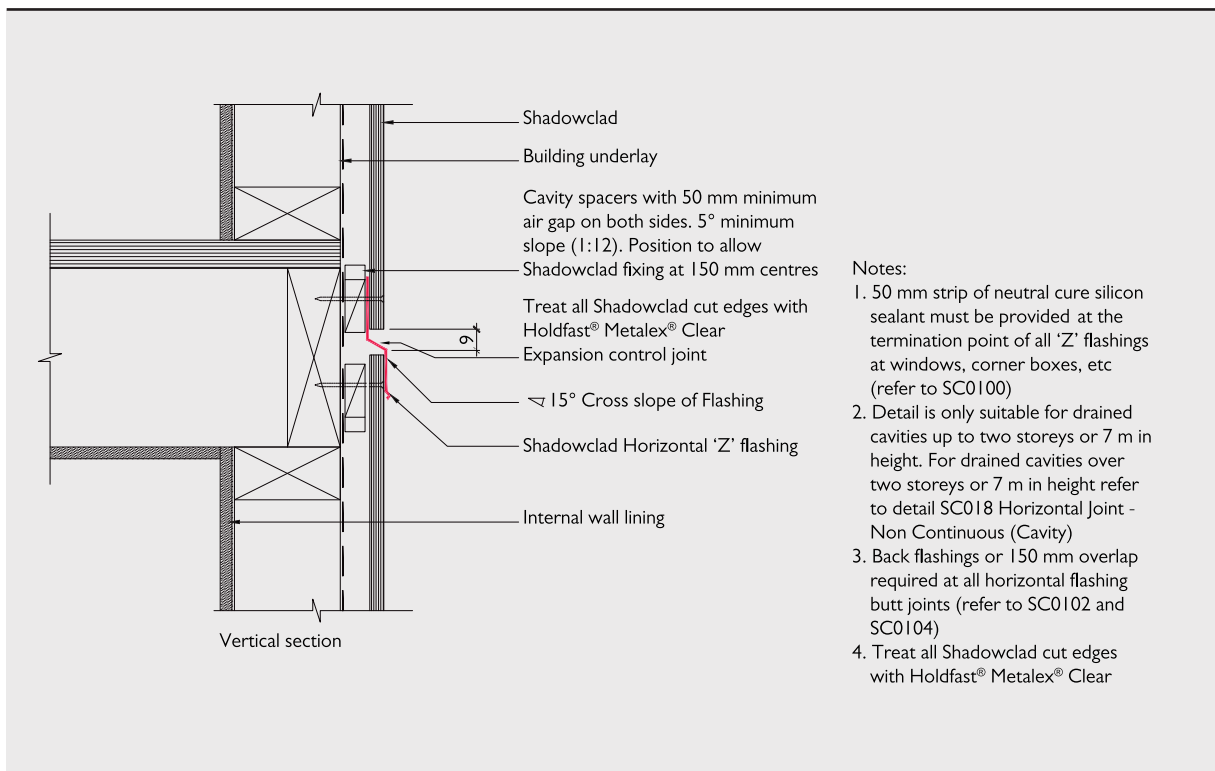
If aluminium 'Z' flashings are being used, all butt joints must include proprietary back flashings. Stainless steel flashings should be lapped by a minimum 150mm at joints.

A 50mm strip of neutral cure silicon (refer to SC0100 General Silicon Sealing of Horizontal 'Z' Flashings) or stop ends (as applicable) required at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings.

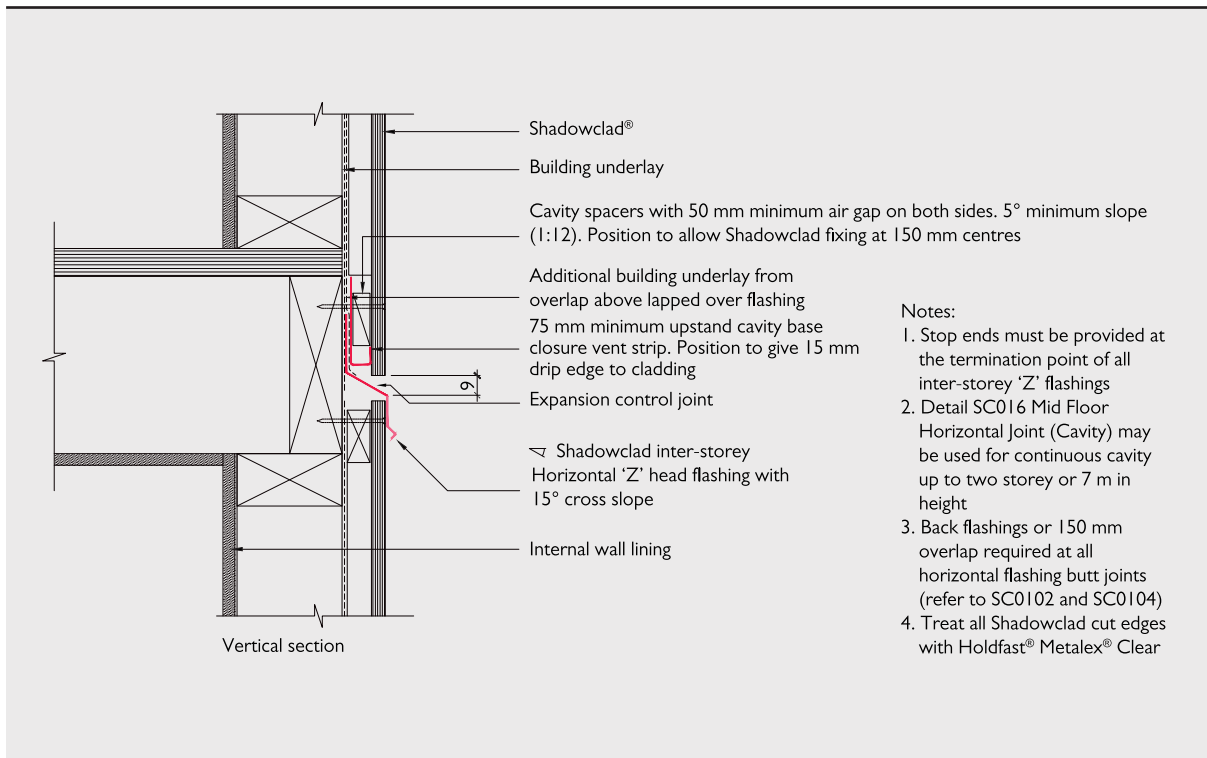
## SC0100: Shadowclad® General Silicon Sealing of Horizontal 'Z' Flashings



## SC016: Shadowclad Mid Floor Horizontal Joint (Cavity)

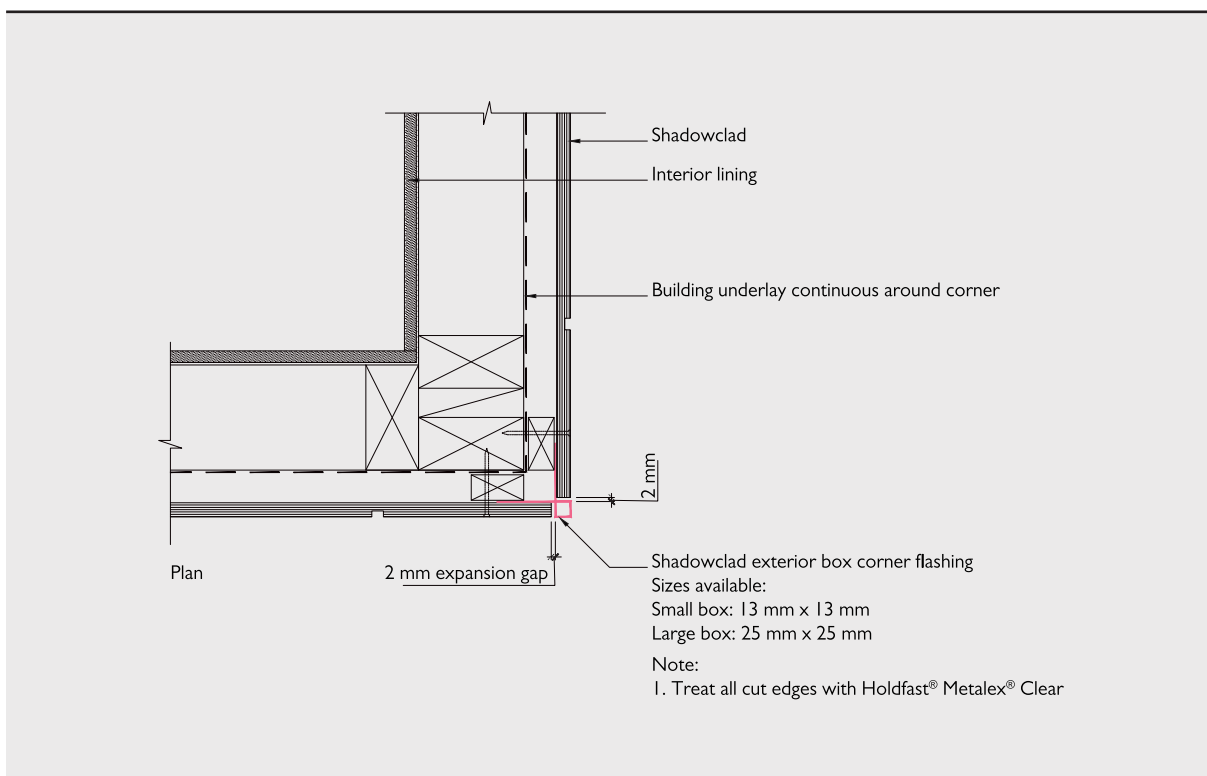


### SC018: Shadowclad® Mid Floor Horizontal Joint – Non Continuous (Cavity)

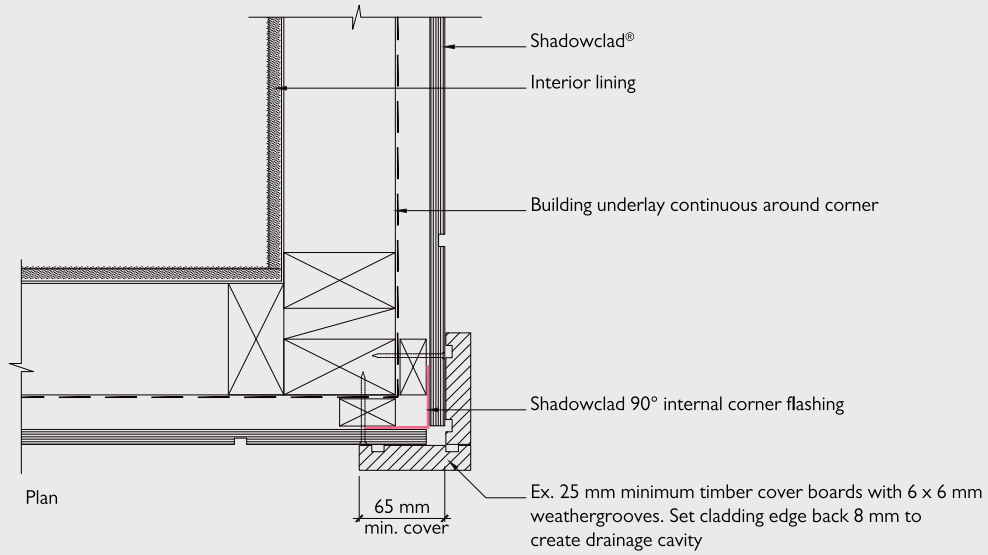


## 4.12 EXTERNAL CORNERS

### SC020: Shadowclad External Corner with External Box Flashing (Cavity)



## SC022: Shadowclad® External Corner with Cover Boards (Cavity)

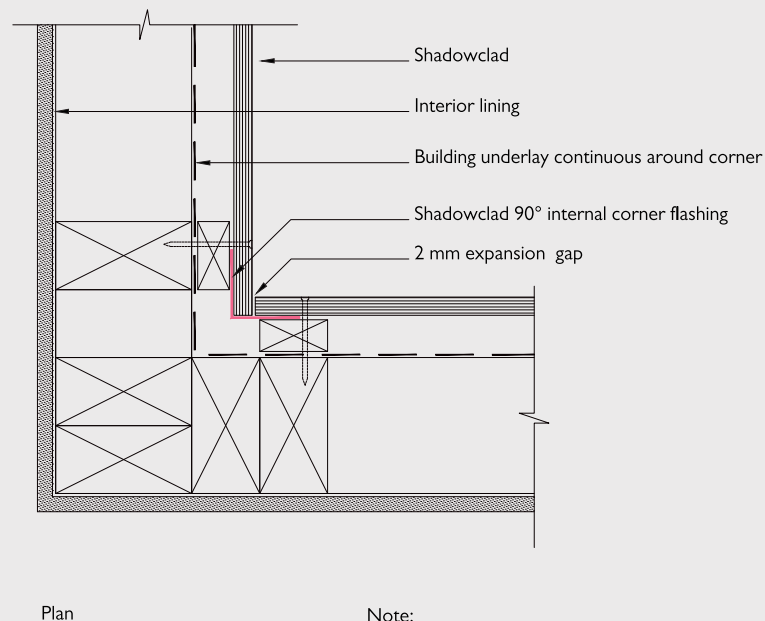


## Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. 50 mm strip of sealant must be provided at the termination point of all 'Z' flashings at windows, corner boxes, etc. (refer to SC0100)

## 4.13 INTERNAL CORNERS

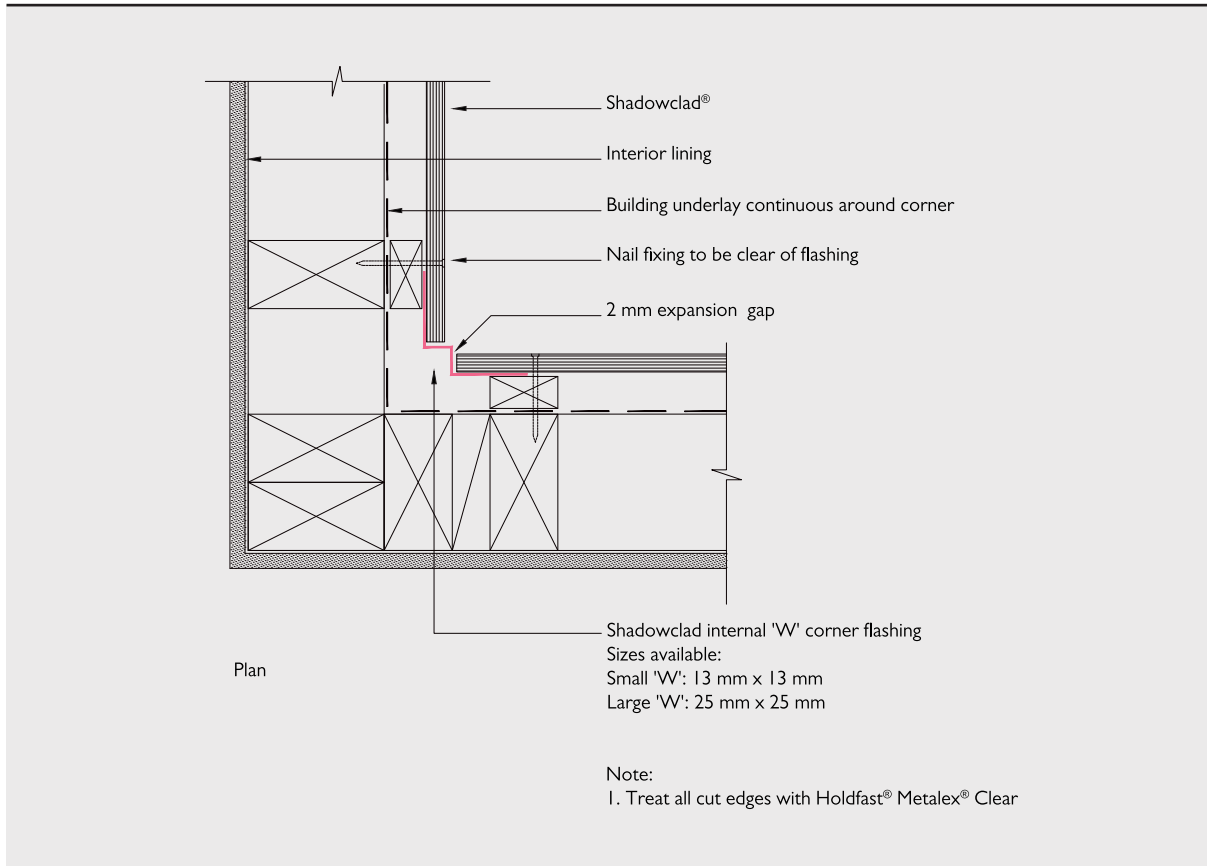
## SC024: Shadowclad Internal Corner with 90° Flashing (Cavity)



## Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

## SC026: Shadowclad® Internal Corner with 'W' Flashing (Cavity)



### 4.14 SHADOWCLAD® FLASHING JUNCTION POINTS

Flashings should have expansion joints where necessary to provide adequate allowance for thermal expansion as set out below.

