

# +RibRaft®

TECHNICAL  
MANUAL





This document contains design and installation information. A variation to any of the information given requires specific engineering design and is hence beyond the scope of this document.

The Firth RibRaft® Floor System can be constructed for all slab-on-ground concrete floors for domestic or residential buildings that fall within the scope of NZS 3604:2011 “Timber Framed Buildings” and Clause 3 “Scope” of Section 1 of this Manual. The design and installation details in this Manual shall be used to design and construct such a floor.

The Firth RibRaft® Floor System is covered by the MBIE Codemark®. This is conditional on the system being used as described in CertMark Australasia certification decision, which in turn requires design in accordance with Section 1 and installation in accordance with Section 2 of this Manual and on site verification in accordance with Section 3.

Note that a MBIE Codemark® means that if this Manual is rigidly followed the relevant Building Control Authority will automatically provide a building permit without the need for producer statements. To comply with the Manual does mean that Firth Certified Concrete® must be used.

# THIS MANUAL CONSISTS OF 3 SECTIONS:

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Contains information principally useful for the specifier or building designer

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## SECTION: DESIGN INFORMATION

# 1

1.0 THIS SECTION OF THIS MANUAL CONTAINS DESIGN INFORMATION NOT REQUIRING SPECIFIC ENGINEERING INPUT FOR THE FIRTH RIBRAFT® FLOOR SYSTEM (THE SYSTEM). FULL INFORMATION ON THE INSTALLATION PROCEDURES IS DESCRIBED IN SECTION 2 OF THIS MANUAL (INSTALLATION INFORMATION). WHERE STANDARDS ARE REFERENCED IN THIS MANUAL, THESE SHALL INCLUDE THE LATEST AMENDMENTS.

## 2.0 TECHNICAL INFORMATION

### 2.1 Overview

The Firth RibRaft® Floor System is a reinforced concrete waffle raft floor slab-on-ground. Typically it consists of an 85mm thick slab supported by a grid of ribs normally 100mm wide at 1200mm x 1200mm centres. The overall depth is 305mm. Edge beams and ribs under load bearing walls are 300mm wide to provide for the extra load carried by these members. Where heating coils of less than 25mm diameter are embedded in the topping, the slab concrete thickness shall be 110mm meaning the overall thickness is 330mm. Where the top floor surface is honed to provide a decorative finish, a slab thickness of 100mm (before honing) should be specified.

### 2.2 Pods

Firth RibRaft® polystyrene pods 1100mm square and 220mm thick are placed directly on levelled ground and are arranged in such a way as to form a reinforced concrete floor slab with a grid of reinforced concrete ribs and edge beams when concrete is placed onto them. Pods may be cut to suit specific architecture layout and also to accommodate services. 300mm thick pods are available if needed for deeper edge beams and internal ribs.

### 2.3 Steel

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m<sup>2</sup>, a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 200mm centres, and ductility class L or E, hereafter referred to “mesh”. The presence of Class E reinforcing bars in the ribs and beams provides adequate ductility of the system which allows the use of class L mesh. Typically the topping mesh reinforcement will be 665 mesh (class L) or SE62 ductile mesh, each being equally applicable. The reinforcing bars in the ribs and edge beams shall conform to AS/NZS 4671:2001 “Steel Reinforcing Materials”. Specifically designed spacers are used to position the polystyrene pods and the rib and edge beam reinforcing steel bars in a secure manner until the concrete is placed. The reinforcing mesh is held in place by mesh chairs. Conventional timber or steel formwork is used to form the edge of the slab.

### 2.4 Concrete

One of the following Firth concrete products shall be used in the system:

- 1) Raftmix: a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix.
- 2) Raftmix25: a 25MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix. This mix shall be specified for buildings constructed in the ‘sea spray zone’ (i.e. within 500m of the sea including harbours, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere defined as exposure zone D in 4.2.3.3 of NZS3604).

### 3.0 SCOPE

This Clause sets out the limitations that apply to the use of the system to ensure that specific engineering input is not required. The concrete floor slab for buildings or ground conditions that do not meet this scope must be subjected to specific engineering design to comply with the requirements of the New Zealand Building Code.

#### 3.1 Structure Limitations

Specific engineering input shall not be required only where the structure supported by the system complies with the following criteria:

- > The structure supported by the system is constructed in a location where the Seismic Hazard Factor Z (defined in NZ1170.5) is less than or equal to 0.45 (refer to Figure 6).
- > The system is laid level, or has a maximum step of 600mm detailed in accordance with this Manual.
- > The structure supported by the system has no basement, part basement or foundation walls.
- > The total height from the lowest ground level to the highest point of the roof shall not exceed 10m.
- > The structure supported by the system has a roof pitch limited to 60 degrees maximum from the horizontal.
- > The maximum height of a single or top storey is 4.8m and any other storey is 3m.
- > Only ground floor walls of the structure supported by the system are permitted to be "heavy external walls" (as defined in Clause 3.3).
- > The roof truss span shall be less than or equal to 12m when the roof and ceiling loads are supported entirely by the external walls. Where internal support of roof trusses is used the footings below point loads identified by the truss designer shall comply with this Manual.
- > Where internal load bearing walls are used to support the roof and floor, the loaded dimensions stated in tables 8.2 and 14.10 of NZ3604:2011 shall apply, and these load bearing walls shall be supported on a 300mm wide load bearing rib as detailed in this manual.
- > Floors may be of unlimited size provided that the maximum dimension between free joints shall not exceed 30m. Where free joints are required they should be detailed in accordance with this Manual.

#### 3.2 Live Loading

The live loading cases of structures covered by these designs are:

- > 1.5kPa and 3.0kPa as per NZS3604 "Timber Framed Buildings".
- > 13kN concentrated load in garage over area of 0.3 x 0.3m (vehicle limited to 2500kg gross).

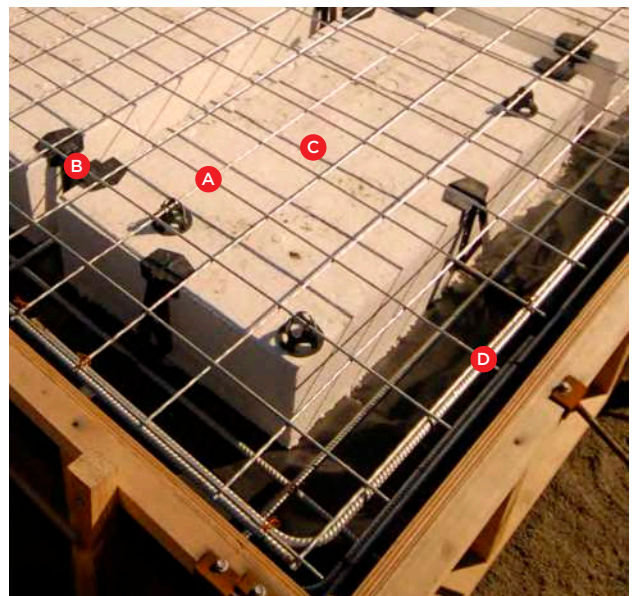
#### 3.3 Snow Loading

Open ground snow loading as defined in NZS3604 of up to 2kPa.

#### 3.4 Dead Loading for Use with This Manual

The dead load cases of structures covered by these designs are:

- > Light external walls with total mass not exceeding 60kg/m<sup>2</sup> – e.g. timber framing with weather boards and interior wall linings.
- > Heavy external walls with total mass greater than 60kg/m<sup>2</sup> but not exceeding 290kg/m<sup>2</sup> – e.g. timber framing with masonry veneer or partially filled 20 series masonry blocks.
- > Internal walls with total mass not exceeding 45kg/m<sup>2</sup> – e.g. timber framing and linings.
- > Light roofs with total mass not exceeding 45kg/m<sup>2</sup> – e.g. ceiling linings and metal roof, including framing.
- > Heavy roofs with total mass greater than 45kg/m<sup>2</sup> but not exceeding 85kg/m<sup>2</sup> – e.g. ceiling lining and concrete tiles or slates, including framing.
- > Mid-floors with total mass not exceeding 60kg/m<sup>2</sup> – e.g. timber framing and flooring, including ceiling linings.
- > Heavy internal walls and/or load bearing internal walls supported on a load bearing rib.



The RibRaft® System

- A** Steel mesh reinforcing
- B** Firth 100mm spacer
- C** Firth RibRaft® polystyrene pods
- D** Steel reinforcing

### 3.5 Foundation Requirement for Different Building Types

The designs given in this Manual are limited to where the system supports Building Types as described in Table 1. The classification of wall and roof weights are as detailed in Clause 3.4 of this Section. Single and two storey shall be as defined in NZS 3604:2011.

**Table 1 Foundation Type Identifier**

NUMBER OF STORIES	ROOF	GROUND FLOOR EXTERNAL WALLS	SECOND STOREY EXTERNAL WALLS	1.5KPA LIVE LOAD & UP TO 1KPA SNOW LOAD	3KPA LIVE LOAD & /OR 2KPA SNOW LOAD
SINGLE STOREY	Light	Light		A	A
	Heavy	Light		A	B
	Light	Heavy		B	B
	Heavy	Heavy		C	C
DOUBLE STOREY	Light	Light	Light	C	D
	Heavy	Light	Light	D	E
	Light	Heavy	Light	D	E
	Heavy	Heavy	Light	E	G

### 3.6 Foundation Soils

The system may be used when the supporting ground meets the definitions of “good ground” given in Section 3 of NZS 3604:2011 (as modified by B1 of the Building Compliance Documents). In addition, the system shall not be used for damp sites i.e. where it can be reasonably expected that the ground water level could come within 600mm of the underside of the system. The acceptability of the ground shall be verified in accordance with Clause 3.1.3 of NZS 3604:2011.

Solutions for soils prone to liquefaction or expansive soils are available using the Firth RibRaft® technology, however these are outside the scope of this Manual and require specific engineering design.

Where the ultimate bearing capacity required of the supporting ground is verified by Scala Penetrometer testing in accordance with Clause 3.3 of NZS3604:2011 or for cohesive soils using a calibrated shear vane in accordance with the NZGS Guideline for Hand Held Shear Vane Test, the bearing capacity shall exceed the values in Table 2 for the proposed building type. For scala penetrometer testing, the bearing capacity shall be considered adequate when the number of blows per 300mm depth of penetration below the underside of the system at each test site exceeds the values given in Table 2 below.

For RibRaft® foundations compliance with Table 2 allows ultimate bearing capacities of less than 300kPa. However, with the exception of bearing capacity all other requirements in NZS3604:2011 for “good ground” shall be complied with.

**Table 2 Scala Penetrometer Blows Required and Ultimate Bearing Capacity**

FOUNDATION TYPE	ULTIMATE BEARING CAPACITY (KPA)	MIN. BLOWS PER 300MM DEPTH FOR SCALA TESTING
A	140	4
B	175	5
C	210	6
D	240	7
E	275	8
G	Good ground	9

### 3.7 Flow Diagrams

The flow diagrams on the following pages (adapted from NZS3604:2011) will help in determining whether the non-specific details for the system can be used for the purposes of the concrete floor slab construction. There are two checks in the process. The first is to determine whether the proposed building complies with the requirements set out in this Manual (Building Check), and the second is to determine whether the site complies with the requirements set out in this Manual (Site Check).

(Note: NZS3604:2011 provides for parts of buildings to be considered as individual buildings. These flow diagrams apply to those parts of the building where slab-on-ground is being considered and where the part of the building can be considered as an individual building under NZS3604:2011).

Figure 1 Building Check Flow Diagram

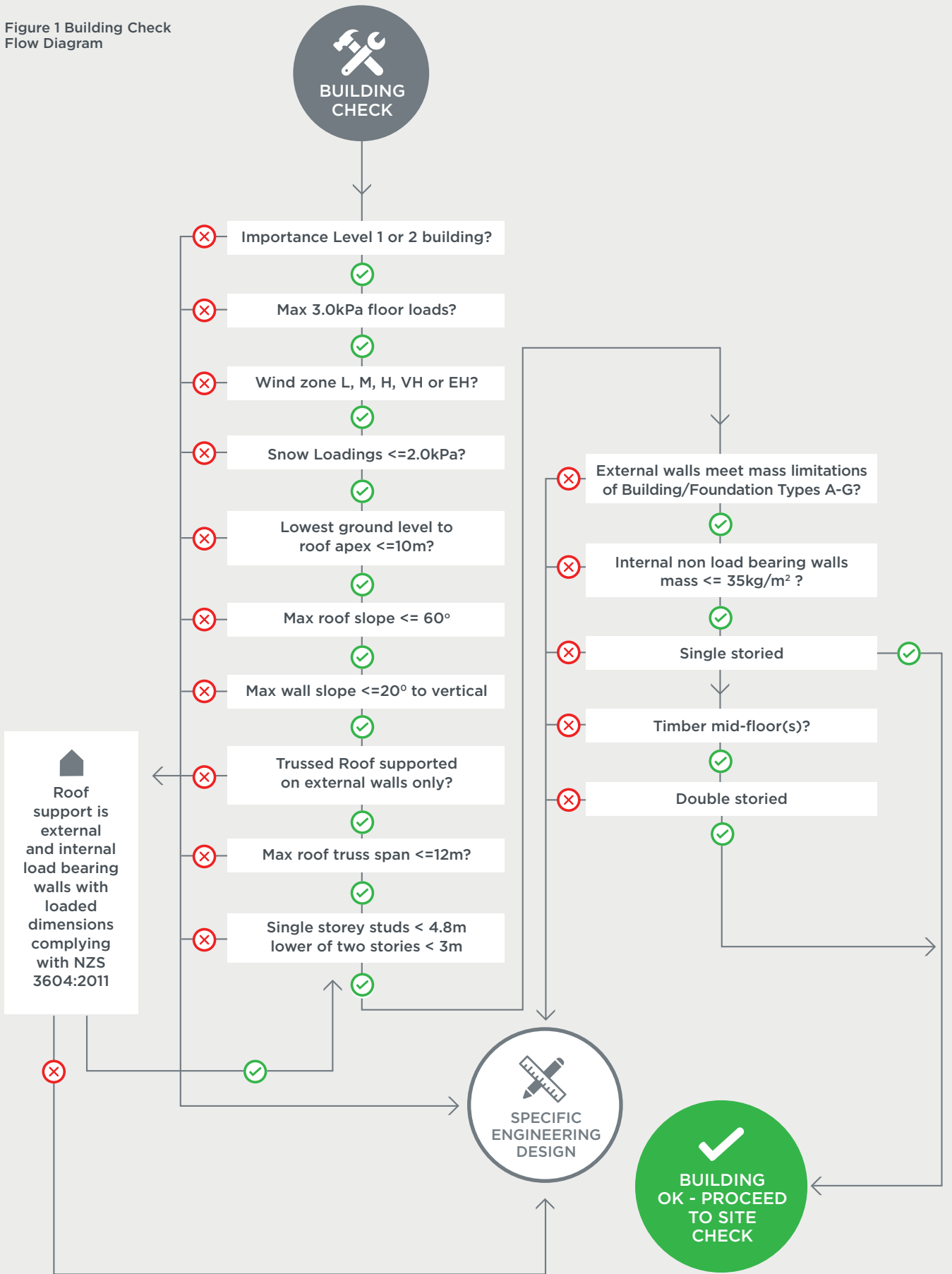
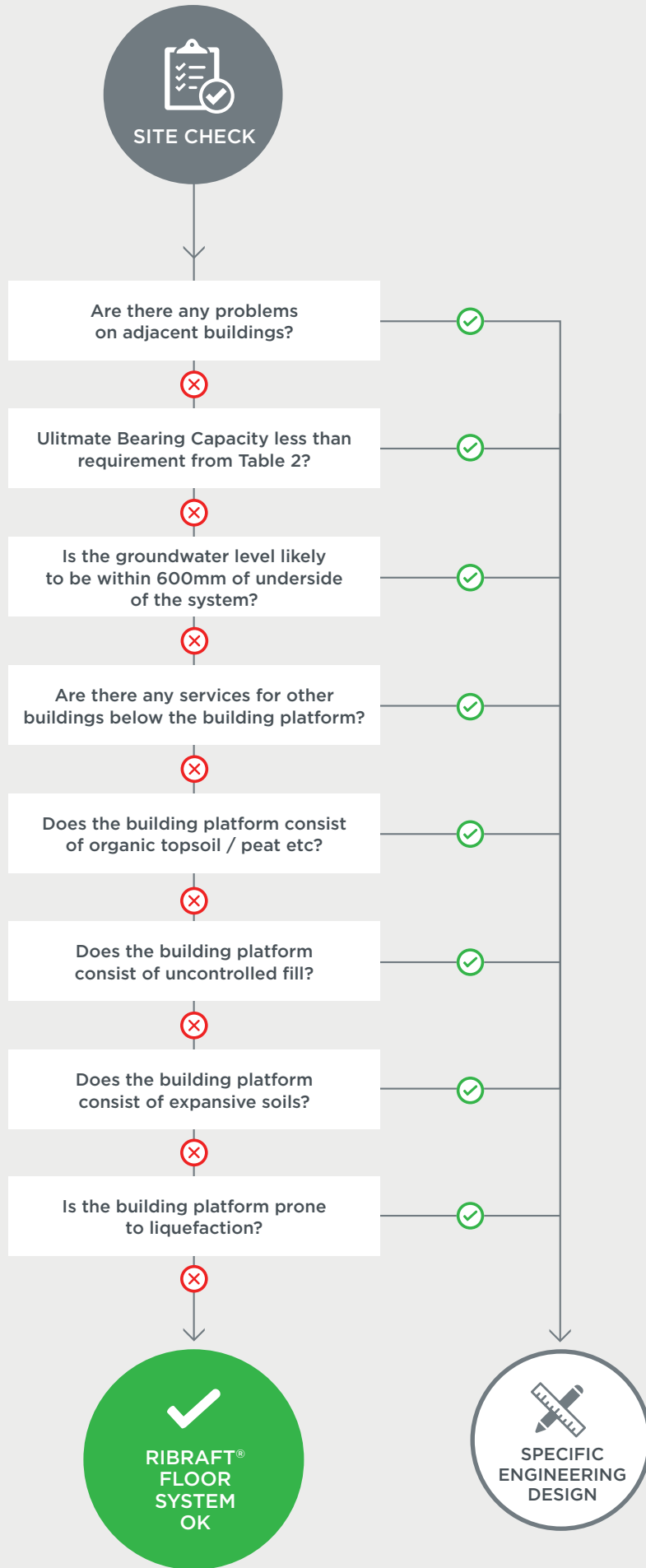


Figure 2 Building Check Flow Diagram



## 4.0 CONSTRUCTION DETAILS

Standard construction details for the system are provided here for buildings that fall within the below scope.

### 4.1 Pod Layout

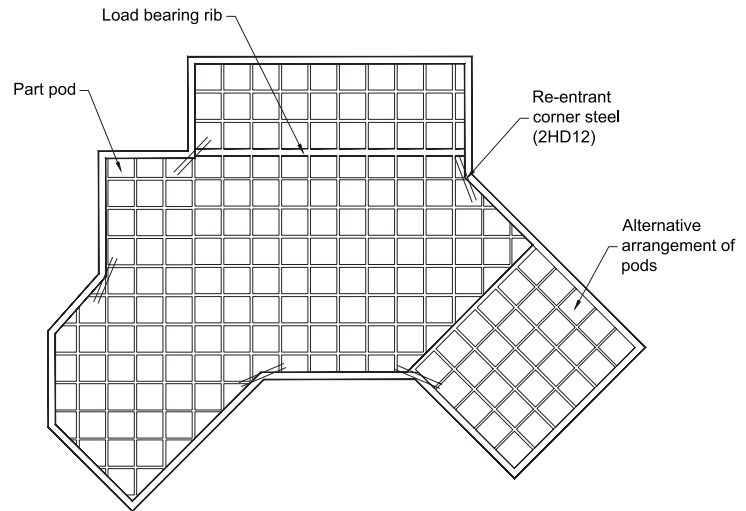
RibRaft® polystyrene pods supplied by Firth (1100 x 1100 x 220mm thick) shall be placed on levelled ground and arranged in a waffle pattern. The pods are used as void formers while the concrete is curing. These pods are an integral component of the system and shall not be substituted.

Pods shall be placed so as to provide the necessary spacing between the edge beams and ribs as described below. The first rib out from the edge beam shall have a maximum clear separation of 1100mm however in all other cases the centre to centre distance between the ribs, whether they are 100mm or 300mm wide, shall be 1200mm. In the case of 100mm ribs this centre to centre spacing is achieved by the 1100mm square pods however between 100mm and 300mm ribs, or between two 300mm ribs, the pods shall be cut down to suit. Pods may be cut down to size but shall not be added to, where this is necessary to suit the building layout, penetrations or orientation of beams and ribs.

**Figure 3** shows a typical layout of the pods and ribs. Note the part pods around the edge, where the building shape dictates, and adjacent to the 300mm rib.

Firth suggests that when drawing the building plan, a generic RibRaft® grid (100mm wide ribs at 1200mm centres) is set out using the corner of the building as a starting point. The location of any load bearing ribs, or point loads greater than 10kN, are identified and pods cut to establish 300mm wide ribs or foundation pads as described in this Manual. The most cost effective solution being a simple grid layout which requires minimum cutting of the pods. Ribs can be used at less than 1200mm centres, however it is more cost effective to use the 1200mm centres wherever practicable.

**Figure 3 Typical RibRaft® Plan**



### 4.2 Edge Beam Width and Reinforcement

Edge beams around the perimeter of the floor slab shall be 300mm to provide bearing capacity for external load bearing walls, and contain 2-HD12 bars (Grade 500E) as bottom steel and 1-HD12 bar (Grade 500E) in the top. This top bar shall be tied to the underside of the reinforcement mesh. Refer Figure 5, below for construction details. The edge beam shall be rebated for brick veneers where necessary as shown in Figure 5(C).

### 4.3 Internal Ribs (non load bearing) Width and Reinforcement

Each standard internal rib shall be 100mm wide and shall contain 1-HD12 steel bar (Grade 500E) held in place at the bottom of the rib by a Firth spacer. Refer Figure 5E for construction details.

### 4.4 Internal Ribs (load bearing) Width and Reinforcement

For load bearing walls that support the roof and floors and heavy internal walls, the pods shall be cut to create a 300mm wide rib directly under the load bearing wall. Refer Figure 5(D) for construction details under load bearing walls. Where the load bearing ribs meet and terminate at an edge beam or internal rib the bottom reinforcement from the load bearing rib shall be bent into the adjacent rib and tied together. The reinforcement shall lap for at least 720mm.

4.5 Point Loads

Truss manufacturers often support the roof trusses internally on posts or studs within a wall, which are described on the truss manufacturer’s drawings as falling into various ultimate limit state categories. Table 3 summaries when individual footings are required below the reactions, and the form these should take.

Table 3 Foundation Requirements for Individual Point Loads

FOUNDATION OPTIONS BELOW POINT LOAD:

ULTIMATE LIMIT POINT LOAD REACTION	PAD OPTION, GOOD GROUND	BEAM OPTION, BEARING CAPACITY GREATER THAN 140KPA <sup>(3)</sup>
Up to 10kN	No thickening required	No thickening required
Up to 20 kN	375x375 pad <sup>(1)</sup>	300mm wide load under point load as detailed in Figure 5
Up to 30kN	450x450 pad <sup>(2)</sup>	300mm wide load under point load as detailed in Figure 5

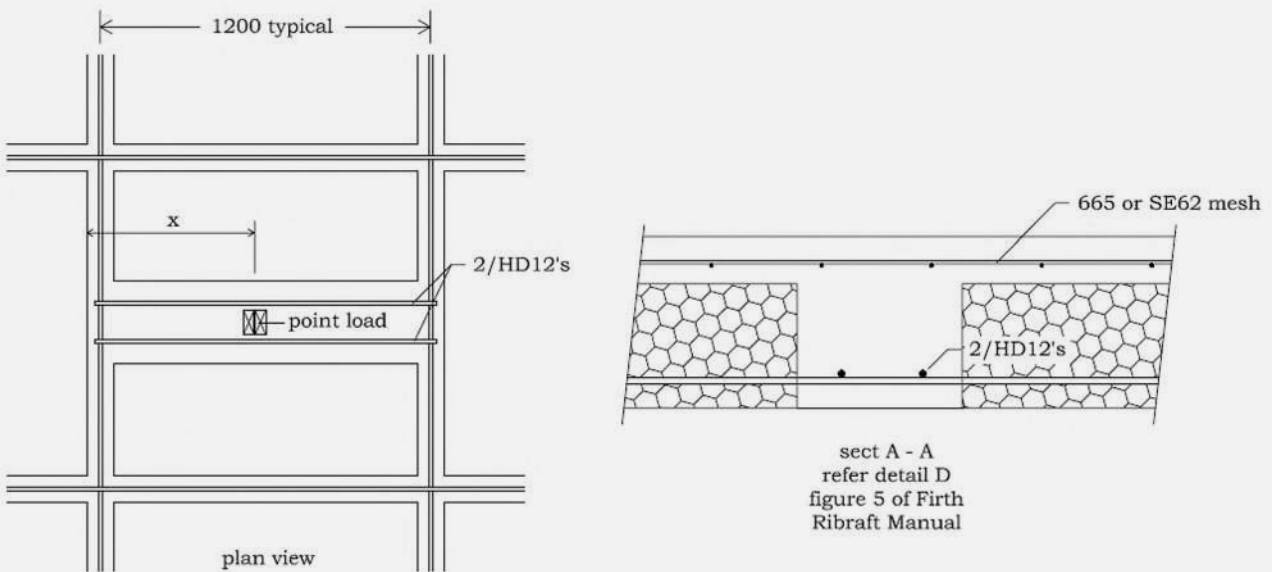
Notes

- (1) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 2 x D12 Bars both ways
- (2) Pad thickness to match depth of pods plus topping (bears on ground not polystyrene) and reinforced with 3 x D12 Bars both ways
- (3) Refer section 3.6 for confirmation of bearing capacity. With exception of bearing capacity all other requirements in NZS3604 for good ground shall be complied with.

Figure 4 Details for Beam Option Thickening Under Point Loads

ULTIMATE LIMIT LOAD P FROM TRUSS DESIGNER	MINIMUM EDGE DISTANCE X IN MM
20kN	200 *
30 kN	400 *

\* If minimum edge distances cannot be achieved extend thickening to next 100mm ribs



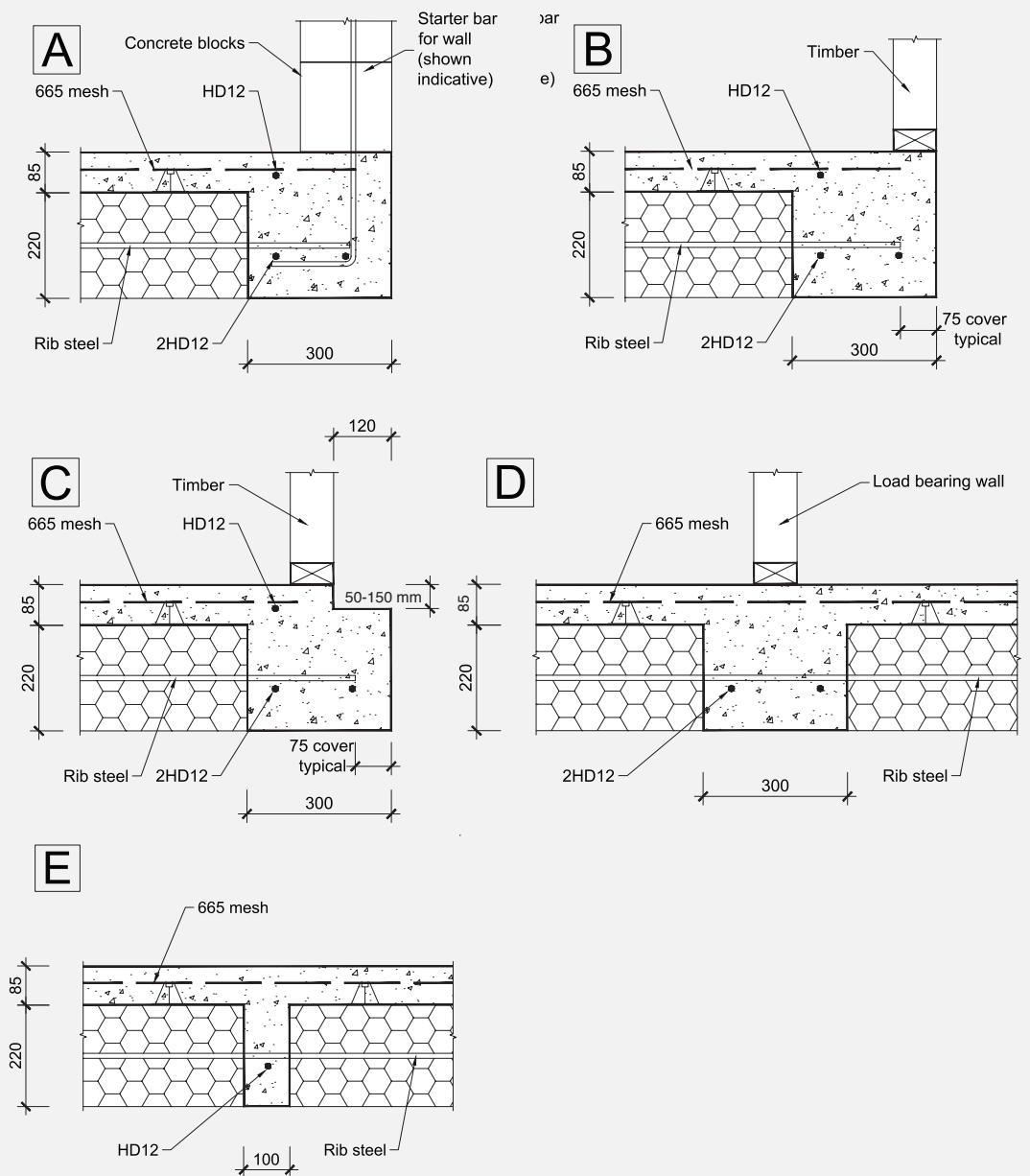
4.6 Mesh Reinforcement

The entire floor slab shall be reinforced with 665 mesh supported on 40mm mesh chairs sitting on the polystyrene pods.

4.7 Re-entrant Corners

In order to limit the width of cracking at the re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover from the internal corner - refer Figure 3.

Figure 5  
Standard RibRaft®  
Construction Details



## 5.0 LATERAL RESISTANCE

### 5.1 Earthquake Resistance

Unlike conventional foundation systems, the Firth RibRaft® system is not embedded into the ground. Sliding resistance to horizontal seismic loads is provided by frictional contact with the soil. In locations where the Seismic Hazard Factor Z is greater than 0.45, shear keys maybe required to resist seismic loads. Such buildings require specific engineering design and are outside the scope of this document. Refer to Figure 6.

Depending on the wind zone and the weight of the building elements this frictional resistance may not be sufficient to provide sliding resistance to wind loads, and specific shear keys may be required, as detailed in Clause 5.2.

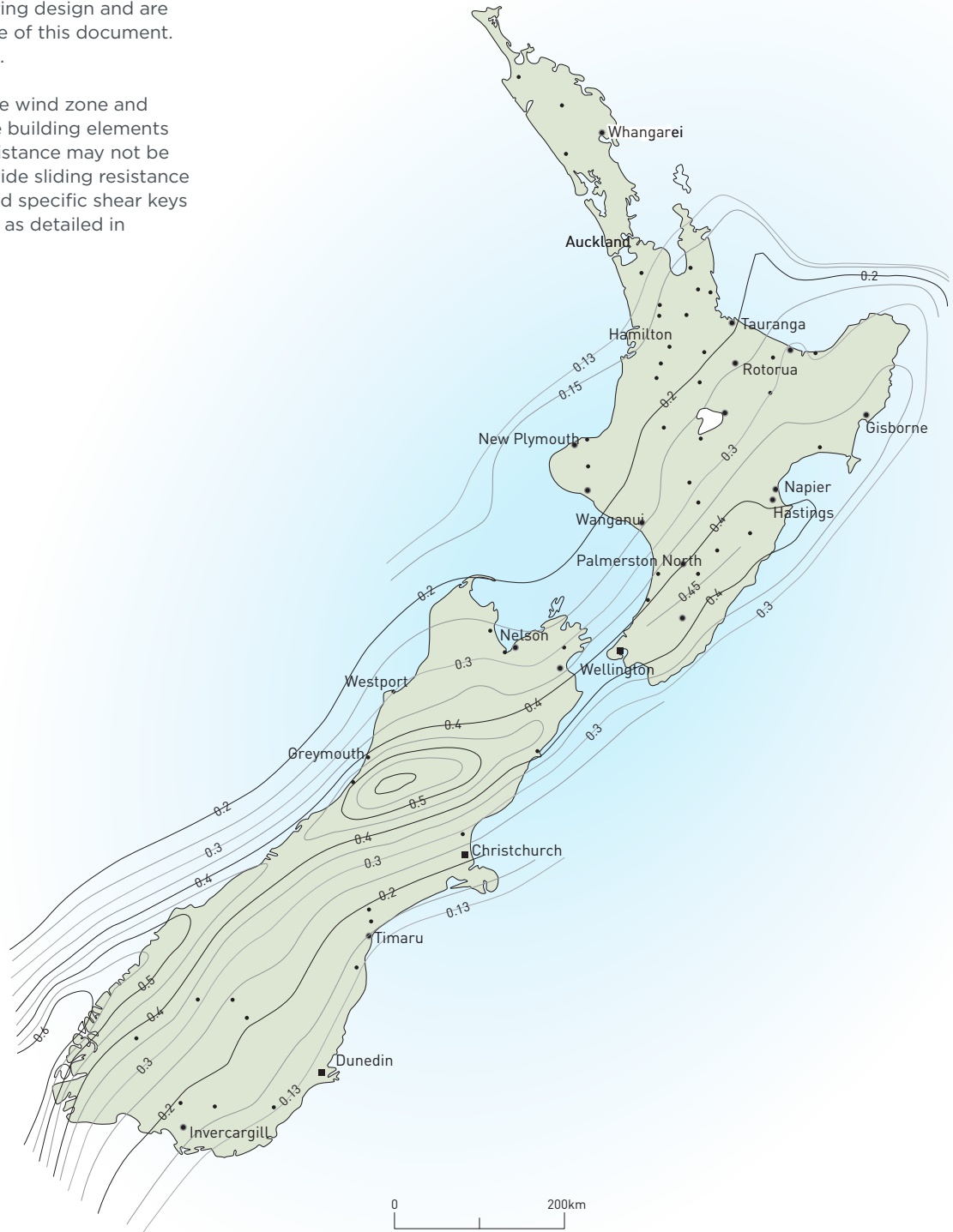


Figure 6  
Seismic Hazard  
Factor Z to  
NZS 1170.5

## 5.2 Wind Resistance

The building's bracing demand from wind loading shall be assessed from Section 5 of NZS 3604:2011 for both directions (i.e. along and across the building). The bracing capacity of the system must exceed the greater of the bracing demands determined.

The bracing capacity of the system shall be determined as the sum of the bracing capacity provided by frictional resistance (i.e. friction between the system and the ground) and the bracing capacity provided by the shear keys (if any) necessary to meet the requirements of Clause 5.2.

The bracing capacity provided by frictional resistance shall be determined from Table 4 depending on the building type, roof weight, and floor live loading. The bracing capacity provided by the shear keys shall be the sum of the bracing capacity of the individual shear keys determined as follows. If the shear key is in clay, each shear key shall be considered to contribute 170 BU's. If the shear key is in sand, each shear key shall be considered to contribute 200 BU's. If the bracing capacity of the system, determined from the frictional resistance and the shear keys as described above, is less than the bracing demand further shear keys shall be added until the bracing demand is met.

BUILDING TYPE	ROOF TYPE	GROUND FLOOR EXTERNAL WALLS	SECOND STOREY EXTERNAL WALLS	BU's PROVIDED PER 100M <sup>2</sup> 1.5KPA	FOR LIVE LOADING OF: 3.0KPA
Single Storey	Light	Light		1630	1746
Single Storey	Heavy	Light		1737	1857
Single Storey	Light	Heavy		1802	1922
Single Storey	Heavy	Heavy		1909	2029
Double Storey	Light	Light	Light	2163	2403
Double Storey	Heavy	Light	Light	2270	2510
Double Storey	Light	Heavy	Light	2335	2575
Double Storey	Heavy	Heavy	Light	2442	2682

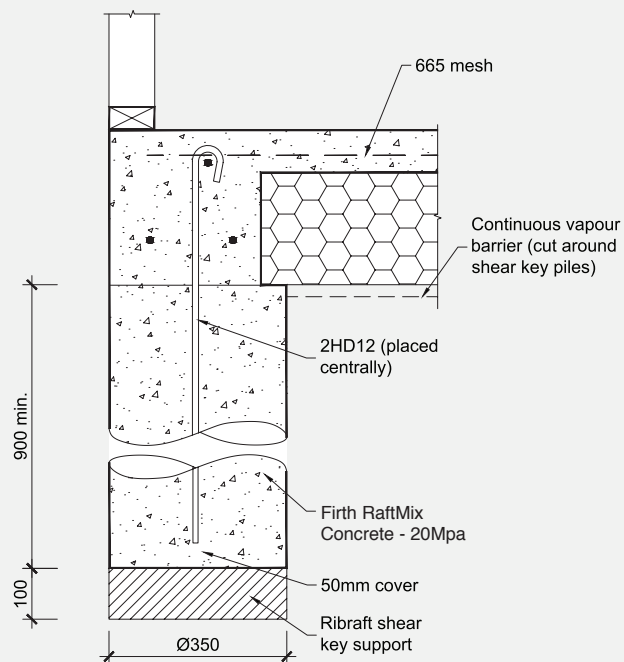
**Table 4 Bracing Capacity Provided By Frictional Resistance Per 100m<sup>2</sup> Of Ground Floor Area**

## 5.3 Shear Keys

Shear key piles required by Clause 5.2 must be uniformly distributed around the perimeter of the building, and be located at the edge beam/internal rib junction. Where a shear key is required, the minimum number of shear keys shall be two per floor plan. Where two shear keys are used they shall be placed at diagonally opposite ends of the floor plan.

Construction details of the shear keys shall be as shown on Figure 7. Shear keys shall be a minimum of 900mm long. The holes shall be over-drilled at least 100mm and a polystyrene RibRaft® Shear Key Support placed into the bottom of each hole. This will support only the plastic (wet) concrete and then allow movement of the shear key if settlement of the supporting ground occurs. The effective end bearing of the shear keys is therefore eliminated.

**Figure 7 RibRaft® Shear Key**



## 5.4 Design Example For Lateral Resistance Calculation

The following is a short example to demonstrate the process of determining whether shear piles are required.

Consider a 180m<sup>2</sup> single storey home with a light roof located in Palmerston North in a VH wind zone as defined by NZS3604. Assume the building height is 6m with 3m above the eaves. The length for across wind considerations is 15m and the width (along wind) is 12m.

First consider seismic actions. From Figure 6 the seismic hazard factor is 0.4. Since this is less than 0.45 shear keys will not be required for earthquake resistance.

Now consider wind loading. Table 5.5 of NZS3604 requires 95 bracing units per meter (BU/m) across the building and 90 BU/m along. As it's a very high wind zone these figures need to be increased by a factor of 1.3.

The BU demand for across building wind is therefore =  $95 \times 1.3 \times 15 = 1853\text{BU}$   
 The BU demand along the building =  $90 \times 1.3 \times 12 = 1404\text{BU}$

From Table 4 for a single storey light weight roof with 1.5kPa live load the capacity is 1630BU per 100m<sup>2</sup>. Therefore for 180m<sup>2</sup> the capacity is 2934BU. As the capacity (2934) is greater than the demand (1853) no shear keys are required.

If the demand had exceeded the capacity then any shortfall can be provided by supplying shear keys in accordance with Section 5.3 with each shear key providing the BU specified in Section 5.2.

## 6.0 OTHER DESIGN DETAILS

### 6.1 R-Values

The insulation performance of a building element is measured by the "R-Value". The schedule method is the simplest method to achieve compliance with Clause H1 of the Building Code. Using this method the minimum R-Values required for floors are R1.3 for light timber frame construction, and typically R1.5 for masonry construction. R-values of R1.3 can be used for masonry construction if glazing with greater insulation is used (refer NZBC, Clause H1). If in-floor heating is used the minimum required R-Value is increased to R1.9, and the resistance to thermal movement into the room must be one tenth of that to the outside environment.

The fourth edition of H1 (amendment 3, January 2017) states that "Concrete slab-on-ground floors are deemed to achieve a construction R-value of 1.3, unless a higher R-value is justified by calculation or physical testing". RibRaft<sup>®</sup> is therefore a deemed to comply solution however in some instances designers may wish to determine the R-value as part of the design process. There are numerous methods for calculating R-values for slabs on ground, with many of the processes giving quite different R-values. NZBC clause H1 prescribed that an "Acceptable methods for determining the thermal resistance (R-values) of building elements are contained in NZS 4214."

The R-values provided in this Manual use the NZS4214 methodology.

If the R-value calculation is required to demonstrate compliance with the Building Code, then the NZS4214 methodology is probably the best alternative due to its reference in H1. However, more technically robust calculation methodologies exist and where the R-values are important, for example heated floors, use can be made of the BRANZ Home Insulation Guide. For these instances edge insulation is also recommended.

When slab edge insulation is specified, it is recommended that Firth HotEdge<sup>®</sup> is used as it has been designed to be compatible with Firth RibRaft<sup>®</sup>.

The R-Value of a concrete floor is dependent on the floor area to perimeter ratio, and the details of the floor perimeter. The R-Value for various solutions are illustrated below. The R-Values have been independently calculated using NZS4214:2006 "Methods of Determining the Total Thermal Resistance of Parts of Buildings," though modified for perimeter heat loss using recommendations from the Building Research Establishment.

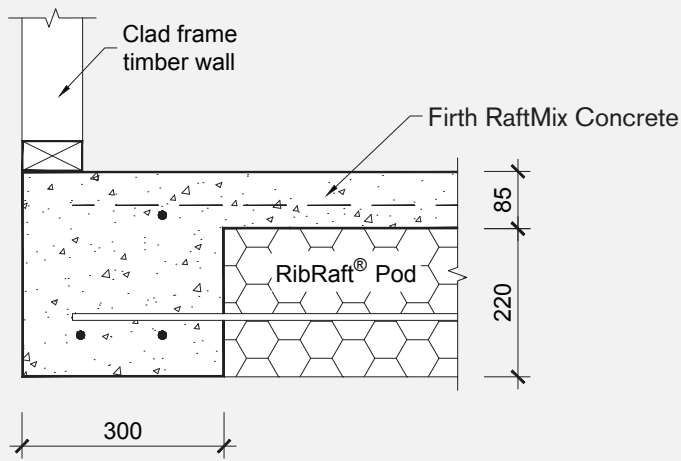


Figure 8  
RibRaft® R Values  
For 90mm Thick  
Walls On The  
Floor Edge

R-Value m <sup>2</sup> °C/W	FLOOR AREA TO PERIMETER RATIO M <sup>2</sup> /M										
	1.00	1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
	1.28	1.40	1.52	1.64	1.75	1.86	1.97	2.07	2.17	2.38	2.57

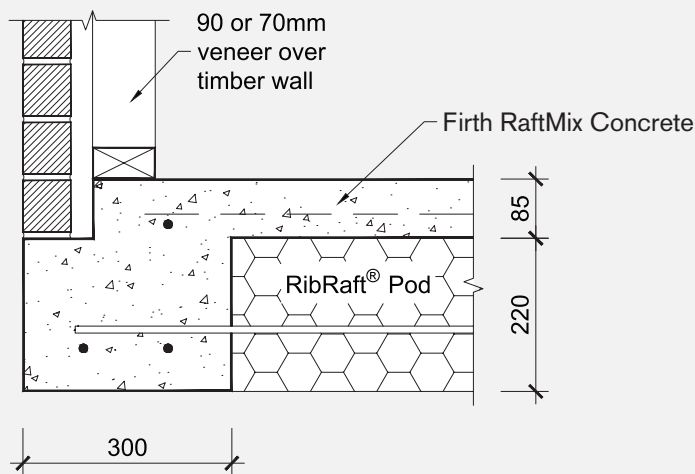


Figure 9  
RibRaft® R Values  
For 70-90mm  
Thick Veneer,  
Cavity, and  
90mm Walls.

R-Value m <sup>2</sup> °C/W	FLOOR AREA TO PERIMETER RATIO M <sup>2</sup> /M									
	1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84

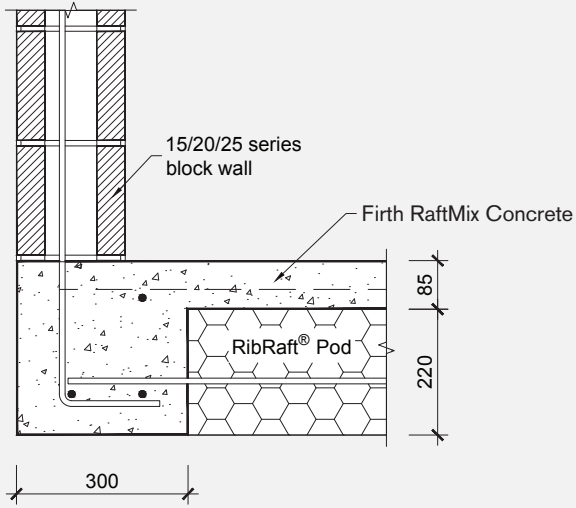


Figure 10  
RibRaft® R Values  
For Various  
Thicknesses  
Of Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M <sup>2</sup> /M									
		1.25	1.50	1.75	2.00	2.25	2.5	2.75	3.0	3.5	4.00
R-Value m <sup>2</sup> °C/W	15 SERIES	1.48	1.60	1.73	1.85	1.96	2.08	2.19	2.30	2.51	2.72
	20 SERIES	1.54	1.67	1.80	1.93	2.05	2.17	2.28	2.40	2.62	2.84
	25 SERIES	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95

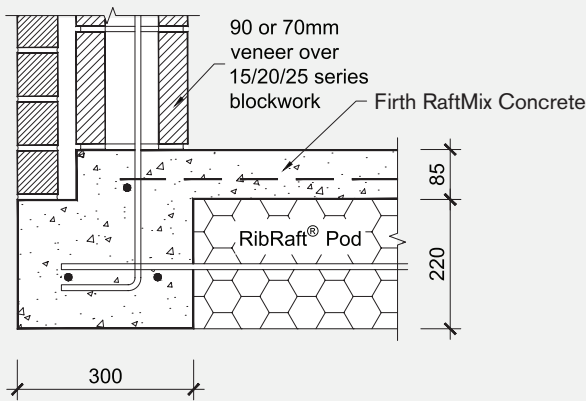


Figure 11  
RibRaft® R-Values  
For 70-90mm Thick  
Veneer, Cavity, And  
Various Thickness  
Masonry Walls

	BLOCK	FLOOR AREA TO PERIMETER RATIO M <sup>2</sup> /M									
		1.25	1.50	1.75	2.00	2.25	2.0	2.75	3.0	3.5	4.00
R-Value m <sup>2</sup> °C/W	15 SERIES	1.59	1.73	1.86	1.99	2.12	2.24	2.37	2.49	2.72	2.95
	20 SERIES	1.64	1.78	1.92	2.06	2.19	2.32	2.44	2.56	2.81	3.04
	25 SERIES	1.69	1.83	1.98	2.11	2.25	2.38	2.51	2.64	2.88	3.12

## 6.2 Shrinkage Control

Shrinkage control joints reduce the risk of unwanted cracks, and their placement needs to be carefully considered where uncontrolled cracking could be unacceptable. Two types are described here: saw cut joints (which are tied joints), and free joints.

### 6.2.1 Saw Cut Joints

Saw cuts are located at positions in which the concrete is likely to crack due to stresses induced by restrained shrinkage. The aim of providing them is for the concrete to crack at the bottom of the saw cut thus minimizing the potential for a visible crack wandering over the surface. The level of reinforcement provided in a RibRaft® mean that cracks have no structural implications being only an aesthetics issue. Factors to consider are the type of floor finish, the location of ribs and ground beams, underfloor heating, and the effect of piles restraining shrinkage.

Preference should be given to using early entry saws which are used immediately after finishing. Shrinkage control joints cut using diamond blades shall be cut as early as possible which is typically within 24 hours of hardening in summer, and 48 hours in winter. They shall be cut to a depth of 25mm. Shrinkage control joints do not guarantee elimination of all visible or unwanted cracks but should minimise number.

Joints shall be positioned to coincide with major changes in floor plan. Where concrete is to be exposed, for example in a garage, or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 5m. Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 1.5:1. Shrinkage control joints shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib, then the joint shall be located directly above one edge of that rib.

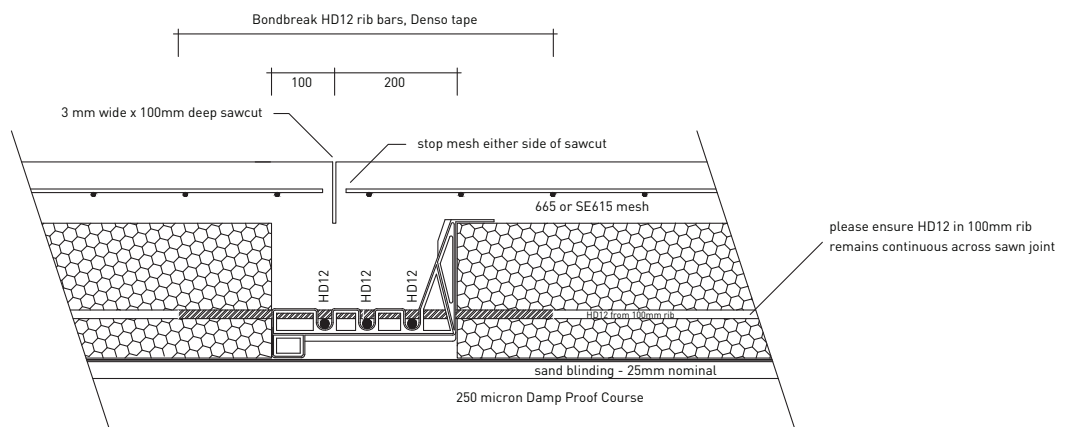
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 3.

### 6.2.2 Free Joints

Where the length of the floor exceeds 30m a free joint shall be provided as detailed in 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 12**  
**Free Joint**  
**Details**



RibRaft® control / free joint detail at 300mm wide thickening  
align sawcut with internal corner where possible

### 6.3 Services Detailing

Two options exist for running services, both of which are appropriate, however some regional Building Control Authorities and Builders have clear preferences. The options being within slab, or under slab. Experience from the Christchurch earthquakes shows that the most seismically robust solution is for services to run within the plane of the pods (within slab).

#### 6.3.1 Within Slab Running of Services

Pipes services can be run within the plane of the pods either exiting out of the side of the perimeter ring beam or going underground at the edge beam. Pipes shall be laid at a fall to comply with NZBC G13/AS1. For pipe up to 65mm diameter the minimum gradient is typically 1 in 40, while for 100mm pipes it's 1 in 60, however greater falls may be required dependent upon the required number of discharge units. Table 5 provides distances from the edge of the slab to pipe surface penetration to achieve minimum pipe gradients. A 300mm pod alternative is often used where the proposed positioning of the service means minimum required gradients cannot be achieved. Where gradients cannot be achieved with a 300mm pod, then service will require to be run under the slab.

Pipes shall be located to pass perpendicular to the ribs and beams and shall not be laid along the length of ribs or beams. Pods are cut as required to achieve the required fall and position. Pipes shall be laid to ensure 15mm concrete cover between pipe and reinforcement in the perimeter beam. All pipes in contact with concrete shall be lagged with an impermeable material of at least 6mm thickness.

Table 5 Maximum Distance From Exterior To Entrance Point Of Plumbing Pipes

PIPE DIAMETER (ID)MM	GRADIENT	MAXIMUM DISTANCE TO EDGE WITH 220MM THICK POD	MAXIMUM DISTANCE TO EDGE WITH 300MM THICK POD
40	1 in 40	3400	6600
50	1 in 40	3000	6200
65	1 in 40	2400	5600
100	1 in 60	1200	4400

#### 6.3.2 Under Slab Running Of Services

For this option, services ducts shall be conveyed underground to their plan location then brought up through the polystyrene pod and the concrete floor slab, within the limitation imposed by Table 8. Services shall not be placed within any concrete except to cross that section of concrete i.e. services shall not run along ribs or edge beams. In accordance with AS/NZS3500.4:2015 pipes penetrating through concrete shall be:

- > Installed at right angles to the slab surface.
- > Lagged with an impermeable material for the full depth of the concrete penetration.
- > Lagging must be at least 6mm thick.

The maximum diameter of the services shall be as outlined in Table 6.

Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in Figure 13, services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in Figure 15 at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

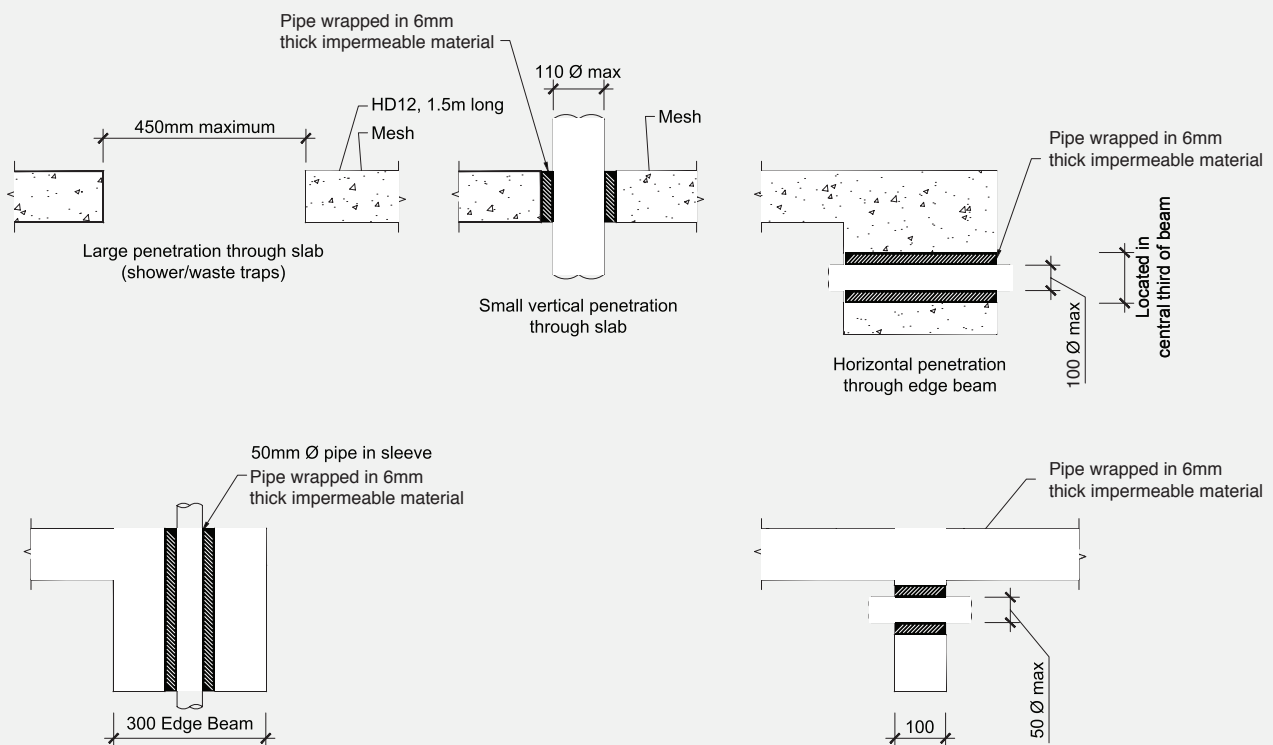
Table 6 Maximum Diameter Of Pipe Services

ELEMENT	VERTICAL SERVICE	HORIZONTAL SERVICE
300mm wide edge beam	50mm nominal bore pipe	100mm NB pipe
500mm localized wide edge beam (1)	100mm NB pipe	100mm NB pipe
300mm wide internal load bearing rib	50 NB pipe	100mm NB pipe
100mm wide internal rib	Nil	100mm NB pipe
Slab	100 NB pipe, or for large services 450mm square see also Note 3	Nil

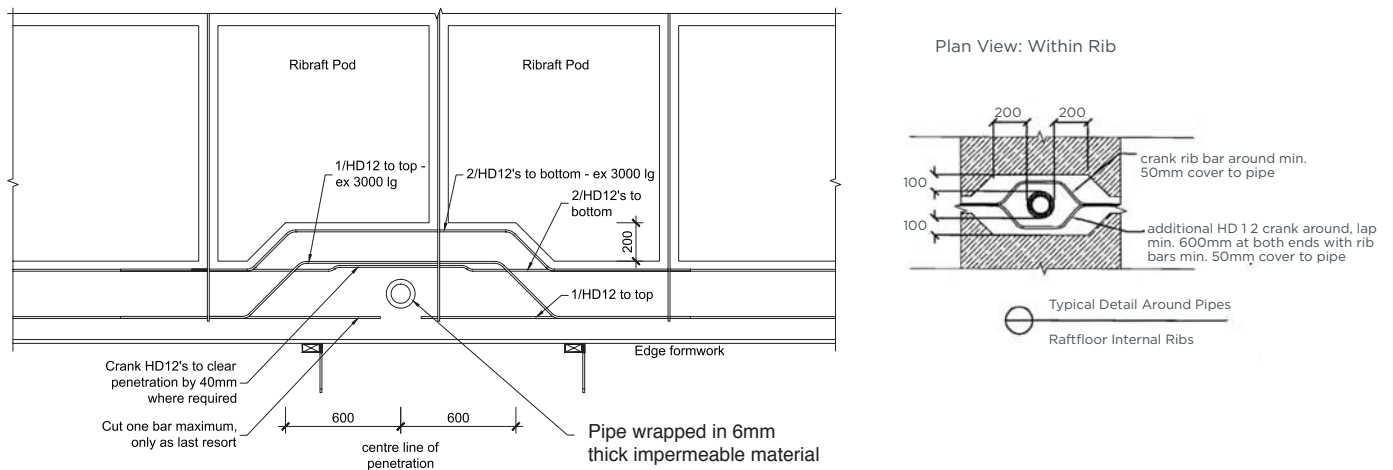
- Notes:
- (1) For situations where a 100mm diameter pipe is required to pass vertically through the edge beam, the edge beam shall be locally increased in width to a minimum of 500mm wide. This shall be achieved by keeping flush the outside face of the edge beam and removing 200mm from the pod. The width shall remain at 500mm for a distance of 600mm beyond the service pipe. Refer to figure 14 for details for pipes passing vertically through edge beam and internal rib.
- (2) Where a gas pipe line runs through the RibRaft® floor system, in addition to the requirements above, the pipeline shall enter the building through the outside face of the perimeter foundation beam and be located in the plane of the pods. The aim being to ensure that damage to the gas pipe will most likely occur outside the building envelope should movement occur between the ground and RibRaft® in a large earthquake.
- (3) Larger penetrations or voids up to 450mm square (e.g. for shower waste/traps) are permitted through the slab provided all the conditions of this paragraph are met. These openings shall be trimmed with 1 HD12 (Grade 500E) bar 1500mm long placed along each side of the opening, tied to the mesh. One set of parallel bars shall be placed on top of the mesh and the other set placed under the mesh. These openings shall not be placed over a rib or edge beam. If necessary, the rib spacing shall be reduced or the pod layout altered to ensure that the opening occurs solely in the slab above a polystyrene pod. Penetrations such as these shall not be installed in garages or other areas where large (>3kN) point loads could be present. Only one penetration greater than 110mm is permitted in the slab above any single pod or part pod. Where two large openings are required to be in close proximity, an internal rib shall separate them. For these large penetrations/voids in the slab, the services shall not be within 25mm of the edges of the void through which they pass, and the opening shall be sealed to prevent materials entering the subfloor cavities. (This type of opening is normally only required for a shower waste/trap and the installation of the shower will ensure that the void is sealed/covered).

A pictorial of some of the above requirements is illustrated in Figure 13 and 14.

Figure 13 Example of Detailing Requirements For Services



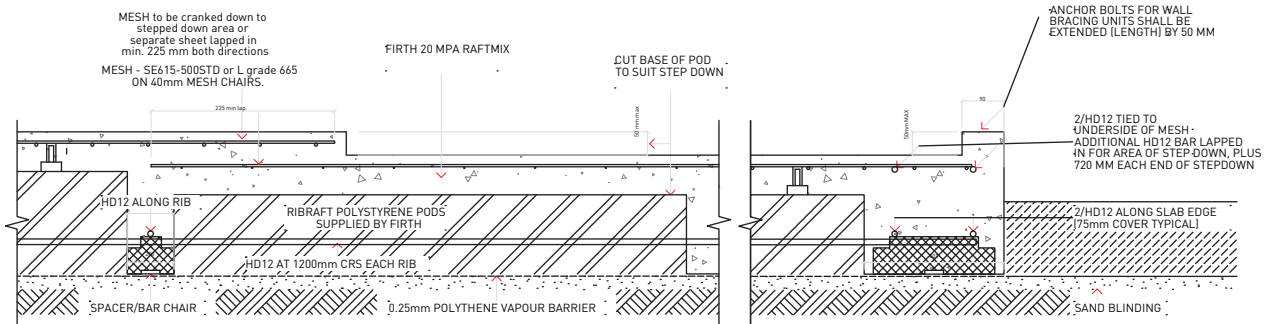
**Figure 14**  
Localised Increase In Width At Edge Beam Where Vertical Service Up To 100mm Diameter Are Required



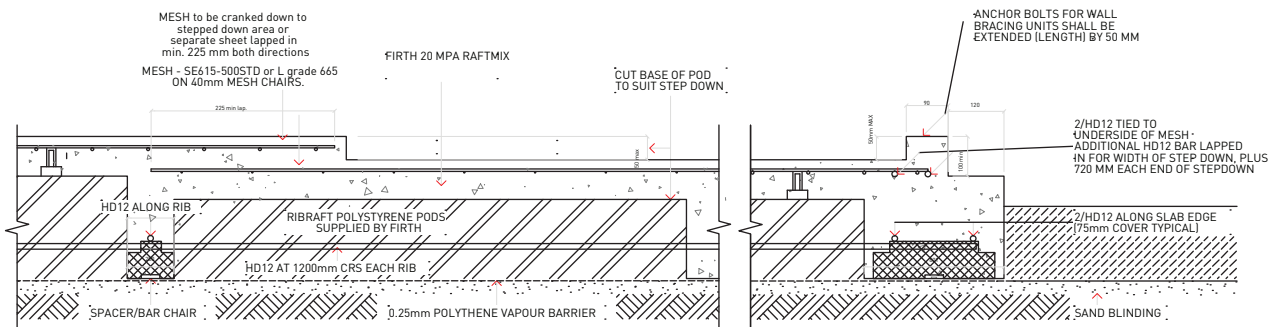
### 6.3.3 Recesses for Showers

Where showers are rebated up to 50mm into the RibRaft® concrete topping, the details specified shall be in accordance with Figure 15.

**Figure 15** Details where recesses of up to 50mm are required for rebated showers

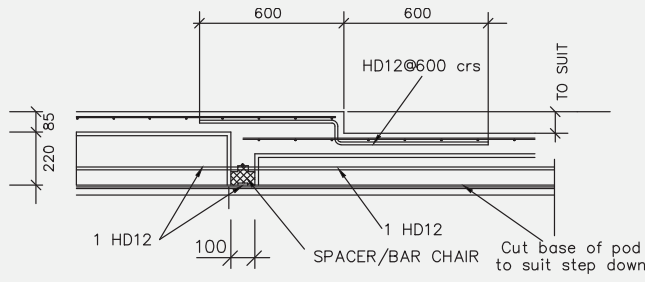


#### RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

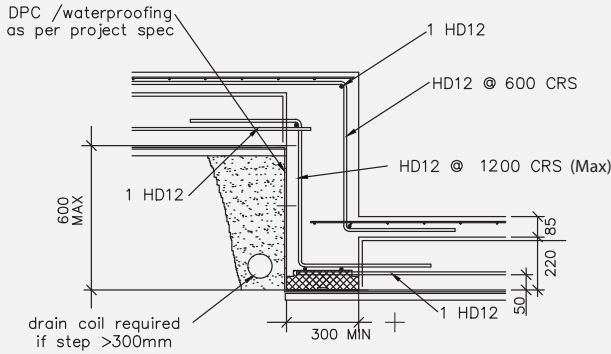


#### RIB RAFT FLOOR - SET-DOWN DETAIL FOR MAX. 50mm REBATED SHOWER

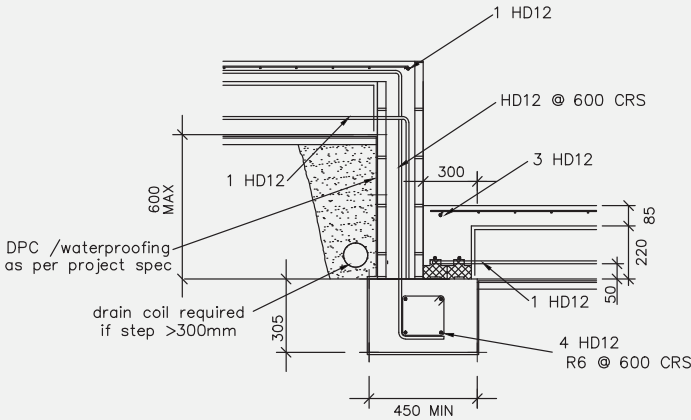
Figure 16 Details where step downs are required in the floor



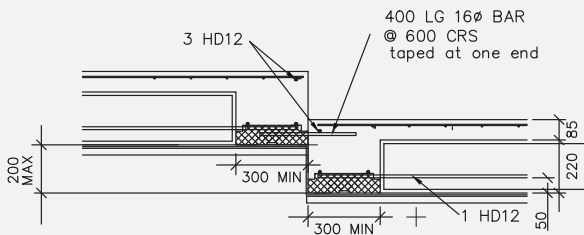
7  
S2  
SET-DOWN  
DETAIL FOR STEP  
UP TO 100mm  
1:20



9  
S2  
SET-DOWN DETAIL  
IN CONCRETE  
FOR STEP LESS  
THAN 600mm  
1:20



8  
S2  
SET-DOWN DETAIL  
IN MASONRY  
FOR STEP LESS  
THAN 600mm  
1:20



10  
S2  
SET-DOWN  
DETAIL FOR STEP  
100 TO 200mm  
FOR SEPARATELY  
POURED SLABS  
1:20

### 6.3.4 Step Down Of Up To 600mm In The RibRaft® Floor

Where the site topography requires a step down in the slab, steps of up to 600mm can be accommodated using one of the details provided in Figure 16. A step down in the RibRaft® floor system anchors the floor in that location with respect to volume changes associated with drying shrinkage. As required by 6.2.2, a free joint shall be provided if the distance from the step down to the slab edge exceeds 15m.

## SECTION: INSTALLATION INFORMATION

# 2

1.0 THIS SECTION DETAILS THE INSTALLATION INFORMATION REQUIRED FOR THE FIRTH RIBRAFT® FLOOR SYSTEM (THE SYSTEM). FULL INFORMATION ON THE DESIGN PROCEDURES NOT REQUIRING SPECIFIC ENGINEERING INPUT, AND REQUIREMENTS FOR THE SITE ASSESSMENT ARE DESCRIBED IN SECTION 1 OF THIS MANUAL (DESIGN INFORMATION). WHERE STANDARDS ARE REFERENCED IN THIS MANUAL THESE SHALL INCLUDE THE LATEST AMENDMENTS.



### 2.0 SITE REQUIREMENTS

#### 2.1 General

The site requirements of this Manual are concerned solely with the soil conditions under or immediately adjacent to the system. If a site does not comply with this Manual, the system shall be subject to specific engineering design.

This Section shall only apply for building sites such that:

- > The ground is as specified in Section 1 of this Manual;
- > Any system erected at the top of a slope (whether fill compacted in accordance with NZS4431, or natural ground) shall be located as shown in Figure 1 so that the finished ground is always outside the dashed line shown. (The vertical distance, V, shall be measured to 50mm below the underside of the slab).

Where the finished ground does not comply with Figure 1, the slope shall be retained by a specifically designed retaining wall.

#### 2.2 Temporary Excavations

No excavation shall take place at a location or in a manner where the stability of the foundation material is likely to be compromised. The backfilled material shall match the compaction and strength of, and have similar properties to, the surrounding material. The sides of the excavation shall be propped as necessary.

Temporary excavations shall be open for no longer than 48 hours and shall take place only above the critical depth line as shown on Figure 2. Should temporary excavations be required below this line, specific engineering design is required.

#### 2.3 Surface Water

Surface water from the site shall not flow across the slab platform. For example, on cut and fill sites the ground uphill from the system shall be graded to direct any surface run-off away from the system as shown in Figure 3.

Figure 1  
Relationship  
Of RibRaft®  
To Sloping  
Ground Surface

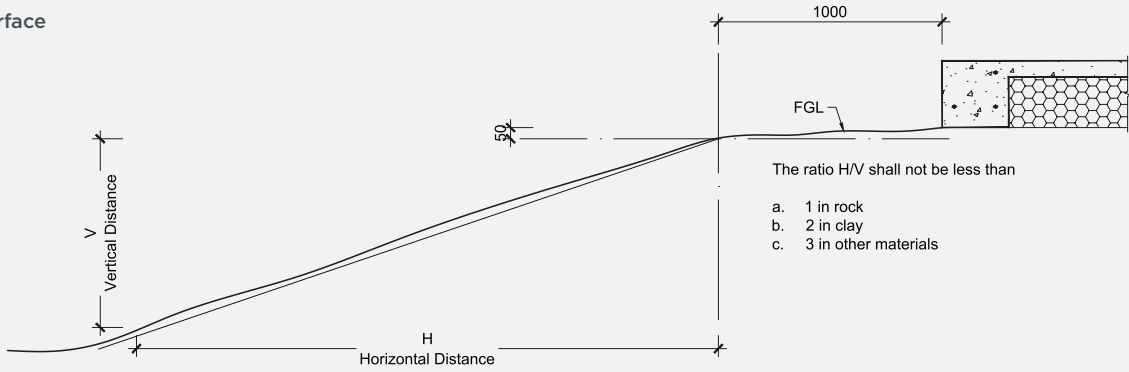


Figure 2  
Temporary  
Excavation  
Limited

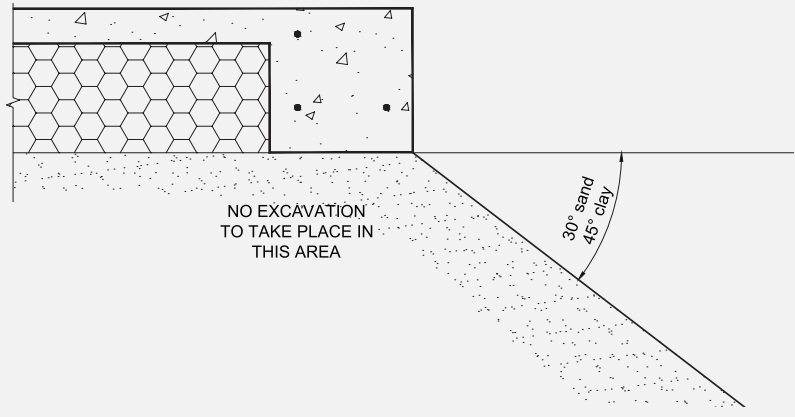
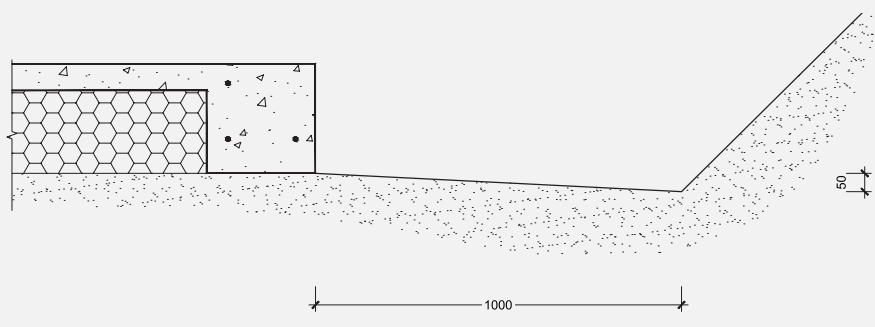


Figure 3  
Site Grading



### 3.0 INSTALLATION PROCEDURE

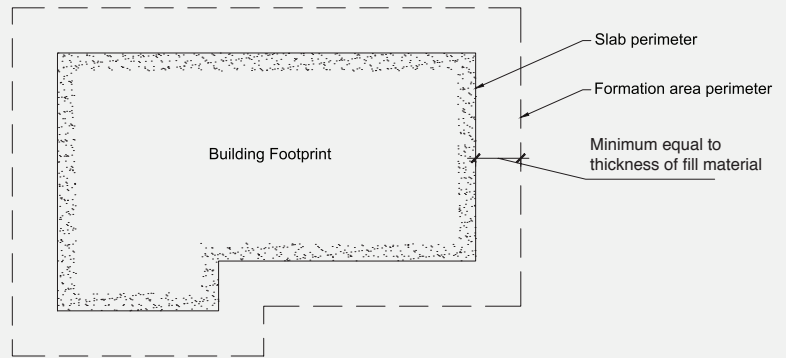
#### 3.1 Site Preparation

All vegetation, topsoil and other organic or deleterious material shall be removed from the area to be covered by the building (formation area) prior to commencing construction of the system.

#### 3.2 Earthworks

The formation area shall be cut or filled to a level approximately 330mm below finished floor level. Where fill is required to achieve this level, the fill shall be certified by a geotechnical engineer (outside the scope of this Manual) or shall be granular fill in accordance with Clause 7.5.3 of NZS 3604:2011 "Timber Framed Buildings". The formation area shall also extend a distance equal to the thickness of the fill material beyond the slab perimeter as shown in Figure 4. The installer shall confirm the acceptability of the ground over the entire building platform before proceeding with the construction. Refer to Clause 3.5 of Section 1 (Design Information) for requirements.

Figure 4 Plan of Formation Area



#### 3.3 Shear Keys

Where shear keys are required, the holes shall be drilled following the site clearing and earthworks, in accordance with Clause 4 in this section, and prior to the construction of the system commencing.

#### 3.4 Plumbing and Services

Plumbing and services required beneath the system should preferably be conveyed underground to their plan location then brought up through the system.

The trenching, placing, and bedding of the pipes/ducts and the backfilling of the trenches shall conform to the requirements of the consent documentation. Services shall not run along ribs or edge beams. The maximum diameters of the services shall be as dictated in Clause 6.3 of Section 1.

Where required, the services can be installed by removing unnecessary polystyrene and placing pipes within the pod depth. All pipes shall be held firmly in place and have temporary end covers. Any services crossing ribs or the edge beam horizontally shall be placed only within the middle third of the member. Except as noted in Figure 14 (Section 1) services crossing the ribs vertically shall also be constrained to the middle third of the width of the edge or internal load bearing rib. Except as noted in Figure 13 (section 1) at no stage shall any of the reinforcement bars be relocated or cut to allow for the services (it is acceptable, however to cut the mesh). In some instances this will dictate the location of the ribs. The pods shall be cut to allow for this and if necessary, the spacing of the ribs shall be decreased locally. There shall be 600mm minimum clear spacing in each direction between penetrations through the system.

Where the services pass through the top of the pods, the opening shall be sealed to prevent materials entering the

subfloor cavities. (This can be achieved with Denso tape and a type of easily compressible foam.)

Larger penetrations or voids that are required, up to 450mm square (e.g. for shower waste/traps), shall be installed in accordance with all the conditions of this paragraph. These openings shall be trimmed with 1 HD12 bar (Grade 500E) 1500mm long placed along each side of the opening, tied to the mesh. One set of parallel bars shall be placed on top of the mesh and the other set placed under the mesh. These openings shall not be placed over a rib or edge beam. If necessary, the rib spacing shall be reduced or the pod layout altered to ensure that the opening occurs solely in the slab above a polystyrene pod. Penetrations such as these shall not be installed in garages or other areas where large (>3kN) point loads could be present. Only one penetration greater than 110mm is permitted in the slab above any single pod or part pod. Where two large openings are required to be in close proximity, an internal rib shall separate them. For these large penetrations/voids in the slab, the services shall not be within 25mm of the edges of the void through which they pass, and the opening shall be sealed to prevent materials entering the subfloor cavities. (This type of opening is normally only required for a shower waste/trap and the installation of the shower ensure that the void is sealed/covered).

Where a recess of up to 50mm is required in the topping to provide a rebate for a shower, the construction details shall be as shown in Figure 15 (Section 1).

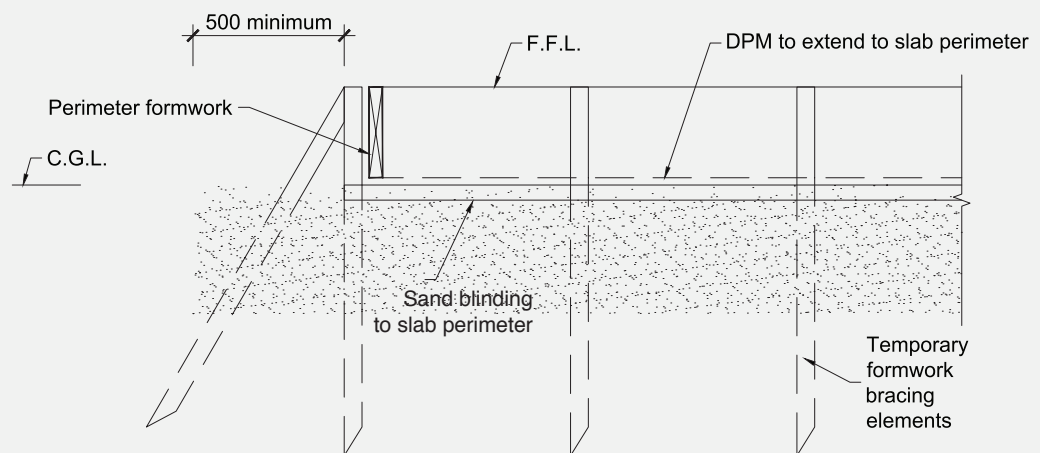
### 3.5 Sand Blinding

A layer of sand shall be placed, screeded and compacted over the building platform, extending to the outside edge of the perimeter foundation, refer Figure 5. The maximum thickness of this blinding layer shall be 50mm. The surface shall be level and a minimum of 305mm below finished floor level. A small plate compactor, vibrating roller or similar, should be used to compact the sand blinding layer. When the building platform is clay, it is essential that the blinding sand is compacted onto a clay surface that has not been softened by construction activities. If the clay has been softened (i.e. has a muddy surface layer due to construction activities), remove the softened material from under the RibRaft® ribs before placing the sand. If excavation lowers the clay surface to more than 50mm below the underside of the RibRaft®, fill shall be placed in accordance with Clause 7.5.3 of NZS 3604:2011 "Timber Framed Buildings". The sand is required to be level to ensure that pods remain stable throughout the installation of the system.

### 3.6 Damp Proof Membrane

The damp proof membrane (DPM) material shall be polyethylene sheet in accordance with NZS 3604:2011. The DPM shall be laid over the entire building platform directly on top of the sand blinding layer, extending to the outside of the edge beam - refer Figure 5 below. The joints shall be lapped not less than 150mm and sealed with pressure sensitive tape not less than 50mm wide. All penetrations of the DPM by plumbing and services or punctures during construction shall also be sealed with pressure sensitive tape. The DPM may extend beyond the edge of the slab i.e. underneath the formwork, or may be folded and stapled up the inside of the formwork. The minimum requirement is that the DPM extends to the outside of the edge beam. It is very important that the DPM is not bunched up at the formwork. The installer shall ensure a square and tidy finish at the underside and at all corners of the edge beam.

Figure 5 Sand blinding / DPM / Formwork Details



### 3.7 Edge Formwork

The edge formwork shall be constructed ensuring that the requirements of NZS 3109:1997 "Concrete Construction" are adhered to. The formwork shall be adequately supported and braced to prevent any buckling or warping. If the wall is to be constructed in masonry veneer, formwork for a masonry veneer rebate should be adequately fixed to the perimeter formwork.

Thorough cleaning of re-useable formwork and the use of release agents enhances the life and performance of formwork and maintains a quality surface finish.

### 3.8 Laying the Pods and Spacers

The Firth RibRaft® polystyrene pods shall be laid out over the DPM in a regular waffle pattern ensuring direct contact with the ground across the entire pod. The edge beam shall be formed using the Firth approved 300mm spacers (refer Figure 9). These shall be placed at a maximum of 1200mm centres along the perimeter of the slab and one per pod or part pod. Ribs supporting a load bearing wall shall be formed using a minimum of one Firth approved 300mm spacer along the edge of each pod or part pod.

Except where a 300mm wide rib is required, each pod or part pod shall always be separated by 100mm using a minimum of one Firth approved 100mm spacer along each edge of each pod or part pod. The ribs in both directions shall form a waffle pattern throughout the slab. It is essential that the ribs and edge beams are straight when the concrete is poured, i.e. the pods need to be lined up. Figure 6 shows a detailed layout of the pods and spacers.

Where the shape of the house plan dictates, it may be more practical to consider the floor to be made up of different segments. The pods in each segment shall be in a regular waffle pattern – refer right hand side of Figure 7. Where these segments meet, the pods shall be cut to suit and the ribs made to join. The non right-angle rib junctions created by this approach are acceptable.

Alternatively, it is also acceptable to keep the orientation of the pods constant throughout the plan and have non right-angle junctions between the ribs and edge beam – refer left hand side of Figure 7.

As can be seen from Figure 7, it is not necessary for the pods to line up perfectly with the edge beam. It is acceptable to cut the pods (i.e. use part pods).

Figure 6  
Detailed layout  
of Pods and  
spacers (mesh  
and top steel omitted  
for clarity)

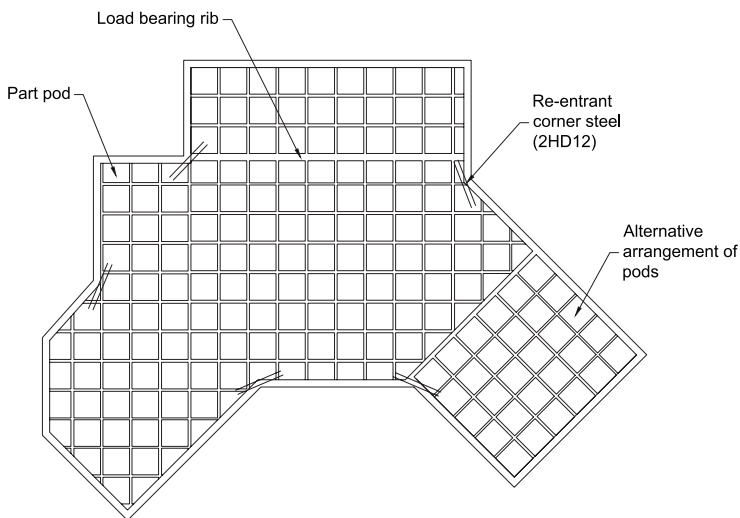
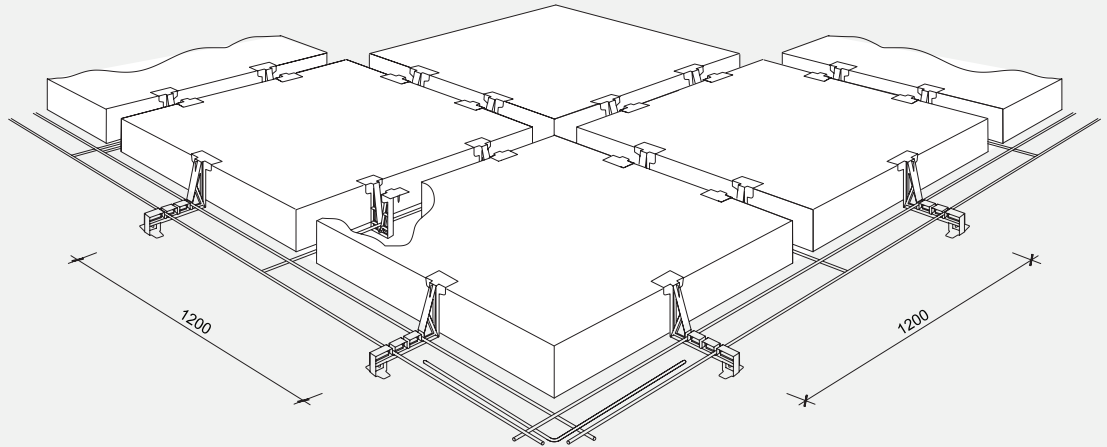


Figure 7 Typical Pod And Rib Layout

### 3.9 Reinforcing Steel

Reinforcing bars shall conform to NZS 4671:2001 “Steel Reinforcing Materials”. All bars shall be of deformed type (Grade 500E). All bends shall be made cold without fracture and in accordance with the bend diameters given in NZS 3109 “Concrete Construction”. Welded lap joints are not permitted.

Reinforcing steel in the slab shall consist of Welded Reinforcing Mesh complying with AS/NZS 4671:2001 with a minimum weight of 2.27kg/m, a lower characteristic stress of 500MPa, square configuration of orthogonal bars between 150 to 200mm centres, and ductility class L or E, hereafter referred to as “mesh”. The presence of Class E reinforcing bars in the ribs and beams provides adequate ductility of the system which allow the use of class L mesh. Typically the topping mesh reinforcement will be 665 mesh (class L) or SE62 ductile mesh, each being equally applicable

Figure 10 shows the detailed layout of the spacers and the steel in the edge beam and the standard ribs.

### 3.9.1 Edge Beam Steel

Two edge beam reinforcing bars shall be placed in the bottom of the edge beam and supported in the correct position by the Firth spacers, as shown in Figure 10. One edge beam bar shall be tied below the mesh at the perimeter of the area covered by the polystyrene pods as shown in Figure 10.

All steel shall be lapped a minimum of 60 bar diameters (720mm for 12mm steel). Tying of the edge beam steel is only required at corners. Figure 8 shows the layout for the edge beam bottom steel bars at the corner. The inner bottom bars and the top bars shall cross each other and extend to 75mm from the outside face of the edge beam as shown. These bars shall be tied together where they cross. For solutions using veneer rebates the top bars shall terminate 50mm from the inside face of the rebate and be tied where they cross.

### 3.9.2 Rib Steel

Rib reinforcing steel shall be placed in the bottom of the internal ribs and supported in the correct position by the Firth or Wilton Joubert spacers (WJ). Figure 9 shows the detail of the Firth and WJ spacers, and Figure 10 shows a detailed section identifying how the steel is located in the spacers. The 300mm spacer shall be used for the 300mm wide internal ribs. These spacers ensure that cover to DPM below the base is greater than 45mm and cover to the exterior perimeter is 75mm.

