

Approved Building Consent Documents

Please Note: A copy of the stamped approved documents must be available on site for all inspections.

INSPECTION BOOKING TIMEFRAMES		
Telephone 03 347 2839		
Call received	<i>Before 3pm inspection will be done</i>	<i>After 3pm inspection will be done</i>
Monday	Wednesday	Thursday
Tuesday	Thursday	Friday
Wednesday	Friday	Monday
Thursday	Monday	Tuesday
Friday	Tuesday	Wednesday

MEMORANDUM FROM LICENSED
BUILDING PRACTITIONER

SDC - Approved Building Consent Document - BC180486 - Pg 2 of 226 - 19/04/2018 - edwards

Peter Ray
Homes

MADE FOR YOU. BY US.

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:	1 Hurley Drive		
Suburb:	Rolleston		
Town/City:	Christchurch	Postcode:	7615

THE OWNER(S)

Name(s):	Craig & Camilla Potter		
Mailing address:	9 Rochester Crescent		
Suburb:	Rolleston	PO Box/Private Bag:	
Town/City:	Christchurch	Postcode:	7615
Phone number:	0274775024	Email address:	craigpotter@hotmail.com

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 Matthew Bryant 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
All RBW design work relating to B1 <input checked="" type="checkbox"/>		<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Plans and Specs of the building
Foundations and subfloor framing <input checked="" type="checkbox"/>	NZS3604:2011 Foundation	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Plans and Specs

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"/>	90x45 SG6/SG8 timber wall framing	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Floor Plan Cross-Section Details Specification
Roof <input checked="" type="checkbox"/>	As per truss design	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Truss design of specification
Columns and beams <input type="checkbox"/>		<input type="checkbox"/> Carried out <input type="checkbox"/> Supervised	
Bracing <input checked="" type="checkbox"/>	Bracing in accordance with GIB Ezybrace systems. Ecoply bracing as selected.	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Bracing Plan Bracing part of specification
Other <input 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 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
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 <input checked="" type="checkbox"/>		<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Building plans and specifications
Damp proofing <input checked="" type="checkbox"/>	Damp proofing to underside of the slab	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Foundation details Engineer details Concrete section of specification
Roof cladding or roof cladding system <input checked="" type="checkbox"/>	Colorsteel Longrun roofing on bitumac 750 roof underlay on 75 x 50 purlins on purpose made trusses	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Cross-Section Roofing details Roofing section of Specifications
Ventilation system (for example, subfloor or cavity) <input checked="" type="checkbox"/>	Rockcote Integra plaster cladding system & James Hardie Linea on a cavity based system	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Floor Plan Elevations Cross-Section Details
Wall cladding or wall cladding system <input checked="" type="checkbox"/>	Rockcote Integra plaster cladding system & James Hardie Linea on a cavity based system	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Floor Plan Elevations Cross-Section Details
Waterproofing <input checked="" type="checkbox"/>	General waterproofing of the building in compliance with the New Zealand Building Code	<input type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Building Plans and Specifications
Other <input 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 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
FIRE SAFETY SYSTEMS: C1 - C6			
Emergency warning systems Evacuation and fire service operation systems <input checked="" type="checkbox"/> Suppression or control systems Other	Smoke Alarms - Residential type	<input checked="" type="checkbox"/> Carried out <input checked="" type="checkbox"/> Supervised	Floor Plan
Note: 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.			

WAIVERS AND MODIFICATIONS	
Waivers or modifications of the Building Code are required. <input type="radio"/> Yes <input checked="" type="radio"/> 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: **Matthew Bryant**

LBP or Registration number: **131720**

The practitioner is a: Design LBP Registered architect Chartered professional engineer

Design Entity or Company (optional): **Peter Ray Homes Ltd**

Mailing address (if different from below):

Street address/Registered office: **521 Blenheim Road**

Suburb: **Sockburn**

Town/City: **Christchurch**

PO Box/Private Bag: **PO BOX 8184**

Postcode: **8440**

Phone number: **03 348 1994**

Mobile:

After hours:

Fax:

Email address: **matthew@peterrayhomes.co.nz**

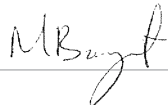
Website:

DECLARATION

I, Matthew Bryant 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: _____

23/03/18

**Peter Ray
Homes**

MADE FOR YOU. BY US.