- Expansion joints to be provided for joined flashings when their combined length exceeds 8 metres.
- Even if less than 8 metres in length, where both ends of a flashing are constrained and fixed, allowance should be made for expansion.

#### Cavity Base Closure

Fix Shadowclad® cavity base closures to bottom plates through the upstand with 40 x 2.5mm, hot dipped galvanised or stainless steel (as appropriate) flat head nails at 300mm centres.

The cavity base closure should be positioned to allow a minimum drip edge to the wall cladding of 15mm at the base of walls, and 15mm above window head flashings.

#### Internal and External Flashings

Internal and external angles and 'Z' flashings can be nominally fixed with hot dipped galvanised or stainless steel (as applicable) flat head nails and then permanently fixed with the Shadowclad fasteners penetrating the flashing wings/upstands.

#### Horizontal 'Z' Flashings

Horizontal aluminium 'Z' flashings should be butted together with a back flashing to create a weathertight joint (refer to SC0102).

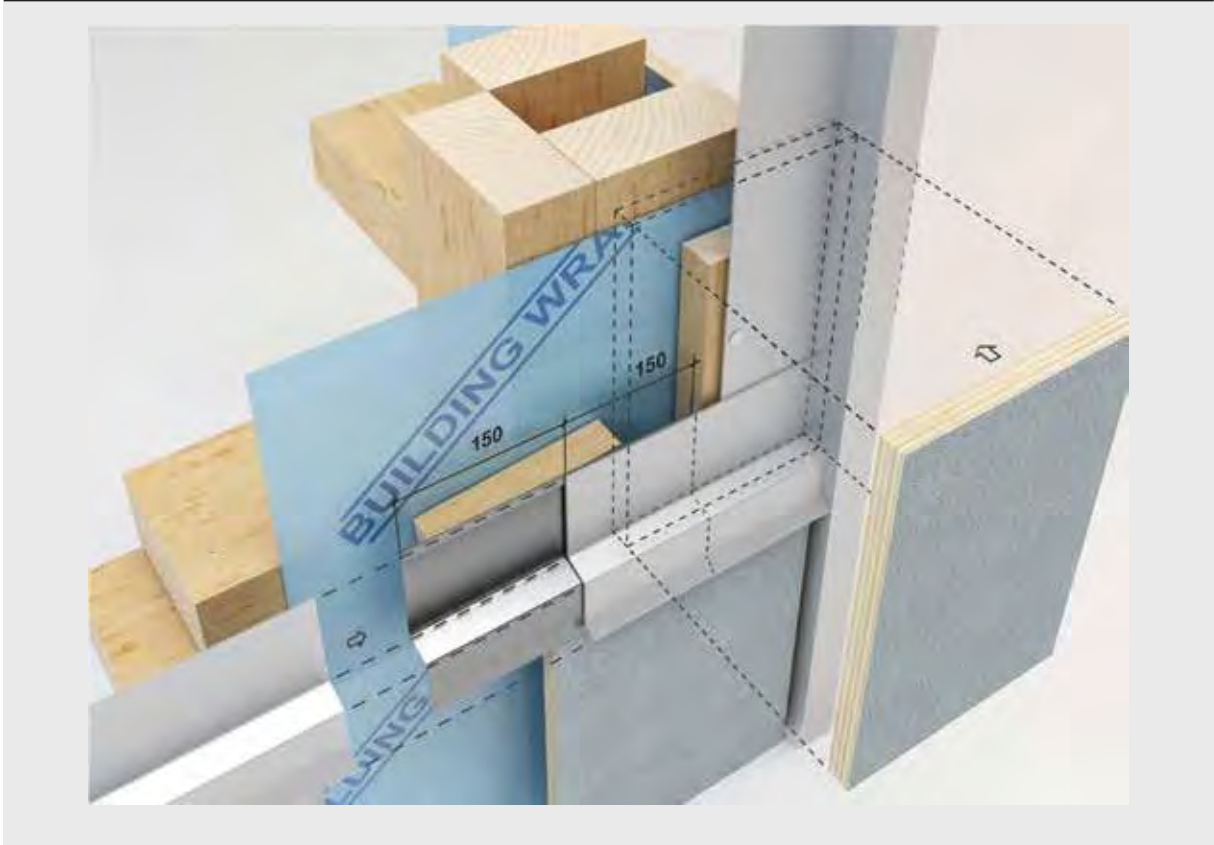
Stainless steel back flashings should overlap by a minimum of 150mm at joints to create weathertight joints where horizontal flashings meet (refer to SC0104).

#### 'Z' Flashings Terminations

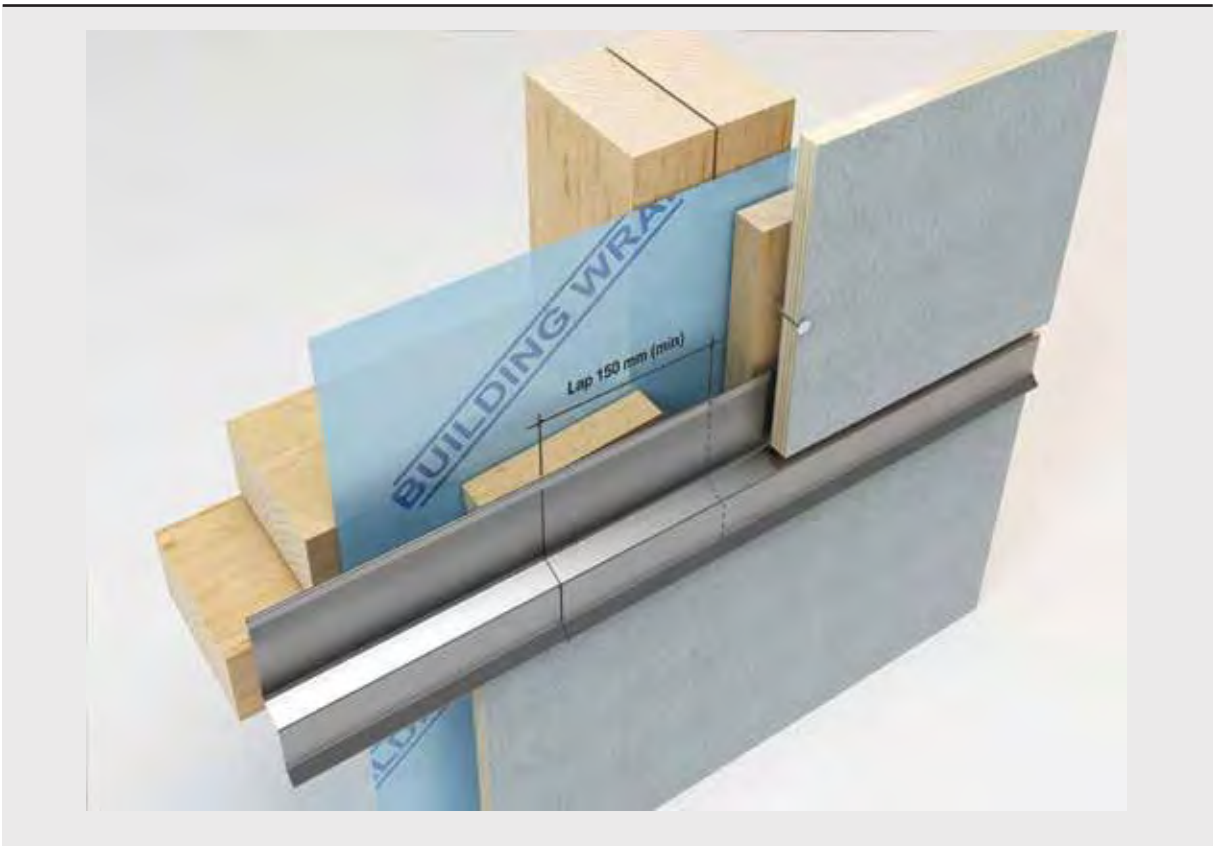
Where inter-storey 'Z' flashings terminate stop ends must be installed.

A 50mm strip of neutral cure silicon (refer to SC0100 General Silicon Sealing of Horizontal 'Z' Flashings) or stop ends (as applicable) required at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings.

SC0102: Shadowclad® Aluminium Flashing Junctions and Connections (Cavity)



SC0104: Shadowclad Stainless Steel 'Z' Flashing Joins (Cavity)

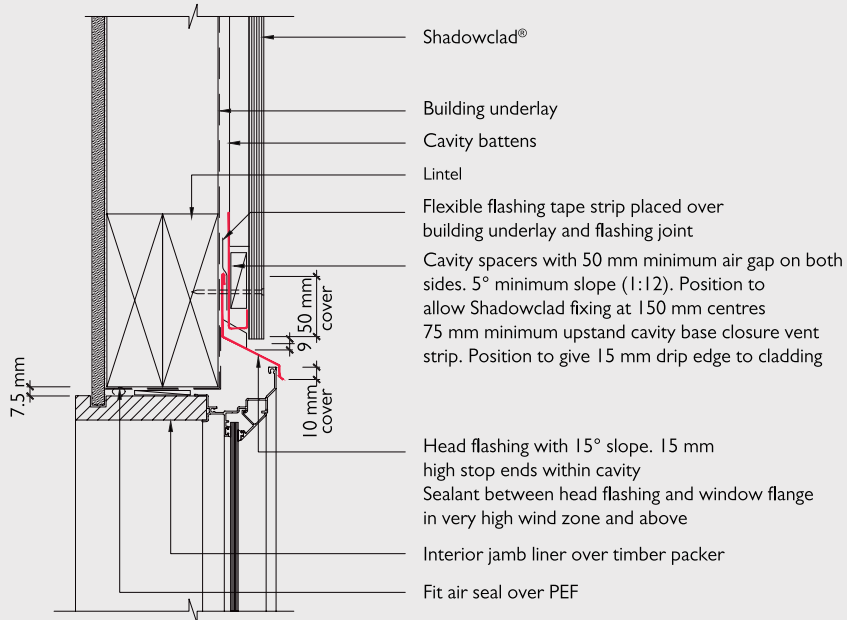


## 4.15 WINDOW PENETRATIONS

Window joinery flashings (i.e. head and sill flashings) should be sourced from the joinery fabricator to meet the requirements of Acceptable Solution E2/AS1 or an Alternative Solution such

as the Window Association of New Zealand Window Installation System (WANZ WIS) which can be downloaded at [www.wanz.org.nz](http://www.wanz.org.nz).

### SC028: Shadowclad® Window Head Detail (Cavity)

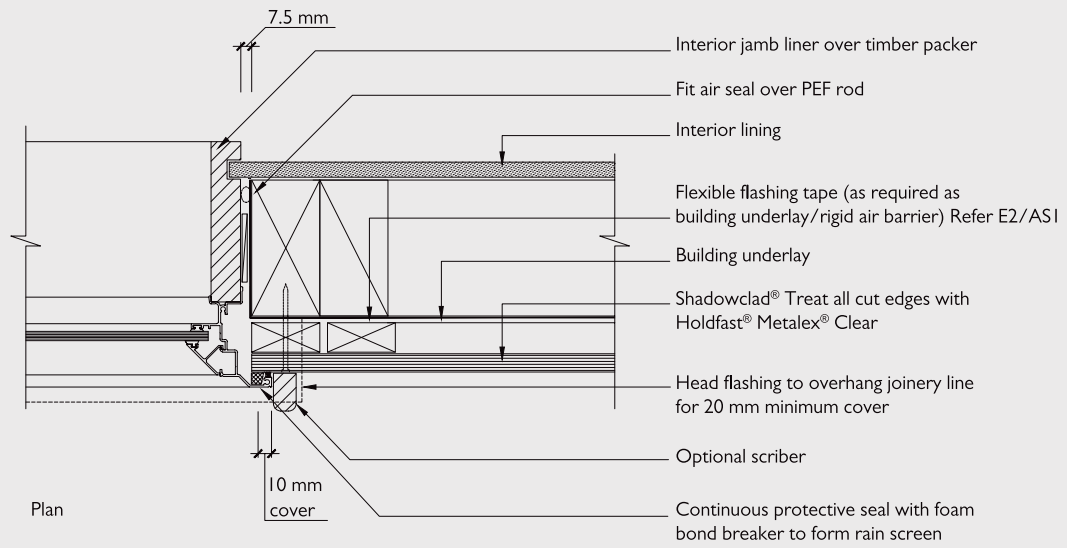


Note:

1. Treat all cut edges with Holdfast® Metalex® Clear
2. Stop ends to head flashing terminations



## SC030: Shadowclad® Jamb Detail (Cavity)

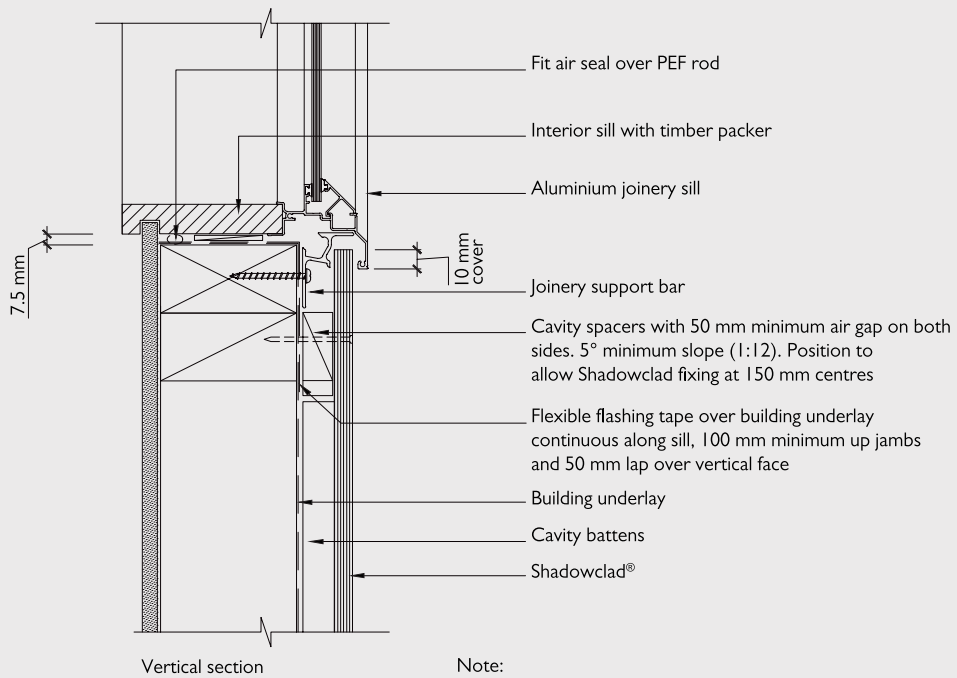


## Note:

1. Treat all Shadowclad cut edges with Holdfast® Metalex® Clear
2. 50 mm strip of sealant must be provided at the termination point of all 'Z' flashings at windows, corner boxes, etc

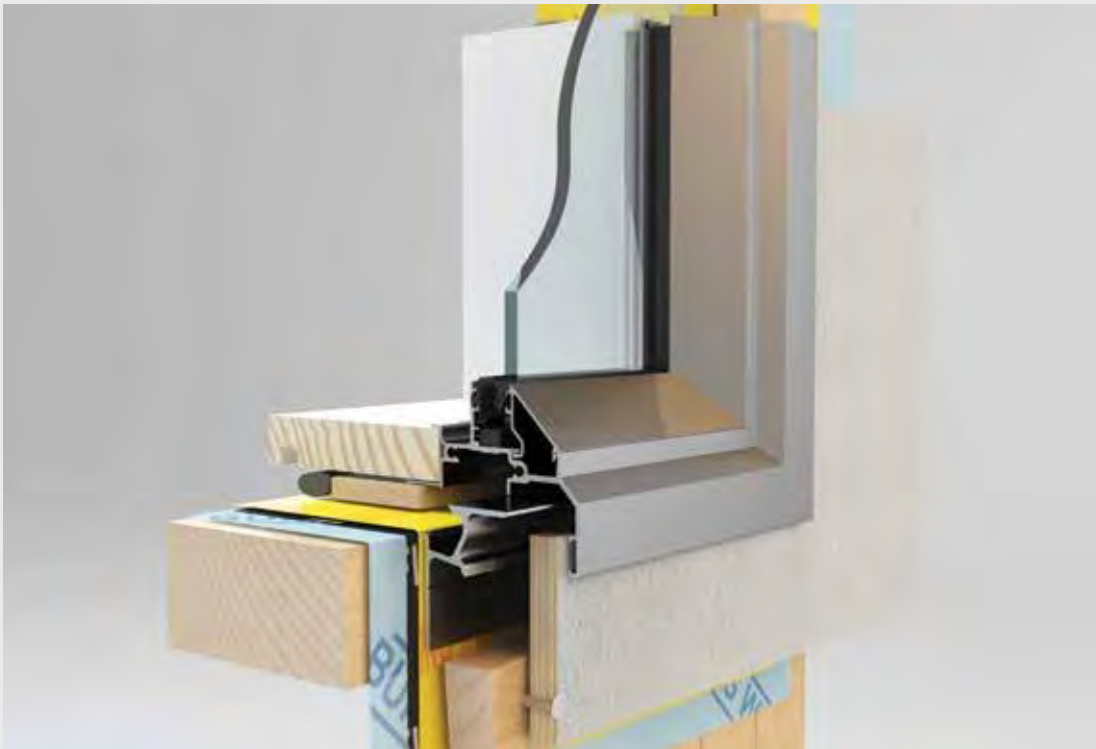


## SC032: Shadowclad® Window Sill Detail (Cavity)



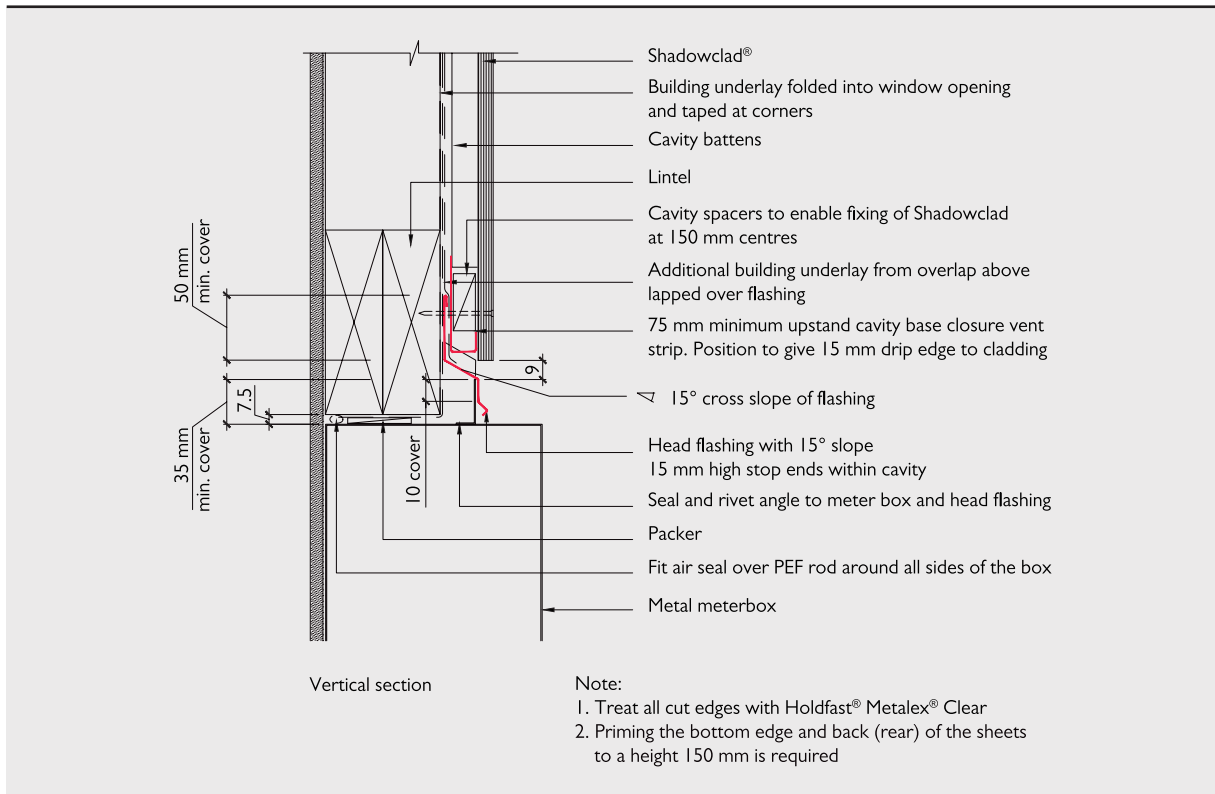
Note:

1. Treat all cut edges with Holdfast® Metalex® Clear

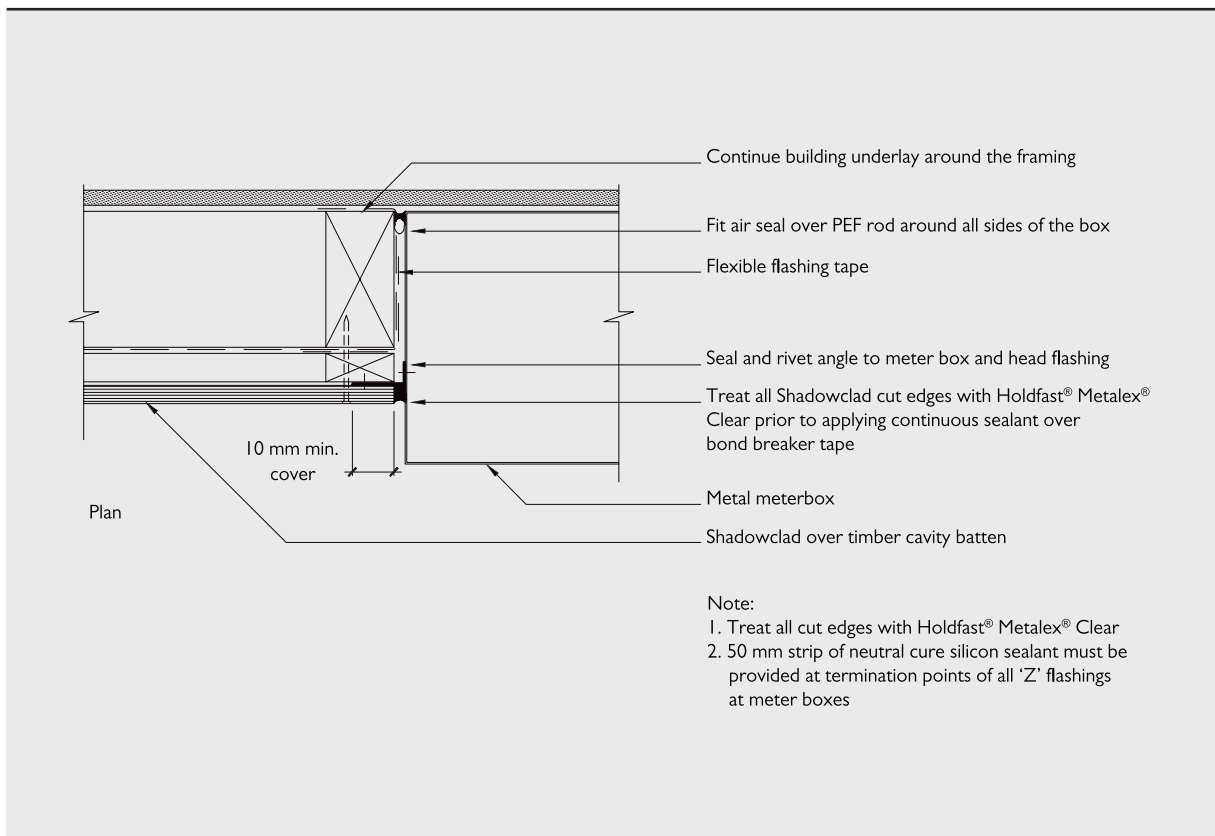


## 4.16 WALL PENETRATIONS

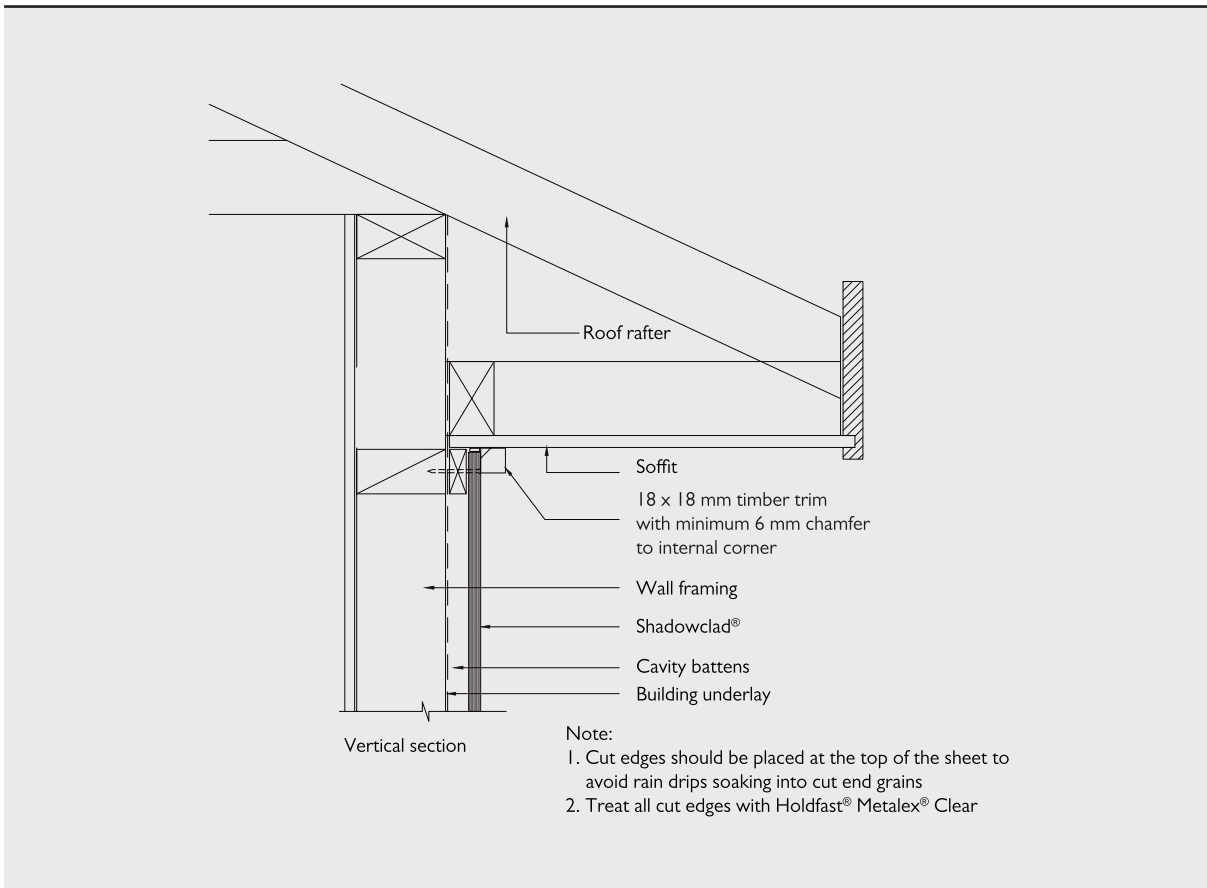
## SC034A: Shadowclad® Meterbox Vertical Cross Section (Cavity)