All steel shall be lapped a minimum of 60 bar diameters (720mm for 12mm steel). At junctions with the edge beam, each rib steel bar shall sit on top of the edge beam bars, and extend to the outermost bar. The 75mm cover to the edge of the beam shall still be allowed for. One HD12 bar (Grade 500E) shall be placed in the bottom of each 300mm wide rib. For perimeter 300mm ribs a HD12 bar is also required in the top at the beam.

### 3.9.3 Mesh Reinforcing

Mesh reinforcing shall be placed over the pods and supported on 40mm mesh chairs spaced at a minimum of 1200mm centres, with at least two mesh chairs placed per pod and at least one per part pod. At laps the overlap of the outermost cross wires of the sheets shall be the spacing of the wires plus 50mm.

### 3.9.4 Re-entrant Corner Steel

Two HD12 bars (Grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner as detailed in Figure 7 (this steel is to help reduce the width of cracks that may develop at this location)

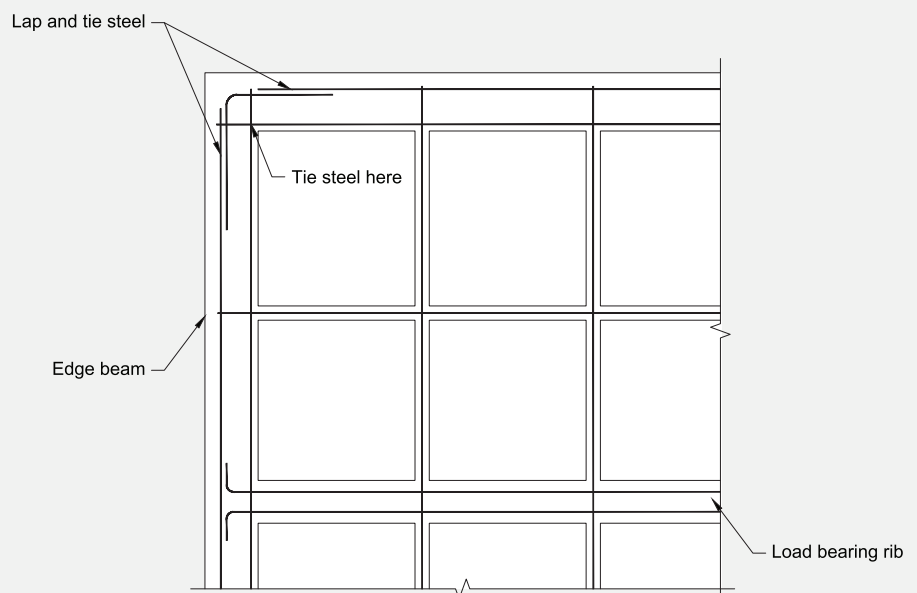


Figure 8 Corner steel layout

### 3.10 Concrete Installation

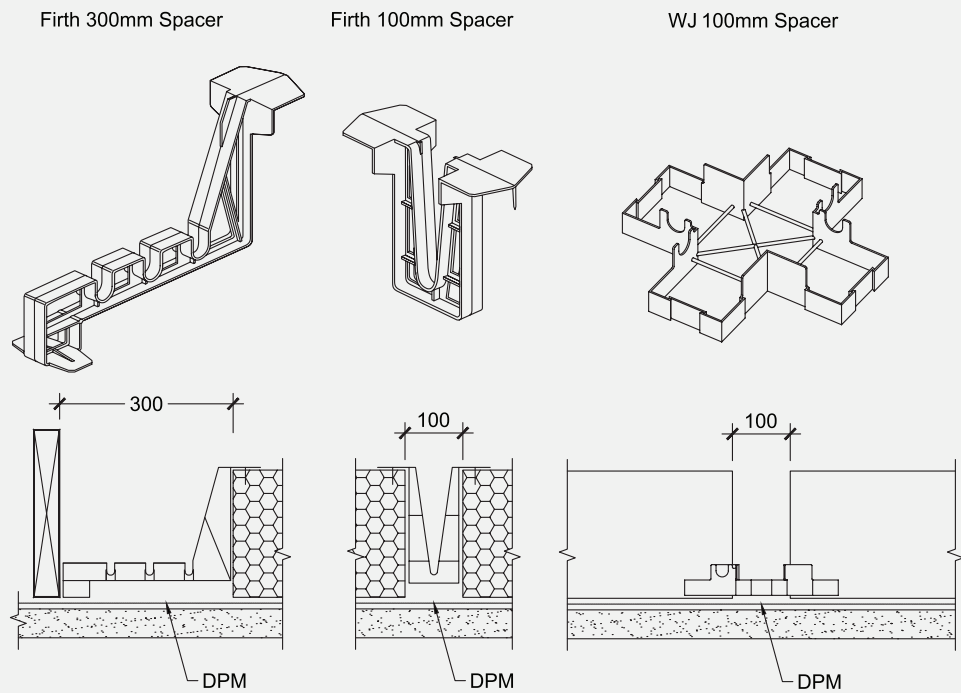
To comply with this manual, Firth Certified Concrete® must be used. Concrete placing, finishing and curing shall be in accordance with NZS 3109:1997, Clause 7.

#### 3.10.1 Placing

Only Raftmix or Raftmix25 concrete supplied by Firth Industries, shall be used in the floor. These two different concrete mixes shall be used in the following instances:

- > Raftmix – a 20MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix
- > Raftmix25 – a 25MPa 100mm slump mix available as a pump mix suitable for 100mm pump lines available in either a 13mm or more usually a 19mm nominal aggregate size, or as a structural (non-pump) mix. This mix shall be specified for buildings constructed in the ‘sea spray zone’ (i.e. within 500m of the sea including harbors, within 100m of tidal estuaries or inlets, on offshore islands and elsewhere defined as exposure Zone D in 4.2.3.3 of NZS3604).

Figure 9  
Spacer  
Details



The concrete supplied by Firth shall be poured in such a way to ensure that the pods remain in position during placing (Firth recommends that small amounts of concrete be placed on top of the pods prior to the ribs being filled). The concrete shall be compacted with the use of an immersion vibrator around all steel and into all corners of the formwork.

### 3.10.2 Finishing

Screeding with the aid of a level shall commence immediately after compaction. Unless specifically installed as a screeding datum, the top of the formwork shall not be assumed as level and thus shall not be used for screeding purposes. Final finishing with a trowel shall take place after all the bleed water has evaporated. The edge of the slab and rebates shall be tooled to prevent chipping of the top of the slab.

Early age care of the slab shall be in accordance with good trade practice appropriate for the weather conditions – refer CCANZ website sections if further guidance is required:

[www.ccanz.org.nz/page/Early-Age-Crack-Control.aspx](http://www.ccanz.org.nz/page/Early-Age-Crack-Control.aspx)

Early Age Crack Control

[www.ccanz.org.nz/page/Hot-and-Cold-Weather-Concreting.aspx](http://www.ccanz.org.nz/page/Hot-and-Cold-Weather-Concreting.aspx)

Hot and Cold Weather Concreting

The surface shall be a blemish-free surface to class U3 finish (Refer NZS 3114:1987 “Specification for Concrete Finishes”).

### 3.10.3 Curing

Proper curing of the concrete must take place immediately after finishing the concrete. One of the following methods of curing is recommended:

- > Ponding or continuous sprinkling of water.
- > Placing a wet covering or plastic membrane over the slab.
- > The use of liquid membrane curing compounds. However if these are used, they must be compatible with any subsequent applied surfacing.

## 3.11 Shrinkage Control Joints

Shrinkage control joints reduce the risk of unwanted cracks, and their placement needs to be carefully considered where uncontrolled cracking could be unacceptable. Two types are described here: saw cut joints (which are tied joints), and free joints.

### 3.11.1 Saw Cut Joints

Saw cuts are located at positions in which the concrete is likely to crack due to stresses induced by restrained shrinkage. The aim of providing them is for the concrete to crack at the bottom of the saw cut thus minimizing the potential for a visible crack wandering over the surface. The level of reinforcement provided in a RibRaft® mean that cracks have no structural implications being only an aesthetics issue. Factors to consider are the type of floor finish, the location of ribs and ground beams, underfloor heating and the effect of piles restraining shrinkage.

When warm sunny days are followed by cool nights, the change in temperature can cause cracking. Hence preference should be given to using early entry saws which are used immediately after finishing. Shrinkage control joints cut using diamond blades shall be cut as early as possible which is typically within 24 hours of hardening in summer, and 48 hours in winter. They shall be cut to a depth of 25mm. Shrinkage control joints do not guarantee to eliminate all visible or unwanted cracks.

Joints shall be positioned to coincide with major changes in floor plan. Where concrete is to be exposed, for example in a garage, or brittle covering placed over, the maximum intermediate bay sizes shall be limited to 5m. Bay dimensions formed by shrinkage control joints shall be limited to a maximum ratio of length:width of 1.5:1. Shrinkage control joints shall be placed over 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide load bearing rib, then the joint shall be located directly above one edge of that rib.

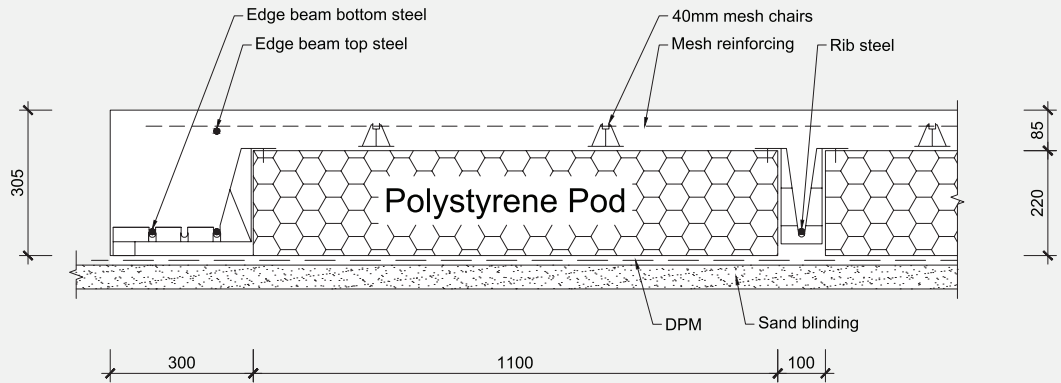
In order to limit the width of cracks at re-entrant, or internal corners, extra steel shall be placed on top of the mesh. These shall be 2-HD12 bars (grade 500E), 1200mm long tied to the top of the mesh at 200mm centres, with 50mm cover to the internal corner – refer Figure 7.

### 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

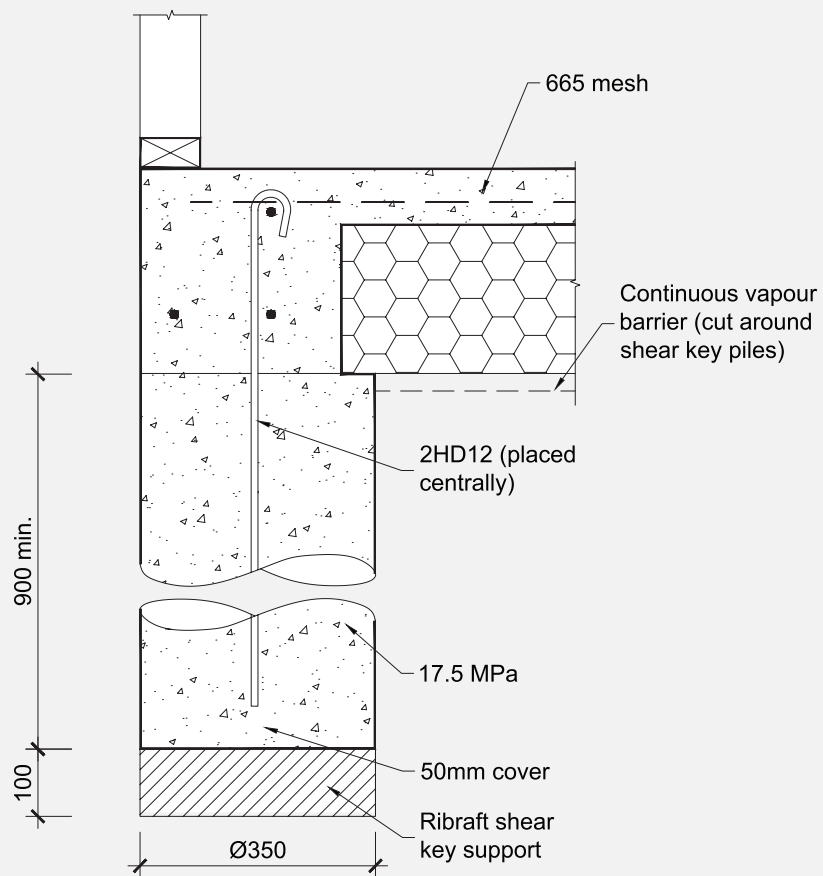
The building owner shall ensure that the ground surrounding the system be maintained so that the integrity of the system is not jeopardised. In other words, at no time shall the ground immediately adjacent to the system be allowed to settle away to expose the underside of the slab.

#### 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

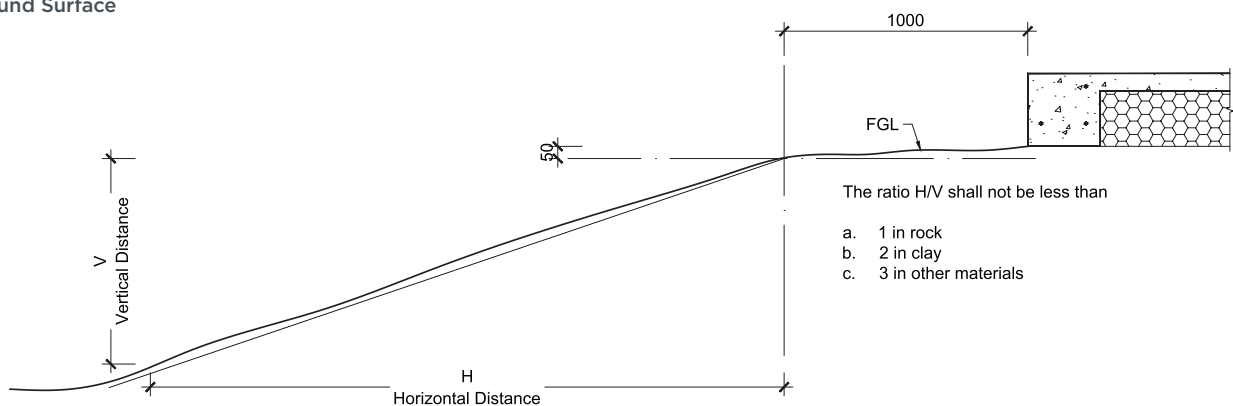
The RibRaft® foundation system has been designed to accommodate structures complying with the non specific design standards NZS3604 or NZS4229. With these types of structures the Building Control Authority specifies the inspections required and often conducts these. A similar construction verification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

## 4161MI Marshall Weatherization System

	<b>Marshall Innovations Ltd</b> +64 07 5430948 headoffice@mwnz.com www.mwnz.com
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### SUPPORTING DOCUMENTS

#### **BRANZ Appraisal 548 - Tekton® Building Wrap**

Ref 10504. Uploaded 10 Aug 2020

Purpose: Performance

#### **BRANZ Appraisal 621 - The Marshall Weatherization System**

Ref 10506. Uploaded 10 Aug 2020

Purpose: Performance

#### **BRANZ Appraisal 719 - Trade-Seal Pipe and Penetration Seal**

Ref 10507. Uploaded 10 Aug 2020

Purpose: Performance, Installation

#### **BRANZ Appraisal 846 - SUPER-STICK Flexible Flashing Tape**

Ref 10508. Uploaded 10 Aug 2020

Purpose: Performance, Installation

#### **Marshall Innovations Tekton Weatherization System 100968**

Ref 10209. Uploaded 26 Jun 2020

Purpose: Performance, Installation, Maintenance, Warranty, Environmental

#### **Tekton Building Wrap 102502**

Ref 10292. Uploaded 26 Jun 2020

Purpose: Performance, Installation

**BRANZ Appraised**  
Appraisal No. 548 [2019]

**TEKTON® BUILDING  
WRAP**

**Appraisal No. 548 [2019]**

This Appraisal replaces BRANZ  
Appraisal No. 548 [2013]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### Marshall Innovations Limited

PO Box 9411  
Greerton  
Tauranga  
Tel: 07 543 0948  
Fax: 07 541 1029  
Web: [www.mwnz.com](http://www.mwnz.com)



### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 Tekton® Building Wrap is a synthetic breather-type flexible wall underlay and air barrier for use under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured of a coated spun-bonded polypropylene.

## Scope

- 2.1 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on timber framed 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 absorbent wall claddings directly fixed to framing; and,
  - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
  - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.2 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on steel framed 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 absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - with masonry veneer subject to specific design; and,
  - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.3 Tekton® Building Wrap has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed 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 absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
  - 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 Extra High.
- 2.4 Tekton® Building Wrap has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Tekton® Building Wrap into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Tekton® Building Wrap, if used, designed, 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. Tekton® Building Wrap meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, Tekton® Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 – 12.3.

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

## Technical Specification

4.1 Tekton® Building Wrap is a 100 g/m<sup>2</sup> light grey sheet polypropylene membrane material approximately 0.6 mm thick.

4.2 The product is supplied in rolls 1.370 m x 37 m and 2.743 m x 37 m. The product is printed with the Tekton® logo repeated along the length of the roll. The rolls are wrapped with an instruction sticker.

### Accessories

4.3 Accessories used with Tekton® Building Wrap which are supplied by the installer are:

- Fixings – staples, clouts, screws or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
- Wall underlay support – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

## Handling and Storage

5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Tekton® Building Wrap. 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 the studs at maximum 1200 mm centres.

### General

7.2 Tekton® Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber and steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, 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 Tekton® Building Wrap must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.
- 7.5 Tekton® Building Wrap is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Tekton® is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.
- 7.6 Tekton® Building Wrap 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.

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

NZBC E2/AS1 Table 23 Wall Wrap Properties	Property Performance Requirement	Actual Property Performance
Absorbency	$\geq 100 \text{ g/m}^2$	Classified as non-absorbent [see paragraph 7.5]
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	$\geq 5.5$ and $\leq 8$	9.78 [Note 1]
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	<b>Edge tear:</b> Machine direction = 228 N Cross direction = 186 N <b>Tensile strength:</b> Machine direction = 4.4 kN/m Cross direction = 3.9 kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass

*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 underlay performance, or the performance of other materials.*

- 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.

#### **Stucco Plaster**

- 7.8 Tekton® Building Wrap is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wall underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.
- 7.9 Tekton® Building Wrap may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 [b].

## Structure

- 8.1 Tekton® Building Wrap 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

- 9.1 Tekton® Building Wrap meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building wraps used where the cladding durability requirement is 15 years.

## Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Tekton® Building Wrap is expected to have a serviceable life equal to that of the cladding.

## Control of Internal Fire and Smoke Spread

- 10.1 Tekton® Building Wrap has an AS 1530 Part 2 flammability index of not greater than 5 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 Tekton® Building Wrap 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 Tekton® Building Wrap must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Tekton® Building Wrap, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.
- 12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

## Installation Information

### Installation Skill Level Requirements

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

### Wrap Installation

- 14.1 Tekton® Building Wrap must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Tekton® Building Wrap must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Tekton® Building Wrap can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- 14.6 Any damaged areas of Tekton® Building Wrap, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

### Inspections

- 14.7 The Technical Literature must be referred to during the inspection of Tekton® Building Wrap 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. A range of these tests were completed before and after Tekton® Building Wrap was exposed to ultra-violet light.
- 15.3 The Flammability Index of Tekton® Building Wrap has been evaluated in accordance with AS 1530.2.

#### Other Investigations

- 16.1 A durability opinion was given by BRANZ technical experts.
- 16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Tekton® Building Wrap, and to examine completed installations.
- 16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of Tekton® Building Wrap 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 certification by ICC-ES and CCMC covering quality aspects associated with the product.
- 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 wall wrap 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

- 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 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- 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 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



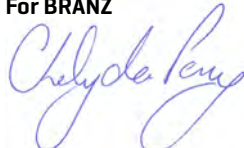
In the opinion of BRANZ, **Tekton® Building Wrap** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

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.

For BRANZ



**Chelydra Percy**

Chief Executive

Date of Issue:

14 June 2019

**BRANZ Appraised**  
Appraisal No. 621 [2020]

## THE MARSHALL WEATHERIZATION SYSTEM

**Appraisal No. 621 [2020]**

This Appraisal replaces BRANZ  
Appraisal No. 621 [2014]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



#### Marshall Innovations Limited

PO Box 9411  
Greerton  
Tauranga  
Tel: 07 543 0948  
Fax: 07 541 1029  
Web: [www.mwnz.com](http://www.mwnz.com)



#### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



### Product

1.1 The Marshall Weatherization System consists of Tekton® Building Wrap, HYDRA Wall Underlay, HYDRA Roof Underlay, Super Stick Tape or Protecto Sill System (flexible flashing tapes), Tekton Seam Tape and TRADE-SEAL. The system is used behind wall cladding systems, under roof claddings and around framed joinery openings as a secondary weather resistant barrier for walls.

### Scope

- 2.1 The Marshall 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 in accordance with NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings; and,
  - with absorbent wall claddings directly fixed to the framing complying with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions 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 NASH Building Envelope Solutions 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 tile roof cladding; and,
  - with metal tile and profiled metal roof cladding; and,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or NASH Building Envelope Solutions 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 Marshall 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 Marshall Weatherization System meets this requirement. See Paragraphs 10.1 - 10.3.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. The Marshall Weatherization System contributes to exterior walls and roof cladding systems meeting this requirement. See Paragraphs 13.1 and 13.2.

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

## 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 wall underlay** - HYDRA Wall Underlay is a synthetic building underlay for use under wall claddings. The product consists of a plain non-woven top scrim and a woven bottom scrim with a polymeric laminated facer supplied in rolls 1.37 m wide x 36.5 m long or 2.74 m wide x 37.0 m long.
- **Flexible Roof Underlay** - HYDRA Roof Underlay is a heavy duty, spun-bonded, non-woven fabric laminated breathable coating, coloured blue and is supplied in rolls 1.25 m wide x 20 m or 40 m long.
- **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 200 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 75, 150 and 200 mm wide, 30 m long and 0.5 mm thick roll and Protecto Tak is supplied in a 369 g can.
- **Pipe and Services Penetration Seal** - 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. 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, HYDRA Wall Underlay and HYDRA Roof Underlay 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 Marshall 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.
- 7.2 Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.

### General

- 8.1 The Marshall 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.
- 8.2 HYDRA Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 8.3 The system will 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.
- 8.4 The Marshall Weatherization System is suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c]. Refer to Table 1.
- 8.5 HYDRA Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 or NASH Building Envelope Solutions Table 23. Refer to Table 2 for the material properties of HYDRA Roof Underlay.
- 8.6 TRADE-SEAL when used with Tekton® Building Wrap or HYDRA Wall Underlay, 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, or NASH Building Envelope Solutions Paragraph 9.1.10.3 and Figure 63.

**Table 1: Material Properties**

NZS 2295 Property	Property Performance Requirement	Actual Property - Tekton Building Wrap	Actual Property - HYDRA Wall Underlay
Absorbency	$\geq 100 \text{ g/m}^2$	Classified as non-absorbent	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	1.15 MN s/g	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass	Pass
pH of Extract	$\geq 6$ and $\leq 9$	9.78 [Note 1]	Pass
Shrinkage	$\leq 0.5\%$	0.10%	Pass
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	Edge tear: Machine direction = 191.3 N Cross direction = 145.6 N Tensile strength: Machine direction = 4.53 kN/m Cross direction = 3.32kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass	Pass

*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.*

**Table 2: Material Properties**

NZS 2295 Property	Property Performance Requirement	Results
Absorbency	≥ 150 g/m <sup>2</sup>	Pass
Vapour Resistance	≤ 0.5 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 5.5 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average] Machine Direction > 166 N Cross Direction > 117 N Tensile Strength [Average] Machine Direction > 6.1kN/m Cross Direction > 4.3kN/m

- 8.7 The Marshall Weatherization System is suitable for use under wall cladding as a wall underlay system in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that it cannot be used with non-absorbent wall claddings in direct fixed installations. The Marshall Weatherization System is also suitable for use under wall cladding as a wall underlay system as called up in NASH building envelope solutions, Table 23 on steel framed buildings, except that it cannot be used with non-absorbent wall claddings in direct fixed installations.
- 8.8 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens. This is 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 or NASH Building Envelope Solutions, Paragraph 9.1.9.5.
- 8.9 When The Marshall 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

- 9.1 The Marshall Weatherization System is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including Extra High when used as an overlay for rigid building underlays.

## Durability

### Serviceable Life

- 10.1 The Marshall Weatherization 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 ultra-violet [UV] light at any time in service.
- 10.2 Provided it is not exposed to the weather or UV light for a total of more than 14 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, HYDRA Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.
- 10.3 The exterior cladding must be maintained weathertight at all times for The Marshall Weatherization System to have a serviceable life equal to that of the cladding.

### Control of Internal Fire and Smoke Spread

- 11.1 The Marshall Weatherization System has an AS 1530 Part 2 flammability index of 0 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, 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

- 12.1 Separation or protection must be provided to The Marshall Weatherization System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

### External Moisture

- 13.1 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.
- 13.2 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

- 14.1 All design and building work must be carried out in accordance with The Marshall Weatherization System Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays and weatherization system installation. Where the work involves Restricted Building Work [RBW] this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License class.

### System Installation

- 15.1 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.
- 15.2 Tekton® Building Wrap and the Hydra Wall Underlay 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.

- 15.3 Openings are dressed with lengths of Super Stick or Protecto Sill System Tapes where required and adhered to the Tekton® Building Wrap or HYDRA Wall Underlay. The tape is 'fanned' around the corners onto the face of the Tekton® Building Wrap or HYDRA Wall Underlay and folded over the outside edge of the opening framing. All surfaces must be clean and dry prior to the installation. *[Note: Super Stick requires two layers on the sill.]*
- 15.4 HYDRA Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 15.5 HYDRA Roof Underlay may be run horizontally or vertically. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.
- 15.6 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide.
- 15.7 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

- 15.8 The Technical Literature must be referred to during the inspection of The Marshall Weatherization System installations.

## Basis of Appraisal

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

#### Tests

- 16.1 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.
- 16.2 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.
- 16.3 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.
- 16.4 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.
- 16.5 The following tests have been carried out on HYDRA Roof Underlay and Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6 and pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after HYDRA Roof Underlay and Wall Underlay was exposed to ultra-violet light.
- 16.6 The Flammability Index of HYDRA Roof Underlay and Wall Underlay has been evaluated in accordance with AS 1530.2.



**BRANZ Appraised**  
Appraisal No. 621 [2020]

**BRANZ Appraisal**  
Appraisal No. 621 [2020]  
15 May 2020

THE MARSHALL  
WEATHERIZATION SYSTEM



### Other Investigations

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

### Quality

- 18.1 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.
- 18.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 18.3 Building designers are responsible for the design of the building, and for the incorporation of The Marshall Weatherization System into their design in accordance with the instructions of Marshall Innovations Limited.
- 18.4 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.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
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- The Building Regulations 1992.



**BRANZ Appraised**  
Appraisal No. 621 [2020]

**BRANZ Appraisal**  
Appraisal No. 621 [2020]  
15 May 2020

THE MARSHALL  
WEATHERIZATION SYSTEM



In the opinion of BRANZ, **The Marshall 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

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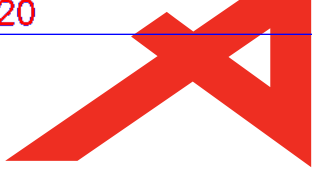
For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

15 May 2020



## BRANZ Appraised

Appraisal No. 719 [2019]

## TRADE-SEAL PIPE AND SERVICES PENETRATION SEAL

### Appraisal No. 719 [2019]

This Appraisal Replaces BRANZ  
Appraisal No. 719 [2011]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### Marshall Innovations Limited

PO Box 9411  
Greerton  
Tauranga  
Tel: 07 543 0948  
Fax: 07 541 1029  
Web: [www.mwnz.com](http://www.mwnz.com)



### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 TRADE-SEAL is a wall cladding pipe and service penetration seal consisting of an elastic EPDM sleeve fitted with a self adhesive flange.

## Scope

- 2.1 TRADE-SEAL has been appraised for use as a pipe and service penetration seal for use where the pipes and service penetration penetrates the wall underlay on timber framed buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
  - with BRANZ Appraised flexible and rigid wall underlays; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 TRADE-SEAL has been appraised for use as a pipe and service penetration seal for use where the pipes and service penetration penetrates the wall underlay on steel framed 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 BRANZ Appraised flexible and rigid wall underlays; and,
  - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.3 TRADE-SEAL has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of TRADE-SEAL into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, TRADE-SEAL, 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 (b), 15 years and B2.3.2. TRADE-SEAL meets these requirements. See Paragraphs 8.1 and 8.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the wall cladding system, TRADE-SEAL will contribute to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. TRADE-SEAL meets this requirement and will not present a health hazard to people.

## Technical Specification

4.1 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. TRADE-SEAL is available with various diameter EPDM sleeve sizes to accommodate different size wall penetrations.

## Handling and Storage

5.1 TRADE-SEAL must be protected from damage and weather. It must be stored under cover in clean, dry conditions away from direct exposure to sunlight, heat or flame. TRADE-SEALS should not be removed from the packaging until they are ready to use.

5.2 Handling and storage of TRADE-SEAL, whether on-site or off-site, is the responsibility of the installer.

## Technical Literature

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

## Design Information

### General

7.1 TRADE-SEAL when used with BRANZ Appraised flexible and rigid wall underlays 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.

7.2 TRADE-SEAL is primarily designed to prevent moisture ingress at pipes and services penetrations through walls.

7.3 The performance of TRADE-SEAL is reliant on it being the correct size for the pipe or service penetration and being fully adhered to the flexible or rigid wall underlay. TRADE SEAL must be protected from UV light when installed.

7.4 TRADE-SEAL can be applied to either side of the flexible or rigid wall underlay to provide a seal for pipes and services penetrations.

7.5 Where a proprietary cladding system is used, all flashing details must be carried out in accordance with the specifications of the system. Flashing details which are outside the scope of the cladding system are the responsibility of the designer for compliance with the NZBC.

### Durability

- 8.1 Assessment of durability to meet the NZBC is based on the difficulty of access and replacement, and the ability to detect failure of the TRADE-SEAL during both normal use and maintenance of the building.

### Serviceable Life

- 8.2 Provided the selected flexible and rigid wall underlay is not exposed to the weather or ultra-violet light for longer than stated in the relevant Appraisal, [a maximum of 90 days applies to the TRADE-SEAL] and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, TRADE-SEAL is expected to have a serviceable life equal to that of the cladding.

### Maintenance

- 9.1 No maintenance is required for TRADE-SEAL, however regular checks must be made of the cladding system to ensure it is sound and will not allow moisture penetration.

### Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to TRADE-SEAL 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 TRADE-SEAL provides suitable flashing and sealing around pipe and service penetrations when used in conjunction with BRANZ Appraised wall underlays and will contribute to the wall cladding meeting code compliance with NZBC Clause E2.3.2.

## Installation Information

### Installation Skill Level Requirements

- 12.1 Installation of the product supplied by Marshall Innovations Limited must be completed by competent trades people in accordance with the Technical Literature and this Appraisal.

### General

- 13.1 The appropriate diameter TRADE-SEAL must be used. There must be a tight fit around the pipe or service penetration, but TRADE-SEAL should not be forced over the pipe or service penetration.
- 13.2 The flexible and rigid wall underlays to receive the TRADE-SEAL must be clean and dry. TRADE-SEAL must be rotated a quarter turn so the point of the TRADE-SEAL flange is upwards before adhering it to the substrate. This will assist moisture run off. The flange is smoothed over to ensure a good bond to the flexible or rigid wall underlay.
- 13.3 The TRADE-SEAL collar extension can be trimmed to ensure the best fit to the penetration.
- 13.4 When TRADE-SEAL is used in a retrofit installation, the collar extension is pushed through from the inside.

### Health and Safety

- 14.1 Safe use and handling procedures for TRADE-SEAL is provided in the Technical Literature.

## Basis of Appraisal

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

### Tests

- 15.1 Adhesion testing after various forms of accelerated aging has confirmed the adhesion of TRADE-SEAL to a range of flexible and rigid wall underlays. The results have been reviewed by BRANZ experts and found to be satisfactory.

### Other Investigations

- 16.1 Assessment of the composition of the materials used to make TRADE-SEAL has been completed and a durability opinion has been provided by BRANZ experts.
- 16.2 The practicability of installation was assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of TRADE-SEAL has not been examined by BRANZ but details of the quality and composition of the materials used were obtained and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 17.3 The quality of installation on site is the responsibility of the installer.
- 17.4 Designers are responsible for the building design, and building contractors are responsible for the quality of the installation of the framing system, the wall underlay and cladding system.
- 17.5 Building owners are responsible for the maintenance of the cladding system over the TRADE-SEAL.

### 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 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



**BRANZ Appraised**  
Appraisal No. 719 [2019]

**BRANZ Appraisal**  
Appraisal No. 719 [2019]  
09 May 2019

TRADE-SEAL PIPE AND SERVICES  
PENETRATION SEAL



In the opinion of BRANZ, **TRADE-SEAL Pipe And Services Penetration Seal** 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.

For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

09 May 2019



**BRANZ Appraised**  
Appraisal No. 846 [2019]

## SUPER-STICK FLEXIBLE FLASHING TAPE

**Appraisal No. 846 [2019]**

This Appraisal replaces BRANZ  
Appraisal No. 846 [2013].



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### Marshall Innovations Limited

PO Box 9411  
Greerton  
Tauranga  
Tel: 07 543 0948  
Fax: 07 541 1029  
Web: [www.mwnz.com](http://www.mwnz.com)



### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 SUPER-STICK is a flexible flashing tape used around framed joinery openings as a secondary weather resistant barrier.
- 1.2 SUPER-STICK is installed into and around the framed joinery opening over the building wrap and exposed frame to cover both the face and edge of the opening framing. SUPER-STICK is also used at joinery heads to seal flashing upstands to the building wrap.

## Scope

- 2.1 SUPER-STICK has been appraised as a flexible flashing system for use around window and door joinery openings for buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
  - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
  - with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing tape system; and,
  - with wall underlays compatible with the flexible flashing tape; and,
  - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 SUPER-STICK has also been appraised as a flexible flashing system for use around window and door joinery openings for steel framed buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan area; and,
  - constructed with steel 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,
  - with wall cladding systems covered by a valid BRANZ Appraisal that specifies a flexible flashing system; and,
  - with wall underlays compatible with the flashing tape and steel frame; and,
  - situated in NZS 3604 Wind Zones up to, and including, Extra High.

*Note: Marshall Innovations Ltd offer SUPER-STICK as a jointing and flashing tape for use with rigid air barrier systems that do not require a flexible wall underlay, but this aspect is outside the scope of this Appraisal. Contact the rigid air barrier system proprietor for system details including recommended jointing and flashing tapes.*



## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, SUPER-STICK, 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 (b), 15 years and B2.3.2. SUPER-STICK meets these requirements. See Paragraphs 8.1 and 8.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. SUPER-STICK contributes to meeting this requirement. See Paragraphs 7.1 - 7.4 and 11.1.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. SUPER-STICK meets this requirement and will not present a health hazard to people.

## Technical Specification

4.1 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 200 mm x 22.86 m.

## Handling and Storage

5.1 Handling and storage of all materials supplied by Marshall Innovations Ltd, whether on or off site, is under the control of the installer. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for SUPER-STICK. 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 SUPER-STICK meets the requirements of AC148: 2001 which is an alternative solution to the version of AC148 referenced by NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5 (b). The installation method for SUPER-STICK is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figure 72A and 72B.
- 7.2 The use of flexible flashing tape systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.
- 7.3 SUPER-STICK is suitable for use over flexible wall underlays compatible with the flashing tape in NZS 3604 Wind Zones up to and including Extra High. In the Extra High Wind Zone, the flexible underlay must be installed over a rigid underlay complying with NZBC Acceptable Solution E2/AS1, Table 23.
- 7.4 SUPER-STICK is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing timber.
- 7.5 SUPER-STICK is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. SUPER-STICK flashing tape is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

- 7.6 When SUPER-STICK 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.

### Durability

- 8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of SUPER-STICK both during normal use and maintenance of the building.

### Serviceable Life

- 8.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, SUPER-STICK is expected to have a serviceable life equal to that of the cladding. The maximum exposure period may however be limited by the requirements of the substrate supplier.

### Maintenance

- 9.1 No maintenance is required for SUPER-STICK. Regular checks, at least annually, must be made of the junctions between the joinery and wall cladding to ensure that they are maintained weathertight and that the primary means of weather resistance for the junction e.g. flashing, sealant, etc continues to perform its function, to ensure that water will not penetrate the cladding.

### Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to SUPER-STICK 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 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 [b], SUPER-STICK may be used.

## Installation Information

### Installation Skill Level Requirements

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

### General

- 13.1 The selected building wrap must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The wrap is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.
- 13.2 Before SUPER-STICK is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion.
- 13.3 A 75 mm wide x 150 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the jamb/sill junction overlapping the corner by 3 mm to create a seal at the corner junction. A length of SUPER-STICK is then cut to the length of the sill plus 300 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 150 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the building wrap and "butterfly" installed across the corner. Cut another length of SUPER-STICK the exact length of the sill and overlay onto the already installed Tape to ensure nail sealability requirements are met.



- 13.4 A 300 mm length of SUPER-STICK must be installed 150 mm down the jamb and 150 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 150 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.
- 13.5 SUPER-STICK must not be stretched. When joining two sections of tape, the overlap must be 100 mm minimum.
- 13.6 If SUPER-STICK is exposed to the weather or UV light for more than 90 days, it must be replaced with new material.

#### Installation Temperature

- 13.7 SUPER-STICK must not be installed where temperatures are less than -5°C [Note: Marshall Innovations Ltd approve the installation of SUPER-STICK down to -20°C. This has not been addressed by this Appraisal and is outside its scope.]

#### Inspections

- 13.8 The Technical Literature must be referred to during the inspection of SUPER-STICK installations.

## Basis of Appraisal

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

#### Tests

- 14.1 Testing of SUPER-STICK has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC148. The adhesion of SUPER-STICK to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays have been tested and found to be satisfactory.

#### Other Investigations

- 15.1 An assessment was made of the durability of SUPER-STICK by BRANZ technical experts.
- 15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

#### Quality

- 16.1 The manufacture of SUPER-STICK 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 undertakes an ongoing review of product quality on an inwards goods basis.
- 16.2 The quality of supply to the market is the responsibility of Marshall Innovations Ltd.
- 16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and building wraps in accordance with the instructions of the designer.
- 16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Marshall Innovations Ltd.

#### Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- 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 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraised  
Appraisal No. 846 [2019]

BRANZ Appraisal  
Appraisal No. 846 [2019]  
7 June 2019

SUPER-STICK FLEXIBLE  
FLASHING TAPE



In the opinion of BRANZ, **SUPER-STICK** 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.

For BRANZ

A handwritten signature in blue ink, appearing to read 'Chelydra Percy'.

**Chelydra Percy**

Chief Executive

Date of Issue:

7 June 2019

# Marshall Innovations Tekton Weatherization System

Product Technical Statement: 100968

**miproducts**  
THE NATIONAL PRODUCT DATABASE

Tekton Building Wrap & Seam Tape with Protecto Wrap One Piece Sill Tape or SuperStick Building Tap

[View miproducts listing](#)



## Level of assurance needed to demonstrate NZ Building Code Compliance

Supporting documentation should include technical information by manufacturer and either an independent assessment or reference to an industry-based scheme



Marshall Innovations confirms that this minimum level of assurance has been met or exceeded by the following:

BRANZ Appraisal  
[621\(2014\)](#)

## Technical Statement

### 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 of use

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 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.

### New Zealand Building Code (NZBC)

The product will, if employed in accordance with the supplier's installation and maintenance requirements, assist with meeting the following provisions of the building code:

- Clause B2 Durability:** Performance B2.3.1(a), B2.3.1(b), B2.3.2
- Clause E2 External moisture:** Performance E2.3.2
- Clause F2 Hazardous building materials:** Performance F2.3.1

### Notes

This is an Alternative Solution in terms of the New Zealand Building Code

### Evidence

The product meets the requirements set out in the following documents, or relevant parts of cited standards within the documents:

Tekton Weatherization System is an Alternative Solution in terms of New Zealand Building Code compliance.

### Supporting Evidence

The product has and can make available the following additional evidence to support the above statements:



BRANZ Appraisal  
[621\(2014\)](#)

## Product Criteria

### Design requirements



**masterspec partner**

### Company Contact Details



Company: Marshall Innovations Ltd

Physical Address: 41 Hotuhotu Street  
Tauriko  
TAURANGA

Postal Address: PO Box 9411  
Greerton  
TAURANGA

Telephone: 64 07 5430948

Fax: 64 07 5411029

Email: [headoffice@mwnc.com](mailto:headoffice@mwnc.com)

Website: [www.mwnc.com](http://www.mwnc.com)

# Marshall Innovations Tekton Weatherization System

Product Technical Statement: 100968



Please refer to [Tekton Weatherization Technical Specification](#) for full details of installation.

## Installation requirements

Please refer to [Tekton Weatherization Technical Specification](#) for full details of installation.

Tekton Weatherization System must be installed by or under the guidance of an Licensed Building Practitioners

## Warrantees

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.

## Company Product Information

### Relationships

BRANZ #621 (2020)

### Videos

[Tekton Weatherization System Video](#)



Date last validated: **07 October 2016**



Date last updated: **07 October 2016**

Disclaimer: The Product Technical Statement (PTS) template is copyright to Construction Information Limited. However the content of this PTS is the responsibility of the product manufacturer/supplier. Refer to the miproducts Terms and Conditions

# Tekton Building Wrap

Product Technical Statement: 102502

**miproducts**  
THE NATIONAL PRODUCT DATABASE

Tekton combines leading tear strength & water holdout, 60 day UV rating & a zero flammability index

[View miproducts listing](#)



## Level of assurance needed to demonstrate NZ Building Code Compliance

Supporting documentation should include technical information by manufacturer and either an independent assessment or reference to an industry-based scheme



Tekton confirms that this minimum level of assurance has been met or exceeded by the following:

BRANZ Appraisal  
[548\(2007\)](#)

## Technical Statement

### Product Description

Tekton building wrap is a synthetic breather-type building wrap for use as a wall wrap and air barrier under direct and non-direct (over cavity battens) wall cladding on timber and steel framed buildings. The product is a coated spun-bonded polypropylene.

### Scope of use

May be installed in buildings in wind zones up to and including very high.

### New Zealand Building Code (NZBC)

The product will, if employed in accordance with the supplier's installation and maintenance requirements, assist with meeting the following provisions of the building code:

- **Clause B2 Durability:** Performance B2.3.1(a)
- **Clause E2 External moisture:** Performance E2.3.2
- **Clause F2 Hazardous building materials:** Performance F2.3.1

### Notes

This is an Alternative Solution in terms of the New Zealand Building Code

### Supporting Evidence

The product has and can make available the following additional evidence to support the above statements:



BRANZ Appraisal  
[548\(2007\)](#)

## Product Criteria

### Design requirements

The wrap material is approximately 0.6mm tick and supplied in rolls 2740mm x 37 metres and 1370mm x 37 metres. May be installed in walls that are unlined internally such as gable ends. Can be left exposed for up to 60 days. Will not lose integrity if exposed to soaps, detergents, or cleaning chemicals. Non absorbent claddings like vinyl and metal cannot be direct fixed to Tekton - These claddings must be on a cavity.

Tekton Building Wrap has an AS 1530 Part 2 Flammability Index of 0 and meets the requirements of NZBC Acceptable Solution C/AS1 Part 6, Table 6.2 for surface finish requirements for suspended flexible fabrics, and therefore it may be used with no restrictions in all buildings.

### Installation requirements

Install must be carried in accordance with the technical literature and by a competent tradesperson/s with an understanding of wall wrap installation. Refer to the Marshall innovation Specification for Tekton building wrap. Studs must be at a maximum of 600mm centres, with nogs flush at maximum 1200mm centres. For install details [click here](#)

### Maintenance requirements

Once the Tekton Building Wrap has been install correctly the nature of the product means no maintenance is required.

### Warrantees

Tekton Wall Underlay meets the durability requirements of NZBC B2.3.1(a), 50 years and B2.3.1(b), 15 years. Tekton Wall Underlay is warranted to be free of defect in manufacture. This warranty is limited to replacement of the Tekton Wall Underlay material. Marshall Innovations NZ/AUS Ltd (the



**masterspec partner**

### Company Contact Details



Company:	Marshall Innovations Ltd
Physical Address:	41 Hotuhotu Street Tauriko TAURANGA
Postal Address:	PO Box 9411 Greerton TAURANGA
Telephone:	64 07 5430948
Fax:	64 07 5411029
Email:	<a href="mailto:headoffice@mwz.com">headoffice@mwz.com</a>
Website:	<a href="http://www.mwz.com">www.mwz.com</a>

# Tekton Building Wrap

Product Technical Statement: 102502

**miproducts**  
THE NATIONAL PRODUCT DATABASE

distributor) is not liable for incorrect installation or any accidental or wilful damage to the product.

## Company Product Information

### Environmental

Tekton contains more than 23% Post Industrial recycle content.

### Relationships



BRANZ Appraisal 548



Date last validated: **19 August 2015**



Date last updated: **19 August 2015**

Disclaimer: The Product Technical Statement (PTS) template is copyright to Construction Information Limited. However the content of this PTS is the responsibility of the product manufacturer/supplier. Refer to the miproducts Terms and Conditions

## 4161T Thermakraft Underlays & DPC

**Thermakraft**

**Thermakraft Ltd**

+64 09 2733727

info@thermakraft.co.nz

www.thermakraft.co.nz

### SUPPORTING DOCUMENTS

#### **BRANZ Appraisal 329 - Supercourse 500™ Damp-Proof Course and Concealed Flashing**

Ref 10565. Uploaded 12 Aug 2020

Purpose: Performance, Warranty

#### **Code Mark Certificate 30028 - Thermakraft Covertex 407™ Absorbent Breathable Roof Underlay**

Ref 10577. Uploaded 12 Aug 2020

Purpose: Warranty

#### **Premium Joining Tape - Data Sheet**

Ref 14030. Uploaded 2 Oct 2020

Purpose: Performance

#### **Premium Joining Tape - Installation Guide**

Ref 14031. Uploaded 2 Oct 2020

Purpose: Installation

#### **Supercourse 500 DPC - Data Sheet**

Ref 13998. Uploaded 1 Oct 2020

Purpose: Performance

#### **Supercourse 500 DPC - Installation Guide**

Ref 13999. Uploaded 1 Oct 2020

Purpose: Installation

#### **Thermakraft Roof underlay Covertex 407 106515**

Ref 10296. Uploaded 26 Jun 2020

Purpose: Performance, Installation

#### **Thermakraft Warranty**

Ref 14033. Uploaded 2 Oct 2020

Purpose: Warranty

#### **Thermathene Black DPM - Data Sheet**

Ref 14020. Uploaded 1 Oct 2020

Purpose: Performance

## **Thermathene Black DPM - Installation Guide**

Ref 14021. Uploaded 1 Oct 2020

Purpose: Installation



## BRANZ Appraised

Appraisal No. 329 [2016]

## SUPERCOURSE 500 DAMP-PROOF COURSE AND CONCEALED FLASHING

Appraisal No. 329 [2016]

This Appraisal replaces BRANZ

Appraisal No. 329 [2005]

Amended 23 February 2017



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### Thermakraft Limited

PO Box 58 112  
Greenmount  
Auckland

Tel: 09 273 3727

Fax: 09 273 3726

Free phone: 0800 806 595

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



### BRANZ

#### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 Supercourse 500 is a single layer black polyethylene, embossed on both faces to produce a small diamond pattern. It is for use as a general damp-proof course (DPC), and also as a concealed flashing for masonry veneer cladding.

## Scope

- 2.1 Supercourse 500 has been appraised for use as a damp-proof course for separating timber, wood-based products and metal from concrete, masonry or clay brick in accordance with NZS 3604.
- 2.2 Supercourse 500 has also been appraised for use as a damp-proof course and flashing in masonry veneer walls in accordance with NZBC Acceptable Solution E2/AS1.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Supercourse 500 Damp-Proof Course and Concealed Flashing, if used, designed, 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 and B2.3.2. Supercourse 500 meets these requirements. See Paragraph 8.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2 and E2.3.3. When used as a flashing as part of a masonry veneer cladding system, Supercourse 500 will contribute to meeting the requirements of E2.3.2. When used as a DPC, Supercourse 500 will meet the requirements of E2.3.3. See Paragraphs 11.1 and 11.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Supercourse 500 meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** DPC in terms of the New Zealand Building Code compliance. This is also an Appraisal of an **Acceptable Solution** flashing when used behind masonry veneer in accordance with NZBC Acceptable Solution E2/AS1.



## Technical Specification

- 4.1 Supercourse 500 is 0.5 mm thick, extruded polyethylene film. It consists of a single layer of black polyethylene, embossed on both faces to produce a small diamond pattern. The total thickness of the product after embossing is 0.75 mm. Supercourse 500 is supplied in rolls 30 m long and is available in widths of 50, 75, 90, 100, 150, 200, 250, 300 and 1000 mm. Other widths are available upon request.
- 4.2 Each roll is labelled with the product name, dimensions, standards reference, and manufacturer's information.

## Handling and Storage

- 5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather and must be stored under cover, in clean, dry conditions.

## Technical Literature

- 6.1 Refer to the Appraisals listings on the BRANZ website for details of the current Technical Literature for Supercourse 500. 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 Certificate must be followed.

## Design Information

### General

- 7.1 Supercourse 500 exceeds the vapour resistance requirements of NZBC Acceptable Solution E2/AS1, Table 23 for DPC's and is a suitable moisture impermeable alternative to bituminous DPC's.
- 7.2 Supercourse 500 is intended for use as a DPC separating timber, wood-based products and metal from concrete or masonry elements, or where required, timber jack studs or bearers from concrete or timber piles, e.g. where required by NZS 3604, Paragraph 2.3.3 and Figure 6.3. When used as a DPC, the roll width selected must enable the Supercourse 500 to extend at least 6 mm beyond each face of the timber in accordance with the requirements of NZS 3604, Paragraph 2.3.3 [b].
- 7.3 Supercourse 500 is also intended for use as a flashing material with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.4 and also as a DPC in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.5.

### Timber Treatment

- 7.4 Supercourse 500 when used as a DPC or flashing, is suitable for use in contact with timber treated with light organic solvent preservative (LOSP) or water-based timber preservatives. The solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of Supercourse 500.

### Exposure Zone Fixing Selection

- 7.5 Where Supercourse 500 is used as a flashing behind masonry veneer, fixings shall be hot dip galvanised clouts in Exposure Zones B and C and stainless steel clouts in Exposure Zone D.

## Durability

### Serviceable Life

- 8.1 Supercourse 500 is expected to have a serviceable life in excess of 50 years when it is installed in accordance with the requirements of this Appraisal and the Technical Literature, provided it is not exposed to the weather or ultra-violet [UV] light for a total of more than 30 days, and is never exposed to chemicals, or solvents that will degrade polyethylene.



## Control of Internal Fire and Smoke Spread

- 9.1 Damp-proof courses and flashings are exempt from the surface finish requirements of NZBC Acceptable Solutions C/AS1 – C/AS6 by NZBC Acceptable Solution C/AS1, Paragraph 4.2.2 e), and NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 4.17.6 e).

## Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Supercourse 500 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 Supercourse 500, when installed as a flashing in accordance with the Technical Literature and this Appraisal, will assist in the masonry veneer cladding system meeting the performance requirements of Clause E2.3.2.
- 11.2 Supercourse 500 when used as a DPC in accordance with this Appraisal, prevents walls, floors and structural elements in contact with the ground from absorbing or transmitting moisture in quantities that could cause undue dampness or damage to building elements to meet the performance requirements of Clause E2.3.3

## Installation Information

### Installation Skill Level Requirements

- 12.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by competent tradespersons with an understanding of DPC and flashing installation.

### Supercourse 500 Installation

#### General

- 13.1 Strips of Supercourse 500 may be cut to length with a sharp knife.

#### DPC Installation

- 13.2 The surfaces to be separated must be smooth and flat, free from projections such as small stones or sharp ridges that may puncture the membrane when pressure is applied.
- 13.3 When used to separate timber and wood-based products from concrete or masonry, Supercourse 500 should be temporarily held in place with small hot-dip galvanised clouts or zinc plated staples. The strip of DPC must be wide enough to fully protect the width of the material in contact with the concrete or masonry. Refer also to Paragraph 7.2.
- 13.4 When used under timber plates fixed over concrete floor slabs and foundation walls, a small slit should be made in the material before pushing down over the bolts or fixings. Alternatively, a small hole can be formed by gently tapping the product resting on top of the bolt until a puncture is formed.

#### Flashing Installation

- 13.5 Supercourse 500 must be fixed in place to framing members at maximum 300 mm centres with small hot-dip galvanised clouts.
- 13.6 Horizontal and vertical joints must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the flashing.
- 13.7 At the sill/jamb junction, the jamb flashing must overlap the sill flashing.



## Basis of Appraisal

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

### Tests

14.1 The following tests have been carried out on Supercourse 500 by Amdel Ltd, a NATA Certified laboratory: Water permeability, thickness, mass per unit area, pigment, impact resistance, and labelling, all in accordance with AS/NZS 2904 and AS/NZS 4347. The test results have been reviewed by BRANZ experts and found to be satisfactory.

### Other Investigations

15.1 Durability and weathertightness opinions were given by BRANZ technical experts.

15.2 The practicability of installation has been assessed by BRANZ and found to be satisfactory.

15.3 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

### Quality

16.1 The manufacture of Supercourse 500 has been examined by BRANZ, and details of the methods adopted for quality control and the quality of the materials used, have been obtained.

16.2 The quality management system of the Supercourse 500 manufacturer, Cromford Pty Ltd, has been assessed and registered as meeting the requirements of ISO 9001: 2008 by ApprovalMark International, Certificate Number QMS 27839.

16.3 The quality of supply to the market is the responsibility of Thermakraft Limited.

16.4 Building designers are responsible for the design of the building, and for the incorporation of Supercourse 500 into their design in accordance with the instructions of Thermakraft Limited.

16.5 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

### Sources of Information

- AS/NZS 2904: 1995 Damp-proof courses and flashings.
- AS/NZS 4347 Damp-proof courses and flashings - Methods of test.
- NZS 3604: 2011 Timber Framed Buildings.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- 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.

## Amendments

### Amendment No. 1, dated 23 February 2017.

This Appraisal has been amended to update the Appraisal Holder.



**BRANZ Appraised**  
Appraisal No. 329 [2016]

**BRANZ Appraisal**  
Appraisal No. 329 [2016]  
22 December 2016

SUPERCOURSE 500  
DAMP-PROOF COURSE AND  
CONCEALED FLASHING



In the opinion of BRANZ, **Supercourse 500 Damp-Proof Course and Concealed Flashing** 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 **Thermakraft 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. **Thermakraft 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 **Thermakraft 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 **Thermakraft Limited** or any third party.

For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

22 December 2016

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



Page 1 of 4



### Product Description

Thermakraft Covertex 407 Fire Retardant Self-Supporting Roof Underlay (Covertex 407) is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water resistant film laminated to two layers of non woven spun-bonded polyolefin. Covertex 407 is coloured white on the top bottom faces.

### Product purpose and use

Covertex 407 has been assessed for use as a self-supporting roof underlay on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1 (Amendment 8, 30 November 2018), Paragraph 1.1 with regards to building height and floor plan area; and,
- with masonry tile roof cladding; and,
- with metal tile and profiled metal roof cladding; and,
- situated in NZS 3604-2011 Wind Zones up to, and including Extra High.

Covertex 407 is supplied in rolls 1.250 m wide x 20 m and 40 m long or 2.550 m wide x 29.5 m long. The product is printed with the Covertex 407 logo repeated along the length of the roll as well as lap lines. A customer specific version without the Covertex 407 print is also available. The rolls are wrapped in clear polythene film.

Accessories used with Covertex 407 which are supplied by the installer are:

- Fixings - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

For use as an alternative to kraft paper roofing underlays: fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity and to assist in the moisture management of the cladding system.

### Certificate holder

**Thermakraft Limited**  
 11 Turin Place, East Tamaki Auckland, New Zealand  
 Tel: +64 9 2733727  
[www.thermakraft.co.nz](http://www.thermakraft.co.nz)

CodeMark Certification Body		11/3/2013	1/7/2019	1/7/2022	GM-CM30028-RevF
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222 <a href="http://www.Global-Mark.com.au">www.Global-Mark.com.au</a>	Herve Michoux Managing Director	Date of issue	Last update	Date of next re-certification	Certificate Number

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. This certificate is issued by Global-Mark Pty Limited, an independent certification body accredited by the product certification accreditation body (JAS-ANZ) appointed by the Chief Executive of the Ministry of Business Innovation and Employment under the Building Act 2004. The Ministry of Business Innovation and Employment does not in any way warrant, guarantee, or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry of Business Innovation and Employment disclaims, to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate. This Certificate may only be reproduced in its entirety. It is advised to check that this Certificate of Conformity is currently valid and not withdrawn, suspended or superseded by a later issue by referring to the Ministry of Business Innovation and Employment website, <http://www.mbie.govt.nz/> New Zealand Building Code (NZBC) references the Building Code in force at the time of issuing the product certificate. Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertex 407



Page 2 of 4



### Compliance with the New Zealand Building Code (NZBC):

- **Clause B2 DURABILITY:** Performance B2.3.1(a), not less than 50 years, B2.3.1(b), 15 years and B2.3.2. Covertex 407 meets these requirements.
- **Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:** Performance C3.4 (c) Covertex 407 meets this requirement.
- **Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof cladding system, Covertex 407 will contribute to meeting this requirement.
- **Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Covertex 407 meets this requirement and will not present a health hazard to people.

### Subject to the following conditions and limitations:

- Maintaining the validity of BRANZ Appraisal No. 651 (2019) Thermakraft Covertex 407 Fire Retardant Self Supporting Roof Underlay. (The Appraisal) (refer to [www.branz.co.nz](http://www.branz.co.nz))

### Design and Installation Conditions:

- **Timber and Steel Framing**  
Timber and steel roof framing must be provided in accordance with the requirements of the NZBC and the roof cladding manufacturer.
- **General**

Table 1: NZBC E2/AS1 (Amendment 8, 30 November 2018) Table 23 Requirements

Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass > 150 g/m <sup>2</sup>
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	$\geq 6$ and $\leq 9$	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): <ul style="list-style-type: none"> <li>• Machine direction = 320 N</li> <li>• Cross direction = 289 N</li> </ul> Tensile strength (Average): <ul style="list-style-type: none"> <li>• Machine direction = 6.0 kN/m</li> <li>• Cross direction = 5.8 kN/m</li> </ul>

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407

Page 3 of 4



Covertek 407 is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.

The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.

Covertek 407 is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1 (Amendment 8, 30 November 2018), Table 23. Refer to Table 1 for the material properties of Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay.

Covertek 407 is suitable for use in residential and commercial roofs with roof pitches of minimum 3°. The product must not span unsupported more than 1200 mm in one direction. Spans greater than 1200 mm require additional support such as galvanised wire mesh or safety mesh.

- At roof pitches of 10° or more, Covertek 407 may be run horizontally or vertically.
- At roof pitches less than 10° (minimum 3°), Covertek 407 may be run
  - horizontally, or
  - vertically if installed over a roof underlay support.

Refer to Table 2 for a summary of the roof underlay support requirements.

Table 2: Roof Underlay Support Requirements

Roof Pitch	Span	Roof Underlay Support Required?	
		Horizontally Installed	Vertically Installed
10° or more	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	No
Less than 10° (minimum 3°)	Greater than 1200 mm	Yes	Yes
	1200 mm or less	No	Yes

### • Structure

Covertek 407 is suitable for use in all Wind Zones of NZS 3604-2011 up to, and including, Extra High.

### • Durability

Covertek 407 meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b), 15 years for roof underlays used where the roof cladding durability requirement is 15 years.

### • Serviceable Life

Provided it is not exposed to the weather or ultra-violet light for a total of more than 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Covertek 407 is expected to have a serviceable life equal to that of the roof cladding.

### • Control of Internal Fire and Smoke Spread

Covertek 407 has an AS 1530 Part 2 – 1993 (including Amendment 1) flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6 Amendment 4 (1 January 2017), 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

Separation or protection must be provided to Covertek 407 from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 Amendment 4 (1 January 2017), and NZBC Verification Method C/VM1 Amendment 4 (1 January 2017) provide methods for separation and protection of combustible materials from heat sources.

# CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

## Thermakraft Covertek 407



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- **External Moisture**

Covertek 407 must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 (Amendment 8, 30 November 2018).

Thermakraft Covertek 407 Fire Retardant Self-Supporting Roof Underlay, when installed in accordance with Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17), will assist in the total cladding system's compliance with NZBC Clause E2.

- **Underlay Installation**

Covertek 407 must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.

Covertek 407 may be run vertically or horizontally. Refer to Table 2 for a summary of roof underlay support requirements. The roof underlay must extend from the ridge and overhang the fascia board by 20-25 mm.

Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide. To assist with achieving the correct lap dimension, Covertek 407 has a 150 mm lap line printed continuously along the top face.

When fixing the product in windy conditions, care must be taken due to the large sail area created.

Any damaged areas of Covertek 407, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

- **Installation Conditions**

Shall be carried out by:

- A Licensed Building Practitioner with experience in roof cladding installation; or,
- By competent tradespersons with an understanding of roof underlay installation.

The installer shall also:

Comply with all relevant technical information relating to the products use, including information contained within the Thermakraft Covertek 407 Synthetic Roof Underlay (J2902-05/17) and the Appraisal.

**End of record**



## Product Data Sheet

# PREMIUM JOINING TAPE

## High-End Construction Tape

Thermakraft Premium Joining Tape is a high-end construction tape used to join a wide range of underlays and rigid sheathing products. The product has a thick layer of acrylic adhesive to support wide range of service temperatures and bonding to common construction substrates.

Premium Joining Tape comes in one standard size

Product Code	Roll Size	Rolls Per Carton
PJT060025	60mm wide x 25m long	10 individually wrapped rolls

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# Premium Joining Tape

## High-End Construction Tape

### Product Description

Thermakraft Premium Joining Tape is a multi-layered reinforced synthetic tape. Compared with most construction joining tapes, it is more tear and rip resistant, and has a significantly stronger adhesion performance. The product is simply applied onto the lap joints of underlays and rigid sheathing products.

### Scope of Use

Thermakraft Premium Joining Tape can be used to join the laps of wall and roof underlays, damp proof membranes, vapour control products such as foil underlays and rigid sheathing products (e.g. plywood rigid underlay, OSB board, fibre cement and insulation panels). Installer or designer must check the compatibility of Thermakraft Premium Joining Tape with the substrate manufacturer.

For flexible underlay joining in both residential and commercial buildings, Thermakraft Premium Joining Tape must be used within the following scope:

- With flexible underlays that meet the performance requirements outlined in standard NZS 2295.2006.
- Is suitable to use with air barrier underlays in unlined wall spaces.
- Is suitable to be used in conjunction with thermal breaks on steel framed buildings.

### General

- Operating temperature from -40°C to 80°C. Installation temperature from -10°C.
- Roll Size 60mm wide x 25m long. Rolls are individually packaged.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent to flash off in a well ventilated area. Recommended minimum 7 days.

### Limitations

- Thermakraft Premium Joining Tape is NOT a window flashing tape and must NOT be used as a window flashing tape.
- Must NOT be used in areas where the tape is permanently exposed to the weather or UV. This includes not using with translucent cladding materials.
- Must NOT be exposed to the weather/UV for more than 90 days.
- Premium Joining Tape is NOT designed to overcome poor detailing and workmanship.

### Compliance

When Thermakraft Premium Joining Tape is used and installed in accordance with Thermakraft literature:

- Thermakraft Premium Joining Tape will meet or contribute to meeting the performance requirements of NZBC Clauses B2, Durability, B2.3.2 [b] 15 years\*, and B2.3.2, and F2 Hazardous Building Materials. \*Note, the external cladding must be maintained according with the cladding manufacturer's instructions and the cladding remains weather resistant. Thermakraft Premium Joining Tape must not be exposed to the weather/UV for more than 90 days.
- Thermakraft Premium Joining Tape is designed to work on building underlays that meet the requirements of NZBC E2/AS1 Table 23, and on all Thermakraft BRANZ appraised wall and roof flexible underlays.

### Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at [thermakraft.co.nz](http://thermakraft.co.nz) or call **0800 806 595**.

Thermakraft Limited / 0800 806 595

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## Installation Guide

# PREMIUM JOINING TAPE

## High-End Construction Tape

Thermakraft Premium Joining Tape is a high-end construction tape used to join a wide range of underlays and rigid sheathing products. The product has a thick layer of acrylic adhesive to support wide range of service temperatures and bonding to common construction substrates.

### Product Usage

Thermakraft Premium Joining Tape is a multi-layered reinforced synthetic tape. The product is simply applied onto the lap joints of underlays and rigid sheathing products.

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# Installation Guide

## Application Method

- Always ensure Thermakraft Premium Joining Tape is applied to surfaces that are clean and free of dust, contaminants, solvents, oil or waxes.
- Peel off the release liner from the Thermakraft Premium Joining Tape.
- Position Thermakraft Premium Joining Tape at the centre of the lap material.
- Firmly press Thermakraft Premium Joining Tape down and peel off more release liner from the tape as needed. Do not stretch or pull the tape at any point during the installation.
- Crease mark or folds on the tape can occur when large amount of correction is made or made too quickly to straighten the tape during installation. When the tape is off-centre, terminate the tape by cutting it with a sharp craft knife and start again with new tape at the location where it shows off-centred.
- Lap join between Thermakraft Premium Joining Tape must be minimum 50mm.
- For rigid sheathing or rigid underlay application, always check the compatibility of Thermakraft Premium Joining Tape with the substrate manufacturer before mass installation.
- Tape damages due to installation or site activities must be repaired by applying a second layer over the damaged area. Lap join distance is minimum 50mm.

## Flexible underlay application

- Take care when pressing down the tape not to damage or overstretch the flexible underlay material.
- Apply the Thermakraft Premium Joining Tape just before the installation of the external cladding. This will reduce the chance of overexposing the tape to UV and strong wind undoing the tape as the underlay flexes heavily. Note, the maximum UV or weather exposure for Thermakraft Premium Joining Tape is 90 days.
- Ensure the underlay has a minimum lap space of 150mm (refer to underlay installation guide).

## Application Tips

- Install the Thermakraft Premium Joining Tape above -10°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent to flash off in a well ventilated area. Recommended minimum 7 days.

## Handling and Storage

Thermakraft Premium Joining Tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.



## Product Data Sheet

# SUPERCOURSE 500

### Synthetic Damp Proof Course

Supercourse 500 is a general damp-proof course (DPC) used to prevent moisture transfer between building materials. It is also used as a concealed flashing for masonry veneer cladding.

Manufactured using a single layer of black polyethylene, Supercourse 500 is tough, high-impact and tear resistant. It is a suitable moisture impermeable alternative to bituminous DPC.

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# Supercourse 500

## Synthetic Damp Proof Course

### Supercourse 500 comes in eleven roll sizes:

Product Code	Roll Size	Rolls Per Carton
SPC05030	50mm x 30m	42
SPC07530	75mm x 30m	24
SPC09030	90mm x 30m	24
SPC10030	100mm x 30m	18
SPC15030	150mm x 30m	12
SPC20030	200mm x 30m	6
SPC25030	250mm x 30m	6
SPC30030	300mm x 30m	6
SPC40030	400mm x 30m	
SPC50030	500mm x 30m	
SPC100030	1000mm x 30m	

### Scope of Use

- Supercourse 500 intended for use as a damp-proof course separating timber and wood-based products and metal from concrete, masonry elements or clay bricks.
- Can also be used to separate timber jack studs or bearers from concrete or timber piles.
- Supercourse 500 can be used as a concealed flashing in masonry veneer walls.

### General

- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.
- Available in 11 product width sizes.

### Limitations

- Maximum weather or UV exposure is 30 days.
- Supercourse 500 is NOT a window flashing tape and NOT a thermal break product.

### Compliance

When Supercourse 500 is used and installed as a damp-proof course and/or concealed flashing behind masonry veneer walls, the product 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 and B2.3.2.
- Clause E2 External Moisture: Performance E2.3.2 and E2.3.3. When used as a flashing as part of a masonry veneer cladding system, Supercourse 500 will contribute to meeting the requirement of E2.3.2. When used as a damp-proof course, Supercourse 500 will meet the requirements of E2.3.3.
- Clause F2 Hazardous Building Materials: Performance F2.3.1. Supercourse 500 meets this requirement and will not present a health hazard to people.

More details can be found in Supercourse 500 BRANZ Appraisal 329 (2016)

### Durability

Supercourse 500 is expected to have a serviceable life in excess of 50 years when it is:

- Installed in accordance with Thermakraft's literature and BRANZ Appraisal.
- Not over exposed to the weather or UV (not more than 30 days).
- Never exposed to chemicals or solvents that will degrade or affect polyethylene material.

### Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at [thermakraft.co.nz](http://thermakraft.co.nz) or call **0800 806 595**.

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The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found on the website. E&OE.



## Installation Guide

# SUPERCOURSE 500

### Synthetic Damp Proof Course

Supercourse 500 is a general damp-proof course (DPC) used to prevent moisture transfer between building materials. It is also used as a concealed flashing for masonry veneer cladding.

Manufactured using a single layer of black polyethylene, Supercourse 500 is tough, high-impact and tear resistant. It is a suitable moisture impermeable alternative to bituminous DPC.

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# Installation Guide

## Product usage

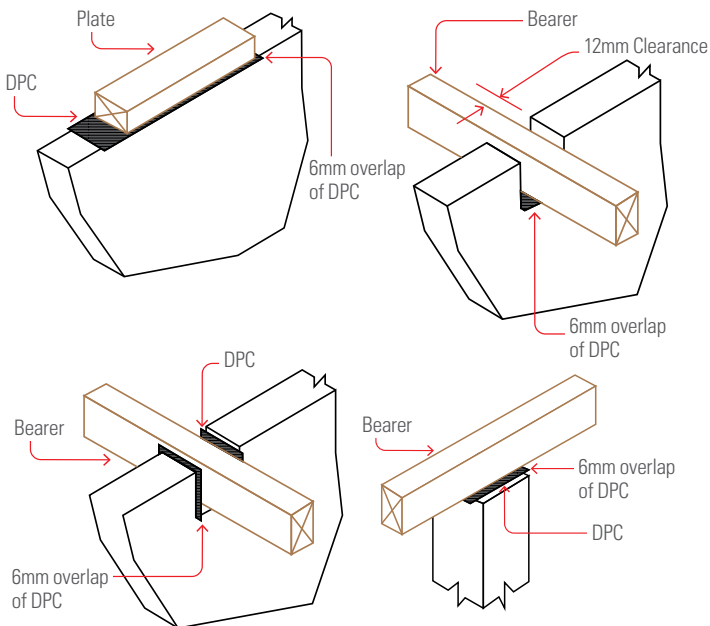
Thermakraft Supercourse 500 provides a moisture barrier protection and prevent walls, floors and structural elements in contact with the ground absorbing or transmitting moisture. When used as a flashing in masonry walls, the product provides moisture protection around window and door joinery.

## Application Method

### Damp-Proof Course (DPC) Installation

- Strips of Thermakraft Supercourse 500 DPC may be cut to length with a sharp knife.
- Surface must be smooth and flat, free from sharp ridges/projections such as small stones that may puncture membrane.
- The strip of Thermakraft Supercourse 500 DPC must be wide enough to fully protect the width of material in contact with concrete or masonry.
- When used to separate timber and wood-based products from concrete or masonry, Supercourse 500 should be temporarily held in place with small hot-dip galvanised clouts or zinc plated staples.

**Note:** when use as a DPC, the roll width selected must be enable the Supercourse 500 to extend 6mm beyond each face of the timber in accordance with the requirement of the NZ 3604 standard paragraph 2.3.3 (b). See extract image below from NZ 3604:2011.



Note: Timber, unless otherwise stated, to be treated to the levels specified in NZS 3604.

- A small slit should be made in the material to accommodate the bolts or fixings when used under timber plates or concrete floors or foundation walls. Alternative, a small hole can be formed by gently tapping the product resting on top of the bolt until a puncture is formed.

### Flashing Installation

- Thermakraft Supercourse 500 must be fixed in place to framing members at 300mm centres with small hot-dip galvanised clouts.
- Horizontal and vertical joints must be no less than 75mm wide, with the direction of the lap ensuring that water is shed to the outer face of the flashing.
- At the sill/jamb junction, the jamb flashing must overlap the sill flashing.

Supercourse 500 is unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

### Handling and Storage

Supercourse 500 must be handled with care to prevent damage such as tearing and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

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The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards. Literature subject to change without notification. Latest documentation can be found on the website. E&OE.

# Thermakraft Roof underlay Covertek 407

Product Technical Statement: 106515

**miproducts**  
THE NATIONAL PRODUCT DATABASE

Fire retardant synthetic roof underlay. Also suitable as a wall underlay. Absorbent and Breathable

[View miproducts listing](#)



## Level of assurance needed to demonstrate NZ Building Code Compliance

Supporting documentation should include technical information by manufacturer and either a BRANZ or independent Appraisal or CodeMark



Thermakraft confirms that this minimum level of assurance has been met or exceeded by the following:

CodeMark  
[GM-CM30028-RevA](#)  
BRANZ Appraisal  
[651](#)

## Technical Statement

### Product Description

Consists of a microporous water resistant film, sandwiched between two layers of shrink resistant spun-bonded polyolefin.

In Roof Applications - Intended for use as a alternative to conventional kraft paper roof underlay, which are fixed over timber or steel framed roofs and to assist in the moisture management of roof cladding systems.

In Wall Applications - Intended for use as an alternative to conventional kraft paper wall underlays, which are fixed over timber or steel frame walls in order to limit the entry of wind into building cavities.

### Scope of use

Covertek 407 Fire retardant absorbent breathable synthetic non-woven roof underlay can be used as a roof underlay 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 masonry tile roof cladding; and,
- with metal tile and profiled roof cladding; and,
- situated in NZS 3604 Building Wind Zones up to, and including "Very High" when used in walls. May be used in all wind zones including "Extra High" when used as a roof underlay

### New Zealand Building Code (NZBC)

The product will, if employed in accordance with the supplier's installation and maintenance requirements, assist with meeting the following provisions of the building code:

- **Clause B2 Durability:** Performance B2.3.1(a), B2.3.1(b), B2.3.2
- **Clause E2 External moisture:** Performance E2.3.2
- **Clause F2 Hazardous building materials:** Performance F2.3.1

### Evidence

The product meets the requirements set out in the following documents, or relevant parts of cited standards within the documents:

Meets E2/AS2, Table 2

### Supporting Evidence

The product has and can make available the following additional evidence to support the above statements:



CodeMark  
[GM-CM30028-RevA](#)



BRANZ Appraisal  
[651](#)

## Product Criteria

### Design requirements

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation to prevent moisture build-up in the roof cavities. Factors which adversely affect the condensation risk in roofing systems include;

- Humid, and/or cold climatic regions



**masterspec partner**

### Company Contact Details

**Thermakraft**

Company:	Thermakraft Ltd
Physical Address:	11 Turin Place East Tamaki AUCKLAND
Postal Address:	PO Box 58112 Botany AUCKLAND
Telephone:	64 09 2733727
Fax:	64 09 2733726
Email:	<a href="mailto:info@thermakraft.co.nz">info@thermakraft.co.nz</a>
Website:	<a href="http://www.thermakraft.co.nz">www.thermakraft.co.nz</a>

# Thermakraft Roof underlay Covertek 407

Product Technical Statement: 106515

**miproducts**  
THE NATIONAL PRODUCT DATABASE

- Warm/Skillion roof construction
- Low roof cavity air volume and restricted air movement
- Omitting Vapour Control Layers
- Ceiling penetrations and entry of warm air into roof cavities
- Occupancy activities which have high moisture loading on conditioned spaces
- Low pitched roof
- Bulk insulation
- Building structures ability to naturally dry Construction Moisture

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation

For additional information or advice [www.thermakraft.co.nz](http://www.thermakraft.co.nz)

## Installation requirements

LONG-RUN METAL ROOFING / VERTICAL OR HORIZONTAL INSTALLATION METHOD

Application

ROOF can be direct fix or cavity fix and must be installed in a manner that prevents ponding of water, and span no more than 1200mm without additional support.

Minimum roof pitch 3 degrees on roof pitches below 10 degrees must be supported if run vertically.

Must be laid firmly (tight) without creases.

All laps either vertical or horizontal must have a minimum of 150mm lap.

Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings.

## Warrantees

Click [here](#) to download the Thermakraft warranty statement.

## Company Product Information

### Environmental

Covertek has no known negative environment conditions

Covertek has no VOCs in manufacture installation or use

Covertek is recyclable at end of life with no harmful residue

### Relationships



New Zealand Made



Date last validated: **02 November 2015**



Date last updated: **02 November 2015**

Disclaimer: The Product Technical Statement (PTS) template is copyright to Construction Information Limited. However the content of this PTS is the responsibility of the product manufacturer/supplier. Refer to the miproducts Terms and Conditions

# Warranty Statement

## WARRANTY

1. Subject to the terms of this warranty statement, **Thermakraft Limited (“Thermakraft”)** warrants to the original purchaser of a Thermakraft product (**“the Product”**) that the Product will, subject to compliance with the conditions below, be free from defects due to defective factory workmanship or materials. For the avoidance of doubt, the Product will not be defective for the purposes of this warranty to the extent that the Product is performing or operating within any applicable tolerance or rating (or similar) levels as set out in Thermakraft’s relevant published literature current at the time of purchase. Thermakraft warrants to the original purchaser of any accessories in respect of the Product supplied by Thermakraft that such accessories will be free from defects due to defective factory workmanship or materials.
2. Nothing in this warranty shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act 1993 (**“Consumer Guarantees Act”**) or otherwise (except where the same may be excluded or modified to the maximum extent permitted by law). For the avoidance of doubt, the Consumer Guarantees Act does not apply to any purchaser of the Product who acquires the Product for:
  - (a) resupplying the Product in trade;
  - (b) consuming the Product in the course of a process of production or manufacture; or
  - (c) repairing or treating in trade other goods or fixtures on land, and does not apply if the Product is not of a kind ordinarily acquired for personal, domestic or household use or consumption.
3. The term of the warranty in respect of the Product is 15 years from the date of purchase. Thermakraft is not liable for any claim that is not lodged by the original purchaser within the term of the warranty.
4. The entity giving this warranty is Thermakraft Limited (company number 6220850), a duly incorporated company having its registered address at 11 Turin Place, Otara, Auckland 2013. Its contact details are as follows:
  - (a) Telephone: **0800 806 595 / 09 273 3726**
  - (b) Email: **sales@thermakraft.co.nz**

## CONDITIONS OF WARRANTY

**This warranty is strictly subject to the following conditions:**

5. Thermakraft will not be liable for breach of warranty unless the claimant has a valid claim and submits a claim in writing to Thermakraft. The written claim must be made within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
6. The claim to Thermakraft must include the following:
  - (a) proof of purchase;
  - (b) the name, physical address, phone number and email address of the original purchaser (as the claimant);
  - (c) the name and address of the licensed building practitioner (as defined in section 7 of the Building Act 2004) (**“Licensed Building Practitioner”**) who completed the installation (if any); and
  - (d) the date on which the defect became apparent.

For the avoidance of doubt, Thermakraft will not process any claim under this warranty unless the claim includes all of the relevant documents and/or information set out in this clause 6.
7. The warranty is personal to the original purchaser of the Product and is not transferable.
8. The Product must be installed by or under the direct supervision of a Licensed Building Practitioner strictly in accordance with the relevant Thermakraft literature in respect of the Product current at the time of installation. The Product must be installed in conjunction with the components or products specified in the relevant literature.
9. The Product must be installed in accordance with all applicable legal requirements.
10. All other products, including coating and joining systems, applied to, or used in conjunction with the Product must first have been verified by a Licensed Building Practitioner and/or an accredited laboratory as being compatible with the Product, must be applied or installed by a Licensed Building Practitioner, and must be maintained strictly in accordance with the relevant manufacturer’s instructions and good trade practice.

11. The project in which the Product is used must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand building code (as defined in section 7 of the Building Act 2004) ("**Building Code**"), regulations and standards and in accordance with the terms specified in any building consent issued by the local or territorial authority in which the project is being undertaken. If requested by Thermakraft, the claimant must provide a copy of the building consent.
12. The claimant agrees to provide information in relation to the installation and/or maintenance of the Product reasonably requested by Thermakraft in assessing any claim. Thermakraft is not liable for under this warranty if the requirements set out in clauses 8 to 11 have not been satisfied.
13. Notwithstanding any other provision contained in this warranty, the claimant's sole remedy for breach of this warranty is that Thermakraft will, at its sole discretion, elect to:
  - (a) supply a replacement for the defective product;
  - (b) rectify the defective product; or
  - (c) pay the cost of the replacement or rectification of the defective product.

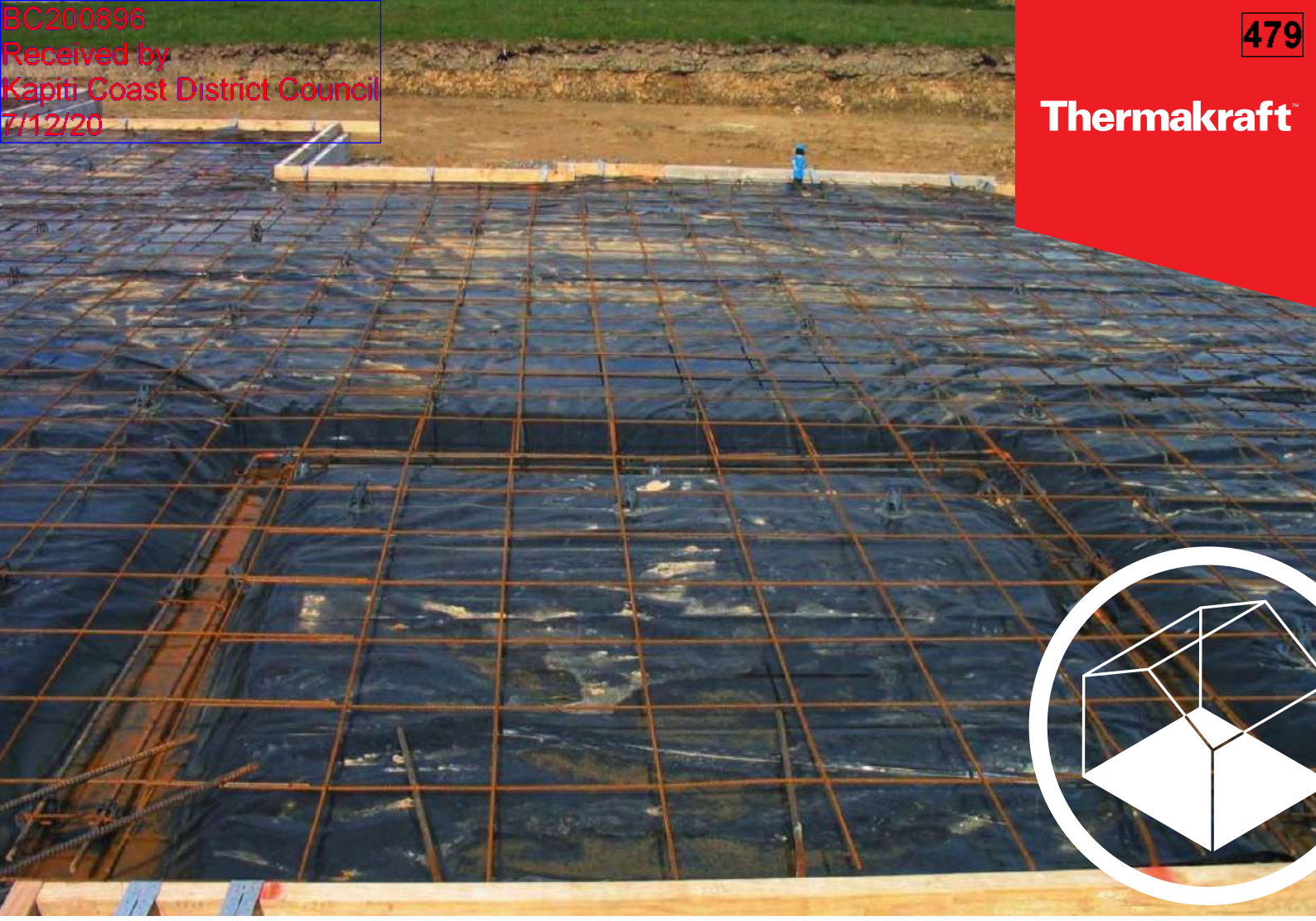
If a defective product is repaired or rectified, the original warranty period will continue to apply based on the original date of purchase of the relevant product.

To the maximum extent permitted by law, Thermakraft's liability for failing to comply with any statutory guarantee (or liability under any other warranty, condition or indemnity that cannot be excluded) is limited in the same manner as set out in this clause 13.
14. The claimant is responsible for its expenses in making any claim against Thermakraft under this warranty.
15. If Thermakraft determines that a claim is not valid, Thermakraft may charge the claimant for any labour, materials or transport costs incurred by it in assessing the claim
16. To the maximum extent permitted by law, except as expressly set out in this warranty, Thermakraft will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing, Thermakraft will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of or failure of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, normal wear and tear, growth of mould, mildew, fungi, bacteria or any organism on any Product surface or Product. It is a condition of this warranty that the claimant indemnifies Thermakraft against any and all of these excluded losses, damages and claims.
17. To the maximum extent permitted by law, all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded.
18. Any references to statutes or statutory provisions in this warranty include those statutes or statutory provisions as amended, extended, consolidated, re-enacted or replaced from time to time and any orders, regulations, instruments or other subordinated legislation made under them.

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## Product Data Sheet

# THERMATHENE BLACK

### Damp Proof Membrane (DPM)

Thermathene Black is a concrete underlay that is made from a tear and puncture resistant polyethylene film. It is commonly known as a Damp Proof Membrane (DPM).

Thermathene Black comes in two roll sizes:

Product Code	Width	Length	Coverage
PF250025	4000mm	25m	100m <sup>2</sup> coverage
PF250050	4000mm	50m	200m <sup>2</sup> coverage

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# Thermathene Black

## Damp Proof Membrane (DPM)

---

### Scope of Use

Thermathene Black intended for use as a damp-proof membrane separating concrete slab from ground soil. The product acts as a vapour barrier to stop ground moisture penetrating the concrete. Thermathene Black must be sealed with Thermakraft White General Purpose tape at the laps joints to form a complete vapour barrier.

### General

- Unaffected by LOSP treated timber. However, LOSP treated timber must have sufficient time for the solvent chemical to flash off in well ventilated area. Recommended minimum 7 days.
- 4m x 25m [100m<sup>2</sup>] and 4m x 50m [200m<sup>2</sup>] unfolded size.
- 250 Micron in thickness.