14 March 2018

File: 23647

Peter Ray Homes Ltd
PO Box 8184
Riccarton
Christchurch 8440

Attention: Peter Bee

Your Reference: Potter House

Dear Sir

Re: Shallow Geotechnical Investigation – Lot 297, Stage 22, Faringdon South Subdivision, Rolleston

1. Introduction

Lewis & Barrow Ltd has carried out a Shallow Geotechnical Investigation and prepared this report at the request of Peter Ray Homes Ltd, to determine the type of foundation required for a proposed new residential dwelling.

The investigation included the following:

- Confirm the Geology of the site.
- Four Scala Penetrometer Tests to a maximum depth of 0.66m.
- Four 50mm diameter hand auger bore holes / test pits hand dug down to a maximum depth of 0.6m.
- Assessment of ENGEO Ltd subdivision Geotechnical Investigation Report.
- Evaluation of shallow liquefaction potential of this site.

2. Site

The property is a predominantly level site and is approximately 802 square metres in area. A review of historic Google Earth aerial imagery dated 15/07/2016 and 29/12/2016 indicates that the area of this site was originally used as a grove and more recently as a yard for subdivision earthworks contractors.

The site is currently zoned as "Green Zone N/A - Rural & Unmapped" by the Canterbury Earthquake Recovery Authority (CERA) and the Ministry of Business, Innovation & Employment (MBIE) indicating that a foundation Technical Category classification has not been assigned to the area of this site.

ENGEO Ltd have issued a geotechnical investigation report for this subdivision dated 22/04/2016 reporting that the subdivision area is equivalent to a Technical Category 1 (TC1) classification indicating that future land



damage from liquefaction is unlikely and ground settlements are likely to be within normally accepted tolerances.

3. Geology

The GNS publication "Geology of the Christchurch Area" 2008 shows that the area of this site is underlain with brownish grey river alluvium.

Environment Canterbury's (ECan) database of well bores shows that there are two wells within 250m of this site with useful bore information (Appended):

- M36/3884 is located approximately 240m north-east of the site and shows earth to 0.3m, followed by predominantly gravel to the extent of the bore at 30.0m below ground level. The drill date is 18/04/1988 and the location accuracy is logged as 50m – 300m.
- M36/20382 is located approximately 290m south-west of the site and shows topsoil to 0.5m, followed by gravel to the extent of the bore at 36.0m below ground level. The drill date is 13/01/2010 and the location accuracy is logged as 10m – 50m.

As part of the wider subdivision geotechnical investigation and included in the 22/04/2016 report by ENGEO Ltd, a series of mechanically excavated test pits were completed, the closest of which, shows the following recorded information (Appended):

- Test Pit 'TP12' is located approximately 90m west of the site and was undertaken on 05/04/2016. The log shows topsoil to 0.2m, silt to 0.4m, followed by sandy gravel to the extent of the test pit at 3.0m below ground level.

4. Results of Site Tests

Attached is a site plan (Drawing A) and separate sheets for each penetrometer test and auger hole or hand dug test pit. The penetrometer tests have been graphed to show the ultimate bearing strength of each depth alongside the soil types. The logs of the hand auger boreholes have been recorded in general accordance with the New Zealand Geotechnical Society 'Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes' 2005.

'Test No. 1 and 3' show topsoil and possible fill to depths of up to 0.45m overlying silt and possible sandy gravel fill to the extent of testing at a maximum depth of 0.6m below ground level on inferred natural gravel. 'Test No. 2 and 4' show topsoil from ground level to the extent of testing at a maximum depth of 0.3m below ground level.