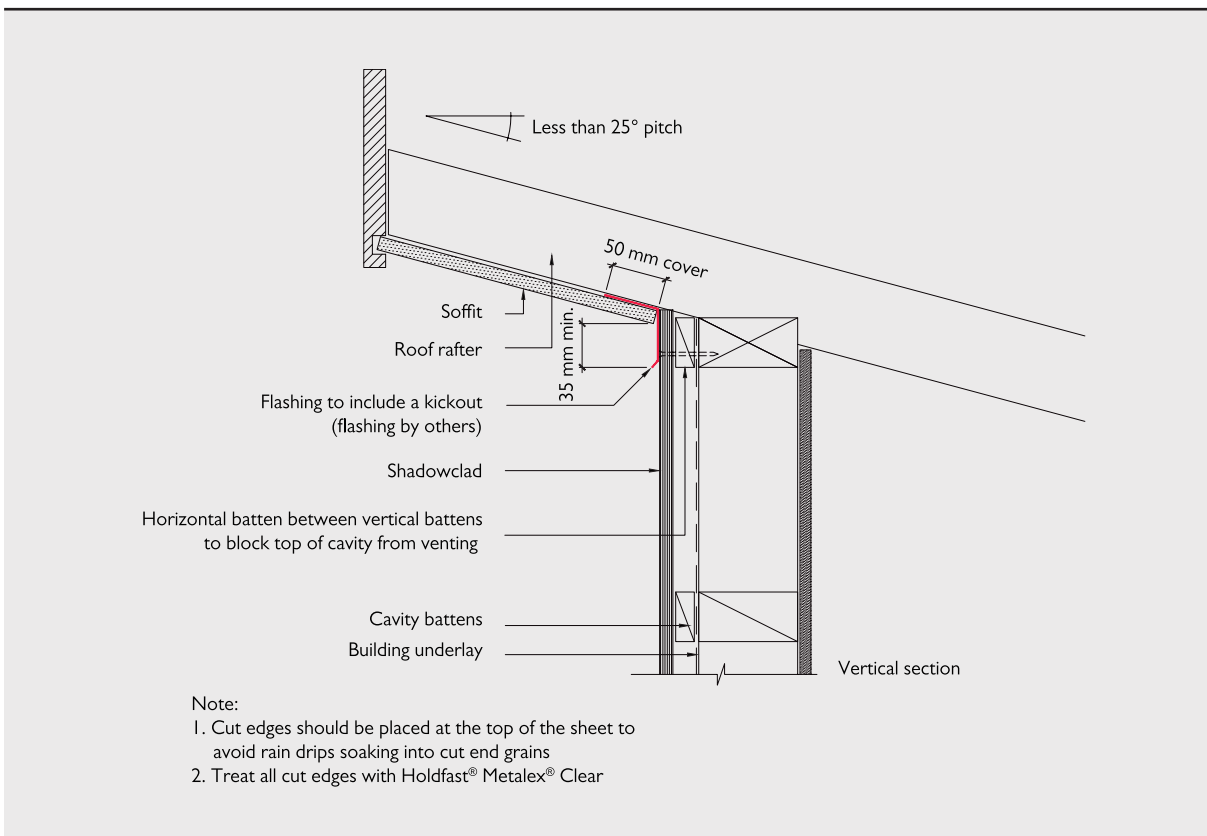
## SC034B: Shadowclad Meterbox Horizontal Cross Section (Cavity)



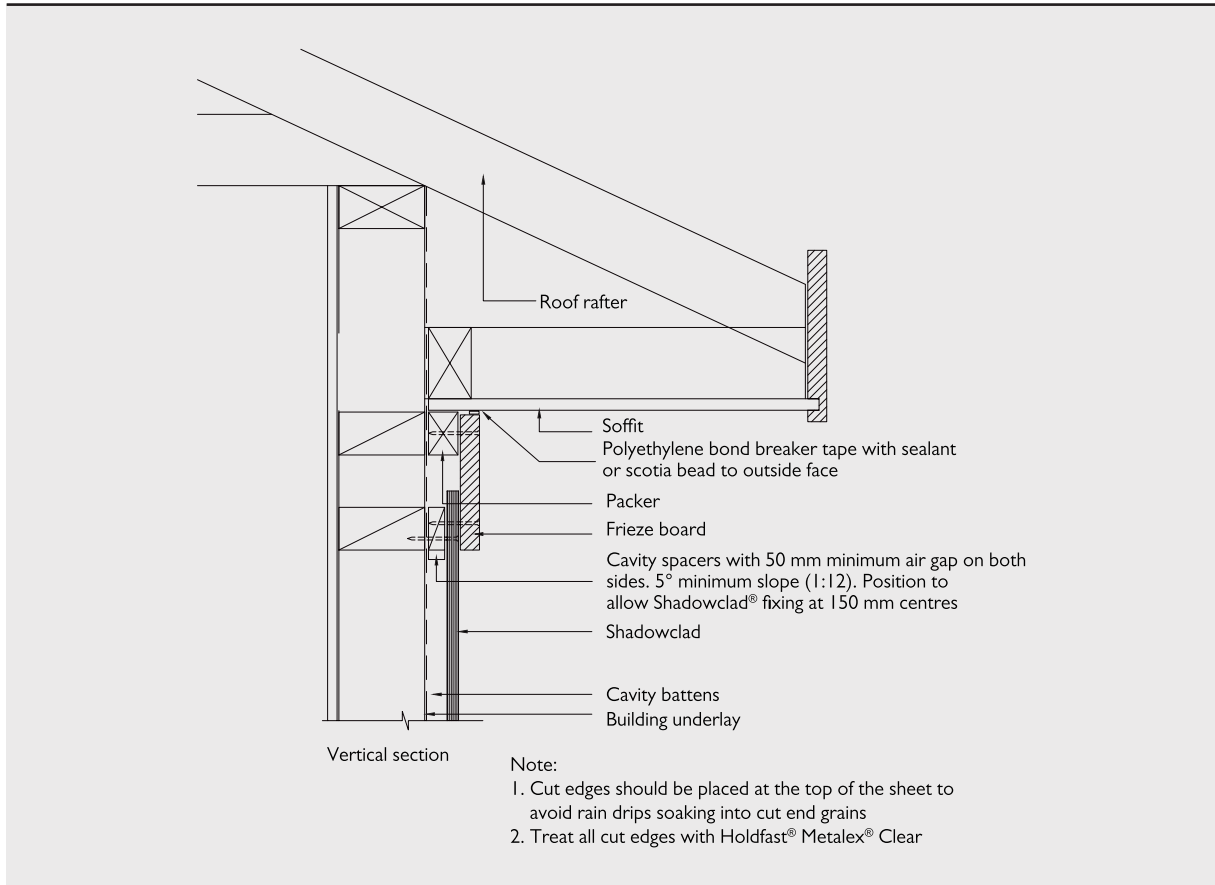
## SC036: Shadowclad® Soffit Detail (Cavity)



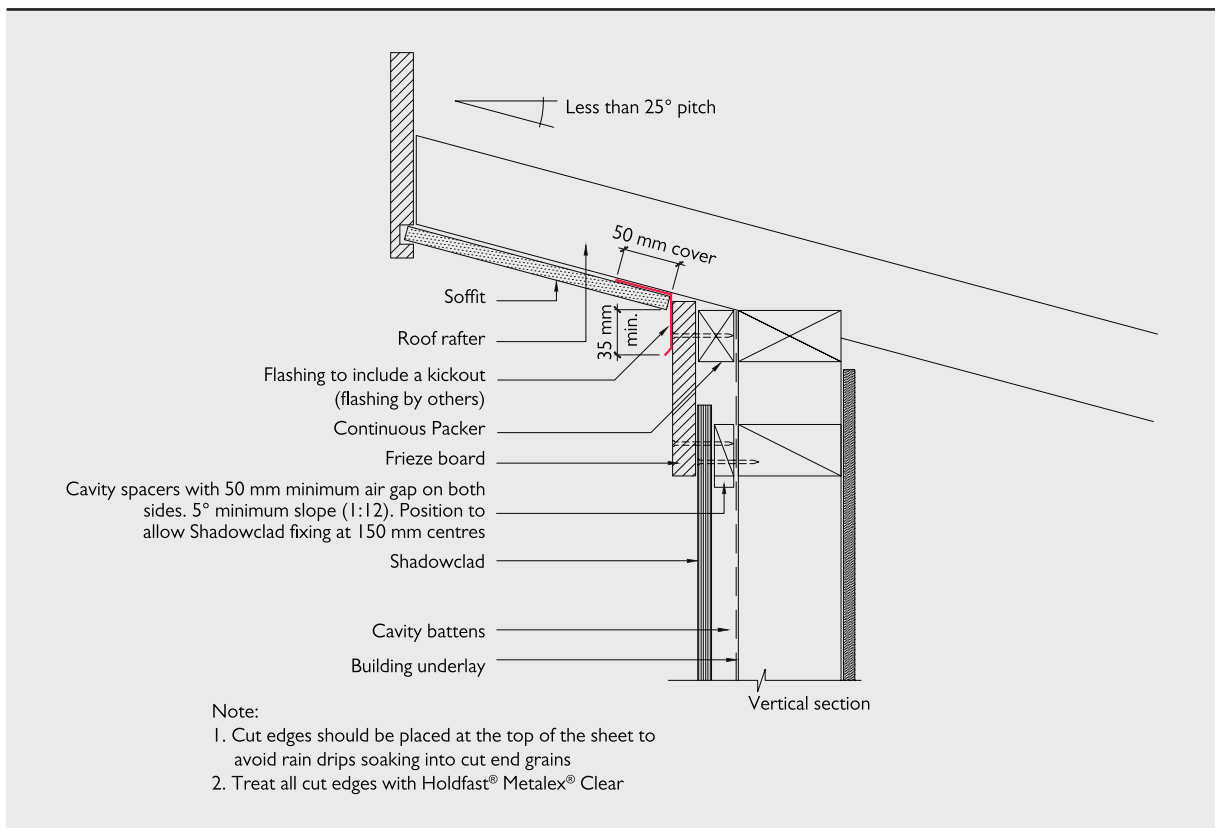
## SC036A: Shadowclad Alternative Soffit Detail (Cavity)



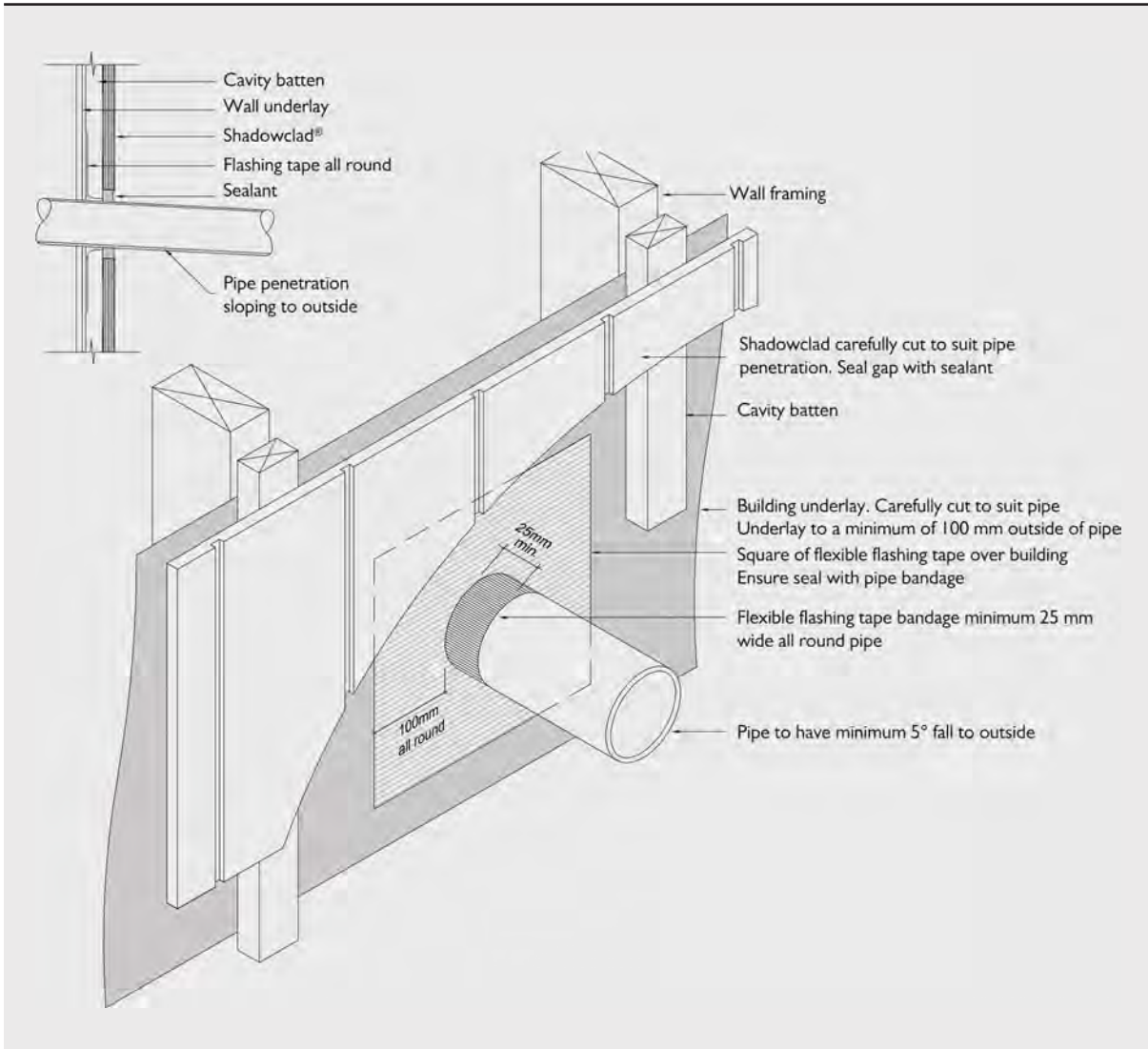
## SC038: Shadowclad® Soffit Alternative Detail (Cavity)