### Limitations

- Maximum weather or UV exposure is 28 days.
- Cannot be used as a roof or wall underlay.

### Compliance

Thermathene Black is an acceptable solution as per the requirements of the NZBC. Thermathene Black meets the requirements of NZBC 3604:2011 Clause 7.5.4.2, NZBC Acceptable Solutions E2/AS1, Table 23 and NZS 4229:2013 Clause 7.4 & 7.6.

When Thermathene Black is used and installed as a damp-proof membrane as per Thermakraft's literature, the product will meet or contribute to meeting the following provisions of the NZBC: Clause B2 Durability: Performance B2.3.1 (a), 50 years, Clause E2 External Moisture: Performance E2.3.3 & Clause F2 Hazardous Materials: Performance F2.3.1.

### Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at [thermakraft.co.nz](http://thermakraft.co.nz) or call **0800 806 595**.

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## Installation Guide

# THERMATHENE BLACK

## Damp Proof Membrane (DPM)

Thermathene Black is a concrete underlay that is made from a tear and puncture resistant polyethylene film. It is commonly known as a Damp Proof Membrane (DPM).

### Product usage

Thermathene Black is used as a concrete underlay and a moisture vapour barrier in areas where protection is required. The product is 250 microns in thickness and is coloured black. Thermathene Black may also be used under suspended subfloors as ground protection from rising damp.

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# Installation Guide


## Application Method

- Thermathene Black should be installed in accordance with the requirements of NZS3604:2011 and must be laid on a properly prepared base as required by NZS3604:2011 Section 7.5.3 to 7.5.6.2.
- Thermathene Black must be laid in a continuous manner with all laps minimum 150mm, and penetrations to be taped with Thermakraft White General Purpose Tape.
- Thermathene Black should be laid in a neat fashion with a smooth surface, with as many of the ripples as possible eliminated.
- Thermathene Black must be inspected for any damage (tears or penetrations) prior to concrete placement. Any damage must be repaired with Thermakraft White General Purpose Tape, for any larger damage a patch of Thermathene Black maintaining a 150mm lap.
- Thermathene Black must not be left exposed for more than 28 days.
- Thermathene must be installed by a licensed building practitioner.
- Thermathene Black may also be used to cover ground areas under suspended timber floors to prevent the rise of dampness. Ensure that the site is clear of rubbish, sharp edges such as rocks or bricks. Slit and patch around jack studs or pipe work. All penetrations and joints must be taped.

## Handling and Storage

Thermathene Black must be handled with care to prevent damage, the product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

# 4223SC Shadowclad Plywood Cladding

	<p><b>Carter Holt Harvey Plywood</b> +64 0800 326759 info@ecoply.co.nz www.chhply.co.nz</p>
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## SUPPORTING DOCUMENTS

### BRANZ Appraisal 764 - Shadowclad® Ventilated Cavity Cladding System

Ref 10590. Uploaded 12 Aug 2020

Purpose: Performance, Warranty

**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.



**CarterHolt Harvey  
Plywood Ltd**

Private Bag 92-106  
Auckland  
Tel: 0800 326 759  
Fax: 09 633 1582  
Web: [www.chhwoodproducts.co.nz](http://www.chhwoodproducts.co.nz)



**BRANZ**

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



**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  $\leq 10$  m and at a distance of  $\geq 1.0$  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  $\leq 10$  m and at a distance of  $\geq 1.0$  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 4.3.11, 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.



**BRANZ Appraised**  
Appraisal No. 764 [2017]

**BRANZ Appraisal**  
Appraisal No. 764 [2017]  
21 September 2017

SHADOWCLAD® VENTILATED  
CAVITY CLADDING SYSTEM



**BRANZ**

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

## 4239JH James Hardie® Soffits



### James Hardie

+64 0800 808868  
info@jameshardie.co.nz  
www.jameshardie.co.nz

## SUPPORTING DOCUMENTS

### Eaves and Soffits Care and Maintenance

Ref 10392. Uploaded 29 Jul 2020

Purpose: Maintenance

### HardieSoffit Lining Product Warranty

Ref 10388. Uploaded 29 Jul 2020

Purpose: Warranty

### James Hardie Eaves and Soffits Installation Manual - Aug 2017

Ref 10424. Uploaded 30 Jul 2020

Purpose: Installation

## Care and Maintenance

It is the responsibility of the Specifier to determine normal maintenance requirements to comply with the New Zealand Building Code. The extent and nature of maintenance required will depend on the geographical location and exposure of the building.

As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down your exterior every 6-12 months using low pressure water and a brush, and every 3-4 months in extreme coastal conditions (such as high winds and sea spray)
- Clean out your gutters, downpipes and overflow pipes as required
- Cut back vegetation and landscaping which is too close to or touching the building
- Re-applying exterior protective finishes. Always refer to the paint manufacturer for re-coating requirements related to ongoing paint performance
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants

Date:

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Project:

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Address:

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Customer Name:

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# Product Warranty



James Hardie New Zealand Limited ("James Hardie") warrants for a period of 15 years from the date of purchase that the HardieSoffit™ Lining (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

## CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

- a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation;
- b) this warranty is not transferable;
- c) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice;
- d) the project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards;
- e) the claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product;
- f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces);
- g) all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;
- h) if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of the HardieSoffit™ Lining when installed in accordance with the Eaves and Soffit Linings Installation Manual, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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# Installation Manual

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## WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

**Ask James Hardie™**

Fax 0800 808 988

[literaturefeedback@jameshardie.co.nz](mailto:literaturefeedback@jameshardie.co.nz)

# 1 Introduction

**James Hardie have a wide range of soffit linings and pre-finished soffit linings that enable you to create the look you want.**

Cool, wide soffits and verandahs have, over the years, been a feature which specifiers have used to provide shade from the hot summer sun and to give UV protection to exterior paintwork and interior fabrics.

Today's high energy costs demand that all avenues be explored to develop cost-efficient ways for keeping our homes cool. One

of these methods — tried and proven — is the use of wide soffits, verandahs and covered outdoor living areas. James Hardie products are resistant to fire and damage from moisture and rotting when installed and maintained as directed.

James Hardie HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining are not suitable for use as a cladding.



## 1.1

HardieSoffit™ | 

HardieSoffit™ Linings are 4.5mm thick and are specifically manufactured for the narrow soffit around the perimeter of the house or building. Standard widths of 450mm, 600mm and 750mm are available.

- HardieSoffit Linings have an unsanded finish suitable for semi-gloss acrylics or lightly textured semi-gloss or high-gloss coatings. Smooth high-gloss coatings must be avoided as some surface undulations may be visible in critical light.
- HardieSoffit Linings can be nail-fixed to timber or mechanically fixed to a steel frame.
- HardieSoffit Linings can be uPVC jointed or the joints can be left expressed.



## 1.2

HardieFlex™ | 

HardieFlex™ Eaves Lining are 4.5mm in thickness and are available in wider widths for use in wider soffits, ceilings and verandahs. They are complementary to the HardieSoffit Lining and are fixed and jointed in a similar way.

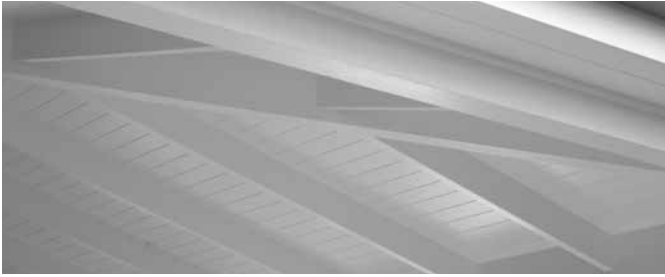
- HardieFlex Eaves Lining has an unsanded finish suitable for semi-gloss acrylics or lightly textured coatings. Smooth high-gloss coatings must be avoided as some surface undulations may be visible in critical light.
- HardieFlex Sheet 6mm, can also be used in eaves application for extra rigidity on larger spanning eaves.
- When higher impact or wind resistance is required, 6mm thick HardieFlex Sheet is used.

## 1.3

Eclipsa™ | 

Eclipsa™ Eaves Lining is a 4.5mm thick, pre-finished acrylic eave providing innovative style and enduring performance.

- Easy to install, saving both time and money.
- A slipsheet minimises surface marks on paint during transportation and installation.



1.4

HardieGroove™ |  SOFFIT LINING

HardieGroove™ Soffit Lining has the charm of traditional tongue and groove timber panelling, but has all the qualities of a modern James Hardie fibre cement product. It's perfect for enhancing design lines on modern buildings or renovating old villas and bungalows.

- HardieGroove Soffit Lining comes with a half groove length ways along the edge of the sheet to achieve concealed joints.



1.5

Villaboard™ |  SOFFIT LINING

Villaboard™ Soffit Linings are 6mm and 9mm in thickness to suit both residential and commercial applications. The recessed edges are suitable for flush jointing to give a smooth flush finish. Ideal for larger sized soffits.

- The sheets are fully sanded to give a smoother face surface.
- Two long sheet edges are supplied with a recessed finish and site-cut edges can be readily ground on site. Other combinations are also available. Refer Table 2, page 5.
- Square-edge sheets are also available. These sheets can be used for the alternative expressed, sealant-filled or uPVC joint finish.



This manual covers the use of HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining, and Villaboard Soffit Lining in external eave and soffit applications. Further technical literature relating to these products and internal linings are available from James Hardie in the following manuals:

- HardieFlex Sheet Technical Specification.
- Villaboard Lining Installation Manual.
- HardieGroove Lining Installation Manual.
- Fire and Acoustic Design Manual.

The specifier or other responsible party for the project must ensure the information and details in this manual are appropriate for the intended application and specific design and detailing is undertaken for areas which fall outside the scope of this document.

#### MAKE SURE YOUR INFORMATION IS UP TO DATE

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit [www.jameshardie.co.nz](http://www.jameshardie.co.nz) or Ask James Hardie™ on 0800 808 868.

## 1.6 PRODUCT DESCRIPTION

Table 1


HardieSoffit Lining Sheet Sizes					
Square-cut edge for use with jointers 	Length (mm)	Mass (kg/m <sup>2</sup> )	Width 1200mm		
			450	600	750
	4.5mm thickness		6.5		
2400			401948	401947	401946

Table 2


HardieFlex Eaves Lining Sheet Sizes							
Square-cut edge for use with jointers 	Width (mm)	Mass (kg/m <sup>2</sup> )	Length (mm)				
			1800	2400	2700	3000	
	4.5mm thickness		6.5				
	900			400194			
1200			400190	400187	400185	400183	

Table 3


Eclipsa Eaves Lining Sheet Sizes				
Pre-finished square-cut edge sheet for use with jointers 	Length (mm)	Mass (kg/m <sup>2</sup> )	Width (mm)	
			600	1200
	4.5mm thickness		6.6	
2400			404807	404808

Table 4

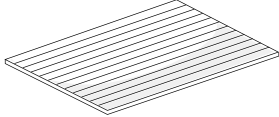
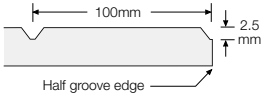
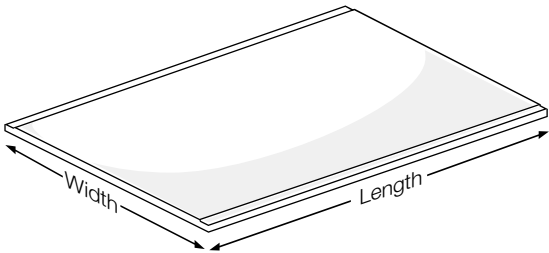
HardieGroove Soffit Lining Sheet Sizes					
Half groove length ways to achieve concealed joints  	Length (mm)	Mass (kg/m <sup>2</sup> )	Width (mm)		
			1200		
	7.5mm thickness		10.4		
	2400			400246	
2700			400245		

Table 5

Villaboard Soffit Lining Sheet Sizes						
Smooth recessed edge for flush jointing. Square-cut edge also available for use with jointers.  Villaboard Lining 6mm has no chamfer on square edge sheet. Villaboard Lining 9mm has small chamfer on square edge sheet.  	Length (mm)	Mass (kg/m <sup>2</sup> )	Width 1200mm			
			Edge Finish			
				4 rec/edges	2 rec/edges (long)	Square edges
	6mm thickness		8.6			
	2400			400432	400429	400444
	2700				400428	
	3000				400427	400442
	9mm thickness		12.4			
	2400			400439	400436	400445
	2700				400435	
3000				400434	400059	

## 1.7 ACCESSORIES

Table 6

HardieFlex™ Eaves Lining And HardieSoffit™ Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	<b>Soffit 4.5mm PVC 2-way Jointer</b> 2400mm long, uPVC / White	300915		<b>Hardiejointer 5mm</b> uPVC / White 2400mm long 750mm long 600mm long 450mm long	300729 300921 300920 300919
	<b>6mm Hardiejointer</b> uPVC/Bone colour 2400mm long 3000mm long	300730 300734		<b>HardieFlex 5mm Capping Mould</b> 2400mm long, uPVC / White	300538
	<b>6mm Capping Mould</b> uPVC/Bone colour 2400mm long 3000mm long	300539 300540		<b>Scotia Mould (base and cap)</b> 2400mm long, uPVC / White	300916
	<b>Fastfix Fasteners</b> 38 x 12mm, Nylon / White	300632		<b>Inseal 3259</b> 1.5mm thick 50mm wide x 50m long, Black compressible foam	300767
	<b>HardieKnife™</b> Scoring tool for easy cutting.	305926			

Table 7

Eclipsa Eaves Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	<b>Hardiejointer 5mm uPVC</b> 2400mm long 750mm long 600mm long 450mm long	300729 300921 300920 300919		<b>Soffit 4.5mm PVC 2-way Jointer</b> 2400mm long, uPVC / White	300915
	<b>Soffit Scotia Mould (base and cap)</b> 2400mm long, uPVC / White	300916		<b>HardieFlex Capping Mould 5mm</b> 2400mm long, uPVC / White	300538
	<b>Fastfix Fasteners</b> 38 x 12mm, Nylon / White	300632		<b>Inseal 3259</b> 1.5mm thick 50mm wide x 50m long, Black compressible foam	300767
	<b>Eclipsa Eaves Lining Touch-up Paint</b> 15ml	Free Ask James Hardie on 0800 808 868		<b>HardieKnife™</b> Scoring tool for easy cutting.	305926








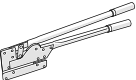





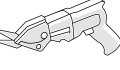
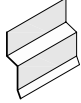







Table 8

HardieGroove Soffit Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	<b>Soffit Scotia Mould (base and cap)</b> 2400mm long, uPVC / white	300916		<b>Inseal 3259</b> 1.5mm thick 50mm wide x 50m long, black compressible foam	300767
	<b>HardieBlade Saw Blade</b> Ø184mm poly crystalline diamond blade, for fast, clean cutting of James Hardie fibre cement.	300660		<b>James Hardie Base Coat</b> Base compound for filling over screws. 4kg Pail 15kg Bag	304490 304491
	<b>HardieDrive Screw s/s 316</b> 30mm x 7g. 100 per jar For fastening to timber frames.	300928		<b>Villadrive Screw 6g x 30mm</b> For fastening to timber frames. 100/jar 5kg Box Collated/ 1000	300992 300993 300994
	<b>HardieKnife™</b> Scoring tool for easy cutting.	305926			

Table 9

Villaboard® Soffit Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	<b>Soffit Scotia Mould (base and cap)</b> 2400mm long, uPVC / White	300916		<b>Inseal 3259</b> 1.5mm thick 50mm wide x 50m long, Black compressible foam	300767
	<b>Hardiejointer 6mm</b> uPVC / Bone colour 2400mm long 3000mm long	300730 300734		<b>9mm Hardiejointer</b> uPVC / Bone colour 3000mm long	300736
	<b>HardieFlex Capping Mould 6mm</b> uPVC / Bone colour 2400mm long 3000mm long	300539 300540		<b>Control Joint</b> 2700mm long, uPVC / White	300978
	<b>Corner Angle</b> uPVC 3000mm long	300669		<b>James Hardie Top Coat</b> Topping compound for flush finished jointing. 3kg Pail 15kg Pail	304492 304493
	<b>James Hardie Base Coat</b> Base compound for flush finished jointing. 4kg Pail 15kg Bag	304490 304491		<b>HardieBlade Saw Blade</b> Ø184mm poly crystalline diamond blade, for fast, clean cutting of James Hardie fibre cement.	300660
	<b>HardieDrive Screw s/s 316</b> 30mm x 7g 100 per jar For fastening to timber frames.	300928		<b>Villadrive Screw 6g x 30mm</b> For fastening to timber frames. 100/jar 5kg Box Collated/1000	300992 300993 300994
	<b>FibreZip® Screws</b> Self drilling rib head screw Box 1000	303840		<b>HardieKnife™</b> Scoring tool for easy cutting.	305926

Table 10

Components Not Supplied by James Hardie			
James Hardie recommends the following products for use in conjunction with its eaves and soffit linings. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.			
Accessories	Description	Accessories	Description
	<b>HardieFlex Nail</b> 40 x 2.8mm galvanised or stainless steel nails.		<b>Second Coat Trowel 200mm</b> For installing second coats on set joints on Villaboard Lining.
	<b>Rondo P35</b> Control joint used in movement joints.		<b>Finishing Coat Trowel</b> For installing top coats on set joints on Villaboard Lining.
	<b>Perforated Paper Tape</b> Joint reinforcing tape.		<b>Corner Tool</b> For setting of internal corners on Villaboard Lining.
	<b>Level/Straight Edge</b> For checking straightness of frame.		<b>Hawk</b> To assist in the application of finishing compounds especially with the use of trowels.
	<b>Hand Guillotine</b> Guillotine for cutting fibre cement.		<b>Hand Sander</b> For sanding set joints on Villaboard Lining.
	<b>Collated Screw Gun</b>		<b>Notched Trowel</b> For applying tile adhesive to face of Villaboard Lining.
	<b>Hole Saw</b>		<b>Broadknife 150mm</b> For setting of joints on Villaboard Lining.
	<b>Electric shear/Fibreshear</b> For cutting Villaboard Soffit Lining, HardieGroove Soffit Lining, HardieSoffit Lining, HardieFlex Eaves Lining.		<b>Flashing to Table 20 'E2/AS1'</b> Flashing fabricator
	<b>Flashing Tape</b> Proprietary tape to adhere to building wrap. Tyvek, Protecto wrap or similar		<b>Flexible Joint Sealant</b> Tube Sikaflex MS or similar
	<b>Masking Tape</b> 3M Scotch™ Blue 2090 - I8E 70006576972 or Sellotape 5855 Long Life		<b>Paperback Corners</b> 'Goldline' corner moulds
	<b>Polyurethane Tape</b>		<b>Adhesive Sealant</b> Sikaflex-11FC by Sika Seal N Flex-1 by Bostik
	<b>Acrylic Paint</b> Dulux X10 or similar brand		<b>Waterproofing Admixture</b> Multiplast Resin by Plaster Systems. Used in diluted form over Villaboard Lining sheet edges to control moisture suction before flush stopping.

# 2 Safe working practices

## STAY HEALTHY WHEN WORKING WITH BUILDING PRODUCTS CONTAINING CRYSTALLINE SILICA

### Crystalline Silica

What is it? Why and when is it a health hazard?

### Crystalline Silica is

- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

### Why is Crystalline Silica a health hazard?

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks.
- The most hazardous dust is the dust you cannot see!

### When is Crystalline Silica a health hazard?

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica.
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board).

### FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS AND INSTALLATION INSTRUCTIONS WHEN WORKING WITH JAMES HARDIE PRODUCTS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

## AVOID BREATHING IN CRYSTALLINE SILICA DUST!

### Safe working practices

- 👎 NEVER use a power saw indoors or in a poorly ventilated area
- 👎 NEVER dry sweep
- 👍 ALWAYS use M Class extractor unit as a minimum and always hose down with water/wet wipe for clean up
- 👎 NEVER use grinders
- 👍 ALWAYS use a circular sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance.
- 👍 ALWAYS follow tool manufacturers' safety recommendations
- 👍 ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- 👍 ALWAYS wear an approved properly-fitted, approved dust mask (P1 or P2) or respirator

Use one of the following methods based on the required cutting rate:

### BEST

- HardieKnife™
- Hand guillotine
- Fibreshear

### BETTER

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and M Class extractor unit.

### GOOD

- Dust reducing circular saw with HardieBlade™ Saw Blade

### Working outdoors

- 👍 Make sure you work in a well ventilated area
- 👍 Position cutting station so wind will blow dust away from yourself and others in the working area
- 👍 Cut products with either a HardieKnife or fibre cement shears or, when not feasible, use a HardieBlade™ Saw Blade (or equivalent) and a dust-reducing circular saw attached to a M Class extractor unit
- 👍 When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or P2 mask (correctly fitted in accordance with manufacturers' instructions) and when others are close by, ask them to do the same
  - If you are not clean shaven, then use a powered air respirator with a loose fitting head top.
  - Wear safety glasses
  - Wear hearing protection
  - When others are close by, ask them to do the same.

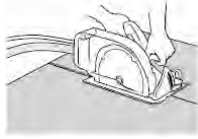
### Working indoors

- 👎 Never cut using a circular saw indoors
- 👍 Position cutting station in a well ventilated area
- 👍 Cut ONLY using a HardieKnife, hand guillotine or fibreshears (manual, electric or pneumatic)
- 👍 Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class extractor unit

**IF CONCERN STILL EXISTS ABOUT EXPOSURE LEVELS OR YOU DO NOT COMPLY WITH THE ABOVE PRACTICES, YOU SHOULD ALWAYS CONSULT A QUALIFIED INDUSTRIAL HYGIENIST.**

### Working Instructions

- Refer to Recommended Safe Working Practices before starting any cutting or machining of product.



### HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.

### Hole-Forming

#### For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet.
- Pre-drill a 'pilot' hole.
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.



#### For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face.
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.

## STORAGE & DELIVERY

### Keeping products and people safe

#### Off loading

- James Hardie products should be off-loaded carefully by hand or by forklift.
- James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite.

#### Storage

#### James Hardie products should be stored:

- in their original packaging
- under cover where possible or otherwise protected with a waterproof covering to keep products dry
- off the ground – either on a pallet or adequately supported on timber or other spacers
- flat so as to minimise bending

#### James Hardie products must not be stored:

- directly on the ground
- in the open air exposed to the elements

**JAMES HARDIE IS NOT RESPONSIBLE FOR DAMAGE DUE TO IMPROPER STORAGE AND HANDLING.**

## TIPS FOR SAFE AND EASY HANDLING

### Weatherboard products

- Do not lift planked products flat and in the middle
- Carry the products on the edge
- If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product
- If two people are carrying the plank, hold it near each end and on edge
- Exercise care when handling weatherboard products to avoid damaging the edges/corners

### Sheet products

- Carry with two people
- Hold near each end and on edge
- Exercise care when handling sheet products to avoid damaging the edges/corners

# 3 Framing

## 3.1 TIMBER FRAME

Timber framing must be in accordance with NZS 3604 Timber Frame Buildings.

Specific design to NZS 3603 and AS/NZS 1170 can also be undertaken providing that:

- the framing centres do not exceed those given in this specification
- the framing member widths conform to this specification.

Also refer to the Approved Document for NZBC Clause B2 'Durability' and NZS 3602 (Timber and Wood-Based Products for use in Buildings) regarding timber treatment requirements and allowable moisture contents in timber for various components of the building. Also refer to the framing manufacturer's literature for further guidance on the use of treated timber.

## 3.2 STEEL FRAME

The figures in this brochure are drawn for timber framing. However, steel framing and furring channels can also be used.

All metal framing centres are to be the same as specified for timber frame in this manual.

Steel framing members must be fabricated from light-gauge sheet steel 0.55mm thick minimum to 1.6mm maximum. If heavier sections are used difficulties may be experienced in fixing the self-drilling, self-tapping fasteners. Refer to specific details for the minimum flange width requirements.

Sheets must not be fixed directly to drawn steel or hot-rolled steel sections. These must first be battened out with ex 50mm-thick (40mm minimum) timber battens or light-gauge metal furring channels.

Screw-fix 6mm or thicker sheets only.

Screw fixings can be finished flush or sunk a maximum of 0.5mm below the sheet surface ready for filling.

NOTE: The fasteners must not be over driven as will reduce the holding capacity of the sheet.

## 3.3 FRAMING SET-OUT

For the framing set-out of up to 600mm-wide soffit refer to Figure 1.

For the framing set-out of 601mm to 1200mm wide soffits refer to Figure 2.

### 3.3.1 Pre-finished steel fascia/gutters

When pre-finished steel fascia/gutters are used the soffit edge must be supported 4mm minimum into fascia recess, similar to Figure 10.

Ribbon board to be continuous for product fixing.

NOTE: Because of the limited fascia groove available with some metal fascias a supporting ribbon board will be required with fixings at 300mm centres maximum. Pre-finished soffits can distort due to surface tension when adequate edge support is not provided.

Table 11

Eaves Lining Framing Centres		
Eaves And Soffit Width (mm)	Wind Zone	Max. Soffit Bearer Centres (mm)
Up to 450	L, M	1200
	H, VH	900
451 - 600	L, M	1200
	H, VH	600
601 - 1200	L, M, H, VH	600
Various	EH*	600

\*HardieFlex Sheet 6mm or Villaboard Lining 6mm must be used in EH Wind Zone with soffit bearers maximum 600mm centres.

Figure 1: Eaves and soffit up to 600mm

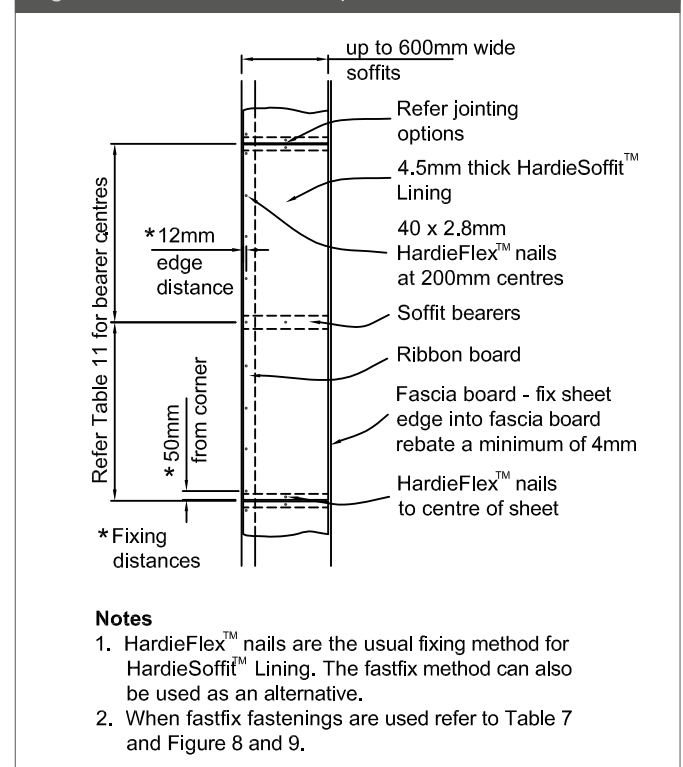
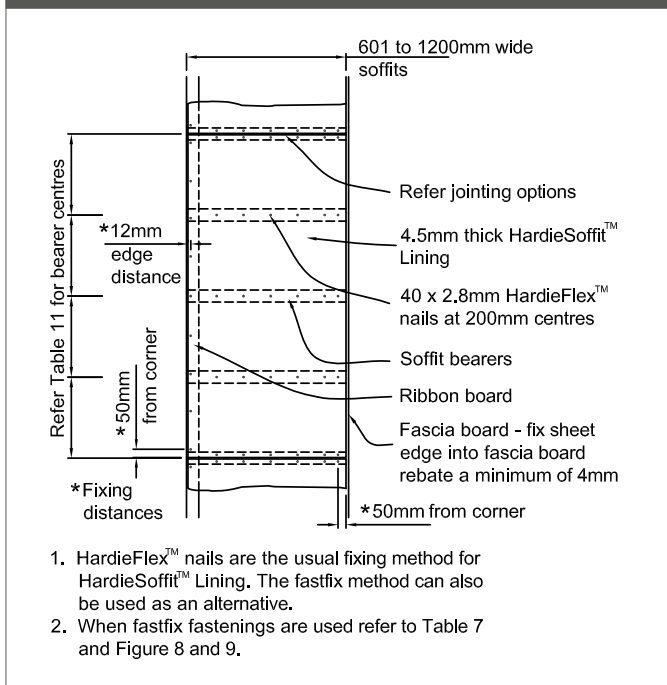


Figure 2: Eaves and soffits 601mm to 1200mm



NOTE: Because of the limited fascia groove available with some metal fascias a supporting ribbon board will be required with fixings at 300mm centres maximum. Pre-finished soffits can distort due to surface tension when adequate edge support is not provided.

### 3.4 BATTEN REQUIREMENTS

Battens are required when sheets are fixed over:

- Gypsum board exceeding 20mm in thickness
- Softboard, polystyrene or similar
- Concrete, masonry block or brick.

Timber battening is to be a minimum of 35mm deep x 40mm wide to achieve adequate sheet nail penetration.

Steel battens must be minimum 0.55mm thick, 23mm deep and have a bearing surface of 38mm min. Battens must be galvanised to meet the durability requirements of the New Zealand Building Code (NZBC) and fixed to manufacturer's specifications. All battening centres and sheet fixing is to be strictly in accordance with the framing and fixing required by this manual. Care must be taken to ensure the battens are packed and aligned to give a true even surface for the sheets to be fixed. Check the face of the battens with a long straight-edge before fixing sheets.

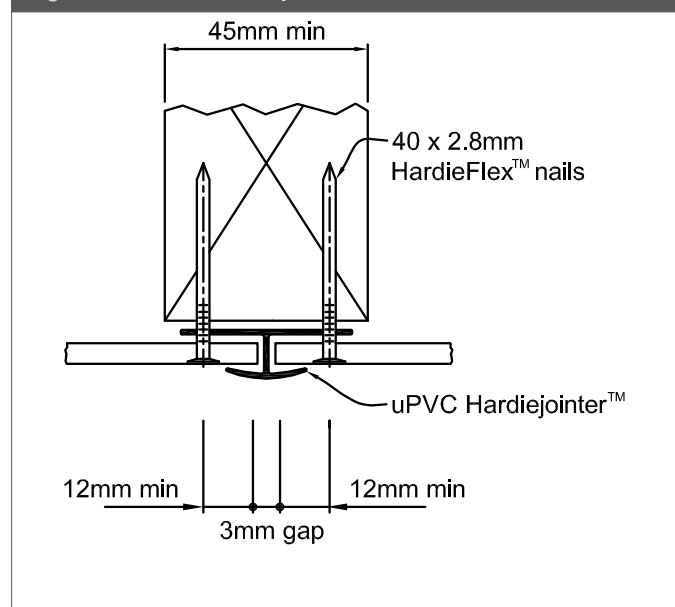
### 3.5 SKILLION ROOF DESIGN

When installing soffit linings direct to the under side of skillion roof framing, ensure that sufficient ventilation has been provided within the roof space. The temperatures within these smaller roof spaces can reach very high levels in certain conditions and this can cause cracking in flush stopped joints due to excessive movement in roof framing. Therefore the framing in skillion soffits and ceilings need a specific engineering design consideration.

General design guide for a narrow strip of flash stopped soffits is to provide a control joint at 4.8m centres.

General design guide for large flash stopped soffits is to provide control joints at 4.8m x 3.6m in either direction when fixing to this type of framing.

Figure 3: uPVC Hardiejointer detail



# 4 Jointing options

- All soffit lining sheet edges must be supported by framing and/or a fascia board.

## HARDIESOFFIT LINING

- Refer to Figure 3 for uPVC Hardiejointer detail
- Refer to Figure 5 for express joint detail
- Refer to Figure 9 for two-way uPVC jointer

## HARDIEFLEX EAVES LINING

- Refer to Figure 3 for uPVC Hardiejointer detail
- Refer to Figure 4 for butt joint detail
- Refer to Figure 5 for express joint detail
- Refer to Figure 9 for two-way uPVC jointer

## ECLIPSA EAVES LINING

- Refer to Figure 3 for uPVC Hardiejointer detail
- Refer to Figure 8 for Fastfix Fasteners fixing detail. Use a 6mm diameter masonry drill bit to drill a hole and fix fasteners
- Refer to Figure 9 for Two-way uPVC Jointer

## HARDIEGROOVE SOFFIT LINING

- Sheets have half groove along the long edges for butt jointing
- Sheets to have chamfer formed on site along the short edge for butt jointing

## VILLABOARD SOFFIT LINING

- Refer to Figure 6 for flush joint details. Refer to Section 5.5 for flush jointing
- Refer to Figure 3 for uPVC Hardiejointer detail
- Refer to Figure 4 for butt joint detail
- Refer to Figure 5 for express joint detail
- Refer to Figure 7 for sealant joint detail

Figure 4: Butt joint detail

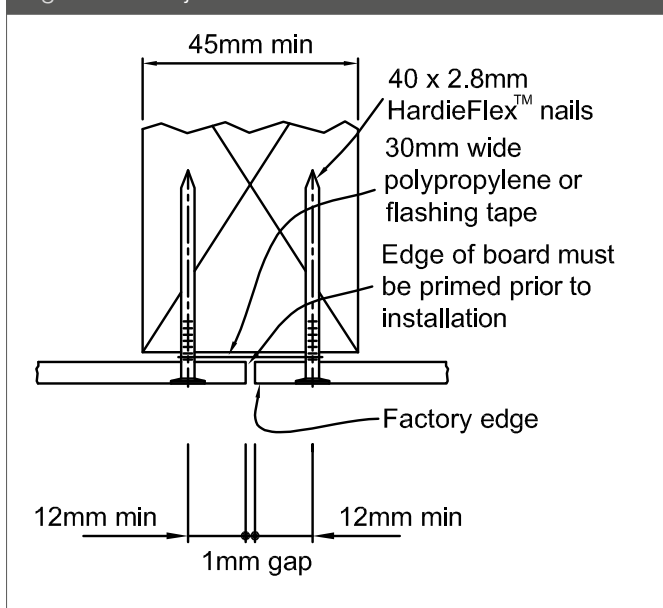


Figure 5: Exposed joint detail

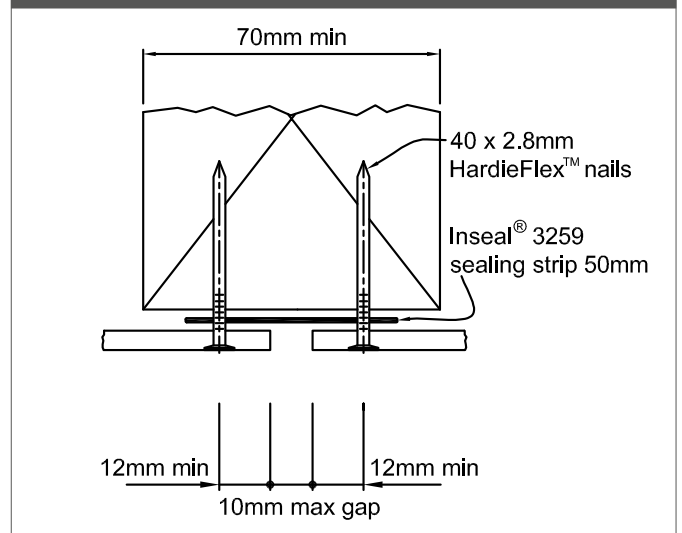


Figure 6: Vertical flush joint setout

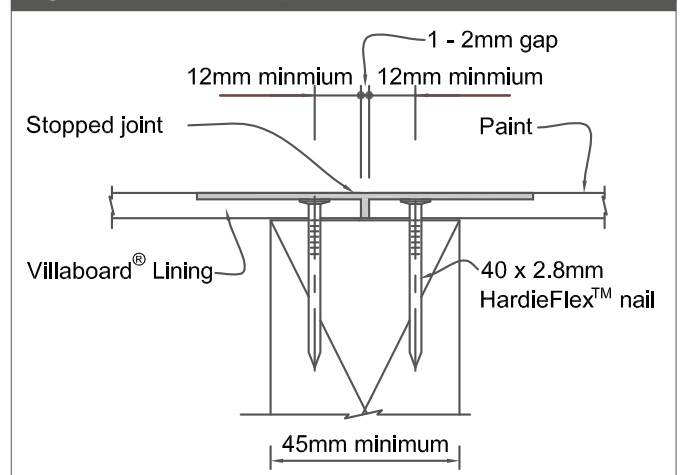


Figure 7: Sealant joint detail

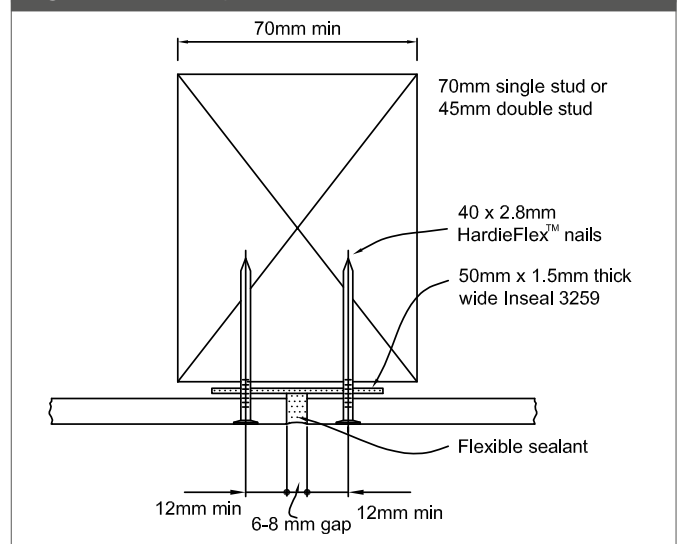
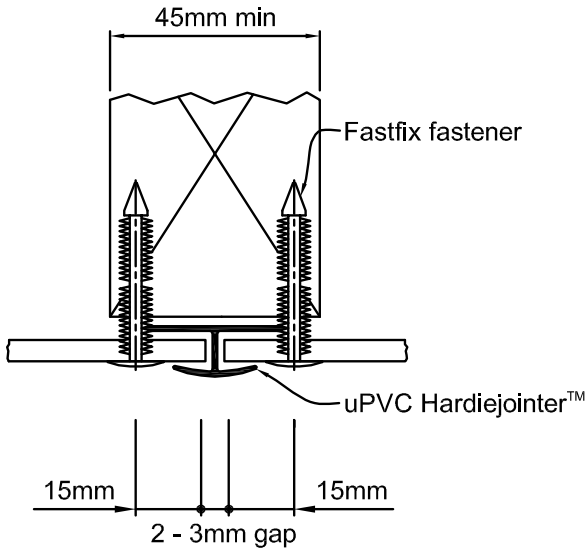


Figure 8: Fastfix fastener fixing detail



Note: Use a 6mm drill bit for drilling holes in sheet for fixing Fastfix fasteners.

Figure 10: Cladding detail with scotia mould

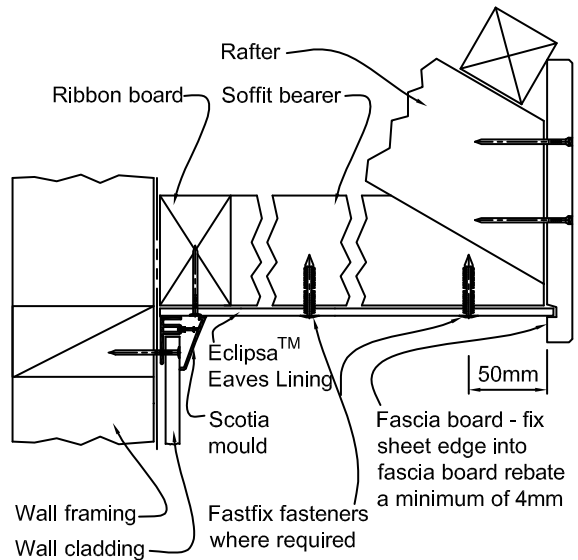
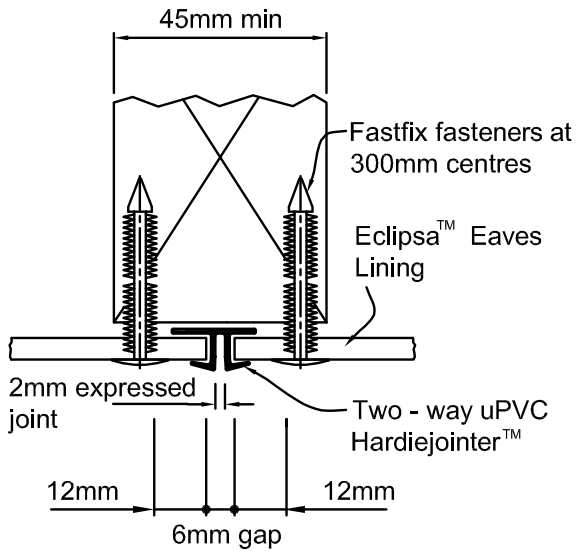
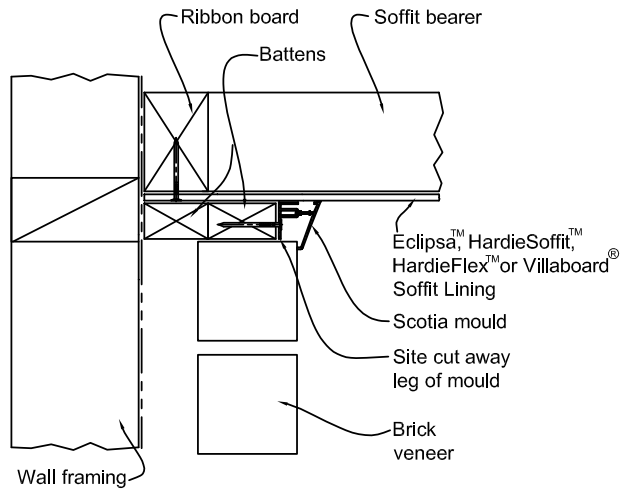


Figure 9: Two-way uPVC jointer



Note: Use a 6mm drill bit for drilling holes in sheet for fixing Fastfix fasteners.

Figure 11: Brick veneer detail with scotia mould



Note: Take vertical mortar out of bricks to provide ventilation as required by NZS 3604

# 5 Installation

This installation manual covers the use of James Hardie Eaves and Soffits for buildings within the scope of NZS 3604. For all other buildings specific engineering design is required.

## 5.1 GENERAL

Refer to Table 11 and Figure 1 and 2 regarding nail fixing centres, for framing and types of fasteners.

The eaves/soffits must be sealed against claddings to minimise moisture ingress behind the claddings. The roof must have been installed before installing the soffits linings. Where the soffits are sloping upwards away from the wall, a mechanical flashing must be provided in the soffit to wall junction. The flashing is fixed under soffit lining and laps over the face of cladding by 35mm minimum. Refer to Figure 27 - Figure 30.

### 5.1.1 Drip Edge

All soffit linings must either be installed with a grooved fascia, refer Figure 10, or with exterior cladding which forms a drip edge below the soffit lining by 15mm minimum. Soffit linings are generally fitted into the recess formed in fascia board to form the drip edge.

### 5.1.2 Structural Ceiling Diaphragms

HardieFlex Eaves Lining and Villaboard Soffit Lining are suitable for use in structural ceiling diaphragms as per NZS 3604. Refer to the James Hardie Bracing Design Manual.

### 5.1.3 Curved Applications

HardieFlex Eaves Lining and Villaboard Soffit Lining can be used for curved applications.

The minimum bending radii are shown below.

Table 12

Curved Soffit/Ceiling Minimum Bending Radii	
	Along length (mm)
9mm Villaboard Lining	3000
6mm Villaboard Lining	1800
HardieFlex Eaves Lining	1800
HardieSoffit Lining	1800

NOTE: The bending radii given above require no pre-wetting of the sheet. Mechanical fix at 200mm centres maximum to entire framing.

To maintain the smoothness of the curve, ceiling battens are generally required at spacings as shown below.

Table 13

Curved Lining — Soffit Batten Spacing	
Range of Radii (mm)	Soffit batten spacing (mm)
1800 to 3000	300
Above 3001	400

### 5.1.4 FIRE RATED SOFFITS

For full details refer to the James Hardie Fire and Acoustic Design Manual or Ask James Hardie on 0800 808 868.

## 5.2 FASTENER DURABILITY

Fasteners used in external applications must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing's material to be used in relation to the exposure conditions and are summarised in Table 14.

Table 14

### Exposure conditions and nail selection prescribed by NZS 3604

Zone / Nail Material		
Zone D*	Zone C outside sea spray zone and Zone B and geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 Stainless

\* (Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made)

When using screws to fix into steel framing a minimum class-3 coated screw must be used.

## 5.3 HARDIESOFFIT LINING

For framing and fixing schedules refer to Section 3.

All sheet edges are to be supported by framing or a fascia board. Fixings are to be at 200mm centres to all framing (refer Figures 1 and 2).

HardieSoffit Lining up to a max. width of 600mm can be jointed up to a maximum 150mm off the ceiling/soffit batten when using uPVC jointers.

### NOTES

1. Use of 6mm thick sheets will minimise the deflection and enhance the impact resistance.
2. Sheets can be jointed as per Section 4.
3. Do not screw fix 4.5mm thick sheets.

## 5.4 HARDIEFLEX EAVES LINING

For framing and fixing schedules refer to Section 3.

All sheet edges are to be supported by framing or a fascia board. Fixings are to be at 200mm centres to all framing (refer Figures 1 and 2).

### NOTES

1. Use of 6mm thick sheets will minimise the deflection and enhance the impact resistance.
2. Sheets can be jointed as per Section 4.
3. Do not screw fix 4.5mm thick sheets.

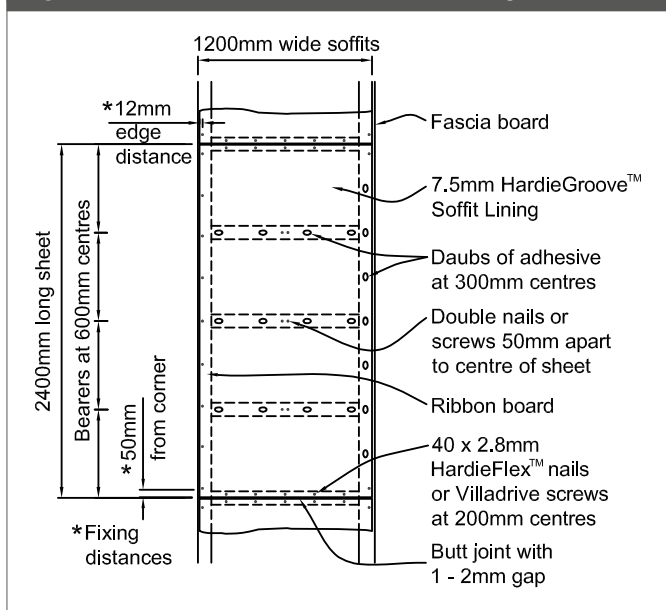
## 5.5 HARDIEGROOVE SOFFIT LINING FIXING METHOD

For framing and fixing schedules refer to Section 3.

The recommended fixing methods are combined nail and adhesive or screw and adhesive. (Refer Figure 12).

To achieve a concealed joint, butt the long edges together (half grooved). (Refer Figure 13).

Figure 12: Nail or screw and adhesive fixing



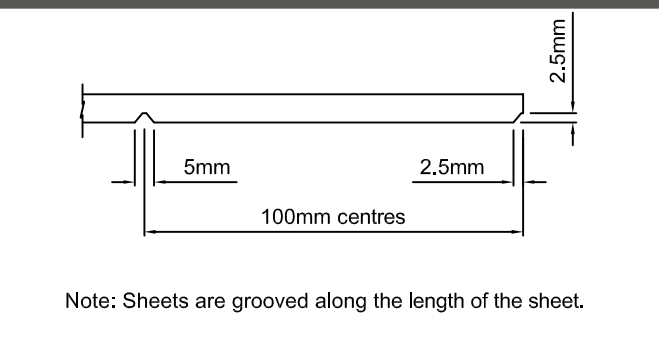
### NOTES

1. Do not place nails or screws within 100mm of the adhesive daubs.
2. Fix with either HardieFlex nails 40 x 2.8mm (galvanised or 316 stainless steel), Villadrive wood screws or HardieDrive stainless steel 30mm x 7g wood screws.
3. Use only stainless steel fixings in sea spray zones.
4. When butt jointing short ends of HardieGroove Lining in ceiling/soffit applications, the short edges must be cut square and have chamfer formed.

Nails must be finished flush with the sheet surface. Screw heads can be finished 0.5mm below the sheet surface and stopped.

In steel framing the fasteners should be driven as close as possible to the stud corners to avoid deflection of the stud flange

Figure 13: Sheet edge and groove detail



Note: Sheets are grooved along the length of the sheet.

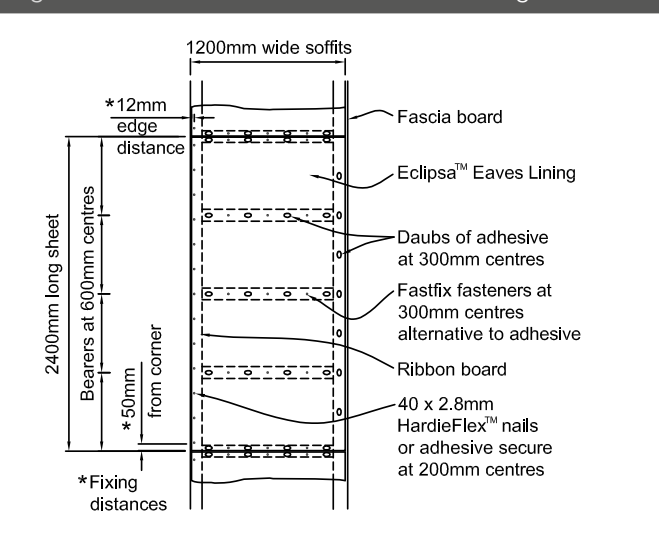
### 5.5.1 Finishing

Once the sheets are in place, fill over all driven fixings with James Hardie Base Coat to the required level of finish.

## 5.6 ECLIPSA EAVES LINING

- Eclipsa Eaves Lining are to be supported by bearers and fasteners at the maximum spacings specified for the 4.5mm sheets in Section 3, Table 11 and Figures 3, 8 and 9 of this manual
- To fix larger soffit, ceiling or verandah applications provide a perimeter frame to all sheet edges and intermediate noggings at the centres shown in Table 11.
- Fix the Eclipsa Eaves Lining into the fascia board groove then nail into the ribbon board at 300mm centres with 40 x 2.8mm HardieFlex nails. Ensure nails will be hidden by the scotia mould or timber scotia (refer Figures 10, 11 and 14).
- Use a 6mm-diameter masonry bit to drill holes and fix Fastfix fasteners (refer Figures 8 and 9).
- Eclipsa Eaves Lining up to a maximum 600mm width can be jointed up to a maximum 150mm off the ceiling/soffit batten when using uPVC jointers.

Figure 14: Fastfix fastener and adhesive fixing



**5.6.1 Fastfix fasteners**

Fastfix fasteners (38mm long) can be used as an alternative fixing for prefinished soffit and ceiling systems in conjunction with adhesives. Drill a 6mm-diameter hole through the sheet and framing to insert the Fastfix fastener. In timber the hole must be 40mm deep.

**5.6.2 Masking Tape**

The recommended masking tape for use with Eclipsa Eaves Lining is 3M Scotch Blue I8E 2090 or Sellotape 5855 longlife. This tape can only be left on the Eclipsa Eaves Lining for maximum 7 days, otherwise tape removal may cause paint loss.

**5.7 VILLABOARD SOFFIT LINING (SOFFITS UP TO 1200mm)**

Villaboard Lining 6mm-thick is used when a smooth sanded sheet is required to achieve a painted flush finish.

Refer to the framing fixing schedule Section 3 Table 11, Figures 1 and 2, and finishing schedules on Section 6.

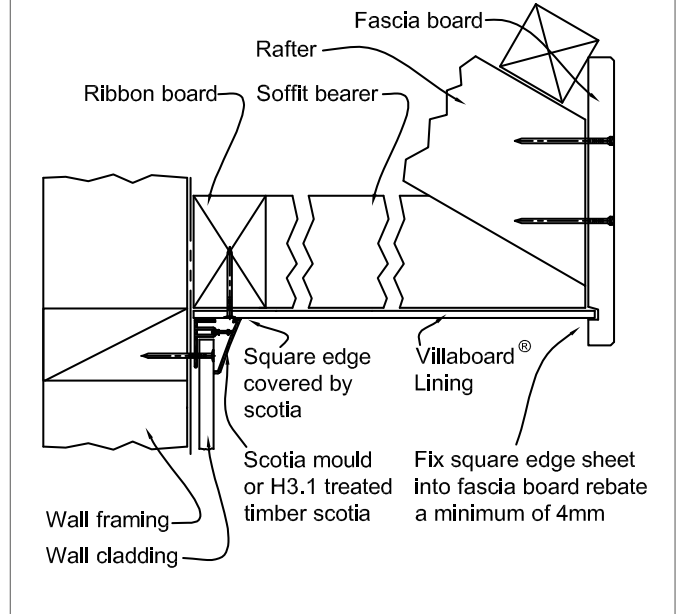
Refer to the flush jointing procedures, Section 6.

Fix with either HardieFlex nails 40 x 2.8mm (galvanised or 316 stainless steel), Villadrive sood screws or HardieDrive stainless steel 30mm x 7g wood screws

Screws finished 0.5mm below surface,

Nails finished flush with surface.

Figure 16: Soffit cross section



**5.7.1 Control Joints**

Control joints are required in long runs of Villaboard Lining soffits/ceilings to accommodate structural movement. Control joints must also be provided where the soffits change in direction, change in level, where there is a construction joint in framing or where the soffits continue into passage ways etc. See Table 15 for maximum control joint spacing and Figure 17 for a typical control joint detail.

**5.7.2 Jointing Options**

Villaboard Soffit Lining is suitable for:

- Flush-jointed narrow strip soffits around a building
- Flush-jointed ceilings over verandahs, porches and entryways to residential and small-scale commercial buildings
- Expressed, uPVC-jointed and sealant-filled joint ceilings where a smooth surface finish is required
- All edges to be supported by the framing.

Figure 15: Nail/screw and adhesive fixed soffit

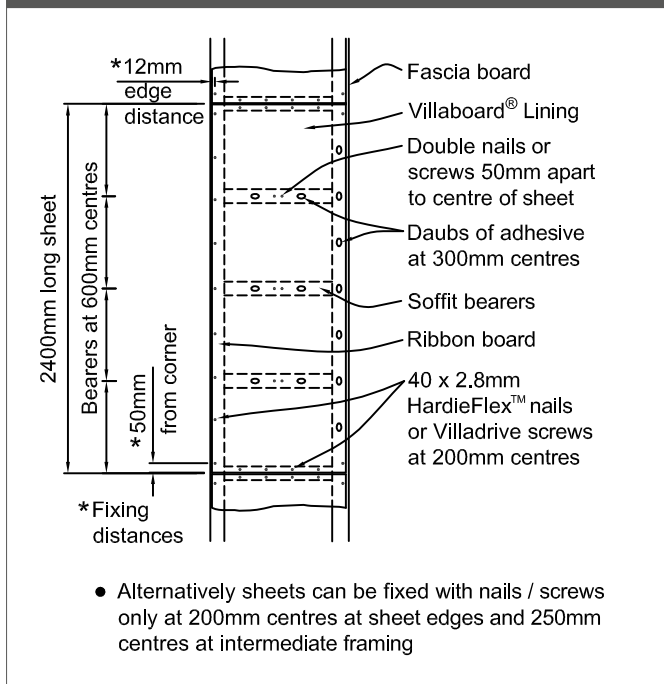
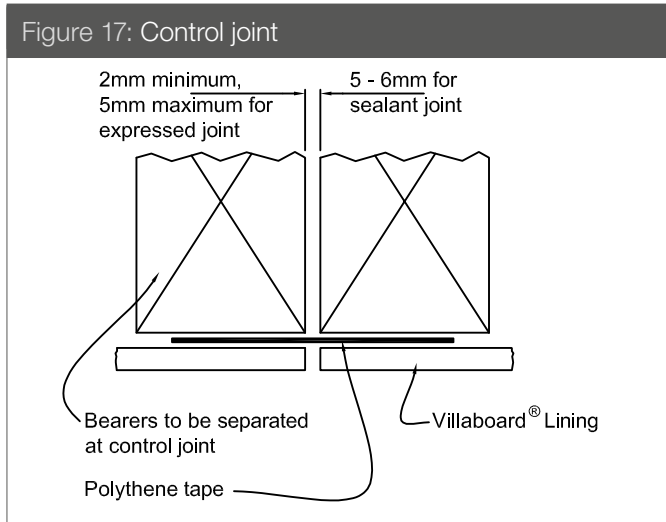


Table 15

Maximum spacing for control joints (m)		
	STEEL FRAMING	TIMBER FRAMING
General	4.8	7.2

### 5.7.3 Narrow-Strip Flush-Jointed Soffits And Ceilings

In these applications sheets must be jointed on the framing as shown in Figures 1 and 2. Control joints, as shown in Figure 17, must be located at a distance as specified in Table 15. Sheets must not be fixed to the bottom cord of roof trusses.



#### NOTE

Refer Section 5.7.3 for skillion roof design.

## 5.8 VILLABOARD SOFFIT AND CEILING LINING (LARGE AREAS)

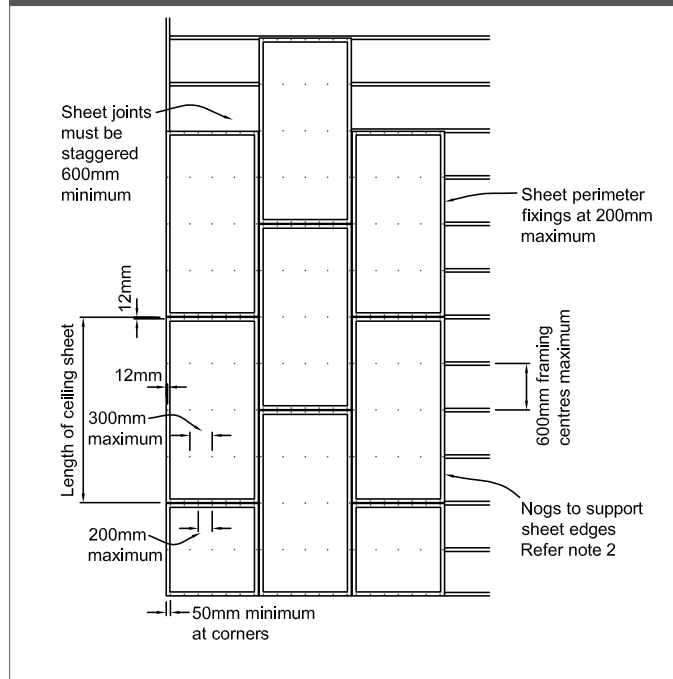
For standard commercial soffits and ceilings, framing must be at 600mm maximum centres and 6mm thick Villaboard Soffit Lining can be used. For high-impact areas, heavy-use commercial areas, and high-wind areas, framing at 600mm maximum centres and 9mm thick Villaboard Soffit Lining should be used. Sheets must not be fixed to the bottom cord of roof trusses. Timber or steel ceiling battens must be fixed to the underside of the roof truss. Sheets must be laid in an offset pattern so that adjacent end joints do not coincide. Timber ceiling battens must comply with the requirements of NZS 3604 or the specific engineering design. Steel ceiling battens must be a minimum of 37mm wide x 23mm deep x 0.55mm thick and have a bearing surface of 37mm minimum. Battens must be galvanised steel (275 g/m<sup>2</sup> zinc coating), have a suitable coating to meet the durability requirements and be fixed to the manufacturer's specifications. Refer to the flush-jointing and finishing procedures on Section 6.

For specific engineering design projects consideration must be given to framing deflections expected due to loadings and appropriate selection of sheet jointing method must be made.

#### NOTE

1. It is recommended that flush stopping of joints is suitable when using recessed edge Villaboard Lining.
2. When nogs not installed for perimeter support, the unsupported sheet edges across the framing must be supported by back blocking using a 300 – 400mm wide Villaboard Lining strip adhered to rear face and centred between the framing.

Figure 18: Ceiling layout



### 5.8.1 Control Joints

The ceilings must be divided into bays not exceeding 7.2 x 4.8m. To permit movement, control joints must be formed at the perimeter of each bay (refer Figures 19, 20, 21 and 22) and at the junction of large ceilings with narrow passage strips or where there is a change in direction (also refer Figures 20 and 21). Each bay must be independent of adjacent bays and the surrounding building structure. When the ceilings or soffits contain sloping areas then control joint centres must be reduced to coincide with the slope change lines (refer Figure 22). Framing members (to which the sheet is fixed) must not continue across this control joint. Sheets shall be fixed across the ceiling joists or ceiling battens (refer Figures 24 and 25). Figures 20 and 21 show control joints with the battens running in the same direction as the sheet joint. When these ceilings are wider than one sheet width the sheets can be fixed to the framing provided the control joints are placed to limit the bay size to 7.2m x 4.8m maximum.

Figure 19: Control joint layout

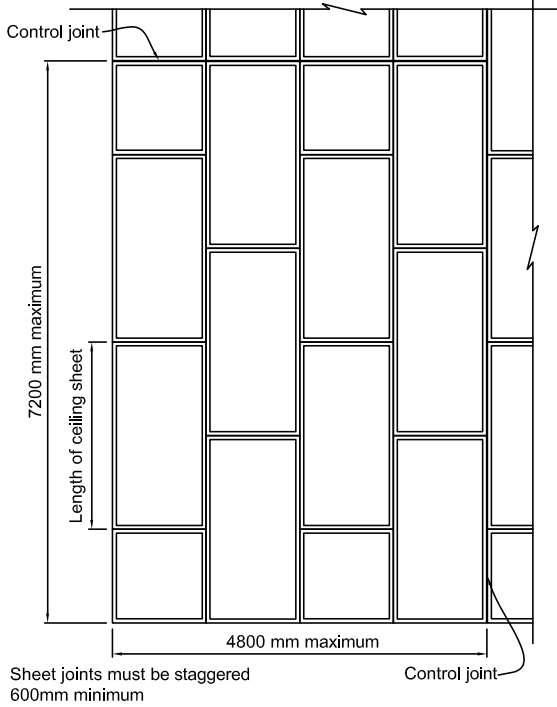


Figure 21: Timber control joint detail

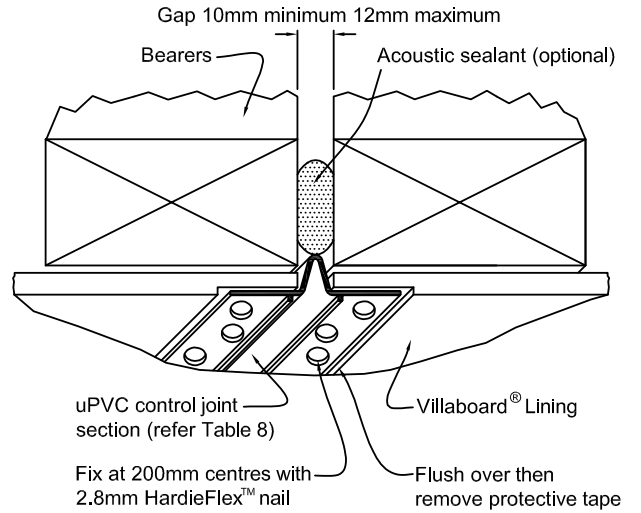


Figure 20: Steel ceiling batten control joint detail

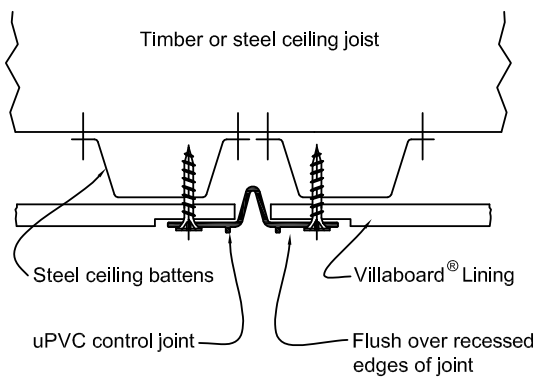
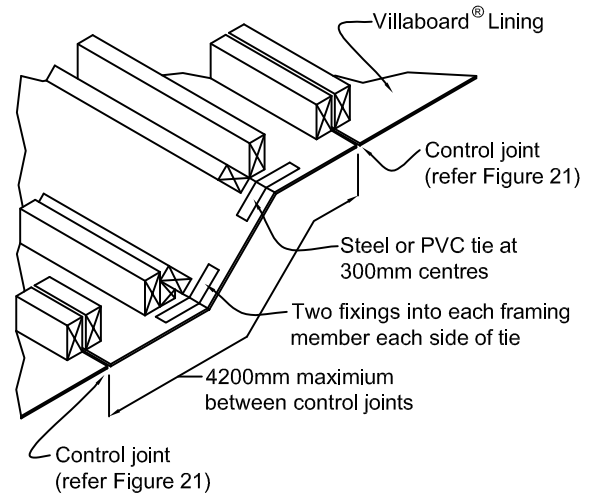
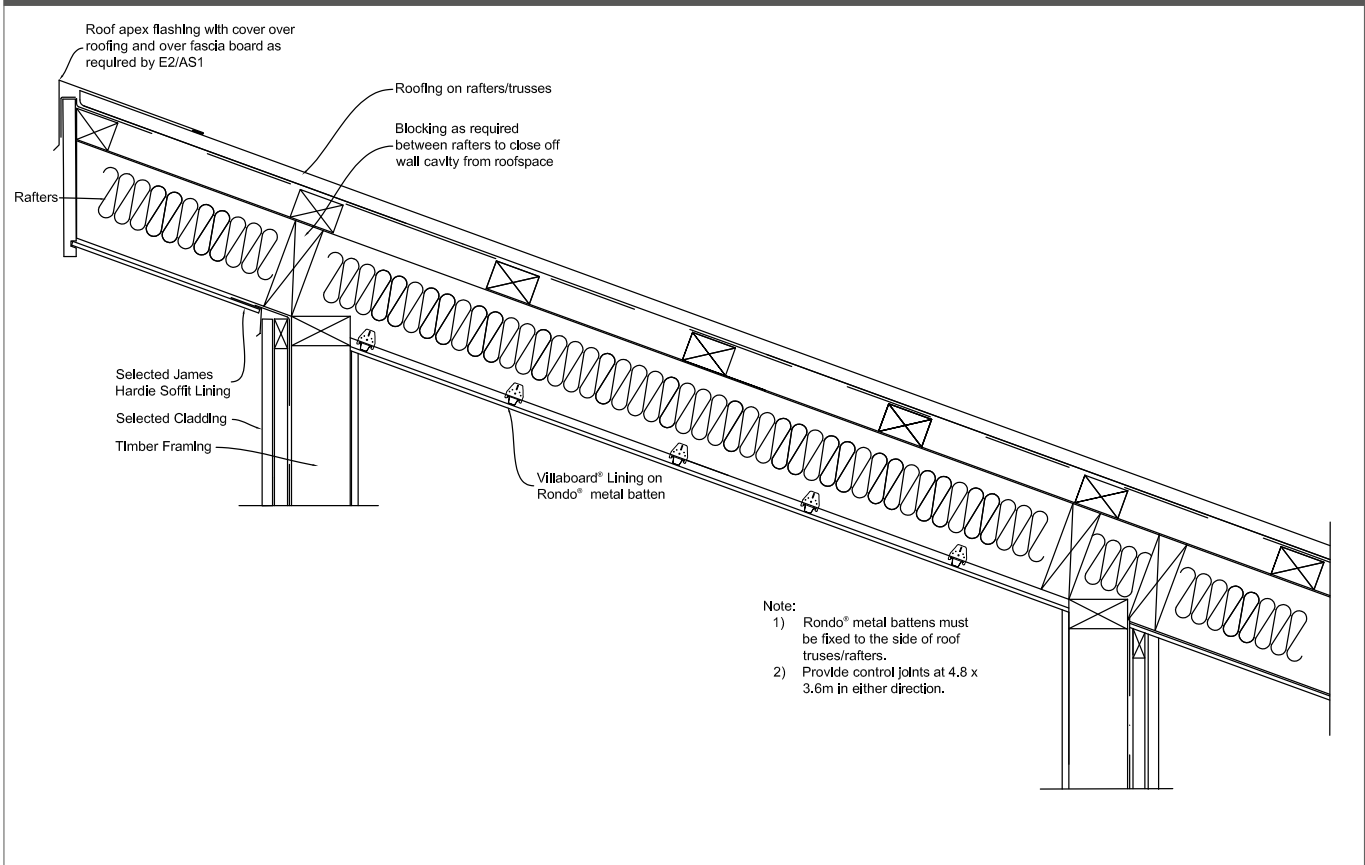


Figure 22: Directional changes to soffits and ceilings – control joint



Note: Tie fixings to be 40 x 2.8mm HardieFlex™ nails.

Figure 23: Skillion Roof/Ceiling



**5.8.2 Skillion Roof Design**

When installing soffit linings direct to skillion roof framing ensure that sufficient ventilation has been provided within the roof space. The temperatures within these smaller roof spaces can reach very high levels in certain conditions and this can cause cracking in flush stopped joints due to excessive movement in framing. Therefore the framing in skillion soffits and ceiling need a static engineering design consideration. General design guide is to provide control joints at 4.8m x 3.6m in either direction when fixing to this type of framing.

**5.8.3 Fixing Option One**

A smooth surface finish is obtained by minimising the visible sheet fixings. For painted finishes the combined nail or screw and adhesive method gives this superior finish (refer Figure 24). Fix at 200mm centres down each sheet end with edge fixings in each joist or batten. Double-fix in the centre of each joist or batten. Do not place nails or screws within 100mm of adhesive daubs. Daubs of wallboard adhesive 25mm diameter and 15mm thick must be applied to the intermediate joists or battens at 250mm centres (refer Figure 24). When noggs are not installed for perimeter support, the unsupported edges between ceiling joists or battens must be supported with back blocking using a 300-400mm wide Villaboard Lining strip adhered to rear face and centred between framing.

**NOTES**

1. All surfaces to receive adhesive must be clean, free of dust, oil etc.
2. Ensure daubs of adhesive never coincide with permanent fastener points, as adhesive shrinkage may cause fastener head protrusion.

Figure 24: Nail or screw and adhesive fixing

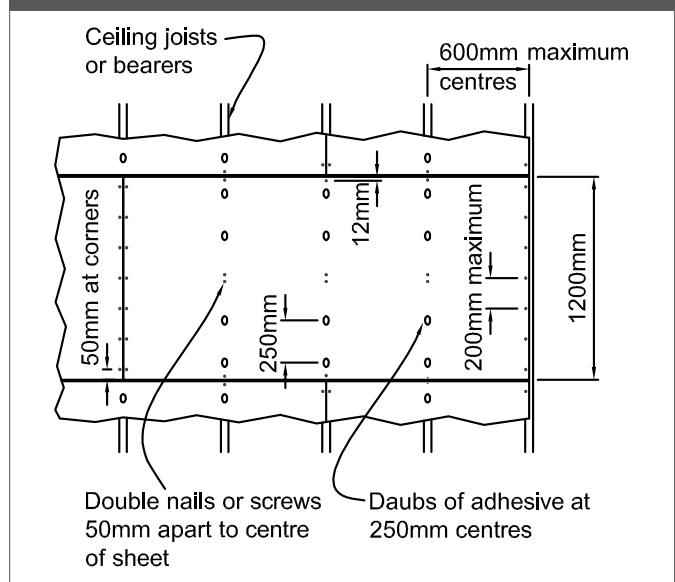
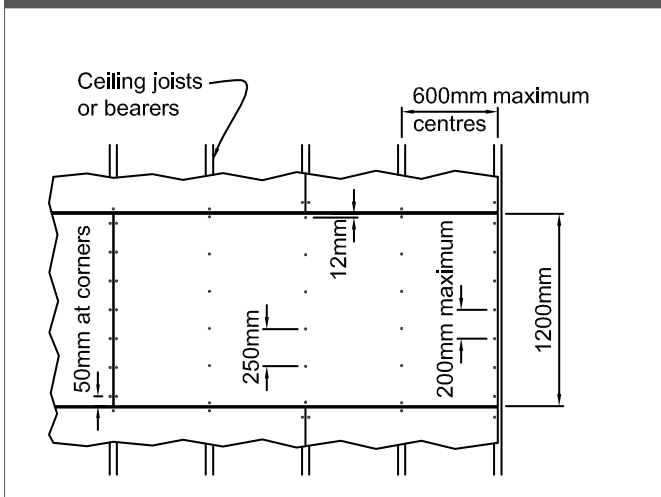


Figure 25: Nail or screw



#### 5.8.4 Fixing Option Two

For an alternative nail or screw-fixing method, fasteners are to be driven along the sheet perimeter at 200mm centres and along intermediate ceiling battens at 250mm centres (refer Figure 25).

When nogs are not installed for perimeter support, the unsupported edges between ceiling joists or battens must be supported with back blocking using a 300-400mm wide Villaboard Lining strip adhered to rear face and centred across ceiling joists.

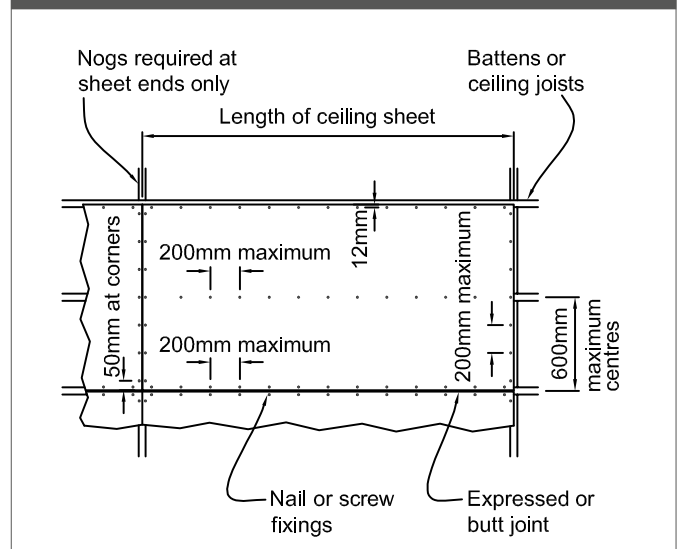
#### 5.8.5 Column Or Wall Abutments

Soffit sheeting must be free to move independently from the building element it abuts with. This is critical for flush-jointed sheeting, otherwise cracking at the joint may occur.

#### 5.8.6 Square-Edge Villaboard Lining Ceilings And Soffits

Square-edge Villaboard Lining is used for butt-joint; expressed-joint or uPVC-jointed ceilings.

Figure 26: Nail or screw along ceiling joist (expressed or butt joints)



### 5.9 TITAN FACADE PANEL

May be used as soffit with expressed joint when installed as per Figure 5 and fixings as per Villaboard Soffit Lining.

### 5.10 INTERNAL SWIMMING POOL APPLICATION

For fixing Villaboard Lining and HardieGroove Lining in internal swimming pool areas;

- The sheets must be back and edge sealed before installation.
- When fixing Villaboard Lining to the ceiling under a skillion roof, roof ventilation must be considered to minimise thermal movement and sheet joint cracking.
- All Villaboard Lining recessed sheet joints must be stopped.
- Alternatively, when using square edge Villaboard Lining, the sheet joint must be butted over an Inseal 3259 tape with an appropriate flexible sealant in the 1mm joint.
- All HardieGroove Lining joints must have continuous bead of sealant applied to edge of sheet before butting together.

Only stainless steel fasteners must be used.

- Full perimeter fixing required.
- In addition, it is recommended that H3.1 treated timber ceiling battens are used to resist decay due to higher condensation levels present in this area.

5.11 SPECIAL DETAILS

Figure 27: Sloping soffit and direct fixed flatsheet cladding

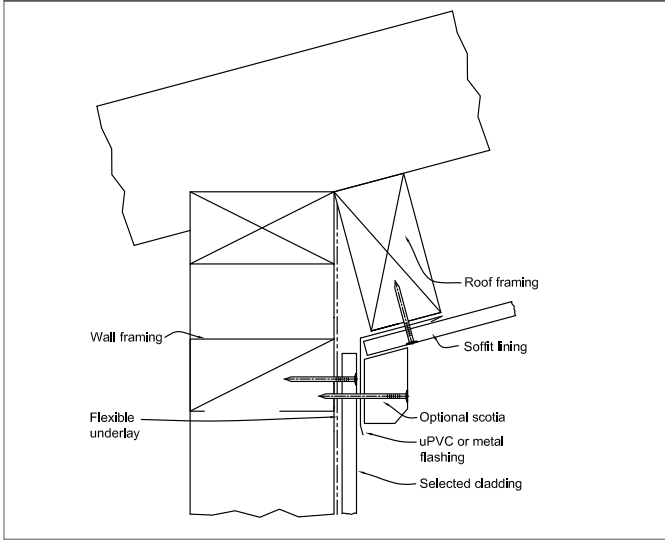


Figure 29: Sloping soffit and direct fixed weatherboard cladding

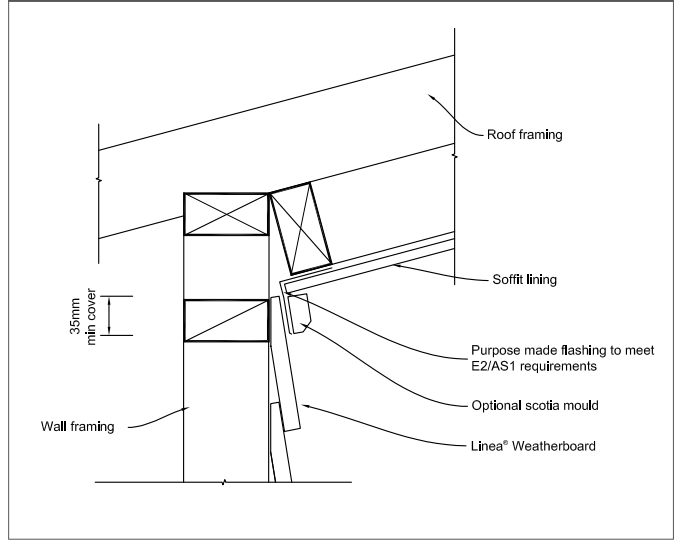


Figure 28: Sloping soffit and cavity fixed flatsheet cladding

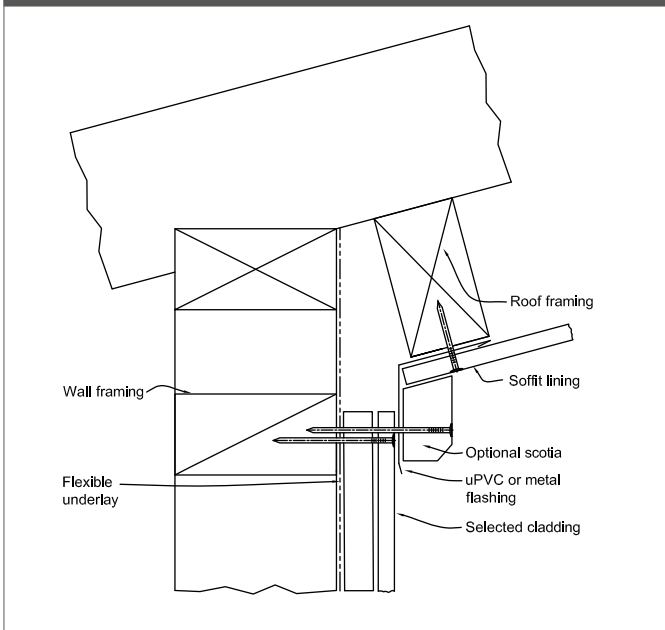
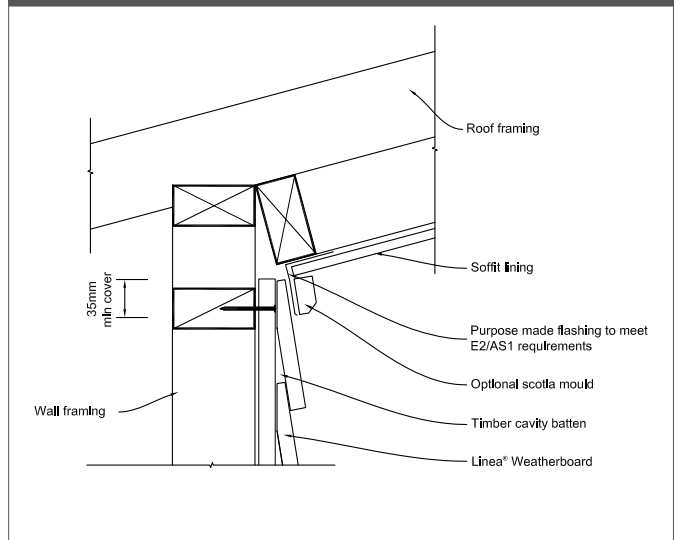


Figure 30: Sloping soffit and cavity fixed weatherboard cladding



# 6 Villaboard Joint Stopping

## FOR VILLABOARD LINING

### 6.1 GENERAL

Villaboard Soffit Lining is finished with paint complying with parts 7, 8, 9 and 10 of AS 3730. The application and maintenance must be in accordance with the manufacturer's specifications.

**NOTE:** Before flush stopping sheet edges must be sealed with Multiplast resin, water proofing admixture or other similar products.

### 6.2 GLANCING LIGHT

In some instances, due to glancing light, set joints may be noticeable in Villaboard Lining walls, especially where paint finishes have a high gloss level. Work closely with your builder or designer to minimise this.

Artificial lighting needs to be considered in relation to soffits.

Where glancing light is an issue its effect can be lessened by:

- Artificial light shading devices.
- The use of light coloured, matt finish paints.

### 6.3 LEVEL OF FINISHES

Different levels of finishes are typically specified for different applications. Higher levels of finishes are used to address the glancing light issues with painted Villaboard Soffit Lining referred to above. A description of the various levels of finishes and the jointing/coating requirements can be found in Table 16.

Table 16

Levels of Finishes			
Level of finish	Definition*	Typical jointing/setting	Finish
0	This level of finish may be useful in temporary construction.	No stopping, taping, finishing or accessories are required. The work is confined to gluing or screwing/nailing sheets in place.	For use in areas where finishing and stopping is not considered necessary.
1	For use in plenum areas above ceilings, in areas where the work would generally be concealed, or in building service corridors and other areas not normally open to public view.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape.	Surface free from excess jointing compound. Tool marks and ridges are generally acceptable.
2	For use in warehouse, storage or other areas where surface appearance is not of primary concern.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape and James Hardie Top Coat.	Minor tool marks and ridges are generally acceptable.
3	For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes or where heavy wall paper coverings are to be applied as the final decoration. This level of finish is not generally suitable where smooth painted surfaces or light to medium wall coverings are specified.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape and James Hardie Top Coat.	This level of finish must be sufficiently smooth to accept heavy vinyl, tiles or textured coatings without blemishes.
4	This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by noncritical lighting.	Refer to flush jointing recommendations on page 24.  All joints and corner joints will have tape embedded in James Hardie Base Coat applied over all joints, angles, fastener heads and accessories.  This application is applicable to recessed edge sheets only. The use of square edge sheets will require a high build application and coating finish.	For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light.  The weight, texture and sheen level of wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wall-covering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.
5	This level of finish is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheet paints.	Refer to page 23 steps 1–4 for jointing.  Final James Hardie Base Coat application should be feathered out to approximately 200mm + each side of the joint. Then a full skim coat of James Hardie Top Coat must be applied over entire sheet surface in order to achieve a uniform finish.  This application is applicable to recessed edge sheets only.  The use of square edge sheets will require a high build application and coating finish.	This level of finish is for use where gloss, semigloss, low-sheen or non-textured paints are specified or where critical lighting conditions occur.

\*Reference: AS/NZS 2589.1: 'Gypsum lining in residential and light commercial construction — Application and finishing. Part 1: Gypsum plasterboard'

## 6.4 PAINT FINISHES

Prior to application of paint finishes, remove any residual sanding dust and ensure the surface is suitable for paint application.

Always follow the paint manufacturer's recommendations for paint suitability, mixing and application.

### NOTES

1. Use of a 'sealer coat' or 'preparation undercoat' is recommended.
2. Do not tile ceilings.

## 6.5 VILLABOARD SOFFIT LINING JOINTING AND STOPPING

Villaboard Soffit Lining joints are set with James Hardie jointing compounds reinforced with perforated paper tape. Recessed edge sheet joints require joint setting by using the jointing products outlined. The performance of joints is the responsibility of the installer, as this is governed by the installation practices and the standard of workmanship applied. However, James Hardie considers that the recommendations provided in Table 16 describe best practice to reduce the risk of joint cracking or other problems. There are various factors that can affect the performance of jointing compounds on edge recessed fibre cement substrates. These factors include the framing, movement, installation quality, vibrations, moisture, humidity, temperature, etc. To achieve satisfactory joint performance these factors need to be carefully considered and understood by the installer and designer when positioning joints and selecting jointing compounds. Furthermore, it is important that the jointing compound used has the physical attributes required to perform considering these factors. James Hardie compounds have been specifically developed for use with Villaboard Soffit Lining.

In addition, provision for movement needs to be made by the installation of control joints. Refer to clause 5.7.1.

### COMPOUND COVERAGE

1kg of Base Coat will provide approximately 5 lm of standard joints.

1kg of Top Coat will provide approximately 5.6 lm of standard joints.

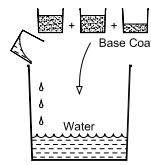
### NOTE

Follow the mixing instructions carefully when mixing James Hardie Base Coat and Top Coat.

## MIXING INSTRUCTIONS

Table 17

### James Hardie Base Coat Mixing Instructions

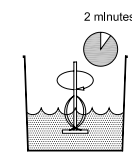
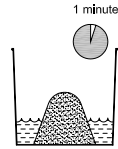


#### Step 1

First, add 1 part of clean water into bucket.

Then add 2½ parts James Hardie Base Coat powder

Allow to soak for 1 minute.

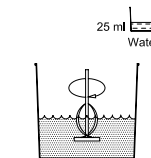


#### Step 2

Mix for 1½ – 2 minutes using paint mixer or equivalent. (approximately 2500-3000rpm)

James Hardie Base Coat is NOT like the plaster based compounds. Initial mixing will indicate a dry mix and further mixing **WITHOUT** further addition of water will deliver the ideal workable paste.

Warning: Inadequate or over mixing can lead to poor workability and can cause performance issues. **Do not hand mix.**



#### Step 3

The mix at this stage should be consistently smooth.

Based on the environmental conditions (i.e. temperature and humidity) you may add maximum of 25ml of water per 1Kg of base coat powder in the mix at this stage to adjust workability. Mix it well.

(Note: Adding excess water than the recommendation may delay the drying of base coat and may cause joint cracking due to excessive shrinkage.)

Mix should be glossy and smooth. There should be no lumps in the mix.