The penetrometer bearing tests show there is an Ultimate Bearing Capacity of 300kPa at the underside of the topsoil layer at 0.4m below ground level. The testing was found to be consistent over the site and in general accordance with the findings of the ENGEO Ltd subdivision geotechnical investigation report.

5. Groundwater

A natural groundwater table was not struck during on-site testing. The attached ECan borelogs, M36/7639 and M36/20382, indicate a groundwater depth of between 5.81m to 7.2m below ground level.

6. Liquefaction

The ENGEO Ltd report dated 22/04/2016 has classified the area of this subdivision as TC1 indicating future land damage from liquefaction is unlikely and ground settlements are likely to be within normally accepted tolerances.

The site investigation shows shallow gravels and the desktop study indicates an average groundwater level at approximately 6.51m below ground level. The site penetrometer testing shows the gravels have a high bearing capacity indicating a shallow liquefaction potential is not likely to exist on this site. The ECan borelogs show that conditions that could cause deep seated liquefaction are also unlikely to exist on this site and hence the TC1 classification for this site is assessed as appropriate.

7. Lateral Spreading

Lateral spreading is the post liquefaction movement of liquefied soils towards a free edge such as a water course or sloped ground surface.

Liquefaction is not considered likely to occur on these sites and hence lateral spreading is not considered a risk to these sites.

8. Seismic Considerations

Peak Ground Accelerations (PGA) have been assessed for each event at this site and are shown on the New Zealand Geotechnical Database (NZGD) Map 'Ground Motion' (CGD5170 – 30/06/2015).

As each of these events vary in magnitude and time, the Mean PGA's have been adjusted to be equivalent to the design M7.5 event, i.e. the shaking of a M7.1 event is shorter than a M7.5 event and hence the effective equivalent M7.5 PGA will be less. These values are set out as follows:

Earthquake	Date	Mean P.G.A.	Equivalent P.G.A. for M7.5 Event
M7.1	4 September 2010	0.37g	0.33g
M6.2	22 February 2011	0.14g	0.10g
M6.0	13 June 2011	0.06g	0.04g
M5.9	23 December 2011	0.08g	0.05g

The equivalent design PGA's for a M7.5 event are:

- To have no damage and be serviceable (Serviceability Limit State S.L.S.) 0.13g.
- To not fail catastrophically (Ultimate Limit State U.L.S.) 0.35g.

As this site has experienced one equivalent M7.5 P.G.A. event of more than 1.7 times the design S.L.S. value (0.22g), and therefore this site can be regarded as having been "sufficiently tested" to SLS design levels by the Canterbury Earthquake sequence once to date.

There was no visible evidence of ground damage on the site during testing and available Google Earth images of the site dated 15/2/2011 and 28/03/2011 show no indication of ground damage that could be related to the Canterbury earthquakes.

A site subsoil classification of D in accordance with NZS 1170.5:2004 is appropriate for seismic design for this site.



9. Foundation Recommendations

This site complies with the N.Z.S.3604:2011 definition of 'good ground' and therefore foundations detailed in accordance with the requirements of that code are suitable for the residential building proposed for this site. An ultimate bearing capacity of 300kPa is available at the underside of topsoil level at approximately 0.4m below existing ground level.

All rooty and organic topsoil material is to be removed from below the floor slab area which may be up to 0.4m below existing ground level.

A Chartered Professional Engineer with experience in foundation design shall inspect and approve the foundation excavations due to the presence of possible fill. If the fill is found to be unsuitable to support the building foundations then the foundations may also need to extend through the fill to natural ground which is expected at 0.6m below ground level.

10. Limitations

1. This report has been prepared for the benefit of Peter Ray Homes Ltd as our client with respect to the brief. The reliance by any other parties on the information or options contained in this report shall, without prior review and agreement in writing be at such other parties sole risk.
2. The recommendations and opinions contained in this report are based on the information gained. The nature and continuity of subsoil conditions away from the test locations are inferred and it must be appreciated that actual conditions could vary from the assumed model.
3. If any fill, or soils other than those noted in the above report are encountered in the excavations then the author of this report must be consulted for further advice as the foundation design may need to be modified.
4. This report assumes acceptance of the ENGEEO Ltd subdivision geotechnical assessment report held by the Territorial Authority.