## SC038A: Shadowclad Alternative Soffit Detail (Cavity)



## SC040: Shadowclad® Pipe Penetration (Cavity)



## 4.17 SHEET CLEARANCES

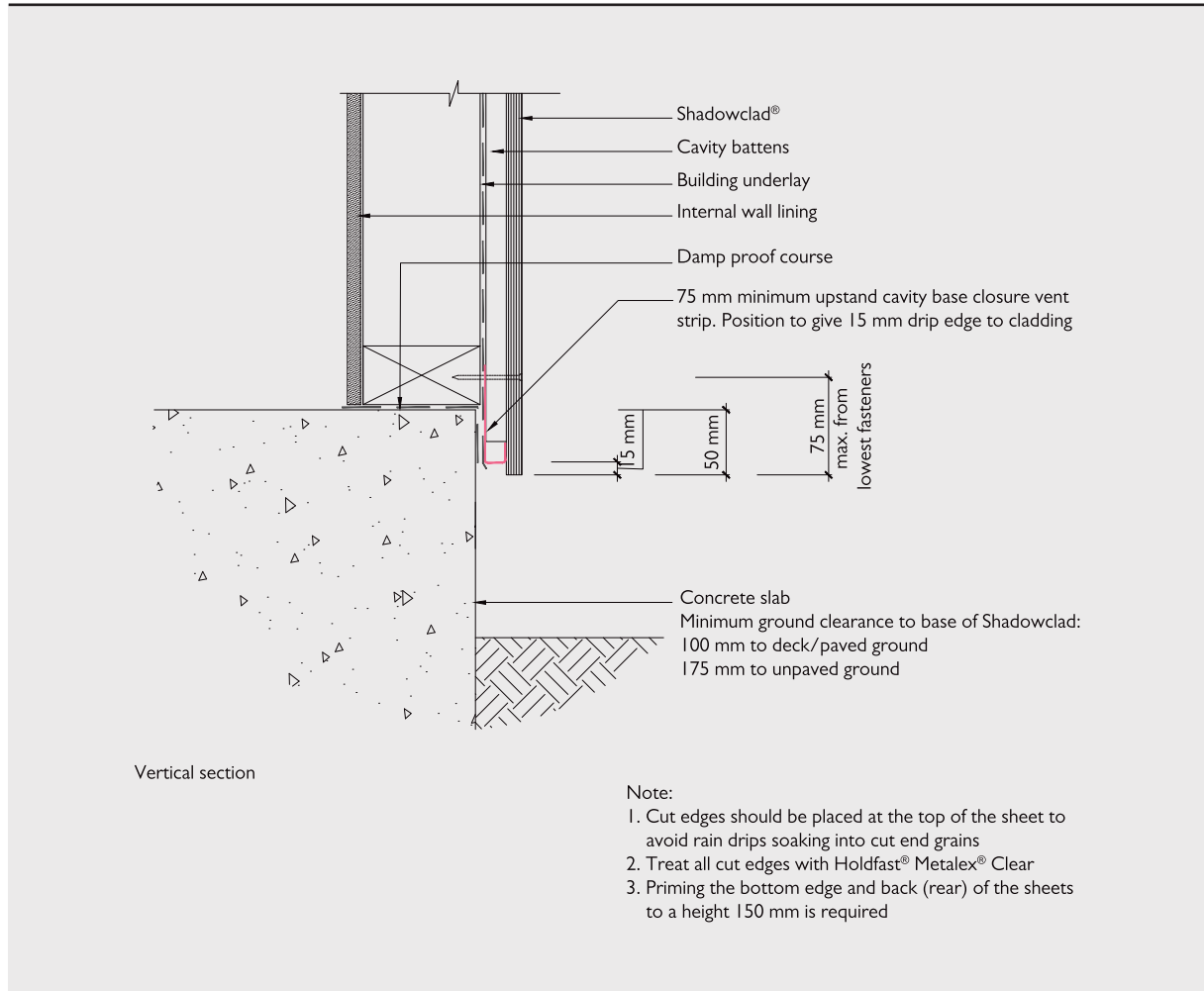
### Ground Clearances

Shadowclad® must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZS 3604 and E2 - External Moisture. Maximum distance from the bottom of the sheet to the fixing shall not exceed 75mm.

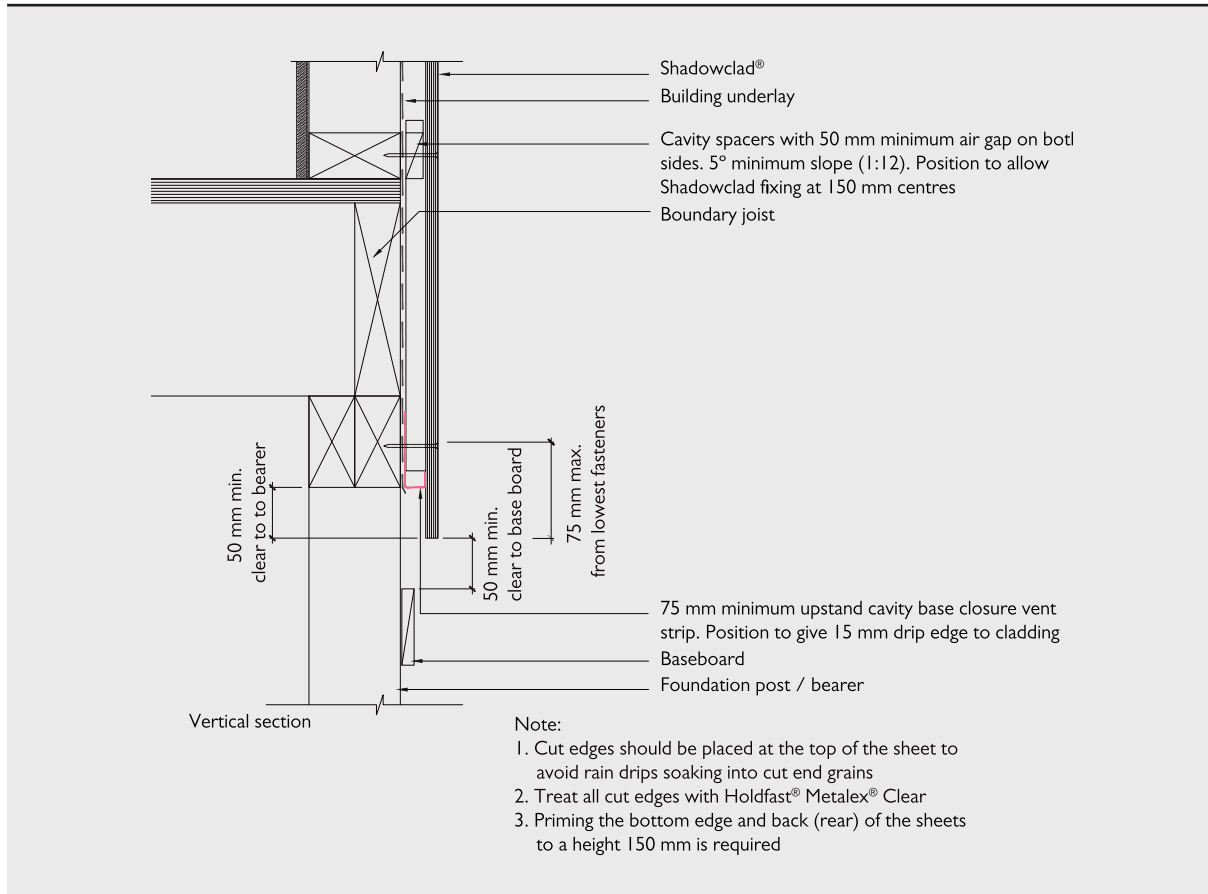
The bottom edge of the Shadowclad sheet must be a minimum of 50mm above decks and verandahs, 100mm above paved ground and a minimum of 175mm above unprotected ground.

For garage door openings, refer Paragraph 9 "Openings to garages" in Acceptable Solution E2/AS1.

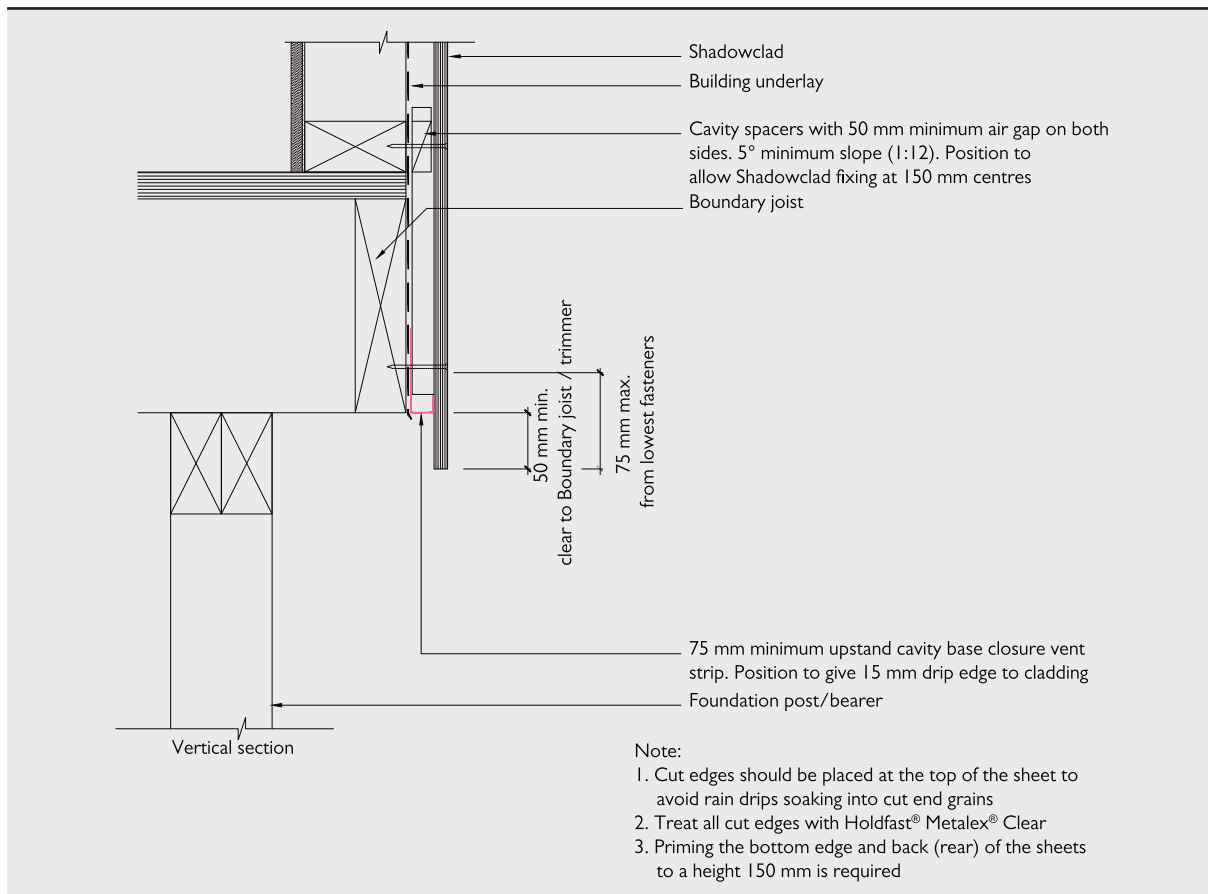
### SC042: Shadowclad® Overhangs and Ground Clearances (Cavity)



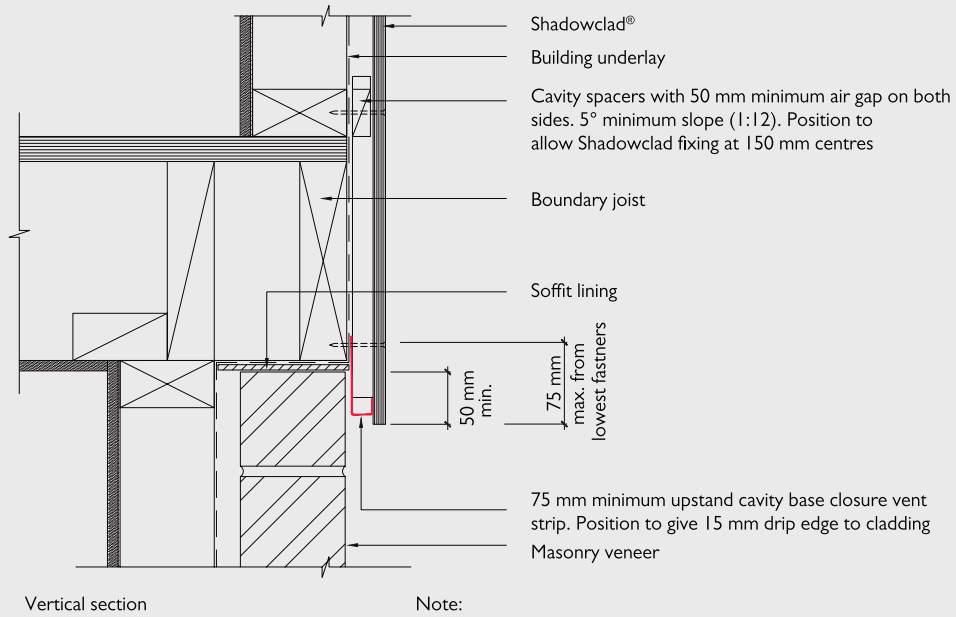
## SC042A: Shadowclad® Overhang for Timber Ground Floor to Non-Cantilevered Wall