### Important Notes:

1. Do not apply James Hardie Base Coat in temperatures above 40° C or below 5° C.
2. Allow the compounds to dry before applying the next coat. The drying time will vary between 12 to 24 hours depending upon the weather conditions.
3. Site cut and site recessed sheet edges must be sealed with an acrylic sealer e.g. Dulux Acraprime 501/1, Dulux 1 Step or similar product.
4. In corners, use James Hardie uPVC internal/external corner mould primed with Dulux Primerlock or similar. A 'GIB® Goldline™ Platinum' corner mould can also be used.
5. Use only perforated paper tapes in straight joints.
6. It is recommended that one (1) base coat bag is mixed in three (3) portions.
7. Before stopping the sheet edges, Multiplast Resin or a similar product in diluted form must be applied over the sheet edges. Mix the resin as per the manufacturers recommendations.

### Product Life:

James Hardie Base Coat has a shelf life of 12 months in unopened bags when stored in a cool dry place.

James Hardie Base Coat has a bag life of 1 month if opened bags are resealed and stored in a cool dry place.

## 6.6 SET JOINTS

### Step 1 – Preparation

Ensure that the recesses are clean and free of dust and contaminants. Sheet edges must be sealed with Multiplast resin, water proofing admixture or other similar products. If working conditions are hot and dry, dampen the area around the joint prior to working.

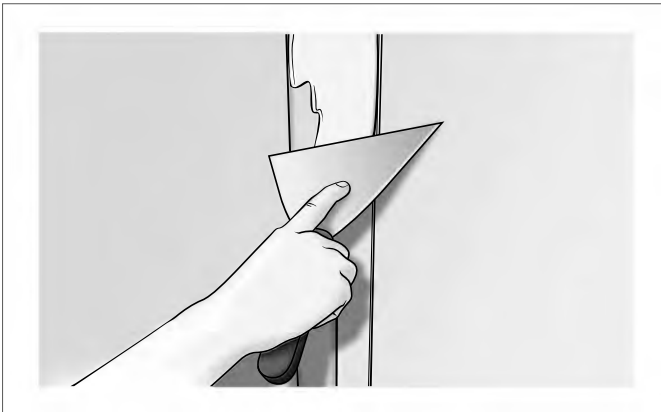


#### NOTE

The jointing method shown below provides a Level 4 finish. For more information about this and other finishes refer to page 21.

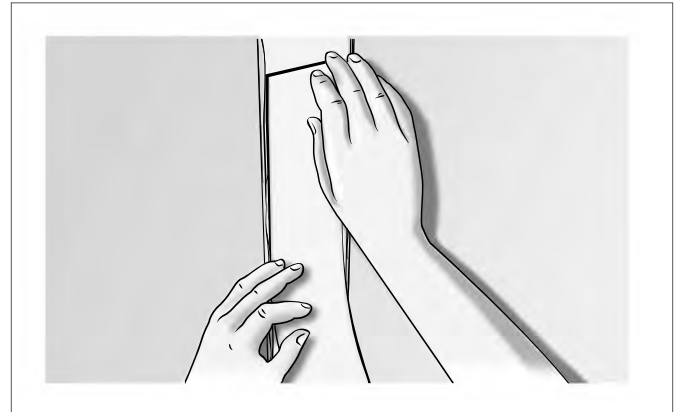
### Step 2 – First Coat

Apply James Hardie Base Coat to fill the recess with a 150mm broad knife.



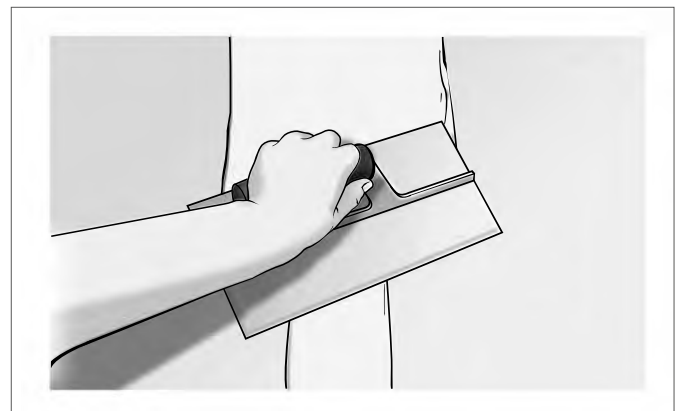
### Step 3 – Embed Tape

Firmly embed the perforated paper tape centrally into the joint using a 50mm broad knife. Ensure that there are no voids under the tape and remove excess compounds.



### Step 4 – Thin Layer

Immediately cover tape with a thin layer of James Hardie Base Coat applied with a 150mm broadknife.



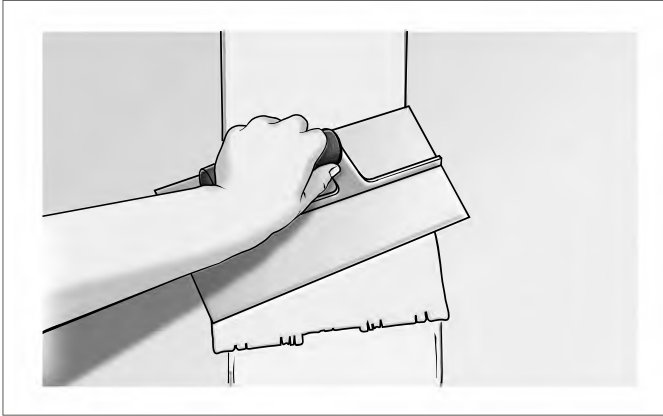
#### NOTE

Steps 5, 6 and 7 are only required for paint and wall paper finish.

# 7 Finishing

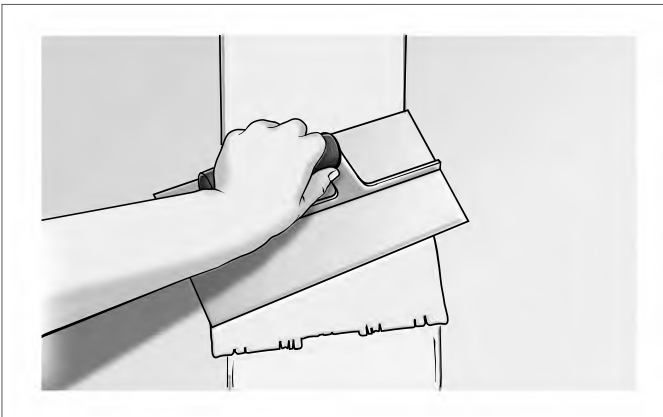
## Step 5 – Second Coat

When the first coat is fully dry, use a 200mm wide second coat trowel to apply the James Hardie Base Coat. Apply this coat approximately 180mm wide, laid down over the recess and feather the edges.



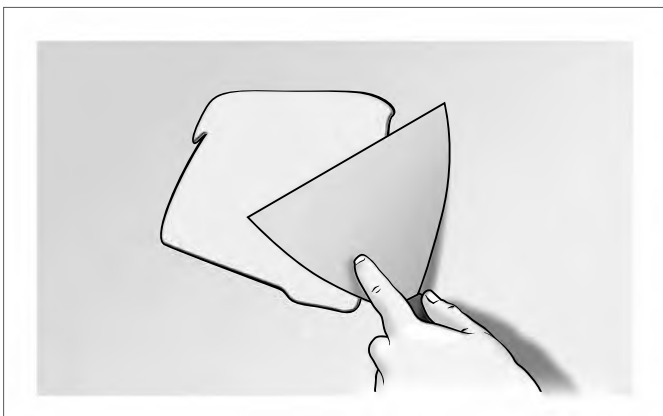
## Step 6 – Finishing Coat

Ensure the second coat is fully dry. Using a finishing trowel, apply a coat of James Hardie Top Coat 280mm wide centrally over the joint and feather out the edges. Allow to dry fully before sanding. Sand with a 180 grit sand paper to achieve a smooth finish for painting.



## Step 7 – Fastener Heads

Apply a finishing coat of James Hardie Base Coat to fastener heads, feathering out the edges. Allow to fully dry before sanding.



## 7.1 PAINTING

HardieSoffit Lining, HardieFlex Eaves Lining, Villaboard Soffit Lining and HardieGroove Soffit Lining sheets are to have a minimum of two coats of acrylic paint applied after fixing in order to meet the requirements of the NZBC. All sheets must be coated within 3 months of installation.

Use quality 100% acrylic paints. Economy paints are not recommended because generally they are less well bound, less moisture resistant and more prone to mould growth.

In all cases the manufacturer's specification for the selected paint must be followed. Note that some paints require an undercoat before applying finish coats.

Damp, shady situations, proximity to bush, agricultural paddocks or seaspray environments may induce an extra tendency to mould growth. Use mould-inhibiting and alkaline-resistant undercoats and consult the paint manufacturer for details of maximum mould-resistant paints.

Before painting, remove any surface grime or other contaminants and ensure the HardieSoffit Lining, HardieFlex Eaves Lining, Villaboard Soffit Lining and HardieGroove Soffit Lining is dry. Paint must not be applied when the air temperature is below 10°C.

When using uPVC moulds avoid dark colours (paints must have light reflection of 40% or more) as excessive movement may cause buckling of the uPVC when exposed to direct sunlight.

Enamel-based paints can be used, utilising a three-coat system.

For full details apply to the selected paint manufacturer before commencing the work.

## 8 Product information

### 8.1 GENERAL

HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining are a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water.

HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining is manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets').

James Hardie New Zealand Limited is an ISO 9001 'Telarc' certified manufacturer. HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining are classified Type A, Category 3 in accordance with AS/NZS 2908.2 'Cellulose-Cement Products'.

For Safety Data Sheets (SDS) visit [www.jameshardie.co.nz](http://www.jameshardie.co.nz) or Ask James Hardie on 0800 808 868.

### 8.2 DURABILITY

#### Resistance to moisture/rotting

HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining has demonstrated resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Heat rain (Clause 6.5)
- Water permeability (Clause 8.2.2)
- Warm water (Clause 8.2.4)
- Soak dry (Clause 8.2.5)

### 8.3 FINISHES

HardieSoffit Lining, HardieFlex Eaves Lining, Eclipsa Eaves Lining, HardieGroove Soffit Lining and Villaboard Soffit Lining must be paint finished within 90 days of their installation. Refer to the paint manufacturer for paint suitability, mixing and application.

### 8.4 GROUP NUMBER CLASSIFICATION

HardieGroove Lining and Villaboard Lining have a 'Group Number' classification of 1 – S as per the requirements of Clause C of the NZBC.

## 9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements for eaves and soffits to comply with NZBC Acceptable Solution B2/AS1. The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months\*,
- Pre-painted soffits, such as Eclipsa Soffit Lining, when used in harsh coastal environments, the soffit must be washed down using a hose and soft brush minimum once every four months in addition to the other maintenance requirements\*,
- Re-applying exterior protective finishes\*\*,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants,
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation close to or touching the building.

\* Do not use a water blaster to wash down the soffits.

\*\*Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.







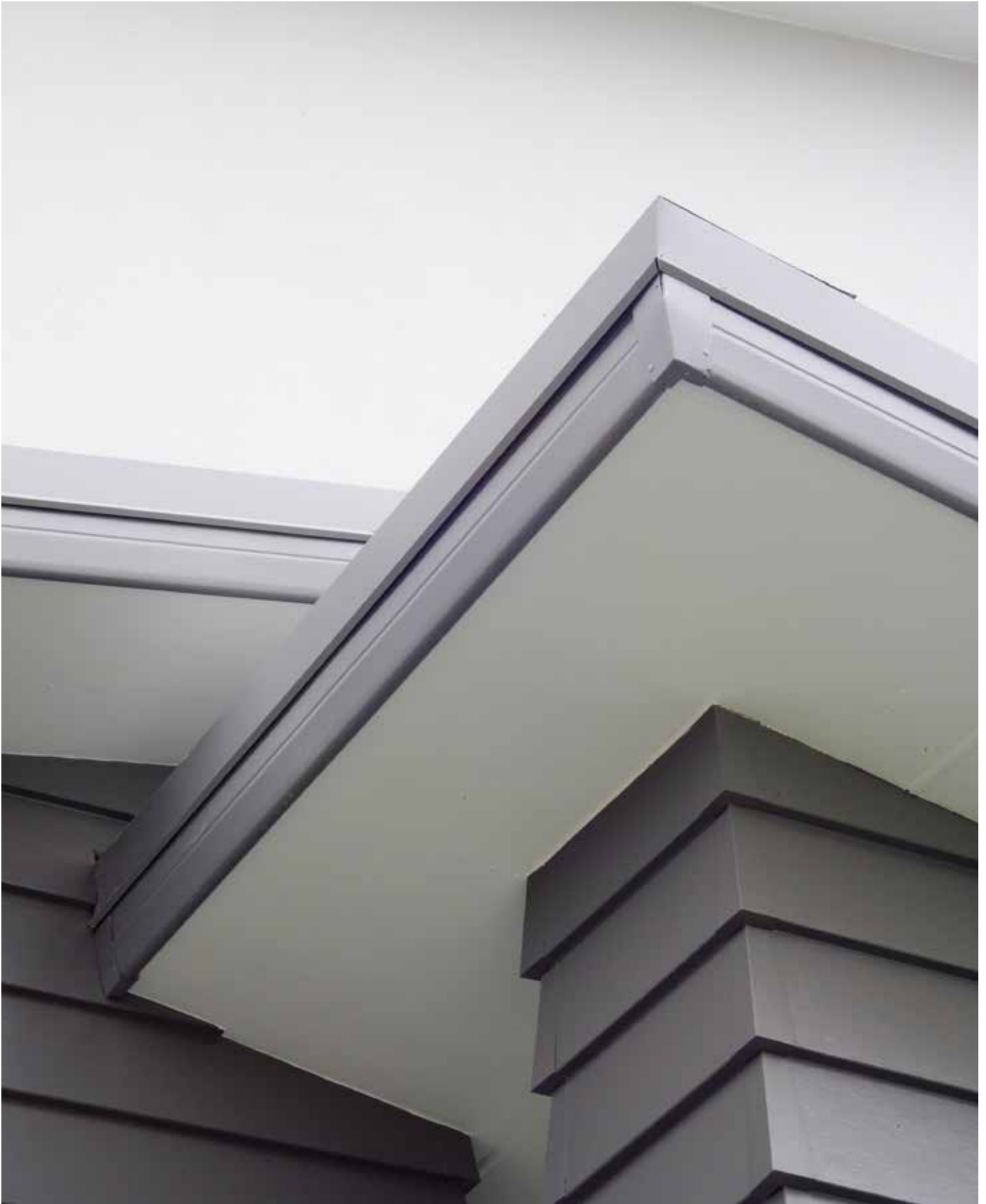
# Product Warranty

## Eaves & Soffits

All James Hardie eaves and soffit linings come with a 15 year product warranty. Pre-finished products such as Eclipsa Eaves Lining come with a 10 year coating warranty and 15 year warranty on the base sheet. All accessories supplied by James Hardie are warranted for a period of 15 years. For full warranty details visit [www.jameshardie.co.nz](http://www.jameshardie.co.nz) or Ask James Hardie on 0800 808 868.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) in each products warranty under "Conditions of Warranty". James Hardie has tested the performance of the HardieSoffit™ Lining, HardieFlex™ Eaves Lining, Eclipsa™ Eaves Lining, HardieGroove™ Lining and Villaboard™ Soffit Lining, and when installed in accordance with the HardieSoffit™ Lining, HardieFlex™ Eaves Lining, Eclipsa™ Eaves Lining, HardieGroove™ Lining and Villaboard™ Soffit Lining installation manual, in accordance with the standards and verification methods required by the New Zealand Building Code (NZBC) and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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## 4311M Metalcraft Profiled Roofing



### Metalcraft Roofing Limited

+64 09 2732820

frances.charles@unitedindustries.co.nz

<http://www.metalcraftgroup.co.nz/>

## SUPPORTING DOCUMENTS

### Environmental Categories Brochure

Ref 11029. Uploaded 26 Aug 2020

Purpose: Performance, Environmental

### MC760 Loadspan Graph

Ref 11096. Uploaded 27 Aug 2020

Purpose: Performance, Installation

### MC760 Product Assurance Supplier Statement

Ref 11098. Uploaded 27 Aug 2020

Purpose: Warranty

# Special environments

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas. If you think your project may experience one of the below environments, please contact New Zealand Steel for advice about the best COLORSTEEL® product to use.

## GEOTHERMAL AREAS

Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define.

## WEST COAST, SOUTH ISLAND

In this area, smoke from coal burning fires may cause high concentrations of sulphur dioxide in the air. The combination of this and the high rainfall for the region creates an aggressive situation which must be considered when choosing the appropriate COLORSTEEL® solution. The effects of a severe coastal environment aggravate the situation.

This area combines the most severe features of both industrial and coastal environments.

## INTERNAL ENVIRONMENTS

Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds for intensive animal farming.

## INDUSTRIAL ENVIRONMENTS

Environments close to corrosive industrial emissions and subject to heavy fallout from them require extra consideration.

# Considerations

## IMPORTANT

- As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel product to suit your specific environment.
- Gutters should be installed according to manufacturer's instructions.
- Unwashed and high risk areas require manual washing every 3 months.

## NON-RESIDENTIAL WARRANTY

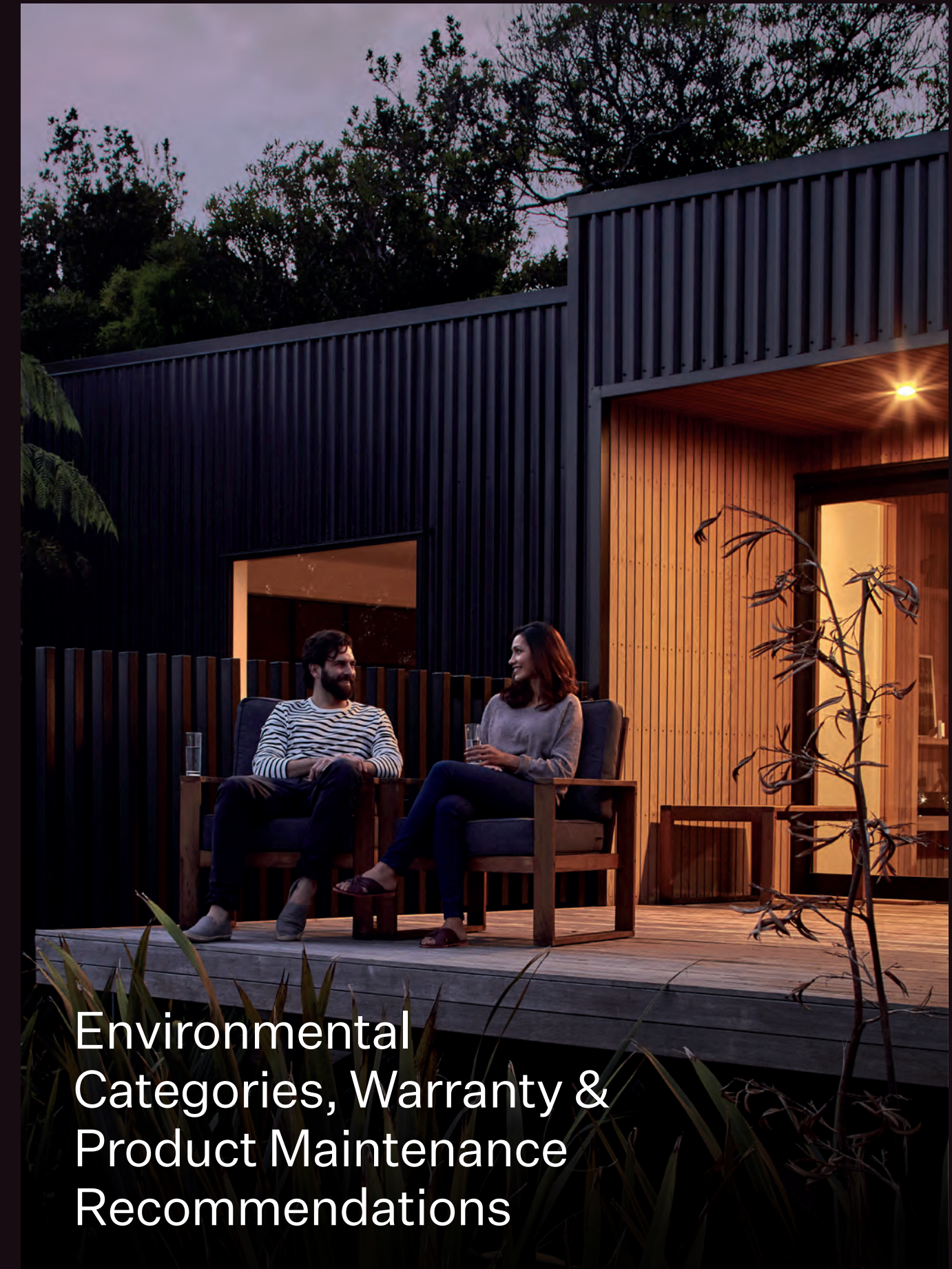
For applications like schools, warehouses and other commercial buildings please contact New Zealand Steel. The maximum warranty offered on commercial buildings is 15 years.

## FURTHER ASSISTANCE

Further advice on the selection of the appropriate product to suit your particular location is available from New Zealand Steel or your local COLORSTEEL® supplier.



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



# Environmental Categories, Warranty & Product Maintenance Recommendations

For more information about warranties and maintenance, please call **0800 697 833** or visit **colorsteel.co.nz**

NOTE: Buyers and users of New Zealand Steel Limited products and services must make their own assessment of the products for their own conditions. All queries regarding product specification, purpose or application should be directed to New Zealand Steel Limited, phone 0800 697 833. New Zealand Steel Limited reserves the right to modify products, techniques, equipment and statements to reflect improvements in the manufacture and application of its products. The information contained in this brochure is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of conflict between this information and the standard terms and conditions, the standard terms and conditions prevail. This Environmental Categories, Warranty & Product Maintenance Recommendations guide supercedes all previous editions. COLORSTEEL®, COLORSTEEL® DRIDEX®, COLORSTEEL® MAXX® and COLORSTEEL® ENDURA® are registered trademarks of New Zealand Steel Limited. ZINCALUME® is a registered trademark of BlueScope Steel Limited.

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## New Zealand has a wide range of environmental conditions.

From the harsh west coast beaches, to the relative shelter of the Waikato farming region, New Zealand Steel offers a range of coated steel products that are suitable for most locations.

This chart is intended as a guide only. Design, position and other factors can influence which product is recommended. Please contact New Zealand Steel for further advice on the best COLORSTEEL® product to use.

■ Eligible for a residential warranty.

■ Not eligible for a residential warranty.

<sup>1</sup> Against perforation as a result of corrosion.

<sup>2</sup> Covering the paint surface against flaking, peeling and excessive fade.

### VERY SEVERE



Starts 25m from the high water mark on the east coast and 50m from the high water mark on the west coast, characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf such as is found on exposed coasts (typically starts 25-50 metres).

*This environment may be extended inland by prevailing winds and local conditions*

### SEVERE



Characterised by:

- Light salt deposits.
- A frequent smell of salt in the air.
- Typically starts 100 – 500 metres from breaking surf such as is found on exposed coasts.
- In the immediate vicinity of large expanses of calm salt water such as harbour foreshores.

*This environment may be extended inland by prevailing winds and local conditions*

### MODERATE



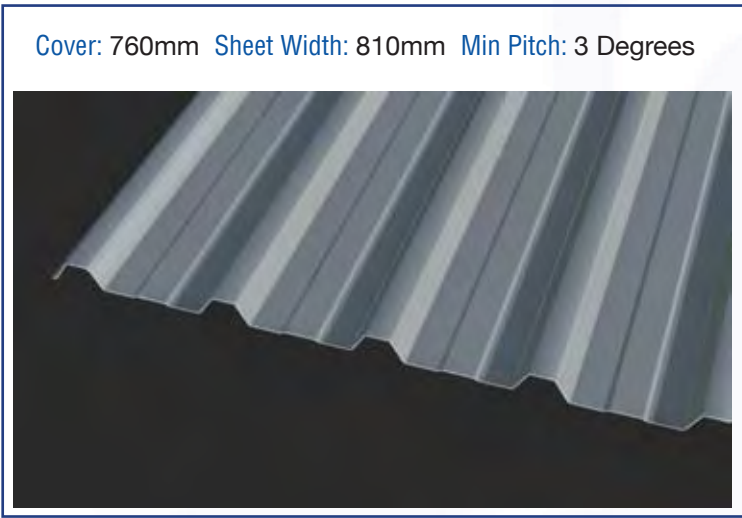
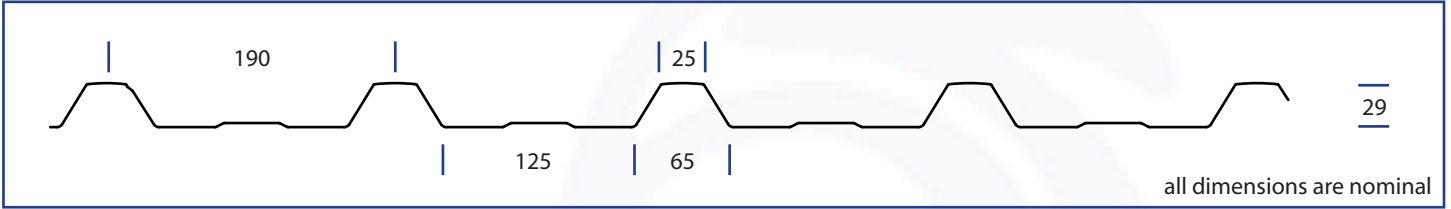
Characterised by:

- Little or no salt deposits.
- The occasional smell of salt in the air.
- Typically starts 500 – 1000 metres from breaking surf such as is found on exposed coasts, or in the immediate vicinity of calm salt water such as estuaries.

		WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA	WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA	WALL CLADDING	ROOFING	GUTTER DOWNPIPES	FASCIA
<b>ENDURA®</b>	RESIDENTIAL WARRANTIES	PERFORATION <sup>1</sup>					15 YEARS	10 YEARS	15 YEARS	15 YEARS	30 YEARS	10 YEARS	15 YEARS
		PAINT <sup>2</sup>					15 YEARS	5 YEARS	5 YEARS	15 YEARS	18 YEARS	10 YEARS	10 YEARS
	MAINTENANCE	Not recommended in this environment				Not recommended in this environment	Rain washing	Manual washing every 3 months	Manual washing every 3 months	Rain washing plus manual washing every year	Rain washing	Manual washing every 6 months	Manual washing every 6 months
<b>MAXX®</b>	RESIDENTIAL WARRANTIES	PERFORATION <sup>1</sup>	15 YEARS	15 YEARS	10 YEARS	15 YEARS	20 YEARS	10 YEARS	15 YEARS	15 YEARS	30 YEARS	10 YEARS	15 YEARS
		PAINT <sup>2</sup>	15 YEARS	15 YEARS	10 YEARS	10 YEARS	15 YEARS	15 YEARS	10 YEARS	10 YEARS	18 YEARS	10 YEARS	10 YEARS
	MAINTENANCE	Rain washing plus manual washing every 3 months	Rain washing	Manual washing every month	Manual washing every month	Rain washing plus manual washing every 6 months	Rain washing	Manual washing every 3 months	Manual washing every 3 months	Rain washing plus manual washing every year	Rain washing	Manual washing every 6 months	Manual washing every 6 months
<b>DRIDEX®</b>	RESIDENTIAL WARRANTIES	PERFORATION <sup>1</sup>								15 YEARS	30 YEARS		
		PAINT <sup>2</sup>								15 YEARS	18 YEARS		
	MAINTENANCE	Not recommended in this environment				Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment
<b>DRIDEX+®</b>	RESIDENTIAL WARRANTIES	PERFORATION <sup>1</sup>				15 YEARS	20 YEARS			15 YEARS	30 YEARS		
		PAINT <sup>2</sup>				15 YEARS	15 YEARS			15 YEARS	18 YEARS		
	MAINTENANCE	Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment	Rain washing plus manual washing every 6 months	Rain washing	Not recommended in this environment	Not recommended in this environment
<b>ZINCALUME®</b>	RESIDENTIAL WARRANTIES	PERFORATION <sup>1</sup>								15 YEARS	15 YEARS	10 YEARS	10 YEARS
	MAINTENANCE	Not recommended in this environment				Not recommended in this environment				Rain washing plus manual washing every 6 months	Rain washing	Manual washing every 3 months	Manual washing every 3 months

# MC760

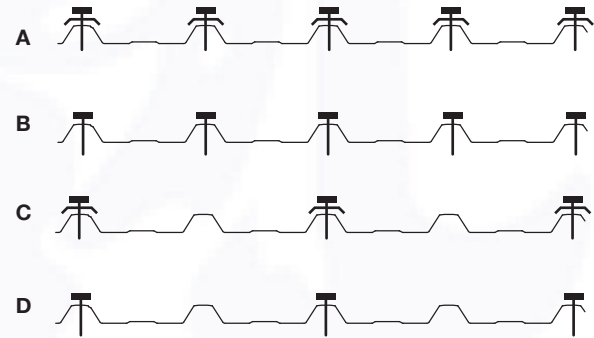
MC760 is a popular and versatile 5 rib trapezoidal roofing profile that can be used in commercial and residential applications as roof and wall cladding. MC760 offers the value of Corrugate whilst being able, by design, to achieve roof pitches down to 3 degrees. MC760 is available in Zinalume, Galvsteel, Colorsteel Endura and Colorsteel Maxx.



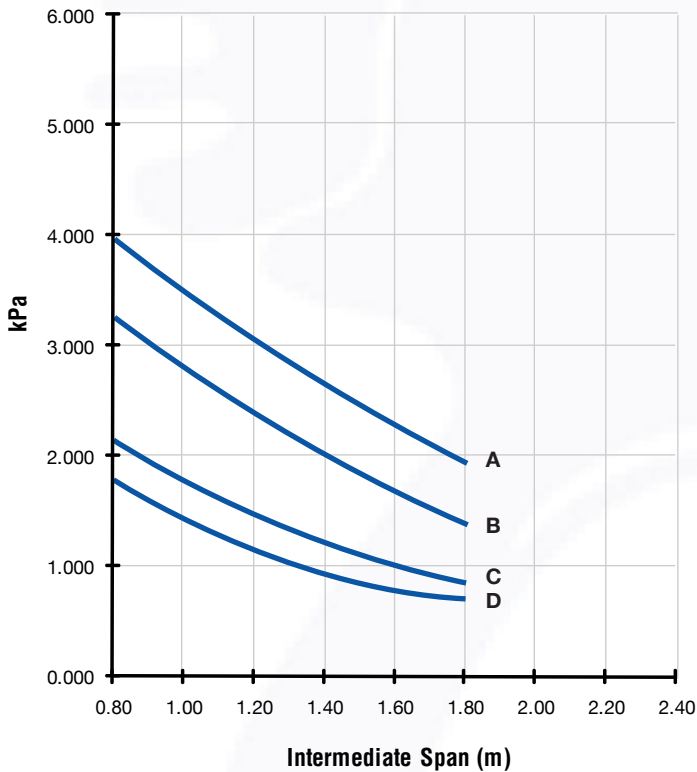
### Recommended Fixings

Timber: 12G x 65mm or 14G x 75mm with load spreading washer  
 Steel: 12G x 45mm or 12G x 55mm with load spreading washer

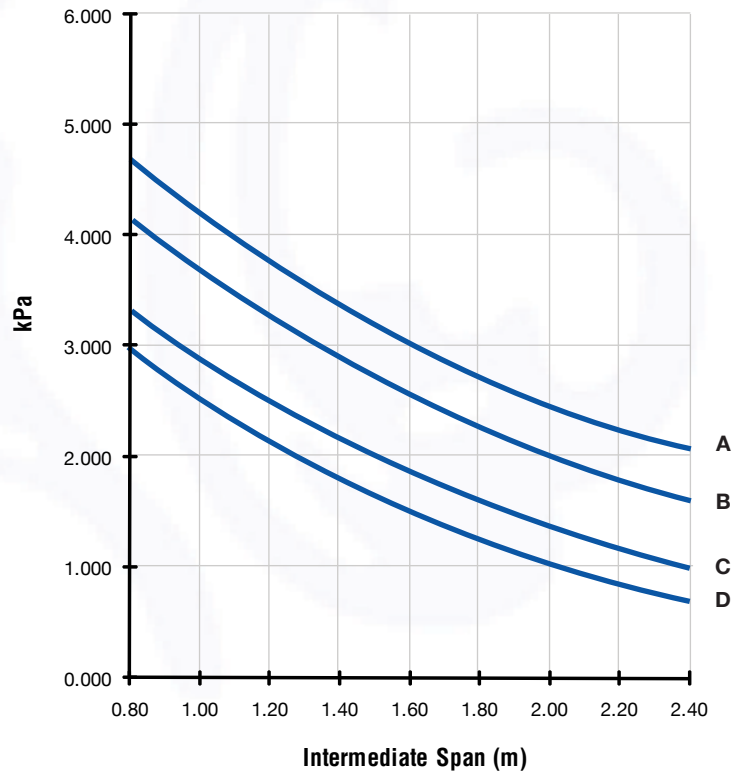
### Fixing Patterns



**MC760 0.40mm UDL**



**MC760 0.55mm UDL**



Note: The intermediate spans shown in the graphs above are based on G550 Steel as the base metal. To calculate end spans please multiply the intermediate span calculated by 0.66. Spans are based on restricted access. For alternative metals please contact your local Metalcraft branch.

**Manufacturing Locations** Auckland, New Plymouth, Hastings

MC760 is available for purchase from all Metalcraft branch locations

# METALCRAFT MC760

## PURPOSE

Metalcraft Roofing supplies Metalcraft MC760 for use as a roofing, and horizontally and vertically laid wall cladding.

## EXPLANATION

Metalcraft MC760 is a 5-Rib asymmetrical trapezoidal profiled, long-run steel sheet. Fabricated from New Zealand (NZ) Steel product and supplied with different protective coatings, it is designed to withstand NZ's exposure zones. The sheets are available in the full Colorsteel® colour range.

Metalcraft MC760 sheets are available in the following NZ Steel branded products:

- Colorsteel® Endura®
- Galvsteel®
- Thicknesses (mm): 0.40 and 0.55
- Colorsteel® Maxx®
- Zinalume®
- Width (mm): Cover – 760, Sheet - 810

The sheets are available in the following sizes:

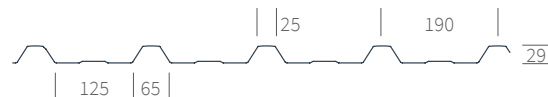


Figure 1: Profile Dimensions (nominal)



## SCOPE AND LIMITATIONS OF USE

Scope	Limitations
<b>Location</b> In all wind zones as defined in NZS 3604:2011 and in all calculated design loads.	<ul style="list-style-type: none"> <li>➤ Metalcraft MC760 load spans apply in wind zones up to and including extra high.</li> <li>➤ Where the calculated design loads exceed 2.5kPa the engineer must satisfy themselves that the product, pitch and fixings will meet the conditions.</li> </ul>
In all exposure zones as defined by NZS 3604:2011.	<ul style="list-style-type: none"> <li>➤ In exposure Zone D only Colorsteel® Endura® or Colorsteel® Maxx® may be used.</li> <li>➤ For use in "Microclimatic considerations" (as defined in Sec 4.2.4) refer to Metalcraft Roofing.</li> </ul>
On buildings located any proximity to a relevant boundary.	<ul style="list-style-type: none"> <li>➤ Metalcraft MC760 is non-combustible.</li> </ul>
<b>Building</b> On timber or steel structural framing.	<ul style="list-style-type: none"> <li>➤ Where Metalcraft MC760 is used in an insulated building and in conjunction with steel framing, a thermal break is required.</li> </ul>
In conjunction with a primary structure that complies with the NZ Building Code or where the designer has established that the existing structure is suitable for the intended building work.	<ul style="list-style-type: none"> <li>➤ Building height is limited by the Metalcraft MC760 design load span tables (refer to: <a href="http://www.metalcraftgroup.co.nz">www.metalcraftgroup.co.nz</a>) or specific engineering, where applicable.</li> </ul>
As a wall cladding.	<ul style="list-style-type: none"> <li>➤ A drained and ventilated cavity is always required unless the building is unlined or importance level 1, in which case the Metalcraft MC760 may be direct fixed.</li> <li>➤ Flashings, flexible and rigid building underlays and Metalcraft MC760 fixings must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).</li> <li>➤ Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).</li> </ul>
As a roof cladding.	<ul style="list-style-type: none"> <li>➤ Metalcraft MC760 lengths ≤40 m must be installed on a roof with a minimum pitch of 3°.</li> <li>➤ Metalcraft MC760 lengths &gt;40 m and &lt;60 m must be installed on a roof with a minimum pitch of 4°.</li> <li>➤ A potable water collection system may be installed.</li> <li>➤ Flashings, flexible and rigid building underlays and Metalcraft MC760 fixings must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).</li> <li>➤ Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).</li> </ul>

## PERFORMANCE CLAIMS

If designed, installed and maintained in accordance with all Metalcraft Roofing requirements, Metalcraft MC760 will comply with or contribute to compliance with the following performance claims:

NZ Building Code clauses	BASIS OF COMPLIANCE	
	Compliance statement <sup>1</sup>	Demonstrated by
<b>B1 Structure</b> B1.3.1, B1.3.2, B1.3.3 (a, b, c, d, g, i)	ACCEPTABLE SOLUTION B1/AS1	<ul style="list-style-type: none"> <li>➤ AS/NZS 1397:2011.</li> <li>➤ AS/NZS 1170:2002 (for span tables).</li> </ul>
<b>B2 Durability</b> B2.3.1 (b), B2.3.2 (b)	ACCEPTABLE SOLUTION B2/AS1	<ul style="list-style-type: none"> <li>➤ Coated in accordance with AS/NZS 2728:2013 (cited in E2/AS1).</li> </ul>
<b>C3 Fire Affecting Areas Beyond the Fire Source</b> C3.4 (a), C3.7 (a)	ACCEPTABLE SOLUTION C/AS1 C/AS2 1st edition, June 2019	<ul style="list-style-type: none"> <li>➤ Steel is non-combustible.</li> <li>➤ BRANZ (FH 6102-TT, dated 3/1/2017) (Material Group 1-S).</li> <li>➤ BRANZ is accredited to perform ISO 5660 test.</li> </ul>
<b>E2 External Moisture</b> E2.3.1, E2.3.2, E2.3.7 (a, b, c)	ACCEPTABLE SOLUTION E2/AS1	<ul style="list-style-type: none"> <li>➤ NZMRM Code of Practice (V3.0).</li> </ul>
<b>F2 Hazardous Building Materials</b> F2.3.1	ALTERNATIVE SOLUTION	<ul style="list-style-type: none"> <li>➤ Coating system is inert once dry.</li> <li>➤ Colorsteel® safety data sheet</li> </ul>

1. The Compliance Statement is the pass holder's statement that they have met their obligations under s14G(2) of the Building Act 2004.

Other performance statement	BASIS OF STATEMENT	
	Performance statement	Demonstrated by
Metalcraft MC760 will not contaminate potable water.	AS/NZS 4020:2005	<ul style="list-style-type: none"> <li>➤ Claimed by manufacturer: NZ Steel.</li> <li>➤ BRANZ statement that metal roof suitable refer to <a href="http://www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater">www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater</a>.</li> </ul>

## NZ STEEL ASSURANCE

As the manufacturer of the steel, from which Metalcraft MC760 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.

NZ Steel has established an Environmental Management System certified to ISO 14001.

For more information on the specific exposure zones and environmental impacts of the product refer to [www.colorsteel.co.nz](http://www.colorsteel.co.nz).

## SOURCES OF INFORMATION

- AS/NZS 1170:2002. *Structural design actions*.
- AS/NZS 1397:2001. *Steel sheet and strip—Hot-dip zinc coated or aluminium/zinc-coated*.
- AS/NZS 2728:2013. *Prefinished/pre-painted sheet metal products for interior and exterior building applications*.
- BRANZ [www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater](http://www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater).
- NZ Metal Roof Manufacturers (NZMRM): *Code of Practice (V3.0)*.
- NZ Steel. Technical Bulletin 2. [August 2016]. *Fire Testing. Fire Testing of Coated Steel Products*.

**VERSION:**

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**DATE:**

.....

Note: Uncontrolled in printed format.

**NAME:**

.....

Frances Charles

**POSITION:**

.....

National Sales & Marketing Mgr

Signed on behalf of Metalcraft Roofing:

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.

**For more information visit [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz)**

This Product Assurance Supplier Statement (pass™) has been prepared by TBB in accordance with MBIE PTS guidelines and the recommendations of s9.2, Determination No. 2019-011 (issued 12 April 2019). TBB is ISO9001:2016 certified. Copyright © 2017, The Building Business Limited (TBB). All rights reserved.

## 4710P Pink Batts Insulation



### Tasman Insulation New Zealand

+64 09 5792139  
customer@pinkbatts.co.nz  
www.pinkbatts.co.nz

## SUPPORTING DOCUMENTS

### BRANZ Appraisal 238 Pink Batts

Ref 15971. Uploaded 6 Nov 2020

Purpose: Performance, Maintenance, Environmental, Warranty



**BRANZ Appraised**  
Appraisal No. 238 [2018]

## PINK® BATTS® INSULATION

### Appraisal No. 238 [2018]

This Appraisal replaces BRANZ  
Appraisal No. 238 [2012].

Amended 26 November 2018.



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



### Tasman Insulation New Zealand Ltd

PO Box 12 069  
Penrose  
Auckland  
Tel: 09 579 2139  
Fax: 09 571 3482  
Freephone: 0800 746 522  
Web: [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz)



### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 Pink® Batts® Insulation is a range of resin bonded fibrous glasswool thermal insulating material for use in walls, ceilings and roofs of buildings. Pink® Batts® Insulation is pre-cut to suit a range of framing spacings.

## Scope

- 2.1 Pink® Batts® Insulation has been appraised as a thermal insulation material for framed or part-framed walls, ceilings and roofs of domestic and commercial buildings.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Pink® Batts® Insulation, 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 and B2.3.1 [b] 15 years. Pink® Batts® Insulation meets these requirements. See Paragraph 8.1.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.1. Pink® Batts® Insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Pink® Batts® Insulation meets this requirement and will not present a health hazard to people.

**Clause H1 ENERGY EFFICIENCY:** Performance H1.3.1 [a] and H1.3.2 E. Pink® Batts® Insulation will contribute to meeting these requirements. See Paragraphs 14.1 and 14.2.

## Technical Specification

- 4.1 Pink® Batts® Insulation is a resin bonded fibrous glasswool insulation manufactured from recycled and/or virgin glass and cured urea extended phenolic resin.
- 4.2 Pink® Batts® Insulation is manufactured in a range of sizes to suit framing centres and cavity depths. Building Insulation Blanket (BIB) is supplied in rolls for commercial applications. Pink® Batts® Insulation is available as set out in Table 1.

**Table 1: Pink® Batts® Insulation product table.**

R-value	Length [mm]	Width [mm]	Nominal Thickness [mm]	Nominal Total Area [m <sup>2</sup> ]	Density [kg/m <sup>3</sup> ]
<b>Roof - Thermal Insulation</b>					
1.8 <sup>†</sup>	1220	432	95	13.7	8.3
2.2 <sup>†</sup>	1220	432	115	12.6	8.2
2.6 <sup>†</sup>	1220	432	140	10.5	7.7
3.2 <sup>†</sup>	1220	432	170	8.4	8.4
3.2 <sup>†</sup>	1220	432	170	8.4	6.9
3.6 <sup>†</sup>	1220	432	180	7.4	7.4
3.6	1220	432	180	7.4	8.8
4.0 <sup>†</sup>	1220	432	195	6.3	8.1
5.0 <sup>†</sup>	1220	432	220	4.2	10.0
6.0 <sup>†</sup>	1220	432	235	3.7	13.0
6.3 <sup>†</sup>	1220	432	250	3.2	12.3
7.0 <sup>†</sup>	1220	432	260	2.6	15.8
<b>Roof - Building Insulation Blanket</b>					
1.2	12,000	1200	50	28.8	12.0
1.8	8000	1200	75	19.2	12.0
2.2	8000	1200	100	19.2	9.1
2.4	8000	1200	100	19.2	11.5
2.6	6000	1200	110	14.4	11.0
3.2	8000	1200	135	9.6	10.9
<b>Roof - Pink® Batts® Retrofit Insulation</b>					
2.9 <sup>†</sup>	1220	432	150	9.5	7.7
3.3 <sup>†</sup>	1220	432	175	8.4	7.1
<b>Wall - Masonry Insulation</b>					
1.0 <sup>†</sup>	1220	580	40	21.2	14.0
1.2	1220	580	50	17.0	12.8
<b>70 mm Wall Range - Thermal Insulation</b>					
2.2	1140	560	70	6.4	30.0
<b>90 mm Wall Range - Thermal Insulation</b>					
1.8 <sup>†</sup>	1140	560	90	16.6	9.0
2.2 <sup>†</sup>	1140	560	90	13.4	11.6
2.4 <sup>†</sup>	1140	560	90	10.2	14.7
2.4 <sup>†</sup>	1140	560	90	10.2	17.4
2.6 <sup>†</sup>	1140	560	90	9.6	19.4
2.8 <sup>†</sup>	1140	560	90	6.4	27.1

**Table 1: Pink® Batts® Insulation product table cont.**

R-value	Length [mm]	Width [mm]	Nominal Thickness [mm]	Nett Area [m <sup>2</sup> ]	Density [kg/m <sup>3</sup> ]
<b>90 mm Narrow Wall Range - Thermal Insulation</b>					
2.2 <sup>1</sup>	1140	360	90	9.0	11.8
2.6 <sup>1</sup>	1140	360	90	7.4	19.4
2.8 <sup>1</sup>	1140	360	90	4.5	27.1
<b>90 mm Steel Wall Range - Thermal Insulation</b>					
2.2 <sup>1</sup>	1220	610	90	15.6	11.8
2.6 <sup>1</sup>	1220	610	90	9.7	19.4
<b>140 mm Wall Range - Thermal Insulation</b>					
3.2 <sup>1</sup>	1140	560	140	9.6	9.6
3.6 <sup>1</sup>	1140	560	140	7.0	14.0
4.0 <sup>1</sup>	1140	560	140	5.1	19.5
<b>140 mm Narrow Wall Range - Thermal Insulation</b>					
3.2 <sup>1</sup>	1140	360	140	7.0	9.6
4.0 <sup>1</sup>	1140	360	140	4.1	19.5

<sup>1</sup> Pink® Batts® Insulation products that have the Environmental Choice license.

- 4.3 Pink® Batts® Insulation is pink in colour and is baled in polythene bags with labelling in compliance with AS/NZS 4859.1.
- 4.4 Pink® Batts® Retrofit Ceiling Insulation is pink in colour and is baled in teal polythene bags with labelling in compliance with AS/NZS 4859.1.
- 4.5 Accessories used with Pink® Batts® Insulation, which are supplied by the insulation installer, are wire netting, plastic strapping and fixings.

## Handling and Storage

- 5.1 Pink® Batts® Insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the bales. The bales must be stored in an orientation that avoids excessive compression of the product.
- 5.2 In general, insulation products are sensitive to the length of time they are stored under compression packaging. Product that does not recover to its nominal thickness may not achieve the stated R-value.

## Technical Literature

- 6.1 Refer to the Appraisal listing on the BRANZ website for details of the current Technical Literature for Pink® Batts® Insulation. 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 Pink® Batts® Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Pink® Batts® Insulation can be used to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Greater construction R-values can be achieved where specific design is used. For construction R-values refer to the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.

- 7.2 Pink® Batts® Insulation thermal resistance [R-value] has been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.
- 7.3 Pink® Batts® Insulation is designed to be friction-fitted between wall, ceiling or roof framing. They can also be laid directly on a ceiling lining, over ceiling battens or joists/truss chords. In other horizontal situations, the insulation must be adequately supported by galvanised wire netting or some other suitable durable material.
- 7.4 Where the insulation is installed in exterior walls, the insulation material nominal thickness must be selected to provide a snug close fit which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.
- 7.5 Where the insulation is retrofitted in external walls without a wall underlay, and with direct-fixed claddings, the insulation must be at least 20 mm thinner than the framing to allow a gap of at least 20 mm between the insulation and the wall cladding. Horizontal straps must be stapled into the sides of the wall studs at 300 mm centres maximum as support before the insulation is installed. Refer also to NZS 4246, Section 5.4.2.
- 7.6 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- 7.7 Building Insulation Blanket is designed specifically for commercial roof and commercial wall applications. In residential applications, installation must be completed in line with NZS 4246.
- 7.8 To prevent moisture transfer and to provide roof ventilation, a separation of 25 mm minimum is required between the insulation and any rigid substrate or flexible roof underlay. Selecting specifically designed skillion roof insulation products with a controlled nominal thickness can assist with this requirement.
- 7.9 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.10 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturer's instructions and NZS 4246. See Paragraphs 10.1 - 10.3.

## Durability

### Serviceable Life

- 8.1 Where the building is maintained so that provisions of NZBC Clauses E2 and E3 are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance (e.g. moisture), Pink® Batts® Insulation can be expected to have a serviceable life of at least 50 years.

## Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of dampness repaired. Cavities must be clean and dry before fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

## Prevention of Fire Occurring

- 10.1 Pink® Batts® Insulation is considered a non-combustible material and need not to be separated from heat sources such as fire places, heating appliances, flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1.

### Downlights

- 10.2 Recessed luminaires shall be of type and be installed in accordance with NZBC Acceptable Solution C/AS1 to C/AS6, Section 7.4.
- 10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires in existing buildings.

### Control of Internal Fire and Smoke Spread

- 11.1 Pink® Batts® Insulation has been classified non-combustible when tested to AS 1530.1 and can therefore be assigned a Group Number of 1-S. Unless foamed plastics building materials are also used as part of the wall or ceiling construction, there are no internal surface finish requirements in Risk Group SH in accordance with NZBC Acceptable Solution C/AS1, Paragraph 4.2. When used in an occupied space, Pink® Batts® Insulation does not need to be enclosed in any Risk Group. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6 for the specific internal surface requirements for walls or ceilings in other Risk Groups.

### External Moisture

- 12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.
- 12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2 (a), or a lower moisture content if required by the lining manufacturer.

### Internal Moisture

- 13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.
- 13.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2 E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

### Energy Efficiency

- 14.1 Pink® Batts® Insulation will contribute to meeting the requirements of NZBC Clause H1, Performance H1.3.1 (a) and H1.3.2 E by compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraphs 7.1 - 7.8.
- 14.2 Pink® Batts® Insulation R-values have been determined by BRANZ testing to AS/NZS 4859.1 and are given in Table 1.

## Installation Information

### Installation Skill Level Requirements

- 15.1 Installation of Pink® Batts® Insulation must be completed by an installer with an understanding of insulation installation.

### General

- 16.1 Installation of Pink® Batts® Insulation must be in accordance with the Technical Literature, Installation Instructions and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.
- 16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.
- 16.3 Pink® Batts® Insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.

- 16.4 Pink® Batts® Insulation is supplied in segment and blanket form [see Table 1] to suit framing layouts. The product is able to be cut to suit wall cavities and when fitted between roof or ceiling framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced. In wall cavities the insulation must be neatly friction-fitted between framing members to prevent sagging. In ceiling or roofs, the insulation may be fitted between framing members or fitted over framing members and butted tightly. The insulation must extend to the external wall top plate. The insulation must not be folded or compressed. A close even fit provides the most efficient thermal performance. Whenever possible, the insulation should be fitted beneath wiring or plumbing.
- 16.5 The clearance requirements for heating appliances and downlights must be followed. Refer also to NZS 4246.

#### Inspections

- 16.6 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Pink® Batts® Insulation installations.

#### Health and Safety

- 17.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

### Basis of Appraisal

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

#### Tests

- 18.1 BRANZ has carried out thermal resistance testing of Pink® Batts® Insulation in accordance with AS/NZS 4859.1.
- 18.2 Tests have been carried out in accordance with AS 1530.1. Pink® Batts® Insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.

#### Other Investigations

- 19.1 An assessment of the durability of Pink® Batts® Insulation has been made by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature including installation instructions have been reviewed by BRANZ and found to be satisfactory.

#### Quality

- 20.1 The manufacture of Pink® Batts® Insulation 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.
- 20.2 The range of Pink® Batts® Insulation products have been assessed for their environmental impact by the New Zealand Ecolabelling Trust and comply with the requirements of the Environmental Choice Specification, Licence No. 2504017 - Thermal [resistive type] Building Insulants. The products that have the Environmental Choice license are noted in Table 1.
- 20.3 Tasman Insulation New Zealand Ltd is responsible for the quality of the product supplied.
- 20.4 Quality of installation of the product on site is the responsibility of the installer.
- 20.5 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.



### Sources of Information

- AS 1530.1: 1994 Combustibility test for materials.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- NZS 4246: 2016 Energy efficiency - Installing bulk thermal insulation in residential buildings.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- Acceptable Solution and Verification Methods for New Zealand Building Code Energy Efficiency Clause H1, Ministry of Business, Innovation and Employment, Fourth Edition, [including Amendment 3, 1 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 05 September 2018.**

This Appraisal has been amended to include the use of Pink® Batts® Insulation when retrofitting external walls without wall underlay with direct-fixed claddings.

#### **Amendment No. 2, dated 26 November 2018.**

This Appraisal has been amended to update Table 1 to include the Roof - Building Insulation Blanket product range.



**BRANZ Appraised**  
Appraisal No. 238 [2018]

**BRANZ Appraisal**  
Appraisal No. 238 [2018]  
03 August 2018

PINK® BATTES® INSULATION



In the opinion of BRANZ, **Pink® Batts® Insulation** 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 **Tasman Insulation 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. **Tasman Insulation 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 **Tasman Insulation 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 **Tasman Insulation New Zealand Ltd** or any third party.

For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

03 August 2018

## 5111H James Hardie® Fibre Cement Sheet Linings



### James Hardie

+64 0800 808868  
info@jameshardie.co.nz  
www.jameshardie.co.nz

## SUPPORTING DOCUMENTS

### HardieGroove Lining Installation Manual - Aug 2020

Ref 10543. Uploaded 10 Aug 2020

Purpose: Installation

### HardieGroove Lining Product Warranty

Ref 10408. Uploaded 29 Jul 2020

Purpose: Warranty



# Installation Manual

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## WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

**Ask James Hardie™**  
[literaturefeedback@jameshardie.co.nz](mailto:literaturefeedback@jameshardie.co.nz)

# 1 Introduction

HardieGroove™ Lining combines the appearance of traditional timber tongue and groove wall panelling with the benefits of modern fibre cement.

Because the baseboard is James Hardie fibre cement, it's resistant to fire and damage from moisture, rotting and termites when installed and maintained as directed.

HardieGroove Lining has decorative v-shaped grooves carved into the front face of the 7.5mm sheet, and is sanded, ready to be painted in any colour.

HardieGroove Lining can be fixed to the full height of the wall or at dado height to create a decorative, hard-wearing, impact resistant lining in hallways and to withstand the toughest treatment in family rooms, rumpus rooms, laundries and bathrooms (not suitable for shower areas).

HardieGroove Lining is also ideal for use in ceilings, either to add interest to a modern design, or to create historical detail on a renovation project.

The main features of HardieGroove Lining are:

- Durable internal lining, soffit and ceiling sheet.
- Creates suitable surface for paint finish.
- Sheet edges have a 'half groove' to achieve concealed sheet joints.

- Reliable impact resistant decorative lining. Ideal for wall lining where walls are prone to damage.
- Resistance to damage from moisture making it ideal for bathrooms, laundries and kitchens.
- Joints won't pull or shift apart.
- Authentic v-shaped grooves replicate traditional tongue and groove look and style.
- Ideal as feature wall to dado height.

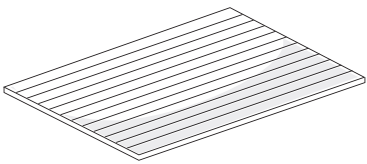
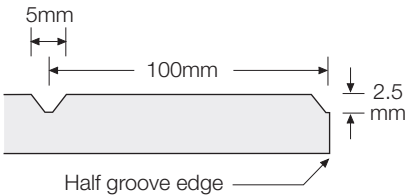
The specifier or other responsible party for the project must ensure the information and details in this guide are appropriate for the intended application and specific design and detailing is undertaken for areas which fall outside the scope of this documentation.

### Make sure your information is up to date

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or if you need more information, visit [www.jameshardie.co.nz](http://www.jameshardie.co.nz) or Ask James Hardie™ on 0800 808 868.

HardieGroove Lining is only for use in internal applications.

Table 1

Product	Description	Description
		<p>HardieGroove Lining is a v-grooved internal lining board with the look of timber and the durability of fibre cement.</p> <p>Individual batten widths are 100mm</p> <p>Sheet sizes:</p> <p>2400mm x 1200mm x 7.5mm Product code <b>400246</b></p> <p>2700mm x 1200mm x 7.5mm Product code <b>400245</b></p> <p>3000mm x 1200mm x 7.5mm Product code <b>404917</b></p>

NOTE: All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Table 2









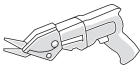


Product/Accessories/Tools supplied by James Hardie					
Product	Description	Product Code	Product	Description	Product Code
	HardieBlade™ Saw Blade 184mm diameter, poly diamond blade, for fast, clean cutting of James Hardie fibre cement.	<b>300660</b>		FibreTEKS® Screw For fastening to 0.75mm to 1.0mm BMT steel frames. Class 3 finish. Length: 30mm x 9g ® denotes a registered mark of Buildex	1000/box <b>303840</b>
	James Hardie Base Coat For finishing fastener heads. Volume: 4kg Pail 15kg Bag	<b>304490</b> <b>304491</b>		HardieDrive™ Screw s/s 316 30mm x 7g	100/jar <b>300928</b>
	Soffit Scotia Mould 2 pcs. (base and cap) 2400mm	<b>300916</b>		Villadrive™ Wood Screw Envirodrab coating. Length: 30mm x 6g	100/jar <b>300992</b> 5kg/box <b>300993</b> 1000 collated <b>300994</b>
	HardieKnife™ Scoring tool for easy cutting.	<b>305926</b>			

Table3

Product/Accessories/Tools not supplied by James Hardie			
James Hardie recommends the following products for use in conjunction with its HardieGroove Lining. James Hardie does not supply these products and does not provide a warranty for their use. Please contact the component manufacturer for information on their warranties and further information on their products.			
	HardieFlex™ nails 40 x 2.8mm galvanised or stainless steel 316 fibre cement nails for fastening to timber.		Fibreshear Electric cutting tool.
	Adhesive Sealant Sika Sikaflex 11FC, Bostik Seal N Flex-1, Fullers Max Bond, Selley's Liquid Nails		Brad Nail ND 50 To be used in conjunction with 6mm bead of adhesive on a stud/nogs. Only suitable for internal walls.

## 2 Safe working practices

### **WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA**

**James Hardie products contain sand, a source of respirable crystalline silica. May cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.**

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/NZS 1716 P1 filter and refer to Australian/New Zealand Standard 1715:2009 Selection, Use and Maintenance of Respiratory Protective Equipment for more extensive guidance and more options for selecting respirators for workplaces. For further information, refer to our installation instructions and Safety Data Sheets available at [www.jameshardie.co.nz](http://www.jameshardie.co.nz).

### **FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.**

#### **Crystalline Silica is**

- Commonly known as sand or quartz
- Found in many building products e.g. concrete, bricks, grout, wallboard, ceramic tiles, and all fibre cement materials

#### **Why is Crystalline Silica a health hazard?**

- Silica can be breathed deep into the lungs when present in the air as a very fine (respirable) dust
- Exposure to silica dust without taking the appropriate safety measures to minimise the amount being breathed in, can lead to a potentially fatal lung disease – silicosis – and has also been linked with other diseases including cancer. Some studies suggest that smoking may increase these risks
- The most hazardous dust is the dust you cannot see!

#### **When is Crystalline Silica a health hazard?**

- It's dangerous to health if safety protocols to control dust are not followed when cutting, drilling or rebating a product containing crystalline silica
- Products containing silica are harmless if intact (e.g. an un-cut sheet of wall board)

#### **Avoid breathing in crystalline silica dust**

#### **Safe working practices**

- ✗ NEVER use a power saw indoors or in a poorly ventilated area
- ✗ NEVER dry sweep
- ✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up
- ✗ NEVER use grinders
- ✓ ALWAYS use a dust reducing circular saw equipped with a sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the HardieBlade™ logo or one with at least equivalent performance – connected to an M Class or higher vacuum
- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ✓ ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

#### **Use one of the following for cutting:**

##### **Best**

- HardieKnife™
- Hand guillotine
- Fibreshear

##### **Better**

Dust reducing circular saw equipped with HardieBlade™ Saw Blade and connected to a M Class or higher vacuum.

#### **When cutting outdoors**

- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Cut products with either a HardieKnife™ or fibre cement shears or, when not feasible, a HardieBlade™ Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or higher mask (correctly fitted in accordance with manufacturers' instructions), ask others to do the same.
  - Keep persons on site at least 2 metres and as far as practicable away from the cutting station while the saw is in operation

- If you are not clean shaven, then use a powered air respirator with a loose-fitting head top
  - Wear safety glasses
  - Wear hearing protection
  - When others are close by, ask them to do the same
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

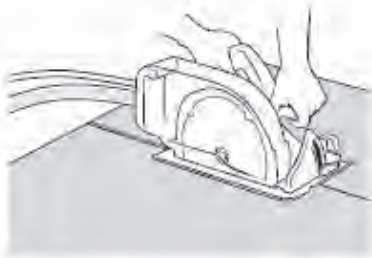
### When cutting indoors

- ✗ Never cut using a circular saw indoors
- ✓ Position cutting station in a well ventilated area
- ✓ Cut ONLY using a HardieKnife™, hand guillotine or fibreshears (manual, electric or pneumatic)
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

### Working instructions

#### HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust collector connected to a M Class or higher vacuum. When sawing, clamp a straight edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



### Hole forming

#### For smooth clean cut circular holes:

- Mark the centre of the hole on the sheet
- Pre-drill a 'pilot' hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill



### For irregular holes:

- Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face
- Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported

## 2.1 STORAGE AND DELIVERY

Keeping products and people safe

### Off loading

- ✓ James Hardie products should be off-loaded carefully by hand or by forklift
- ✓ James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

### Storage

James Hardie products should be stored:

- ✓ In their original packaging
- ✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- ✓ Off the ground – either on a pallet or adequately supported on timber or other spacers
- ✓ Flat so as to minimise bending

James Hardie products must not be stored:

- ✗ Directly on the ground
- ✗ In the open air exposed to the elements

**James Hardie is not responsible for damage due to improper storage and handling.**

## 2.2 TIPS FOR SAFE AND EASY HANDLING OF HARDIEGROOVE LINING

- ✓ Carry with two people
- ✓ Hold near each end and on edge
- ✓ Exercise care when handling sheet products to avoid damaging the edges/corners

## 3 Framing

### 3.1 GENERAL

HardieGroove Lining can be fixed to either timber or light gauge domestic type steel framing. The framing used must comply with the relevant building regulations and standards and the requirements of this manual.

Note: HardieGroove Lining must not be used in shower areas.

### 3.2 TIMBER

Timber framing must comply with the durability requirements of Clause 'B2' of the NZBC. Timber must be treated as per the requirements of the NZS 3602.

Timber framing sizes and set out must satisfy the minimum requirements of NZS 3604 and this installation guide.

The minimum stud width of 35mm may be used. However, where butt jointing is used the minimum stud width is 45mm at the joint. See Figure 13.

Reference NZS 3604 'Timber-framed Buildings'.

### 3.3 STEEL

The minimum size for steel stud framing should be 64mm deep x 0.55mm base metal thickness (BMT). Steel framing shall comply with NASH 3405 Steel Framed Buildings. Steel sections shall be galvanised or zinc coated of 0.55mm – 1.6mm BMT. Studs must not be less than 38mm wide at butt joints.

Figure 1: Frame straightness



### 3.4 PREPARATION

Ensure frame is square and work from a central datum line. Frames must be straight and true to provide a flush face to receive the sheeting.

A suggested maximum tolerance of between 3mm and 4mm in any 3000mm length of frame will give best results. HardieGroove Lining will not straighten excessively warped or distorted frames and any warping may still be visible after the internal lining is installed.

## 4 Installation

### 4.1 SHEET LAYOUT

HardieGroove Lining is usually fixed vertically. Sheet joints must coincide with the centre line of the framing member.

The long edges of the sheet have a unique half groove, which achieves a concealed joint.

Note: Where fixing half height sheets as a dado wall, provide a row of noggings to allow for fastening of the sheet edge.

When fixing around window openings, best practice would be to align the sheet joints with the window jamb.

### 4.2 FASTENERS

Fasteners must have the appropriate level of durability required for the intended project.

Fasteners must be fully compatible with all other material that they are in contact with to ensure the durability and integrity of the assembly.

- On timber frame use Villadrive screws 30mm x 6g or HardieDrive stainless steel screws for quick installation of HardieGroove sheets.
- Alternatively the HardieGroove sheets can be fixed with 40 x 2.8mm HardieFlex nails or ND 50 brad nails.
- For fixing HardieGroove Lining to 0.55 – 1.0mm BMT steel framing, use 30mm Buildex FibreTEKS collated screws.

Nails must be finished flush (Figure 2). Screws can be driven 0.5mm below the sheet surface to achieve the required finish level (Figure 2). In steel framing the fasteners should be driven as close as possible to the stud corners to avoid deflection of the stud flange, see Figure 3.

Note: Do not place nails or screws within 100mm of the adhesive daubs.

Figure 2: Fastener depth

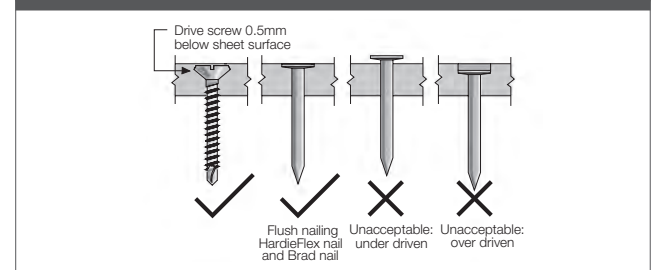
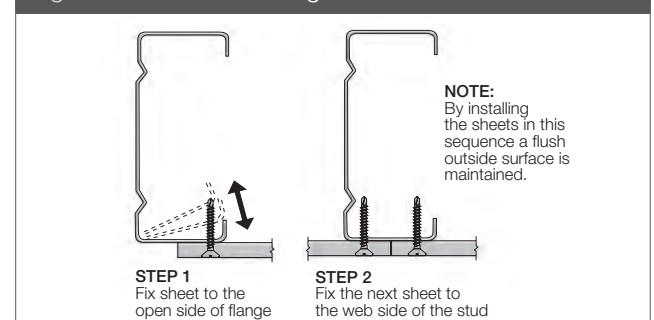


Figure 3: Screw fastening



## 4.3 FIXING TO WALLS

### Step 1

Place 6.0mm off-cut packers along floor as temporary support for sheets.

This allows provision for frame movement. Put sheet in place as shown.

Figure 4: Sheet installation



### Step 2

Fix sheet starting from the centre of sheet and working outwards to avoid any druminess. For fastener spacings refer to Figures 6 and 8 for full height and dado height walls respectively.

Figure 5: Sheet fixing



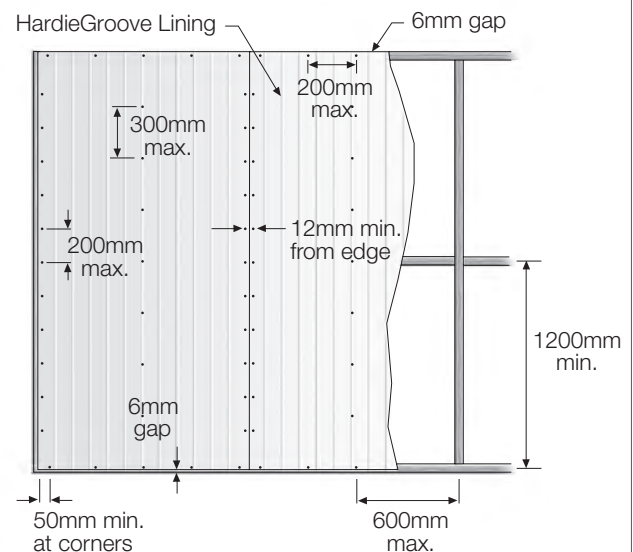
### Final step

Fix remaining sheets in similar sequence.

## 4.4 FULL SHEET FIXING

When fixing full sheets of HardieGroove Lining to framed walls, fasten sheets as shown in Figure 6. Sheet butt joints must coincide with the centre line of framing members.

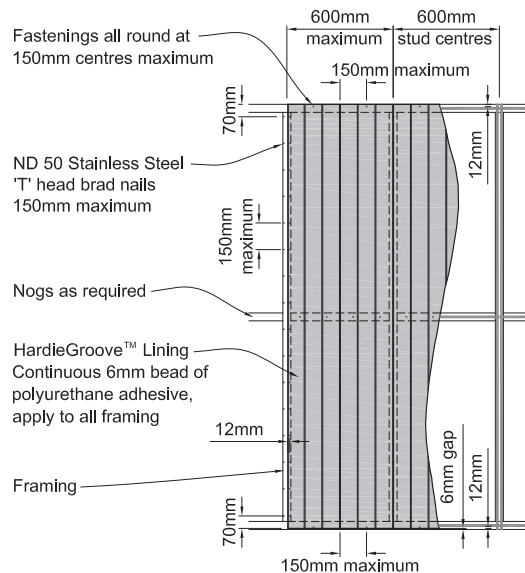
Figure 6: Full sheet fixing



### NOTES:

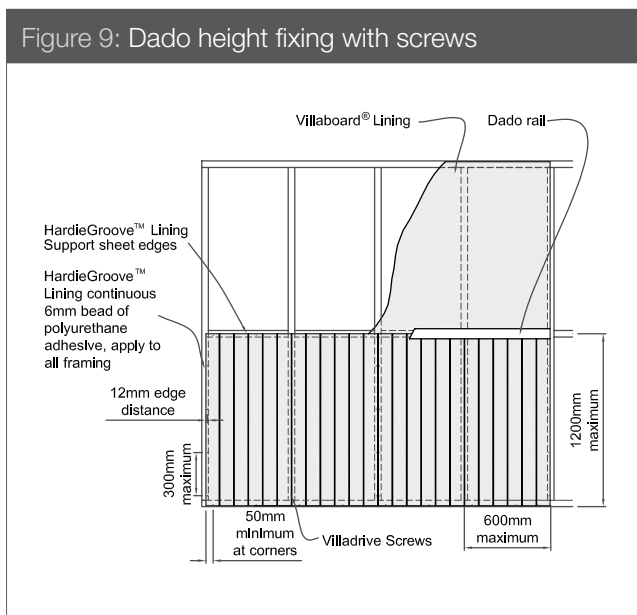
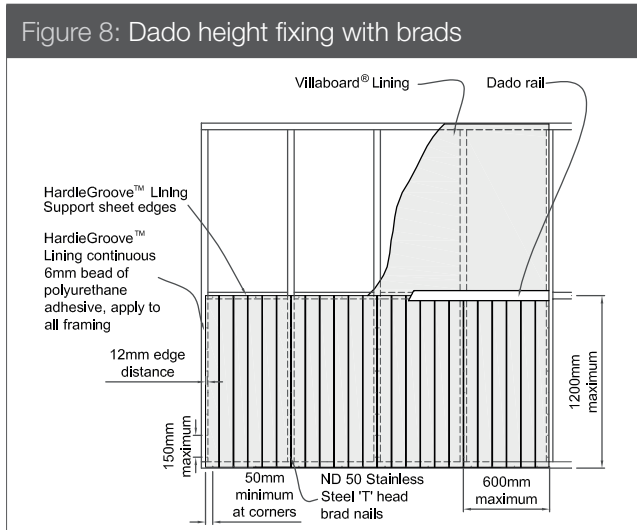
1. To reduce the number of visible fixings the centre of the sheet can be fixed with adhesive. See Figure 8 and 9 for details.
2. HardieGroove Lining can also be fixed using brad nails in conjunction with adhesives to reduce visible fixings.

Figure 7: Brad nail fixing



### 4.5 DADO HEIGHT FIXING

HardieGroove Lining may be installed to half the wall height to create a dado appearance. Ensure top of sheet is fixed to an in-line row of noggings as shown in Figure 8 and 9.



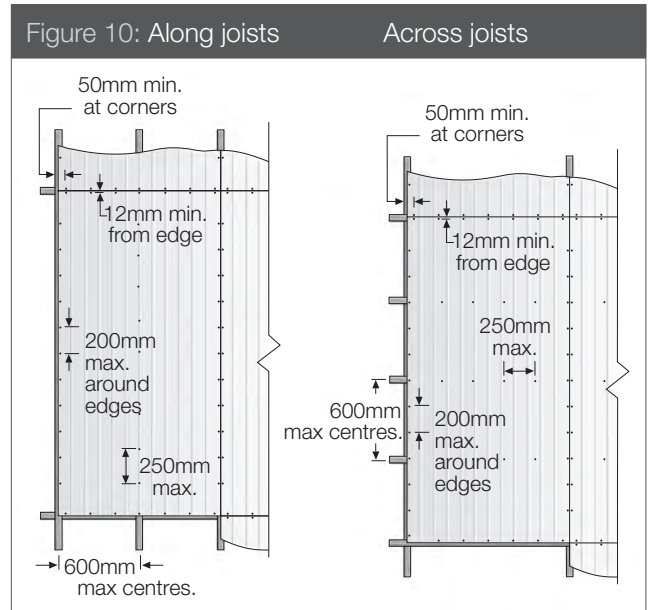
### 4.6 FIXING OVER PLASTERBOARD LINING

HardieGroove Lining can be fixed over an existing plasterboard lining. The sheet must be fixed with minimum 50mm nail or a screw 40mm x 8g.

### 4.7 FIXING TO CEILINGS AND SOFFITS

For Fixing HardieGroove Lining to soffit/ceiling, refer to Eaves and Soffit Linings Installation Manual for further detailed information.

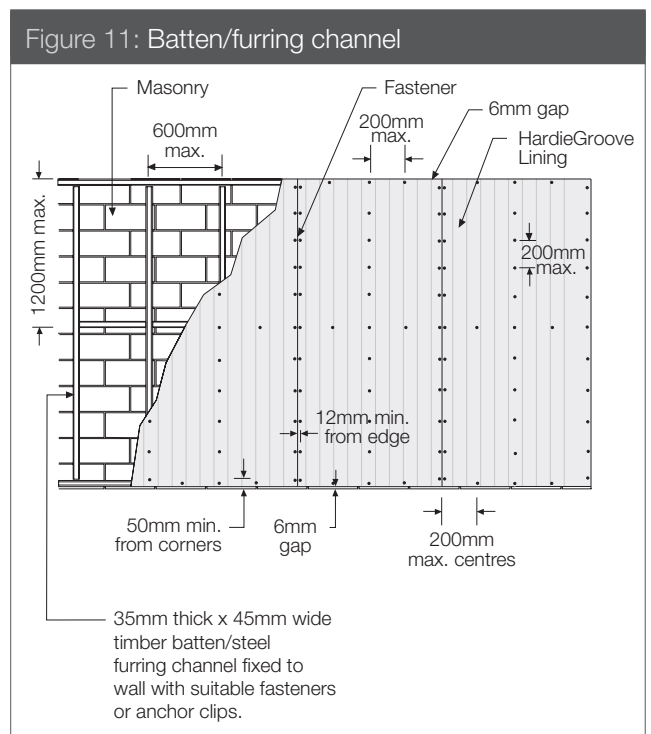
In ceiling applications HardieGroove Lining can be fixed either parallel or perpendicular to framing. See Figure 10.



- NOTES:**
1. Fastener fixing method is shown, however, fastener/adhesive fixing method may also be used. See Figure 8 and 9.
  2. In ceiling applications do not fix sheets to the bottom chord of roof trusses. Instead, fix to timber battens or metal furring channels.
  3. Do not use brad nails in ceiling/soffit applications.
  4. When butt jointing short ends of HardieGroove Lining in ceiling/soffit applications, the short edges must be cut square and have chamfer formed.

### 4.8 FIXING TO MASONRY SUBSTRATES

HardieGroove Lining can be installed over masonry substrates. Refer Figure 11.



# 5 Jointing and corners

## 5.1 BUTT JOINTS

HardieGroove Lining is butt jointed by joining two factory finished half groove sheet edges on stud. This creates a grooved look consistent with the rest of the sheet. See Figures 12 and 13.

Figure 12: Butt joint

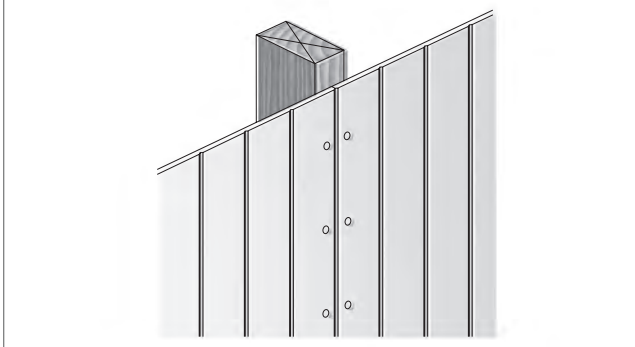
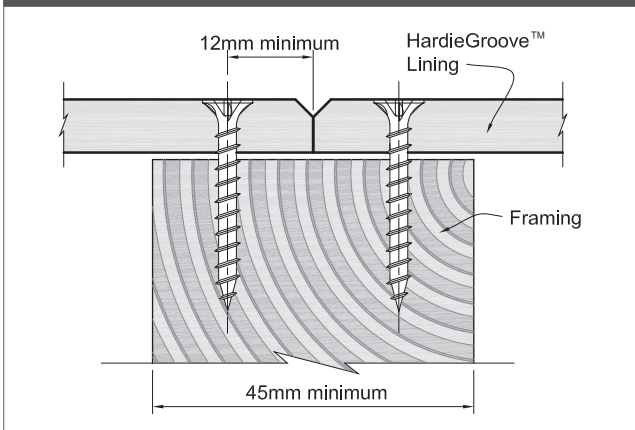


Figure 13: Butt joint



## 5.2 CORNERS

External and internal corners are created by butting sheet edges as shown, see Figures 14 to 16. If sheets need to be trimmed, for best appearance place the cut sheet edge into corner first ensuring that it is hidden by the overlapping sheet. Alternatively a suitable timber moulding may be used.

Figure 14: Corner details

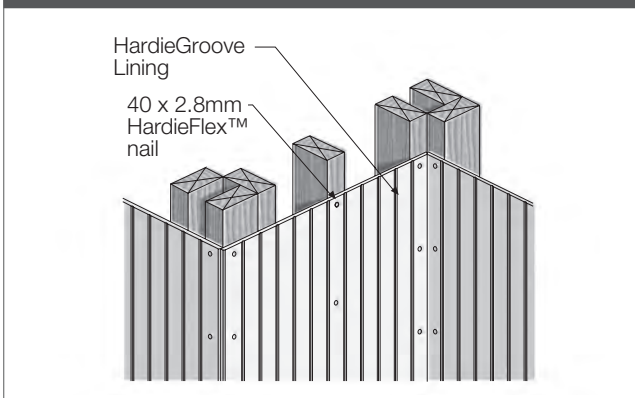


Figure 15: External corner

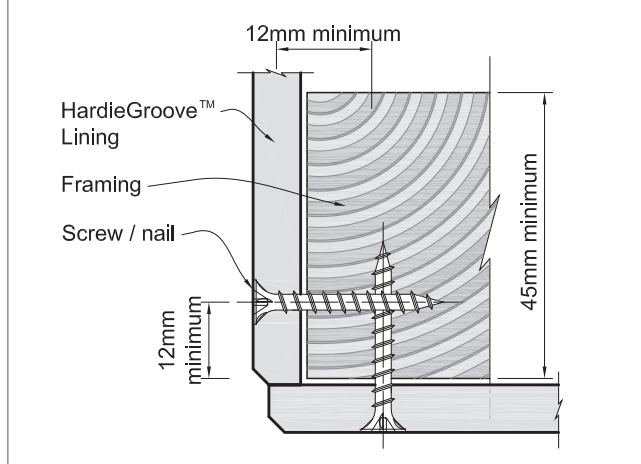
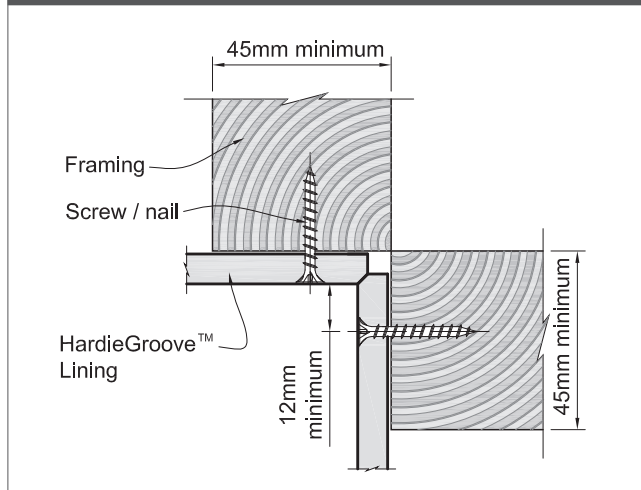


Figure 16: Internal corner



# 6 Product information

## 6.1 GENERAL

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HardieGroove Lining is a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water.

HardieGroove Lining is manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets').

HardieGroove Lining is classified Type B, Category 3 in accordance with AS/NZS 2908.2 'Cellulose-Cement Products'.

For Safety Data Sheets (SDS) visit [www.jameshardie.co.nz](http://www.jameshardie.co.nz) or Ask James Hardie™ on 0800 808 868.

## 6.2 PRODUCT MASS

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Based on equilibrium moisture content the approximate mass of HardieGroove Lining is 10.44kg/m<sup>2</sup>.

## 6.3 DURABILITY

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### Resistance to moisture/rotting

HardieGroove Lining has demonstrated resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Heat rain (Clause 6.5)
- Water permeability (Clause 8.2.2)
- Warm water (Clause 8.2.4)
- Soak dry (Clause 8.2.5)

## 6.4 FIRE PROPERTIES

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Maximum service temperature for the HardieGroove Lining is 60°C.

HardieGroove Lining sheet has been tested for heat release rate as per AS/NZS 3837 and the product has a Heat Release Rate below 50 kw/m<sup>2</sup>.

HardieGroove Lining has a 'Group Number' classification of 1-S as per the requirements of clause C of the NZBC.

## 6.5 FINISHES

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Once HardieGroove Lining has been fixed in place, fill over all fixings with James Hardie Base Coat compound.

Villadrive or HardieDrive screws should be finished 0.5mm below the surface.

When dry, lightly sand smooth and finish with a suitable paint system. Refer to the paint manufacturer for paint suitability, mixing and application.

If staining HardieGroove Lining, care must be taken to ensure the desired finish is achieved. It is advisable to test the stain on an off-cut, paying particular attention to fasteners and filled areas.

## 6.6 MAINTENANCE

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James Hardie recommends that the cleaning and maintenance of the HardieGroove Lining be undertaken regularly as per the recommendations of the coating manufacturer. Joints must also be maintained and be free of dirt and grime.







# Product Warranty



James Hardie New Zealand Limited (“James Hardie”) warrants to the first purchaser of the Product for a period of 15 years from the date of purchase that the HardieGroove™ Lining (the “Product”), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie’s relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie to be used in conjunction with the Product will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

## CONDITIONS OF WARRANTY

The warranty is strictly subject to the following conditions:

- (a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation;
- (b) this warranty is not transferable;
- (c) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. To obtain copies of such literature please contact ‘Ask James Hardie™ 0800 808 868’. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer’s instructions and good trade practice;
- (d) the project must be designed and constructed in strict compliance with all relevant provisions of the current NZBC, regulations and standards;
- (e) the claimant’s sole remedy for breach of warranty is (at James Hardie’s option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product;
- (f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces);
- (g) all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;
- (h) if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

**DISCLAIMER:** The recommendations in James Hardie’s literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of HardieGroove™ Lining when installed in accordance with the HardieGroove™ Lining installation manual, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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# Product Warranty



James Hardie New Zealand Limited ("James Hardie") warrants to the first purchaser of the Product for a period of 15 years from the date of purchase that the HardieGroove™ Lining (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie to be used in conjunction with the Product will be free from defects due to defective factory workmanship or materials.

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- (a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation;
- (b) this warranty is not transferable;
- (c) the Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. To obtain copies of such literature please contact 'Ask James Hardie™ 0800 808 868'. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice;
- (d) the project must be designed and constructed in strict compliance with all relevant provisions of the current NZBC, regulations and standards;
- (e) the claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product;
- (f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces);
- (g) all warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law;
- (h) if meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

**DISCLAIMER:** The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of HardieGroove™ Lining when installed in accordance with the HardieGroove™ Lining installation manual, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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## 5113G GIB Plasterboard Linings



### Winstone Wallboards Ltd

+64 09 6330100  
info@gib.co.nz  
www.gib.co.nz

## SUPPORTING DOCUMENTS

### BRANZ Appraisal 427 (2007) GIB Aqualine® Wet Area Systems

Ref 10726. Uploaded 17 Aug 2020

Purpose: Performance

### GIB Standard Plasterboard 101955

Ref 10140. Uploaded 26 Jun 2020

Purpose: Installation

### GIB® Site Guide

Ref 11079. Uploaded 27 Aug 2020

Purpose: Installation, Maintenance



**BRANZ Appraised**  
Appraisal No.427 [2007]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 427 (2007)**

Amended 31 January 2012

**GIB AQUALINE®  
WET AREA SYSTEMS**

**Winstone Wallboards Limited**  
P O Box 12 256  
Penrose  
Auckland 1642

Tel: 09 633 0100  
Fax: 09 633 0101  
Helpline Tel: 0800 100 442  
Helpline Fax: 0800 229 222  
Web: [www.gib.co.nz](http://www.gib.co.nz)  
Email: [info@gib.co.nz](mailto:info@gib.co.nz)

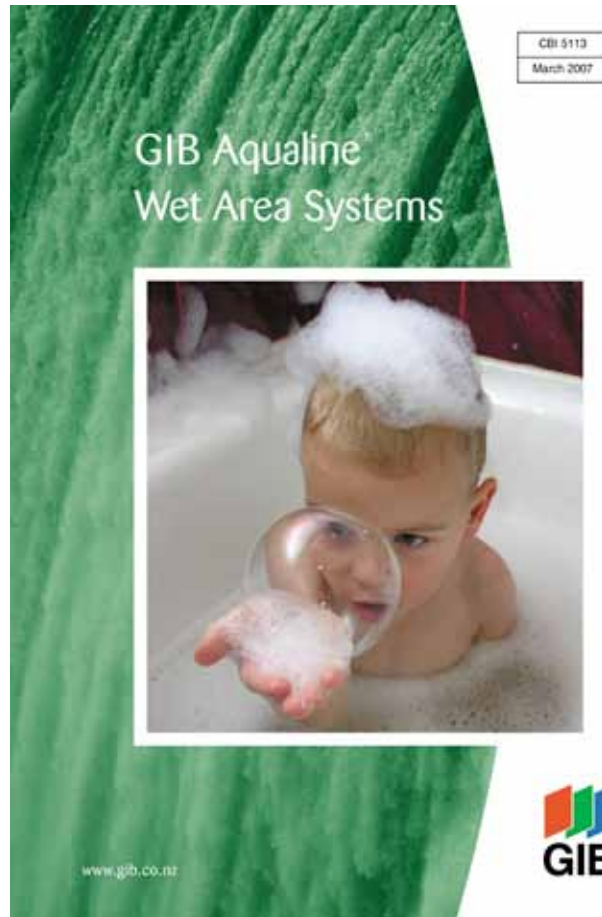


**BRANZ Limited**  
Private Bag 50 908  
Porirua City  
New Zealand  
Tel: +64 4 237 1170  
Fax: +64 4 237 1171  
[www.branz.co.nz](http://www.branz.co.nz)



## Product

- 1.1 GIB Aqualine® Wet Area Systems are for the interior lining of timber and steel frame walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water resistant lining material is desirable.
- 1.2 GIB Aqualine® Wet Area Systems are based on 10 mm and 13 mm thick GIB Aqualine® water resistant plasterboard.