Yours faithfully,



Nigel Hogg
Structural Engineer

This report has been prepared solely for the benefit of our Client with respect to the brief. The reliance by other parties on the information or opinions contained in this report, shall without our prior review and agreement in writing, be at such other parties sole risk.

Reviewed/Checked By: 

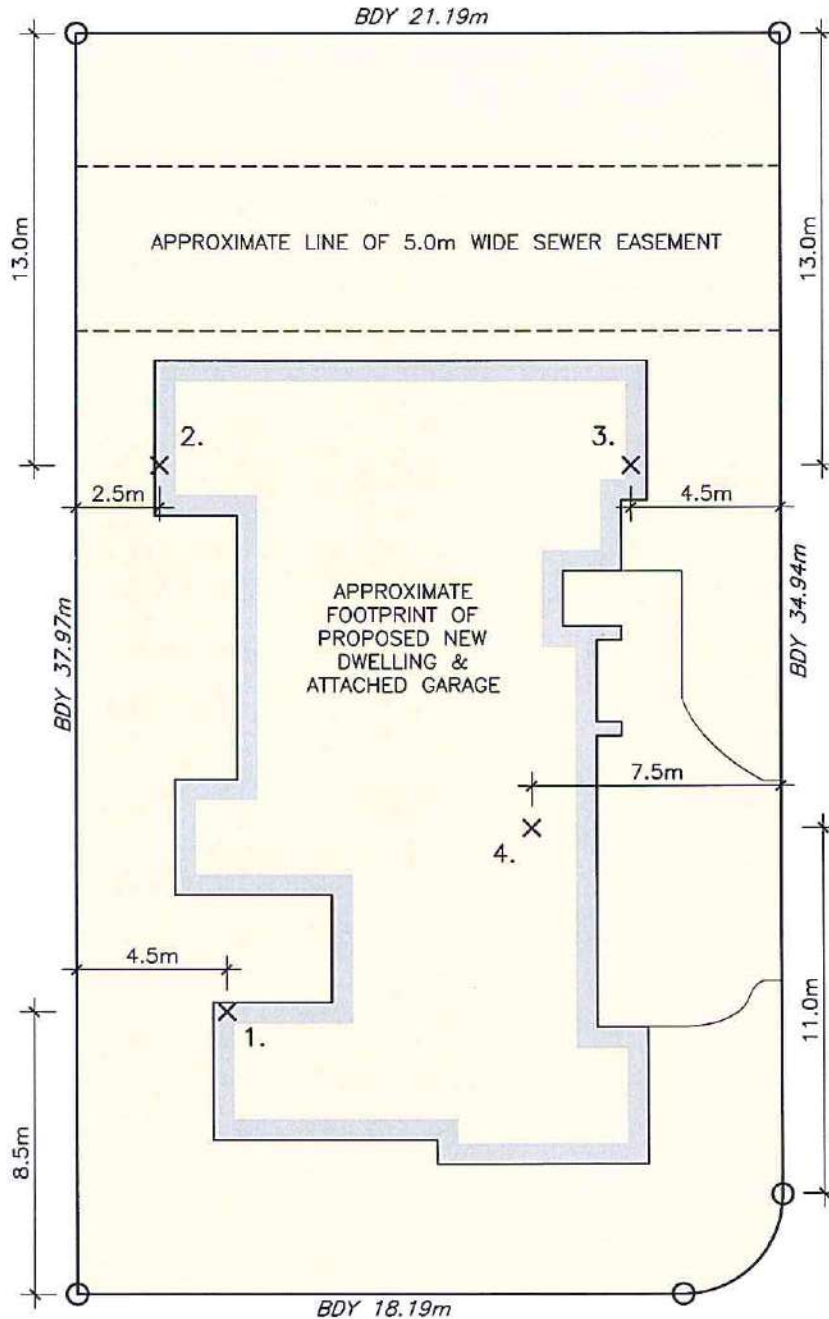




SITE PLAN

DRAWING **A**

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POSSIBLE
KEMBLE DRIVE
CONTINUATION