## SC042B: Shadowclad Overhang for Timber Ground Floor to Cantilevered Wall



## SC044: Shadowclad® Upper Storey to Masonry Lower Storey (Cavity)

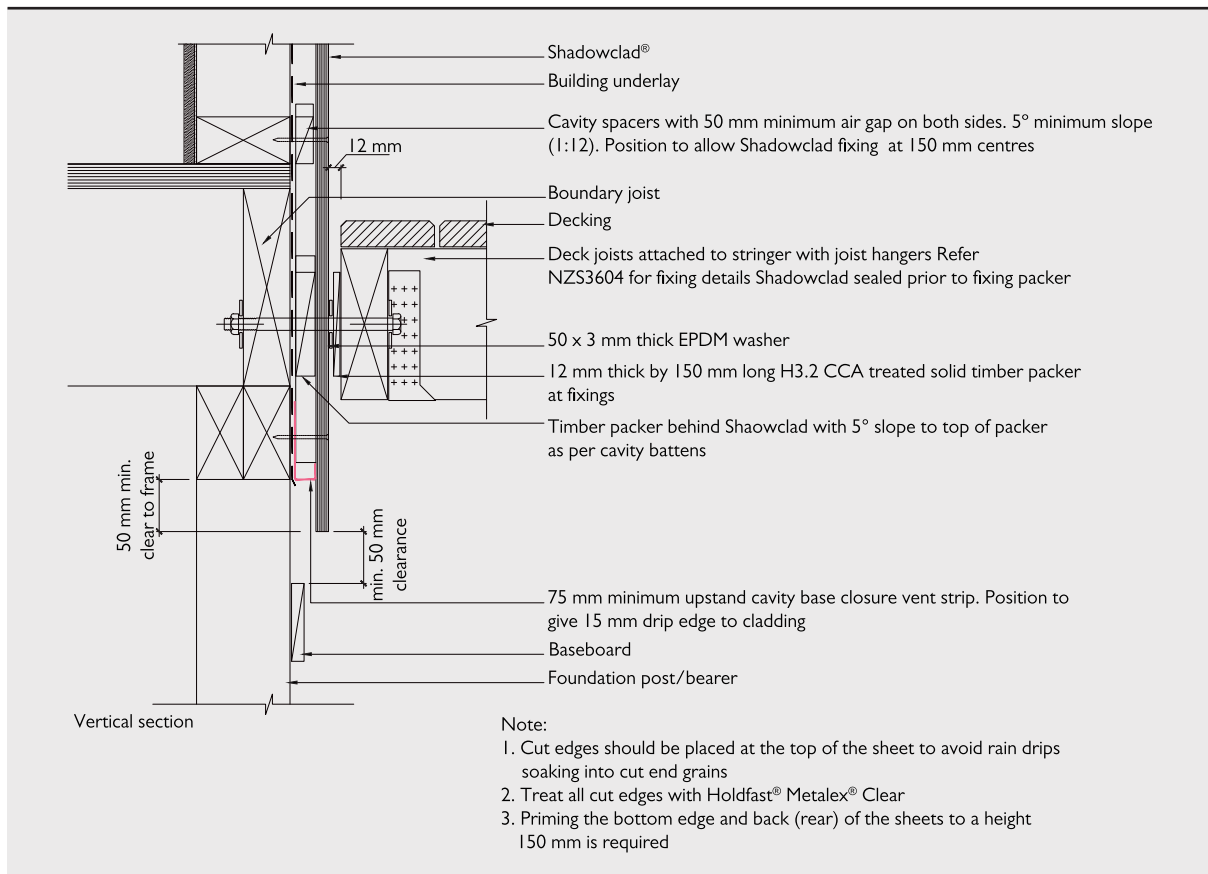


## Note:

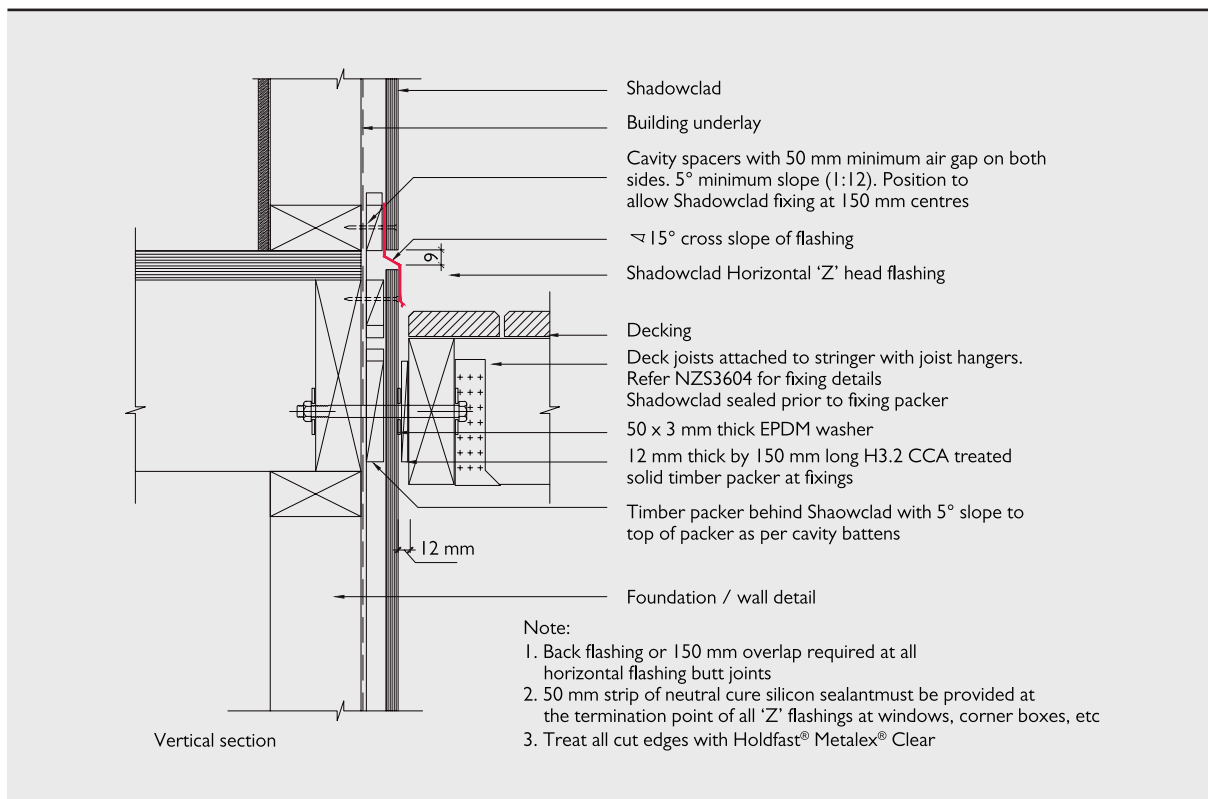
1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear
3. Priming the bottom edge and back (rear) of the sheets to a height 150 mm is required

## 4.18 OTHER DETAILS

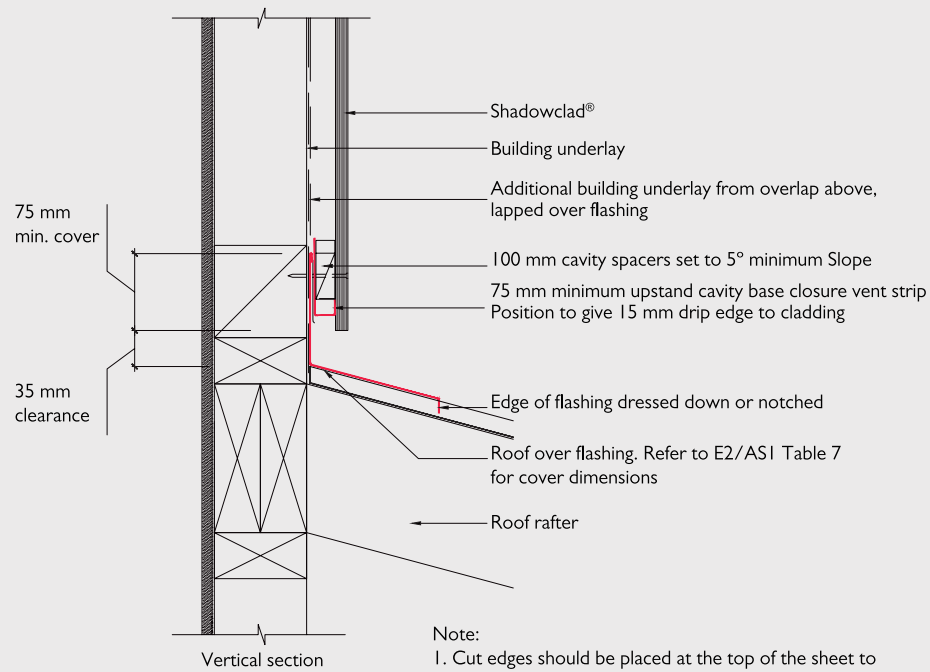
## SC046: Shadowclad® Timber Ground Floor to Non-Cantilevered Deck (Cavity)



## SC048: Shadowclad Mid Floor to Non-Cantilevered Deck (Cavity)



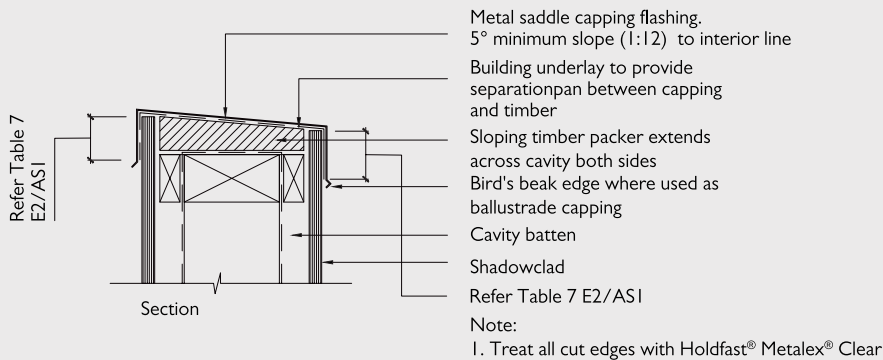
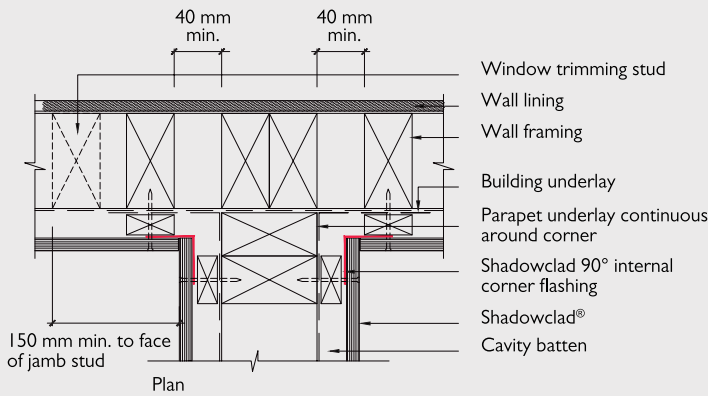
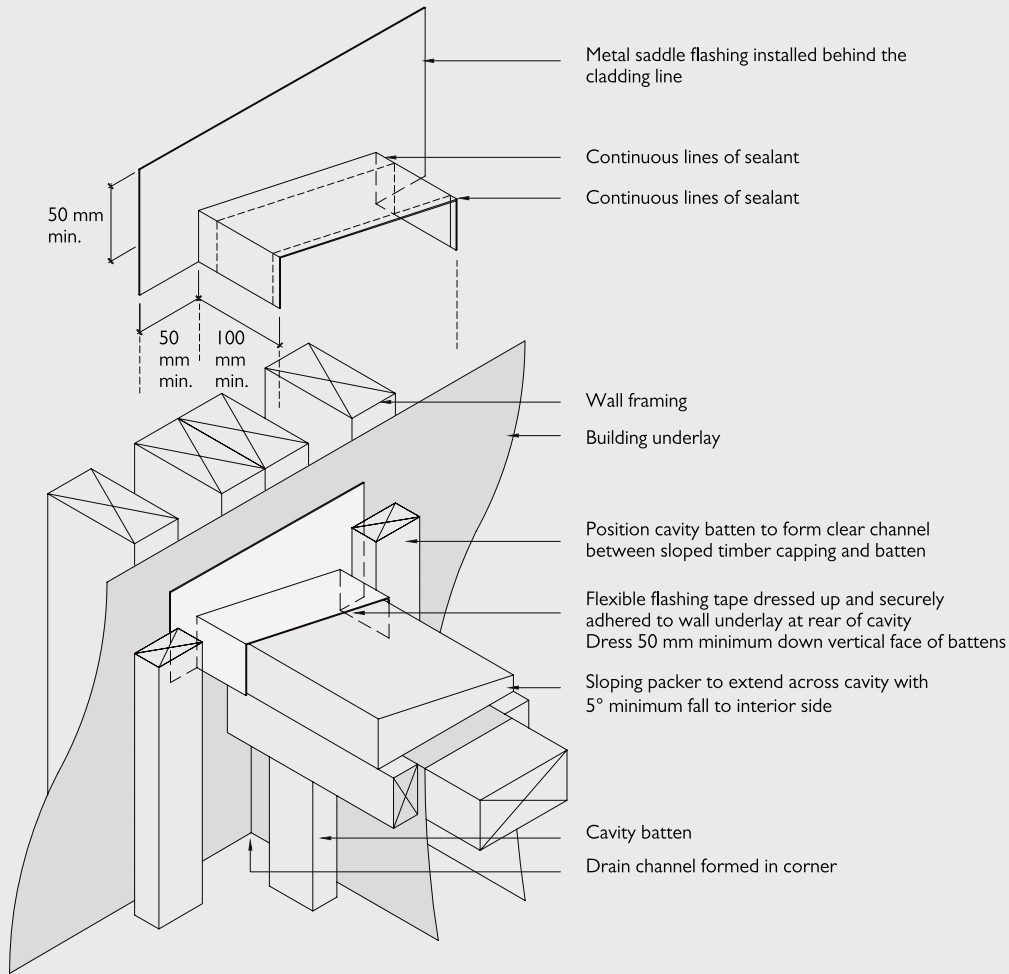
## SC050: Shadowclad® Basic Apron Flashing (Cavity)



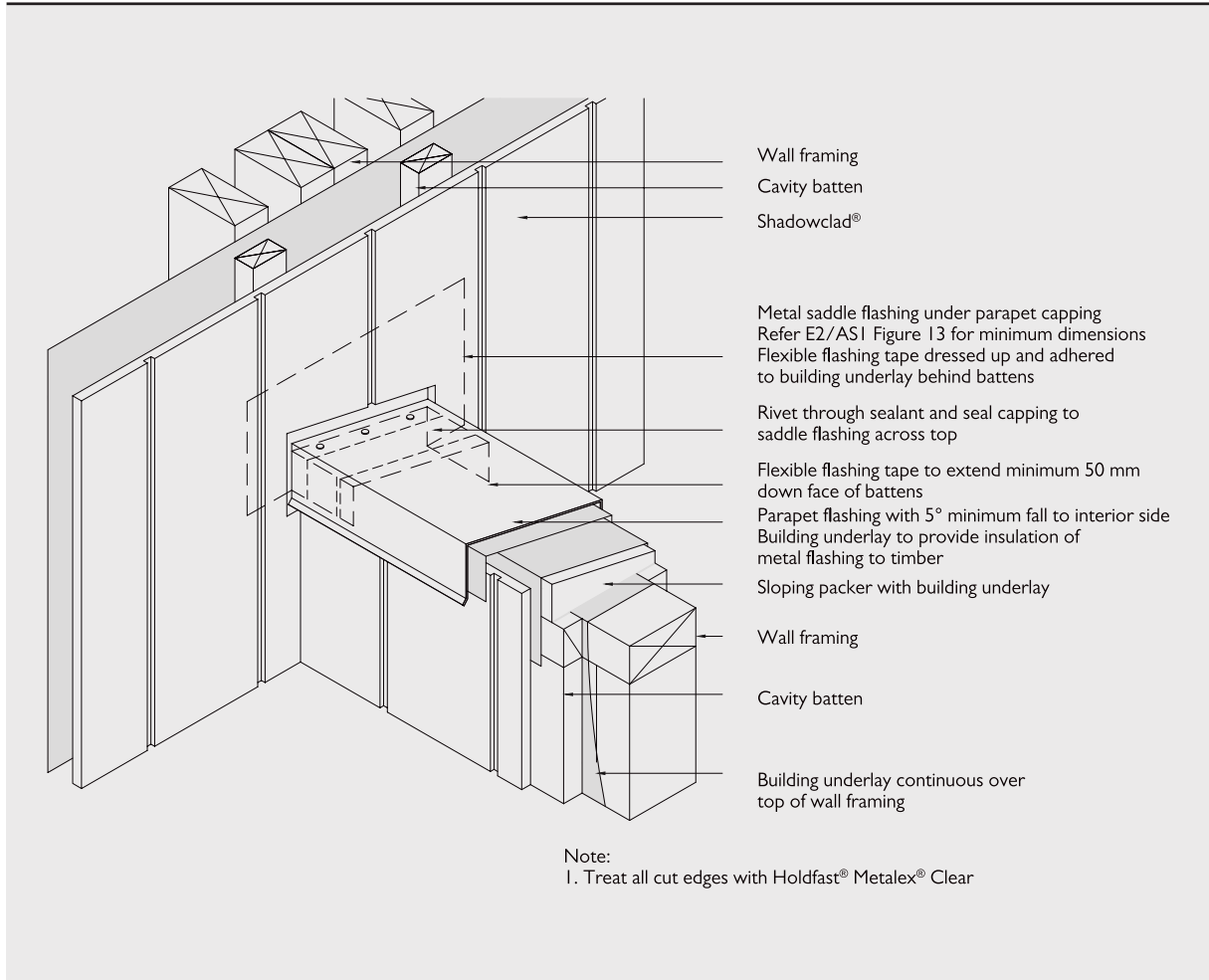
## Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear
3. Priming the bottom edge and back (rear) of the sheets to a height 150 mm is required