## Scope

- 2.1 GIB Aqualine® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:
  - on framed walls and ceilings within the scope limitations on NZS 3604; and,
  - on timber and light gauge steel framed walls and ceiling subject to specific design; and,
- 2.2 GIB Aqualine® may also be used to substitute for some other GIB® Plasterboards in fire-rated, sound-rated and bracing-rated wall and floor/ceiling constructions.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, the GIB Aqualine® Wet Area Systems, 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. GIB Aqualine® Wet Area Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1 - 8.3.  
**Clause B2 DURABILITY:** Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 9.1 - 9.5.

**Clause C3 SPREAD OF FIRE:** Performance C3.3.1, C3.3.2, and C3.3.5. GIB Aqualine® Wet Area Systems meet these requirements by providing passive fire and smoke protection.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.4, E3.3.5 and E3.3.6. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. GIB Aqualine® Wet Area Systems meet this requirement and will not present a health hazard to people.

**Clause G6 AIRBORNE AND IMPACT SOUND:** Performance G6.3.1 and G6.3.2. GIB Aqualine® Wet Area Systems meet the requirements. See Paragraph 14.1.

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

## Technical Specification

4.1 The GIB® plasterboards and accessories used in the GIB Aqualine® Wet Area System and supplied or specified by Winstone Wallboards Limited are as follows:

### GIB Aqualine®

4.2 GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. The sheets have a taper on the two long sheet edges. GIB Aqualine® is available in 10 mm and 13 mm sheet thicknesses, a sheet width of 1200 mm and in lengths of 2400 mm, 2700 mm, 3000 mm and 3600 mm. The maximum weights are 7.8 kg/m<sup>2</sup> and 10.2 kg/m<sup>2</sup> for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.

### Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:  
6g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel:  
6g x 25 mm and 32 mm.
- GIB® Nails  
30 mm and 40 mm x 2.8 mm

### Adhesive and Sealants

- GIBFix® One (Acrylic)
- GIBFix® All-Bond (Solvent)

### GIB® Accessories and GIB® Jointing Compounds

- As specified in the GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature.

### Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

## Handling and Storage

5.1 The best results are achieved when GIB Aqualine® is treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the GIB Aqualine® Wet Area 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

### General

7.1 GIB Aqualine® provides a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls and paint, and wallpaper to walls and ceilings.

7.2 GIB Aqualine® must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
- In areas of high humidity (above 90% RH) or continually wet such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. (Refer to appliance and fitting manufacturer's for installation details.)

7.3 GIB Aqualine® may be substituted for some other GIB® Plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems and GIB Ultraline® PLUS Lining System.

### Wet Areas

7.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

1. Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
2. Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. Shower areas must additionally be waterproof. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

### Intertency Walls – Wet Areas

7.6 Intertency drywall constructions that incorporate fire resistance and noise control must be protected from water splash. In shower areas GIB Aqualine® must not be substituted for other GIB® Plasterboards but must be an extra lining layer. Refer to the GIB Aqualine® Wet Area Systems Technical Literature.

### Tiling

7.7 GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® up to 20kg/m<sup>2</sup>
- 13 mm GIB Aqualine® up to 32kg/m<sup>2</sup>.

*Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m<sup>2</sup>. For further information on tiling consult the BRANZ Good Practice Guide – Tiling.*

## Framing

7.8 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB Aqualine® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

## Structure

### Bracing

8.1 GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900 mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100 mm centres, using the GIB Braceline® corner fixing pattern.

8.2 GIB Aqualine® must not be used for bracing in shower areas or behind baths.

### Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

## Durability

### Serviceable Life

9.1 GIB Aqualine® has a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining GIB Aqualine® will have a serviceable life in excess of 50 years. The ability of GIB Aqualine® to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

### Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB Aqualine® substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB Aqualine® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

## Outbreak of Fire

10.1 Separation or protection must be provided to GIB Aqualine® Wet Area Systems from heat sources such as stoves, heaters, flues and chimneys.

10.2 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

## Spread of Fire

11.1 When 10 mm GIB Aqualine® is substituted into fire rated systems in place of 10 mm GIB Fyreline®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13 mm GIB Aqualine® is substituted for 13 mm GIB Fyreline®.

## Flame Barrier

12.1 Where flame barriers are required by Acceptable Solution C/AS1 Table 6.3, GIB Aqualine® is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing, or backblocked with GIB® plasterboard.

## Internal Moisture

13.1 When installed in accordance with this Appraisal, GIB Aqualine® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

## Airborne and Impact Sound

14.1 When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur.

## Installation Information

### Installation Skill Level Requirement

15.1 Installation of GIB Aqualine® Wet Area Systems can be carried out by any competent building contractor.

## General

16.1 GIB Aqualine® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

### Cutting

16.2 GIB Aqualine® is easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

### Health and Safety

16.3 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

### Framing

16.4 To achieve an acceptable decorative finish, GIB Aqualine® Wet Area Systems and the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Limited recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

## Fixing Sheets

### Non-Tiled Areas

17.1 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws or GIB® Nails at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

### Tiled Areas

17.2 Control joints must be provided at maximum 4 m centres.

Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle prior to lining the walls.

17.3 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 100 mm centres to perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

### Ceilings

17.4 Supports of timber or steel battens or ceiling joists must be 450 centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine®.

17.5 GIB Aqualine® sheets must be fixed with GIB® Grabber® screws at 600 mm centres around perimeter and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive fixed at 200 mm centre between.

## Penetrations and Sealants

18.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.

18.2 A bead of silicone sealant must be placed to the full thickness of the GIB Aqualine® sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.

18.3 In tiled areas, a bead of silicone sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

## Jointing and Finishing

19.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.

19.2 Tiled shower areas must incorporate a waterproofing membrane over GIB Aqualine®. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

## Investigations

20.1 The GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

20.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

20.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

20.4 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

## Quality

21.1 Winstone Wallboards Limited's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory. The quality management systems of Winstone Wallboards Limited have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581. Winstone Wallboards Limited is responsible for the quality of the product supplied.

21.2 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.

21.3 Designers are responsible for the design of buildings.

21.4 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

## Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- BRANZ Good Practice Guide - Tiling, March 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



# BRANZ

In the opinion of BRANZ, GIB Aqualine® Wet Area Systems 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 the Client, Winstone Wallboards 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. The Client:
  - 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.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation 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 the Client.
5. 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.

For BRANZ

P Robertson  
Chief Executive

Date of issue: 4 April 2007

#### Amendment No. 1, dated 29 April 2010.

This Appraisal has been amended to include a new adhesive, GIBFix® One, and to update reference to AS/NZS 1170.

#### Amendment No. 2, dated 31 January 2012.

This Appraisal has been amended to update reference to NZS 3604: 2011.

# GIB Standard Plasterboard

Product Technical Statement: 101955

miproducts  
THE NATIONAL PRODUCT DATABASE

GIB® Standard plasterboard is an economical lining material available in 10mm and 13mm thicknesses.

[View miproducts listing](#)

Appraisal Company

GIB confirms that this minimum level of assurance has been met or exceeded by the following:

GIB

[Technical Data](#)



## Technical Statement

### Product Description

GIB® Standard plasterboard is an economical lining material available in 10mm and 13mm thicknesses.

13mm GIB® Standard plasterboard is recommended for use on ceilings as it is stronger and more rigid than 10mm GIB® Standard plasterboard.

Sheets have a width of 1200mm and are available in 2400, 2700, 3000, 3300, 3600, 4200, 4800 and 6000mm lengths - see the [selector chart](#) for more information.

GIB Standard plasterboard is available with both edges tapered to allow for flush finishing, or with 1 tapered, 1 square edge to provide a flat surface for finishing trims when fixing horizontally

### New Zealand Building Code (NZBC)

The product will, if employed in accordance with the supplier's installation and maintenance requirements, assist with meeting the following provisions of the building code:

### Notes

### Evidence

The product meets the requirements set out in the following documents, or relevant parts of cited standards within the documents:

### Supporting Evidence

The product has and can make available the following additional evidence to support the above statements:



CodeMark



BRANZ Appraisal

### Use in Service History

## Product Criteria

### Installation requirements

GIB® Standard must be installed in accordance with the manufacturer's Technical Literature.

### Warrantees

## Company Product Information

### Relationships

GIB

[Technical Data](#)



Environmental Choice New Zealand

masterspec partner

### Company Contact Details



Company: Winstone Wallboards Ltd

Physical Address: 37 Felix Street  
Penrose  
AUCKLAND

Postal Address: PO Box 12256  
Penrose  
AUCKLAND

Telephone: 64 09 6330100

Fax: 64 09 6330101

Email: [info@gib.co.nz](mailto:info@gib.co.nz)

Website: [www.gib.co.nz](http://www.gib.co.nz)



Date last validated: 12 July 2017



Date last updated: 12 July 2017

## SPECIFICATION

of 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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**masterspec**

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## 1220 GENERAL REQUIREMENTS

### 1 GENERAL

#### 1.1 THE WORKS

The works are as described in this specification and shown on the drawings.

#### 1.2 PERSONNEL

Owner: The person defined as "owner" in the New Zealand Building Code.

Contractor: The person contracted by the owner to carry out the contract.

#### 1.3 THE SITE

Confine access and work to the area of site indicated on the drawings.

#### 1.4 SPECIFICATION SECTIONS

Sections are for reference and convenience only and do not constitute individual trade sections or work elements. Read all sections together and read this section with all other sections.

#### 1.5 INTERPRETATIONS

Required:	Required by the documents, or by a statutory authority.
Proprietary:	Identifiable by naming the manufacturer, supplier, installer, trade name, brand name, catalogue or reference number.
Approval:	Approval in writing.
Direction:	Direction in writing.
Notified:	Notified in writing.

#### 1.6 ABBREVIATIONS

The following abbreviations are commonly used throughout the specification:

AS	Australian Standard
AS/NZS	Joint Australian/New Zealand Standard
BCA	Building Consent Authority
BRANZ	Building Research Association of New Zealand
LBP	Licensed Building Practitioner
NZBC	New Zealand Building Code
NZS	New Zealand Standard
NZS/AS	Joint New Zealand/Australian Standard
NUO	Network Utility Operator
OSH	Occupational Safety and Health
RBW	Restricted Building Work
TA	Territorial Authority

#### 1.7 INCONSISTENCIES

If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.

#### 1.8 SUBSTITUTIONS

A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions.

Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified. Advise the owner whether an amendment will or may be required to the Building Consent and the expected costs of such amendment.

#### 1.9 THE WORDS "PROVIDE" OR "FIX"

The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.

## 1.10 MANUFACTURERS AND SUPPLIERS

Manufacturers and suppliers requirements, instructions, specifications or details are those issued by them for their particular material, product or component and are the latest edition.

## 1.11 REFERENCED DOCUMENTS

Reference is made to various New Zealand Building Code (NZBC) acceptable solutions (AS) and verification methods (VM) for criteria and/or methods used to establish compliance with the [Building Act 2004](#). Reference is also made to various Standards produced by Standards New Zealand (NZS, AS/NZS) and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise. Documents cited both directly and within other cited publications are part of this specification.

## 1.12 PRECEDENCE OF REFERENCED DOCUMENTS

This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where Building Consent is affected, the change notified to the BCA for advice as to whether an amendment is required to the Building Consent Authority.

## 1.13 BUILDING CONSENT COMPLIANCE

It is an offence under the [Building Act 2004](#) to carry out any work not in accordance with the Building Consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where Building Consent is affected refer any change to the BCA for advice as to whether an amendment is required to the Building Consent.

## 1.14 STATUTORY OBLIGATIONS

Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.

## 1.15 BUILDING CONSENT

Obtain the original or copies of the Building Consent form and documents from the owner and keep on site. Liaise with the BCA and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

## 1.16 INSPECTIONS

Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the BCA inspector.

## 1.17 KEY PERSONNEL

Provide names and contact detail of LBP's/ key personnel. Prior to Restricted Building Work being carried out, provide names, registrations numbers (where appropriate) and contact detail of LBP's that are required for RBW by the Building Consent Authority as part of the Building Consent.

Include the following as applicable:

- Person with the appropriate site license
- Carpenter
- Registered drainlayer
- Registered plumber
- Registered electrician
- Roofer
- External window manufacturer

## 1.18 PRODUCER STATEMENTS AND LBP DOCUMENTATION

When Records of Work or producer statements verifying construction are required, for the application for the Code Compliance Certificate, provide copies to both the BCA and the owner. Provide LBP documents and producer statements in the form required by the BCA.

## 1.19 CERTIFICATE OF COMPLIANCE

Provide Certificates of Compliance for electrical and gas work carried out.

## 1.20 CODE COMPLIANCE CERTIFICATE

Provide documentation that the Owner requires in order to obtain a Code Compliance Certificate for the consented work.

## 1.21 TRADE GUARANTEES AND WARRANTIES

Where specific trade guarantees/warranties are offered covering materials and/or execution of proprietary products or complete installations, or are required as a condition of Building Consent, provide guarantees/warranties to the owner.

## 1.22 SITE ACCOMMODATION

Provide, erect and maintain scaffolding, sheds, toilets, water, power and hoardings. Allow for cartage, craneage, plant hire and storage. Arrange for temporary works and services necessary for the completion of the works.

## 1.23 HEALTH AND SAFETY

Make the works safe and provide and maintain a safe working environment, to the requirements of the [Health and Safety at Work Act 2015](#). Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards and risks.

## 1.24 PROTECT THE WORKS

Protect parts of the work liable to damage until completion of the works. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.

## 1.25 STORAGE AND PROTECTION

Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturer's requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.

## 1.26 ANTIQUITIES AND ITEMS OF VALUE AND INTEREST

Report immediately the finding of any fossils, antiquities, pre-1900 items, or objects of value. Ensure they remain undisturbed until approval is given for their removal.

## 1.27 MEANS OF COMMUNICATION

All directions and approvals in writing.

## 1.28 PROGRAMME

Provide a programme for the contract works, including the work of separate contractors being carried out concurrently with this contract. Form of programme: A dated bar chart, identifying the contract work's critical path and all key dates for the provision of labour, materials and elements. Supply a copy of the programme, and any updates to the owner.

## 1.29 WORKING HOURS

Work on site is restricted to between 0800 to 1800, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by the owner.

## 1.30 RESTRICTIONS

Do not:

- smoke on site
- light rubbish fires on the site
- bring dogs on to or near the site
- bring radios/audio players on to the site.

## 1.31 QUALITY ASSURANCE

Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.

## 1.32 DAMAGE AND NUISANCE

Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the TA and relevant Acts and Standards.

## 1.33 SET-OUT AND DATUM

Set out the works to conform with the drawings. Establish a permanent site datum to confirm the existing ground floor level and its relationship to other existing and new building levels.

**1.34 EXECUTION OF THE WORK**

Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face. Employ only experienced workers familiar with the materials and techniques specified.

**1.35 MATERIALS AND PRODUCTS**

Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.

**1.36 COMPATIBILITY**

Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.

**1.37 COMPLETE ALL SERVICES**

Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.

**1.38 CLEAR AWAY**

Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.

**1.39 CLEAN**

Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.

## 1233 DOCUMENTS REFERENCED

### 1 GENERAL

Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.

The latest edition of the cited document (including amendments and provisional editions) at the date of this specification applies unless stated otherwise.

#### 1.1 ACTS AND REGULATIONS

[Building Act 2004](#)

[Health and Safety at Work Act 2015](#)

[Electricity \(Safety\) Regulations 2010](#) (Reprint as at 4 April 2016)

[Plumbers, Gasfitters and Drainlayers Act 2006](#)

#### 1.2 NEW ZEALAND BUILDING CODE VERIFICATION METHODS

[NZBC E2/VM1](#) External moisture

[NZBC G12/VM1](#) Water supplies

#### 1.3 NEW ZEALAND BUILDING CODE ACCEPTABLE SOLUTIONS

[NZBC B1/AS1](#) Structure - general

[NZBC B2/AS1](#) Durability

[NZBC C/AS2](#) Protection from fire

[NZBC D1/AS1](#) Access routes

[NZBC E1/AS1](#) Surface water

[NZBC E2/AS1](#) External moisture

[NZBC E2/AS3](#) External moisture

[NZBC F2/AS1](#) Hazardous building materials

[NZBC F4/AS1](#) Safety from falling

[NZBC F7/AS1](#) Domestic smoke alarms

[NZBC G1/AS1](#) Personal hygiene

[NZBC G12/AS1](#) Water supplies

[NZBC G13/AS2](#) Foul water - Drainage

## 1.4 NEW ZEALAND STANDARDS

<a href="#">AS/NZS 1604.3</a>	Specification for preservative treatment - Plywood
<a href="#">NZS/AS 1884</a>	Floor coverings - Resilient sheet and tiles - Installation practices
<a href="#">AS/NZS 2269.0</a>	Plywood - Structural - Specifications
<a href="#">AS/NZS 2455.1</a>	Textile floor coverings - Installation practice - General
<a href="#">AS/NZS 2589</a>	Gypsum linings - Application and finishing
<a href="#">AS/NZS 2642.2</a>	Polybutylene pipe systems - Polybutylene pipe for hot and cold water applications
<a href="#">AS/NZS 2699.1</a>	Built-in components for masonry construction Wall ties
<a href="#">AS/NZS 3000</a>	Electrical installations (known as the Australian/NZ Wiring Rules)
<a href="#">AS/NZS 3500.2</a>	Plumbing and drainage - Sanitary plumbing and drainage
<a href="#">AS/NZS 4130:2009</a>	Polyethylene (PE) pipes for pressure applications
<a href="#">NZS 3104</a>	Specification for concrete production
<a href="#">NZS 3109</a>	Concrete construction
<a href="#">NZS 3114</a>	Concrete surface finishes
<a href="#">NZS 3501</a>	Specification for copper tubes for water, gas and sanitation
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3603</a>	Timber structures standard
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 3622</a>	Verification of timber properties
<a href="#">NZS 3631</a>	New Zealand national timber grading rules
<a href="#">NZS 4211</a>	Specification for the performance of windows
<a href="#">NZS 4218</a>	Thermal insulation - Housing and small buildings
<a href="#">NZS 4223.1</a>	Glazing in buildings - Glass selection and glazing
<a href="#">NZS 4223.2</a>	Glazing in buildings - Insulating glass units
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">NZS 4223.4</a>	Glazing in buildings - Wind, dead, snow and live actions
<a href="#">NZS 4246</a>	Energy efficiency - Installing bulk thermal insulation in residential buildings
<a href="#">AS/NZS 4666</a>	Insulating glass units
<a href="#">AS/NZS 4671</a>	Steel reinforcing materials
<a href="#">NZS 6803</a>	Acoustics - Construction noise

## 1.5 BUILDING RESEARCH ASSOCIATION OF NEW ZEALAND (BRANZ)

Good practice guide: Tiling  
 Bulletin 441 - Sealed joints in external claddings - 2. Sealants  
 Bulletin 519 - Fasteners selection

## 1.6 OTHER DOCUMENTS

WorkSafe New Zealand (OSH)

- [Good Practice Guidelines - Excavation Safety](#)

Waterproofing Membrane Association Inc.

- [WMAI CoPTM](#): Code of practice for torch-on membrane systems for roofs and decks

New Zealand Metal Roofing Manufacturers Inc

- [NZMRM COP](#): NZ Metal roof and wall cladding: Code of practice

Window & Glass Association NZ (WGANZ)

- [PQAS](#): Powder Coating Quality Assurance System
- [Window Installation Guide](#): Guide to Window Installation as described in E2/AS1 Amendment 7.

# 1237 WARRANTIES

## 1 GENERAL

This general section refers to the requirements for warranties/guarantees as listed in this section, as referred to within the body of this specification, and as referred to within separate specifications/documents relating to this project. It includes:

- Warranties for parts of the work required by the principal in a required form
- Installer/applicator warranties for parts of the work in the installer's/applicator's standard form
- Manufacturer/supplier warranties provided with products, appliances and the like in the manufacturer's/supplier's standard form
- Guarantees provided by contractor in the contractor's standard form

These guarantees/warranties are in addition to any warranties, implied warranties, or guarantees that are required by the Building Act, the Building Regulations, or the building consent.

### Warranties

#### 1.1 PROVIDE WARRANTIES

Provide executed warranties in favour of the principal in respect of, but not limited to, materials, components, service, application, installation and finishing called for in that specified section of work. The terms and conditions of the warranty in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability under the terms of the warranty called for in that specified section of work.

- Conform to the WARRANTY AGREEMENT form included in the specification/conditions of contract.
- Commence warranties from the date of practical completion of the contract works (unless otherwise stated).
- Maintain their effectiveness for the times stated.
- Provide executed warranties prior to practical completion.

#### 1.2 WARRANTIES - INSTALLER/APPLICATOR

Where installer/applicator warranties are offered covering execution and materials of proprietary products or complete installations, provide such warranties to the contract administrator. These warranties may be provided in lieu of the warranties that are otherwise required provided that these warranties are subject to similar conditions and periods.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

#### 1.3 WARRANTIES - MANUFACTURER/SUPPLIER

Where warranties are offered covering materials, equipment, appliances or proprietary products, provide all such warranties to the contract administrator.

Provide warranties in favour of the principal. The terms and conditions of such warranties in no case negate the minimum remedies available under common law as if no warranty had been offered. Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

### Submission

#### 1.4 REVIEW BY CONTRACTOR

Obtain the warranties from the installers, applicators, manufacturers and suppliers at the earliest possible date and review to ensure that they are correctly filled out and executed. Where warranties are executed as a deed, ensure that a duplicate copy is provided for execution by the owner/principal. Keep safe and secure until required for submission.

#### 1.5 WARRANTIES - REQUIRED BY BUILDING CONSENT AUTHORITY

Obtain copies of warranties required as a condition of the building consent in the form required for submission to the BCA. Keep safe and secure until required at the time of the BCA final inspection and Code Compliance Certificate.

## 1.6 WARRANTIES - REQUIRED BY CONTRACT

Obtain copies of warranties listed in the contract documents. Provide all warranties at the same time. If the project has an operations and maintenance documentation provision, present the warranties with the operations and maintenance information. If no operations and maintenance documentation provision exists, present the warranties to the contract administrator in a loose-leaf binder with a contents index suitably labelled and including the project name and details. Provide a title on the binder edge "Warranties for (project name)"

## 2 SELECTIONS

### Guarantees - Contractor - Master Build Services Ltd

#### 2.1 MASTER BUILD SERVICES LTD - 10 YEAR PREMIUM GUARANTEE

Provide a 10 Year Premium Guarantee (including all optional cover), include all costs in the contract price. Detach the guarantee application form from the guarantee agreement. Complete the form, obtain all required signatures (builder and owner). Send the completed form to Master Build Services for approval along with a copy of the building contract (include a full scope of work for any addition/alteration work), prior to any work commencing. Obtain the Master build Services acceptance letter and provide this to the owner along with the guarantee document. On completion of the building work complete the notice of practical completion form, obtain all required signatures (builder and owner) and forward the form to Master Build Services.

### Weathertightness and watertightness warranty

#### 2.2 WEATHERTIGHTNESS AND WATERTIGHTNESS WARRANTY

A warranty is required from the contractor for a minimum period of 2 years, covering the weathertightness of the complete building envelope and the watertightness of all liquid supply and disposal systems and fittings. This general warranty is in addition to any specific warranties required.

Provide this warranty in favour of the principal. The terms and conditions of this warranty in no case negate the minimum remedies available under common law as if no warranty had been offered.

Failure to provide the warranty does not reduce liability for execution and materials for that part of the work.

- Conform to the standard form WARRANTY AGREEMENT included in the contract documents.
- Commence the warranty from the date of Practical Completion.
- Maintain its effectiveness for the time stated.

## 3 SCHEDULES

### Schedule of work section warranties

#### 3.1 SCHEDULE OF WORK SECTION WARRANTIES

Refer to the following sections:

4161MI	Marshall Weatherization System
4161T	Thermakraft Underlays & DPC
4239JH	James Hardie® Soffits
4311M	Metalcraft Profiled Roofing
4521AR	APL Residential Aluminium Windows & Doors
4610AG	AGP Glazing Residential
4710P	Pink Batts Insulation
5111H	James Hardie® Fibre Cement Sheet Linings
6411K	Karndean Vinyl Surfacing
6511	Carpeting
6700D	Dulux Painting General
7120	Hot & Cold Water System
7411C	Continuous Spouting Rainwater Systems
7421MO	Marley Optim DWV Sanitary System
7612	Residential Extract Systems
7701	Electrical

## 2210 PREPARATION & GROUNDWORK

### 1 GENERAL

This section relates to the clearance, excavation and backfilling of the site area in preparation for:

- footings and floor slabs

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZS 3604](#) Timber-framed buildings  
[WorkSafe NZ](#) [Good Practice Guidelines - Excavation Safety](#)

#### 1.2 SITE SAFETY

Provide adequate support for all excavations. Cover holes and fence off open trenches and banks.

#### 1.3 ARCHAEOLOGICAL DISCOVERY

If fossils, antiquities and other items of value are found refer to the general section 1220 GENERAL REQUIREMENTS for actions to be taken with archaeological discovery.

### 2 PRODUCTS

#### 2.1 EXCAVATED CLEAN FILL

Clean, free of contamination, mineral soil from other formations in the excavation which may be selected and approved as suitable for filling by having grading and moisture content properties that will allow recompaction to 95% of maximum density.

#### 2.2 SAND FILL

Clean sand of such grading in particle size to achieve mechanical compaction to 90% maximum density.

#### 2.3 GRANULAR FILL

Approved screened crushed gravel or scoria, graded in size from 20mm to 7mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.

#### 2.4 DRESSING COURSE

Scoria to GAP 20 grading, or "dirty footpath scoria", or equivalent "all in" graded crushed metal aggregate.

#### 2.5 FREE-DRAINING AGGREGATE

Scoria or crushed gravel graded 50 to 14 clean.

### 3 EXECUTION

#### 3.1 WASHOUT BAY FOR TRUCK

Provide a designated area for trucks to be washed down to avoid mud and dirt being carried off site.

#### 3.2 EXCAVATION GENERALLY

Carry out excavation, using plant suitable for the purpose, to the guidelines set by the [WorkSafe NZ](#), [Good Practice Guidelines - Excavation Safety](#).

#### 3.3 BURNING OF MATERIALS

Burning of materials is not permitted on site.

#### 3.4 PROTECT EXISTING WORK

Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained.

### 3.5 PROTECT EXISTING TREES, PLANTING, OR LANDSCAPE FEATURES

Protect from damage trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained. Ensure existing levels are undisturbed beneath the dripline of retained trees.

### 3.6 EROSION CONTROL

Ensure measures are in place to contain silt dislodged as a result of water infiltration and to prevent it being carried off site with stormwater.

### 3.7 SURFACE PREPARATION

Comply with [NZS 3604](#), section 3.5, **Site preparation**. Remove all turf, vegetation, trees, topsoil, stumps, uncontrolled fill and rubbish from the area to be built on.

### 3.8 UNDERGROUND ELEMENTS AND SERVICES

Break out and remove old foundations, slabs, drainage pipes, manholes, tanks, cables and redundant services. Report for instructions when any unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.

### 3.9 STOCKPILE TOPSOIL

Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spread and level where directed before completion of the works.

### 3.10 SHORING AND UNDERPINNING

Carry out shoring and underpinning shown on the drawings and as necessary to prevent subsidence of adjoining public or private property and to ensure the safety of the public and site personnel.

Maintain protection throughout the progress of the works, or until foundations and subgrade structures have been completed and the stability of adjoining public and private property secured.

### 3.11 GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

### 3.12 ROCK EXCAVATION

If rock is found at any level above the underside of the structural foundations, or above required base levels for site service trenches, immediately notify the owner. Obtain written instructions from the consulting structural engineer on the proposed approach to rock excavation, or consequent alterations to subgrade construction. Confirm any changes with the territorial authority.

### 3.13 FOUNDATION EXCAVATION

Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and free of soft spots, stepped as detailed and clean and free of water.

### 3.14 INADEQUATE BEARING

If localised bearing is not to [NZS 3604](#), 3.1.2 **Foundations** and 3.1.3 **Determination of good ground**, then excavate further and backfill with material as follows:

- Below slabs on grade: Hardfill compacted in 150mm layers
- Below footings: 10 MPa concrete

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.

Confirm any changes with the territorial authority.

For inadequate bearing or over excavation of service trenches, use hardfill compacted in 150mm layers.

### 3.15 STANDARD OF COMPACTION

Place fill in layers of not more than 150mm and compact to achieve 95% of maximum dry density. For granular fill material, the fill shall be compacted to 80% of saturated dry density.

### 3.16 GRANULAR BASE FOR SLABS

To conform to [NZS 3604](#), section 7.5.3, **Granular base**. Consolidate with a vibrating roller. Blind the surface with 20mm of coarse sand or sand/cement and roll ready to receive a damp-proof membrane.

### 3.17 GENERAL BACKFILLING

Obtain written confirmation from the owner before using any excavated material. Compact approved backfilling in 150mm layers with the last 200mm in clean topsoil, lightly compacted and neatly finished off.

### 3.18 RETAINING WALLS

Backfill behind retaining walls with free draining granular material and compact in 200mm layers. Ensure any tanking membranes, protection sheets, drain coil and damp-proofing are not damaged.

### 3.19 SURPLUS MATERIAL

Remove surplus and excavated material from the site.

# 3155FR FIRTH RIBRAFT® FLOOR SYSTEMS

## 1 GENERAL

This section relates to the supply and installation of **Firth Industries** RibRaft® floor system.

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

**ACRS** Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.  
ACRS Web site - [www.steelcertification.com](http://www.steelcertification.com)

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B1/VM1</a>	Structure
<a href="#">NZBC B1/AS1</a>	Structure
<a href="#">NZBC G13/AS1</a>	Foul Water
<a href="#">Nzs 3104</a>	Specification for concrete production
<a href="#">Nzs 3109</a>	Concrete construction
<a href="#">Nzs 3114</a>	Specification for concrete surface finishes
<a href="#">Nzs 3604</a>	Timber-framed buildings
<a href="#">Nzs 3631</a>	NZ Timber grading rules
<a href="#">Nzs 4229</a>	Concrete masonry buildings not requiring specific engineering design
<a href="#">AS/Nzs 4671</a>	Steel reinforcing materials

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Firth RibRaft® Floor System Manual\*  
Firth RibRaft® Technical Manual January 2020  
Firth RibRaft® Flooring Solutions (Introductory brochure)  
Firth RibRaft® HotEdge® installation manual  
Firth RibRaft® X-Pod® Brochure (Introductory brochure)  
Firth RibRaft® X-Pod® Structural Design Guide  
CodeMark™ [Bureau Veritas CM70056](#) - RibRaft® Floor System

\* A copy of this manual must be held on site.

Manufacturer/supplier contact details

Company: **Firth Industries**

Web: [www.firth.co.nz](http://www.firth.co.nz)

Email: [info@firth.co.nz](mailto:info@firth.co.nz)

Telephone: 0800 FIRTH1 (0800 347841)

Further information and/or names of tradespeople who have installed Firth RibRaft® floors are available by phoning Firth Information Service 0800 347841.

### Requirements

### 1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Firth RibRaft® Floor System or component, or associated Firth products.

Concrete used for the construction of Firth RibRaft® Floor System must be supplied by Firth. RibRaft® formers are only available from Firth Industries and are only supplied on a project with confirmation of an order for Firth Concrete.

## 1.5 QUALIFICATIONS

Tradespeople to be competent, experienced, and familiar with the Firth RibRaft® Floor System materials and techniques specified.

## 1.6 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to [AS/NZS 4671](#). Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

## 1.7 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used during construction. Include records of workmanship during construction and photographs of as-built details. Make the information available to the Building Consent Authority inspector on request.

### Performance

## 1.8 COMPLIANCE - RIBRAFT® FLOOR SYSTEM

RibRaft® Floor System meets the requirements of the CodeMark® certificate CodeMark™ Bureau Veritas CM70056 when used within the conditions and limitations of its Certificate of Conformity.

Achieves compliance with NZBC as follows:

- [NZBC B1.3.1](#), 3.2, 3.3, B1.3.1, B1.3.3 (a,b,f,g,h,q,m), B1.3.4
- [NZBC B2.3.1](#) (a), B2.3.1(a), B2.3.2(a)
- [NZBC E2.3.3](#)
- [NZBC F2.3.1](#)
- [NZBC H1. 3.1](#) (refer to limitation c)

## 2 PRODUCTS

### Materials

### 2.1 BLINDING

50mm maximum compacted GAP 7.

### 2.2 TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to [NZS 3631](#).

### 2.3 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to [NZS 3604](#): clause 7.5.4, Damp-proof membrane (DPM). Refer to SELECTIONS.

### 2.4 NORMAL CONCRETE - NON RIBRAFT® APPLICATIONS

Normal concrete 20 MPa grade, maximum aggregate size 19mm to [NZS 3104](#) for concrete work where Firth Raftmix™ or Firth Raftmix™ Pump are not appropriate

### 2.5 REINFORCEMENT

Bars to [AS/NZS 4671](#). Grade 500E deformed, other than for ties, stirrups, and spirals, unless shown otherwise on the drawings.

### 2.6 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

### Materials – RibRaft® Floor System

### 2.7 POLYSTYRENE PODS FORMERS– RIBRAFT® FLOOR SYSTEM

Firth RibRaft® proprietary purpose made polystyrene pods.

### 2.8 INTERNAL CORNER REINFORCEMENT – RIBRAFT® FLOOR SYSTEM

Minimum 2 x HD12 bars Grade 500E to [AS/NZS 4671](#).

### 2.9 MESH – RIBRAFT® FLOOR SYSTEM

Welded reinforcing mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1, generally, Class E, minimum to [NZBC B1/AS1](#) - Grade 500E, 2.27kg/m<sup>2</sup> (1.14kg/m<sup>2</sup> in each direction). Minimum SE62 500E mesh or the equivalent.

- 2.10 **CONCRETE 25MPa - RIBRAFT® FLOOR SYSTEM**  
Firth Raftmix25, a 25 MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size, supplied by Firth Industries. Firth Raftmix™ for direct placement and Firth Raftmix™ Pump for pump applications.
- 2.11 **SPACERS**  
Firth proprietary spacers. Refer to SELECTIONS for size.

### 3 EXECUTION

#### Conditions

#### Application -General

- 3.1 **SITE CLEARANCE**  
Clear the slab area of any vegetation and topsoil down to the subgrade level.
- 3.2 **BUILDING PLATFORM**  
Create a building platform to a level surface to the required depth below finished floor level to suit the RibRaft® or RibRaft® Xpod system. Cut and/or fill sloping sites. Confirm finished floor level.
- 3.3 **POST-CUT INSPECTION – RIBRAFT® FLOOR SYSTEM**  
Inspect and confirm that the soil conditions are as anticipated by the geotechnical investigation and report and conform to the requirements of the Firth RibRaft® manual. Refer to Firth RibRaft® Floor System Manual Section 1 - Design Information, 3.5 Foundation Soils.
- 3.4 **TEMPORARY BUILDING PLATFORM DRAINAGE**  
Construct suitable drainage to keep excessive ground water off the building platform during and after construction as required.
- 3.5 **HARDFILL**  
Place hardfill and ensure it is spread and compacted with mechanical compaction.
- 3.6 **BLINDING LAYER**  
Spread GAP 7 blinding layer to a minimum 500mm past the outside edge of the slab, compact to a level layer no greater than 50mm thick and no higher than 305mm below finished floor level.
- 3.7 **FORMWORK**  
Construct formwork as required, well braced, and tied to remain in position, straight and plumb during construction. Ensure formwork will provide for the topping depth, including rebates and the required concrete finish.
- 3.8 **INSTALL DAMP-PROOF MEMBRANE**  
Apply DPM to the prepared basecourse extending to the outside of all edge beams or fold and staple up the inside of the formwork. Overlap all joints in the DPM sheets a minimum 150mm. Tape laps and penetrations with 50mm wide pressure sensitive plastic tape. Ensure DPM is not damaged during the construction process. Repair all damage to DPM before proceeding with following procedures.

#### Application - RibRaft® floor system

- 3.9 **PIPED SERVICES – BELOW SLAB INSTALLATION**  
Ensure piped and cabled underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and according to Firth RibRaft® floor system requirements. Refer to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.4 Plumbing and Services.
- 3.10 **PLACE POLYSTYRENE PODS**  
Place polystyrene pods in a regular waffle pattern using the spacers in the specified grid pattern to fit the floor plan. Cut pods on site with a saw or suitable hot wire as required. Cut holes for services and trim around piles as required on site.

### 3.11 INSTALL SPACERS

Install spacers and locations to the Firth RibRaft® floor system requirements.

Form standard ribs between pods using Firth 100mm spacers. Place the spacers at a minimum of one spacer along each edge of each pod or part pod. The ribs in both directions form a waffle pattern throughout the slab.

Form the edge beam using Firth 300mm spacers. Place the spacers at 1200mm centres maximum along the perimeter of the slab at least and one spacer per pod or part pod.

Form ribs to support loadbearing walls using Firth 300mm spacers. Place the spacers at a minimum of one spacer along the edge of each pod or part pod.

### 3.12 PLACE REINFORCING STEEL: RIB STEEL

Place rib reinforcing steel in the bottom of the internal ribs and supported in the correct position by the Firth spacers. Lap all steel 720mm minimum and hook all plain bars. At the junction with the edge beam, each rib steel bar shall sit on top of the edge beam bars and extend to the outermost bar. Allow for 75mm cover to the edge of the beam. Place 1 x HD12 bar in each 100mm wide rib and 2 x HD12 bars in each 300mm wide rib.

### 3.13 PLACE REINFORCING STEEL: EDGE BEAM STEEL

Place the two edge beam reinforcing bars in the bottom of the edge beam and supported in the correct position by the Firth spacers. Tie one edge beam bar below the mesh at the perimeter of the area covered by the polystyrene pods. Lap all steel 720mm minimum and hook all plain bars. At corners, the inner bottom bars and the top bars cross each other and extend to 75mm from the outside face of the edge beam. Tie these bars together where they cross. Tying of edge beam steel is only required at corners.

### 3.14 PLACE REINFORCING STEEL: RE-ENTRANT CORNER STEEL

Place two HD12 bars, 1200mm in length across the corner. Tie to the top of the mesh at re-entrant corners at 200mm centres with 50mm side cover from the internal corner.

Install specified steel to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.9 Reinforcing Steel. Ensure specified minimum cover requirements are maintained.

### 3.15 PLACE REINFORCING MESH AND CHAIRS

Place reinforcing mesh over the pods and support on the mesh chairs spaced at 1200mm centres minimum, with two mesh chairs minimum placed per pod and with one mesh chair minimum per part pod.

### 3.16 MESH LAPS

For slabs on ground the welded reinforcing mesh to be lapped and tied, such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 225mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

#### **Application - General**

### 3.17 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings.

Form a minimum 50mm rebate in slab for masonry veneer construction with a width dependent on the veneer width, cavity width and overhang. Waterproof the rebate with a bituminous sealer on both the vertical and horizontal faces.

### 3.18 TOPPING SLAB DEPTH

Refer to SELECTIONS for required topping slab depth.

### 3.19 PRE-PLACEMENT INSPECTION

Arrange for excavations, formwork and reinforcement to be inspected and passed by the Building Consent Authority.

### 3.20 CONCRETE PLACEMENT AND COMPACTION

Ensure the rib and edge beam canals are clean, free of debris. Pour the floor in a single pour using only Firth Raftmix™ Pump concrete and ensuring that the pods remain in position during placing. Pour concrete onto the top of each pod prior to filling the ribs around the pod to help prevent them from floating and lifting.

Use Firth Raftmix™ for placement in the floor directly from the concrete truck chute or Firth Raftmix™ Pump concrete for placement in the floor by concrete pump.

Compact concrete using a suitable poker vibrator for the ribs and ground beams and into all corners of the formwork. Screed as required. Confirm levels with a laser level.

### 3.21 CONCRETE FINISHING

Float and trowel to provide a U3 finish to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

### 3.22 CONCRETE CURING

Curing of the concrete slab must take place immediately after finishing the concrete to [NZS 3109](#) by one of the following curing methods:

- ponding or continuous sprinkling of water
- placing a wet covering or plastic membrane over the slab
- the use of liquid membrane curing compounds

### 3.23 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints as shown on the plans after hardening to a depth of 25mm within 24 hours in summer or 48 hours in winter.

Where shrinkage control joints have not been shown on the plans, position the shrinkage control joints to coincide with major changes in the floor plan. Agree position of shrinkage control joints with the designer.

Bay dimensions formed by the shrinkage control joints to be limited to a maximum ratio of length to width of 2 to 1 with a maximum dimension of 6 metres. Place the shrinkage control joints over the 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide loadbearing rib, locate the cut directly above one edge of the 300mm rib.

### 3.24 CLEAN OUT SHRINKAGE CONTROL JOINTS

Clean out control joints. If required fill with suitable flexible sealant.

#### **Application - other concrete work**

### 3.25 PLACE HARDFILL

Place hardfill and ensure it is spread and compacted with mechanical compaction.

### 3.26 PLACE CONCRETE

Do not place fresh concrete against the preceding layer after more than 45 minutes, or such lesser time as required by the circumstances, to [NZS 3109](#): clause 7.4, Handling and placing.

### 3.27 SCREED THE SURFACE

Screed the concrete surface by straight edge or vibrating screed immediately after compaction and to tolerances in [NZS 3109](#): table 5.2, Tolerances for in situ construction.

### 3.28 CONCRETE FINISHING

Screed and provide a U3 finish to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

#### **Finishing**

### 3.29 STRIKE FORMWORK

Strike formwork after at least 12 hours after the slab has been finished without damaging or overloading structure.

### 3.30 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with suitable patching mortar, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

## 4 SELECTIONS

For further details on selections go to [www.firth.co.nz](http://www.firth.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

### Materials

#### 4.1 DAMP-PROOF MEMBRANE

Brand/type: Thermathane Orange  
Thickness: 0.25mm

#### 4.2 NORMAL CONCRETE

Concrete mix: Firth 20MPa  
Thickness: 100 mm  
Mesh:: 665

### Materials - RibRaft® Floor System

#### 4.3 FIRTH RIBRAFT® POD FLOOR SYSTEM

Brand: Firth Ribraft® Floor System  
Size: 1100mm x 1100mm x 220mm  
Concrete mix: Firth Raftmix 25MPaMPa  
Topping thickness: 85mm  
Mesh: Class E, Grade 500E, minimum SE62 or equivalent

#### 4.4 FIRTH SPACERS

Brand: Firth  
Size: 100mm and 300mm

### Finishing

#### 4.5 CONCRETE SURFACE FINISH - FLOORS

Finish class: U3 (interior)

# 3811 PREFABRICATED STRUCTURAL TIMBER FRAMING

## 1 GENERAL

This section relates to the manufacture, supply and erection, of prefabricated:

- timber trusses
- timber frames

### 1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

FTMA	Frame and Truss Manufacturers Association of New Zealand Inc.
SED	Specific Engineering Design

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/VM1	Structure
NZBC B2/AS1	Durability
AS/NZS 1170	Structural Design Actions
NZS 1170.5	Structural Design Actions - Earthquake actions - New Zealand
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3640	Chemical preservation of round and sawn timber
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

### Requirements

### 1.3 QUALIFICATIONS

Fabricators to be experienced competent workers, familiar with the materials and the techniques specified.

Fabrication companies to be members of the FTMA and accredited by the connector plate manufacturers.

### 1.4 DESIGN CRITERIA NON-SPECIFIC DESIGN

Frames and trusses to [NZS 3604](#).

### 1.5 DESIGN CRITERIA SED

Frames and trusses to, [NZBC B1/VM1](#), [AS/NZS 1170](#), [NZS 1170.5](#) and [NZS 3603](#).

### Documentation required for the Code Compliance Certificate application

### 1.6 PROVISION OF STATEMENTS

Provide the following documentation. The statements shall include the name and position within the company of the person providing the statement.

Fabricator Design and Manufacturing Statements shall be noted as being:

- Issued by a named company, accredited as a fabricator by the nail plate manufacturer
- Issued to the named Owner and available for use by a BCA to assist in determining compliance with the NZBC.

## 1.7 SHOP DRAWINGS

Provide drawings showing the trusses and their layout;

- one prior to fabrication (buildable truss layout) for consent purposes.
- one post fabrication (final truss layout) for construction and code compliance purposes.

The drawing shall be identified as 'Buildable' or 'Final' and shall include the following:

- The name and contact details of the accredited fabricator
- The job/design reference name or number
- The site address/location

Site specific structural and loading information including

- Pitch
- Cladding type
- Wind and snow loading values
- Date drawn
- A truss layout with truss labels and dimensions to locate the trusses on the supporting structure
- Identification of all load bearing walls/beams used to support trusses
- Specification and location of truss to truss and truss to top plate fixings or notification that such items are specified by
- Identification of the location of any resulting loads where the design of the supporting member will be outside the scope of [NZS 3604](#) (point loaded lintels and point loads on internal walls where the downward and upward loads are higher than 16kN)
- Reference to the Fabricator Design Statement

## 1.8 DESIGN STATEMENT - FABRICATOR

Provide a Design Statement issued by the fabricator listing the job specific inputs used in the design process.

The Design Statement shall identify:

- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- Software date/version
- Reference to the Producer Statement - Design
- Supporting compliance documents including standards for material grades and sizes
- The job/design reference name or number
- The site address/location

Job specific information:

- Loads allowed for in the specific design including dead loads (cladding and ceiling) and live loads (wind and snow)
- Roof pitch
- Nominal overhang length
- Importance Level

Design working life:

- A list of the designed trusses, spans and maximum spacing
- Date of design

## 1.9 PRODUCER STATEMENT - DESIGN

Provide a Producer Statement - Design issued by the software provider, supporting the software and the engineering principles being applied by the software.

The Producer Statement shall:

- Have a level of detail consistent with that of an IPENZ Producer Statement PS1
- State the means of compliance with NZBC
- Reference the truss layout and Fabricator Design Statements
- Identify the job/design reference name or number
- Identify the software date/version
- Be signed by a Chartered Professional Engineer

## 1.10 MANUFACTURING STATEMENT

Provide a statement to support the manufacture of the roof trusses, issued by a fabricator after manufacture has occurred and identifying:

- The job/design reference name or number
- The site address/location
- The name and contact details of the accredited fabricator
- The name of the software/nail plate manufacturer that has accredited the fabricator
- That the trusses were manufactured in accordance with the Fabricator Design Statement
- The name and position within the company of the person providing the statement

### Truss identification

## 1.11 IDENTIFICATION OF TRUSSES ON SITE

A selection of trusses in a job lot manufactured by a fabricator shall carry identification labels or markings fitted during manufacture, to [NZS 3604](#), 10.2.2.5, **Truss identification**.

Identification shall be evident on the bottom chords of main rafter or girder trusses on a minimum of 6 trusses in a job lot, or on every truss where there are less than 6 trusses in the job lot.

Identification text shall be a minimum of 10mm high and shall include:

- The fabricator name
- The nail-plate manufacturer name
- The job/design reference name or number

## 2 PRODUCTS

### Materials

### 2.1 TRUSSES NOT EXPOSED

Structural grade timber to [NZS 3602](#), [NZBC B2/AS1](#), gauged, maximum moisture content of 20%, treated to [NZS 3640](#), [NZBC B2/AS1](#), hazard class H1.2 and identified with its unique identifier.

### 2.2 FRAMES NOT EXPOSED

Structural grade timber to [NZS 3602](#), [NZBC B2/AS1](#), gauged, maximum moisture content of 20%, treated to [NZS 3640](#), [NZBC B2/AS1](#), hazard class H1.2 and identified with its unique identifier.

### Accessories

### 2.3 STEEL CONNECTOR PLATES

0.8mm to 2.0mm thick steel sheet, hot-dip galvanized to [NZS 3604](#), table 4.2, **Galvanizing of steel components other than nails and screws** and punched to form a toothed connector or nail on connector.

### 2.4 STAINLESS STEEL CONNECTOR PLATES

0.9mm to 2.0mm thick 304 stainless steel sheet, punched to form a nail on connector.

### 2.5 GALVANIZED STRUCTURAL BRACKETS

>3mm thick steel plate brackets, hot-dip galvanized to [NZS 3604](#), table 4.2, **Galvanizing of steel components other than nails and screws** with hot-dip galvanised bolts/screws and washers.

### 2.6 STAINLESS STEEL STRUCTURAL BRACKETS

>3mm thick, 304 stainless steel plate brackets with stainless steel bolts/screws and washers.

### 2.7 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

## 3 EXECUTION

## Conditions

- 3.1 COMPLY  
Comply with current standards, code requirements and the [FTMA CoP](#) in the design and fabrication of trusses and frames.
- 3.2 DELIVER, HANDLE AND STORE TRUSSES AND FRAMES  
Deliver, handle and store frames and trusses so no structural damage occurs, corners and edges are not damaged, or surfaces marked or stained. Follow manufacturer's requirements. Handle all frames and trusses with nylon strops or similar to prevent damage. Store under cover and clear of the ground, to keep dry prior to installation.

## Fabrication

- 3.3 DIMENSIONS, NOT EXPOSED ELEMENTS  
Each member calculated length  $\pm 3$ mm. Width and thickness to gauging tolerances. Each overall joint within  $\pm 3$ mm of correct outside profile (including camber allowance).
- 3.4 DIMENSIONS, EXPOSED ELEMENTS  
Each member calculated length  $\pm 1$ mm width and thickness to gauging tolerances. Each overall joint within  $\pm 3$ mm of correct outside profile (including camber allowance). Joint thickness and width difference between members 1mm maximum. Plate location within half of the manufacturer's tolerances plus a rotation of no more than 1mm in 100mm off reference line.
- 3.5 INSPECTION  
Request inspection when timber for exposed trusses and frames is ready for cutting prior to fabrication.
- 3.6 FABRICATION  
Factory fabricate to [FTMA CoP](#). Build camber into all elements to accommodate normal deflection under load. Lay up members accurately with all joints tight fitting. Mechanically press plates to manufacturer's tolerances, fully and flat over their whole area into the members forming the joint.
- 3.7 TRUSS AND FRAME FIXINGS  
Factory fit truss and frame fixings to comply with the required loading capacity for that particular joint and in accordance with the fixing type and capacity in [NZS 3604](#), Section 10, **Roof framing**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

## Site installation

- 3.8 TRUSS ERECTION  
Lift, place and fix trusses without overstressing or deformation. Use temporary supports as needed without causing damage. Fix trusses to wall plates and beams to manufacturer's requirements, but no less than [NZS 3604](#), section 10, **Roof framing** and in particular section 10.2.2, **Roof trusses**. Fit and fix bracing as detailed and to [NZS 3604](#): section 10.2.2, **Roof trusses** and section 10.3, **Systems to resist horizontal loads**. Ensure all trusses are correctly located, plumb and true to line and face.
- 3.9 FRAME ERECTION  
Lift, place and fix frames without overstressing or deformation. Use temporary bracing and supports as needed without causing damage. Fix frames to floor or base plates and other walls or columns to manufacturer's requirements, but no less than [NZS 3604](#), section 8, **Walls** and in particular section 8.7, **Plates**. Fit and fix bracing as detailed and to [NZS 3604](#): section 5, **Bracing design** and section 8.3, **Systems to resist horizontal loads**. When necessary provide framing to suit any required cladding/lining control joints. Ensure all frames are correctly located, plumb and true to line and face.
- 3.10 FIT CONNECTORS AND FIXINGS - TRUSS  
Fit connectors and fixings to obtain full bearing over all contact surfaces and ensure the required loading capacity for the truss and frame roof is maintained. Fix each roof framing member in accordance with [NZS 3604](#), Section 10, **Roof framing**. Ensure the size, number and location of nails to be used in roof framing comply with requirements of Table 10.8, **Nailing schedule for hand-driven and power-driven nails**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

**3.11 FIT CONNECTORS AND FIXINGS - FRAMES**

Fit connectors and fixings to obtain full bearing over all contact surfaces and ensure the required loading capacity for the frame is maintained. Fix each framing member in accordance with [NZS 3604](#), Section 8, **Walls**. Ensure the size, number and location of nails to be used in framing comply with requirements of Table 8.19, **Nailing schedule for hand-driven and power-driven nails**, the manufacturer's requirements or to engineering specific design. Ensure all elements are correctly located, plumb and true to line and face.

**3.12 DPC TO TIMBER**

Lay DPC between all timber frames and concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. For LOSP treated timber use only a DPC specifically suitable with LOSP treatment.

**3.13 TIGHTEN BOLTS**

Check and tighten all fixing bolts after erection is completed.

**Completion****3.14 REPLACE**

Replace or repair damaged elements.

**3.15 REMOVE**

Remove debris, unused materials and elements from the site.

**3.16 LEAVE**

Leave work to the standard required by following procedures.

**4 SELECTIONS****4.1 PREFABRICATED TIMBER TRUSSES, NOT EXPOSED**

Fabricator/brand: Mi Tek  
 Species/grade: Radiata Pine  
 Moisture content: 16% maximum  
 Treatment: H.1  
 Connectors: Galvanised

**4.2 PREFABRICATED TIMBER FRAMES, NOT EXPOSED**

Fabricator/brand: Mi Tek  
 Species/grade: Radiata Pine  
 Moisture content: 16% maximum  
 Treatment: H.1  
 Connectors: Galvanised

## 3820 CARPENTRY

### 1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as partitioning. It includes prefabricated timber and engineered wood.

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B2/AS1</a>	Durability
<a href="#">AS/NZS 1328.1</a>	Glued laminated structural timber - Performance requirements and minimum production requirements
<a href="#">AS/NZS 1604.4</a>	Specification for preservative treatment - Laminated veneer lumber (LVL)
<a href="#">AS/NZS 1604.5</a>	Specification for preservative treatment - Glue laminated timber products
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3603</a>	Timber structures standard
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 3622</a>	Verification of timber properties
<a href="#">NZS 3640</a>	Chemical preservation of round and sawn timber
<a href="#">AS/NZS 4357.0</a>	Structural laminated veneer lumber - Specification
<a href="#">FTMA CoP</a>	Frame and Truss Manufacturers Association Code of Practice
<b>*A copy of <a href="#">NZS 3604</a> Timber-framed buildings, must be held on site.</b>	

#### 1.2 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

#### 1.3 DIMENSIONS

All timber sizes except for battens are actual minimum dried sizes.

## 2 PRODUCTS

#### 2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to [NZS 3602](#), [NZBC B2/AS1](#) and treatment to [NZS 3640](#), [NZBC B2/AS1](#). Structural grade (SG) to [NZS 3604](#), [NZS 3622](#) with properties to [NZS 3603](#).

#### 2.2 LAMINATED TIMBER

Radiata pine laminations to [AS/NZS 1328.1](#); treated as required by [NZS 3602](#), [NZBC B2/AS1](#), to the requirements of [NZBC B2/AS1](#), [AS/NZS 1604.5](#), [NZS 3640](#), with special attention to Appendix B "Specification advisory notes". Supply weather resistant sealed.

#### 2.3 ENGINEERED WOOD

LVL members to [AS/NZS 4357.0](#), to required sizes and lengths and the manufacturer's design properties.  
Treatment to [NZS 3640](#) and [AS/NZS 1604.4](#).

#### 2.4 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 or H3.2 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings.  
To [NZS 3602](#), table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

#### Components

#### 2.5 NAILS

Type to [NZS 3604](#), section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of [NZS 3604](#), sections 6-10.

## 2.6 SCREWS

Wood screws to the requirements of [NZS 3604](#), 2.4 Fastenings and Fabrication, and section 4, **Durability**, and of the type, number and form required for each screw application to [NZS 3604](#), sections 6 - 10.

## 2.7 BOLTS AND COACH SCREWS

Bolts and coach screws complete with washers, to the requirements of [NZS 3604](#), clause 2.4.5 Bolts and Coach Screws, and section 4, **Durability**, and of the type, number and form required for each particular junction to [NZS 3604](#), sections 6 - 10.

## 2.8 NAIL PLATES

Comply with the requirements of [NZS 3604](#), section 4, **Durability**, and of the number and form required for each particular junction to [NZS 3604](#), sections 6 - 10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

## 2.9 CONNECTORS

Comply with the requirements of [NZS 3604](#), section 4, **Durability**, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

## 2.10 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

## 2.11 DPC

Polyethylene film to [AS/NZS 2904](#) and to the appropriate test methods set out in [AS/NZS 4347.0](#). Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings to doors and windows.

# 3 EXECUTION

## 3.1 EXECUTION GENERALLY

To [NZS 3604](#) except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

## 3.2 SEPARATION

Separate all timber framing timbers from concrete, masonry and brick by: -

- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

## 3.3 ATTENDANCE

Provide and fix blocks, nogs, openings and other items as required by other trades.

## 3.4 MOISTURE CONTENT

Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.

Framing at erection:	24% maximum
Framing at enclosure:	20% maximum
Framing at lining:	16% maximum

## 3.5 SET-OUT

Set out framing in accordance with the requirements of [NZS 3604](#) and as required to support sheet linings and claddings. When necessary provide framing to suit any required cladding/lining control joints and sheet joints.

## 3.6 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to [NZS 3604](#), section 8, **Walls**.

### 3.7 FRAMING ROOFS

Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.

### 3.8 FRAMING CEILINGS

Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

### 3.9 DPC TO TIMBER

Lay polyethylene DPC under treated and untreated timber, including LOSP treated timber, of all timber framed walls on concrete and concrete masonry, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. Lay DPC between dissimilar materials where required.

## 4 SELECTIONS

### 4.1 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
Exterior walls, bottom plates	Radiata pine	SG8	H3.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Radiata pine	SG8	H3.2

### 4.2 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

### 4.3 INTERIOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2

### 4.4 EXTERIOR EXPOSED TIMBERS

Member	Species	Grade	Treatment
Posts:	Radiata pine	SG8	H4 CCA
Joists:	Radiata pine	SG8	H3.2 CCA
Exterior stairs and steps:	Radiata pine	SG8	H3.2 CCA
Pergola:	Radiata pine	SG8	H3.2 CCA
Ground contact members	Radiata pine	SG8	H5 CCA

Note all CCA to be preservative code 01 or 02

### 4.5 DPC

Supercourse 500™ DPC

# 4161MI MARSHALL WEATHERIZATION SYSTEM

## 1 GENERAL

This section relates to the application of the **Marshall Weatherization System** which consists of:

- **Tekton® Building Wrap** (also called **Tekton HouseWrap**)
- **SUPER-STICK Building Tape®**
- **Tekton® Seam Tape**
- **TRADE-SEAL** (penetration seal)

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

Wall underlay	the same meaning as defined in <a href="#">NZBC E2/AS1</a> , covering kraft based and synthetic wall underlays, sometimes called, wall wraps, building wraps or building papers.
Roof underlay	the same meaning as defined in <a href="#">NZBC E2/AS1</a> , covering kraft based and synthetic roof underlays

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B2/AS1</a>	Durability
<a href="#">NZBC E2/AS1</a>	External moisture

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Specification for **Marshall Weatherization System**

Specification for **Tekton® Building Wrap**

Brochure for **Tekton® HouseWrap**

Specification for **SUPER-STICK Building Tape®**

Brochure for **SUPER-STICK Building Tape®** Specification for **TRADE-SEAL**

Brochure for **TRADE-SEAL**

[BRANZ Appraisal 444](#) - Protecto Sill Window Sealing System

[BRANZ Appraisal 548](#) - Tekton® Building Wrap

[BRANZ Appraisal 621](#) - The Marshall Weatherization System

[BRANZ Appraisal 719](#) - Trade-Seal Pipe and Penetration Seal

[BRANZ Appraisal 846](#) - SUPER-STICK Flexible Flashing Tape

[BRANZ Appraisal 1071](#) - HYDRA Roof Underlay

Manufacturer/supplier contact details

Company: **Marshall Innovations Limited**

Web: [www.mwnz.com](http://www.mwnz.com)

Email: [headoffice@mwnz.com](mailto:headoffice@mwnz.com)

Telephone: 0800 776 9727

### Warranties

#### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

15 years: Provide a material manufacturer/supplier warranty:

- 15 years: For **Tekton® Building Wrap**
- 15 years: For **HYDRA roof underlay**
- 15 years: For **SUPER-STICK Building Tape®**
- 15 years: For **Tekton® Seam Tape**
- 15 years: For **TRADE-SEAL**
- 15 years: For **Protecto Sill Window System**

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

#### 1.5 QUALIFICATIONS - WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Work to be carried out by competent, experienced tradespeople, who are familiar with the **Marshall Innovations Limited** materials and techniques specified, by or under the supervision of a Licensed Building Practitioner (LBP) with the relevant Licence Class.

#### 1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified **Marshall Innovations Limited** systems, components and associated products listed in this section.

## 2 PRODUCTS

#### Materials

#### 2.1 TEKTON BUILDING WRAP

**Tekton® Building Wrap**, a synthetic breather-type wall underlay, as a coated spun-bonded polypropylene product approximately 0.6mm thick. Supplied in rolls 2740mm x 37m and 1370mm x 37m.

#### 2.2 TEKTON SEAM TAPE

**Tekton® Seam Tape**, a white polypropylene film coated with a cold weather acrylic adhesive. Tape is supplied in rolls 48mm wide x 50m long.

#### 2.3 TRADE-SEAL

**TRADE-SEAL**, a one piece self-adhesive EPDM collar bonded to a polyethylene carrier, for pipes and conduits that penetrate the cladding/wrap/underlay. Provides secondary protection air and moisture seal, and is available in ten size options to suit penetration diameters from 8mm to 220mm.

#### 2.4 SUPER-STICK BUILDING TAPE

**SUPER-STICK Building Tape®**, a multi-layered silver polyester-faced, copolymer, self-adhesive tape. Utilizes a high tack pressure sensitive adhesive (PSA) combined with a high-performance toughened film. Tape is supplied in 75mm, 150mm and 200mm wide x 22.86m long rolls.

#### Accessories

#### 2.5 FIXINGS

Staples, clouts, screws, proprietary wrap fixings or other temporary fixings to attach the wall or roof underlay to the framing.

#### 2.6 BUILDING WRAP/WALL UNDERLAY RESTRAINTS

Polypropylene tape or galvanized wire or 75mm galvanized mesh, to [NZBC E2/AS1](#), clause 9.1.8.5, **Wall framing behind cavities**, for intermediate restraining of the building wrap/wall underlay from bulging into the drained cavity where stud spacings are greater than 450mm. Wire or tape to be run horizontally at 300mm centres.

## 3 EXECUTION

#### Conditions

### 3.1 GENERAL REQUIREMENTS

To [NZBC E2/AS1](#) Table 23 Properties of Roof Underlays and Wall Underlays; and manufacturers technical literature.

Note: Care should be taken not to expose the underlay to continuous wet and windy conditions.

### 3.2 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Store all products under clean dry conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture. Rolls of **Tekton® Building Wrap** to be stored on end.

### 3.3 PRE-INSTALLATION REQUIREMENTS

Before starting work, check that the framing will allow work of the required standard. The framing must be free from any sharp protrusions that may damage the wrap/underlay. Carry out remedial work identified before the installation of the **Marshall Weatherization System**.

#### Installation/application - generally

### 3.4 STANDARDS AND TOLERANCES

To [NZBC B2/AS1](#) and [NZBC E2/AS1](#). Refer to the general section 1270 CONSTRUCTION for general requirements.

#### Installation - Tekton® Building Wrap

### 3.5 WRAP/UNDERLAY GENERALLY

To comply with Marshall Innovations Limited specification for the **Marshall Weatherization System**, [BRANZ Appraisal 621](#) - The **Marshall Weatherization System** and [BRANZ Appraisal 548](#) - Tekton® Building Wrap.

Face branded side of the wrap/underlay away from the framing. Run horizontally and extend from upper side of the top plate to the underside of bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.

Ensure horizontal laps no less than 75mm with the direction of the lap ensuring that water is shed to the outside. End laps to be made over framing and be no less than 150mm wide.

### 3.6 FIXINGS

Fix the wrap/underlay into place using 6mm to 8mm zinc plated staples, hot dip galvanised large head clouts, tek screws or proprietary wrap/underlay fixings. Care to be taken when fixing in windy conditions, due to large sail area created by roll widths.

### 3.7 POSITION ROLL

Position roll against the framing with a short length of wrap/underlay free of the roll. Align the guide marks printed on the **Tekton® Building Wrap** with visible studs and nail/staple to the framing.

### 3.8 FIX TO FRAMING

Unroll wrap/underlay across framing and fix to all framing members at a maximum of 300mm centres. Keep straight and taught over framing. Unroll wrap/underlay across framing and fix to all framing members at a maximum of 300mm centres. Keep straight and taut over framing.

### 3.9 WRAP/UNDERLAY GENERALLY

To comply with Marshall Innovations Limited specification for the **Marshall Weatherization System**, [BRANZ Appraisal 1072](#) - HYDRA Wall Underlay.

Face branded side of the wrap/underlay away from the framing. Run horizontally and extend from upper side of the top plate to the underside of bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.

Ensure horizontal laps no less than 75mm with the direction of the lap ensuring that water is shed to the outside. End laps to be made over framing and be no less than 150mm wide.

### 3.10 FIXINGS

Fix the wrap/underlay into place using 6mm to 8mm zinc plated staples, hot dip galvanised large head clouts, tek screws or proprietary wrap/underlay fixings. Care to be taken when fixing in windy conditions, due to large sail area created by roll widths.

### 3.11 APPLY SEAM TAPE

Apply **Tekton® Seam Tape** to all horizontal and vertical building wrap/underlay joints. Lap joint to sit halfway under the tape width. Press all tape firmly into position to enhance adhesion. Use **Tekton® Seam Tape** to repair small rips, punctures or tears in the building wrap/underlay and tape into place. Ensure overlapping material extends at least 150mm beyond the damaged area.

### 3.12 INSTALL PENETRATION SEAL

For pipe and conduit penetrations of the cladding/wrap/underlay use the appropriate sized **TRADE-SEAL**, to ensure a tight fit around the pipe. Any paired cable or multiple air conditioning pipes must pass through a conduit. Conduits must be sealed to prevent entry of any wind driven moisture. Conduits can be sealed with either an expanding foam or sealant. Install the **TRADE-SEAL** to Marshall Innovations Limited requirements. Push back the collar to fit the cavity width. Ensure the **TRADE-SEAL** exposure to weather and UV does not exceed 90 days. Trade-Seals should never be forced over pipes or conduit, they can be trimmed to get appropriate fit.

### Installation - SUPER-STICK Building Tape

### 3.13 SUPER-STICK BUILDING TAPE

To comply with Marshall Innovations Limited specification for **Marshall Weatherization System**, [BRANZ Appraisal 621](#) - The **Marshall Weatherization System** and [BRANZ Appraisal 846](#) - SUPER-STICK Building Tape®.

### 3.14 PREPARATION

Ensure all surfaces are clean, dry and free of any foreign matter that may adversely affect adhesion. Do not install tape below -6°C. When used in conjunction with LOSP treated timber, allow solvent to evaporate for a minimum of 7 days prior to application. Extend building wrap/underlay over opening and cut on a 45° angle away from each corner. Fold flaps into opening and secure to the interior face of framing.

### 3.15 SILL AREA – OVER BUILDING WRAP

Cut 4 strips of SUPER-STICK at 150mm x 75mm, Apply 2 strips at a 45 degree angle to the two bottom corners overlapping the corner by 3mm to create a seal at the corner junction. Measure and mark 150mm (for 90mm framing) / 200mm (for 140mm framing) up the jamb from the bottom corners of opening. Measure sill length. Measure and cut a length of **SUPER-STICK** 300mm (for 90mm framing) / 400mm (for 140mm framing) longer than sill length. Roll up the cut length with the split release film to the outside of the roll. Peel back 50mm of the split release film from the inside edge. Align SUPER-STICK with 150mm (for 90mm framing) / 200mm (for 140mm framing) mark and flush with inside edge of the opening. Apply tape down frame and tight into corner.

When the sill jamb junction is reached ensure tape is pressed firmly into corner. Continue removing backing paper and adhering SUPER-STICK across the length of the sill and up the other jamb. Keep tape flush with inside edge of opening and the overhang to the outside of the framing.

At the corner and starting at the front edge of the tape overhang, carefully cut the tape back towards the framing stopping 3mm from the opening corner. The remainder of the split release film can now be removed. Fold the overhang onto the face of the framing and smooth firmly into place over the building wrap and corner butterflies. Press the tape down firmly to ensure proper adhesion.

Apply a layer of 75 mm SUPER-STICK over the top of the original flashing tape along the entire length of the sill. Align the tape to the inside face of the sill or alternatively apply a 150 mm by 150 mm square of Super Stick on top of the original flashing tape on the sill, where a nail will penetrate, to provide a fixing seal as per BRANZ Appraisal.

### 3.16 TOP CORNERS - OVER BUILDING WRAP

Cut two 300mm (for 90mm framing) / 400mm (for 140mm framing) lengths of **SUPER-STICK**. Mark 150mm (for 90mm framing) / 200mm (for 140mm framing) down from the underside of the lintel.

Roll up the cut length with the split release film to the outside of the roll. Peel back 50mm of the split release film from the inside edge. Align **SUPER-STICK** with 150mm (for 90mm framing) / 200mm (for 140mm framing) mark and flush with inside edge of opening. Apply tape up the frame and tight into the corner. Press tape firmly into the corner junction, then continue across the underside of the opening. At the corner and starting at the front edge of the tape overhang, carefully cut the tape back towards the framing stopping 3mm from the opening corner. The rest of the split liner / release film can now be removed.

Fold the overhang onto the face of the framing and smooth firmly into place.

Take the 75mm x 150mm strips of **SUPER-STICK**, remove the backing paper. Adhere diagonally across each corner, overlapping the corner by 3mm to create a seal at the corner junction. Press the overlap tightly into the corner to form a tight bond between the tapes. Smooth all tape firmly into place to maximize adhesion.

### 3.17 HEAD FLASHING

Install tape to head flashings using **SUPER-STICK** 75mm in accordance with Marshall Innovations Limited **SUPER-STICK** specification and RAB manufacturers specifications.

#### Completion

### 3.18 DEFECTIVE OR DAMAGED WORK

Repair small rips, punctures or tears in the underlay and tape into place. Ensure overlapping material extends at least 150mm beyond the damaged area.

## 4 SELECTIONS

#### Materials

### 4.1 MARSHALL WEATHERIZATION SYSTEM - WALL UNDERLAY

Wrap/underlay:	Tekton Wall Underlay
Seam tape:	<b>Tekton® Seam Tape</b>
Penetration seal:	<b>TRADE-SEAL</b>
Sill tape/system:	<b>SUPER-STICK Flexible Flashing Tape</b>

# 4161T THERMAKRAFT UNDERLAYS & DPC

## 1 GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM roofing underlays and accessories.

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

NZMRM                      New Zealand Metal Roofing Manufacturers Inc.

#### Documents

### 1.2 DOCUMENTS

The following documents are specifically referred to in this section:

<a href="#">NZBC C/AS2</a>	Protection from fire
<a href="#">NZBC E2/AS1</a>	External moisture
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
<a href="#">NZS 2295</a>	Pliable, permeable building underlays
<a href="#">AS/NZS 2904</a>	Damp-proof courses and flashings
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4214</a>	Methods of determining the total thermal resistance of parts of buildings
<a href="#">AS/NZS 4389</a>	Roof safety mesh
<a href="#">AS/NZS 4534</a>	Zinc and zinc/aluminium-alloy coatings on steel wire
<a href="#">NZMRM CoP</a>	NZ Metal Roof and Wall Cladding Code of Practice

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:

Thermakraft product manual and technical data sheets.

[BRANZ Appraisal 329](#) - Supercourse 500™ Damp-Proof Course and Concealed Flashing

[BRANZ Appraisal 651](#) - Thermakraft Covertek™ 407 Fire Retardant Self-Supporting Roof and Wall Underlay

[BRANZ Appraisal 1104](#) – Thermathene Orange Concrete Underlay

[BRANZ Appraisal 1122](#) – Thermaflash Flashing Tape

[Code Mark Certificate 30028](#) - Thermakraft Covertek 407™ Absorbent Breathable Roof Underlay

Manufacturer/supplier contact details

Company:                      Thermakraft Ltd

Web:                              [www.thermakraft.co.nz](http://www.thermakraft.co.nz)

Email:                            info@thermakraft.co.nz

Telephone:                      0800 806 595

#### Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Ltd warrant performance of products if design and installation complies with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of Thermakraft™ Product Warranty available on request.

#### Requirements

### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

## 1.6 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of Thermakraft™ products and familiar with Thermakraft™ technical literature and the related documents listed in this design i.e. [NZMRM CoP](#) NZ Metal Roof and Wall Cladding Code of Practice.

## 2 PRODUCTS

### Materials

#### DPC

### 2.1 EMBOSSSED POLYETHYLENE

Supercourse 500™ hi-impact polyethylene film to [AS/NZS 2904](#) and embossed on both sides. Thickness 500 microns minimum, manufactured for use as a damp-proof course and concealed flashings around doors and windows and to [BRANZ Appraisal 329](#).

#### DPM

### 2.2 DAMP-PROOF MEMBRANE - MEDIUM DUTY, BLACK

Thermathene Black™, a minimum of 250 microns polyethylene film. Complies with [NZS 3604](#), 7.5.4, Damp-proof Membrane, to [NZBC E2/AS1](#). Refer to SELECTIONS for type of jointing tape.

### Roofing underlays

### 2.3

#### SYNTHETIC FIRE RETARDANT SELF SUPPORTING NON-WOVEN ROOFING UNDERLAY - COVERTEK 407

CoverTek™ 407, a fire retardant non-woven self-supporting roofing underlay, consisting of two spun-bonded polyolefin fabric layers bonded to a micro porous inner layer, designed for use as a water absorbent, breathable, water resistant roofing underlay for sloped roofs. CoverTek™ 407 has a flammability index of ≤ 5, when tested to AS 1530.2, to [NZBC C/AS2](#), meets the requirements for suspended fabrics, [BRANZ Appraisal 651](#) and [Code Mark Certificate 30028](#). Can be used in areas exposed to view in occupied spaces.

### Accessories

### 2.4 GUTTER AND UNDER FLASHINGS

Thermakraft 215™, bituminous breather type underlay to [NZS 2295](#) cut to width for use under valley, apron flashing and internal gutters.  
Soffit liner cut to width from Thermakraft 215™ bituminous breather type underlay. Refer to SELECTIONS.

### 2.5 TAPE

Thermakraft™ tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:

- Thermakraft™ White General Purpose Underlay Tape
- Thermakraft Premium Joining tape
- Thermakraft™ Window Sealing Tapes, used to repair damaged bituminous underlays

## 3 EXECUTION

### Conditions

### 3.1 GENERAL REQUIREMENTS

Design application and installation of Thermakraft Building products to [NZBC E2/AS1](#), [BRANZ Appraisals](#), Thermakraft Technical Literature and Industry Codes of Practice.

### 3.2 STORAGE

Store building underlays and accessory materials, under conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture.

### 3.3 INSPECTION

Before starting work, check that the building construction phase will allow work of the required standard. Carry out remedial work identified before laying underlay.

#### **Application DPC**

### 3.4 DPC TO LOSP/CCA TREATED TIMBER

Lay Supercourse 500™ DPC under LOSP or CCA treated bottom plate of all timber framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier.

### 3.5 DPC TO TIMBER / STEEL

Lay Supercourse 500™ DPC under the bottom plate of all timber / steel framed walls on concrete, in a single layer with 50mm overlaps at joints to provide a waterproof barrier. Refer to SELECTIONS for type.

#### **Application - DPM**

### 3.6 DPM TO CONCRETE FLOOR

Lay DPM under concrete floor substrate over sand blinding, in a single layer with 150mm overlaps at joints to provide a waterproof barrier. Tape all joints and penetrations with Thermakraft™ White GP Tape 60mm.

#### **Application - roofing underlay**

### 3.7 ROOF UNDERLAY

Horizontally lay over purlins starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations and avoid prolonged exposure by installing the roof immediately.

### 3.8 GUTTER AND UNDER FLASHINGS

Lay Thermakraft 215™ bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix Thermakraft 215™ bituminous breather type underlay soffit liner from top plate down 150mm past ribbon plate.

#### **Completion**

### 3.9 CLEAN UP

Clean up as the work proceeds.

### 3.10 LEAVE

Leave work to the standard required by following procedures.

### 3.11 REMOVE

Remove debris, unused materials and elements from the site.

## **4 SELECTIONS**

For further details on selections go to [www.thermakraft.co.nz](http://www.thermakraft.co.nz). Substitutions are not permitted to the following, unless stated otherwise.

#### **Damp Proof Course**

### 4.1 THERMAKRAFT - SUPERCOURSE 500™ DPC

Type: Supercourse 500™ DPC  
Joining tape: Thermakraft™ window sill tape 75mm Aluband™

### 4.2 THERMATHENE BLACK™

Type: Thermathene Black™  
Joining tape: Thermakraft™ Premium Joining Tape

#### **Roofing Underlays**

#### 4.3 COVERTEK ROOFING UNDERLAYS

Type: CoverTek™ 407 fire retardant non-woven SS roofing underlay,  
Joining tape: Thermakraft™ Premium Joining Tape

#### **Gutter and Under Flashing**

#### 4.4 GUTTER AND UNDER FLASHINGS

Type: Valley guard 625mm wide  
Joining tape: Thermakraft™ Premium Joining Tape

## 4221 TIMBER BOARD CLADDING

### 1 GENERAL

This section relates to the supply and fixing of timber cladding:

- weatherboards

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External Moisture
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 3617</a>	Profiles of weatherboards, fascia boards and flooring
<a href="#">NZS 3631</a>	New Zealand timber grading rules

#### Performance

#### 1.2 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by [NZS 3604](#).

#### 1.3 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations.

### 2 PRODUCTS

#### Materials

#### 2.1 UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

#### 2.2 WEATHERBOARDS

Profile (unless detailed otherwise) to [NZS 3617](#), species and grading to [NZS 3602](#), [NZS 3631](#), minimum treatment to [NZS 3602](#), table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in long lengths, with all knots excluded.

#### 2.3 COVER BOARDS, BOXED CORNERS AND SCRIBERS

To profiles as detailed, with species and grading to [NZS 3602](#), [NZS 3631](#), but with all knots excluded. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

#### Components

#### 2.4 NAILS, GALVANIZED

60mm x 2.8mm and 75mm x 3.15mm galvanized steel.

#### 2.5 FLASHINGS

Material, grade and colour as detailed and scheduled and to [NZBC E2/AS1](#); Table 21: Compatibility of materials in contact and Table 22: Compatibility of materials subject to run-off. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

#### 2.6 SOAKERS, ALUMINIUM/ZINC COATED STEEL

Machine folded aluminium/zinc coated steel sheet to profile of weatherboard and mitred corner joints.

- 2.7 SOAKERS, COPPER  
Machine folded half-hard copper sheet to profile of weatherboard and mitred corner joints.

### Finishes

- 2.8 SEMI-TRANSPARENT STAIN  
Water borne acrylic stain, solvent borne semi-transparent oil stain, or solvent-borne semi-transparent oil-alkyd stain to suit the timber.

## 3 EXECUTION

### Conditions

- 3.1 GENERALLY  
Execution to [NZBC E2/AS1](#): 3.0 Weathertightness risk factors, and 9.0 Wall claddings, 9.1.8 Drained cavities.
- 3.2 STORAGE  
Take delivery of timber, dry, unmarked and undamaged. Store on site, laid flat and true under cover.
- 3.3 SUBSTRATE  
Before starting fixing ensure that the substrate conforms with [NZS 3604](#), section 2, table 2.1, **Timber framing tolerances** and the requirements of [NZS 3604](#), section 6, **Foundation and subfloor framing** and [NZBC E2/AS1](#), governing support for timber board cladding.
- 3.4 MOISTURE CONTENT  
Immediately before starting fixing, test the moisture content of the boards. Use an electrical moisture meter to test 5% of boards, but not less than 10 boards in the centre of the length. Do not start fixing until 90% of the values obtained are within the range in [NZS 3602](#) table 4, Allowable moisture content (%) at time of installation or in the case of framing timber at time of enclosure.

### Application - preparation

- 3.5 FIX UNDERLAYS  
Refer to 4161 UNDERLAYS, FOIL AND DPC section
- 3.6 PENETRATIONS  
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:
  - wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames and other penetrations
  - claddings neatly finished off to all sides of openings
  - installation of flashings (those required to be installed prior to installation of penetrating elements).
- 3.7 SET-OUT  
Using laser or mechanical devices set-out the overlap boards to ensure dimension to exposed face in line of weather is constant and that boards remain horizontal/vertical. Use a string line to set out all nailing that will be visible in the finished work. Align all nailing accurately in straight lines.

### Application - fixing

- 3.8 FIXING, CLEAR FINISH  
Coat all cut ends before fixing. Drill all fixings located within 25mm of board ends. Finish fixings flush.
- 3.9 FIXING BEVEL BACK WEATHERBOARDS  
Nail weatherboards to every fixing point with one nail just clear of the lap. Butt end joints, mitre external corners and scribe internal corners. Back flash internal corners. Fit soakers to end joints and external corners, nailed under lap. Random stagger end joints across adjacent boards.
- 3.10 INSTALL FLASHINGS  
Install flashings, covers and soakers as detailed on the drawings and to [NZBC E2/AS1](#)

**3.11 COMPLETE**

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

**Completion****3.12 REPLACE**

Replace all damaged or marked elements.

**3.13 LEAVE**

Leave work to the standard required for following procedures.

**3.14 REMOVE**

Remove all debris, unused materials and elements from the site.

# 4223SC SHADOWCLAD® PLYWOOD CLADDING

## 1 GENERAL

This section relates to the use of Carter Holt Harvey Plywood Ltd (CHH PLY) Shadowclad® range of plywood exterior cladding on a drained cavity.

It includes:

- Shadowclad® Ultra Texture

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS/NZS 1604.3</a>	Specification for preservative treatment - Plywood
<a href="#">AS/NZS 2269.0</a>	Plywood - Structural - Specifications
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings

Window & Glass Association NZ (WGANZ) documents:

<a href="#">Window Installation Guide</a>	Guide to Window Installation as described in E2/AS1 Amendment 7
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Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

#### 1.2 MANUFACTURER'S DOCUMENTS

Carter Holt Harvey Plywood Ltd documents relating to work in this section are:

**Shadowclad®** sITe APP

**Shadowclad®** Specification and Installation Guide for Cavity Construction (May 2018)

**Shadowclad®** Specification & Installation Guide For Mixed Cladding Systems On Cavity Construction (May 2018)

**Shadowclad®** Safety Data Sheets (May 2018)

[BRANZ Appraisal 764](#) - Shadowclad® Ventilated Cavity Cladding System

FSC Certification available on request for W8.1 Plywood FSC Mix

CHH Tokoroa FSC-C012019 SCS-COC-001316 Controlled Wood SCS-CW-001316 - expires 5 June 2023

Copies of the above literature are available at

Web: [www.shadowclad.co.nz](http://www.shadowclad.co.nz)

Telephone: 0800 326 759

### Requirements

#### 1.3 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

#### 1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

#### 1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Refer to the general section 1234 DOCUMENTATION for provision of the following general operation and maintenance information as electronic PDF format documents:

**Shadowclad®** Specification and Installation Guide for Cavity Construction.

### Performance

## 1.6 APPRAISED

Shadowclad® Ventilated Cavity Cladding Systems is BRANZ Appraised ([BRANZ Appraisal 764](#)) with scope limitations. Shadowclad® Ventilated Cavity details were tested to E2/VM1 as part of the technical investigations carried out.

## 1.7 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations.

# 2 PRODUCTS

## Materials

### 2.1 SHADOWCLAD® ULTRA TEXTURE CLADDING

Radiata pine veneer 12mm (nom) ply sheet to [AS/NZS 2269.0](#). Treated LOSP Azole H3.1 or CCA H3.2 to [AS/NZS 1604.3](#). Pre-primed bandsawn surface finish and vertical ship lap joint. Standard sheet cover width is 1200mm. Standard sheet lengths are 2440mm and 2745mm.

### 2.2 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

### 2.3 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, nominal 20mm thick, 45mm wide and height to match timber framing studs. To [NZS 3602](#), table 1, reference 1D.10. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 2.4 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

**Shadowclad®** cavity base closure with upstand to two sides and 5mm diameter holes at 15mm centres to base. Available in aluminium (natural anodised) and stainless steel. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction. To [NZBC E2/AS1](#): Vermin-proofing clause 9.1.8.3 and Cavity base closer figure 66.

### 2.5 EXTERIOR COVER BATTENS & TRIM

Radiata pine battens, trim and covers to profiles as required by the cladding manufacturer. Clears grade or finger-jointed, treated H3.1.

- cover battens minimum 65mm x 18mm with 6mm x 6mm weather grooves
- internal corner/soffit battens 18mm x 18mm with back corner chamfered

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

## Components

### 2.6 NAILS

Refer to the **Shadowclad®** Specification and Installation Guide for Cavity Construction fixing requirements for size and use. Refer to SELECTIONS for material and type.

- Minimum 60mm x 2.8mm. (hand driven)

When using rigid air barriers, increase fixing length by at least the thickness of that panel. Refer to power tool manufacturers for equivalent power driven nail size.

### 2.7 SCREWS

Refer to the **Shadowclad®** Specification and Installation Guide for Cavity Construction fixing requirements for size and use. Refer to SELECTIONS for material and type.

- Minimum No. 8 x 65mm countersunk screws.

When using rigid air barriers, increase fixing length by at least the thickness of that panel.

### 2.8 FLASHINGS

**Shadowclad®** flashing range either; aluminium mill finish or anodised, or G304 stainless steel.

Note, lengths and finish do vary for aluminium profiles, but stainless steel profiles are all 3000mm long.

To [NZBC E2/AS1](#), Table 20 **Material Selection**. Refer to the **Shadowclad®** Specification and Installation Guide for Cavity Construction.

## 2.9 FLASHING TAPE

Flexible flashing tape to [NZBC E2/AS1](#), 4.3.11 Flexible flashing tape, UV resistant for exposed applications.