THAMES DRIVE

1. X Approximate Position of Scala Penetrometer Test and Hand Dug Test Pit / Hand Auger.

ADDRESS: STAGE 22, FARINGDON SOUTH SUBDIVISION, ROLLESTON
LOT: 297
DP: TBA
SITE AREA: 802m²



Test No. 1

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 1 of 4

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Soil Description

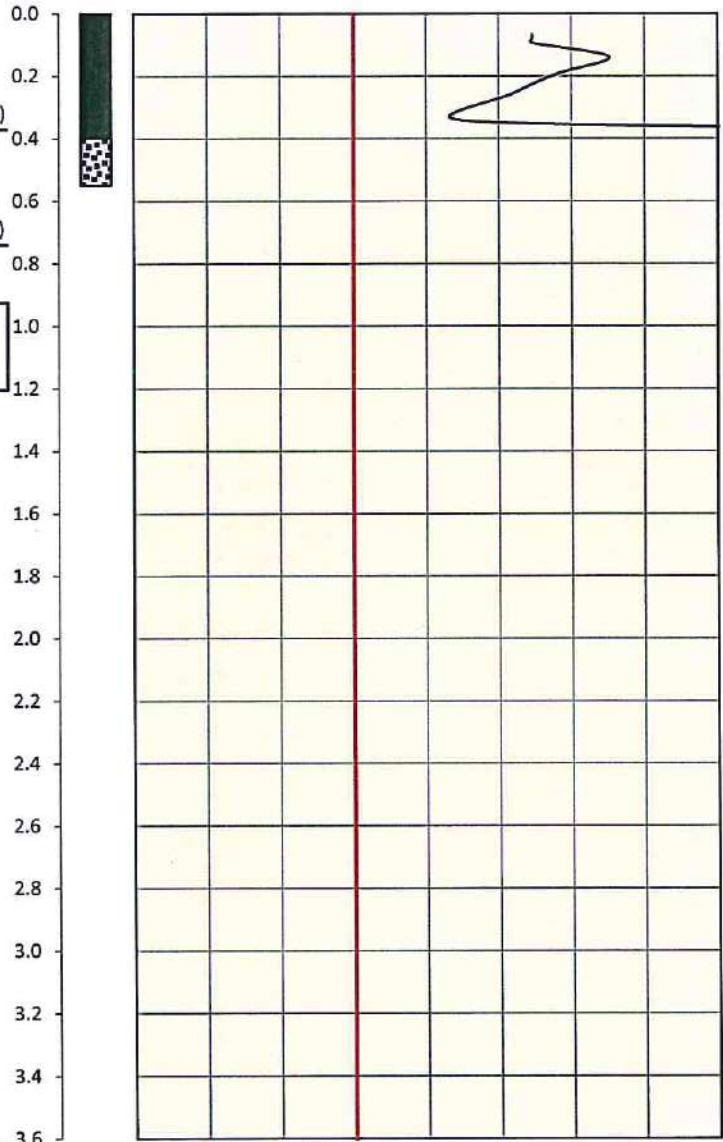
Organic SILT, trace sand, gravel, rootlets; dark brown. Moist. [TOPSOIL FILL]
(From 0.3m: Some fine to cobbly gravel) (0.0 - 0.4m)

Sandy fine to cobbly GRAVEL, trace silt; grey. Tightly packed; moist; sand, fine to coarse; gravel, rounded to sub-rounded, well graded. [POSSIBLE FILL] (0.4 - 0.55m)

* Scala penetrometer met refusal at 0.38m BGL due to gravel content.
* Hand dug test pit completed at 0.55m BGL.