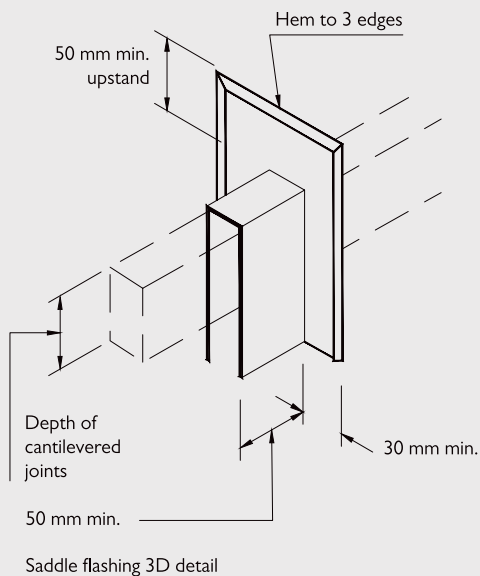
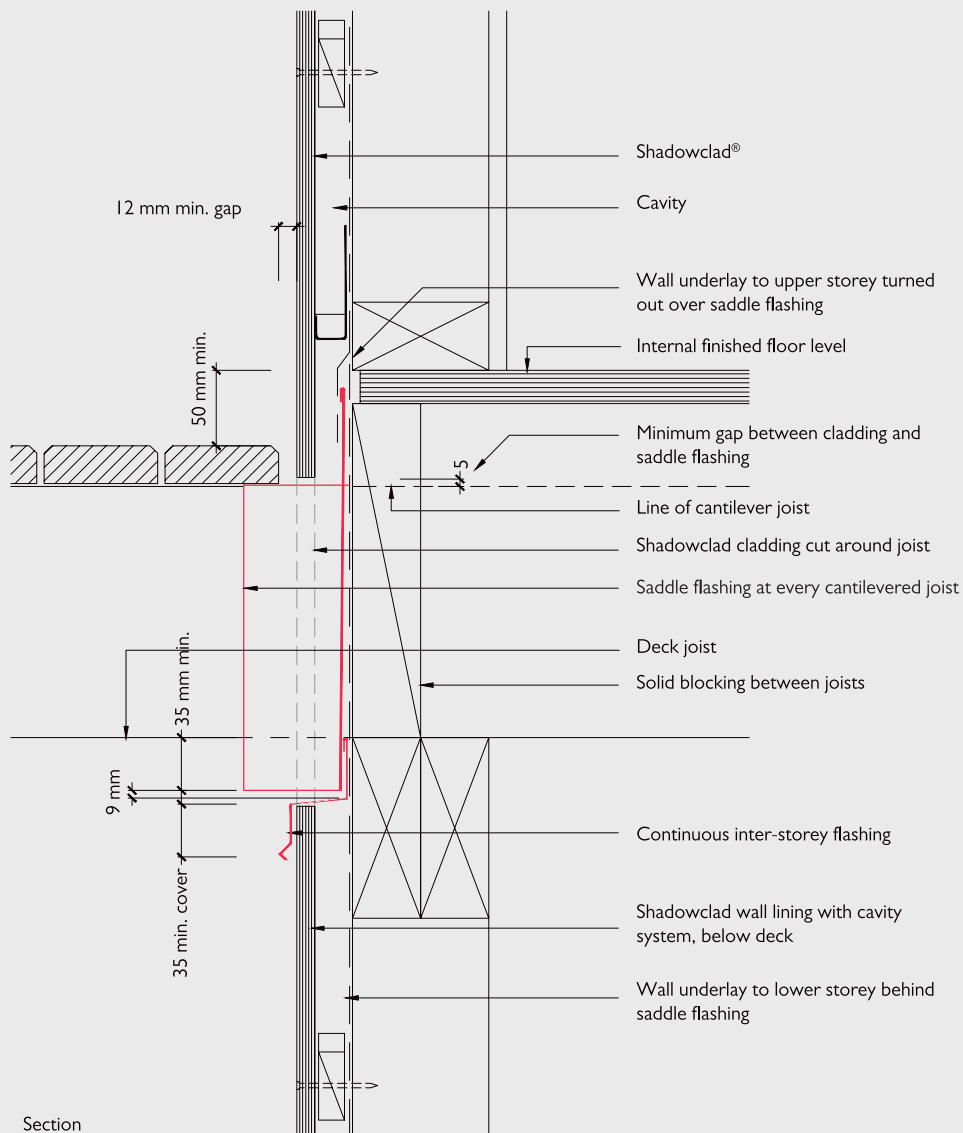
SC052: Shadowclad® Balustrade to Wall Junction (Cavity)



## SC054: Shadowclad® Balustrade to Wall Junction (Cavity)



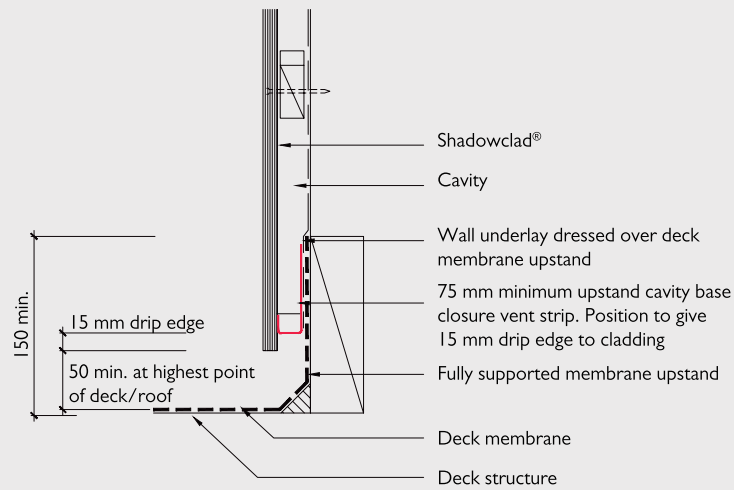
## SC056: Shadowclad® Junction with Wall for Cantilevered Deck (Cavity)



## Note:

1. Building wrap at back of cavity shall be taped around joist penetration
2. The back of the saddle flashing shall be positioned behind the cladding
3. Saddle flashing terminates over inter-storey flashing
4. Treat all cut edges with Holdfast® Metalex® Clear

## SC058: Shadowclad® Detailing for Enclosed Balustrade (Cavity)



## Note:

1. Cut edges should be placed at the top of the sheet to avoid rain drips soaking into cut end grains
2. Treat all cut edges with Holdfast® Metalex® Clear
3. Priming the bottom edge and back (rear) of the sheets to a height 150 mm is required

## 5.0 COATING & APPLICATION – EXTERIOR CLADDING

### 5.1 SURFACE PREPARATION

- Shadowclad® is manufactured, treated and stored in dry conditions at CHH Woodproducts manufacturing facilities. The H3 treatment provides temporary repellence to mould prior to on site coating, however it remains the applicators responsibility to ensure the surface is dry and free from dust and mould prior to coating.
- If Shadowclad has been exposed to external weathering for over 3 months wash surfaces with a mild detergent solution to remove any dirt, dust, mould or sea spray prior to coating.
- If recoating, remove loose, flaking or unsound coatings and wash walls prior to recoating.
- The Shadowclad surface must be dry prior to applying any surface coating.

### 5.2 COATING APPLICATION

- If sheets feel greasy to touch, separate and place in a dry, well ventilated area to allow any residual solvents from the treatment process to flash off prior to applying coatings.
- **Shadowclad® is envelope preservative treated. Where sheets are cut, cut edges must be coated with a brush on timber preservative in accordance with the relevant manufacturer's instructions. Holdfast® Metalex® Clear is recommended. Failure to properly apply preservative to cut edges will negatively affect the durability of cut panels.**
- Coatings should be applied by brush to ensure adequate coating film build is achieved. Application via roller or spray is not recommended.
- Shadowclad Natural panels should be coated within 3 months of installation.
- Priming of sheet edges and on the rear of the sheet to a height of 150mm is considered good practice, and required at the base of all sheets.
  - Shadowclad® Ultra sheets are coated on the rear to a height of 150mm (minimum) to meet this requirement.
- A minimum total coating system film build of 90 microns is recommended when painting or using film forming stains, including a minimum 30 micron thickness per coat.
- For detailed advice on surface preparation, coating product suitability and general coating practice always refer to the coating manufacturer prior to application.

### 5.3 COATING SELECTION

The following coating information should be treated as a generic guide to coating systems typically used with Shadowclad® exterior cladding. The selection, application and maintenance of coatings is the responsibility of building owners and the professionals that they engage. For advice on specific coating products and their suitability for use on Shadowclad always refer to the coating manufacturer.

It is important to note regardless of the cladding materials selected there will always be a level of coating maintenance required to ensure the cladding material is sufficiently protected from the elements and maintains the desired appearance.

#### Paints & Film Forming Stains

Three coats (1 undercoat, 2 top coats) of a good quality, 100% acrylic paint system with a light reflectance value (LRV) of 50% or greater (i.e. light colours) which is regularly maintained will provide the highest level of protection and durability for Shadowclad and is likely to require the least amount of coating maintenance over the life of the cladding.

Dark colours (LRV of below 50%) may still be used, however they are likely to increase heat and stress on the panel surface, reducing the panels overall lifespan and increasing the level of coating maintenance required to maintain an acceptable visual appearance.

Some film forming stains (i.e. coatings with the consistency of paint but with an appearance similar to penetrating stains) may offer similar protection qualities to paints however advice and

assurance should be sought from the coating manufacturer as to their suitability for use with Shadowclad prior to application.

Where paints or film forming stains are to be used, Shadowclad Ultra is recommended. Shadowclad Ultra features a factory applied performance coating which in most cases eliminates the use of time consuming wet primers. (Refer Table 10).

Shadowclad Natural can also be used with paint however a conventional wet primer is required as part of the coating manufacturers overall system specification.

#### Penetrating Stains

Penetrating stains show the natural texture and character of timber and are widely used on Shadowclad exterior cladding.

Penetrating stains offer less protection for panels from exterior weathering than paints and film forming stains which are considerably thicker in surface film build. Due to their translucency, penetrating stains are likely to require additional coating maintenance during the panel's life to maintain an acceptable visual appearance.

Penetrating stains should only be used on Shadowclad Natural and are not recommended for use on Shadowclad Ultra.

CHH Woodproducts does not recommend the use of linseed oil based coating which have the potential to promote mould growth in this product.

### Clear Coatings & Uncoated Shadowclad®

If Shadowclad® is left uncoated or is clear coated in exterior applications the long term aesthetics of the board will be significantly reduced. While the product will meet durability and weathertightness requirements under E2/AS1 a high visual appearance will not be achieved in the long term.

### Face Checking

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture which is exacerbated by darker colours. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. If you are the specifier, it is important to discuss these issues with your client before finalising colour choice. If checking occurs, repaint with a good quality, 100% acrylic exterior house paint in accordance with the manufacturer's instructions, thoroughly working paint into the face checks with a paint brush.

**Table 10: Coating System for Shadowclad® Ultra**

<b>Within 3 Months of Erection</b>	<b>Ensure the panel is clean and dry prior to top coating. Top coat with two coats of premium 100% acrylic exterior house paint.</b>
<b>OR</b>	
<b>Within 3 to 6 Months of Erection</b>	<b>Wash the surface with a mild detergent solution to remove any chalky material prior to top coating. Top coat with two coats of premium 100% acrylic exterior house paint.</b>

Note: For best results.

i/ allow 24 hours between coats.

ii/ use a light coloured paint system, LRV above 50%.

iii/ Recommend panel be washed down prior to painting to remove any sea salt spray or dirt deposits.

iv/ Minimum total coating film build of 90 microns is recommended, including a minimum 30 microns per coat.

## 5.4 COATING REQUIREMENTS IF RUN OFF IS USED FOR DRINKING WATER

Chemical manufacturers recommend that any run-off from treated surfaces should not be used for drinking water. Unsealed (e.g. unpainted) plywood claddings should not be used in situations where run-off directly from such claddings

is collected in water tanks for drinking water. Ensure selected coatings act as a sealant and refer to the coating manufacturer's Safety Data Sheets to confirm specified coatings are suitable for use in these applications.

## 6.0 MAINTENANCE

All cladding materials, including Shadowclad®, require careful and regular product maintenance by the building owner throughout the cladding's normal service life to ensure long term durability and to maintain visual aesthetics.

### Claddings:

At a minimum, Shadowclad should be maintained by:

- Regularly washing it down (at least annually) with a mild detergent or solution to remove surface dirt, moss, mould, and sea spray.
- Inspect on at least a yearly basis paying particular attention to sheet joints, corners and bases.
- Keep dirt, soil or leaf build-up at least 150mm away from the base of panels.
- Clean spouting and downpipes as required, so that stormwater is not overflowing onto the cladding.
- Repaint as soon as the first sign of coating deterioration is identified in accordance with the coating manufacturer's specifications (including edges and sheet bottoms).
- Panel recoating requirements may vary depending on climate, orientation to the sun, coating type and coating colour selected.
- Maintain the exterior envelope and connections including joints, penetrations, flashings, heat pumps, and sealants that may provide a means of moisture entry beyond exterior cladding to comply with the requirements of the NZBC Clause E2 - External Moisture.
- Prune back vegetation which is close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned.
- **Do not** use water blasters to wash down the cladding.

### Flashings:

- Flashings should be periodically cleaned on a similar basis to the glass in windows.
- Clean Shadowclad® flashings with a diluted solution of mild liquid detergent avoiding excessively hot solutions. Use a soft bristle brush. **Do not** use abrasive tools or cleaners on the coating.
- After cleaning, rinse thoroughly with fresh water. **Do not** use strong solvent type cleaners. Where the use of solvents is required, such as cleaning paint spills, use nothing other than methylated spirit. Ensure contact time is as short as possible, and rinse the solvent cleaner thoroughly from the surface with copious amounts of quality drinking water.
- Where cavity base closures are installed, ensure drainage holes are kept clear.