### Accessories

## 2.10 SEALANT

Refer to the plywood manufacturer's requirements for elastomeric sealant to waterproof penetrations.

## 2.11 TREATMENT OF SHEET CUTS

Soudal Metalex Ready to Use, clear colour product.

# 3 EXECUTION

## Conditions

### 3.1 TIMBER FRAMING

Ensure it is to [NZS 3604](#) and the manufacturer's requirements.

### 3.2 SUPPORT

Fully support all edges and joints.

### 3.3 VERTICAL JOINT EXPANSION - SHADOWCLAD® TEXTURE

Provide 2-3mm gap at all vertical edges of cladding for sheet expansion. Maintain 2mm minimum expansion gap in the vertical shiplap joint to create an adequate expansion allowance. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction

### 3.4 HORIZONTAL JOINT EXPANSION - SHADOWCLAD® 'Z' FLASHING

For horizontal joints using **Shadowclad®** 'Z' flashings, provide a horizontal 9mm gap between the 'Z' flashing and the sheet above at the outside face to create an adequate expansion allowance. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.5 FRAMING MOISTURE CONTENT

Maximum moisture content 20% to [NZS 3602](#). for general framing and cavity battens

## Application

### 3.6 DRAINED CAVITY - 400 STUD SPACING

Confirm that drained cavity is installed as follows with 400mm stud spacing and 800mm max nog spacing, or 600mm max nog spacing when using vertical cover battens. 20mm nominal thickness drained cavity to [NZBC E2/AS1: 9.0 Wall claddings](#), with battens over underlay or rigid air barrier.

Vertical cavity battens fixed to each stud. Top of the cavity is to be sealed. Cavity closer/vermin proofing should be used at the base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens should not be used except when closing off the top of a cavity from all roof spaces and enclosed soffits to prevent entry of moist air.

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

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.7 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall/cladding underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

Refer to the [WGANZ Window Installation Guide](#). This covers the WGANZ recommendations on the preparation of window/door openings, minimum clearances between rough openings and the window/door frame, dressing of the wall underlay into the prepared opening, application of flexible flashing tape to the sill and top corners of the opening, installation of window/door frames and flashings, sealing of the window/door frame into the opening to create a pressure equalisation cavity, installation of flashings and the maintenance of appropriate clearances between the frame and the surrounding construction.

### 3.8 TREATING CUT EDGES

Treat cut edges of plywood with Soudal Metalex Ready to Use to Soudal requirements, before fixing. Cut edges must be placed at the top of the sheet to avoid rain drips soaking in to cut end grain.

### 3.9 PRIMING EDGES & REAR OF SHEET

Before installation prime the bottom edges and back (rear) of sheets to a height of 150mm. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.10 PRE-PAINTING OR STAINING

Before installation pre-paint or pre-stain as appropriate, up to one finishing coat on exposed edges and surfaces that will be difficult to paint after installation. Refer to Metalex Ready to Use datasheet for specific requirements.

### 3.11 INSTALL SHADOWCLAD® PLYWOOD CLADDING

Install to the requirements of **Shadowclad®** Specification and Installation Guide for Cavity Construction. Ensure sheets are installed vertically, do not install horizontally. Use a Shadowclad Stick to determine required clearances.

### 3.12 FIXING SHADOWCLAD® PLYWOOD CLADDING

Fix at 150mm maximum centres at sheet edges and no closer than 7mm to the sheet edge. Fix intermediate supports at 300mm maximum centres to studs and nogs. Sheets to be nailed off independently of each other, with nailing pattern and ship lap joint nailing to detailed requirements of **Shadowclad®** Specification and Installation Guide for Cavity Construction (in particular refer details SC003, SC006, SC006A, SC008, SC008A). Do not fix through grooves. Finish fixings flush.

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.13 INSTALL COVER BATTENS AND TRIMS

Install as detailed on the drawings and in accordance with the cladding manufacturer's requirements.

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.14 INSTALLING FLASHINGS GENERALLY

Install flashings and covers as detailed on the drawings and in accordance with **Shadowclad®** recommended details. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.15 INSTALLING SHADOWCLAD® 'Z' FLASHINGS - CONTINUOUS CAVITY

Install **Shadowclad®** standard Horizontal 'Z' flashing with the upstand over the cavity battens to **Shadowclad®** recommended details and as detailed on the drawings. Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.16 INSTALLING SHADOWCLAD® 'Z' FLASHINGS - NON-CONTINUOUS CAVITY

Install **Shadowclad®** Inter-Storey 'Z' flashing with the upstand under the cavity battens along with **Shadowclad®** Cavity Base Closure, to **Shadowclad®** recommended details and as detailed on the drawings.

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.17 JOINTING & TERMINATING SHADOWCLAD® 'Z' FLASHINGS

Horizontal 'Z' flashings shall be jointed as follows:

- Butt jointed over back flashing for aluminium flashings
- Overlapped by 150mm for stainless steel flashings

Horizontal 'Z' flashings shall have ends terminated as follows:

- 50 mm strip of neutral cure silicon or
- Stop ends
- End terminations not required butting into Shadowclad® metal corner flashings.

Refer **Shadowclad®** Specification and Installation Guide for Cavity Construction.

### 3.18 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

# 4239JH JAMES HARDIE® SOFFITS

## 1 GENERAL

This section relates to the supply and fixing of **James Hardie®** products to the underside of exterior soffits, verges and eaves.

### Documents

#### 1.1 DOCUMENTS

The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
<a href="#">AS/NZS 2908.2</a>	Cellulose-cement products - Flat sheet
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:  
James Hardie® Eaves and Soffits Installation Manual

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	<a href="http://www.jameshardie.co.nz">www.jameshardie.co.nz</a>
Email:	<a href="mailto:info@jameshardie.co.nz">info@jameshardie.co.nz</a>
Telephone:	0800 808 868

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years: For James Hardie® HardieFlex™ Eaves Lining, James Hardie® HardieGroove™ Soffit Lining and HardieSoffit™ Lining

(refer to James Hardie® product warranty)

15 year: For accessories supplied by James Hardie® (refer to James Hardie® product warranty)

From: Date of purchase

- Provide this warranty on the manufacturer's standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 QUALIFICATIONS

Workers / Installers / applicators to be experienced, competent trades people familiar with the materials and techniques specified.

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

#### 1.6 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

#### 1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide relevant James Hardie maintenance requirements at completion of the work.

### Performance

## 1.8 PERFORMANCE - UP TO AND INCLUDING VERY HIGH WIND ZONE

The design wind speeds/zones are to [NZS 3604](#), up to and including Very High Wind Zone. James Hardie® Eaves and Soffits Installation Manual requirements are suitable for these conditions.

## 2 PRODUCTS

### Materials

### 2.1 HARDIESOFFIT™ LINING

James Hardie® HardieSoffit™ Lining, 4.5mm thick cellulose fibre reinforced cement sheet. Manufactured to [AS/NZS 2908.2](#) from Portland cement, ground sand, cellulose fibre and water.

### Components

### 2.2 FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to [NZBC E2/AS1](#), Table 20, Material selection for fixing material, and [NZBC E2/AS1](#), Table 21, Compatibility of materials in contact, for selection of suitable fixing materials and their compatibility with other materials.

Exposure	Fixing	Fixing Material	Zone
Sheltered	Nail	Stainless steel	B, C, D, E
Sheltered	Screw	Stainless steel	B, C, D, E

Check against SED (specific engineering design) requirements for microclimate conditions. Refer to SELECTIONS for fastener type.

## COMPONENTS

### 2.3 HARDIEFLEX™ NAILS

HardieFlex Nail, 40 x 2.8mm stainless steel or galvanized nail.

### 2.4 POLYPROPYLENE TAPE

Polypropylene tape, 30mm minimum width.

## 3 EXECUTION

### Conditions

### 3.1 STORAGE

Take delivery of products dry and undamaged. Store on site, lay flat on a smooth level surface clear of the ground. Protect materials, finished surfaces, edges and corners from damage, water and moisture.

### 3.2 HANDLING

Move/handle goods in accordance with James Hardie® requirements. Avoid distortion and contact with potentially damaging surfaces. Do not drag sheets across each other, or across other materials. Protect edges, corner and surface finish from damage. Reject and replace goods that are damaged or will not provide the required finish. Install materials in a dry state.

### 3.3 SUBSTRATE - TIMBER FRAMING

Do not commence work until the substrate is of the standard required for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by [NZS 3602](#) to minimise shrinkage and movement after sheets are fixed.

### 3.4 COMMENCE WORK

Do not commence work until the roof has been installed.

### Application - general

### 3.5 SHEET LAYOUT

All sheet edges must be fully supported by framing or rebates in fascia and barge boards.

**3.6 CUTTING SOFFIT CLADDING**

Cut sheets dry using score and snap method, hand guillotine method or fibreshear heavy duty method. If these methods are not feasible, use an alternative manufacturer approved method.

**3.7 CIRCULAR HOLE FORMING**

Mark the centre of the hole on the sheet, pre-drill a pilot hole. Use the pilot hole as a guide for a hole saw fitted to a heavy duty electric drill.

**3.8 IRREGULAR HOLE FORMING**

Drill a series of small holes around the perimeter of the proposed hole, tap out the waste piece from the sheet face.

**3.9 INSTALL HARDIEFLEX™ EAVES LINING**

Install in accordance with James Hardie® installation manual requirements.

**3.10 INSTALL HARDIEGROOVE™ SOFFIT LINING**

Install in accordance with James Hardie® installation manual requirements. Where required butt joint short ends of cladding (cut square and form chamfer to match) and align to provide continuation of grooved profile line.

**3.11 INSTALL HARDIESOFFIT™ LINING**

Install in accordance with James Hardie® installation manual requirements.

**3.12 BUTT JOINT**

Paint sheet edges prior to installation.

**3.13 CONTROL JOINT**

Install control joint to James Hardie® installation manual requirements.

**3.14 FASTENER - SIZE AND LAYOUT**

Fix to James Hardie® installation manual requirements.

**3.15 SEALANTS**

Application and use of sealants to manufacturer's instructions. Check with sealant manufacturer prior to coating over sealants.

**3.16 PAINTING**

Refer to painting section/s for protective coating system.

**Completion****3.17 COMPLETE**

Ensure the work is complete with all components, accessories, trim, sealant and finishing properly installed so the soffit cladding system is completely weathertight.

**3.18 REPLACE**

Replace all damaged or marked elements.

**3.19 CLEAN**

Clean surfaces.

**3.20 LEAVE**

Leave work to the standard required for following procedures.

**3.21 REMOVE**

Remove debris, unused materials and elements from the site.

**4 SELECTIONS**

For further details on selections go to [www.jameshardie.co.nz](http://www.jameshardie.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

**Materials**

#### 4.1 HARDIESOFFIT™ LINING

Brand/type:	James Hardie® HardieSoffit™ Lining
Thickness:	4.5mm
Fixing Method:	HardieFlex™ nails
Fixing type:	Stainless steel HardieFlex™ Nail, 40 x 2.8mm
Joint detail:	Butt joint with 30mm wide polypropylene or flashing tape (1mm gap).

#### **Painting**

#### 4.2 PAINTING

Refer to painting section/s for details.

# 4311M METALCRAFT PROFILED ROOFING

## 1 GENERAL

This section relates to the supply and fixing of **Metalcraft Roofing** profiled roofing complete with accessories.

It includes:

- Asymmetrical rib roofing profiles

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone
LBP	Licensed Building Practitioner

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC G12/AS1</a>	Water supplies
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
<a href="#">NZS 3604</a>	Timber-framed buildings
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmosphere - Classification determination and estimation
<a href="#">NZMRM CoP</a>	NZ Metal Roof and Wall Cladding Code of Practice

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Metalcraft Roofing Metrib760 product literature  
Metalcraft Roofing Metcom7 product literature

Manufacturer/supplier contact details

Company:	<b>Metalcraft Roofing</b>
Web:	<a href="http://www.metalcraftgroup.co.nz">www.metalcraftgroup.co.nz</a>
Email:	frances.charles@unitedindustries.co.nz
Telephone:	09 274 0408

### Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years	for failure of coating adhesion
20 years	for weatherproofing by material penetration

For Warranty requirements in excess of this contact Metalcraft Roofing.

### 1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years	for workmanship
---------	-----------------

- Provide this warranty on the material manufacturers standard warranty form.
- Commence the warranty from the date of practical completion of the contract works.

Include a copy of the Metalcraft Roofing maintenance requirements with the warranty.  
Refer to the general section 1237 WARRANTIES for additional requirements.

## Requirements

- 1.6 NO SUBSTITUTIONS  
Substitutions are not permitted to any specified system, or associated components and products.
- 1.7 QUALIFICATIONS  
Roof Installers shall be experienced, competent roofers familiar with Metalcraft products. And for Restricted Building Work shall also be, an LBP or supervised by an LBP.  
Carry out work with experienced, competent installers familiar with the products being used and preferably with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

## Performance - wind

- 1.8 WIND - NON SPECIFIC DESIGN  
Building wind zone:  
Very High / 1.55kPa ULS (refer to [NZS 3604](#), table 5.4)  
Refer to Metalcraft for "Wind Load Span Design Graphs" for load parameters.
- 1.9 FIXINGS, WIND  
Design and use the fixings/fixing pattern appropriate for the wind design parameters and [NZMRM CoP NZ](#). Refer to Metalcraft profiled roofing product literature for profile details. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

## Performance - General

- 1.10 PERFORMANCE  
Install roofing materials in accordance with the [NZMRM CoP](#), and Metalcraft profiled roofing product literature, to form a weather-tight performance for the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.
- 1.11 DRINKING WATER  
Roofing for collecting potable water to [NZBC G12/AS1](#).
- 1.12 CO-ORDINATE  
Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile or cladding to the primary structure.

## 2 PRODUCTS

### Materials

- 2.1 PRE-FINISHED HOT-DIPPED ZINC COATED STEEL  
Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

### Fixings

- 2.2 FASTENERS GENERALLY  
Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with E2/AS1 and/or the [NZMRM CoP](#) and Metalcraft profiled roofing product literature.  
For fixing patterns refer to Metalcraft product literature for roofing profile.
- 2.3 FIXING SCREWS  
To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metalcraft and with a Class 4 or 5 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.
- 2.4 RIVETS  
Sealed aluminium, minimum diameter 4.0mm. Refer to Metalcraft for requirements..

## 2.5 FLASHINGS GENERALLY

To [NZBC E2/AS1](#), 4.0, **Flashings**.

Formable grade 0.55 BMT for galvanized, aluminium/zinc, aluminium/zinc/magnesium - coated and pre-painted steel and 0.90 BMT for aluminium (or 0.7mm for small aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

### Components

## 2.6 FLASHINGS TO VERGE, RIDGE AND HIP

To [NZBC E2/AS1](#), 4.0, **Flashings**.

Supplied by the roofing manufacturer to match or to suit the roofing.

## 2.7 BOOT FLASHINGS

Generally to E2/AS1, 8.4.17 **Roof penetrations** (note; E2/AS1, Figure.54 **Soaker flashing for pipe penetration**, has an error, use as guide only).

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

### Accessories

## 2.8 WIRE NETTING AND UNDERLAY

Refer to 4161 UNDERLAYS AND DPC.

## 2.9 SEALANT

Neutral curing silicone or polymer sealant as required by Metalcraft and used as directed.

## 2.10 CLOSURE STRIPS

Polyurethane profiled closed cell foam strips to fit the sheet profile.

Brand: Ecofoam

Profile: To suit selected cladding profile

# 3 EXECUTION

## Conditions

### 3.1 INSPECTION

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could damage the roofing.

### 3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

### 3.3 STORAGE

Upon delivery visually inspect sheets for damage and accept packs of undamaged roofing. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air circulation and drying between sheets.

### 3.4 HANDLING

Do not drag sheets across each other or other materials. Avoid distortion and contact with damaging substances, including cement. Long lengths of roofing should be lifted onto the roof using an approved load spreading beam. Protect edges and surface finishes from damage, keep under cover and remove as the product is being installed. Use soft, flat sole shoes when fixing and for all other work on the roof. Walk along the purlin line whenever possible.

### 3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use lead sheet or copper in contact with or allow water run-off onto galvanized or aluminium/zinc coated steel.

#### **Application**

### 3.6 FIX INSULATION

Refer to thermal insulation sections.

### 3.7 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

### 3.8 END LAPS

End laps are not recommended, except where specifically detailed.

### 3.9 THERMAL MOVEMENT

Fix for Thermal Movement to Metalcraft requirements for thermal movement.

### 3.10 FIXING GENERALLY

Install and fix in accordance with the [NZMRM CoP](#) recommendations, and to Metalcraft required fixing patterns and details for each area of the building roofing. Use only screws as required by Metalcraft. Paint colour matched fixings and accessories before installation.

### 3.11 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking Zinalume® and Colorsteel®. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

### 3.12 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of sheets. Form downturns at the gutter line where the roof pitch is less than 8 degrees. Form using the required tools.

### 3.13 INSTALL FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Flashings to be installed on timber framing with moisture content of less than 20%. Where no detail is provided flash to [NZMRM CoP](#) recommendations and Metalcraft and [NZBC E2/AS1](#) requirements. Cut accurately and fix using sealant and rivets to detail and to Metalcraft requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

### 3.14 USE OF SEALANTS

Select and use sealants only as recommended by Metalcraft. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

### 3.15 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

#### **Completion**

### 3.16 REPLACE

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

### 3.17 LEAVE

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

**3.18 REMOVE**

Remove all trade rubbish, swarf and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

**4 SELECTIONS**

For further details on selections go to [www.metalcraftgroup.co.nz](http://www.metalcraftgroup.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

**Coating system****4.1 COATING SYSTEM - EXPOSURE ZONE D (CAT 4)**

Project Exposure Zone C to [NZS 3604](#)

Base material: Zinalume® on steel

Coating system: Colorsteel Endura

**Roofing - asymmetrical rib profile****4.2 METALCRAFT - MC760 ASYMMETRICAL RIB PROFILE ROOFING**

Manufacturer: Metalcraft Roofing

Profile: MC760

Dimensions: Sheet width 810mm, cover 760mm, rib height 29mm, and roll formed to any length

BMT/material: 0.55mm Steel

Purlin material: timber

Fixings: 14G x 75mm with load spreading washer

**Accessories****4.3 FLASHINGS - GENERALLY**

BMT/material: 0.55mm Steel

Coating system: To match roofing

Paint colour: To match roofing

# 4521AR APL RESIDENTIAL ALUMINIUM WINDOWS & DOORS

## 1 GENERAL

This section relates to the fabrication, supply and installation of **APL Window Solutions** residential window and door systems manufactured by either **Altherm**, **First** or **Vantage**.

It includes:

- APL Residential aluminium windows and doors
- Hardware and furniture
- Flashings and sealants

### 1.1 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WGANZ	Window & Glass Association NZ
WEERS	Window Energy Efficiency Rating System
PQAS	Powder Coating Quality Assurance System

### Documents

## 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC F4/AS1</a>	Safety from falling
<a href="#">NZBC H1/VM1</a>	Energy efficiency
<a href="#">NZBC H1/AS1</a>	Energy efficiency
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">AS/NZS 1580.108.1</a>	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
<a href="#">AS/NZS 1734</a>	Aluminium and aluminium alloys - Flat sheet, coiled sheet and plate
<a href="#">AS/NZS 1866</a>	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">AS 3715</a>	Metal finishing - Thermoset powder coatings for architectural applications
<a href="#">NZS 4211</a>	Specification for performance of windows
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">NZS 4303</a>	Ventilation for acceptable indoor air quality
<a href="#">AS/NZS 4680</a>	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
<a href="#">AAMA 2603</a>	Voluntary specification, performance requirements, and test procedures for pigmented organic coatings on aluminium extrusions and panels (with coil coating appendix)
<a href="#">AAMA 2604</a>	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
<a href="#">AAMA 2604.05</a>	Performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels
<a href="#">AAMA 2605</a>	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels
<a href="#">BS 3900</a>	Methods of tests for paints, Part C5: Determination of film thickness
<a href="#">BRANZ BU 636</a>	Protecting Glass From Damage
Window & Glass Association NZ (WGANZ) documents:	
<a href="#">Window Installation Guide</a>	Guide to Window Installation as described in E2/AS1 Amendment 7
<a href="#">PQAS</a>	Powder Coating Quality Assurance System
<a href="#">SFA 3503-03</a>	Anodic Oxide coatings on wrought aluminium for external architectural application (2005)
US Federal Specification:	
<a href="#">TT-S-001543A</a>	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
<a href="#">TT-S-00230C</a>	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:  
 Altherm Specifier's Guide  
 First Specifier's Guide  
 Vantage Specifier's Guide  
 APL Guide to specifying powders and issuing/applying for warranties  
 APL Window Energy Efficiency Rating System (WEERS) Report Series

Manufacturer/supplier contact details

Company: **APL Window Solutions**

Web: [www.altherm.co.nz](http://www.altherm.co.nz)  
[www.firstwindows.co.nz](http://www.firstwindows.co.nz)  
[www.vantage.co.nz](http://www.vantage.co.nz)  
[www.aplnz.co.nz](http://www.aplnz.co.nz)

Email: [specifiersguide@aplnz.co.nz](mailto:specifiersguide@aplnz.co.nz)

Telephone:: 07 849 2113

#### Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years:	For fabrication
2 years:	For hardware

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

### 1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5 years:	For installation
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- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

### 1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified APL aluminium system, or associated components and products.

### 1.7 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

### 1.8 COMPLIANCE

Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).

### 1.9 CERTIFICATION

Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of [NZS 4211](#).

#### Performance

### 1.10 PERFORMANCE - WINDOWS AND DOORS

To [NZS 4211](#), including:

- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

### 1.11 STRUCTURAL/WEATHER-TIGHTNESS

The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window fabricator.

#### **Performance - Wind (design by contractor)**

### 1.12 DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of [NZS 3604](#), table 5.1.

#### **Finishes**

### 1.13 CERTIFY COATINGS - POWDER COATING

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided. The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

## **2 PRODUCTS**

### 2.1 WINDOWS

Refer to SELECTIONS for type and finish.

### 2.2 DOORS

Refer to SELECTIONS for type and finish.

#### **Materials**

### 2.3 ALUMINIUM EXTRUSIONS

Alloy designation to comply with [AS/NZS 1866](#). Branded and extruded for anodising or powder coating.

### 2.4 ALUMINIUM SHEET AND STRIP

Complying with [AS/NZS 1734](#) of suitable thickness. Rolled for anodising or powder coating.  
Alloy designation: 5251 - H16 or 5005 - H16

### 2.5 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel  
Finish grade: 2B (satin lustre)

### 2.6 GLASS

Refer to the glazing section for glass types and installation.

#### **Reveals**

### 2.7 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

### 2.8 REVEALS - ALUMINIUM

Aluminium reveals fitted to frame via thermal break.

#### **Flashings**

### 2.9 FLASHINGS GENERALLY

To [NZBC E2/AS1](#), 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

#### **Components for installation - cavity systems**

**2.10 STANDARD CAVITY CLOSER**

A device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with [NZBC E2/AS1](#) to the spaces above the window or door.

**2.11 SUPPORT BAR**

WGANZ extruded aluminium support bar with built in drainage and ventilation to [NZBC E2/AS1](#), and support bar location bracket, to provide continuous support to the window unit. Size to suit cladding type.

**Components****2.12 GLAZING GASKETS**

Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

**2.13 HARDWARE AND FURNITURE**

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

**2.14 SAFETY STAYS**

Stainless steel non releasable restrictors to limit window opening to [NZBC F4/AS1](#), Table 2, Acceptable opening sizes for barriers.

**2.15 FIXING BRACKETS**

Designed by manufacturer to specific design.

**2.16 WEATHERING/INSTALLATION SEALANT**

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT S 0011534A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus ( $\pm 25\%$  movement) to US Federal Specification TT S 00230C.

**Accessories****Finishes****2.17 DURATEC POWDER COATED ALUMINIUM**

High-performance polyester powder coating in accordance with [WGANZ PQAS](#), and AAMA 2604.

**3 EXECUTION****Conditions - generally****3.1 DO NOT DELIVER**

Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.

**3.2 UNLOAD WINDOW JOINERY**

Unload, handle and store elements in accordance with the window manufacturer's requirements.

**3.3 AVOID DISTORTION**

Avoid distortion of elements during transit, storage and handling.

**3.4 PREVENT DAMAGE**

Store windows and doors on site in a clean and dry environment in such a manner as to prevent damage to prefinished surfaces. Stack the units in a vertical position resting on their sills, with layers interleaved between to prevent rubbing. Keep paper and cardboard wrappings dry.

**3.5 PROPRIETARY ELEMENTS**

Fix in accordance with the window manufacturer's requirements.

### 3.6 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 636 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

### 3.7 ADDITIONAL PROTECTION

Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

#### **Conditions - fixings and fastenings**

### 3.8 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m<sup>2</sup> complying with [AS/NZS 4680](#).

### 3.9 INSTALLATION FIXING

To [NZBC E2/AS1](#), 9.1.10.8, **Attachments for windows and doors**. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings. Install packers between reveals and framing at fixing points, except at the head.

#### **Assembly**

### 3.10 FABRICATION

Fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

### 3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces. Securely fix reveals through aluminium fin.

### 3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

### 3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with [NZBC F4/AS1](#) 4.0, Opening windows.

#### **Installation - windows and doors**

### 3.14 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS.

### 3.15 EXPOSED FIXINGS AND FASTENINGS

Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 304 stainless steel.

### 3.16 PROTECTED FIXINGS AND FASTENINGS

Fixings and fastenings not exposed to the weather may be hot-dip galvanized steel with a coating weight of 610 g/m<sup>2</sup> complying with [AS/NZS 4680](#).

### 3.17 CORROSION PROTECTION

Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

### 3.18 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to [NZBC E2/AS1:9.1.5 Wall underlays to wall openings](#).
- Full height 20mm jamb battens to [NZBC E2/AS1 figure 72A](#) (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).
- application of waterproof sealer to all door and window sills in concrete floor or concrete sill situations. To door sills only, apply a suitable membrane over the sealer
- all in accordance with the shop drawings, where applicable.

### 3.19 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

### 3.20 INSTALLATION CAVITY CONSTRUCTION

Install to [WGANZ Window Installation Guide](#) details and drawings including WGANZ sill support bars.

For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to [NZBC E2/AS1, figure 62\(d\)](#).

### 3.21 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm plus any jamb scribe width at each end.

### 3.22 COMPLETE AIR SEAL

To [NZBC E2/AS1:9.1.6 Air seals](#). Form an air-tight seal by means of proprietary expanding foam or sealants used with PEF backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

### 3.23 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

#### **Application - jointing and sealing**

### 3.24 SEAL FRAMES ON SITE

Seal frames to each other and to adjoining structure and finishes, all as required by the window and sealant manufacturer and to make the installation weathertight.. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

### 3.25 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

### 3.26 BACK UP

When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

**3.27 SEALANT FINISH**

Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer. Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.

**Cleaning****3.28 REMOVE TRADE DEBRIS**

Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.

**3.29 TRADE CLEAN**

Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

**Completion****3.30 PROTECTIVE COVERINGS**

Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

**3.31 REPLACE**

Replace damaged, cracked or marked elements.

**3.32 PROTECTION**

Protect finishes against damage from adjacent and following work.

**3.33 IN-SITU TOUCH-UP TO POWDER COATED ALUMINIUM**

In situ touch-up of polyester coated aluminium is only permitted to minor surface scratching. Otherwise replace all damaged material.

**3.34 SAFETY**

Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

**4 SELECTIONS**

For further details on selections go to [www.aplnz.co.nz](http://www.aplnz.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

**4.1 SUPPLY AND INSTALLATION**

Supply and installation of the specified **APL** aluminium joinery.

Supply: By fabricator

Installation: By builder

**Performance****4.2 THERMAL PERFORMANCE**

R-value: R0.31 (as determined from [NZBC H1/VM1](#) or [H1/AS1](#))

**Performance - Wind (design by contractor)****4.3 DESIGN PARAMETERS - NON SPECIFIC DESIGN**

Building wind zone H 1360 Pa ULS

**Finishes**

## 4.4 DURATEC - POWDER COATING FINISH

Type: Polyester organic powder coating  
 System integrity: 15 years  
 Thickness: Average of 90 microns with a minimum of 50 microns

**Glazing**

## 4.5 GLASS

Type/thickness: Refer to glazing section for type and thickness.

## 4.6 HARDWARE FINISH

Finish: Powder coat  
 Colour: Match to frame

## 4.7 FLASHINGS

Material/type: Powder coat aluminium  
 Pattern: Formed to suit details provided

## 4.8 WEATHERING SEALANT

Type: 1-part polyurethane moisture curing, elastic joint sealant  
 Colour: white

**Reveals**

## 4.9 TIMBER JAMB REVEALS

Timber species: Radiata Pine  
 Grade/treatment: H3.1  
 Thickness: 19 mm  
 Reveals: Grooved for wall linings  
 Finish: Paint

## 4.10 ALUMINIUM REVEALS - ADAPTOR/INFILLS

Type: To suit frame location  
 Finish: Powder coated

**Window and door system - RESIDENTIAL**

## 4.11 APL RESIDENTIAL WINDOWS &amp; DOORS

Brand/type: **Altherm RESIDENTIAL Series**  
 Window No.: refer to schedule

## 4555 GARAGE DOORS

### 1 GENERAL

This section relates to the manufacture, supply and installation of garage door systems including required opening/operating systems.

#### Documents

#### 1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

<a href="#">AS/NZS 1170</a>	Structural design actions
<a href="#">NZS 1170.5</a>	Structural design actions - Earthquake actions - New Zealand
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">AS/NZS 4505</a>	Garage doors and other large access doors

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

#### Requirements

#### 1.2 INFORMATION FOR OPERATION AND MAINTENANCE

Provide operating instructions for the garage doors and associated opening equipment. Provide a list of all components requiring regular maintenance.

#### Performance

#### 1.3 DESIGN PARAMETERS WIND

Design the installation to the manufacturers requirements and as appropriate for the project.

#### 1.4 LOADS - NON - SPECIFIC DESIGN - DOORS UP TO 3.0M HIGH

Garage doors complete with hinges, roller assemblies and fasteners to comply with wind performance requirements to [NZS 3604](#).

#### 1.5 RESPONSIBILITY FOR PERFORMANCE

Accept responsibility for the structural and weathertight performance of the completed garage door installation.

### 2 PRODUCTS

#### 2.1 GARAGE DOOR

Manufacture to [AS/NZS 4505](#) complete with a compliance label.

#### 2.2 MOTORISED DOOR OPENER

Remote control units and fixed in switching

### 3 EXECUTION

#### 3.1 PREPARATION FOR INSTALLATION

Check that the trimmed and lined openings are formed and constructed to suit the required door units. Do not proceed until openings are properly formed.

#### 3.2 MANUFACTURER'S REQUIREMENT FOR INSTALLATION

Install door, track and operating equipment complete with all specified and necessary accessories and hardware to the manufacturer's requirements.

#### 3.3 START UP

Carry out start up procedures and verify proper performance of the doors.

#### 3.4 ADJUSTMENT

Lubricate bearings and sliding parts and adjust doors to operate easily, free of warp, twist or distortion with a weathertight fit round the entire perimeter.

### 3.5 DEMONSTRATION

Carry out start up procedures and verify proper performance of the door. Demonstrate the operation of the door to the principal/principal's representative. Set security features to principal's requirements. Reset security features at practical completion of the contract works.

#### **Completion**

### 3.6 ENSURE

Ensure all elements are free of marks or blemishes, with all moving parts working fully and freely.

### 3.7 REPLACE

Replace damaged, cracked or marked elements.

### 3.8 LEAVE

Leave work to the standard required by following procedures.

### 3.9 REMOVE

Remove all debris, unused materials and elements from the site.

# 4610AG AGP GLAZING RESIDENTIAL

## 1 GENERAL

This section relates to the supply and fixing of **AGP** glass products for use only with APL Window Solutions external and internal joinery in residential type buildings and includes:

- windows and doors
- splashbacks
- mirrors

Note; This **AGP** section is to be read in conjunction with **APL Window Solutions** branded sections. **AGP** glass products are only available in the North Island with the **APL** brands; **Altherm, First, Klima** or **Vantage Window and Doors**.

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
IGU	Insulated Glass Units

#### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC F4/AS1</a>	Safety from falling
<a href="#">NZBC F9/AS1</a>	Means of restricting access to residential pools
<a href="#">NZBC H1/AS1</a>	Energy Efficiency
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind loads
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 4211</a>	Specification for performance of windows
<a href="#">NZS 4218</a>	Thermal insulation - Housing and Small Buildings
<a href="#">NZS 4223.1</a>	Glazing in buildings - Glass selection and glazing
<a href="#">NZS 4223.Supp1</a>	Glazing in buildings - Supplement 1 to <a href="#">NZS 4223.1:2008</a> and <a href="#">NZS 4223.4:2008</a>
<a href="#">NZS 4223.2</a>	Glazing in buildings - Insulating glass units
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">NZS 4223.4</a>	Glazing in buildings - Wind, dead, snow and live action
<a href="#">AS/NZS 2208</a>	Safety glazing materials in buildings

### 1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section:  
AGP Product Notes

Copies of the above literature are available at

Company:	AGP
Web:	<a href="http://www.aplnz.co.nz">www.aplnz.co.nz</a>
Email:	<a href="mailto:technical@agpl.co.nz">technical@agpl.co.nz</a>
Telephone:	07 849 8880

#### Warranties

### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

12 years:	for insulating glass units
12 years:	for laminated glass
12 years:	for toughened glass
12 years:	for screen printed glass
2 years:	for mirrors

#### Requirements

## Performance

### 1.5 THERMAL STRESS ANALYSIS

For non-heat treated glass obtain a thermal stress analysis for spandrel panels, tinted, reflective and other solar control vision glass including IGU's for review before placing final order.

### 1.6 ENERGY EFFICIENCY

Provide glazing to meet the energy requirements of [NZS 4218](#) and [NZBC H1/AS1](#) for housing small buildings.

Refer to SELECTIONS and schedules for location and type of glazing.

### 1.7 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer requirements and as appropriate for the project wind design,

## 2 PRODUCTS

### Materials

#### 2.1 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

#### 2.2 LAMINATED GLASS

Grade A Safety Glass to [AS/NZS 2208](#) with PVB interlayer.

#### 2.3 TOUGHENED GLASS

Grade A Safety Glass to [AS/NZS 2208](#).

Heat soaked toughened glass to [NZS 4223.1](#), Appendix E required for critical areas.

#### 2.4 REFLECTIVE AND COATED FLOAT GLASS

Either coated float glass incorporating both solar and thermal insulation properties; or coated float glass with only the thermal insulation properties.

#### 2.5 INSULATING GLASS UNITS (IGU'S)

To the performance requirements of [NZS 4223.2](#).

Marking to [NZS 4223.2](#) as modified by [NZBC B2/AS1](#), 3.5.

Surface numbering order for glass panes in an IGU are #1, #2, #3, and #4 as follows:

- Surface #1 - outer face of exterior pane
- Surface #2 - cavity face of the exterior pane
- Surface #3 - cavity face of the interior pane
- Surface #4 - outer face of the interior pane

### Materials, mirrors

#### 2.6 MIRROR GLASS

Clear annealed mirror float glass, including silver, activation, passivation and two protective coats.

### COMPONENTS, ALUMINIUM GLAZING

#### 2.7 GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

#### 2.8 SETTING BLOCKS

APL Window and Door Systems setting blocks. Refer to APL, Altherm, First and Altherm window manufacturer's manufacturing packs for part numbers to suit the frame and panel type. Setting blocks must be PE, PP or PA material.

### Components, wall mounted glass (mirrors and splashbacks)

#### 2.9 GLASS ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

### 3 EXECUTION

#### Conditions

#### 3.1 GENERAL REQUIREMENTS

To [NZS 4223.1](#), [NZS 4223.2](#), [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, and [NZS 4223.4](#). All external glazing to be wind and watertight on completion.

#### 3.2 PRE-INSTALLATION REQUIREMENTS

Check work previously carried out and confirm it is of the required standard for this part of the work.

#### 3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces in accordance with [AS/NZS 4667](#).

#### 3.4 GLASS THICKNESS

Whether stated in a glazing schedule or not, confirm glass thicknesses to [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#). For windows tested to [NZS 4211](#), ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading, or human impact considerations govern.

#### 3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to [NZS 4223.1](#), Section 4 Glazing.

#### Conditions - human impact safety requirements

#### 3.6 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) as modified by [NZBC B1/AS1](#), 7.3.1, for thickness and maximum areas of safety glass.

#### 3.7 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in [NZS 4223.3](#), that also comply with the relevant requirements of [AS/NZS 2208](#). Ensure material is permanently marked and if cut by the distributor or installer mark each piece to [NZS 4223.3](#), 2.8 Identification.

#### 3.8 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

#### Assembly

#### 3.9 WORKING OF GLASS

All working of glass as required in [NZS 4223.1](#).

#### 3.10 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

#### Installation/application

#### 3.11 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements. Refer to [AS/NZS 4667](#) and [NZS 4223.1](#) for glass and glazing.

#### 3.12 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

#### 3.13 INSTALLING INSULATING GLASS UNITS

Refer to the APL branded window manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to the manufacturers requirements. Fit setting and location blocks and bead glaze units using a compatible sealant.

### 3.14 INSTALLING REFLECTIVE AND COATED GLASS

In addition to the type of glazing specified refer to the requirements of the glass manufacturer and ensure that the rebate dimensions, clearances and edge cover are sufficient to allow for the movement created by the particular solar glass being used. Check thermal stability for the particular location and ensure any sealant or compound is compatible with the coating.

#### Application aluminium

### 3.15 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

#### Application uPVC

### 3.16 INSTALL GLASS TO UPVC FRAMES

Install glass to [NZS 4223.1](#).

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

#### Application - wall mounted glass (mirrors and splashbacks)

### 3.17 WALL MOUNTED GLASS, ADHESIVE FIXED

For mirrors and splashbacks, fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive area 0.2 m<sup>2</sup> per 1 m<sup>2</sup> of glass to [NZS 4223.3](#).

#### Finishing

### 3.18 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

### 3.19 MANIFESTATIONS

To [NZS 4223.3](#), 2.2 Manifestation (making glass visible).

## 4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

#### Performance - wind

### 4.1 WIND ZONE - NON-SPECIFIC DESIGN

Building wind zone: VH (as determined from [NZS 3604](#), [NZS 4223.4](#))

#### Glass by type

### 4.2 AGP TEXTURED, PATTERNED OR OBSCURE GLASS

Brand/pattern: AGP  
Pattern: Mistlite

### 4.3 AGP PVB LAMINATED GLASS

Brand: AGP  
Type: PVB

### 4.4 AGP TOUGHENED GLASS

Brand/type: AGP  
Type: Toughened

### 4.5 AGP HIGH PERFORMANCE THERMAL AND SOLAR GLASS

Brand: AGP  
Type: Stopsol

**4.6 AGP INSULATING GLASS UNIT SYSTEM (IGU'S)**

Brand/type: AGP Double Glazing System  
Outer glass type: Clear  
Spacer type: ATS  
Space gas: Argon  
Inner glass type: Clear

**4.7 AGP SOLUX-E™ - HIGH-PERFORMANCE LOW E THERMAL AND SOLAR CONTROL GLASS**

Location: ALL IGUs  
Brand/type: AGP SOLUX-ETM  
Outer glass type: Clear float  
Coated surface: #2  
Spacer type: ATS  
Space gas: Argon  
Inner glass type: Clear

**Mirrors****4.8 AGP MIRROR**

Brand/type: AGP  
Fixing method: Adhesive

**Splashbacks****4.9 AGP SPLASHBACKS**

Brand/type: AGP  
Type: Toughened

# 4710P PINK BATTS INSULATION

## 1 GENERAL

This section relates to Tasman Insulation **Pink® Batts®** insulation materials installed into residential buildings.

It includes:

Thermal:

- **Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Skillion Roof Insulation**
- **Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® 140mm Wall Insulation**

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC C/AS1-AS2</a>	Protection from fire
<a href="#">NZBC H1/AS1</a>	Energy efficiency
<a href="#">NZS/AS 1530.1</a>	Methods for fire tests on building materials, components and structures - Combustibility test for materials
<a href="#">AS/NZS 3000</a>	Electrical installations
<a href="#">NZS 4218</a>	Thermal insulation - Housing and small buildings
<a href="#">NZS 4220</a>	Code of practice for energy conservation in non-residential buildings
<a href="#">NZS 4243.1</a>	Energy Efficiency - Large buildings - Building thermal envelope
<a href="#">NZS 4246</a>	Energy efficiency - Installing bulk thermal insulation in residential buildings
<a href="#">AS/NZS 60598.2.2:2001</a>	Luminaires- Particular Requirements - Recessed luminaires
<a href="#">AS/NZS 60695.11.5</a>	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Tasman Insulation New Zealand: Product Data Sheets and Installation Instructions

[BRANZ Appraisal 238](#) - Pink® Batts® Insulation

[BRANZ Appraisal 632](#) - Pink® Batts® SnugFloor® Underfloor Insulation

[BRANZ Appraisal 767](#) - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company: **Tasman Insulation New Zealand**

Web: [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz)

Telephone: 0800 746 522

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

Lifetime Warranty	For <b>Pink® Batts®</b> insulation products
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- Commence the warranty from the date of practical completion of the contract works.
- Provide this Warranty on the **Pink® Batts® Lifetime Warranty Certificate** form.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 QUALIFICATIONS, PINK® BATTS®

Installers to be **PinkFit® - Preferred Pink® Batts® installers**. A list of approved installers can be obtained from the web, by telephone or from the local building supplies merchant.

Web: [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz)

Telephone: Freephone 0800 746 534

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Tasman Insulation **Pink® Batts®** insulation or associated products, components or accessories.

#### **Performance - combustibility**

#### 1.6 FIRE PREVENTION

**Pink® Batts®** insulation materials are considered a non-combustible material to NZS/AS 1530.1 and need not be separated from heat sources such as fire places, heating appliances, flues and chimneys to **NZBC C/AS1** to **C/AS2**, except if used in conjunction with, or attached to other heat sensitive materials.

## 2 PRODUCTS

### **Materials - thermal**

#### 2.1 PINK® BATTS® CEILING INSULATION

**Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)** is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaries the insulation must withstand a 30s Needle Flame test to **AS/NZS 60695.11.5**. Pink® Batts® insulation meets this requirement.

#### 2.2 PINK® BATTS® WALL INSULATION

**Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)** is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs.

#### 2.3 PINK® BATTS® ULTRA 140MM WALL INSULATION

**Pink® Batts® 140mm Wall Insulation** is bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R-values and thickness options.

#### 2.4 PINK® BATTS® SKILLION ROOF INSULATION

**Pink® Batts® Skillion Roof Insulation** is bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaries the insulation must withstand a 30s Needle Flame test to **AS/NZS 60695.11.5**. Pink® Batts® insulation meets this requirement.

### **Components**

#### 2.5 FASTENERS

Insul anchors complete with retaining washer.

#### 2.6 PLASTIC STRAPPING TAPES

Proprietary plastic strapping tape, stapled over framing to retain insulation in unlined wall, ceiling and underfloor locations.

For drained cavities where stud spaces are greater than 450mm and only flexible underlay is used, strapping required to **NZBC E2/AS1 9.1.8.5 Wall framing behind cavities**.

#### 2.7 ADHESIVE TAPE

Pressure sensitive adhesive tape.

## 3 EXECUTION

### 3.1 STORAGE

Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, compression, puncturing and damage to edges of materials. Do not use damaged or wet insulation materials.

### 3.2 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

### 3.3 INSPECTION

Before starting installation of blankets and slabs, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall underlays and vapour barriers are in place.

#### Application - general

### 3.4 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#) and [NZS 4220](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Confirm with fireplace manufacturer for clearances; **Pink® Batts®** insulation need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

### 3.5 RECESSED LIGHT FITTINGS - CLEARANCE

Non-residential applications;

The clearance between insulation and recessed downlights

- 100mm gap to [AS/NZS 3000](#), figure 4.9.
- Provide larger clearances where required by the light manufacturer.

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger clearance where required by the light manufacturer.
- In a retrofit situation where recessed downlights are unclassified or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

#### Application, thermal insulation

### 3.6 INSTALL PINK® BATTS® CEILING INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Ceiling Insulation** beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the **Pink® Batts®** insulation and roof underlay. Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

### 3.7 INSTALL PINK® BATTS® WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

### 3.8 INSTALL PINK® BATTS® 140MM WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® 140mm Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to [NZS 4246](#) for installation guidelines and Pink® Batts® installation instructions for detailed information.

### 3.9 FIT PINK® BATTS® SKILLION ROOF INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5mm-10mm to ensure a friction fit.

#### Completion

### 3.10 CLEAN UP

Clean up as the work proceeds, so no spare offcuts or any other matter or item remain behind claddings or linings.

### 3.11 LEAVE

Leave work to the standard required by following procedures.

### 3.12 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

For further details on selections go to [www.pinkbatts.co.nz](http://www.pinkbatts.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

#### Thermal insulation

### 4.1 PINK® BATTS® CLASSIC CEILING INSULATION

Brand: **Pink® Batts® Classic Ceiling**  
R-value: R3.6

### 4.2 PINK® BATTS® ULTRA® 90MM WALL INSULATION

Brand: **Pink® Batts® Ultra® Wall**  
R-value: R2.6

### 4.3 PINK® BATTS® ULTRA® 140MM WALL INSULATION

Brand: **Pink® Batts® Ultra® 140mm Wall**  
R-value: R 3.2

### 4.4 PINK® BATTS® SKILLION ROOF INSULATION

Brand: **Pink® Batts® Skillion Roof**  
R value: R3.2

## 4821 FLASHINGS

### 1 GENERAL

This section relates to the fabrication and installation of flashing systems not forming part of a proprietary system.

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B2/AS1</a>	Durability
<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS/NZS 2728</a>	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
AS 3566	Self-drilling screws for the building and construction industries - General requirements and mechanical properties
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZMRM CoP</a>	NZ Metal Roof and Wall Cladding Code of Practice

#### Requirements

#### 1.2 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

#### 1.3 VERIFY DIMENSIONS

Verify dimensions against site measurements prior to fabrication.

#### Standards of performance

#### 1.4 DURABILITY REQUIREMENTS

Design and install the flashings appropriate for the durability applications in accordance with [NZBC B2/AS1](#). The Building Code B2, 3.2 requires that all hidden elements have at least the same durability as that of the element that covers it. Refer to [NZBC B2/AS1](#) Table 1: Durability Requirements of Nominated Building Elements and [NZBC E2/AS1](#) Table 20 Material selection.

#### 1.5 COMPATIBILITY REQUIREMENTS

Each flashing material shall be selected in accordance with [NZBC E2/AS1](#) Table 20 to minimise corrosion. Refer to either [NZS 3604](#) Clause 4.2 or [AS/NZS 2728](#) for the relevant exposure conditions. For compatibility of materials in contact and subject to run-off, refer to [NZBC E2/AS1](#) table 21 and [NZBC E2/AS1](#) table 22.

## 2 PRODUCTS

### 2.1 FLASHING MATERIALS

Acceptable materials for flashings are described in [NZBC E2/AS1](#), 4.0. Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the building and cladding materials and their fixings.

### 2.2 FLASHING FABRICATION

Fabricate flashings generally to [NZBC E2/AS1](#), 4.0, from a ductile grade of metal designed for lateral strength by folding, stiffening or ribbing on external edges, having a maximum un-stiffened width of 300mm. Provide all hooks, hems, kick outs, bird's beaks, stop ends, soft edges and turn downs etc. to [NZBC E2/AS1](#), 4.0, or as shown on the drawings.

### 2.3 FIXINGS

Rivets, screws, nails and cleats to be compatible with the materials being fastened. Fasteners complying with the corrosion requirements of AS 3566 are suitable for use with ZINCALUME® steel products. Use only low carbon non-conductive sealing washers.

## 2.4 JOINTS - SEALANTS

Neutral Curing silicone or MS polymer sealant as required, with low resistance to compression and be-able to withstand large temperature variations. MS polymer sealant to be used where the sealant is exposed and the surrounding surfaces are to be subsequently painted or coated.

## 2.5 JOINTS - SOLDER

Eutectic solder of 60% tin/40% lead using a suitable proprietary flux.

# 3 EXECUTION

## Conditions

### 3.1 DELIVERY

Keep flashings dry in transit. Take delivery of flashings in an undamaged condition. Reject all damaged materials.

### 3.2 STORAGE

Store materials and accessories on a level, firm base, in dry conditions, well ventilated, out of direct sunlight and completely protected from weather and damage. Ensure storage areas are away from current work areas. Cover to keep dry until fixed.

### 3.3 HANDLING

Avoid distortion and contact with potentially damaging surfaces/substances. Do not drag flashings across each other, or across other surfaces. Protect edges, corners and surfaces from damage.

### 3.4 SUBSTRATE

Do not commence work until the substrate is of the standard required by the installer for the specified flashings, level and in true alignment.

### 3.5 PROTECT

Protect surfaces, window and door joinery, and finishes already in place, from the possibility of damage during the installation process.

### 3.6 CONFIRM LAYOUT

Before commencing work confirm the proposed installation of the flashings and expansion joints and other visual considerations of the finished work.

### 3.7 CO-ORDINATE INSTALLATION

Co-ordinate installation of flashings with associated trades.

## Application

### 3.8 INSTALLATION

Install flashings in accordance with [NZMRM CoP](#) and in compliance with [NZBC E2/AS1, 4.0](#) Flashings. For very high wind zones and where the pitch of the roof is below 15° the flashing joint laps shall be sealed with sealant at each end of the lap to prevent the ingress of water.

Refer to [NZBC E2/AS1 Table 7](#) for general dimensions of flashings.

### 3.9 FIXINGS

Fix flashings with fasteners appropriate to the situation. For fixing flashings with proprietary brackets or clips ensure they are aligned to allow for movement and are compatible with the flashing material.

Fix screws with the shank perpendicular to the surface of the flashing with the washer fitted firmly against the flashing. Screws to be compatible with the flashing material.

Rivets 'blind' or 'pop' are to be sealed when used. Aluminium rivets are compatible with zinc or AZ coated steel. Monel and stainless steel rivets can be used to fix galvanized steel flashings.

Minimum diameter of rivet to be used is 4.0mm. Drill hole 1mm larger than the rivet size. Seal head of rivet with neutral cured silicone.

**3.10 JOINTING - SEALANTS**

Clean surfaces to be lapped using a solvent ensuring all traces of the solvent are removed with a clean rag. Apply sealant by gun in a continuous bead of approximately 5mm diameter. Width of sealant when compressed should not exceed 25mm. Sealant joints shall be mechanically fixed for strength. Refer to [NZMRM CoP](#) for details.

**3.11 JOINTING - SOLDER**

Solder joints in galvanized steel and non-ferrous metals when specified with lead/tin solder. Clean joint ensuring it is dry and free of grease immediately prior to applying a proprietary flux. Lap the flashing 25mm in the direction of the water flow and fasten the lap with rivets or screws at 50mm centres. Completely sweat the joint to avoid leaving any flux residue. Wash down the joint to remove any trace of flux.

**3.12 FINAL INSPECTION**

A final inspection by the installer to take place after completion of the flashing work. Any defects or subsequent damage to be made good.

**Completion****3.13 PROTECT**

Protect new work from damage.

**3.14 REPLACE**

Replace all damaged or marked elements.

**3.15 LEAVE**

Leave work to the standard required for following procedures.

**3.16 REMOVE**

Remove debris, unused materials and elements from the site.

**4 SELECTIONS****4.1 FLASHINGS**

Materials: Aluminium, stainless steel, aluminium/zinc coated steel, , uPVC, butyl rubber

Refer to [NZBC E2/AS1](#), 4.3, for minimum properties of these

Examples;

General flashings: 0.55mm Colorsteel Endura

Window Head: 0.9mm aluminium anodised to match window

# 5111H JAMES HARDIE® FIBRE CEMENT SHEET LININGS

## 1 GENERAL

This section relates to the supply and installation of **James Hardie®** HardieGroove™ Lining for internal wall linings

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">AS/NZS 2589</a>	Gypsum linings - Application and finishing
<a href="#">AS/NZS 2908.2</a>	Cellulose-cement products - Flat sheet
<a href="#">NZS 3602</a>	Timber and wood-based products for use in buildings

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

James Hardie® documents relating to this part of the work:  
HardieGroove™ Lining

Manufacturer/supplier contact details

Company:	James Hardie New Zealand Limited
Web:	<a href="http://www.jameshardie.co.nz">www.jameshardie.co.nz</a>
Email:	<a href="mailto:info@jameshardie.co.nz">info@jameshardie.co.nz</a>
Telephone:	Ask James Hardie™ on 0800 808 868

### Warranties

#### 1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

15 years:	For James Hardie® HardieGroove™ (refer to James Hardie® product warranty)
15 years:	For accessories supplied by James Hardie® (refer to James Hardie® product warranty)
From:	Date of purchase

- Provide this warranty on the manufacturer's standard form.

### Requirements

#### 1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

#### 1.5 SAFE WORKING

To James Hardie® requirements for safe working practices with James Hardie® products, particularly with regards to cutting and drilling.

#### 1.6 COMPLIANCE

Fibre cement sheets to [AS/NZS 2908.2](#).

## 2 PRODUCTS

### Materials

#### 2.1 PROFILED FIBRE CEMENT SHEET LININGS

James Hardie® HardieGroove™ Lining treated cellulose fibre in a matrix of cement and sand autoclaved sheet.

### Components

- 2.2 **BATTENS, TIMBER**  
Minimum 45mm wide, 35mm deep timber with depth suitable for length of fasteners used.
- 2.3 **PACKERS**  
3 - 4mm timber packers.
- 2.4 **NAILS**  
6mm and 9mm linings: 40mm x 2.8mm galvanized flathead HardieFlex™ nails  
Over Gypsum plasterboard: 50mm x 2.8mm galvanized flathead HardieFlex™ nails
- 2.5 **SCREWS FOR POWER SCREW GUN DRIVING**  
Timber framing  
6mm and 9mm linings: Villadrive 6 gauge x 30mm self embedding screws or HardieDrive™ self embedding stainless steel screws  
Steel framing: Steel 8 gauge x 32mm self embedding screws
- 2.6 **WALL BOARD ADHESIVE**  
Polyurethane wallboard adhesive. Refer to James Hardie® product installation manual.

### **Accessories**

- 2.7 **CONTROL JOINTS SECTION**  
45mm x 10mm shaped PVC control joint or Rondo P35 jointer.
- 2.8 **EXTERNAL CORNER SECTIONS**  
30mm x 30mm x 1.2mm PVC angle.
- 2.9 **POLYETHYLENE TAPE**  
Self adhesive polyethylene for behind expressed joints and expressed control joints.
- 2.10 **JOINT REINFORCING TAPE**  
52mm wide perforated paper tape.
- 2.11 **BEDDING COMPOUND**  
James Hardie® Base Coat compound powder.
- 2.12 **FINISHING COMPOUND**  
James Hardie® Top Coat premixed.
- 2.13 **SEALANT**  
Silicone or polyurethane sealant. Refer to the James Hardie® installation manual.

## **3 EXECUTION**

### **Conditions**

- 3.1 **MOISTURE CONTENT**  
Maximum moisture content of timber framing to [NZS 3602](#).
- 3.2 **PROTECT**  
Protect joinery, fittings and finishes already in place from water staining or damage from lining installation.
- 3.3 **BUILDING**  
Ensure building is weatherproof before lining work commences.
- 3.4 **STORAGE**  
Take delivery of products dry and undamaged on pallets, and keep on pallet. Protect edges and corners from damage and covered to keep dry until fixed.

### 3.5 HANDLING

Avoid distortion and contact with potentially damaging surfaces. Carry sheets vertically. Do not drag sheets across each other, or across other materials. Protect edges, corners and surface finish from damage.

### 3.6 SUBSTRATE

Do not commence work until the substrate is of the standard required by the relevant manufacturer's technical literature for the specified finish; plumb, level and in true alignment. Maximum moisture content of timber framing to [NZS 3602](#).

#### Application

### 3.7 FIXING FLUSH JOINTED WALLS, PAINT OR WALLPAPER

Prepare and fix recessed edge sheets to James Hardie® installation manual. Fix with screws and/or nails at edges.

### 3.8 PROVIDE VERTICAL CONTROL JOINTS

Provide vertical control joints at 7.2 metre centres maximum for general application and 4.2 metres centres maximum for tiled applications. Provide acoustic sealant in walls having an acoustic rating.

### 3.9 PROVIDE HORIZONTAL CONTROL JOINTS

Provide horizontal control joints at 7.2 metres centres maximum for general application and 4.2 metre centres maximum for tiled applications.

### 3.10 PROVIDE EXTERNAL CORNER ANGLE

Provide perforated PVC external corner angle or paper faced rigid spine corner mould to external corners.

### 3.11 INTERNAL CORNERS

When used in tiling applications provide a Lumberlock Stud saver to framed internal corner prior to fixing of Villaboard™ Lining.

Provide perforated PVC corner mould, or paper faced rigid spine corner mould or solid blocking to internal corners.

### 3.12 FORMING HOLES

Required holes accurately formed and cut to James Hardie® requirements.

### 3.13 SILICONE JOINTS

Provide polyethylene tape behind joints finished with flexible sealant.

#### Levels of Finish

Refer to [AS/NZS 2589](#).

Refer to SELECTIONS/drawings for required levels of finish.

### 3.14 LEVEL 4 FINISH

**Application:** This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.

**Jointing/setting:** Refer to flush jointing recommendations on page 11 James Hardie® Villaboard™ Lining installation manual.

**Finish:** For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level of wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wallcovering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.

#### Joint Finishing

### 3.15 JOINT FINISHING FOR GLOSS PAINT AND CRITICAL LIGHTING CONDITIONS

Embed tape in joints and corners and apply James Hardie® Base Coat over all joints, angles, fastener heads and accessories. Apply a thin skim coat of James Hardie® Top Coat to the entire surface to be plastered. Finish to a smooth surface, free of tool marks and ridges to achieve a level 5 finish suitable for these critical finishes.

#### **Completion**

#### 3.16 REPLACE

Replace damaged or marked elements.

#### 3.17 CLEAN

Clean adjoining surfaces and fittings of spots, marks, dust and droppings.

#### 3.18 LEAVE

Leave work to the standard required by following procedures.

#### 3.19 REMOVE

Remove debris, unused materials and components from the site.

# 5113G GIB® PLASTERBOARD LININGS

## 1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber framed walls and ceilings to form:

- standard systems
- bracing systems
- wet area systems

### 1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

AWCINZ Association of Wall and Ceiling Industries New Zealand

#### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC C/AS2</a>	Protection from fire
<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">AS 1397</a>	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
<a href="#">AS/NZS 2588</a>	Gypsum plasterboard
<a href="#">AS/NZS 2589</a>	Gypsum linings - Application and finishing
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">ISO 5660.1</a>	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
<a href="#">ISO 5660.2</a>	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
<a href="#">BRANZ Technical Paper P21</a>	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and Supplier documents relating to this part of the work.

- GIB® Site Guide (September 2018)
- GIB® Noise Control Systems (September 2017)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Bracing Software (2016)
- GIB Goldline™ Platinum Tape-on Trims (January 2006)
- GIB UltraFlex® high impact corner mould (September 2004)

[BRANZ Appraisal 427](#) (2007)  
[BRANZ Appraisal 928](#) (2016)

GIB Aqualine® Wet Area Systems  
GIB Ezybrace® Systems 2016

GreenTag Certification

[WWL-002-V2-2018](#) - GreenTag™ GreenRate / Level A  
- GIB® Standard (10mm & 13mm)  
- GIB Braceline® (10mm & 13mm)  
- GIB Noiseline® (10mm & 13mm)  
- GIB Wideline® (10mm & 13mm)

Copies of the above literature available at:

Company:

Winstone Wallboards

Web:

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

Telephone:

0800 100 442

## Requirements

### 1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

### 1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

## Performance

### 1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

### 1.7 SOUND INSULATION REQUIREMENTS

Provide the GIB® Noise Control Systems. Include for forming and treating of perimeters of openings and penetrations in the elements to ensure the specified performance. Ensure absence of adjoining flanking paths.

### 1.8 BRACING REQUIREMENTS

Braced wall systems to [NZS 3604](#) when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems (2016) and/or GIB Ezybrace® Bracing Software (2016)

Refer to drawings for location and type.

## 2 PRODUCTS

### Materials

#### 2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to [AS/NZS 2588](#). Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard

GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard

GIB Aqualine® wet area plasterboard

### Components

#### 2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber

Refer to GIB® requirements for appropriate details.

#### 2.3 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould

GIB® Levelline® Tape on Trim

#### 2.4 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims

## Accessories

### 2.5 ADHESIVE

Timber frame and/or steel frame:  
 GIBFix® One ultra low VOC water based wallboard adhesive  
 GIBFix® All-Bond solvent based wallboard adhesive

### 2.6 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi

### 2.7 JOINTING TAPE

GIB® jointing tape.

### 2.8 ACOUSTIC SEALANT

GIB Soundseal® ultra low VOC water based highly flexible acoustic sealant.

### 2.9 GAP FILLER

GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

## 3 EXECUTION

### Conditions

#### 3.1 STORAGE

Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (September 2018).

#### 3.2 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in [AS/NZS 2589](#).

#### 3.3 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

**Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.**

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to [AS/NZS 2589](#).

#### 3.4 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer requirements. Refer to GIB® Site Guide (September 2018).

#### 3.5 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to [AS/NZS 2589](#) for timber framing at lining: 18% or less for plasterboard linings. Refer to [NZBC E2/AS1](#) and GIB® Site Guide (Sept 2018).

#### 3.6 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Sept 2018).

### Application

**3.7 LINING WALLS AND CEILINGS GENERALLY**

Form to GIB® Site Guide (September 2018). Ensure bulk insulation thickness shall not exceed that of the wall framing.

**3.8 BOARD ORIENTATION**

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

**3.9 FORM NOISE CONTROL SYSTEMS**

Form to GIB® Noise Control Systems requirements.

**3.10 FORM WET AREA SYSTEMS**

Form to GIB Aqualine® Wet Area Systems requirements.

**3.11 FORM BRACING SYSTEMS**

Form bracing systems to:

- GIB Ezybrace® Systems (2016)

**3.12 FORM CONTROL JOINTS**

Form control joints to GIB® Site Guide (September 2018) requirements.

**3.13 INSTALL TAPE-ON TRIMS**

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

**Finishing****3.14 FINISHING GENERALLY**

To GIB® Site Guide (September 2018) and [AS/NZS 2589](#).

**Completion****3.15 REPLACE**

Replace damaged sheets or elements.

**3.16 CLEAN DOWN**

Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer requirements, to leave completely smooth and clean.

**3.17 REMOVE**

Remove debris, unused materials and elements from the site.

**3.18 LEAVE**

Leave work to the standard required by following procedures.

**4 SELECTIONS****Plasterboard****4.1 GIB® STANDARD SYSTEMS WALLS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All rooms except garage and wet areas	GIB® Standard plasterboard	10mm	4

**4.2 GIB® WATER RESISTANT SYSTEMS WALLS**

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Ensuite and Bathrooms	GIB Aqualine® plasterboard	10mm	4

## 4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All rooms except wet areas	GIB® Standard plasterboard	13mm	5

## 4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Ensuite and Bathrooms	GIB Aqualine® plasterboard	13mm	5

## 4.5 GIB® SOUND RATED SYSTEMS

Refer to GIB® Noise Control Systems

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
As marked on plans	Gib Noiseline plasterboard	10mm	4

# 5123LS LAMINEX NEW ZEALAND STRANDBOARD TIMBER BOARD LININGS

## 1 GENERAL

This section relates to the supply and fixing of **Laminex New Zealand** Strandboard® engineered reconstituted wood panels for:

- wall linings
- wall bracing

Strandboard® is recommended for dry interior use only and must not be used in an external situation. Strandboard® panels are not waterproof and must not be allowed to come into direct or prolonged contact with water. The panels must be finished with a protective coating prior to occupation of the building.

### Documents

#### 1.1 DOCUMENTS REFERRED TO

Refer to the general section 1233 REFERENCED DOCUMENTS. Documents referred to in this section are:

<a href="#">NZS 3604</a>	Timber Framed Buildings
<a href="#">NZBC B1/AS1</a>	Structure
<a href="#">NZBC C/AS1, C/AS2</a>	Protection from fire
<a href="#">NZBC C/VM2</a>	Protection from fire
<a href="#">NZBC 3.4(a)</a>	Internal Surface Linings
<a href="#">NZS 1170.5</a>	Structural design actions - Earthquake actions
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
<a href="#">AS/NZS 1859.1</a>	Reconstituted wood-based panels - Specifications - Particleboard

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

#### 1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

**Laminex New Zealand** Strandboard® Technical Brochure  
 Declare LMX-5001 Laminex Strandboard®  
 Copies of the above literature are available from **Laminex New Zealand**.  
 Web: [www.Laminex.co.nz](http://www.Laminex.co.nz)  
 Email: [info@laminex.co.nz](mailto:info@laminex.co.nz)  
 Telephone: 0800 303 606

This literature gives in-depth details of design and installation methods referred to in this specification. For specific design applications, contact **Laminex New Zealand** customer services.

### Requirements

#### 1.3 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified Laminex New Zealand components and associated products listed in this section.

### Performance

#### 1.4 BRACING REQUIREMENTS

Provide wall systems to meet the requirements of [NZS 3604](#), Section 5, **Bracing design**

#### 1.5 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters and topographical classification (T) of the site and building height to [NZS 3604](#), table 5.1. Suitable for wind zone up to and including Extra High as specified by [NZS 3604](#).

#### 1.6 SEISMIC - NON SPECIFIC DESIGN

Design the system and its anchorages/fixings to resist the earthquake loads of the earthquake zone in accordance with [NZS 3604](#), 5.3 Earthquake bracing demand.

## 2 PRODUCTS

### Materials

#### 2.1 STRANDBOARD WALL LINING

**Laminex New Zealand** Strandboard® engineered reconstituted wood panels to [AS/NZS 1859.1](#). Panels are available 3600mm and 2400mm x 1200mm in 9mm thickness; 3600mm and 2400mm x 1200mm or 3600mm x 2400mm in 12mm thickness. Confirm compatibility of manufacturing adhesives with adhesives used for waterproofing membranes.

### Components

#### 2.2 NAILS - STRANDBOARD

Corrosion resistant flat-head or jolt-head, hand or power-driven nails to **Laminex New Zealand** Strandboard® requirements for sheet thickness. Refer to **Laminex New Zealand** Strandboard® requirements for size and use in each location.

Either:

40mm x 2.5mm ring shank hot dipped galvanised

40mm x 2.5mm ring shank stainless steel

Fixings along panel edges must be min. 10mm from the panel edge.

#### 2.3 SCREWS - STRANDBOARD

Corrosion resistant Twinfast™-type to manufacturer's requirements for sheet thickness. Refer to **Laminex New Zealand** Strandboard® requirements for fixing centres.

### Accessories

#### 2.4 CONTACT ADHESIVE

Contact adhesive to manufacturer's and **Laminex New Zealand** Strandboard® requirements.

#### 2.5 FILLER

Solvent-based wood dough filler tinted as required for the specific coating application to the manufacturer's recommendations.

## 3 EXECUTION

### Conditions

#### 3.1 STORAGE

Take delivery and only accept panels dry and undamaged. Reject all damaged material. Store on a level, firm base, well ventilated and completely protected from weather and damage to **Laminex New Zealand** Strandboard® requirements.

#### 3.2 HANDLING

Avoid distortion and contact with damaging substances. Protect all edges and surfaces from damage. **Laminex New Zealand** Strandboard® panels are not waterproof and must not be allowed to come into direct or prolonged contact with water.

#### 3.3 FRAMING AND/OR SUBSTRATE

Before commencing installation the building must be completely enclosed, with timber framing dimensions and moisture content to **Laminex New Zealand** Strandboard® requirements and with all other materials free from damp. Ensure the substrate is plumb, level and in true alignment.

#### 3.4 FRAMEWORK SETOUT

Allow for the stud, purlin, rafter, beams, etc. to accommodate a 2mm expansion gap at **Laminex New Zealand** Strandboard® panel joints especially where large areas or long walls are to be covered.

### Application

#### 3.5 SITE MEASURE

Site check and confirm dimensions before wall linings are cut and fixed. Verify positions of electric power outlets, wiring to light fittings included in joinery fixtures, water supplies and waste pipe locations.

### 3.6 FIXING STRANDBOARD LINING

Before fixing, the substrate moisture content must be less than 18% and the sheets fillet stacked on site to pre-condition. Provide edge clearances and dimensional increases to **Laminex New Zealand Strandboard®** requirements and fix boards vertically with vee-butt joints and with all edges fully supported. Minimum 10mm, maximum 15mm from the edge, 150mm centres along edges and 200mm centres on intermediate supports. Seal board surfaces immediately after fixing.

### 3.7 SHRINKAGE & EXPANSION

Arrange jointing and fixing so that shrinkage in any part and direction does not impair the strength or appearance of the finished work or damage the adjoining work.

Allow a 2-3mm gap at edges of linings for sheet expansion; and;

2 - 3mm at each sheet joint; or

6 - 9mm at 3.6 metres; or

8 - 12mm every 4.8 metres

In areas with an expected high level of internal moisture, allow a gap of 4 - 6mm every 1.2 metres.

### 3.8 FIXING SHEET BRACING

Ensure required hold down, strapping, angles, or bolts are in place, and that framing centres are correct.

Fit and fix to [NZS 3604](#), and **Laminex New Zealand Strandboard®** bracing requirements with sheets and trim all in plumb, true alignment.

#### Completion

### 3.9 REPLACE

Replace damaged or marked elements.

### 3.10 LEAVE

Leave work to the standard required by following procedures.

### 3.11 REMOVE

Remove debris, unused materials and elements from the site.

### 3.12 PROTECTION

Protect the surfaces of finished work if pre-finished or until coatings or coverings have been applied.

Board surfaces should be primed or clear sealed immediately after fixing to minimise the effects of atmospheric moisture or direct sunlight and to resist marking during construction activities.

## 4 SELECTIONS

#### Materials

### 4.1 LAMINEX STRANDBOARD® WALL LINING

Location: Garage

Distributor: **Laminex New Zealand**

Brand/grade: Strandboard®

Thickness: 9mm

### 4.2 SCREWS

Type/size: 10g x 50mm

## 5151 INTERNAL TRIM

### 1 GENERAL

This section relates to simple lengths of trim fixed on site as of isolated internal members, with simple end joints.

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC C/AS1, C/AS2</a>	Protection from fire
<a href="#">NZS 3602</a>	Timber and wood-based products for use in building
<a href="#">NZS 3604</a>	Timber-framed buildings
<a href="#">NZS 3610</a>	Specification for profiles of mouldings and joinery

### 2 PRODUCTS

#### Materials

#### 2.1 TIMBER TRIM

To [NZS 3610](#) and to profiles detailed on the drawings. Timber species, grade and treatment to [NZS 3602](#).

#### Components

#### 2.2 BRADS

Bright steel of a length three times the thickness of the member being fixed. Use cadmium plated where prone to dampness.

### 3 EXECUTION

#### Conditions

#### 3.1 GENERALLY

To comply with [NZS 3604](#), except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

#### 3.2 STORAGE

Take delivery of trims undamaged and unmarked and store on site under cover, away from moisture, heat and direct sunlight in adequately ventilated area and clear of areas where work is in progress, to ensure materials are of the required standard when fixed in place.

#### 3.3 ACCLIMATISE MATERIALS

Remove materials from packaging, separate and allow to acclimatise in the proposed installation area for 48 hours minimum prior to installation.

#### 3.4 ENSURE

Ensure that the substrate to trims will allow work of the required standard. If it does not, do not proceed until the substrate has been remedied.

#### Application - Generally

#### 3.5 INSTALL TIMBER TRIM

Use full lengths. Fit with scribed internal joints, mitred external joints and, mitred and returned at stop ends. Fix plumb, level and true to line and face using nails or brads to suit. Leave secure and with no movement possible.

#### Finishing

### 3.6 PUNCH

Punch all nail heads below the face of trim ready to receive stopping, as specified under painting preparation.

#### **Completion**

### 3.7 LEAVE

Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following procedures.

### 3.8 PROTECTION

Protect the completed work and make good before any surface finish is applied.

### 3.9 REPLACE

Replace damaged or marked elements.

### 3.10 REMOVE

Remove debris, unused materials and elements from the site.

## **4 SELECTIONS**

### 4.1 INTERNAL TIMBER TRIM

Manufacturer:	SPP
Species/grade:	Eco Pine
Profile:	BA 90x10
Finish:	Paint

## 5230 INTERIOR DOORS

### 1 GENERAL

This section relates to the supply and installation of interior doors.

#### 1.1 RELATED SECTIONS

Refer to glazing section/s for glass type and thickness.

#### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZS 3602](#) Timber and wood-based products for use in building  
[NZS 3610](#) Specification form profiles of mouldings and joinery

### 2 PRODUCTS

#### 2.1 TIMBER

To [NZS 3602](#).

#### 2.2 PROFILES, FACINGS, SCRIBERS AND ARCHITRAVES

Traditional profiles to [NZS 3610](#). Proprietary profiles and special profiles as detailed. Pencil radius corners of profiled schedules for paint finish.

#### 2.3 DOORS, PAINTED

Doors as scheduled (without clashing strips).

#### 2.4 CAVITY SLIDERS

Doors hung within a proprietary cavity slider frame and complete with brand-matched sliding door gear.

#### 2.5 FRAMED AND GLAZED DOORS

Solid timber framed doors, stop end jointed and bead glazed.

#### 2.6 DOOR HINGES

Size and gauge to carry door. 3 hinges per door.

#### 2.7 SLIDING DOOR GEAR

To suit door/sash size and glazed weight and as detailed.

### 3 EXECUTION

#### 3.1 SITE MEASURE

Confirm framed openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery. Confirm lintel head and sill deflection for sliding or bi-fold door systems is within the manufacturer's specified tolerances. Provide not less than 10mm unless otherwise required.

#### 3.2 EXECUTION GENERALLY

Manufacture to the methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

#### 3.3 FACTORY FIT HARDWARE

Factory fit the following where specified: -

- Hinges

#### 3.4 FACTORY FINISHING

Before delivery to site: -

- Brace square and provide protection to assemblies during delivery to site. Where factory glazed, indicate the presence of transparent glasses with whiting, tape or signs compatible with the glass type.

**Internal doors****3.5 INTERNAL JOINERY FRAMES**

Fabricate as detailed. Wedge and rigidly fix in place without distortion, plumb, and true to line and face. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish.

**3.6 DOOR FRAMES, SOLID REBATED**

Fabricate as detailed. Hang doors to operate freely on hinges, sliding, or bi-fold gear and to the door manufacturer's requirements. Pre drill for fixings through frame. Countersink and plug frames scheduled for clear finish. Fit hardware.

**3.7 DOOR LINERS, EXTENDED**

Heads and jambs finished 30mm, rebated for wall linings and extended a minimum of 10mm. 10mm planted door stops. Hang doors on hinges, sliding and bi-fold gear to the door manufacturer's requirements and to operate freely. Countersink and plug frames scheduled for clear finish. Fit hardware.

**3.8 CAVITY SLIDERS**

Install in accordance with the door manufacturer's requirements, allowing for removal of top trim for maintenance.

**Completion****3.9 CHECK**

Check and adjust operation of all sashes, doors, hardware and furniture.

**3.10 TEMPORARY PROTECTION**

On completion remove any temporary protection and leave ready for following work.

**4 SELECTIONS****4.1 CAVITY SLIDER DOOR**

Brand/type: CS 4 Doors  
 Door size: as scheduled on drawings  
 Finish: Paint  
 Hardware: to owners selection

**4.2 SLIDING DOOR GEAR**

Brand/type: Henderson rollers

**4.3 DOORS**

Manufacturer: Superior Doors  
 Description: MDF faced with Ribcore  
 Hardware: to owners selection

**Accessories****4.4 DOOR HINGES**

Interior doors

Type:	Loose pin
Size:	89mm
Material:	Zinc-plated steel
Pin:	Loose-pin zinc-plated steel

## 6411K KARNDEAN VINYL SURFACING

### 1 GENERAL

This section relates to the supply and installation of Karndean PVC tiles

#### Documents

#### 1.1 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Karndean Product Selector

Karndean International Installation and After Care Data Sheets

Australian Wool Testing Authority Ltd (AWTA Product Testing), Test Reports 7-560532-CV, 7-542749-CV, 7-579137-CV, 7-579140-CV, 7-574302-AV, 7-574328-AV, 7-573400-CV, 7-574283-AV, 7-574261-AV, 7-581075-CV, 7-587233-AV.

Manufacturer/supplier contact details

Company: **Karndean Designflooring**

Web: [www.karndean.com](http://www.karndean.com)

Email: [customerservice@karndean.co.nz](mailto:customerservice@karndean.co.nz)

Telephone: 0800 442 101

Fax: 0800 453 059

#### Warranties

#### 1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

12 years For Knight Tile domestic duty

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of completion of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### 1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/appliator warranty:

1 year For floor preparation and workmanship failure under normal environmental and use conditions

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of completion of installation.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

#### 1.4 QUALIFICATIONS

Vinyl installation to be carried out by competent, experienced resilient flooring installers familiar with the materials and techniques specified.

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

#### 1.6 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Manufacturers maintenance and cleaning instructions to the owner. Provide this information prior to practical completion.

### 2 PRODUCTS

## Materials

- 2.1 VINYL TILES  
Heterogeneous flexible PVC tiles.

## Accessories

- 2.2 ADHESIVE - GENERAL USE  
For general use:
  - Karndean Mega-Bond.
- 2.3 ADHESIVE - SPECIAL USE  
For high temperature and excessive water spillage areas:
  - Karndean 8000 2-part Polyurethane.
- 2.4 PRIMER AND SEALER  
To the adhesive manufacturer's requirements for the particular substrate.

## 3 EXECUTION

### Conditions

- 3.1 GENERALLY  
To manufacturer's requirements and [NZS/AS 1884](#).
- 3.2 STORAGE  
Maintain packages of tiles and accessories undamaged and dry. Store on level surfaces in non-traffic, non-work areas that are enclosed, clean and dry.
- 3.3 HANDLING  
Avoid distortion, stretching, marking and damage to edges while shifting tiles and accessories. Inspect for any faulty material. Do not use faulty or damaged material.
- 3.4 BEFORE COMMENCING WORK  
Ensure that the building is enclosed, wet work complete, doors hung and lockable, finishes and trim complete, and good lighting available, before starting work.
- 3.5 INSPECT  
Inspect the substrate in accordance with [NZS/AS 1884](#), 2.1 **Site Inspection**, to ensure it is of the standard required for work in this section.
- 3.6 LAYING / INSTALLING  
Carry out the whole of the work to [NZS/AS 1884](#), and to the flooring manufacturer's requirements.
- 3.7 LAYOUT  
Before beginning the installation confirm the proposed layout of material, location of seams and other visual considerations of the finished work.

### Preparing substrate

- 3.8 NEW CONCRETE  
Clear substrate of debris, clean off surface contamination and carry out surface repairs using a proprietary levelling compound. Carefully feather out at perimeters of repaired areas. Grind level, then vacuum to remove all dust. Check for moisture content by Hygrometer testing (Hood Method) to [NZS/AS 1884](#) Appendix A and do not commence laying vinyl until readings for the whole area show 75% relative humidity or less. Test alkalinity (pH) level to [NZS/AS 1884](#), Appendix B, do not commence laying until readings for the whole area show a pH of 10 or less.

### Vinyl floor laying

### 3.9 PREPARATION - GENERAL

Check that each colour supplied is from the same batch. Follow the vinyl manufacturer's requirements for working temperatures and conditions before, during and after laying tiles and planks. Protect work from solar heat gain and switch off under-floor heating during and for 48 hours either side, of the work period. Once the heating unit is turned back on it shall be increased at 2°C per day until desired temperature is achieved, to a maximum of 28°C.

### 3.10 PREPARATION - CONDITIONING

Ensure Karndean PVC tiles and planks achieve conditioning by storing on site in stacks outside of the packing in an ambient room temperature range of 18°C - 26°C for 24 hours before installation. The ambient temperature range to be maintained during installation and 24 hours after completion. Note: Failure to pre-condition heterogeneous tiles and planks may cause bonding issues to occur.

### 3.11 ADHESIVE APPLICATION

Apply Karndean approved adhesive as required by the vinyl manufacturer and without trowel marks after setting. Follow requirements for wet bonding, taking note of substrate porosity, ambient temperature and relative humidity. Remove excess adhesive as the work proceeds using required techniques.

### 3.12 LAYING / INSTALLING VINYL TILES

To [NZS/AS 1884](#). Set out from the centre of the area in two preparatory runs and modify to suit before laying tiles from the centre to Karndean's requirements. Ensure air is expelled and, as each section is completed, immediately roll with a the appropriate roller to [NZS/AS 1884](#), section 5. Complete sections before scribing the perimeter tiles.

### **Completion**

### 3.13 CLEAN AND POLISH

Protect all exposed edges abutting other floor coverings with diminishing strips or other suitable mouldings. Remove all debris from floor and vacuum or sweep all dust. Remove all traces of adhesive with Karndean Basic Striper or similar. Option: Strip and seal a newly installed Karndean floor which has its surface protected by K-Guard Plus, a PU coating.

### 3.14 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

### 3.15 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked vinyl flooring. Replace damaged or marked vinyl where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

## 6511 CARPETING

### 1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck).

It includes:

- carpet underlay
- woven sheet carpet

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

- |                               |   |
|-------------------------------|---|
| <a href="#">NZBC C/AS2</a>    | Protection from fire                                      |
| <a href="#">AS/NZS 2455.1</a> | Textile floor coverings - Installation practice - General |

#### Warranties

#### 1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### 1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

#### 1.4 QUALIFICATIONS

Carpet layers to be experienced, competent trades people familiar with the materials and the techniques specified, and with [AS/NZS 2455.1](#).

#### 1.5 MOISTURE CONTENT OF CONCRETE SLAB

Concrete slab is to be cured and dried to a relative humidity of not exceeding 75% or until the moisture content does not exceed 5.5%, in accordance with [AS/NZS 2455.1](#)

#### 1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

#### 1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

## 2 PRODUCTS

#### Materials

2.1 UNDERLAY  
To [AS/NZS 2455.1](#) Soft underlay and underlays manufacturer's requirements.

2.2 CARPET  
To [AS/NZS 2455.1](#) Textile floor coverings.

### Components

2.3 BINDER BARS  
Anodised aluminium section with fluted face.

2.4 DIVIDER STRIPS  
Hardwood strips 20mm x 15mm or as specified.

2.5 EDGE GRIPPER  
Timber/plywood to [AS/NZS 2270](#) with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

### Accessories

2.6 ADHESIVE, UNDERLAY  
To [AS/NZS 2455.1](#), clause 1.5.3. and underlay manufacturer's requirements.

2.7 ADHESIVE, CARPET  
To [AS/NZS 2455.1](#), clause 1.5.3. and carpet manufacturer's requirements.

2.8 TAPE  
To carpet manufacturer's requirements.

## 3 EXECUTION

### Conditions

3.1 DELIVERY  
Take delivery of materials and goods and store on site and protect from damage. Accept rolls of carpet and accessories undamaged and dry.

3.2 HANDLE AND STORE  
Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

3.3 INSPECTION  
Before starting work inspect the substrate to ensure that it will allow work of the required standard, and that all fittings and fixtures around which the carpet is to be scribed are in place.

3.4 PROTECTION  
Protect adjoining work surfaces and finishes during the carpet installation.

3.5 TAPE  
Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

3.6 LAYOUT  
Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

3.7 TEMPERATURE  
Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

### 3.8 FLOOR PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION. Prepare floor and check conditions required for laying to [AS/NZS 2455.1](#), section 2.

#### **Application - substrate preparation**

### 3.9 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust.

### 3.10 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed. Check for moisture content and do not commence laying until readings for the whole area show a moisture content of:  
 8 - 12% for air conditioned buildings  
 10 - 14% for intermittently heated buildings  
 12 - 16% for unheated buildings

#### **Application - carpet laying**

### 3.11 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

### 3.12 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to [AS/NZS 2455.1](#), section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

### 3.13 LAYING TO STAIRS

Install on stairs in accordance with [AS/NZS 2455.1](#).

### 3.14 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

#### **Completion**

### 3.15 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

### 3.16 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

## 4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

### 4.1 UNDERLAY

Brand	Type/thickness/weight
Styrene based rubber latex slab	Heavy duty 11mm

# 6700D DULUX PAINTING GENERAL

## 1 GENERAL

This section relates to the general matters related to painting work.

### 1.1 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">AS/NZS 2311</a>	Guide to the painting of buildings
<a href="#">AS/NZS ISO 9001</a>	Quality management systems - Requirements
<a href="#">WorkSafe NZ</a>	Guidelines for the provision of facilities and general safety in the construction industry
<a href="#">WorkSafe NZ</a>	Guidelines for the management of lead-based paint
MPNZA	Specification manual
MPNZA	Health and Safety Programme
<a href="#">Health and Safety at Work Act 2015</a>	

### 1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

**Dulux** DuSpec specification sheets and product data sheets

Copies of relevant literature are available from **Dulux**

Web: [www.dulux.co.nz/specifier](http://www.dulux.co.nz/specifier) or [www.duspec.co.nz](http://www.duspec.co.nz)

Email: [specifier@dulux.co.nz](mailto:specifier@dulux.co.nz)

Telephone: 0800 800 424

Facsimile: 0800 801 424

### Warranties

### 1.4 WARRANTY

Warrant this work under normal environmental and use conditions against failure of materials and execution.

Product warranty: Products must be applied in accordance with application and preparation procedures according to **Dulux** DuSpec Specifications and Product Data Sheets. Contact a Dulux Trade Representative for project specific warranties.

Refer to the general section 1237WA WARRANTY AGREEMENT for the required format and details of when completed warranty must be submitted.

### Requirements

### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Dulux** system, or associated components and products.

If in the applicator's own expertise and judgement an amendment to this specification is required, or where a substrate preparation or required painting system is not covered in this specification, this shall be brought to the attention of the contract administrator and any amendment agreed before work proceeds any further.

## 1.6 QUALIFICATIONS

Painters to be members of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

The applicator is to have the necessary skill, experience and equipment to undertake the work. The applicator remains responsible for ensuring proper completion of the work.

## 1.7 HEALTH AND SAFETY

Refer to the [Health and Safety at Work Act 2015](#) and [WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry](#). If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to [WorkSafe NZ: Guidelines for the management of lead-based paint](#) for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

## 1.8 PRIOR TO WORK COMMENCING

Before any work commences painters should verify with architect or specifying authority, that their paint matches a previously supplied standard card or panel. Differently coloured paints will vary in price, opacity and durability. Dulux normally only specify two coats of colour but with certain colours such as bold, brights and some corporate colours, three coats may be needed.

## 1.9 MATERIAL SAFETY DATA SHEETS

Refer to **Dulux** for the material safety data sheets for every applicable product and comply with the safety procedures listed. Keep sheets on the site. Refer to [www.dulux.co.nz/specifier](http://www.dulux.co.nz/specifier).