Ultimate Bearing Capacity, kPa

0 100 200 300 400 500 600 700 800



WT not struck

Refer to Associated Report for Engineer's Recommendations

The information on this page should only be interpreted by a Chartered Professional Engineer experienced in Geotechnical Engineering

Site Address: **Lot 297, Stage 22, Faringdon South Subdivision, Rolleston**

Client: **Peter Ray Homes Ltd**

Technical Category: **N/A - Rural & Unmapped**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **NL**

This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law



SOIL PROFILE AND SCALA PENETROMETER RESULTS

Test No. 2

Sheet 2 of 4

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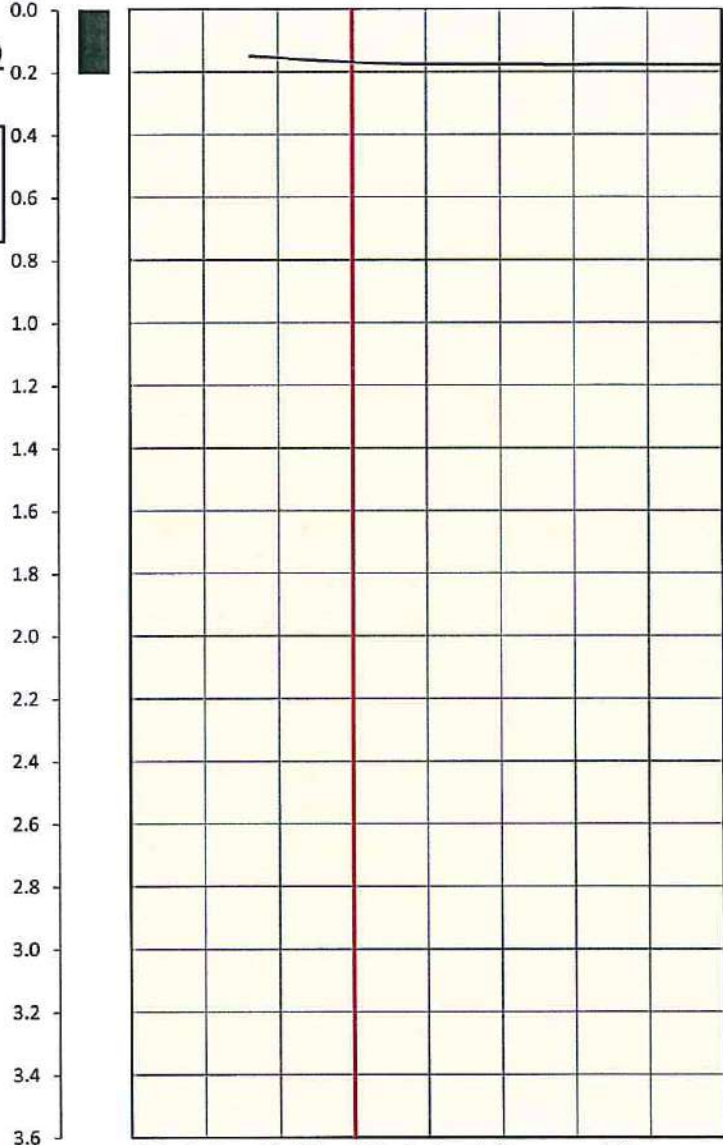
Soil Description

Organic SILT, trace sand, gravel, rootlets; dark brown. Moist. [TOPSOIL FILL] (0.0 - 0.2m)

* Scala penetrometer met refusal at 0.2m BGL due to gravel content.
* Hand auger met practical refusal at 0.2m BGL due to increasing gravel content.