## 7.0 FREQUENTLY ASKED QUESTIONS

**Q:** Where can Shadowclad® be used?

**A:** Shadowclad® can be used as both exterior cladding or as an internal lining (moisture free areas only). For interior linings untreated Shadowclad should be used. For exterior cladding H3 treated Shadowclad is required.

**Q:** Do I have to re-treat cut edges of Shadowclad panels?

**A:** H3 treated Shadowclad is envelope preservative treated. All cuts made in treated plywood **must** have a brush on preservative treatment applied fully to the cut area. CHH Woodproducts recommends the use of Holdfast® Metalex® Clear.

**Q:** When used as an exterior cladding what are the durability expectations of Shadowclad?

**A:** Under the NZBC Shadowclad (when used as an exterior cladding) is required to meet a 15 year minimum durability level.

To achieve a 15 year durability Shadowclad must be:

- H3 preservative treated.
- Uncoated Shadowclad will meet the durability and weathertightness requirements, but a high visual appearance will not be achieved in the long term.
- Coated with a good quality penetrating stain, film forming stain or paint system.
- Coatings must be regularly maintained as part of a normal building maintenance program throughout the life of the building.

**Shadowclad® is not recommended to be left uncoated when used as an exterior cladding.**

**Note** – durability according to the NZBC refers to the products ability to continue to perform its primary function as protection for the building structure. Appearance including the performance of the coating product is not covered under the NZBC durability requirements.

**Q:** Can Shadowclad, when used as an exterior cladding, be coated in dark colours?

**A:** Dark colours (coatings with an LRV of below 50%) will achieve a 15 year durability however customers must expect an increased level of recoat and general product maintenance compared to where light coating colours are used.

The greatest level of cladding protection and least amount of coating maintenance can be achieved by using a good quality paint system (applied as per the coating manufacturers specifications) with an LRV of 50% or greater and a minimum total coating system film build of 90 microns, including a minimum 30 micron thickness per coat.

For further information on coatings always refer to the applicable coating manufacturer's specification material.

**Q:** Does Shadowclad comply with the NZBC Requirements?

**A:** Shadowclad has been tested in accordance with E2/VMI and AS/NZS 4284 "Testing of Building Facades" for compliance with the NZBC requirements and has been BRANZ appraised for use in cavity fix construction.

**Q:** In the Shadowclad exterior flashing range can I colour the flashings to match the colour of my building?

**A:** Shadowclad aluminium exterior flashings are available in either anodised, powder coated or mill finished. Anodised flashings are silver in colour and can be installed immediately. Shadowclad powder coated range of colours are available via [www.shadowclad.co.nz](http://www.shadowclad.co.nz). For alternative colours mill finished flashings are available for customer powder coating.

**Q:** Does face checking affect the performance of Shadowclad?

**A:** Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture which is exacerbated by darker coloured coatings. These checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way.

**Q:** Where can I download the Shadowclad Installation APP?

**A:** The Shadowclad Installation APP can be downloaded from [www.chhsoftware.com/apps](http://www.chhsoftware.com/apps) or the respective device APP procurement marketplace.

**Q:** Where can I get a Shadowclad Stick from?

**A:** Shadowclad Sticks may be ordered by contacting CHH Woodproducts direct by phoning 0800 326 759 or ordering via the Shadowclad APP, the Shadowclad website: [www.shadowclad.co.nz](http://www.shadowclad.co.nz), or contacting your local merchant.

## 8.0 GLOSSARY OF TERMS

**Sealant:** A flexible neutral cure sealant for filling of spaces/gaps and weatherproofing that complies with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use. It is the designers' and builders' responsibility to ensure that sealants are fit for purpose and compatible with Shadowclad® products and any other building materials or components used within the Shadowclad installation.

**Air Seal:** A continuous seal fitted between a window or door reveal and the surrounding wrap and associated tape enclosing wall framing to prevent the flow of air into the building interior. Air seal must be weathertight so that moisture is not able to access the structure. Refer to NZBC E2/AS1 for further detail.

**Foam Bond Breaker:** A tape that is polyethylene backed that prevents "3-Point" adhesion mating surfaces that ensures that the sealant only attaches to two surfaces (and not the third which would create an anchor point preventing the sealant moving as its designed to).

**PEF Rod:** A foam formed polyethylene "noodle" that is designed to be inserted between two surfaces. Should have a 25-33% larger diameter than the gap/space you are inserting it into.

**Holdfast® Metalex® Clear:** A supplementary preservation treatment that preserves the treatment envelope of timbers with a Class H3.1 and above.

## 9.0 REFERENCES & SOURCES OF INFORMATION

- New Zealand Building Code (NZBC).
- AS/NZS 2269:2012 "Plywood Structural".
- AS/NZS 1604.3:2010 "Specification for Preservative Treatment, Part 3: Plywood".
- NZS 3602:2003 "Timber and Wood-Based Products for use in Buildings".
- AS/NZS 4284:2008 "Testing of Building Facades".
- NZS 3603:1993 "Timber Structures Standard".
- NZS 3604:2011 "Timber Framed Buildings".
- AS 3715:2002 "Metal Finishing – Thermoset powder coating for architectural application of aluminium and aluminium alloys".
- NZBC Clause E1 Surface Water.
- NZBC Acceptable Solution, E1/AS1.
- NZBC Clause E2 External Moisture.
- NZBC Acceptable Solution, E2/AS1.
- NZBC Clause E3 Internal Moisture.
- NZBC Acceptable Solution, E3/AS1.
- NZBC Clause B2 Durability.
- NZBC Acceptable Solution, B2/AS1.
- Product Technical Statement.  
– Shadowclad® for Cavity Construction.
- Ecoply® Specification and Installation Guide.
- Ecoply® Barrier Specification and Installation Guide.
- CHH Woodproducts technical notes – downloadable from [www.chhwoodproducts.co.nz/document-library](http://www.chhwoodproducts.co.nz/document-library).
- Safety Data Sheet.
  - SDS Shadowclad Azole Treated Plywood.
  - SDS Shadowclad CCA Treated Plywood.
  - SDS Stainless Steel flashings.
  - SDS Aluminium flashings.
  - SDS Shadowclad Ultra CCA Pre-primed Treated Plywood.
  - SDS Shadowclad Ultra LOSP Pre-primed Treated Plywood.
- Producer Statement – Compliance for Surface Treated Aluminium Products.
- Window Association of New Zealand ([www.wanz.org.nz](http://www.wanz.org.nz)).
- APA ([www.buildabetterhome.org](http://www.buildabetterhome.org)).
- EVPPAA ([www.ewp.asn.au](http://www.ewp.asn.au)).
- BRANZ Appraised 764 – Shadowclad® Cavity Fixed Cladding System.
- BRANZ Recommendations for Building Maintenance.

Standards can be purchased online at [www.standards.co.nz](http://www.standards.co.nz).

Building Code Compliance Documents can be downloaded free of charge at [www.building.govt.nz/building-code-compliance/](http://www.building.govt.nz/building-code-compliance/).

Line drawings within this literature can be downloaded from [www.chhwoodproducts.co.nz/document-library](http://www.chhwoodproducts.co.nz/document-library).

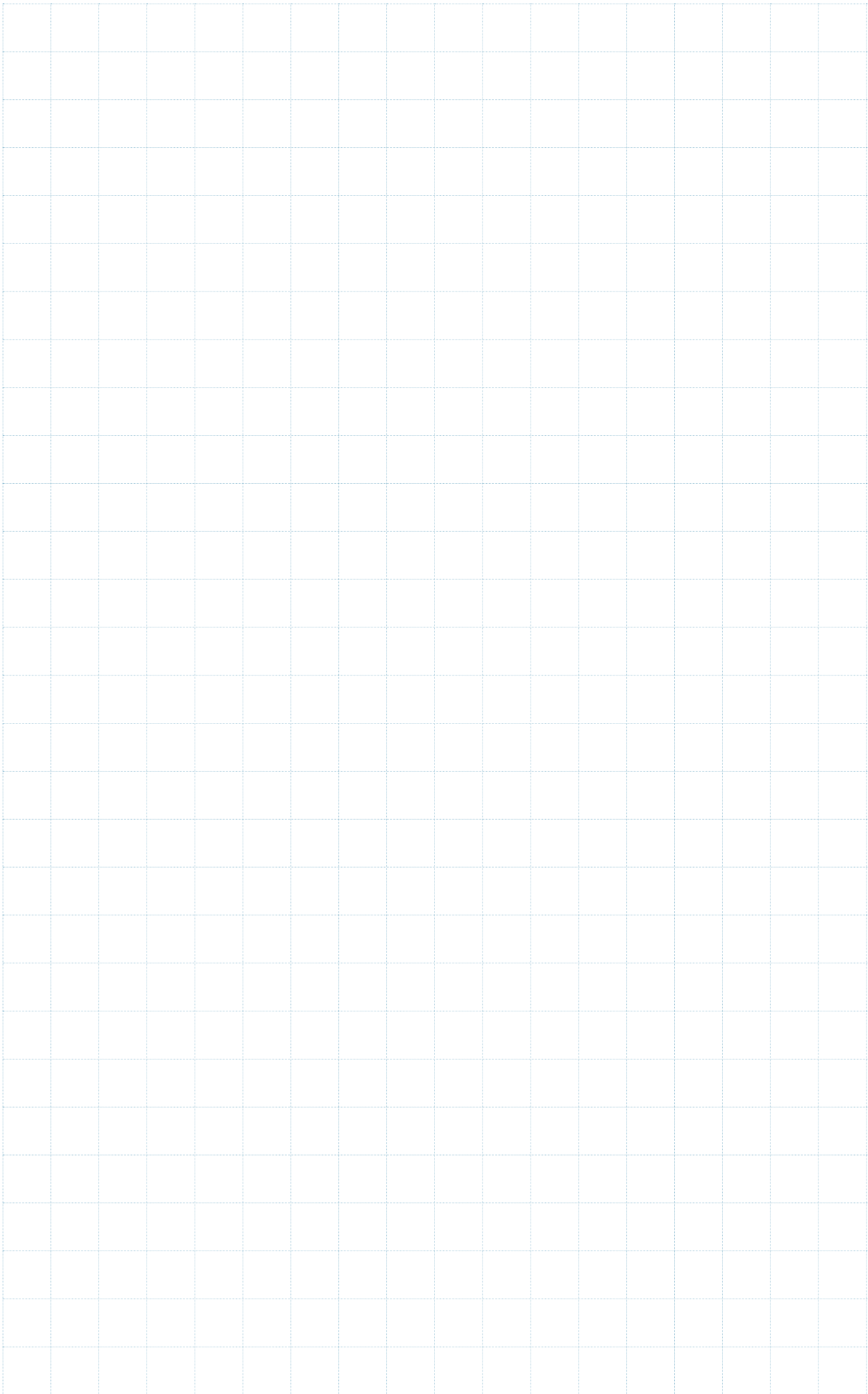
## 10.0 LIMITATIONS

The information contained in this document is current as at May 2018 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Shadowclad® products installed in accordance with this document or the NZBC compliance documents.

This publication replaces all previous CHH Woodproducts design information and literature relating to Shadowclad structural plywood products and flashings installed using a drained and vented cavity. CHH Woodproducts reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz) to obtain current information.

**CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Woodproducts assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.**



# SHADOWCLAD® KEY INSTALLATION & DESIGN POINTS

## EXTERIOR CLADDING APPLICATIONS

The following tasks are provided to installers to point out key installation and design factors when used as an exterior cladding. These do not detract from the requirements to read and understand this literature as a whole.

Task	Tick when checked
<b>Prior to Specification and Installation</b>	
Read the Shadowclad® Specification and Installation Guide in its entirety	<input type="checkbox"/>
<b>Framing Plan</b>	
Framing setout drawings to suit Shadowclad fixing and installation guidelines	<input type="checkbox"/>
<b>Sheet Cuts</b>	
Coat all sheet cuts with a preservative timber treatment such as Holdfast® Metalex® Clear	<input type="checkbox"/>
After applying Holdfast® Metalex® Clear, apply the surface coating (e.g. paint or stain) to cut edges	<input type="checkbox"/>
Place uncut edge to bottom	<input type="checkbox"/>
<b>Fastener Material Type</b>	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones and with H3.2 CCA treated Shadowclad Ultra)	<input type="checkbox"/>
<b>Sheet Fastener Pattern</b>	
Around sheet edge – maximum 150mm centre spacing	<input type="checkbox"/>
Within sheet body – maximum 300mm centre spacing	<input type="checkbox"/>
<b>Horizontal Sheet Joints</b>	
Minimum 9mm separation gap between sheets above all Horizontal 'Z' flashings	<input type="checkbox"/>
Prime the bottom of the sheet edge and 150mm up the back (rear) of the sheets	<input type="checkbox"/>
50 mm strip of neutral cure silicon sealant or stop ends at all 'Z' flashing terminations excluding terminations at Shadowclad metal corner flashings	<input type="checkbox"/>
Back flashings or 150 mm overlap to all flashing butt joints	<input type="checkbox"/>
<b>Expansion Gaps Between Sheets (Vertical Sheet Joints)</b>	
Texture Profile Sheets - 2mm gap between vertical edges of sheets	<input type="checkbox"/>
Groove Profile Sheets - 9mm gap (i.e. full groove space) between vertical edges of sheets	<input type="checkbox"/>
Note: Expansion gaps required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
<b>Ground Clearances</b>	
Paved/Sealed Ground - minimum 100mm distance from the ground to sheet bottom	<input type="checkbox"/>
Broken Ground - minimum 175mm distance from the ground to sheet bottom	<input type="checkbox"/>
Prime the bottom of the sheet 150mm up the back (rear) of the sheet	<input type="checkbox"/>

Refer to the current Shadowclad® Specification and Installation Guide for full installation specifications and suggested details.

# shadowclad<sup>®</sup>



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May 2018



## SUPPORTING MANUFACTURER DOCUMENTATION

For information only. Specification and contract documentation takes precedence.

This version includes documents related to:

Performance | Installation | Maintenance | Warranty | Environmental

## New House

### Project Specification

Lot 6 , Anderson Park, Waikanae, New Zealand

Project Ref: 20018

Printed: 22 November 2020



**masterspec**

Specification built using Masterspec software

Project ID: 211047 - 192332

## Manufacturer Documents Index

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## 3155FR Firth Ribraft Floor Systems



### Firth Industries

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www.firth.co.nz

## SUPPORTING DOCUMENTS

### FIR0667-Ribrafft-Technical-Manual-2020

Ref 12132. Uploaded 13 Sep 2020

Purpose: Performance, Installation, Maintenance, Warranty