### Performance

## 1.10 DULUX INSPECTION

Permit representatives of **Dulux** to inspect the work in progress and take samples of their products from site if requested.

## 1.11 INSPECTION OF THE WORK

Inspection of the whole of the work at each of the stages set out in SELECTIONS may be made. Agree a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

# 2 PRODUCTS

### Materials

## 2.1 PAINT TYPES

Use the manufacturer's complete system and only the products specified.

## 2.2 MATERIALS GENERALLY

Use only **Dulux** products which are guaranteed for their consistency and performance under [AS/NZS ISO 9001](#) and APAS approval, prepared, mixed and applied as directed in the **Dulux** Duspec specification sheets, specification manuals and product data sheets.

## 2.3 THINNERS/ADDITIVES

Use only if and when expressly directed by **Dulux** for their particular product in a particular application.

### Accessories

## 2.4 FILLERS

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified preparation system.

## 2.5 GYPSUM FILLER - INTERIOR

Finishing compound to match the plasterboard stopping system and finishing grade gypsum plaster to match the fibrous plaster system. For interior surfaces such as paper faced plasterboard use **Dulux Professional Ultra 5 Surface Prep & Finish** as an aid to achieving a Level 5 finish.

# 3 EXECUTION

## Conditions

### 3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in [AS/NZS 2311](#), the MPNZA Specification manual, and [WorkSafe NZ: Guidelines for the provision of facilities and general safety in the construction industry](#).

### 3.2 PREPARE

Prepare surfaces to Dulux's requirements.

### 3.3 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

### 3.4 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

### 3.5 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

### 3.6 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

### 3.7 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

### 3.8 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

#### Exterior

For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.

Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

#### Interior

For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.

Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

### 3.9 ANCILLARY SURFACES

The coatings listed in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

### 3.10 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

### 3.11 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

#### Preparation

### 3.12 PREPARATION

Refer to the DuSpec specification sheets for detailed substrate preparation notes

- [www.duspec.co.nz](http://www.duspec.co.nz).

#### Application - before applying final coatings

### 3.13 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

### 3.14 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP. treated joinery has dried sufficiently to lose odour.

### 3.15 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

### 3.16 CONCEALED METAL SURFACES

Apply primer to suit the coating system to all metal surfaces which will be concealed when incorporated into the building.

### 3.17 DOORS

Prime or seal and paint all six faces of doors before hanging.

### 3.18 PUTTY FRONTING

According to the putty manufacturer's instructions allow putty to set, then prime with an appropriate Dulux primer, either **Dulux** 1 Step Acrylic Primer Sealer & Undercoat or 1 Step Oil Based Primer, Sealer & Undercoat. Fully protect the putty by completing the **Dulux** coating system as soon as it is sufficiently firm.

#### Application - generally

### 3.19 PAINTING GENERALLY

Comply with the **Dulux** DuSpec specification sheets, product data sheets and the additional requirements of this work section.

### 3.20 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

### 3.21 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

### 3.22 SEQUENCE OF OPERATIONS

Painting work to generally the following sequence:

- Back-painting and pre-installation painting, then post-installation exposed-face painting
- Complete surface preparation before commencing painting
- Apply primers, sealers, stains, undercoats, paints and clear coatings in the sequences laid down by **Dulux**
- Allow the full drying times between coats laid down by **Dulux**
- Do not expose primers, sealers and undercoats beyond a few days before applying the next coat
- Finish broad areas before painting trim
- Ensure batch numbers of tins are matched for whole areas
- Internally paint ceilings before walls and walls before joinery, trim and other items.

### 3.23 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of **Dulux** and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

### 3.24 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

### 3.25 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

### 3.26 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the **Dulux** paint system specified.

### 3.27 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- uniform finish, colour, texture, sheen and hiding power
- the specified number of coats applied
- no blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, brush marks, ladder marks and blistering
- proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application

Note that some colours may require more than two top coats and/or the use of a tinted undercoat.

This is particularly relevant when using bright or high chromatic coloured paints (e.g. colours derived off True Red, Bold Yellow, Orange, and Extra Bright base) or when painting over existing dark colours.

### Completion

### 3.28 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

### 3.29 CLEAN EQUIPMENT

Use **Dulux** EnviroWash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal. Phone 0800 800 424 for information regarding this system.

### 3.30 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

### 3.31 REMOVE

Remove dropsheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

### 3.32 REPLACE HARDWARE

Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

#### 4 SELECTIONS

Substitutions are not permitted unless stated otherwise.

## 7112 RAINWATER STORAGE TANKS

### 1 GENERAL

This section relates to the installation of domestic rainwater storage tanks.

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC G1/AS1</a>	Personal Hygiene
<a href="#">NZBC G12/AS1</a>	Water Supplies
<a href="#">AS/NZS 1260</a>	PVC-U pipes and fittings for drain, waste and vent application
<a href="#">AS/NZS 1546.1</a>	On-site domestic wastewater treatment units - septic tanks
AS 2070	Plastic materials for food contact use
<a href="#">AS/NZS 2845.1</a>	Water supply - Mechanical backflow prevention devices - materials, design and performance requirements
<a href="#">AS/NZS 3000</a>	Electrical installations
<a href="#">NZS 3104</a>	Specification for concrete production
<a href="#">AS/NZS 3500.1</a>	Plumbing and drainage - water services
<a href="#">AS/NZS 3500.3</a>	Plumbing and drainage - stormwater drainage
<a href="#">AS/NZS 4020:2005</a>	Testing of products for use in contact with drinking water
<a href="#">AS/NZS 4130:2009</a>	Polyethylene (PE) pipes for pressure applications
<a href="#">AS/NZS 4766</a>	Polyethylene storage tanks for water and chemicals
ATS 5200.026	Technical Specification for plumbing and drainage products - Cold water storage
HB 230	Rainwater Tank Design and Installation Handbook (Standards Australia)
Ministry of Health	Household water supplies: The selection, operation, and maintenance of individual household water supplies

#### Requirements

#### 1.2 HEALTH REQUIREMENTS

Refer to The Ministry of Health publication "Household water supplies: The selection, operation, and maintenance of individual household water supplies" for guidance.

#### 1.3 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

#### Performance

#### 1.4 PRODUCER STATEMENT

Provide a producer statement from a suitably qualified person for:  
Design and manufacture  
Producer statements to be in the form required by the Building Consent Authority.

#### 1.5 DESIGN AND INSTALLATION

To HB 230 Rainwater Tank Design and Installation Handbook, to [AS/NZS 3500.1](#), [AS/NZS 3500.3](#) and to [NZBC G1/AS1](#) and [NZBC G12/AS1](#).

#### 1.6 TESTING OF PRODUCTS

Materials used in the manufacture of rainwater tanks to be tested to [AS/NZS 4020](#).

### 2 PRODUCTS

#### Components

## 2.1 RAINWATER STORAGE TANK

- Underground tank manufactured from reinforced concrete. To be designed, inspected and certified by a professional consulting engineer in accordance with the specified test method, performance requirements, pressure testing and objectives of [AS/NZS 1546.1](#) and [AS/NZS 4766](#).

Tanks to be fitted with a secure fitting lid to provide internal access for cleaning or inspection.

### Accessories

## 2.2 TANK FITTINGS

Fittings kit supplied with the tank for complete installation.

## 2.3 UPVC PIPES AND FITTINGS

Unplasticised PVC pipe and fittings to [AS/NZS 1260](#).

## 2.4 POLYETHYLENE PIPES AND FITTINGS

High density polyethylene pipe and fittings to [AS/NZS 4130:2009](#).

## 2.5 WATER PUMP

Pump designed to pressurised water supply from tank into the building.

## 2.6 TANK VENT

Vent with insect proof stainless steel mesh fitted on top of the tank.

## 2.7 FIRST FLUSH WATER DIVERTER

Wall mounted or underground system specific to installation. To prevent the first flow of water from the roof entering the water storage tank.

## 2.8 TANK VACUUM SYSTEM

Designed to suck from the bottom of the tank when the tank is full to overflowing. System to include anti siphon device.

## 2.9 SEALS

Uniseals for pipe connections to the top of the tank.

## 2.10 TANK BASE BEDDING

Clean sand or concrete 100 to 150mm thick.

## 2.11 CONCRETE

To [NZS 3104](#): Prescribed mix 17.5 MPa: For in situ tank base and water pump pad.

# 3 EXECUTION

### Conditions

## 3.1 SITE ACCESS

Transportation on site to the position of the tank is at the risk and responsibility of the contractor. Make provision for manoeuvring and unloading of tank.

### Application - site

## 3.2 SITE EXCAVATION FOR UNDERGROUND GROUND TANK

Excavate to required size. Place tank into excavation and connect up to the plumbing system with backflow prevention fitted to [AS/NZS 3500.1](#). Drainage system to [AS/NZS 3500.3](#). Backfill with free draining material to manufacturer's requirements. Ensure tank access lids are designed and installed to prevent child and stormwater ingress.

## 3.3 LAYING AND JOINTING

Lay in straight lines between changes of line or grade from the lower end of the drain with sockets pointing uphill. Set each pipe true to line and grade and each joint completed before the next pipe is laid.

### Application - fittings

### 3.4 WATER PUMP INSTALLATION

Install pump on a solid base bolted down through base plate. Place weather tight housing over the pump and secure to base. Connect to water supply and power supply.

### 3.5 BACK FLOW PREVENTION DEVICES

Install to [AS/NZS 2845.1](#), to [AS/NZS 3500.1](#) and to [NZBC G12/AS1](#).

#### **Application - connections**

### 3.6 FIRST FLUSH WATER DIVERTER

Install either adjacent to the tank or underground, first flush water diverter. Connect downpipes from the roof gutter to the first flush water diverter. Connect the first flush diverter to the top of the tank. Refer to manufacturer's installation details.

### 3.7 INLET CONNECTION

Install inlet pipe into top of tank at manufacturer's designated mounting area using a Uniseal type connection.

### 3.8 OUTLET CONNECTION

Install pipe to manufacturer's installation details. To the outlet connect a floating arm draw-off to deliver water from 100mm below the surface. From the base connection run a flexible hose to the pump. Install ball valve in line between base connection and water pump. Support all pipework at outlet.

### 3.9 OVERFLOW PIPE

Install pipe to manufacturer's installation details and connect to approved discharge point or as detailed.

### 3.10 PIPE SEALS

Insert Uniseals in clean cut holes of the correct size. Insert Uniseal into hole with widespread facing the pipe to be inserted. Lubricate the pipe with detergent and push through the Uniseal. Use only on top of tank connections.

### 3.11 ELECTRICAL CONNECTION

Installation to [AS/NZS 3000](#). Allow to connect up water pump and water treatment unit to the power supply as provided.

#### **Commissioning**

### 3.12 POST INSTALLATION TESTING

Test and commission the completed system to manufacturer's requirements and [AS/NZS 3500.1](#), section 16.5 Testing and Commissioning a Rainwater System. At the completion and testing of the water service, check all valves and other components to confirm their correct performance.

#### **Completion**

### 3.13 REPLACE

Replace damaged or marked elements.

### 3.14 LEAVE

Leave work to the standard required by following procedures.

### 3.15 CLEAN

Clean and flush out the whole installation. Remove silt and debris.

### 3.16 REMOVE

Remove debris, unused materials and elements from the site.

## **4 SELECTIONS**

### 4.1 RAINWATER STORAGE TANK

Manufacturer:	Larsens ELE Tanks
Tank material:	Reinforced Concrete
Capacity:	10000 litres

## 7120 HOT & COLD WATER SYSTEM

### 1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B2/AS1</a>	Durability
<a href="#">NZBC G4/AS1</a>	Ventilation
<a href="#">NZBC G12/VM1</a>	Water supplies
<a href="#">NZBC G12/AS1</a>	Water supplies
<a href="#">NZBC H1/AS1</a>	Energy Efficiency
<a href="#">AS/NZS 2492</a>	Cross Linked Polyethylene (PE-X) pipe for pressure applications
<a href="#">AS/NZS 2537.2</a>	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
<a href="#">AS/NZS 2845.1</a>	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
<a href="#">AS/NZS 3500.1</a>	Plumbing and drainage - Water services
<a href="#">AS/NZS 3500.4</a>	Plumbing and drainage - Heated water services
<a href="#">NZS 3501</a>	Specification for copper tubes for water, gas and sanitation
<a href="#">AS/NZS 4130:2009</a>	Polyethylene (PE) pipes for pressure applications
<a href="#">NZS 4305</a>	Energy efficiency domestic type hot water systems
<a href="#">NZS 4617</a>	Tempering (3-port mixing) valves
<a href="#">Gas (Safety and Measurement) Regulations 2010</a>	
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	
NZ Backflow Testing Standard: <a href="#">NZ Backflow Testing Standard 2011</a> , Field testing of backflow prevention devices and verification of air gaps	

#### Warranties

#### 1.2 WARRANTY

Provide warranty for:

2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

#### Requirements

#### 1.3 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

## 1.4 HOT WATER TEMPERATURES

To [NZBC G12/AS1](#), 6.14

Storage water heaters to store water at not less than 60°C.

Hot water piping system, with temperature controls where necessary (tempering valve etc), to provide water at the outlet at the following temperatures:

For personal hygiene fixtures (showers, baths, wash hand basins etc) temperatures to be close to but not to exceed 55°C - for personal hygiene fixtures.

For non-personal hygiene fixtures (kitchen sinks and equipment, laundry tubs, cleaners sinks, industrial fixtures etc) temperatures are:

- Unrestricted - direct from water heater, approx. 60°C, must be less than 65°C (for kitchen sinks and equipment, laundry tubs, cleaners sinks etc) - in all buildings.
- Unrestricted - direct from water heater not tempered (for industrial fixtures and specific items etc) - in all buildings.

This clause excludes boiling units.

### Performance

## 1.5 TESTING - TO NZBC G12/AS1

Test to [NZBC G12/AS1](#), 7.5, **Watertightness**, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

## 2 PRODUCTS

### Materials

### 2.1 COPPER PIPE

To [NZS 3501](#) complete with copper-alloy compression fittings or cross type joints and seal ring compression joints complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), Table 1 and [NZBC G12/AS1](#), Table 1.

### 2.2 POLYPROPYLENE RANDOM WATER PIPE

PP-R Polypropylene pipes to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), table 1 and [NZBC G12/VM1](#). Protect from sunlight.

### 2.3 POLYPROPYLENE RANDOM RECYCLED/RECLAIMED WATER PIPE

PP-R Polypropylene pipes, lilac coloured, to DIN 8077 and DIN 8078 complete with fusion welded fittings and accessories brand-matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), table 1 and [NZBC G12/VM1](#). Protect from sunlight.

### 2.4 WATER METER

To the requirements of the network utility operator.

### 2.5 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to [NZBC G12/AS1](#).

### 2.6 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to [AS/NZS 2845.1](#) where it is possible for water or contaminants to backflow into the potable water supply. Refer to [NZBC G12/AS1](#) 3.4 Backflow protection, and [NZBC G12/AS1](#), table 2, Selection of Backflow Protection.

### 2.7 TEMPERING VALVE

Tempering valve to [NZS 4617](#) to [NZBC G12/AS1](#).

### Materials - Hot water heating appliances

- 2.8 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE  
To [NZS 4305](#), ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.
- 2.9 PROTECTIVE TAPE  
Plasticised PVC tape system with primer, mastic fixing and outer coating.

## 3 EXECUTION

- 3.1 EXECUTION GENERALLY  
Generally carry out the whole of this work and tests to [NZBC G12/VM1](#) or [NZBC G12/AS1](#).
- 3.2 HANDLE AND STORE  
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.  
  
Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.
- 3.3 CORE HOLES AND SLEEVES  
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.
- 3.4 CONCEAL  
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.
- 3.5 CORROSION  
Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.
- 3.6 THERMAL MOVEMENT  
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.
- 3.7 PIPE SIZE  
Flow rates to each outlet to be no less than those given in [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in [NZBC G12/AS1](#), table 4, Tempering valve and nominal pipe diameters.
- 3.8 ELECTROLYTIC ACTION  
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
- 3.9 EXCAVATE  
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

### Application - Jointing

- 3.10 JOINTING COPPER PIPE  
Braze pipe, fit alloy compression fittings, cross type joints and seal ring compression joints to [NZBC G12/AS1](#).
- 3.11 JOINTING POLYPROPYLENE PIPE  
Fusion weld joints to manufacturer's requirements.

### Application - Pipework installation

- 3.12 WATER SUPPLY CONNECTION  
Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to [NZBC G12/AS1](#).

### 3.13 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

### 3.14 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and [G12/VM1](#) or [G12/AS1](#).

### 3.15 EQUIPOTENTIAL BONDING METALLIC WATER SUPPLY PIPES

If it is an electrical requirement, before enclosing, ensure metallic water supply pipes and metallic sanitary fixtures are equipotential bonded (or at least conductor cable attached) to [NZBC G12/AS1](#), 9.0.

### 3.16 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

#### **Application - Hot water systems**

### 3.17 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to [NZBC G12/AS1](#), 6.11, Water heater installation. Valve-vented systems to [NZS 4607](#).

### 3.18 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances (storage water heaters) to be restrained to manufacturer's requirements and [NZBC G12/AS1](#), 6.11, Water Heater Installation.

### 3.19 INSTALL ELECTRIC HOT WATER CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with [NZBC G12/AS1](#): 6.11. Valve-vented systems to [NZS 4607](#).

### 3.20 INSTALL STORAGE HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to storage hot water cylinder to [NZBC G12/AS1](#).

### 3.21 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

### 3.22 PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

#### **Installation - Valves**

### 3.23 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

### 3.24 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

### 3.25 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or [NZ Backflow Testing Standard](#).

#### **Completion**

### 3.26 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

### 3.27 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

### 3.28 REPLACE

Replace damaged or marked elements.

### 3.29 LEAVE

Leave work to the standard required by following procedures.

### 3.30 REMOVE

Remove debris, unused materials and elements from the site.

# 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES

## 1 GENERAL

This section relates to the supply and installation of sanitary fixtures, tapware and sanitary accessories.

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E3/AS1</a>	Internal moisture
<a href="#">NZBC F2/AS1</a>	Hazardous building materials
<a href="#">NZBC G1/AS1</a>	Personal hygiene
<a href="#">NZBC G12/VM1</a>	Water supplies
<a href="#">NZBC G12/AS1</a>	Water supplies
<a href="#">NZBC G13/AS1</a>	Foul water
<a href="#">NZBC G13/AS3</a>	Plumbing and drainage
<a href="#">AS/NZS 1730</a>	Washbasins
<a href="#">AS/NZS 2023</a>	Baths for ablutionary purposes
<a href="#">AS/NZS 3500.1</a>	Plumbing and drainage - water services
<a href="#">AS/NZS 3500.2</a>	Plumbing and drainage - sanitary plumbing and drainage
<a href="#">AS/NZS 3662</a>	Performance of showers for bathing
<a href="#">NZS 4223.3</a>	Glazing in buildings - Human impact safety requirements
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

### Requirements

#### 1.2 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a Certifying Plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

#### 1.3 SUPPLIER

A specialist in the supply of tapware, and employing experienced architectural representatives available to assist during the course of the installation.

## 2 PRODUCTS

### 2.1 SANITARY FIXTURES

Refer to owners selection

### 2.2 TAPWARE

Refer to owners selection

### 2.3 SANITARY APPLIANCES

Refer to owners selection

### 2.4 SANITARY ACCESSORIES

Refer to owners selection

## 3 EXECUTION

### Conditions - sanitary fixtures

**3.1 DELIVERY**

Only deliver to the site fixtures or fittings that can be immediately unloaded into suitable storage or be placed for direct installation.

**3.2 STORAGE AND HANDLING**

Take delivery of and store components complete with protective casings and coverings in areas that are enclosed, clean and dry and where no work is being done. Remove protection only to the extent that will allow installation.

**3.3 QUALITY STANDARDS INCLUDING NZBC G13/AS1**

Installation work to comply with [NZBC G1/AS1](#), [NZBC G12/VM1](#), [NZBC G12/AS1](#), [NZBC G13/AS1](#) and the fixture manufacturer's requirements.

**3.4 SUBSTRATE**

Ensure substrate and fixings will allow work of the specified standard.

**3.5 CO-ORDINATION**

Do not proceed if the points of supply and drainage services do not match the points of the fixtures without force or distortion.

**3.6 INSTALLATION REQUIREMENTS INCLUDING NZBC G13/AS1**

Install to [NZBC G1/AS1](#), [NZBC G12/VM1](#), [NZBC G12/AS1](#), [NZBC G13/AS1](#), [NZBC E3/AS1](#) and to the fixture manufacturer's installation requirements for each component. Carry out preparatory and assembly work, including connections to supply and drainage services and the application of slurries and sealants in sequence.

Seal between all sanitary fixtures and wall linings, fixtures and the tops they are in, the tops and wall linings, to [NZBC E3/AS1](#), 3.2.2. Fixtures include baths, basins, tubs or sinks. Tops include, vanities, bath surrounds, sink benches, etc, and there upstands.

**3.7 PROVIDE SUPPORT**

Confirm fixing points needed for each unit and provide solid blocking at each fixing bracket location.

**3.8 EARTHING OR EQUIPOTENTIAL BONDING METALLIC FIXTURES**

If it is an electrical requirement, before installation or enclosing, ensure at-risk metallic sanitary fixtures are earthed or equipotential bonded (or at least conductor cable attached) to [NZBC G12/AS1](#), 9.0.

**Conditions - tapware****3.9 RETAIN**

Retain tapware in the manufacturer's original packaging and ensure that units are complete with fixings and installation instructions. Label each unit separately with its fitting name and space number.

**3.10 STORE**

Store tapware packages in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

**Conditions - sanitary accessories****3.11 RETAIN**

Retain fixtures, fittings and hardware in the manufacturer's original packaging and ensure that units are complete with associated fixings and installation instructions. Label each unit separately to match the submitted and approved schedule.

**3.12 PACKAGE**

Package fixtures, fittings and hardware units required in clear plastic and label each to match the drawings and the submitted schedule. Place packages in cartons selected for 'level', 'location', and/or 'sector' and label the packages and the cartons similarly.

**3.13 STORE**

Store items in a shelved, dry and securely locked area. Provide supervision when the secure area is unlocked and packages and cartons are being distributed; signing off each package from the schedule as released.

### 3.14 INSPECTION

Before starting the installation of proprietary items, check relevant spaces and wall and floor finishes for any condition that would not allow the proper installation of any unit. Do not proceed until such conditions have been remedied.

#### **Installation - sanitary fixtures**

### 3.15 INSTALLING TOILET PAN

Carry out preparatory and assembly work, including connections to supply and drainage services and the application of slurries/bedding and sealants in sequence. Fit the toilet pan in position, plumb, level, flush and rigid without stressing the attachment points of the component. Fixings to be corrosive resistant. Fit seat.

### 3.16 INSTALLING CISTERNS

Fit firmly in place and connect the specified cisterns from the supply services through the flush pipes to the relative fixtures in the positions as detailed all plumb and level.

#### **Installation - Basins**

### 3.17 INSTALLING WASHBASINS

Install to [NZBC G1/AS1](#), [AS/NZS 1730](#). Set basins firmly to walls or vanities as detailed and to comply with [NZBC E3/AS1](#). Connect to supply and drains through trap to the drainage system.

### 3.18 INSTALLING VANITIES - INTEGRAL BASINS

Install in accordance with the manufacturer's requirements. Connect to supply and drains through trap to the drainage system. Seal top and upstand to wall surface to comply with [NZBC E3/AS1](#).

#### **Installation - Showers**

### 3.19 INSTALLING SHOWER FITTINGS

Shower waste, mixer and rose to be install to [NZBC G1/AS1](#) and to [AS/NZS 3662](#).

### 3.20 INSTALLING SHOWER ENCLOSURES AND WALL LININGS

Install in accordance with [NZBC E3/AS1](#). Sit tray firmly in place as detailed, to levels shown and connect to drainage service, ready for following work. Fit screen and door unit to manufacturer's details. Lining materials and finishes to comply with [NZBC E3/AS1](#).

### 3.21 INSTALLING SHOWER DOOR AND SCREEN

To [NZS 4223.3](#) and to the product manufacturer's requirements. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating.

#### **Installation - Baths**

### 3.22 INSTALLING BATHS

Install to [NZBC G1/AS1](#). Set firmly in cradle with required points fully supported, level and flush. Connect to supply and drainage services.

#### **Installation - Sinks**

### 3.23 INSTALLING SINK BENCHES

Install in accordance with manufacturer's/supplier's requirements. Connect to supply and drainage services.

#### **Application - tapware**

### 3.24 GENERAL

To [AS/NZS 3500.1](#) and in accordance with the manufacturer's requirements. Maintain safe water temperatures to comply with [NZBC G12/AS1](#).

#### **Application - sanitary accessories**

### 3.25 INSTALLING ACCESSORIES

Fit specified fittings firmly in place at required dimensions relative to floor and adjoining sanitaryware fittings, all plumb and level.

### 3.26 LOCATE

Locate units at heights and/or locations shown on the drawings, or as required to comply with [NZBC G1/AS1](#). For any dimension not shown or known, request direction before proceeding.

### 3.27 CUTTING AND FITTING

Where cutting and fitting of the substrate is necessary for installing any unit, carry out this work before the painting or finishing of that surface. Remove any hardware when required for painting, placing it in the packaging or carton originally supplied and returning it to the secure store until ready for re-installation.

### 3.28 INSTALLING UNITS

Install each unit in accordance with the proprietary fixture manufacturer's requirements, using the templates and tools supplied or recommended by them. Set units level, plumb and true to line and required location, with moving parts and actions freely and easily operating. Do not make any modifications to supplied units.

## Completion

### 3.29 REPLACE

Replace damaged or marked elements.

### 3.30 PROTECTIVE COVERINGS

Leave fixtures, fittings and accessories clean and unblemished with stickers and protective coverings removed, with supply and drainage connections and all parts fully operating and working. Leave the whole of this work free of blemishes, undamaged and to the standard of finish required for following work.

### 3.31 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

### 4.1

REFER TO OWNERS SELECTION OF FIXTURES, APPLIANCES, TAPWARE AND ACCESSORIES

# 7411C CONTINUOUS SPOUTING RAINWATER SYSTEMS

## 1 GENERAL

This section deals with **Continuous Spouting NZ Ltd** rainwater disposal systems including spouting and downpipes, in various metal substrates.

### 1.1 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc.

### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E1/AS1</a>	Surface Water
<a href="#">NZBC E2/AS1</a>	External moisture
BS EN 988	Zinc and zinc alloys. Specification for rolled flat products for building
AS 1566	Copper and copper alloys - Rolled flat products
<a href="#">AS/NZS 2728</a>	Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
<a href="#">NZMRM CoP</a>	NZ Metal Roof and Wall Cladding Code of Practice

Documents listed above and cited in the clauses that follow are part of this specification. However this specification takes precedence in the event of it being at variance with the cited document.

### 1.3 MANUFACTURER'S DOCUMENTS

**Continuous Spouting New Zealand Ltd** documents relating to work in this section are: Continuous Spouting, Fascia, Spouting, Downpipes.

Copies of the above literature are available from

Copies of the above literature are available from **Continuous Spouting NZ Ltd:**

Web:	<a href="http://www.continuous.co.nz">www.continuous.co.nz</a>
Email:	<a href="mailto:sales@continuous.co.nz">sales@continuous.co.nz</a>
Telephone:	0800 50 1993

### Warranties

### 1.4 WARRANTY

Provide **Continuous Spouting NZ Ltd** warranty covering material and installation in the standard form.

Product performance, life expectancy and warranty are dependent upon environment, maintenance and material selection. Refer to **Continuous Spouting NZ Ltd** for the appropriate warranty terms, conditions and environmental considerations based on performance requirements to [AS/NZS 2728](#).

Refer to the general section 1237 WARRANTIES for details of when completed warranty must be submitted.

### Requirements

### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

### 1.6 QUALIFICATIONS

**Continuous Spouting NZ Ltd** installers and local agents to be experienced competent trades people, familiar with the materials and the techniques specified.

## Performance

### 1.7 TEST

Test the completed rainwater disposal system with water to ensure spoutings are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in spoutings.

### 1.8 DESIGN

Layout, falls and capacity of spouting to falls and the size and position of downpipes to comply with [NZBC E1/AS1](#). Refer to [NZMRM](#) recommendations, sections 5.5 **Gutters** and 5.7 **Downpipes**.

## 2 PRODUCTS

### Materials

#### 2.1 COLORCOTE® ZINCALUME

Colorcote ZRX™ manufactured from Zincalume™ AZ150 coated steel, [tAS/NZS 2728](#).

### Products

#### 2.2 SPOUTING

Manufactured by **Continuous Spouting** NZ Ltd using onsite plant to provide made to measure continuous lengths of spouting. Complete with matching brackets and screws. Spouting to be sized to comply with [NZBC E1/AS1](#) and installed to [NZBC E2/AS1](#) 8.1.6. Refer to SELECTIONS for type.

#### 2.3 DOWNPIPES

Complete with stand-off brackets, screw fixed. Refer to SELECTIONS for type.

### Components

#### 2.4 DOWNPIPE SPREADERS

To comply with E2/AS1 figure 20.

#### 2.5 DROPPERS

Material to match spouting, sized to fit inside the downpipe.

#### 2.6 BRACKETS

Material to match the spouting.

#### 2.7 SEALANT

Neutral cure silicone or Fixall Hitack MS Polymer sealant.

## 3 EXECUTION

### Conditions

#### 3.1 HANDLE AND STORE

Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

#### 3.2 SUBSTRATE

Check that fascias, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

#### 3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting.

### 3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

#### **Application - metal**

### 3.5 INSTALL METAL SPOUTING

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line between 800mm to 900mm centres maximum. In areas where snow fall is possible the centres should be reduced to 600mm and snow strap fitted. Cut out neatly for and fit the pre-formed downpipe dropper and seal and rivet around the joint. All installation to [NZMRM CoP](#) recommendations section 5.5 **Gutters**.

### 3.6 INSTALL METAL DOWNPIPES

Form downpipes complete with offsets and shoes as needed with all joints lapped and sealed as required. Screw fix with matching pipe clips to rigidly stand plumb to the wall, and discharging into the stormwater gully or pipe inlet. All installation to [NZMRM CoP](#) recommendations, section 5.7 **Downpipes**.

#### **Application - general**

### 3.7 INSTALLATION GENERALLY

Install to [NZMRM CoP](#) recommendations where not otherwise specified.

### 3.8 INSTALL DOWNPIPE SPREADERS

Install downpipe spreaders where required to [NZMRM CoP](#), clause 5.7.1, **Downpipe Spreaders**. Proved spreaders to downpipes that discharge on to a lower roof. Ensure spreaders do not discharge directly over fasteners or laps. Spreaders to have holes equalling twice the diameter of the downpipe.

### 3.9 INSTALL SUMPS

Install sumps where required to [NZMRM CoP](#), clause 5.8, **Sumps**.

### 3.10 INSTALL RAINWATER HEADS

Install rainwater heads where required to [NZMRM CoP](#), clause 5.8.1, **Rainwater Heads**.

### 3.11 INSTALL OUTLETS AND OVERFLOWS

Install outlets and overflows where required to [NZMRM CoP](#), clauses 5.8.2, **Outlets and Overflows**.

### 3.12 INSTALL SUMP PROTECTION

Install leaf guards of the same area as the sump. Set the leaf guard above the calculated level of flow; not directly in the outlet

#### **Completion**

### 3.13 REPLACE

Replace damaged or marked elements.

### 3.14 LEAVE

Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.

### 3.15 REMOVE

Remove debris, unused materials and elements from the site.

## 4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

#### **Prepainted Zincalume system**

**4.1 CONTINUOUS SPOUTING NZ LTD - PREPAINTED ZINCALUME SPOUTING**

Manufacturer: **Continuous Spouting** NZ Ltd  
Profile/size: 125mm Box gutter  
Base material: Steel with Zincalume® coating  
BMT: 0.55mm  
Finish: Prepainted Colorcote® ZRX  
Brackets: Internal

**4.2 CONTINUOUS SPOUTING NZ LTD - PREPAINTED ZINCALUME DOWNPIPES**

Manufacturer: **Continuous Spouting** NZ Ltd  
Profile/size: 80mm  
Base material: Steel with Zincalume® coating  
BMT: 0.55mm  
Finish: Prepainted Colorcote® ZRX  
Clips: Munzing Clip to match downpipe material

# 7421MO MARLEY OPTIM DWV SANITARY SYSTEM

## 1 GENERAL

This section relates to the supply and laying of **Marley New Zealand Limited** above ground gravity flow PVC-U sanitary systems for residential applications.

It includes:

- foul water
- sanitary fixtures to first underground drain connection
- system wastes, floor wastes, floor waste gullies, traps, vents and valves
- associated components and accessories to make the system work.

### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC G1/AS1</a>	Personal hygiene
<a href="#">NZBC G13/AS1</a>	Foul water - Sanitary plumbing
<a href="#">AS 2887</a>	Plastic waste fittings
<a href="#">AS/NZS 1260</a>	PVC-U pipes and fittings for drain, waste and vent applications
<a href="#">AS/NZS 1462.22</a>	Methods for test for plastic pipes and fittings - Method 22: Method for determination of pipe stiffness
<a href="#">AS/NZS 1462.3</a>	Methods for test for plastic pipes and fittings - Method for determining the impact characteristics of pipes
<a href="#">AS/NZS 2032</a>	Installation of PVC pipe systems
<a href="#">AS/NZS 3500.2</a>	Plumbing and drainage - Sanitary plumbing and drainage
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	

#### 1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer and supplier documents relating to this part of the work:  
Marley OPTIM® DWV Technical Design Manual  
Marley Material Safety Data Sheets

Manufacturer/supplier contact details

Company: **Marley New Zealand Limited**  
Web: [www.marley.co.nz](http://www.marley.co.nz)  
Email: [guy@marley.co.nz](mailto:guy@marley.co.nz)  
Telephone: 09 279 2799

#### 1.3 WARRANTY - INSTALLER

Provide an installer warranty:

2 years: For installation

- Provide this warranty on the installer standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

#### 1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

#### 1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

## 1.6 AS BUILT DOCUMENTS

Provide the following as built documents and records:  
Dimensioned plan of waste and vent pipe locations and sizes

- Provide draft as built information prior to practical completion.
- Provide final as built information prior to the end of the defects liability period.

### Compliance information

## 1.7 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Installer's approval certificate from the manufacturer / importer / distributor
- Manufacturer, importer or distributor Certificate of Conformance
- Installer's warranty
- Producer Statement - Construction from the installer
- Producer Statement - Construction Review from an acceptable suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

### Performance

## 1.8 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed. Test to [NZBC G13/AS1](#) or [AS/NZS 3500.2](#), 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

## 2 PRODUCTS

### Materials

### 2.1 PVC-U DWV PIPEWORK - RESIDENTIAL

Marley PVC-U DWV pipework comprised of unplasticised PVC waste pipes, traps and fittings manufactured to [AS/NZS 1260](#), tested to AS/NZS 1462.22 and AS/NZS 1462.3, and compliant with [AS/NZS 3500.2](#). Available in a range of pipe types with nominal size DN20 to DN150 and stiffness class SN4 and SN6.

### 2.2 PVC-U VENT PIPES

Marley PVC-U vent pipes comprised of unplasticised PVC including fittings and accessories manufactured to [AS/NZS 1260](#), tested to AS/NZS 1462.22 and AS/NZS 1462.3, and compliant with [AS/NZS 3500.2](#). Available in a range of pipe types with nominal size DN 40 to DN 100 and stiffness class SN4 to SN10.

### 2.3 EXPOSED PIPES AND TRAPS - CHROME

To [AS/NZS 3500.2](#). Satin chrome plated exposed pipes, traps and wastes including all associated fittings.

### 2.4 FLOOR WASTE

Vinyl Rite Floor Waste System, with solvent joint and standard white PVC grate.

### 2.5 GULLY TRAP

Refer to 7430 DRAINAGE for gully traps.

### Components

### 2.6 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

## 3 EXECUTION

### Conditions

- 3.1 EXECUTION GENERALLY - AS/NZS 3500.2  
Carry out this work to [AS/NZS 3500.2](#) and complete all tests to [AS/NZS 3500.2](#), 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.
- 3.2 ELECTROLYTIC ACTION  
Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.
- 3.3 HANDLE AND STORE  
Handle and store pipes, fittings and accessories to avoid damage. Store on site under cover on a clean level area, stacked to eliminate movement and away from work in progress.
- 3.4 SETTING OUT  
Set out location of all stacks, discharge pipes, fittings and vent pipes and the completeness of their discharge into the drainage system.
- 3.5 CORE HOLES AND SLEEVES  
Fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Sleeve diameter to be 25mm larger than outside diameter of pipe accommodated. Strip core holes and make good after installation of pipework.
- 3.6 PIPE ACCESS  
Fit and fix stacks, wastes and pipes in ducts independent of all other services so they are easily replaceable for their full length. Wrap or tape pipes buried in concrete.
- 3.7 FITTINGS ACCESS  
Fit and fix traps and wastes to enable access for cleaning and for maintaining the total system.
- 3.8 CONFIRM LOCATION  
Unless the location and height are clearly delineated on the drawings, confirm installation height and plan locations of sanitary fittings before commencing the piping installation.
- 3.9 CORROSION  
Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

#### **Installation - traps and wastes**

- 3.10 TRAPS AND WASTES - CONCEALED  
Conceal traps and wastes in the fabric of the building in accordance with manufacturer's requirements.
- 3.11 TRAPS AND WASTES - EXPOSED CHROME  
Fit and fix satin chrome plated exposed pipes, traps and wastes in accordance with manufacturer's requirements.
- 3.12 INSTALL GULLY TRAPS  
Refer to 7430 DRAINAGE for installation of gully traps.

#### **Installation - jointing**

- 3.13 JOINTING PVC-U PIPE - SOLVENT WELDED JOINTS  
Prime and solvent weld joints using spigots and sockets to Marley requirements. Jointing to be in accordance with Marley OPTIM DWV jointing procedures as shown in the Marley OPTIM technical manual.

#### **Installation - fixing**

- 3.14 THERMAL MOVEMENT  
Accommodate longitudinal movement in pipes resulting from temperature changes. Incorporate expansion joints in PVC-U pipes. Install PVC pipes to [AS/NZS 2032](#). Take particular care to allow for movement at horizontal take-off locations from stacks.

**3.15 TRAPS AND FIXTURE DISCHARGE PIPES**

Size traps and pipes as required for each fixture or appliance. Establish the developed length of waste pipes. Vent and allow access for cleaning as required. Follow the most direct line with the least number of bends to [NZBC G13/AS1: Foul water sanitary plumbing, table 4, Discharge unit loading for stacks and graded discharge pipes and table 7, Distance between supports.](#)

**3.16 DISCHARGE STACKS AND VENTS**

Size stacks and vents to [NZBC G13/AS1: Foul water sanitary plumbing, table 2, Fixture discharge pipe sizes and discharge units and table 6, Vent pipe sizes.](#) Extend up past the highest branch to form a discharge stack vent terminating to [NZBC G13/AS1: Foul water sanitary plumbing, figure 12](#) and finishing at the base with a 45 degree bend. Support system to [NZBC G13/AS1: Foul water sanitary plumbing, table 7, Distances between supports.](#)

**Completion****3.17 ROUTINE CLEANING**

Carry out routine trade cleaning of this part of the work including periodic removal of all debris, unused materials and elements from the site.

**3.18 DEFECTIVE OR DAMAGED WORK**

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable.

**Commissioning****3.19 TESTING**

Pre-test all pipework during construction. On completion of the work and before approval for acceptance of the pipework, carry out a final test to the approval of the engineer and if required witnessed by the representative of the territorial authority.

**4 SELECTIONS**

For further details on selections go to [www.marley.co.nz](http://www.marley.co.nz)  
Substitutions are not permitted to the following, unless stated otherwise.

**Materials - sanitary systems****4.1 MARLEY PVC DWV PIPEWORK, RESIDENTIAL**

Manufacturer: Marley New Zealand Limited  
Pipe brand/type: Marley Optim  
Pipe diameter: 65mm, 100mm  
Jointing: Solvent joint  
Stiffness class: SN4  
Fittings: to Marley DWV Technical Design Manual

**4.2 MARLEY PVC-U VENT PIPE**

Manufacturer: Marley New Zealand Limited  
Pipe brand/type: Marley Optim  
Pipe diameter: 50mm, 80mm, 100mm  
Jointing: Solvent joint  
Stiffness class: SN4  
Fittings: to Marley DWV Technical Design Manual

## 7430 DRAINAGE

### 1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

#### 1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC E1/VM1	Surface water
NZBC G1/AS1	Personal Hygiene
NZBC G13/AS1	Sanitary Plumbing
NZBC G13/AS2	Foul Water
NZBC G13/AS3	Plumbing and Drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
NZS 3111	Method of test for water and aggregate for Concrete
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
NZS 4402 (set)	Method of testing soils for civil engineering purposes
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
NZCMM	NZ Concrete Masonry Manual section 6.1 Masonry Retaining Walls
NZTA F2	Specification for pipe subsoil drain Construction
<a href="#">Plumbers, Gasfitters and Drainlayers Act 2006</a>	

#### 1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

#### 1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

### 2 PRODUCTS

#### 2.1 CONCRETE

17.5 MPa prescribed mix to [NZS 3104](#).

#### 2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to [AS/NZS 4671](#).

### 2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to [AS/NZS 1254](#) and [AS/NZS 1260](#).

Underground PVC-U pipe to be Classified as follows:

Classification:	Use:
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

### 2.4 GULLY TRAPS - AS/NZS 3500.2

Gully traps complete with grating to [AS/NZS 3500.2](#), 4.6 Gullies, as modified by [NZBC G13/AS3](#).

### 2.5 TRENCH BACKFILLING MATERIAL - AS/NZS 3500.2

Bedding & surround: Crushed rock or gravel screenings of nominal size of 7 - 10 mm.

Backfill material: Excavated material from the trench (free from rock, hard matter and organic material) containing no soil lumps larger than 75 mm.

### 2.6 DRAINAGE MATERIAL

Free draining crushed stone, 7 mm to 20 mm in size.

## 3 EXECUTION

### 3.1 EXCAVATE

Excavate for drains to a firm even base with correct gradients set in straight runs.

Trenches running parallel, below and close to foundations of buildings to [NZS 3604](#) or [NZS 4229](#) to be separated to:

- [NZBC E1/AS1](#), 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
- [NZBC G13/AS2](#), 5.6, **Proximity of Trench to Building**, for foul water drains.

### 3.2 MANUFACTURER'S REQUIREMENTS

All drainage installations to the pipe and fitting manufacturer's requirements.

### 3.3 DRAINAGE GENERALLY - AS/NZS 3500.2 & NZBC E1/AS1

Carry out this work to [AS/NZS 3500.2](#) and complete all tests to [AS/NZS 3500.2](#), 15 Testing of Sanitary Plumbing and Sanitary Drainage Installations.

Carry out stormwater drainage work to [NZBC E1/AS1](#), and complete all tests to [NZBC E1/VM1](#), 8.0 Drain Leakage Tests.

Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#), [AS/NZS 2566.1](#) and [AS/NZS 2566.2](#).

Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#) and [AS/NZS 2566.1](#).

### 3.4 LAY FOUL WATER DRAINS

Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

### 3.5 CONSTRUCT GULLY TRAPS - AS/NZS 3500.2

Set in a minimum 100mm thick concrete with top surround 25mm above paving and 75mm above other surfaces, to [AS/NZS 3500.2](#), section 4.6, Gullies.

### 3.6 LAY STORMWATER DRAINS

Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the underground rainwater storage tank..

### 3.7 INSTALL SURFACE WATER SUMP

To [NZBC E1/AS1](#), complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.

### 3.8 SOAKHOLES OR TRENCHES

Dispose of stormwater on site as shown on the drawings, by soakage, to suit local geology and soil structure; all to specific engineering design

### 3.9 CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

### 3.10 TESTING

Confirm timing before carrying out any tests. Supply potable water and apparatus needed.

Test to [NZBC G13/AS1](#) or [AS/NZS 3500.2](#), 15 as required. Carry out and record a visual inspection that each joint showed no evidence of leaks.

Carry out stormwater drainage work to [NZBC E1/AS1](#), and complete all tests to [NZBC E1/VM1](#), 8.0 Drain Leakage Tests.

### 3.11 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL

Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of  $75 \pm 25$  mm by  $75 \pm 25$  mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg.

### 3.12 PLACING & COMPACTING TRENCH BACKFILLING MATERIAL FOR PVC-U PIPE

Place and rake in bedding material so as to support the pipe once laid.

Embedment material shall be placed uniformly along and around the pipe to ensure uniform density of side support and overlay with no distortion, dislodgment or damage to the pipeline. Following placement, the embedment material shall be compacted in layers to uniformly support the pipe.

Trench fill material shall be placed on the pipe embedment and compacted to fill the trench, with care taken to avoid impact loading of the pipe.

## 4 SELECTIONS

### 4.1 PVC-U PIPES - SEWER

Brand/type:	Marley Optim
Size:	100mm
Jointing:	rubber ring
Fittings	to Marley DWV Technical Manual

### 4.2 INSTALL STRIP DRAIN CHANNEL

Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.

### 4.3 PVC-U PIPES - STORMWATER

Brand/type:	Marley Stormline
Size:	100mm
Jointing:	solvent
Fittings	to Marley DWV Technical Manual

## 7612 RESIDENTIAL EXTRACT SYSTEMS

### 1 GENERAL

This section relates to the supply and installation of extract systems for residential applications. It includes:

- Kitchen extract systems
- Bathroom and laundry extract systems

#### Documents

#### 1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
NZBC G4/AS1	Ventilation
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3350	Safety of household and similar electrical appliances - General requirements

Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)

#### 1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years For supply of fan units, ducting and exteriors grilles

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### 1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years For installation

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

#### Requirements

#### 1.4 CO-ORDINATE WORK

Co-ordinate all items with the main contractor, in particular cutting of penetrations and waterproofing. Exterior penetrations to NZBC E2/AS1 as consistent with the project requirements.

#### 1.5 QUALIFICATIONS

Installers to be experienced, competent trades people familiar with the materials and techniques specified.

#### 1.6 ELECTRICAL QUALIFICATION

Registered electrician to carry out work to Electricity (Safety) Regulations 2010.

#### 1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

#### Compliance information

## 1.8 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -

- Manufacturer's, importers or distributors warranty
- Installer's warranty
- Other information required by the BCA in the Building Consent Approval documents.

## 2 PRODUCTS

### Kitchen extract systems

#### 2.1 KITCHEN RANGEHOOD EXTRACT - TO EXTERIOR WALL / SOFFIT

Mechanical rangehood extract system comprised of rangehood canopy, extract fan, filters, lighting, controls, metal ducting, solid duct wall sleeve, exterior grille and weatherproof cowl.

### Bathroom and laundry extract systems

#### 2.2 CEILING MOUNTED FAN, DUCTED TO EXTERIOR WALL / SOFFIT

Mechanical fan ducted system comprised of ceiling fan, filters, controls, aluminium foil flexi ducting joined to a solid duct sleeve sloped to remove condensation, exterior weatherproof grille and flashing.

#### 2.3 LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Laundry dryer vent comprised of, filter, metal ducting, exterior weatherproof grille and flashing.

### Component

#### 2.4 ELECTRICAL FAN SWITCH

Independent switch connected to socket outlet located near fan / unit.

## 3 EXECUTION

### Installation - mechanical ventilation

#### 3.1 INSTALL KITCHEN RANGEHOOD

Install rangehood to [AS/NZS 3000](#), AS/NZS 3350 and manufacturer's installation instructions. Connect unit with ducting to exit either through roof or exterior wall / soffit. Plug into electrical socket.

#### 3.2 INSTALL BATHROOM / TOILET / LAUNDRY EXTRACT FANS

Install exterior ducted fans to manufacturer requirements to [AS/NZS 3000](#) and [NZBC G4/AS1](#). Duct through to roof or exterior wall / soffit. Plug into electrical socket.

#### 3.3 INSTALL LAUNDRY DRYER VENT, DUCTED TO EXTERIOR WALL

Install exterior ducted fans to manufacturer requirements.

#### 3.4 INSULATION CLEARANCE

Provide 50mm clearance between insulation and motor unit / electrical enclosure. Insulation can abut insulation.

#### 3.5 ELECTRICAL INSTALLATION

Install switch and socket outlets to [AS/NZS 3000](#) and AS/NZS 3350. Refer to electrical section(s) for requirements.

### Conditions

#### 3.6 DELIVERY

Protect materials during transit. Check materials on delivery for condition. Reject and replace damaged materials.

### Completion

#### 3.7 COMPLETION

Leave work operating correctly, with equipment clean and all units operational.

### 3.8 CLEANING

Remove debris, unused materials and elements from the site. Clean soiled or marked work.

Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following procedures.

### 3.9 PROTECT

Protect new work from damage.

# 7701 ELECTRICAL

## 1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrically-powered fittings

### 1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

### Documents

## 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC E2/AS1</a>	External moisture
<a href="#">NZBC F6/AS1</a>	Visibility in escape routes
<a href="#">NZBC F7/AS1</a>	Warning systems
<a href="#">NZBC G4/AS1</a>	Ventilation
<a href="#">AS/NZS 1125</a>	Conductors in insulated electric cables and flexible cord
<a href="#">AS/NZS 1768</a>	Lightning protection
<a href="#">AS/NZS 3000</a>	Electrical installations (known as the Australian/New Zealand Wiring Rules)
<a href="#">AS/NZS 3008.1.2</a>	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
<a href="#">AS/NZS 3100</a>	Approval and test specification-general requirements for electrical equipment
<a href="#">AS/NZS 3112</a>	Approval and test specification - Plugs and socket-outlets
<a href="#">AS/NZS 3190</a>	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
<a href="#">AS/NZS 3439.3</a>	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
<a href="#">AS 3786</a>	Smoke alarms
<a href="#">NZS 4514</a>	Interconnected smoke alarms for houses
<a href="#">AS/NZS 5000.2</a>	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
<a href="#">AS/NZS 60335.1</a>	Household and similar electrical appliances - Safety - General requirements
<a href="#">AS/NZS 60598.2.2:2001</a>	Luminaires - Particular requirements - Recessed luminaires
<a href="#">AS/NZS 61439.3</a>	Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO).
<a href="#">IEC 61643</a>	Components for low voltage surge protection devices
<a href="#">Electricity (Safety) Regulations 2010</a> (Reprint as at 4 April 2016)	
<a href="#">TCF Premises Wiring Code of Practice 2011</a>	

### Warranties

## 1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year: Warranty period

### Requirements

## 1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and [TCF Premises Wiring Code of Practice](#) for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

## 1.5 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

## 1.6 SAFETY OF INSTALLATION - DESIGN BY ELECTRICIAN

Before installation work commences provide a Certified Design. The Certified Design is to comply with the Electrical (Safety) Regulations (2010), regulations 58. It must be signed by the designer of the installation.

## 1.7 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

## 1.8 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

## 2 PRODUCTS

### 2.1 MAINS SUPPLY

Tough plastic sheathed neutral screened cable to [AS/NZS 5000.2](#) and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

### 2.2 CABLES

Tough plastic sheathed copper conductors to [AS/NZS 5000.2](#), stranded above 1.0mm<sup>2</sup>, and to [AS/NZS 3008.1.2](#). Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

Lighting circuits:	Domestic: 1.5mm <sup>2</sup> on 10 amp MCBs
Lighting circuits:	Commercial: 1.5mm <sup>2</sup> on 16 amp MCBs
Power circuits:	2.5mm <sup>2</sup> on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for domestic insulated construction, or filled cavity
	2.5mm <sup>2</sup> on 20 amp MCBs for unenclosed or unfilled cavity construction
	2.5mm <sup>2</sup> on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres
Hot water cylinder circuits:	Single phase: 2.5mm <sup>2</sup> on 20 amp MCBs
Range/oven/hob circuits:	Single phase: 6mm <sup>2</sup> high temperature cable on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C (roof spaces above insulation etc).

### 2.3 DISTRIBUTION BOARD

Flush surface mount boards manufactured to [AS/NZS 3439.3](#), or AS/NZS 61439.3, and installed in accordance with [AS/NZS 3000](#). Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

### 2.4 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with [AS/NZS 3190](#). MCBs to 4.5kA or 6kA rated.

### 2.5 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

### 2.6 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.

### 2.7 HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

- 2.8 SWITCHED SOCKET UNITS  
10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to [AS/NZS 3100](#), [AS/NZS 3112](#) and [AS/NZS 3113](#), single or multi gang as detailed.
- 2.9 SMOKE ALARMS  
Type 1 domestic smoke alarm to [NZBC F7/AS1](#). 1.2 **Descriptions of alarm systems.** Alarm to AS 3786. A wired 230 volt ionised smoke detector type.
- 2.10 SURGE PROTECTION  
Protection for the homes appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.
- 2.11 DOOR BELL SYSTEM  
Complete with transformer for mounting on distribution board.
- 2.12 LIGHT FITTINGS  
High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.
- 2.13 RESIDENTIAL RECESSED LIGHT FITTINGS  
Residential recessed luminaires to [AS/NZS 60598.2.2](#), types IC-F, IC, only.
- 2.14 EXHAUST FANS  
Ceiling, wall or duct mounted exhaust fans for ventilation to [NZBC G4/AS1](#), and compliant with [AS/NZS 60335.1](#).
- 2.15 HEATED TOWEL RAILS  
Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 60335.1](#), scratch resistant powdercoated or chrome finish.
- 2.16 OUTDOOR SWITCHES & SOCKETS  
Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.
- 3 EXECUTION**
- 3.1 MAIN SUPPLY  
Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.
- 3.2 DISTRIBUTION BOARD  
Fit to [AS/NZS 3000](#) and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.
- 3.3 CIRCUIT PROTECTION  
Install MCBs at distribution board to AS/NZS3000 to protect each final sub circuit.

### 3.4 EQUIPOTENTIAL BONDING

Equipotential Bond extraneous conductive parts together and to the electrical installation earthing system to [AS/NZS 3000](#), 5.6, and the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

If they form part of the building, this includes:

- [Conductive water piping](#) (including tap etc) and exposed related connected conductive surfaces (like metal sink benches or metal cladding etc). [Not required where isolated by non-conductors \(plastic pipe etc\) from the mass of earth.](#)
- Other conductive piping (not earthed by other means) and exposed related connected conductive surfaces.
- Concrete reinforcing - for floor or wall forming part of a room with a shower or bath, or the shell and surround of a swimming/spa pool
- Built-in Swimming pool and spa pool - exposed conductive parts of electrical equipment, as well as exposed conductive, fixtures, fittings and pool structures within 1.25m of pool edge

### 3.5 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

### 3.6 EARTH LEAKAGE PROTECTION

Install RCD protection to [AS/NZS 3000](#).

### 3.7 RCD - DOMESTIC INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to [AS/NZS 3000](#).

### 3.8 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.

Install fixed wired RCD protected outlets (SRCD) in the following areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

### 3.9 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

### 3.10 CABLING

Install wiring systems to [AS/NZS 3000](#). All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

### 3.11 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

### 3.12 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or noggs. Fix switch panel wall boxes to solid blocking.

### 3.13 SWITCH AND SOCKET UNITS

Fit all single and double switch units, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units:	1000mm above finished floor
Socket Units:	150mm above work benches
	400mm above finished floor

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.

### 3.14 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

### 3.15 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

### 3.16 EXTRA LOW VOLTAGE LIGHTING

Use electronic drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to [AS/NZS 3000](#).

### 3.17 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;

The clearance between insulation and recessed downlights;

- Leave 100mm gap to [AS/NZS 3000](#), figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F.
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

### 3.18 ELECTRIC HOT WATER SYSTEM

For storage heaters, wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

### 3.19 SPACE HEATERS

Install to the heater manufacturer's requirements, and to [AS/NZS 3000](#). Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance, or otherwise connect to a control switch located adjacent to the heater and a remote thermostat.

### 3.20 SMOKE ALARMS

Install Type 1 domestic smoke alarm system to [NZBC F7/AS1 3.0 Domestic smoke alarms, NZS 4514](#) and to the alarm manufacturer's requirements. Fit neatly and without damage to the surrounding finish.

### 3.21 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with [AS/NZS 3000](#) and [AS/NZS 1768](#). When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

### 3.22 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

### 3.23 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturer's requirements and installed in accordance with AS/NZS 3000 and the NZBC G9/AS1
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with AS/NZS 3000 and NZBC G4/AS1.

### 3.24 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with AS/NZS 3000 and in accordance with the manufacturer's recommendations:

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturer's specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

### 3.25 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

#### Completion

### 3.26 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

## 4 SELECTIONS

#### Materials

### 4.1 SELECTIONS - FITTINGS AND HARDWARE

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

#### Outlets - fittings

### 4.2 INTERIOR OUTLETS

Item	Brand / type
Switch / socket outlets:	PDL Iconic

# Memorandum from licensed building practitioner: Certificate of design work

## Section 45 and section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

### THE BUILDING

Street address: **Lot 6 Anderson Park**

Suburb:

Town/City: **Waikanae**

Postcode: **5036**

### THE OWNER(S)

Name(s): **Dan and Suki Green**

Mailing address:

Suburb:

PO Box/Private Bag: **148**

Town/City: **Paraparaumu**

Postcode: **5252**

Phone number: **021 127 6073**

Email address: **jo.kunac@davidreidhomes.co.nz**

## BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies

- sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design work myself – no other person will be providing any additional memoranda for the project
- lead** designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and **no other** person will be providing any additional memoranda for the project
- lead** designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the **other** designers will provide their own memorandum relating to their specific RBW design
- specialist** designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

## IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I Peter Davis carried out / supervised the following design work that is restricted building work

### PRIMARY STRUCTURE: B1

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
<b>All</b> RBW design work relating to B1 <input checked="" type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	
Foundations and subfloor framing <input checked="" type="checkbox"/> <input type="checkbox"/>	According to Ribraft specifications	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Foundation plan

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Walls <input checked="" type="checkbox"/> <input type="checkbox"/>	Timber framing to NZS 3604	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Framing Plan and Pre-nailer Plans
Roof <input checked="" type="checkbox"/> <input type="checkbox"/>	Metalcraft MC700 trapezoidal profiled metal roofing	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Roof Plan and Pre-nailers Plans
Columns and beams <input checked="" type="checkbox"/> <input type="checkbox"/>	According to NZS 3604, Prolam design and Hyne design	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Framing Plan and Supporting documents for beam calculations
Bracing <input checked="" type="checkbox"/> <input type="checkbox"/>	According to GIB Ezybrace system	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Bracing Plan
Other <input type="checkbox"/> <input checked="" type="checkbox"/>	N/A	<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	N/A

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
<b>EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2</b>			
<b>All</b> RBW design work relating to E2 <input checked="" type="checkbox"/> <input type="checkbox"/>	Roof cladding and wall cladding	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Building Sections and Construction Details.
Damp proofing <input checked="" type="checkbox"/> <input type="checkbox"/>	Polythene DPM	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Construction Details.
Roof cladding or roof cladding system <input checked="" type="checkbox"/> <input type="checkbox"/>	Longrun metal	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Roof Plan
Ventilation system (for example, subfloor or cavity) <input checked="" type="checkbox"/> <input type="checkbox"/>	Wall cladding on cavity and VENT ventilation products	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Construction Details.
Wall cladding or wall cladding system <input checked="" type="checkbox"/> <input type="checkbox"/>	Plywood cladding and timber weatherboards	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Elevations
Waterproofing <input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
Other <input type="checkbox"/> <input checked="" type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
<b>FIRE SAFETY SYSTEMS: C1 - C6</b>			
Emergency warning systems  Evacuation and fire service operation systems Suppression or control systems  Other	<input checked="" type="checkbox"/> Smoke detector  <input type="checkbox"/>	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Refer to Lighting Plan
<b>Note:</b> The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.			

<b>WAIVERS AND MODIFICATIONS</b>	
Waivers or modifications of the Building Code are required. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If Yes, provide details of the waivers or modifications below:	
Clause	Waiver/modification required
List relevant clause numbers of building code	Specify nature of waiver or modification of building code required

## ISSUED BY

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work.

Name: **Peter Davis**

LBP or Registration number: **BP103740**

The practitioner is a:  Design LBP  Registered architect  Chartered professional engineer

Design Entity or Company (optional): **ADarchitecture Ltd**

Mailing address (if different from below):

Street address/Registered office: **5 Kodex Place**

Suburb: **Paraparaumu**

Town/City: **Paraparaumu**

PO Box/Private Bag: **1585**

Postcode: **5252**

Phone number: **04 298 5662**

Mobile: **021 328 471**

After hours:

Fax:

Email address: **peter.d@adarchitecture.nz**

Website:

## DECLARATION

I, Peter Davis LBP, state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code, or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form

Signature:  \_\_\_\_\_

Date: 30/11/2020 \_\_\_\_\_

**GoGet Inspection Audit Report**

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Consent No: **200896**  
 Applicant: **David Reid Homes (Kapiti) Ltd**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Final Inspection**  
 Inspection Outcome: **Fail**  
 Inspected By: **Anthony Wilson**  
 Inspection Date: **8 December 2021 10:33 a.m.**  
 Duration: **60 minutes**

<b>Inspection Element</b>	<b>Status</b>
Exterior	Fail
All previous inspections/notes passed	Fail
<b>Previous fails are pending documentation</b>	
Drawings	Pass
Additional information/plan	Pass
<b>Revised brace plan on site</b>	
Sub-floor ventilation	N/A
Roof fixings	Pass
Spouting and down-pipes	Pass
Deck structure	N/A
<b>Carried out by owner</b>	
Flashings - roof	Pass
Penetrations - flashings	Pass
Barriers	N/A
Gully dishes	Pass
<b>ORG gullys, 1 located 1m from gas bottle</b>	
Stormwater and site drainage	Pass
<b>No requirement for sumps</b>	
Handrails	N/A
Wastes to gully	Pass
Fixings - durability	Pass
Steps/stairs	Fail
<b>Entry deck smooth pine tread does not comply with the slip resistance requirement of the building code.</b>	
<b>And grip seal to be added to tread (entry only)</b>	
Terminal vents/AAVs	Pass
Cladding painted/sealed	Pass
Flashings - windows/doors	Pass
Cladding ground clearance	Pass
<b>Landscaping not done on soil areas, but good at time of inspection</b>	
non compliance discussed onsite	Pass
<b>Discussed non compliant issues on site</b>	
Final check complete	Fail
Other	N/A
Interior	Fail
All previous inspections/notes passed	Fail

Drawings	Pass
Additional information/plan	N/A
Service areas-floors/walls	Fail
<b>Sealant to top of acrylic showers required</b>	
Stair design	N/A
Handrails	N/A
Balustrades	N/A
Lightings	Fail
<b>Electrical certs required</b>	
Laundering	Pass
<b>In garage</b>	
Cooking facilities	Pass
Smoke detectors	Pass
<b>Cavius long life alarm in hallway</b>	
Food storage/preparation	Pass
Ventilation	Pass
<b>Extractors in place</b>	
Insulation and clearance	N/A
HWC flues	Pass
HWC restraint	Pass
Tempering valve	Pass
Glazing - human impact	Pass
<b>Safety glass as required</b>	
Hot water temp	Fail
<b>Unable to test</b>	
Solid fuel heater	N/A
Water supply tank	Pass
<b>To toilets and outdoor taps</b>	
Trap seals and AAVS	Pass
Cistern flushing	Pass
WC pan connection	Pass
Septic tank	N/A
Window labels	Pass
non compliance discussed onsite	Pass
<b>Test of hot water temp required</b>	
Final check complete	Fail
Other	N/A
Intertenancy/commercial	N/A
Other	N/A
<hr/>	
<b>Documentation</b>	
Electrical safety certificate - Inspector	Required
Gas safety certificate	Required



Taken at 9:52 AM on Wednesday 8/12/2021



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Taken at 9:55 AM on Wednesday 8/12/2021



Taken at 10:03 AM on Wednesday 8/12/2021



Taken at 10:03 AM on Wednesday 8/12/2021



Taken at 10:03 AM on Wednesday 8/12/2021



Taken at 10:04 AM on Wednesday 8/12/2021



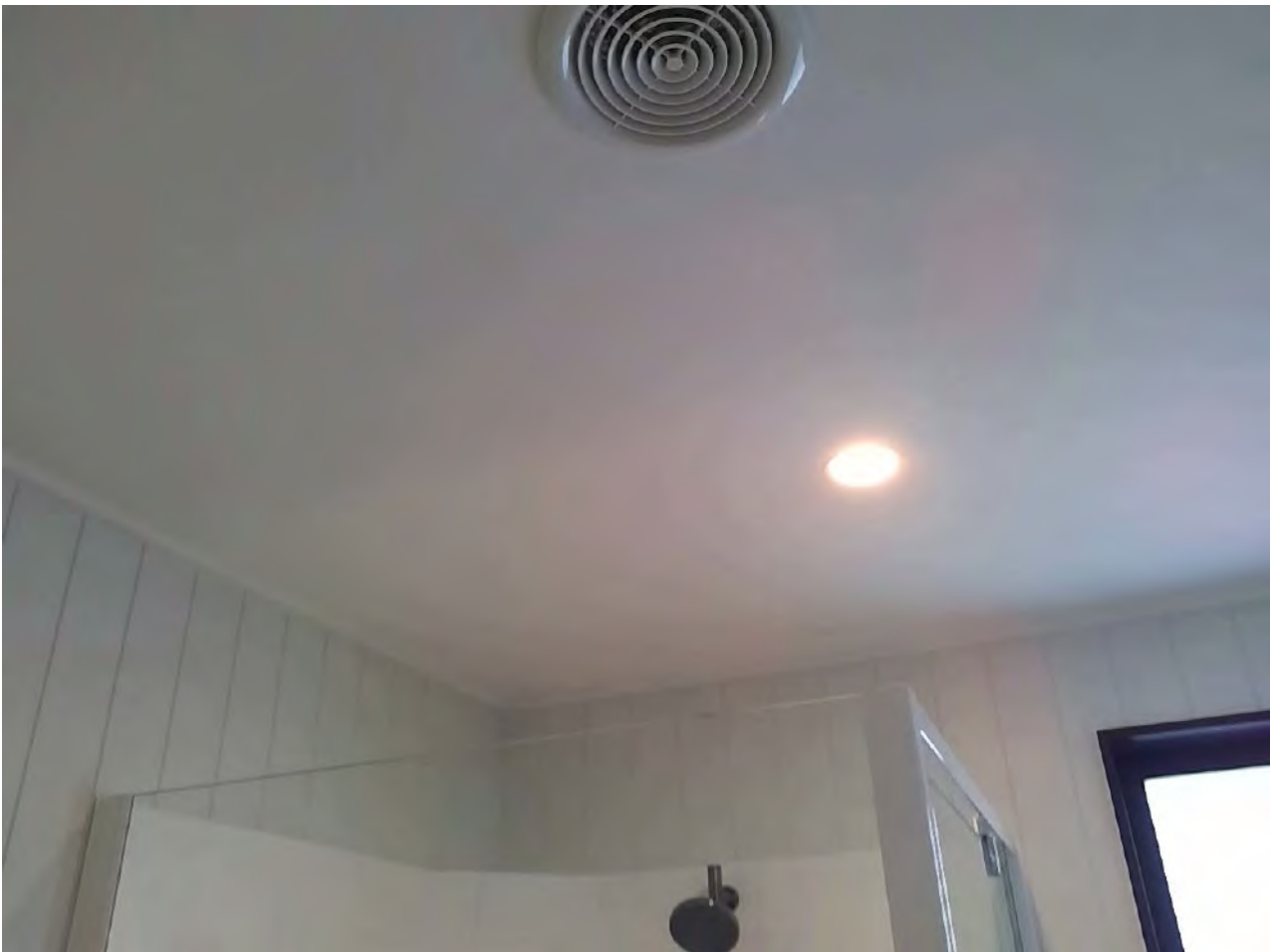
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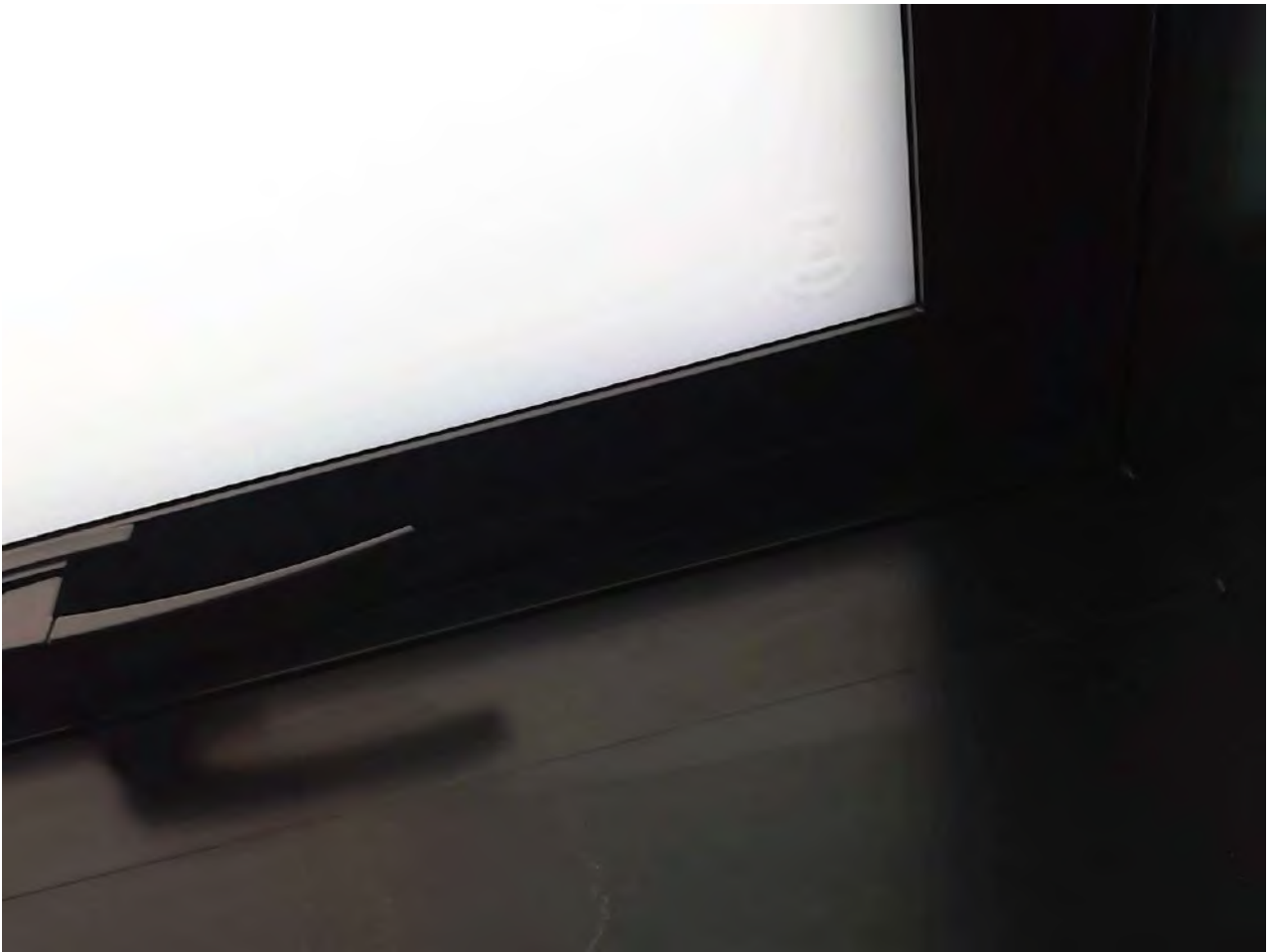
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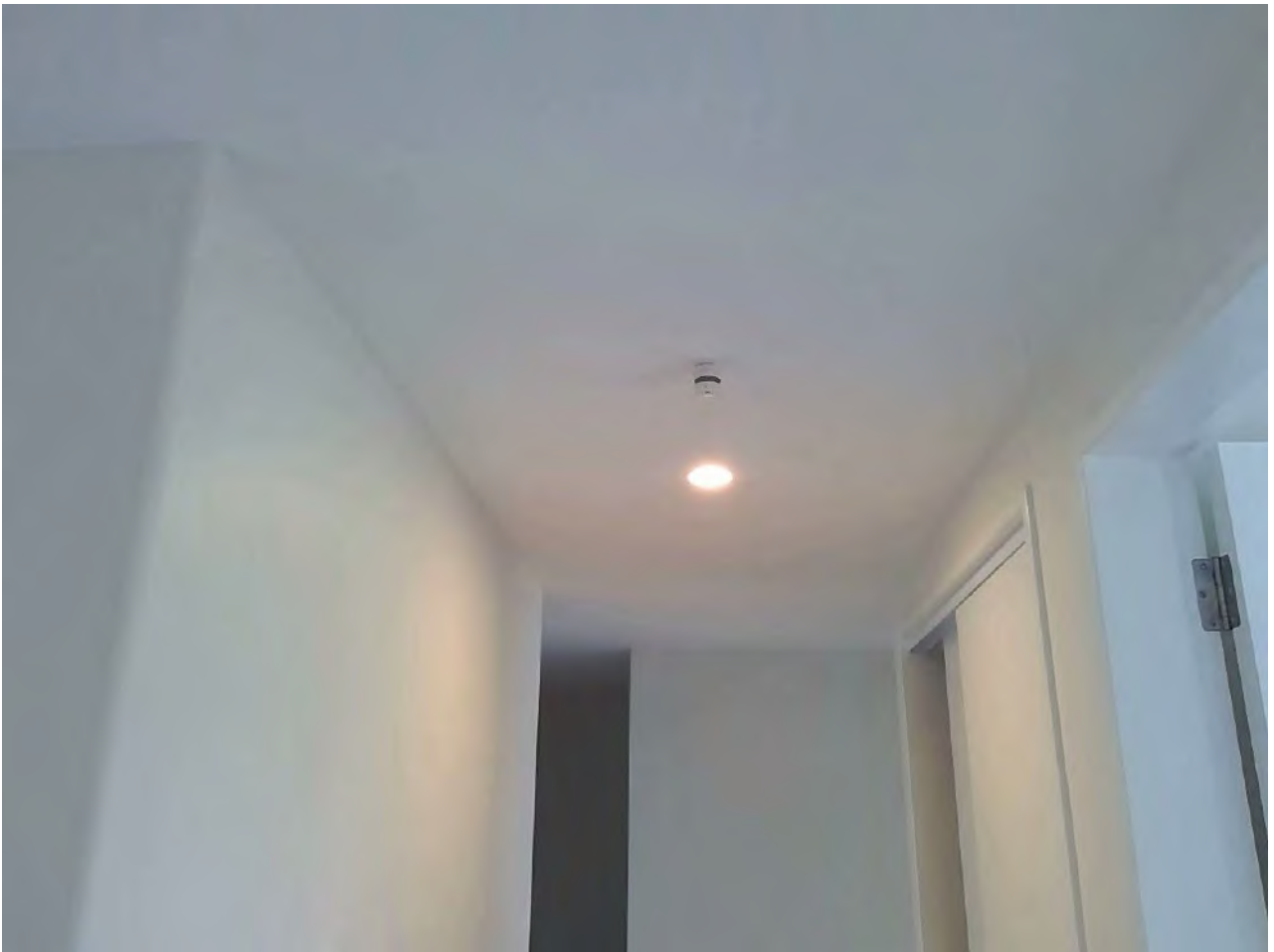
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Taken at 10:12 AM on Wednesday 8/12/2021



Taken at 10:13 AM on Wednesday 8/12/2021



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Taken at 10:28 AM on Wednesday 8/12/2021



Taken at 10:30 AM on Wednesday 8/12/2021



Taken at 10:30 AM on Wednesday 8/12/2021



Taken at 10:30 AM on Wednesday 8/12/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Postline / Wet area Pre Application**  
 Inspection Outcome: **Pass**  
 Inspected By: **Anthony Wilson**  
 Inspection Date: **8 December 2021**

### Passed Items

#### General

##### Other

**Bathrooms lined with hardie groove sheets, no bracing in bathrooms as per revised plan.**

**Ply bracing in garage completed.**

Inspection Type: **Final Inspection**  
 Inspection Outcome: **Fail**  
 Inspected By: **Anthony Wilson**  
 Inspection Date: **8 December 2021**

### Failed Items

#### Exterior

All previous inspections/notes passed  
 Steps/stairs

**Previous fails are pending documentation**

**Entry deck smooth pine tread does not comply with the slip resistance requirement of the building code.**

**And grip seal to be added to tread (entry only)**

Final check complete

#### Interior

All previous inspections/notes passed  
 Service areas-floors/walls  
 Lightings  
 Hot water temp  
 Final check complete

**Sealant to top of acrylic showers required**

**Electrical certs required**

**Unable to test**

### Passed Items

#### Exterior

Drawings

Additional information/plan

**Revised brace plan on site**

Roof fixings

Spouting and down-pipes	
Flashings - roof	
Penetrations - flashings	
Gully dishes	<b>ORG gullies, 1 located 1m from gas bottle</b>
Stormwater and site drainage	<b>No requirement for sumps</b>
Wastes to gully	
Fixings - durability	
Terminal vents/AAVs	
Cladding painted/sealed	
Flashings - windows/doors	
Cladding ground clearance	<b>Landscaping not done on soil areas, but good at time of inspection</b>
non compliance discussed onsite	<b>Discussed non compliant issues on site</b>
Interior	
Drawings	
Laundering	<b>In garage</b>
Cooking facilities	
Smoke detectors	<b>Cavius long life alarm in hallway</b>
Food storage/preparation	
Ventilation	<b>Extractors in place</b>
HWC flues	
HWC restraint	
Tempering valve	
Glazing - human impact	<b>Safety glass as required</b>
Water supply tank	<b>To toilets and outdoor taps</b>
Trap seals and AAVS	
Cistern flushing	
WC pan connection	
Window labels	
non compliance discussed onsite	<b>Test of hot water temp required</b>

---

**Documentation**

<b>Documentation</b>	<b>Status</b>
Application for CCC	Received
Electrical safety certificate - Electrician	Received
As-built drainage plan	Received
Drainage (Form 126) for stormwater & private Sewer installation	Received
Plumbing (Form 125) for pressure test and installation piped services	Received
Construction review PS4 statement for geo-technical engineering	Received
<b>PS4 required from Hamish Wells for soakpit.</b>	
Roof product manufacturers warranty	Received
Water tank warranty	Received
Electrical safety certificate - Inspector	Required
Record of Work	Required

GoGet Inspection Audit Report

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Consent No: **200896**

Applicant: **David Reid Homes (Kapiti) Ltd**

Site Address: **Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae**

Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Foundation**

Inspection Outcome: **Pass**

Inspected By: **Gareth McCullagh**

Inspection Date: **26 March 2021 10:59 a.m.**

Duration: **0 minutes**

<b>Inspection Element</b>	<b>Status</b>
General	Pass
Footing depth	N/A
Engineers details required	Pass
<b>Engineered rib raft done on preslab</b>	
Good bearing	N/A
Reinforcing	N/A
Siting	N/A
Sub-floor vents	N/A
Agent/owner written approval	N/A
non compliance discussed onsite	N/A
LBP number	N/A
Next Inspection required	N/A
Other	N/A
Site Inspection	N/A

## SITE NOTICE

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Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

---

Inspection Type: **Foundation**  
 Inspection Outcome: **Pass**  
 Inspected By: **Gareth McCullagh**  
 Inspection Date: **26 March 2021**

### Passed Items

General

Engineers details required	<b>Engineered rib raft done on prelab</b>
----------------------------	---

---

Inspection Type: **Pre-Slab Building**  
 Inspection Outcome: **Fail**  
 Inspected By: **Gareth McCullagh**  
 Inspection Date: **26 March 2021**

### Failed Items

General

Engineers details required	<b>Rib raft design engineer still to provide site note</b>
Steel reinforcing	<b>Covered by engineer</b>
Bar chairs	

### Passed Items

General

Ground clearance	
Concrete cover	
Sand blinding	
Slab thickenings	<b>In place</b>
Vapour barrier	<b>In taped</b>
DPC penetrations taped	<b>All penetrations taped as required</b>
Minimum floor level	
Siting	<b>Measured off survey pegs as per plan</b>
LBP number	<b>102284</b>
Other	

**GoGet Inspection Audit Report**

---

Consent No: **200896**  
 Applicant: **David Reid Homes (Kapiti) Ltd**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Pre Clad**  
 Inspection Outcome: **Fail**  
 Inspected By: **Luke Natrass**  
 Inspection Date: **14 July 2021 9:36 a.m.**  
 Duration: **60 minutes**

<b>Inspection Element</b>	<b>Status</b>
General	Fail
Inspection notes	Pass
<b>sighted previous inspection notes</b>	
Drawings	Pass
<b>On site and reviewed</b>	
Additional information/plan	N/A
Fire Separations	N/A
Building wrap type	Pass
<b>tecton</b>	
Flexible sealing tape	Pass
<b>Super stick</b>	
Deck membrane fixed in accordance with specification	N/A
Head flashings	Pass
<b>taped in place with cavity closers, stop ends and cavity closers</b>	
Sill flashings	Pass
<b>Wanz bars in place and screwed off as required</b>	
Back flashings	N/A
Saddle flashings	N/A
Internal/external corner flashings	Fail
<b>internal 75 x75 corners still to be installed</b>	
Jamb flashings	N/A
Capillary clearances	N/A
Flashing penetrations	Fail
<b>Penetrations not yet sealed as required</b>	
Ground/Deck Cladding Clearance	N/A
Additional strapping to wrap	N/A
Batten timber treatment	Pass
<b>H 3.1 timber battens</b>	
Cavity closers	Pass
<b>Pvc in place</b>	
Battens in place	Fail
<b>Horizontal cavity batten needs to be casalated</b>	
Battens structural fixing	N/A
Cavity spacers	Fail
<b>Still to be installed for bottom of sheets</b>	
Cavity spacers size and slope	N/A
LBP number	Pass
<b>Ben kusbus</b>	

Agent/owner written approval	N/A
non compliance discussed onsite	Pass
<b>Spoke with Jo kunac re failed items</b>	
Next Inspection required	Fail
<b>re inspection of pre clad</b>	
Other	Fail



Taken at 8:25 AM on Wednesday 14/07/2021



Taken at 8:25 AM on Wednesday 14/07/2021



Taken at 8:25 AM on Wednesday 14/07/2021



Taken at 8:25 AM on Wednesday 14/07/2021



Taken at 8:25 AM on Wednesday 14/07/2021



Taken at 8:26 AM on Wednesday 14/07/2021



Taken at 8:26 AM on Wednesday 14/07/2021



Taken at 8:26 AM on Wednesday 14/07/2021



Taken at 8:26 AM on Wednesday 14/07/2021



Taken at 8:27 AM on Wednesday 14/07/2021



Taken at 8:28 AM on Wednesday 14/07/2021



Taken at 8:29 AM on Wednesday 14/07/2021



Taken at 8:29 AM on Wednesday 14/07/2021



Taken at 8:29 AM on Wednesday 14/07/2021



Taken at 8:30 AM on Wednesday 14/07/2021



Taken at 8:30 AM on Wednesday 14/07/2021



Taken at 8:33 AM on Wednesday 14/07/2021



Taken at 8:36 AM on Wednesday 14/07/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Pre Clad**  
 Inspection Outcome: **Fail**  
 Inspected By: **Luke Natrass**  
 Inspection Date: **14 July 2021**

### Failed Items

#### General

Internal/external corner flashings	<b>internal 75 x75 corners still to be installed</b>
Flashing penetrations	<b>Penetrations not yet sealed as required</b>
Battens in place	<b>Horizontal cavity batten needs to be casalated</b>
Cavity spacers	<b>Still to be installed for bottom of sheets</b>
Next Inspection required	<b>re inspection of pre clad</b>
Other	

### Passed Items

#### General

Inspection notes	<b>sighted previous inspection notes</b>
Drawings	<b>On site and reviewed</b>
Building wrap type	<b>tecton</b>
Flexible sealing tape	<b>Super stick</b>
Head flashings	<b>taped in place with cavity closers, stop ends and cavity closers</b>
Sill flashings	<b>Wanz bars in place and screwed off as required</b>
Batten timber treatment	<b>H 3.1 timber battens</b>
Cavity closers	<b>Pvc in place</b>
LBP number	<b>Ben kusbus</b>
non compliance discussed onsite	<b>Spoke with Jo kunac re failed items</b>

## GoGet Inspection Audit Report

---

Consent No: **200896**

Applicant: **David Reid Homes (Kapiti) Ltd**

Site Address: **9 Kaiwaru Place, Waikanae**

Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Pre Clad**

Inspection Outcome: **Pass**

Inspected By: **Jeremy Lincoln**

Inspection Date: **4 August 2021 11:45 a.m.**

Duration: **30 minutes**

<b>Inspection Element</b>	<b>Status</b>
General	Pass
Internal/external corner flashings <b>Internals now fitted correctly with battens &amp; dynaflashes</b>	Pass
Flashing penetrations <b>Penetrations not yet sealed as required</b>	Pass
<b>Marshalls now fitted</b>	
Battens in place <b>Horizontal cavity batten needs to be casalated</b>	Pass
<b>Battens now fluted</b>	
Cavity spacers <b>Still to be installed for bottom of sheets</b>	Pass
Cavity spacers size and slope	Pass
Next Inspection required	N/A
Other	N/A



**marshall seal**

Taken at 11:39 AM on Wednesday 4/08/2021



**marshall seal**

Taken at 11:39 AM on Wednesday 4/08/2021



**marshal seal**

Taken at 11:39 AM on Wednesday 4/08/2021



**marshal seal**

Taken at 11:41 AM on Wednesday 4/08/2021



**re battened gable wall. join fitted with fluted battens so cavity is maintained**  
Taken at 11:42 AM on Wednesday 4/08/2021



**re battened gable wall. join fitted with fluted battens so cavity is maintained**  
Taken at 11:42 AM on Wednesday 4/08/2021

## SITE NOTICE

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Consent No: **200896**  
Applicant: **Daniel Perry Green**  
Site Address: **9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

---

Inspection Type: **Pre Clad**  
Inspection Outcome: **Pass**  
Inspected By: **Jeremy Lincoln**  
Inspection Date: **4 August 2021**

### Passed Items

#### General

Internal/external corner flashings	<b>Internals now fitted correctly with battens &amp; dynaflashes</b>
Flashing penetrations	<b>Penetrations not yet sealed as required</b>
Battens in place	<b>Marshalls now fitted</b> <b>Horizontal cavity batten needs to be casalated</b>
Cavity spacers	<b>Battens now fluted</b> <b>Still to be installed for bottom of sheets</b>
Cavity spacers size and slope	

## GoGet Inspection Audit Report

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Consent No: **200896**  
Applicant: **David Reid Homes (Kapiti) Ltd**  
Site Address: **9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Pre Wrap**  
Inspection Outcome: **Fail**  
Inspected By: **Jeremy Lincoln**  
Inspection Date: **9 June 2021 8:47 a.m.**  
Duration: **45 minutes**