Ultimate Bearing Capacity, kPa

0 100 200 300 400 500 600 700 800



WT not struck

Refer to Associated Report for Engineer's Recommendations

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Site Address: **Lot 297, Stage 22, Faringdon South Subdivision, Rolleston**

Client: **Peter Ray Homes Ltd**

Technical Category: **N/A - Rural & Unmapped**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **NL**

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Test No. 3

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 3 of 4

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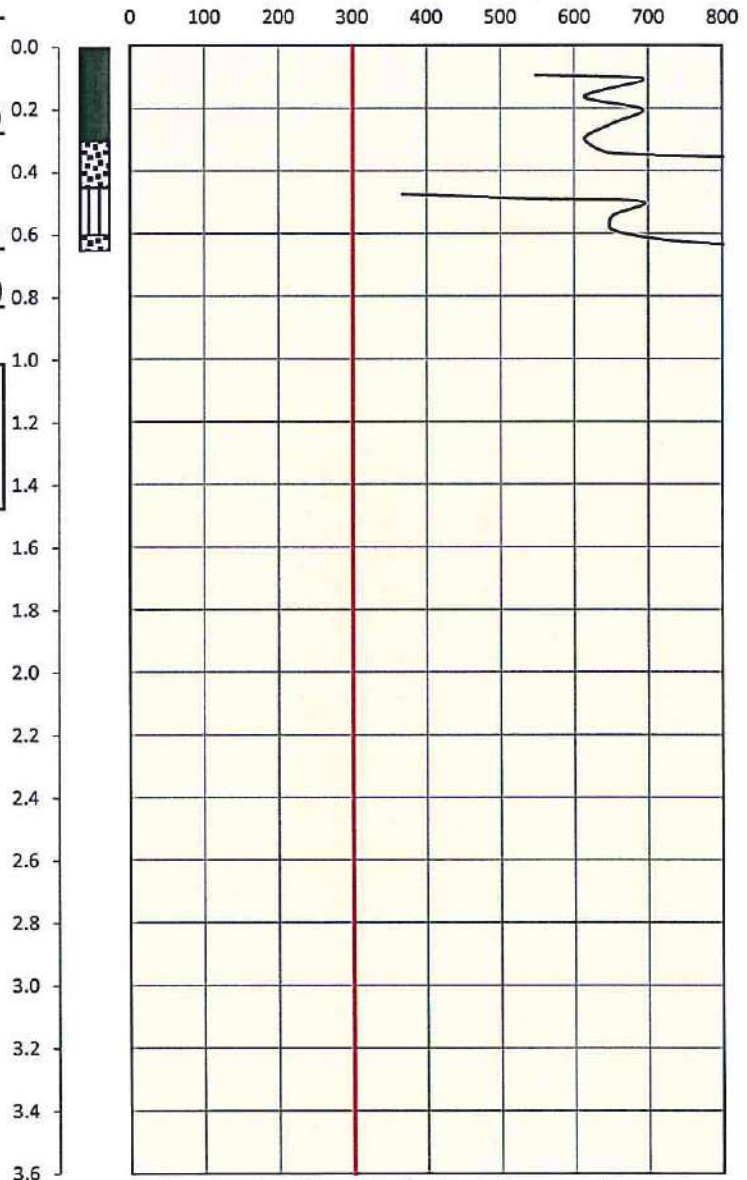
Soil Description

Organic SILT, trace sand, gravel, rootlets; dark brown. Moist. [TOPSOIL FILL] (0.0 - 0.3m)
Sandy fine to cobbly GRAVEL, trace silt; grey. Tightly packed; moist; sand, fine to coarse; gravel, rounded to sub-rounded, well graded. [POSSIBLE FILL] (0.3 - 0.45m)
SILT, minor sand; brown grey. Firm; moist; sand, fine; non-plastic. (0.45 - 0.6m)

* Scala penetrometer met refusal at 0.36m BGL due to gravel content. Restarted at 0.45m BGL and met refusal at 0.66m BGL due to gravel content.
* Hand dug to 0.45m BGL. Hand auger met refusal at 0.6m BGL on inferred natural gravel.