Inspection Element	Status
General	Fail
Inspection notes	Fail
<b>Previous item</b>	
Drawings	Pass
Additional information/plan	N/A
Fire Separations	N/A
Cladding type identified	Pass
<b>Linea &amp; shadowclad</b>	
Framing moisture meets cladding requirements	N/A
Stud spacing appropriate for cladding	Pass
<b>400c</b>	
Exterior sheet bracing and angle brace fixing	N/A
Bottom plate connections	Fail
<b>Recheck, some bluebolts to close to edge of slab, minimum of 55mm</b>	
<b>Kitchen: Bowmac saddle on edge of slab, replace fixings with chemset or bluebolt</b>	
Building wrap type	Pass
<b>Tekton</b>	
Roof Cross Bracing	Pass
Purlin fixing	Pass
<b>Purlins fixed and screw in accordance with the building consent documentation</b>	
Decking substrate	N/A
Top Plate Connection	Pass
<b>Studlock</b>	
Lintel Connections	Pass
<b>Studlock</b>	
Truss connections	Pass
Column posts	Pass
LBP number	Pass
<b>130832</b>	
Agent/owner written approval	N/A
non compliance discussed onsite	Pass
<b>With Jay</b>	
Next Inspection required	Fail
<b>Recheck at preclad</b>	
Other	N/A



**cpc40 rafters connections**  
Taken at 8:28 AM on Wednesday 9/06/2021



**roof strap bracing**  
Taken at 8:28 AM on Wednesday 9/06/2021



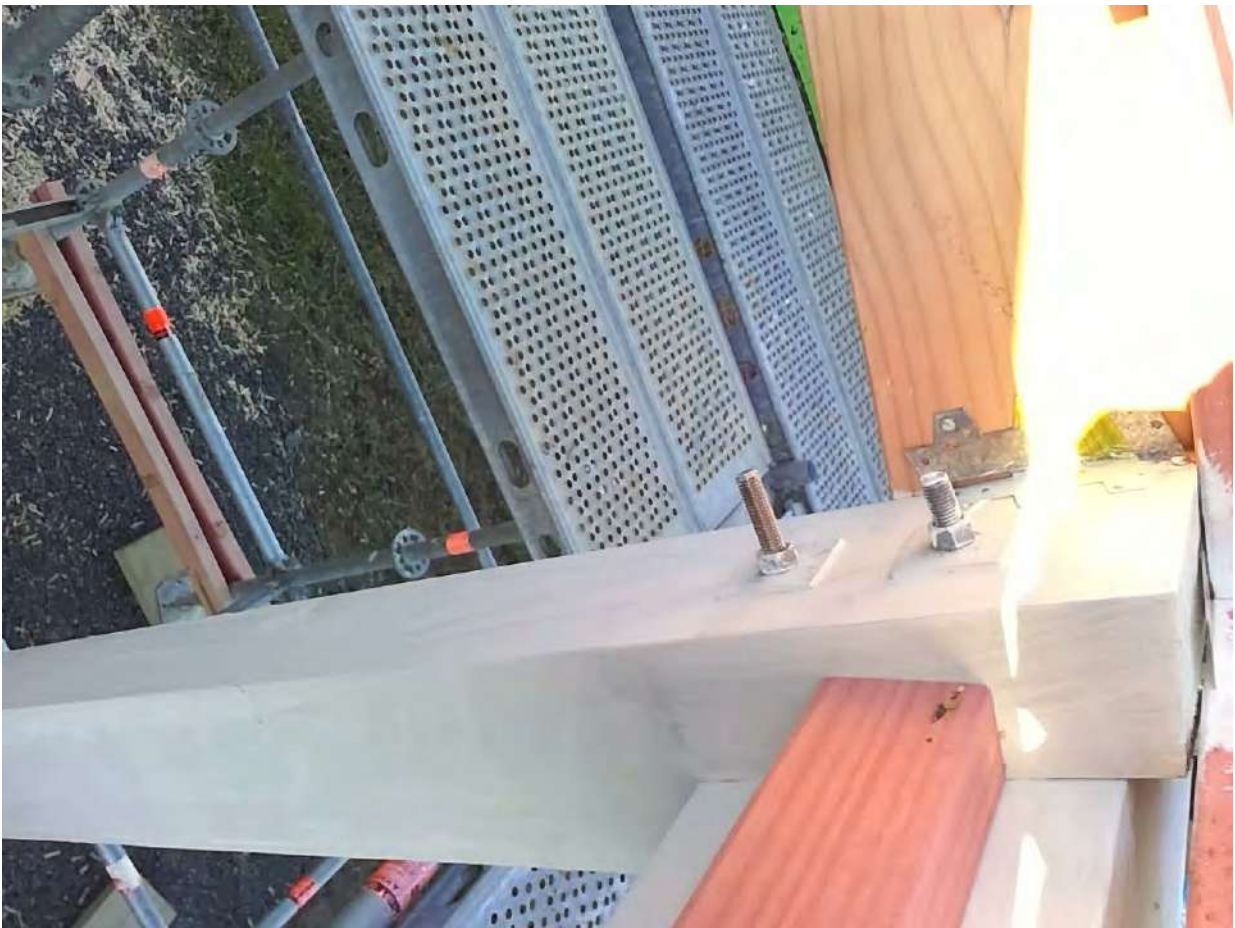
**pozi strut fixings**

Taken at 8:29 AM on Wednesday 9/06/2021



**multigrip rafter connections**

Taken at 8:29 AM on Wednesday 9/06/2021



**bolted fixing of post/beam**  
Taken at 8:29 AM on Wednesday 9/06/2021



**bluescrew purlin fixings**  
Taken at 8:30 AM on Wednesday 9/06/2021



**cross bracing connection**  
Taken at 8:30 AM on Wednesday 9/06/2021



**roof cross bracing**  
Taken at 8:31 AM on Wednesday 9/06/2021



**studlock indicator stamp**  
Taken at 8:32 AM on Wednesday 9/06/2021



**bluscrew bottom plate fixing to close to slab edge**  
Taken at 8:36 AM on Wednesday 9/06/2021



**studlock lintels**

Taken at 8:44 AM on Wednesday 9/06/2021



**studlock lintels**

Taken at 8:45 AM on Wednesday 9/06/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Pre Wrap**  
 Inspection Outcome: **Fail**  
 Inspected By: **Jeremy Lincoln**  
 Inspection Date: **9 June 2021**

### Failed Items

#### General

Inspection notes	<b>Previous item</b>
Bottom plate connections	<b>Recheck, some bluebolts to close to edge of slab, minimum of 55mm Kitchen: Bowmac saddle on edge of slab, replace fixings with chemset or bluebolt</b>
Next Inspection required	<b>Recheck at preclad</b>

### Passed Items

#### General

Drawings	
Cladding type identified	<b>Linea &amp; shadowclad</b>
Stud spacing appropriate for cladding	<b>400c</b>
Building wrap type	<b>Tekton</b>
Roof Cross Bracing	
Purlin fixing	<b>Purlins fixed and screw in accordance with the building consent documentation</b>
Top Plate Connection	<b>Studlock</b>
Lintel Connections	<b>Studlock</b>
Truss connections	
Column posts	
LBP number	<b>130832</b>
non compliance discussed onsite	<b>With Jay</b>

## GoGet Inspection Audit Report

---

Consent No: **200896**

Applicant: **David Reid Homes (Kapiti) Ltd**

Site Address: **9 Kaiwaru Place, Waikanae**

Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Pre Wrap**

Inspection Outcome: **Pass**

Inspected By: **Anthony Wilson**

Inspection Date: **27 September 2021 2:24 p.m.**

Duration: **0 minutes**

<b>Inspection Element</b>	<b>Status</b>
General	Pass
Inspection notes	Pass
<b>Previous inspection reviewed</b>	
Bottom plate connections	Pass
<b>Bolts located as required.</b>	
<b>Bowmac U bracket is holding intermediate jack studs, full length lintel is anchored at the ends.</b>	
Next Inspection required	N/A
Other	Pass
<b>All aspects relating to this inspection have been assessed and checked against the consented documentation and deemed to comply.</b>	



Taken at 2:16 PM on Monday 27/09/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Preline Building**  
 Inspection Outcome: **Fail**  
 Inspected By: **Anthony Wilson**  
 Inspection Date: **27 September 2021**

### Failed Items

#### General

Confirm additional information/amended plan	<b>Minor change of strand board bracing to ply bracing in garage on 3 walls, architect to provide revised details. This can be accepted as a variation.</b>
Agent/owner written approval	<b>Owner to give written approval for change to ply in garage</b>

### Passed Items

#### General

Sighted previous inspection notes	<b>Previous inspections reviewed and updated</b>
Conforms with approved drawings	<b>Set out as per plan</b>
Max moisture content	<b>15%-18%</b>
Ventilation to rooms	<b>Window sizes and openings as per consented documentation</b>
Timber treatment	<b>H1.2 studs and H3.2 bottom plates.</b>
Lintel/beam size and fixing	<b>As required</b>
Insulation	<b>R2.6 wall Acoustic R2.2 wall R3.2 ceiling R3.2 skillion</b>
Ceiling batten spacing	<b>600mm timber</b>
Stud spacing	<b>400 and 600mm</b>
Bracing connections	<b>All fixings in place</b>
Air seals	<b>Sealed with pf rod and foam</b>
Bottom plate fixings	<b>In as required</b>
Building closed in	<b>Building closed in adequately to allow lining</b>
Grade of timber framing	<b>SG8</b>
LBP number	<b>139787</b>
non compliance discussed onsite	<b>Get architect to supply revised brace plan</b>
Next Inspection required	<b>Post line required</b>

Inspection Type: **Pre Wrap**  
Inspection Outcome: **Pass**  
Inspected By: **Anthony Wilson**  
Inspection Date: **27 September 2021**

## **Passed Items**

### General

Inspection notes  
Bottom plate connections

**Previous inspection reviewed  
Bolts located as required.**

**Bowmac U bracket is holding intermediate jack studs,  
full length lintel is anchored at the ends.**

### Other

**All aspects relating to this inspection have been  
assessed and checked against the consented  
documentation and deemed to comply.**

## GoGet Inspection Audit Report

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Consent No: **200896**

Applicant: **David Reid Homes (Kapiti) Ltd**

Site Address: **9 Kaiwaru Place, Waikanae**

Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Postline / Wet area Pre Application**

Inspection Outcome: **Fail**

Inspected By: **Gareth McCullagh**

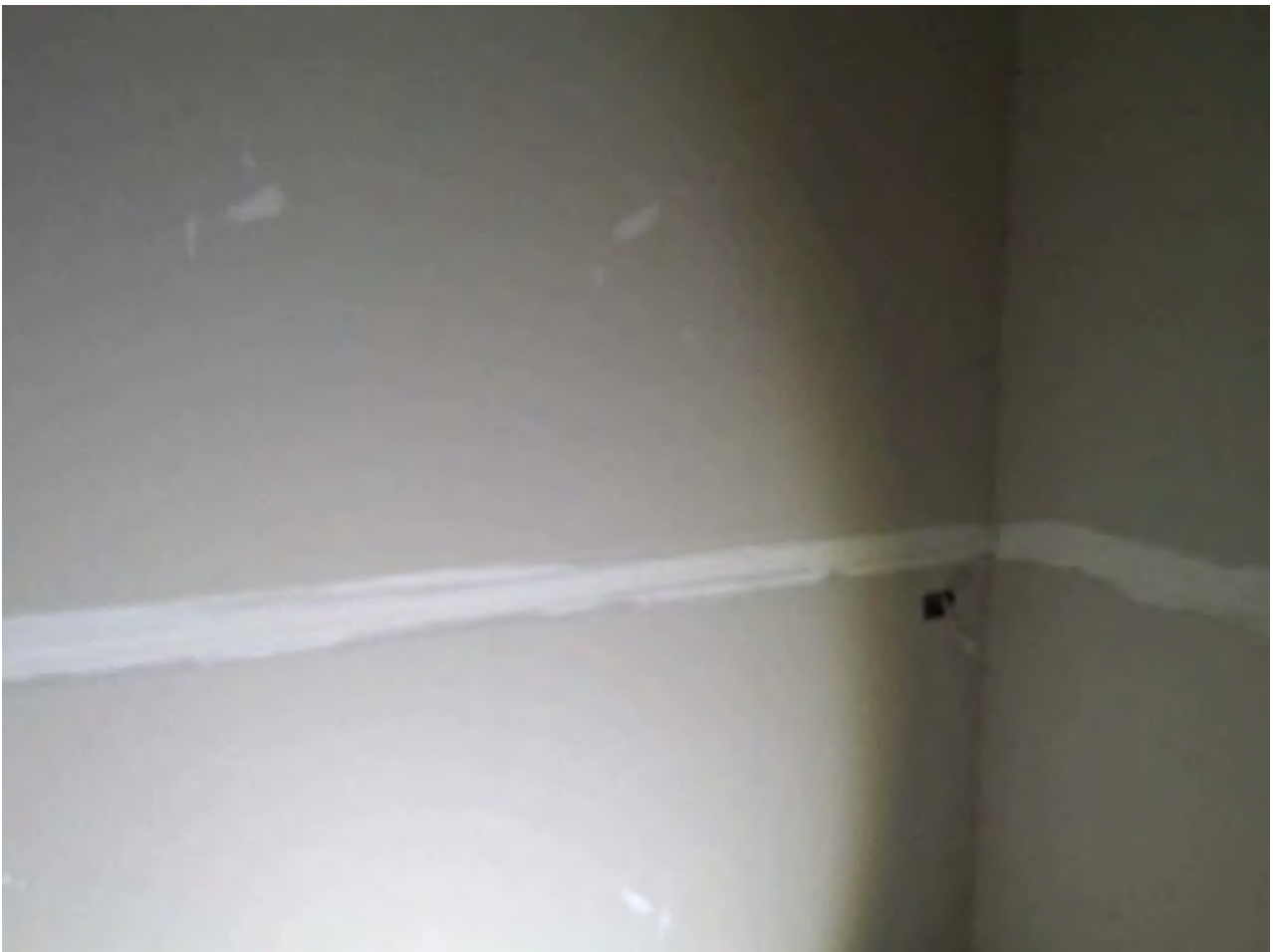
Inspection Date: **7 October 2021 9:37 a.m.**

Duration: **30 minutes**

<b>Inspection Element</b>	<b>Status</b>
General	Fail
Sighted previous inspection notes	Pass
Conforms with approved drawings	Pass
<b>Sighted new plan of ply in garage</b>	
Confirm additional information/amended plan	Pass
Sheet bracing	Pass
<b>All gib in place as per plan</b>	
Sheet fixings	Pass
<b>All screwed as required</b>	
Fire/acoustic separation	N/A
Agent/owner written approval	N/A
Wet area substrate system	N/A
<b>Not part of this consent</b>	
LBP number	Pass
<b>Builder</b>	
non compliance discussed onsite	Pass
<b>Spoke to construction manager</b>	
Next Inspection required	N/A
Other	Fail
<b>Still to inspect garage and bathrooms</b>	



Taken at 9:47 AM on Thursday 7/10/2021



Taken at 9:47 AM on Thursday 7/10/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Drainage**  
 Inspection Outcome: **Fail**  
 Inspected By: **Gareth McCullagh**  
 Inspection Date: **7 October 2021**

### Failed Items

General

Soak pit **Engineer supervising to provide site note**

### Passed Items

General

Pipe diameter	<b>Sewer 100mm stormwater 100mm</b>
Bedding material	<b>Natural sand</b>
Gully trap	<b>in place</b>
Connections/angles	<b>Swept junctions in and inspection points in</b>
Branch length	
Direction/fall	<b>Good fall to lateral stormwater to tank</b>
Holding water	
Terminal vent	<b>Completed</b>
Registration number	<b>13440</b>
non compliance discussed onsite	<b>Spoke to drainlayer</b>

Inspection Type: **Preline Building**  
 Inspection Outcome: **Pass**  
 Inspected By: **Gareth McCullagh**  
 Inspection Date: **7 October 2021**

### Passed Items

General

Confirm additional information/amended plan	<b>Updated plan on site fir ply in garage instead of strand board</b>
Agent/owner written approval	

Inspection Type: **Postline / Wet area Pre Application**  
 Inspection Outcome: **Fail**  
 Inspected By: **Gareth McCullagh**

7 October 2021

Inspection Date: **7 October 2021**

## **Failed Items**

General

Other

**Still to inspect garage and bathrooms**

## **Passed Items**

General

Sighted previous inspection notes

Conforms with approved drawings

Confirm additional information/amended plan

Sheet bracing

Sheet fixings

LBP number

non compliance discussed onsite

**Sighted new plan of ply in garage**

**All gib in place as per plan**

**All screwed as required**

**Builder**

**Spoke to construction manager**

## GoGet Inspection Audit Report

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Consent No: **200896**  
Applicant: **David Reid Homes (Kapiti) Ltd**  
Site Address: **9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

---

Inspection Type: **Preline Plumbing**  
Inspection Outcome: **Pass**  
Inspected By: **Gareth McCullagh**  
Inspection Date: **11 August 2021 8:24 a.m.**  
Duration: **30 minutes**

Inspection Element	Status
General	Pass
Sighted previous inspection notes	Pass
Conforms with approved drawings	Pass
Confirm additional information/amended plan <b>Not part of this consent</b>	N/A
Plumber <b>13440</b>	Pass
Soil pipe size and test <b>Not part of this consent</b>	N/A
Pipes fixed/supported <b>all clipped and secured</b>	Pass
System used <b>AS3500</b> <b>With non potable green pipe to toilets and hoesetaps</b>	Pass
TPR line <b>Not assessed at this inspection</b>	N/A
Inbuilt S/W pipes tested	N/A
Vents terminated <b>50mm completed</b>	Pass
Pressure test <b>all 20:15and10mm dux secure in</b>	Pass
Waste pipe size and test	Pass
Floor wastes	N/A
Shut off valves <b>In garage</b>	Pass
Fire wraps and collars	N/A
LBP number	N/A
Agent/owner written approval	N/A
non compliance discussed onsite	N/A
Next Inspection required	N/A
Other <b>All aspects relating to this inspection have been assessed and checked against the consented documentation and deemed to comply.</b>	Pass



Taken at 8:17 AM on Wednesday 11/08/2021



Taken at 8:17 AM on Wednesday 11/08/2021



Taken at 8:17 AM on Wednesday 11/08/2021



Taken at 8:18 AM on Wednesday 11/08/2021



Taken at 8:18 AM on Wednesday 11/08/2021



Taken at 8:18 AM on Wednesday 11/08/2021



Taken at 8:18 AM on Wednesday 11/08/2021



Taken at 8:20 AM on Wednesday 11/08/2021



Taken at 8:20 AM on Wednesday 11/08/2021



Taken at 8:20 AM on Wednesday 11/08/2021



Taken at 8:20 AM on Wednesday 11/08/2021

## SITE NOTICE

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Consent No: **200896**  
Applicant: **Daniel Perry Green**  
Site Address: **9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

---

Inspection Type: **Preline Plumbing**  
Inspection Outcome: **Pass**  
Inspected By: **Gareth McCullagh**  
Inspection Date: **11 August 2021**

### Passed Items

#### General

Sighted previous inspection notes	
Conforms with approved drawings	
Plumber	<b>13440</b>
Pipes fixed/supported	<b>all clipped and secured</b>
System used	<b>AS3500</b> <b>With non potable green pipe to toilets and hosetaps</b>
Vents terminated	<b>50mm completed</b>
Pressure test	<b>all 20:15and10mm dux secure in</b>
Waste pipe size and test	
Shut off valves	<b>In garage</b>
Other	<b>All aspects relating to this inspection have been assessed and checked against the consented documentation and deemed to comply.</b>

## GoGet Inspection Audit Report

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Consent No: **200896**

Applicant: **David Reid Homes (Kapiti) Ltd**

Site Address: **Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae**

Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

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Inspection Type: **Pre-Slab Building**

Inspection Outcome: **Fail**

Inspected By: **Gareth McCullagh**

Inspection Date: **26 March 2021 10:43 a.m.**

Duration: **30 minutes**

Inspection Element	Status
General	Fail
Engineers details required <b>Rib raft design engineer still to provide site note</b>	Fail
Rebate for brick veneer <b>Not part of this consent</b>	N/A
Ground clearance	Pass
Concrete cover	Pass
Driveway S/W control <b>Not part of this consent</b>	N/A
Sand blinding	Pass
Slab thickenings <b>In place</b>	Pass
Vapour barrier <b>In taped</b>	Pass
Bottom plate fixings <b>Not part of this consent</b>	N/A
Steel reinforcing <b>Covered by engineer</b>	Fail
Bar chairs	Fail
DPC penetrations taped <b>All penetrations taped as required</b>	Pass
Minimum floor level	Pass
Registration numbers <b>Not part of this consent</b>	N/A
Siting <b>Measured off survey pegs as per plan</b>	Pass
Sub slab insulation	N/A
In-slab heating	N/A
LBP number <b>102284</b>	Pass
Agent/owner written approval	N/A
non compliance discussed onsite	N/A
Next Inspection required	N/A
Other	Pass



Taken at 10:42 AM on Friday 26/03/2021



Taken at 10:42 AM on Friday 26/03/2021



Taken at 10:43 AM on Friday 26/03/2021



Taken at 10:43 AM on Friday 26/03/2021



Taken at 10:43 AM on Friday 26/03/2021



Taken at 10:43 AM on Friday 26/03/2021

## GoGet Inspection Audit Report

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Consent No: **200896**  
Applicant: **David Reid Homes (Kapiti) Ltd**  
Site Address: **9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

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Inspection Type: **Final Inspection**  
Inspection Outcome: **Pass**  
Inspected By: **Alan Tinney**  
Inspection Date: **23 December 2021 9:16 a.m.**  
Duration: **30 minutes**

<b>Inspection Element</b>	<b>Status</b>
Exterior	Pass
All previous inspections/notes passed	Pass
<b>Previous fails are pending documentation</b>	
<b>All passed items on this inspection have been assessed against the consented documentation.</b>	
Steps/stairs	Pass
<b>Entry deck smooth pine tread does not comply with the slip resistance requirement of the building code.</b>	
<b>And grip seal to be added to tread (entry only)</b>	
Final check complete	Pass
Interior	Pass
All previous inspections/notes passed	Pass
Service areas-floors/walls	Pass
<b>Now completed</b>	
Lightings	Pass
<b>Electrical certs required</b>	
Hot water temp	Pass
<b>51</b>	
Solid fuel heater	Pass
Final check complete	Pass

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### **Documentation**

Electrical safety certificate - Inspector	Received
Record of Work	Received

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### **Building Practitioners**

Plumber	Clear
Drainlayer	Clear

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Pre-Slab Building**  
 Inspection Outcome: **Pass**  
 Inspected By: **Alan Tinney**  
 Inspection Date: **23 December 2021**

### Passed Items

#### General

Engineers details required	<b>Rib raft design engineer still to provide site note</b>
Steel reinforcing	<b>Covered by engineer</b>
	<b>All steel work placed and tied as per consented documentation</b>
Bar chairs	<b>Bar chairs placed as required</b>

Inspection Type: **Drainage**  
 Inspection Outcome: **Pass**  
 Inspected By: **Alan Tinney**  
 Inspection Date: **23 December 2021**

### Passed Items

#### General

Soak pit	<b>Engineer supervising to provide site note</b>
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Inspection Type: **Final Inspection**  
 Inspection Outcome: **Pass**  
 Inspected By: **Alan Tinney**  
 Inspection Date: **23 December 2021**

### Passed Items

#### Exterior

All previous inspections/notes passed	<b>Previous fails are pending documentation</b>
	<b>All passed items on this inspection have been assessed against the consented documentation.</b>
Steps/stairs	<b>Entry deck smooth pine tread does not comply with the slip resistance requirement of the building code.</b>
	<b>And grip seal to be added to tread (entry only)</b>
Final check complete	

Interior

All previous inspections/notes passed  
Service areas-floors/walls  
Lightings  
Hot water temp  
Solid fuel heater  
Final check complete

**Now completed**  
**Electrical certs required**  
**51**

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**Documentation**

**Status**

Application for CCC	Received
Electrical safety certificate - Electrician	Received
Electrical safety certificate - Inspector	Received
As-built drainage plan	Received
Drainage (Form 126) for stormwater & private Sewer installation	Received
Plumbing (Form 125) for pressure test and installation piped services	Received
Construction review PS4 statement for geo-technical engineering	Received
<b>PS4 required from Hamish Wells for soakpit.</b>	
Roof product manufacturers warranty	Received
Record of Work	Received
Water tank warranty	Received

## GoGet Inspection Audit Report

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Consent No: **200896**  
Applicant: **David Reid Homes (Kapiti) Ltd**  
Site Address: **Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae**  
Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

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Inspection Type: **Pre-Slab Plumbing**  
Inspection Outcome: **Pass**  
Inspected By: **Gareth McCullagh**  
Inspection Date: **22 March 2021 1:04 p.m.**  
Duration: **30 minutes**

Inspection Element	Status
General	Pass
Secondary flow path <b>Not part of this consent</b>	N/A
Pipe material <b>PVC primed and glued</b>	Pass
Pipe protection <b>Larger pipe sleeve</b>	Pass
TPR line <b>Not assessed at this inspection</b>	N/A
Plumbing layout <b>As per consented plans</b>	Pass
Pipes supported	Pass
Wastes and drains <b>All 100mm with correct fall out of slab</b>	Pass
Water/air <b>Water tested</b>	Pass
Leak check	Pass
Registration numbers <b>13440</b>	Pass
Agent/owner written approval	N/A
non compliance discussed onsite	N/A
Next Inspection required	N/A
Other <b>All aspects relating to this inspection have been assessed and checked against the consented documentation and deemed to comply.</b>	Pass
Site Inspection	N/A



Taken at 1:01 PM on Monday 22/03/2021



Taken at 1:01 PM on Monday 22/03/2021



Taken at 1:01 PM on Monday 22/03/2021



Taken at 1:02 PM on Monday 22/03/2021

## SITE NOTICE

Consent No: **200896**  
 Applicant: **Daniel Perry Green**  
 Site Address: **Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae**  
 Work Type: **New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.**

Building Category: **R2**

Inspection Type: **Pre-Slab Plumbing**  
 Inspection Outcome: **Pass**  
 Inspected By: **Gareth McCullagh**  
 Inspection Date: **22 March 2021**

### Passed Items

#### General

Pipe material	<b>PVC primed and glued</b>
Pipe protection	<b>Larger pipe sleeve</b>
Plumbing layout	<b>As per consented plans</b>
Pipes supported	
Wastes and drains	<b>All 100mm with correct fall out of slab</b>
Water/air	<b>Water tested</b>
Leak check	
Registration numbers	<b>13440</b>
Other	<b>All aspects relating to this inspection have been assessed and checked against the consented documentation and deemed to comply.</b>

### Documentation

Documentation	Status
Application for CCC	Required
Electrical safety certificate - Electrician	Required
As-built drainage plan	Required
Drainage (Form 126) for stormwater & private Sewer installation	Required
Plumbing (Form 125) for pressure test and installation piped services	Required
Construction review PS4 statement for geo-technical engineering <b>PS4 required from Hamish Wells for soakpit.</b>	Required
Roof product manufacturers warranty	Required
Record of Work	Required
Water tank warranty	Required

### Building Practitioners

Building Practitioners	Status
Designer 2	Accepted

**Hamish Wells**

Designer 1	Accepted
<b>Peter Davis</b>	
Carpentry 1	Required
Foundations 1	Required
Roofing 1	Required
Plumber	Required
Drainlayer	Required
Electrician	Required

# GoGet Processing Summary Report

Consent No: 200896

Site Address: Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae

Description: New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.

Checklist/Elements	Status	Notes	Processed By
<u>Pre-Application Record</u>	N/A		Melissa Gibson
<u>Vetting</u>	Pass		Heather Wright, Melissa Gibson
Application documentation	Pass		HEW
Application type	Pass	The application is for a building consent.	HEW
Application form signed	Pass	The owners match those listed on the CT. The application form is signed by the owner or by an agent nominated by the owner.	HEW
Proof of ownership	Pass	A certificate of title dated within the last three months.	HEW
Drawings and plans	Pass	Detailed plans are provided that clearly show existing building and the proposed modification or new build.	HEW
Site specific specifications	Pass	Specifications provided that are relevant to the proposed works. Specifications do not contradict the plans. Specifications clearly identify chosen products, and do not show a range of possible options.	HEW
Compliance documentation	Pass	Relevant documentation is shown for: - B1: the truss manufacturer, including a PS1; - B1: bracing calculations; - B2: appraisals for specific products, including all membranes and specific cladding systems; - E2: risk matrix; - E2: cladding specifications and maintenance requirements where relevant; - H1: energy efficiency compliance report or calculation;	HEW
Specific engineered design	Pass	The design involves specific engineering design and: - a PS1 has been provided. - the designer is a CPEng <insert number>.	HEW
Building act	N/A		HEW
Decision- s71-74	N/A		HEW
Waivers and Modifications	N/A		HEW
Multi Use	N/A		HEW
Payment	Pass		HEW, MGI
Payment requested	Pass		HEW
Payment received	Pass		HEW, MGI
<u>CCC and Category</u>	N/A		Melissa Gibson
<u>Planning</u>			Ross Goodman
District Plan			ROG
District Plan Items Checked	Yes		ROG
Section 221 checked	Yes		ROG
Resource Consent granted		RM190153 granted for Residential subdivision 12.12.2019.	ROG
Building Act	N/A		ROG
Sec 37 required	N/A		ROG
<u>Specified Systems Compliance</u>	N/A		Melissa Gibson
<u>Environmental Health</u>	N/A		Melissa Gibson
<u>Quick Consent</u>	N/A		Melissa Gibson

Checklist/Elements	Status	Notes	Processed By
<u>B1 - Structure</u>	Pass		Melissa Gibson
Verification method	N/A		MGI
NZS 3604	Pass		MGI
Scope	Pass	The building is within the scope and limitation of NZS 3604.	MGI
Good ground	Pass	The building site is assumed to meet the requirements for foundations, and good ground has been determined with regards to the PIM. Report provided by Hamish Wells	MGI
Site requirements	Pass	The requirements for site have been considered.	MGI
Risk of liquefaction/ lateral spread	Pass	Confirm the risk of liquefaction/lateral spread for this particular site --- Response - MGI 4 Mar 2021 8:30am --- RFI response: Letter from Richard Skilton, ABuild, Engineer indicating site is considered resistant to liquefaction and lateral spreading is not considered a risk, letter dated 26 January 2021,	MGI
<u>Request for Further Information:</u>			
Request:		Confirm the risk of liquefaction/lateral spread for this particular site	MGI
Response:		RFI response: Letter from Richard Skilton, ABuild, Engineer indicating site is considered resistant to liquefaction and lateral spreading is not considered a risk, letter dated 26 January 2021,	MGI
Deck structure	Pass		MGI
Deck piles	Pass	The: ordinary piles comply with the relevant section of NZS 3604. This includes requirements for heights, materials, footings, and fixings.	MGI
Deck bearers	Pass	Bearers are sized appropriately for their given span, spacing, and loaded dimensions.	MGI
Deck stringers	N/A		MGI
Deck bracing	Pass	The deck is of small enough area that no additional bracing for the deck is required.	MGI
Deck joists	Pass	Deck joists are adequately sized given their spans and spacing. Adequate lateral support is provided to deck joists where required.	MGI
Decking	Pass	Decking has adequate strength given the deck joist spacing.	MGI
Balustrade support	N/A		MGI
Foundations and sub-floor framing	N/A		MGI
Floors	Pass		MGI
Suspended timber floors (ground)	N/A		MGI
Suspended timber floors (first floor and above)	N/A		MGI
Flooring	Pass	Flooring meets the requirements in regards to materials, thickness, and layout.	MGI
Concrete slab	Pass	Ribraft foundation, Firth manual included. There is adequate clearance, both vertically and horizontally, to the surrounding ground around the concrete slab. The foundation edge of the slab is detailed appropriately given the type of construction, with sufficient dimensions and reinforcing. The slab is constructed over granular fill with an appropriate damp proof membrane. The thickness of the slab meets requirements, with adequate reinforcing and shrinkage control where required.	MGI

Checklist/Elements	Status	Notes	Processed By
		Where the slab supports load bearing walls the slab shows sufficient thickening, reinforcing, and fixings to the bottom plate.	
Walls	Pass		MGI
Studs	Pass	Studs in load and non-load bearing walls framing are sized appropriately given the wind zone, their loaded dimension, height and spacing.	MGI
Lintels	Pass	Lintels over openings in wall framing have been sized appropriately given the building elements they support, their loaded dimension, and their span. Fixings are detailed to prevent uplift.	MGI
Plates	Pass	Top and bottom plates are sized appropriately, and have adequate strengthening where required.	MGI
Bracing	Pass	Correct parameters have been used for calculating wall bracing demand. This includes considerations around wind, earthquakes, cladding types, and building characteristics. The wall bracing design shows adequate strength to resist lateral loads expected given the above parameters. The layout of the bracing meets the provisions to avoid torsion due to asymmetric design.	MGI
Posts	N/A		MGI
Roof structure	Pass		MGI
Framed roof	Pass	Provide the supporting documentation for the Posi-Strut rafters --- Response - MGI 4 Mar 2021 8:33am --- RFI response: Posi-strut table provided from Mitek	MGI
<u>Request for Further Information:</u>			
		Request: Provide the supporting documentation for the Posi-Strut rafters	MGI
		Response: RFI response: Posi-strut table provided from Mitek	MGI
Truss roof	Pass	The roof truss has been specifically designed according to B1/VM1. Refer to the Verification Method checklist item. Documentation of the trusses meets the requirements of 10.2.2.3 - Mitek placemakers prenailed truss fabricator	MGI
Eaves and gable verges	Pass	Eaves and gable verges are supported by rafters, purlins that are sized appropriately given the permitted spans.	MGI
Purlins / tile battens	Pass	The purlins are adequately sized given the wind zone, their span and spacing. Correct fixings are specified given the uplift loads expected.	MGI
Bracing	Pass	Adequate bracing is provided for the roof given the roof pitch and area. Bracing is provided by: bracing straps.	MGI
Ceilings	Pass	Ceilings are supported by allowed members, with ceiling battens sized appropriately given their span and spacing.	MGI
Verandah beams	Pass	Verandah beams are adequately sized with the correct fixings given the type of roof, their loaded dimension, and span.	MGI
Snow loading	N/A		MGI
External stairs	N/A		MGI
Internal Barriers	N/A		MGI
3kPa floor loads	N/A		MGI
Other compliance paths	N/A		MGI

Checklist/Elements	Status	Notes	Processed By
Alternative solution	N/A		MGI
<u>B2 - Durability</u>	Pass		Melissa Gibson
B2 prompts	Pass		MGI
Material compatibility	Pass	Adjoining materials are compatible.	MGI
Concrete and concrete masonry	Pass	Concrete strength and cover is appropriate for the exposure zone - 20 MPa	MGI
Timber treatment	Pass	The wood-based building components required to achieve 50 year durability comply with table 1 NZS 3602 as modified by B2/AS1. The wood-based building components required to achieve 15 year durability comply with table 2 NZS 3602 as modified by B2/AS1.	MGI
Steel fixings and fastenings	Pass	Steel fixings are specified where required to meet durability requirements.	MGI
Engineered elements	N/A		MGI
Plumbing materials	Pass	Given the water supply and drainage principles used in the plumbing design appropriate materials are used for water supply and drainage pipes.	MGI
Limited life consent	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>C1-C2 - Protection From Fire</u>	Pass		Melissa Gibson
C/AS1 - Residential and outbuildings	Pass		MGI
Fire cells, systems, and resistance ratings	Pass	Type 1 smoke alarms are shown on the plans in accordance with the requirements of F7/AS1.	MGI
Means of escape	Pass	An escape route leading to a place of safety is provided, with the length of the route not exceeding the length allowed given the type of fire safety system provided.	MGI
Control of internal fire and smoke spread	N/A		MGI
Control of external fire spread	N/A		MGI
Firefighting	N/A		MGI
Prevention of fire occurring	N/A		MGI
C/AS* - Large multi-residential, commercial, and vehicle storage	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>D1 - Access Routes</u>	Pass		Melissa Gibson
Access routes	Pass		MGI
Safety	Pass	Access routes have adequate activity space, visibility, are free from dangerous obstructions, and have safe cross fall and slope in the direction of travel.	MGI
Slip resistance	Pass	Access routes have adequate slip resistant walking surfaces - Timber decking	MGI
Building access	Pass	There is one access route that allows people to safely approach the building from the street edge.	MGI
Ramps	N/A		MGI
Stairs	N/A		MGI
Handrails	N/A		MGI
Accessible car parks	N/A		MGI
Accessible building entries	N/A		MGI
Accessible places of assembly	N/A		MGI
Accessible accommodation units	N/A		MGI

Checklist/Elements	Status	Notes	Processed By
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>D2 - Mechanical Installations For Access</u>	N/A		Melissa Gibson
<u>E1 - Surface Water</u>	Pass		Melissa Gibson
Drainage design	Pass		MGI
Connections	Pass	Existing drainage plans have been checked to ensure the feasibility of the connections proposed.	MGI
Verification method	N/A		MGI
Soak pits	Pass		MGI
Field testing	Pass	Confirm if the surrounding ground is suitable to receive and dispose of water from the soak pit --- Response - MGI 4 Mar 2021 9:01am --- RFI response: On site SW disposal provided by Hamish Wells - PS1 provided including SW calculations	MGI
<u>Request for Further Information:</u>			
Request:		The soakpit calculation is to use the rainfall intensity depth of 44.2mm/hr for the 1 in 100 year event per the consent notice condition not 27.8mm/hr. Provide amended soakpit size and calculations. The designer will be responsible for confirming the assumed soakage rate prior to the issue of the CCC. A site visit at the time of construction will be required and a design statement provided by ADarchitecture.	MGI
Response:		RFI response: On site SW disposal provided by Hamish Wells - PS1 provided including SW calculations	MGI
Soak pit design	Pass	The soak pit has an adequate volume, with appropriate filling and lining to the pit.	MGI
Acceptable solution	N/A		MGI
Floor level	Pass		MGI
Minimum finished floor level	Pass	The slab and/or suspended timber floor is: at least 150mm above surrounding ground, and;	MGI
Stormwater drainage	Pass		MGI
Size and gradient	Pass	The sealed driveway cannot discharge across the KCDC footpath, please revise and provide a sump  The stormwater drains are adequately sized given their gradient and catchment area. The gradient meets or exceeds the minimum requirements. --- Response - MGI 4 Mar 2021 9:04am --- RFI response: DP shown by the laundry tub connecting to the SW system, drainage plan updated	MGI
<u>Request for Further Information:</u>			
Request:		Show the downpipe by the laundry tub connecting to the SW system.	MGI
Response:		RFI response: DP shown by the laundry tub connecting to the SW system, drainage plan updated	MGI
Sumps	N/A		MGI
Roof catchment	Pass		MGI
Downpipes	Pass	The downpipe size is adequate given the roof pitch and plan area of the roof catchment area.	MGI
Gutters	Pass	Gutters have an adequate cross sectional area given the rainfall intensity, plan area of the roof catchment area, and the pitch of the roof.	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>E2 - External moisture</u>	Pass		Melissa Gibson
Acceptable solution	N/A		MGI
Risk matrix	Pass		MGI
Score	Pass	A risk matrix score of 10 has been calculated for the worst case elevation.	MGI

Checklist/Elements	Status	Notes	Processed By
Wall cladding	Pass	Given the risk matrix score it is appropriate to use Shadowclad ply with timber battens and, bevelback weatherboard	MGI
Roof cladding	Pass		MGI
General	Pass	An appropriate roofing underlay is used given the type roofing - Dristud FRU38 roofing underlay Gutters and downpipes are adequately sized, and where necessary, to calculations as laid out in E1/AS1. The building has a low pitch and/or is in a very high or extra high wind zone. Additional protections in the way of larger flashings to apron, barge, and capping details have been taken, in addition to eave and soffit details. The maintenance requirements of the cladding to meet the durability requirements of B2 have been considered for the specific details, constraints, and construction of this building work.	MGI
Cladding junctions	Pass	The gutter to wall junction shows an appropriate kick out flashing, with fall and a stop end to divert water away from the wall cladding.	MGI
Masonry tiles	N/A		MGI
Pressed metal tiles	N/A		MGI
Profiled metal	Pass	Confirm the Coloursteel Endura metal roofing profile for the 4° pitch roof  The pitch of the profiled metal roof is appropriate given the type of the metal profile - 7.5°  Details, including flashing sizes and material compatibility are appropriate for the ridge, barge, eave, apron, and roof/wall junctions given the type of the metal profile. An eave flashing is shown given the low pitch of the profiled metal roof, the shallow soffit depth, and that the building is in a very high wind zone or higher. Penetrations through the profiled metal roof are adequately detailed given the size of the penetration, with appropriate soaker flashings having appropriate cover around the penetration. --- Response - MGI 4 Mar 2021 9:13am --- RFI response: Metalcraft MC700 longrun colorsteel endura, plans changed to note this	MGI
<u>Request for Further Information:</u>			
Request:		Confirm the Coloursteel metal roofing profile for the 4° pitch roof, the detail shows an ST7 profile	MGI
Response:		RFI response: Metalcraft MC700 longrun colorsteel endura, plans changed to note this	MGI
Membrane roofs	N/A		MGI
Wall cladding	Pass		MGI
General	Pass	An appropriate wall underlay is shown - Tekton Building wrap  The building is in a very high wind zone or above. Sealant to the window head flashing is shown. The maintenance requirements of the cladding to meet the durability requirements of B2 have been considered for the specific details, constraints, and construction of this building work.	MGI
Threshold junctions	N/A		MGI
Cladding junctions	Pass	Where different claddings abut, adequate details are shown of the junction, with necessary building	MGI

Checklist/Elements	Status	Notes	Processed By
		elements shown as required by the relevant technical information.	
Masonry veneer	N/A		MGI
Stucco	N/A		MGI
Timber weatherboards	Pass	<p>Timber bevelback weatherboard - The bottom of the timber weatherboard cladding has adequate clearance to paved and unpaved surfaces.</p> <p>Pipe penetrations through the timber weatherboard cladding show adequate flashing tape and/or a flange plate.</p> <p>Window head, jamb, and sill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and raking windows where relevant.</p> <p>Doorsill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and junctions to the floor / deck structure. External and internal corners are detailed, with the correct flashings shown given the junction type and wind zone.</p>	MGI
Fibre cement weatherboards	N/A		MGI
Profile metal wall cladding	N/A		MGI
Fibre cement sheet	N/A		MGI
Plywood sheet	Pass	<p>Shadowclad on cavity current installation manual provided</p> <p>The bottom of the plywood sheet cladding has adequate clearance to paved and unpaved surfaces. Pipe penetrations through the plywood sheet cladding show adequate flashing tape and/or a flange plate.</p> <p>Horizontal and vertical joints are detailed with appropriate flashings, battens and/or clearances shown.</p> <p>Window head, jamb, and sill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and raking windows where relevant.</p> <p>Doorsill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and junctions to the floor / deck structure. External and internal corners are detailed, with the correct flashings shown given the junction type and wind zone.</p>	MGI
EIFS	N/A		MGI
Wall tanking	N/A		MGI
Parapets	N/A		MGI
Decks	Pass		MGI
Threshold levels	Pass	The threshold for the deck has an adequate level separation for a(n) attached slatted decks.	MGI
Membrane decks	N/A		MGI
Balustrades	N/A		MGI
Manufacturer's details	Pass		MGI
Roof claddings	Pass	The manufactured cladding proposed has been sighted against a BRANZ appraisal or similar. It is used within the scope outlined, and details shown	MGI

Checklist/Elements	Status	Notes	Processed By
		on the consent drawings match those provided by the manufacturer and covered by the appraisal - Metalcraft MC700 Coloursteel Endura The pitch of the roof cladding is appropriate - 7.5° Details, including flashing sizes and material compatibility are appropriate for the ridge, barge, eave, apron, and roof/wall junctions of the roof cladding. Penetrations through the roof cladding are adequately detailed given the size of the penetration, with appropriate soaker flashings having appropriate cover around the penetration.	
Wall claddings	Pass	Detail 6/A201 does not show a flashing, please revise	MGI
		The manufactured cladding proposed has been sighted against a BRANZ appraisal or similar. It is used within the scope outlined, and details shown on the consent drawings match those provided by the manufacturer and covered by the appraisal - BRANZ Shadowclad Ventilated cavity cladding system (No 764) The bottom of the cladding has adequate clearance to paved and unpaved surfaces. Pipe penetrations through the cladding show adequate flashing tape and/or a flange plate. Window head, jamb, and sill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and raking windows where relevant. Doorsill details are shown, with adequate consideration of the relevant building elements, including requirements for dimensioning, clearance, flashing, and junctions to the floor / deck structure. External and internal corners are detailed, with the correct flashings shown given the junction type and wind zone. Soffit junctions are shown, with the correct flashing where the soffit is exposed.	
Re-cladding	N/A		MGI
Timber joinery	N/A		MGI
Skylights	Pass		MGI
Skylight junctions	Pass	Provide velux sun tunnel installation manual	MGI
		Velux skylights are proposed. Roof penetration details shown in the consent match those provided by the manufacturer and covered by the appraisal. --- Response - MGI 4 Mar 2021 8:33am --- RFI response: Velux sun tunnel installation manual provided	
		<u>Request for Further Information:</u>	
		Request: Provide the Velux sun tunnel installation manual	MGI
		Response: RFI response: Velux sun tunnel installation manual provided	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>E3 - Internal Moisture</u>	Pass		Melissa Gibson
E3 prompts	Pass		MGI
Moisture control	Pass	There is an adequate combination of thermal resistance, ventilation, and space temperature	MGI

Checklist/Elements	Status	Notes	Processed By
		control.	
Overflow	N/A		MGI
Impervious surfaces	Pass	Details have been provided for surfaces to be impervious, easily cleaned, and for the prevention of water penetration into concealed spaces where the surface is adjacent to sanitary fixtures and appliances or likely to be splashed.	MGI
Proprietary shower tray/walls	Pass	A proprietary shower tray and/or walls is proposed with sufficient details to show impervious and easily cleaned surfaces.	MGI
Tiled shower	N/A		MGI
Level access shower	N/A		MGI
Wet area membrane	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>F1 - Hazardous Agents On Site</u>	N/A		Melissa Gibson
<u>F2 - Hazardous Building Materials</u>	Pass		Melissa Gibson
Asbestos	N/A		MGI
Glazing	Pass		MGI
Manifestation	N/A		MGI
Glazing requirements	Pass	Correct types and thicknesses of glazing are specified to show compliance with the provisions of NZS 4223.3 based on the area of the glazing, its height, and width.	MGI
Bathrooms	Pass	Glazing in bathrooms, including glazing in the shower enclosure, is specified to be compliant with NZS 4223.3 - safety glass shower door shown on Keynote legend on Sheet A501	MGI
Balustrades	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>F3 - Hazardous Substances And Processes</u>	N/A		Melissa Gibson
<u>F4 - Safety From Falling</u>	N/A		Melissa Gibson
<u>F5 - Construction and Demolition Hazards</u>	Pass		Melissa Gibson
F5 prompts	Pass		MGI
Consent addendum	Pass	Compliance with F5 Site Safety is to be noted in the consent addendum.	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>F6 - Visibility In Escape Routes</u>	N/A		Melissa Gibson
<u>F7 - Warning Systems</u>	Pass		Melissa Gibson
F7 prompts	Pass		MGI
System type (excluding simple residential situations)	N/A		MGI
Domestic alarms	Pass	Domestic alarms are proposed, and are able to be tested and have a hush facility. Alarms are located: within 3.0m of each sleeping space;	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>F8 - Signs</u>	N/A		Melissa Gibson
<u>F9 Means of Restricting Access to Residential Pools</u>	N/A		Melissa Gibson

Checklist/Elements	Status	Notes	Processed By
<u>G1 - Personal hygiene</u>	Pass		Melissa Gibson
Provision of sanitary fixtures	Pass		MGI
General sanitary fixture requirements	Pass	An adequate number of sanitary fixtures with appropriate space dimensions have been provided given the building use, user group, occupancy, and type of fixtures provided.	MGI
Privacy	Pass		MGI
Location	Pass	As sanitary fixtures in a household unit, there is at least one door provided between the toilets and the food preparation / storage areas.	MGI
Line of sight	Pass	There is no direct line of sight between an access route and a WC, urinal , bath, shower, or bidet. This is achieved by: visual separation of a single fixture with a door.	MGI
Lobbies	N/A		MGI
Accessible toilets	N/A		MGI
Accessible showers	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G2 - Laundering</u>	Pass		Melissa Gibson
G2 prompts	Pass		MGI
Provision of laundry spaces	Pass	An adequate number of laundering facilities, with a tub or washing machine and sufficient activity space, have been provided given the building use and the building occupancy.	MGI
Accessible laundries	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G3 - Food Preparation And Prevention Of Contamination</u>	Pass		Melissa Gibson
Domestic kitchen facilities	Pass		MGI
Activity space and functionality	Pass	The domestic kitchen provides space for a cooker, perishable food storage, a sink, sufficient food preparation area, and adequate plan area to allow for activity space.	MGI
Interior linings	Pass	Confirm the surface linings adjacent to kitchen appliances and facilities are impervious --- Response - MGI 4 Mar 2021 8:55am --- RFI response: Email confirmed all adjacent wall linings behind the hob will be impervious, either selected tiles or glass splashback.	MGI
<u>Request for Further Information:</u>			
Request: Confirm the surface linings adjacent to kitchen appliances and facilities are impervious			MGI
Response: RFI response: Email confirmed all adjacent wall linings behind the hob will be impervious, either selected tiles or glass splashback.			MGI
Commercial facilities	N/A		MGI
Accessible kitchen facilities	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G4 - Ventilation</u>	Pass		Melissa Gibson
G4 prompts	Pass		MGI
Natural ventilation	Pass	Sufficient natural ventilation is provided to occupied spaces by openable windows and/or doors of an adequate area.	MGI

Checklist/Elements	Status	Notes	Processed By
Mechanical ventilation	Pass	Contaminated air is disposed of in a way which avoids nuisance to people and other property. Sufficient mechanical ventilation is provided to occupied spaces by an extract with an adequate air flow rate. Range hoods/extracts with an appropriate air flow rate are provided to kitchen spaces - vented through the wall	MGI
Gas fuelled appliances	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G5 - Interior Environment</u>	N/A		Melissa Gibson
<u>G6 - Airborne And Impact Sound</u>	N/A		Melissa Gibson
<u>G7 - Natural Light</u>	Pass		Melissa Gibson
G7 prompts	Pass		MGI
Means of providing natural light	Pass	There are windows to habitable spaces that have an area no less than 10% of the floor area.	MGI
Visual awareness	Pass	At least 50% of the glazed area providing natural light is clear glazing falling within the visual awareness zone.	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G8 - Artificial Light</u>	Pass		Melissa Gibson
G8 prompts	Pass		MGI
Artificial lighting	Pass	There is adequate lighting to the: access route. exitways.	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G9 - Electricity</u>	Pass		Melissa Gibson
G9 prompts	Pass		MGI
Energy works certificate	N/A		MGI
Electrical switches and outlets	Pass	Electrical switches and outlets are positioned at an accessible height.	MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G10 - Piped Services</u>	N/A		Melissa Gibson
<u>G11 - Gas As An Energy Source</u>	N/A		Melissa Gibson
<u>G12 - Water Supplies</u>	Pass		Melissa Gibson
Water supply	Pass		MGI
Potable water	Pass	The water supply is from a potable source. Pipe materials used for the water supply system will not contaminate the potable water supply.	MGI
Backflow prevention	Pass	Backflow prevention devices are being used to prevent contamination of water supply. The device is an appropriate type given the cross connection hazard, is testable, and has been added to the draft compliance schedule - Non return valve shown on schematic, sheet A102	MGI
Non-potable supply	Pass	Non-potable supply appropriately protected from cross connection hazards and is identified by appropriate signage - Note shown on Sheet A102 that appropriate signage will be shown	MGI
Freezing zones	N/A		MGI

Checklist/Elements	Status	Notes	Processed By
Water tanks	Pass		MGI
Rural water supply	Pass	Provide manufacturer's installation guide for the water tank to be installed and provide details of the high quality pump to be installed --- Response - MGI 4 Mar 2021 9:00am --- RFI response: Eletank and SBA submersible pump installation information provided.	MGI
<u>Request for Further Information:</u>			
Request: Provide manufacturer's installation guide for the water tank to be installed and provide details of the high quality pump to be installed			MGI
Response: RFI response: Eletank and SBA submersible pump installation information provided.			MGI
Community care water supply	N/A		MGI
Overflow	Pass	Adequately sized overflow pipes are provided to the tanks given the rate of the inlet flow.	MGI
Structural support	Pass	See RFI for manufacturer's documentation There is adequate structural support to the water tanks, including seismic restraint. This is assessed as compliant in B1 Structure.	MGI
Hot water	Pass		MGI
Water heater type	Pass	Hot water is supplied via a(n): electric instantaneous water heater.	MGI
Installation	Pass	The hot water supply system shows an appropriate layout with correct elements given the type of the water heater, venting system, and the water pressure level.	MGI
Structural support	Pass	Adequate structural support and seismic restraints are provided to the storage hot water heater.	MGI
Water temperature	Pass	The hot water temperature supplied at the sanitary fixtures meets required levels given the classified use of the building - Tempering valve shown on HWC vented system schematic, sheet A102	MGI
Solar hot water	N/A		MGI
Wetback hot water	N/A		MGI
Accessible water supply	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G13 - Foul Water</u>	Pass		Melissa Gibson
Drainage design	Pass		MGI
Compliance path	Pass	A means of compliance has been clearly stated in the consent documents.	MGI
Connections	Pass	Existing drainage plans have been checked to ensure the feasibility of the connections proposed.	MGI
Acceptable solution	N/A		MGI
AS/NZS 3500.2	Pass		MGI
Drainage principles	Pass	Show ORG on drainage plan Show Inspection Point on drainage plan  The discharge pipe layout, sizes, and falls are appropriate given types of sanitary fixtures, the fixture loading, and the developed lengths of pipe runs. --- Response - MGI 4 Mar 2021 9:07am --- RFI response: Inspection points shown on the updated drainage plan including where the new drain connects to the site lateral to enable testing and maintenance.	MGI

Checklist/Elements	Status	Notes	Processed By
<u>Request for Further Information:</u>			
Request: Highlight ORG on drainage plan			MGI
Response: RFI response: ORG provided on Drainage plan			MGI
<u>Request for Further Information:</u>			
Request: Show Inspection Points on drainage plan in accordance with the standard nominated. An inspection point is also required where the new drain connects to the site lateral to enable testing and maintenance.			MGI
Response: RFI response: Inspection points shown on the updated drainage plan including where the new drain connects to the site lateral to enable testing and maintenance.			MGI
Elevated drainage principles	N/A		MGI
Single stack	N/A		MGI
Single stack variations	N/A		MGI
Fully vented	N/A		MGI
Fully vented modified	N/A		MGI
Pumping systems	N/A		MGI
AS/NZS 3500.5	Pass		MGI
Residential	Pass	Refer to 3500.2 compliance assessment.	MGI
Hydraulic design	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>G14 - Industrial Liquid Waste</u>	N/A		Melissa Gibson
<u>G15 - Solid Waste</u>	N/A		Melissa Gibson
<u>H1 - Energy Efficiency</u>	Pass		Melissa Gibson
H1 prompts	Pass		MGI
Small building envelope thermal performance	Pass	The building has been assessed as compliant with H1 using the: calculation method, as modified by H1/AS1.	MGI
Large building envelope performance	N/A		MGI
Hot water system efficiency	Pass	There is adequate thermal insulation to the hot water supply to the sink, with the pipe run not exceeding allowable limits.	MGI
Artificial lighting	N/A		MGI
Other compliance paths	N/A		MGI
Alternative solution	N/A		MGI
<u>S67 - Waivers And Modifications</u>	N/A		Melissa Gibson
<u>S75 - Build over 2 allotments</u>	N/A		Melissa Gibson
<u>S112 and S133 AT - Alterations To Existing Buildings</u>	N/A		Melissa Gibson
<u>S115 and S133 AN- Change Of Use</u>	N/A		Melissa Gibson
<u>S116A - Subdivision Code Compliance Requirements</u>	N/A		Melissa Gibson
<u>S363 - Certificate For Public Use</u>	N/A		Melissa Gibson
<u>Restricted Building Work</u>	Pass		Melissa Gibson
Primary structure	Pass		MGI
Foundations and sub-floor framing	Pass	Peter Davis - BP103740	MGI
Walls	Pass	Peter Davis - BP103740	MGI
Roof	Pass	Peter Davis - BP103740	MGI
Columns and beams	Pass	Peter Davis - BP103740	MGI
Bracing	Pass	Peter Davis - BP103740	MGI
Other	N/A		MGI
External moisture	Pass		MGI

Checklist/Elements	Status	Notes	Processed By
Damp proofing	Pass	Peter Davis - BP103740	MGI
Roof cladding	Pass	Peter Davis - BP103740	MGI
Ventilation system	Pass	Peter Davis - BP103740	MGI
Wall cladding	Pass	Peter Davis - BP103740	MGI
Waterproofing	N/A		MGI
Other	N/A		MGI
Fire safety	Pass		MGI
Emergency warning systems	N/A		MGI
Evacuation and fire service operation systems	Pass	Peter Davis - BP103740	MGI
Suppression or control systems	N/A		MGI
Other	N/A		MGI
<u>Reviews</u>	Pass		John Peterson, Jon Moser
Consent Approval	N/A		JMO
Supervision review	Pass		JMO, JOH
Signing officer (building)	Pass	RFI review only - All points are relevant, discussed a wording change to the point relating to the roofing product.	JOH
Signing officer (plumbing)	Pass	Completion review - Melissa has followed the procedure set down in the QAS and considered all relevant code clauses. 12/01/21	JMO
		Reviewed RFI's by Melissa and tweaked as necessary . Soak pit calculations did not match Consent Notice and CN not provided as part of application. Await responses. JM 4/03/21 JM Responses reviewed and accepted with soakpit now designed by engineer.	
Quick Consent	N/A		JMO
Alternative solution	N/A		JMO
S67 - Waivers or modifications	N/A		JMO
S71 - Natural hazard assessment	N/A		JMO
S112 - Alterations to existing buildings	N/A		JMO
S115 - Change of use	N/A		JMO

I am satisfied on reasonable grounds that the provisions of the Building Code will be met if the building work in relation to the attached application is properly completed in accordance with the attached plans and specifications.

Signed: \_\_\_\_\_ Date: 4 March 2021 2:35 pm  
Melissa Gibson

Consent No: 200896

Building Category: R2

Site Address: Lot 6 DP 547543, 9 Kaiwaru Place, Waikanae

Owner/Agent: David Reid Homes (Kapiti) Ltd

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## Inspections

The following inspections are required:

- 1 Piles
- 1 Pre-Slab Building
- 1 Pre-Slab Plumbing
- 2 Drainage
- 1 Preline Building
- 1 Postline / Wet area Pre Application
- 1 Pre Wrap
- 1 Pre Clad
- 1 Preline Plumbing
- 1 Final Inspection
- 11 Total Inspections

Note: Engineer to inspect soakpit. Hamish Wells.

## Documentation

The following documentation is required:

- 1 Application for CCC
- 1 Electrical safety certificate - Electrician
- 1 As-built drainage plan
- 1 Drainage (Form 126) for stormwater & private Sewer installation
- 1 Plumbing (Form 125) for pressure test and installation piped services
- 1 Construction review PS4 statement for geo-technical engineering
- 1 Roof product manufacturers warranty
- 1 Record of Work
- 1 Water tank warranty

PS4 required from Hamish Wells for soakpit.

## Building Practitioners

- 1 Designer 1 Peter Davis
- 1 Designer 2 Hamish Wells
- 1 Carpentry 1
- 1 Foundations 1
- 1 Roofing 1
- 1 Plumber
- 1 Drainlayer
- 1 Electrician

**Statement of Compliance with the NZ Building Code**

**Consent No: 200896**

ISSUED BY: **Kapiti Coast District Council**

**PROJECT**

Site Address: 9 Kaiwaru Place, Waikanae  
Legal Description: Lot 6 DP 547543  
Work Description: New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.  
Building Category: R2

**OWNER**

Name(s): Daniel Perry Green  
Address: PO Box 148, Paraparaumu

- [ P ] Application for CCC received and accepted
- [ P ] Consent description accurate and reflects amendments (if relevant).
- [ P ] Confirm owner named on Building Consent application is current owner
- [ P ] Confirm new owner details and evidence of ownership are correctly documented
- [ P ] Confirm all required inspections completed and documented in GoGet
- [NA] If inspection(s) have been missed, have they been compensated for?
- [NA] If supervision was required for any inspection - did it occur?
- [ P ] Work in accordance with approved consent and approved amendments
- [NA] Have any notices to fix been uplifted?
- [ P ] Supporting documentation required in building consent addenda received
- [ P ] Quality assurance documentation
- [ P ] Restricted building work
- [NA] Owner Builder declaration supplied
- [ P ] Additional information required and received
- [NA] Compliance schedule issued
- [NA] Earthquake prone building
- [NA] Swimming Pool details updated
- [NA] Warnings and Bans
- [ P ] Approve to issue Code Compliance Certificate if all fees paid
- [NA] Approve to issue Certificate for Public Use if all fees paid
- [NA] Approve to issue Certificate of Acceptance if all fees paid
- [NA] Supervision review

**NOTES:**

Inspections Prepaid:

Inspections Done:

**LICENSED BUILDING PRACTITIONERS:**

Designer 1 BP103740 Peter Davis

Designer 2	CPENG186323	Hamish Wells
Carpentry 1	BP130832	
Foundations 1	BP102284	
Roofing 1	BP131831	

---

On review of the documentation and inspection notes it can be considered on reasonable grounds that all work has been completed in compliance with the building consent.

Signed:  
Name: Alan Tinney  
Position: Building Officer



Date: 6 January 2022

## Jeffrey Clement

---

**From:** Shasthri Herath <shasthri.h@adarchitecture.nz>  
**Sent:** Wednesday, March 3, 2021 1:32 PM  
**To:** Mailbox - Building Approvals  
**Subject:** Response to RFI letter - Building Consent 200896  
**Attachments:** 20018\_Green\_BC\_RevB.pdf; Supporting docs.pdf

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Melissa,

Response to RFI letter for 9 Kaiwaru Place as follows:

### **BUILDING**

1. Please find the attached letter from engineer.
2. Please refer to attached PS1 and calculation chart by Posi-STRUT.
3. We confirm that roof cladding is to be Metalcraft MC700. Please refer to amended detail drawings. Sheet A303, A306
4. Please refer to attached Velux sun tunnel installation information.
5. ADA have noted that CHH recommend the use of a flashing at external corners. Detail 1/A304 has been revised accordingly and added to the returned RFI information.

### **PLUMBING AND DRAINAGE**

1. Although the final kitchen materials are subject to a kitchen designer, we confirm that all adjacent wall linings behind the hob will be impervious, either selected tiles or glass splashback.
2. Please find the attached report.
3. Please find the attached water tank information.
4. Please refer to amended drainage plan. ORG is tagged.
5. Please refer to amended drainage plan. DP connected to SW line.
6. Please refer to amended drainage plan. Inspection points added.

### **Shasthri Herath**

*Junior Architectural Technician*

### **ADarchitecture**

*Leaders in Applied Design*

tel (04) 298 5662

[www.adarchitecture.nz](http://www.adarchitecture.nz)

## Jeffrey Clement

---

**From:** Ross Goodman  
**Sent:** Monday, December 21, 2020 2:45 PM  
**To:** jo.kunac@davidreidhomes.co.nz  
**Subject:** BC200896 at 110 Ngarara Road, Waikanae

Hi

I have been looking at the above Building Consent and noted that an Outdoor living court is not shown as required under Rule 5A.1.10 of the Proposed District Plan Appeals Version March 2018.

Could you send me a site plan showing the required Outdoor living court so I can complete the PIM section of the Building Consent.

Cheers

**Ross Goodman**  
Resource Consents Planner  
Te Kai Whakaaro Whakaaetanga Rauemi

Tel 04 296 4621



[www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz)



## Jeffrey Clement

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**From:** Shasthri Herath <shasthri.h@adarchitecture.nz>  
**Sent:** Tuesday, December 22, 2020 2:41 PM  
**To:** Ross Goodman  
**Subject:** RE: BC200896 at 110 Ngarara Road, Waikanae  
**Attachments:** 20018\_Green\_BC\_RevA.pdf

Hi Ross,

Amended site plan is attached.

Kind Regards,

**Shasthri Herath**  
*Junior Architectural Technician*  
**ADarchitecture**  
*Leaders in Applied Design*  
tel (04) 298 5662  
[www.adarchitecture.nz](http://www.adarchitecture.nz)

---

**From:** Ross Goodman <ross.goodman@kapiticoast.govt.nz>  
**Sent:** Tuesday, 22 December 2020 2:07 PM  
**To:** Shasthri Herath <shasthri.h@adarchitecture.nz>  
**Subject:** RE: BC200896 at 110 Ngarara Road, Waikanae

Hi

I would be okay if could ensure it complies with Rule 5A.1.10 as I the plan provided does not have length measurements on it for the Outdoor Living court.

Cheers

**Ross Goodman**  
Resource Consents Planner  
Te Kai Whakaaro Whakaaetanga Rauemi

Kāpiti Coast District Council  
Tel 04 296 4621

[www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz)

---

**From:** Shasthri Herath [<mailto:shasthri.h@adarchitecture.nz>]  
**Sent:** Tuesday, 22 December 2020 1:43 PM  
**To:** Ross Goodman <[ross.goodman@kapiticoast.govt.nz](mailto:ross.goodman@kapiticoast.govt.nz)>  
**Subject:** BC200896 at 110 Ngarara Road, Waikanae

Hi Ross,

Please find the attachment responding to your query.

Kind Regards,

**Shasthri Herath**

Junior Architectural Technician

**ADarchitecture**

Leaders in Applied Design

tel (04) 298 5662

[www.adarchitecture.nz](http://www.adarchitecture.nz)

---

**From:** Ross Goodman <[ross.goodman@kapiticoast.govt.nz](mailto:ross.goodman@kapiticoast.govt.nz)>

**Sent:** Monday, 21 December 2020 2:45 PM

**To:** Jo Kunac <[Jo.Kunac@davidreidhomes.co.nz](mailto:Jo.Kunac@davidreidhomes.co.nz)>

**Subject:** BC200896 at 110 Ngarara Road, Waikanae

Hi

I have been looking at the above Building Consent and noted that an Outdoor living court is not shown as required under Rule 5A.1.10 of the Proposed District Plan Appeals Version March 2018.

Could you send me a site plan showing the required Outdoor living court so I can complete the PIM section of the Building Consent.

Cheers

**Ross Goodman**

Resource Consents Planner

Te Kai Whakaaro Whakaaetanga Rauemi

Tel 04 296 4621



[www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz)



## Jeffrey Clement

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**From:** Lewis Franks <Lewis.Franks@davidreidhomes.co.nz>  
**Sent:** Friday, October 1, 2021 3:58 PM  
**To:** Anthony Wilson  
**Cc:** Mailbox - Building Approvals; Stacey Hedley  
**Subject:** RE: Site Notice : 200896 - Pre Wrap - 2021-09-27 - Pass  
**Attachments:** 200896 - Inspection - Site Notice - 2021-09-27.pdf; 20018\_Green\_Bracing RevB.pdf; 20018\_Green\_A106revD\_ply bracing edit.pdf; Re: Ply to Garage

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Hi Anthony,

Just getting back to you regarding the attached inspection you carried out earlier in the week at 9 Kaiwaru Place, Waikanae.

I have got a revised bracing plan done by the architects and also an email from the owners of their acceptance of the ply. Will also be available on site at the next inspection.

Thanks,  
Lewis



**Lewis Franks**  
Project Manager  
**David Reid Homes (Kapiti) Ltd**  
Franchisee for David Reid Homes Kapiti/Wellington region

**M** 027 389 9350 **P** 04 904 5959



## Jeffrey Clement

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**From:** Anna Smith on behalf of Mailbox - Building Approvals  
**Sent:** Tuesday, January 12, 2021 12:46 PM  
**To:** 'jo.kunac@davidreidhomes.co.nz'  
**Subject:** Request for Further Information – Building Consent: 200896, 1 Kaiwaru Place, Waikanae  
**Attachments:** Request for Further Information – Building Consent 200896, 1 Kaiwaru Place, Waikanae.pdf

Good afternoon

Please find attached: Request for Further Information – Building Consent: 200896, 1 Kaiwaru Place, Waikanae. New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.

We have suspended your application pending receipt of the above information. Please send it to us by 26 January 2021. We are unable to issue your Building Consent until these matters are resolved.

Information can be posted, emailed to [Building.Approvals@kapiticoast.govt.nz](mailto:Building.Approvals@kapiticoast.govt.nz) or dropped in at one of Council's service centres.

If you need more time, have any questions or you would like to discuss this matter, please contact Melissa Gibson on (04) 296 4700 or [Melissa.Gibson@kapiticoast.govt.nz](mailto:Melissa.Gibson@kapiticoast.govt.nz) referencing Building Consent No 200896.

Kind Regards

**Anna Smith**  
Customer Administration Officer  
Te Apiha Whakahaere Maihi Kiritaki

Tel 04 296 5476



[www.kapiticoast.govt.nz](http://www.kapiticoast.govt.nz)





## Statement of Compliance with the NZ Building Code

Consent No: 200896

ISSUED BY: **Kapiti Coast District Council**

### PROJECT

Site Address: 9 Kaiwaru Place, Waikanae  
Legal Description: Lot 6 DP 547543  
Work Description: New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.  
Building Category: R2

### OWNER

Name(s): Daniel Perry Green  
Address: PO Box 148, Paraparaumu

- [ P ] Application for CCC received and accepted
- [ P ] Consent description accurate and reflects amendments (if relevant).
- [ P ] Confirm owner named on Building Consent application is current owner
- [ P ] Confirm new owner details and evidence of ownership are correctly documented
- [ P ] Confirm all required inspections completed and documented in GoGet
- [NA] If inspection(s) have been missed, have they been compensated for?
- [NA] If supervision was required for any inspection - did it occur?
- [ P ] Work in accordance with approved consent and approved amendments
- [NA] Have any notices to fix been uplifted?
- [ P ] Supporting documentation required in building consent addenda received
- [ P ] Quality assurance documentation
- [ P ] Restricted building work
- [NA] Owner Builder declaration supplied
- [ P ] Additional information required and received
- [NA] Compliance schedule issued
- [NA] Earthquake prone building
- [NA] Swimming Pool details updated
- [NA] Warnings and Bans
- [ P ] Approve to issue Code Compliance Certificate if all fees paid
- [NA] Approve to issue Certificate for Public Use if all fees paid
- [NA] Approve to issue Certificate of Acceptance if all fees paid
- [NA] Supervision review

#### NOTES:

Inspections Prepaid:  
Inspections Done:

#### LICENSED BUILDING PRACTITIONERS:

Designer 1 BP103740 Peter Davis

Designer 2	CPENG186323	Hamish Wells
Carpentry 1	BP130832	
Foundations 1	BP102284	
Roofing 1	BP131831	

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On review of the documentation and inspection notes it can be considered on reasonable grounds that all work has been completed in compliance with the building consent.

Signed:  
Name: Alan Tinney  
Position: Building Officer

Date: 6 January 2022

# PLANNING PROCESSING CHECKSHEET

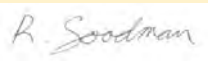
Building Consent Number: BC200896



Property Information			
Property Address:	110 Ngarara Road, Waikanae		
Legal Description:	LOT 2 DP 544253		
Planning Zone:	Residential		
Building Project:	New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.		
	<b>Yes</b>	<b>No</b>	<b>Action Required</b>
Record of Title	Y		
Easements		N	
Section 221	Y		Issued in respect to RM190153.

District Plan Items to Check				
	Yes	No	Action Required	Page
Heritage Register		N		10-9
Eco-site/Native Veg	y		K189 on land at 110 Ngarara Road	3-12 & 3-13
Flood Hazards		N		9-9
Min Floor Level		N	Check Latest Flood Extent layer	
Coastal B.L.R.		N		D1 - 31
Relocatable / No build		N		D1 - 32
EQ Hazard		N		9-21
Airport Zones		N		
	Complies?		Action Required	Page
Yards	Y			5-19 & 7-13
HIRB	Y			5-18 & 7-14
Site Coverage – 40% / 35%	Y			5-18
Max Height	Y			5-18 & 7-13
Permeable Surface - 30%	Y			5-15
Accessory Buildings <60m <sup>2</sup>	Y		Max height 4.5m	5-18 & 7-13
Earthworks	Y			3-15, 4-7 & 9-9
Water Tank	Y			11-32 & 11-34
Stormwater system	Y			11-32
Parking x2 per dwelling	Y			11-87
Minor flat - 54m <sup>2</sup> / 60m <sup>2</sup>	Y			5-18 & 7-13
Retaining Walls	Y		Not a building if 1.5m or less in height	
Outdoor Court 40m <sup>2</sup>	Y		Amended site plan received showing complying OLC.	5-19
Noise Corridor	Y			12-53
National Grid Yard (HVT lines)	Y		Refer to section 221 Notice issued on 2.11.2020	11-43
Separation from waterbodies	Y			9-8

# Building Consent Number: BC200896

Other Provisions				
	Yes	No	Action required	Page
Designations		N		
Outstanding natural landscape and feature		N	Buildings must be no greater than 60m <sup>2</sup> and 6m in height	3-17
Paraparaumu North Rural Precinct		N	All buildings in this precinct are Controlled Activity	7-20
Rural Eco-Hamlet Zone		N	Waikanae North Eco-Hamlet, Ōtaki North Eco-Hamlet & Ngarara Precinct	7-16
Does the building straddle Title/crosslease boundary		N	Section 77 required	
<b>Waikanae North</b>				
Yards				5-47 to 5-49
Insulation				5-48
Solar Panels 2m <sup>2</sup>				5-48
Design Certificate				5-48
<b>Boundary Activity</b>				
Type				
Application forms sent			Apply Section 37 and advise Plan Vetting Team	
Existing Resource Consent	Y		RM190153 17 lot residential subdivision	
Resource Consent required		N	Apply Section 37 and advise Plan Vetting Team	
Marginal / Temporary		N		
DIF Required?		N	Paid in association with RM190153	
Calculate DIF Fees		N	<b>USE CALCULATOR SHEET</b> , print and attach	Amount
Send DIF letter out		N	Date sent	
<b>Additional Comments</b>				
<b>Decision: (tick item which applies)</b>				
<input type="checkbox"/> Application complies with District Plan requirements				
<input checked="" type="checkbox"/> Application does not comply with District Plan — BC to be issued subject to s37				
<b>Officers Name: Ross Goodman</b>			<b>Officers Signature:</b> 	<b>Date: 22.12.2020</b>

12 January 2021

David Reid Homes (Kapiti) Ltd  
PO Box 148  
Paraparaumu 5254

Dear Building Consent Applicant/Building Owner

**Request for Further Information – Building Consent: 200896**

**Site Address:** Lot 2 DP 547543, 1 Kaiwaru Place, Waikanae  
**Legal Description:** LOT 1 DP 544253  
**Project Description:** New dwelling contains 3 bedrooms, 2 bathrooms, Living area, open dining and kitchen area. Multiple cladding exterior walls and monopitched and gabled long run metal roofs cover the dwelling.

Following checking of your Building Consent it is apparent that further information is required.

Information needed:

**BUILDING**

1. Confirm the risk of liquefaction/lateral spread for this particular site
2. Provide the supporting documentation for the Posi-Strut rafters
3. Confirm the Coloursteel metal roofing profile for the 4° pitch roof, the detail shows an ST7 profile
4. Provide the Velux sun tunnel installation manual

**PLUMBING AND DRAINAGE**

1. Confirm the surface linings adjacent to kitchen appliances and facilities are impervious
2. The soakpit calculation is to use the rainfall intensity depth of 44.2mm/hr for the 1 in 100-year event per the consent notice condition not 27.8mm/hr. Provide amended soakpit size and calculations. The designer will be responsible for confirming the assumed soakage rate prior to the issue of the CCC. A site visit at the time of construction will be required and a design statement provided by ADarchitecture.
3. Provide manufacturer's installation guide for the water tank to be installed and provide details of the high quality pump to be installed

4. Highlight ORG on drainage plan
5. Show the downpipe by the laundry tub connecting to the SW system.
6. Show Inspection Points on drainage plan in accordance with the standard nominated. An inspection point is also required where the new drain connects to the site lateral to enable testing and maintenance.

We have suspended your application pending receipt of the above information. Please send it to us by 26 January 2021. We are unable to issue your Building Consent until these matters are resolved.

Information can be posted, emailed to [Building.Approvals@kapiticoast.govt.nz](mailto:Building.Approvals@kapiticoast.govt.nz) or dropped in at one of Council's service centres.

If you need more time, have any questions or you would like to discuss this matter, please contact me on (04) 296 4700 or [Melissa.Gibson@kapiticoast.govt.nz](mailto:Melissa.Gibson@kapiticoast.govt.nz) referencing Building Consent No 200896.

Yours sincerely

Melissa Gibson  
**Building Officer**

cc Building Owner

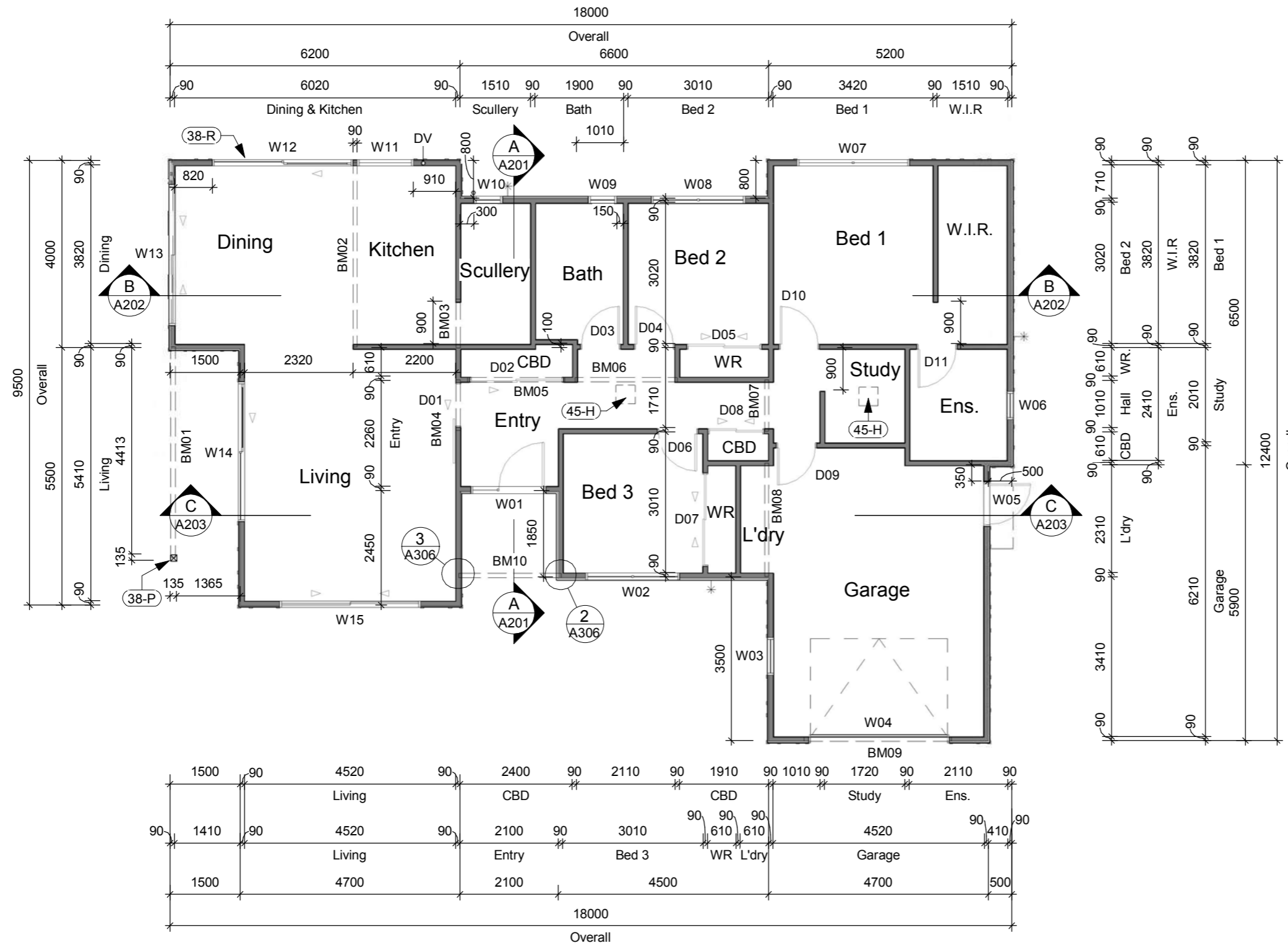
Keynote Legend	
38-P	Prolam PLPH5-150 post
38-R	W12 lintel to be continuous over W11
45-H	Velux suntunnel

**Construction Notes**

- This page is to be read in conjunction with sheet A002 - construction notes for additional information

**Wall Framing Notes**

- Wall framing to be in accordance with NZS 3604 Section 8
- Wall framing to be kiln dried SG8 minimum unless noted otherwise
- All bottom plates to be H3.2 treated
- Top plates to be fixed to studs in accordance with Bowmac Studlok specifications
- Lintel fixings to be in accordance with lumberlok lintel fixing schedule
- All window and door lintels are to prenil manufacturers design unless noted otherwise
- Window openings to be 20mm larger than window sizes ( 10mm tolerance each side)
- Exterior wall framing to be :
  - 90x45 at 400crs up to 2.4 high
  - 2/90x45 at 400crs up to 3.6 high
- Interior wall framing to be :
  - 90x45 at 600crs up to 2.4 high
  - 2/90x45 at 600crs up to 3.6 high
- All fixings in contact with timber treated with copper quaternary (ACQ) or copper azole (CuAz) preservatives are to be type 304 S.S. in exposed or sheltered locations, and hot dipped galvanized in closed situations



**FRAMING PLAN**  
 1 : 100



Rev Date Description

**ADarchitecture**  
 Leaders in Applied Design  
 Email: info@adarchitecture.nz Web: adarchitecture.nz

Phone: (04) 298 5662  
 5 Kodex Place, Paraparaumu 5032

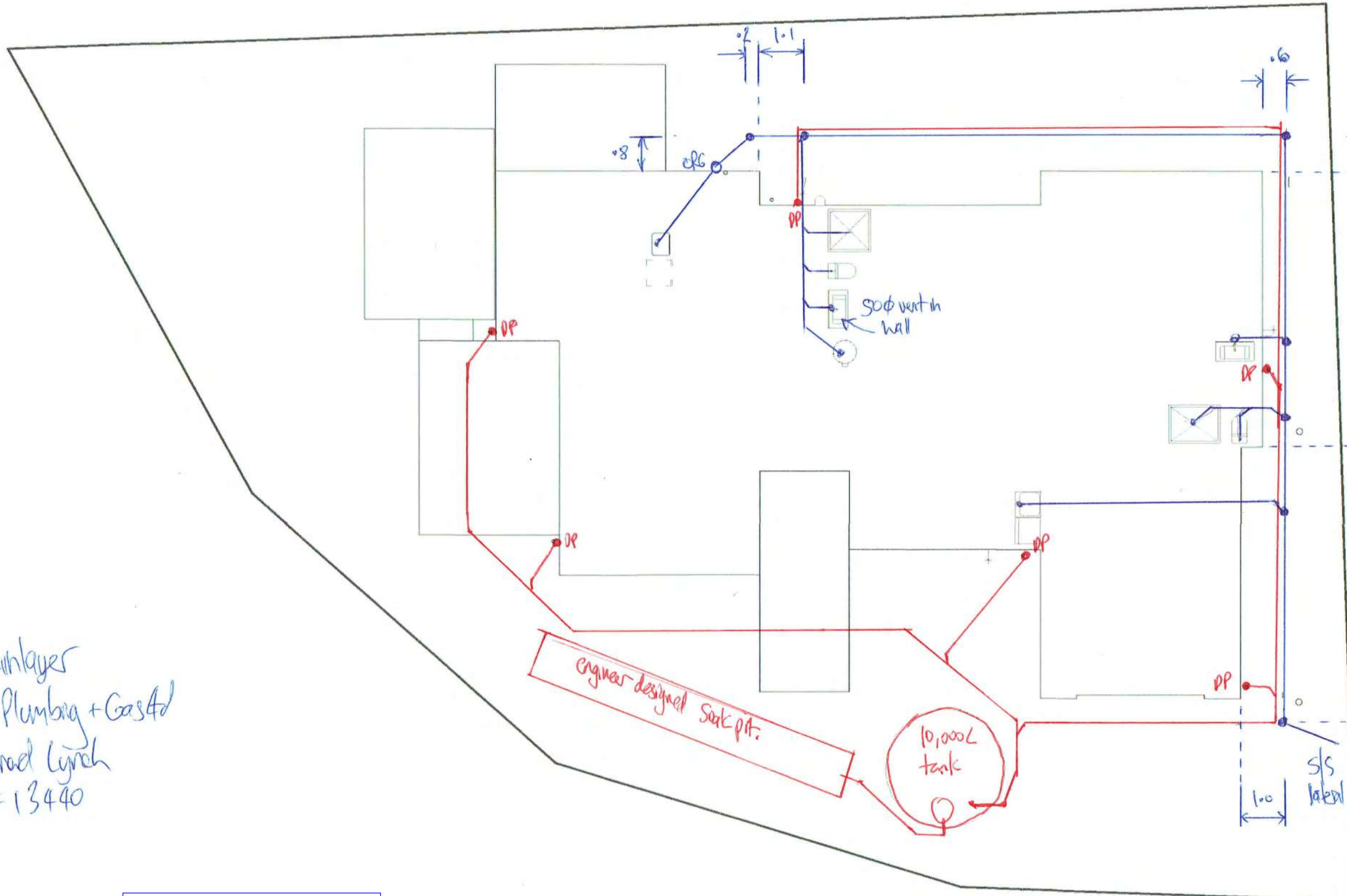
**Proposed House**  
 for Dan and Suki Green  
 Lot 6 Anderson Park  
 Waikanae

**Building Consent**

**Framing Plan**

DO NOT SCALE DRAWING

Job Date Sheet(A3) Rev.  
 20018 30/11/2020 A104



Drainlayer  
 Pro Plumbing + Gas Ltd  
 Bernard Lynch  
 #13440

BC200896  
 Received by  
 Kapiti Coast District Council  
 08/12/21  
 via Simpli

DRAINAGE PLAN As Built  
 1 : 100



Rev	Date	Description

**a. ADarchitecture**  
 Leaders in Applied Design  
 Email: info@adarchitecture.nz Web: adarchitecture.nz  
 Phone: (04) 298 5662  
 5 Kodex Place, Paraparaumu 5032

Proposed House  
 for Dan and Suki Green  
 Lot 6 Anderson Park  
 Waikanae

As Built

Drainage Plan

DO NOT SCALE DRAWING

Job	Date	Sheet(A3)	Rev.
20018	10/03/2021	A101a	