WT not struck

Ultimate Bearing Capacity, kPa



Refer to Associated Report for Engineer's Recommendations

The information on this page should only be interpreted by a Chartered Professional Engineer experienced in Geotechnical Engineering

Site Address: **Lot 297, Stage 22, Faringdon South Subdivision, Rolleston**

Client: **Peter Ray Homes Ltd**

Technical Category: **N/A - Rural & Unmapped**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **NL**

This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. This report has been prepared solely for the benefit of our client. No liability is accepted by this firm or by any Principal, or Director, or any servant or agent of this firm, in respect of its use by any other person, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law



Test No. 4

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 4 of 4

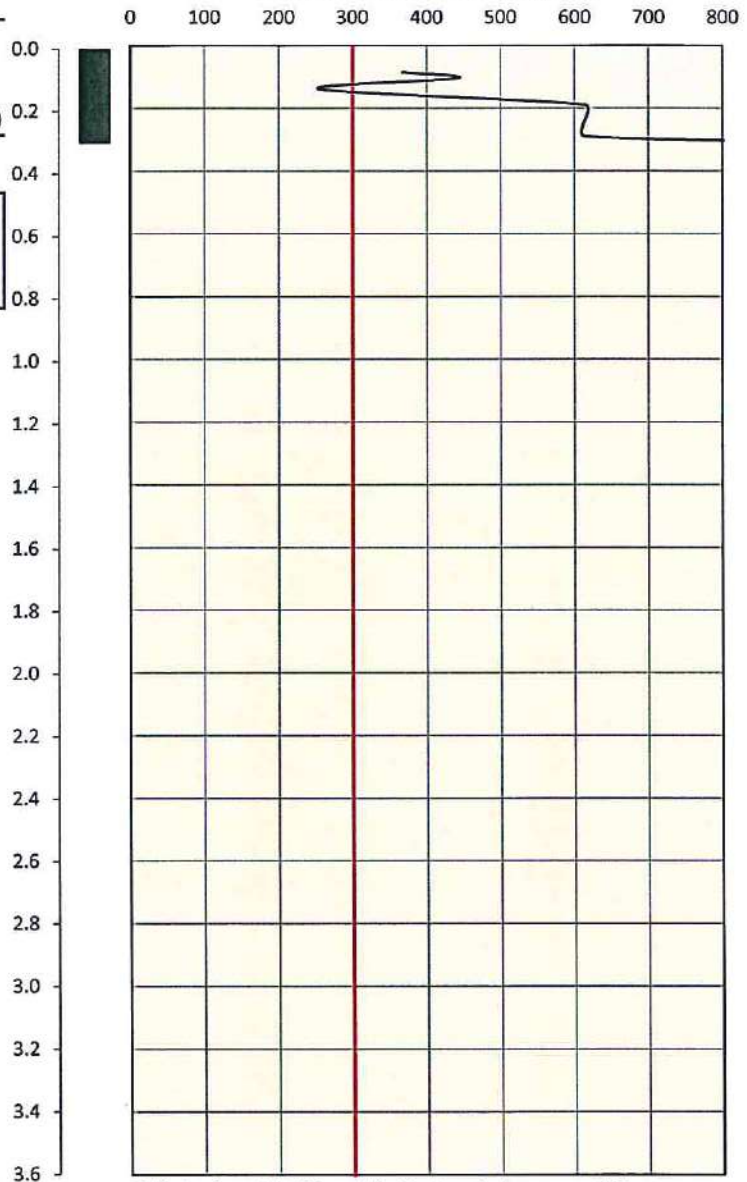
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Soil Description

Organic SILT, trace sand, gravel, rootlets; dark brown. Moist. [TOPSOIL FILL]
(0.0 - 0.3m)

* Scala penetrometer met refusal at 0.35m BGL due to gravel content.
* Hand auger met practical refusal at 0.3m BGL due to increasing gravel content.

Ultimate Bearing Capacity, kPa



WT not struck

Refer to Associated Report for Engineer's Recommendations

The information on this page should only be interpreted by a Chartered Professional Engineer experienced in Geotechnical Engineering

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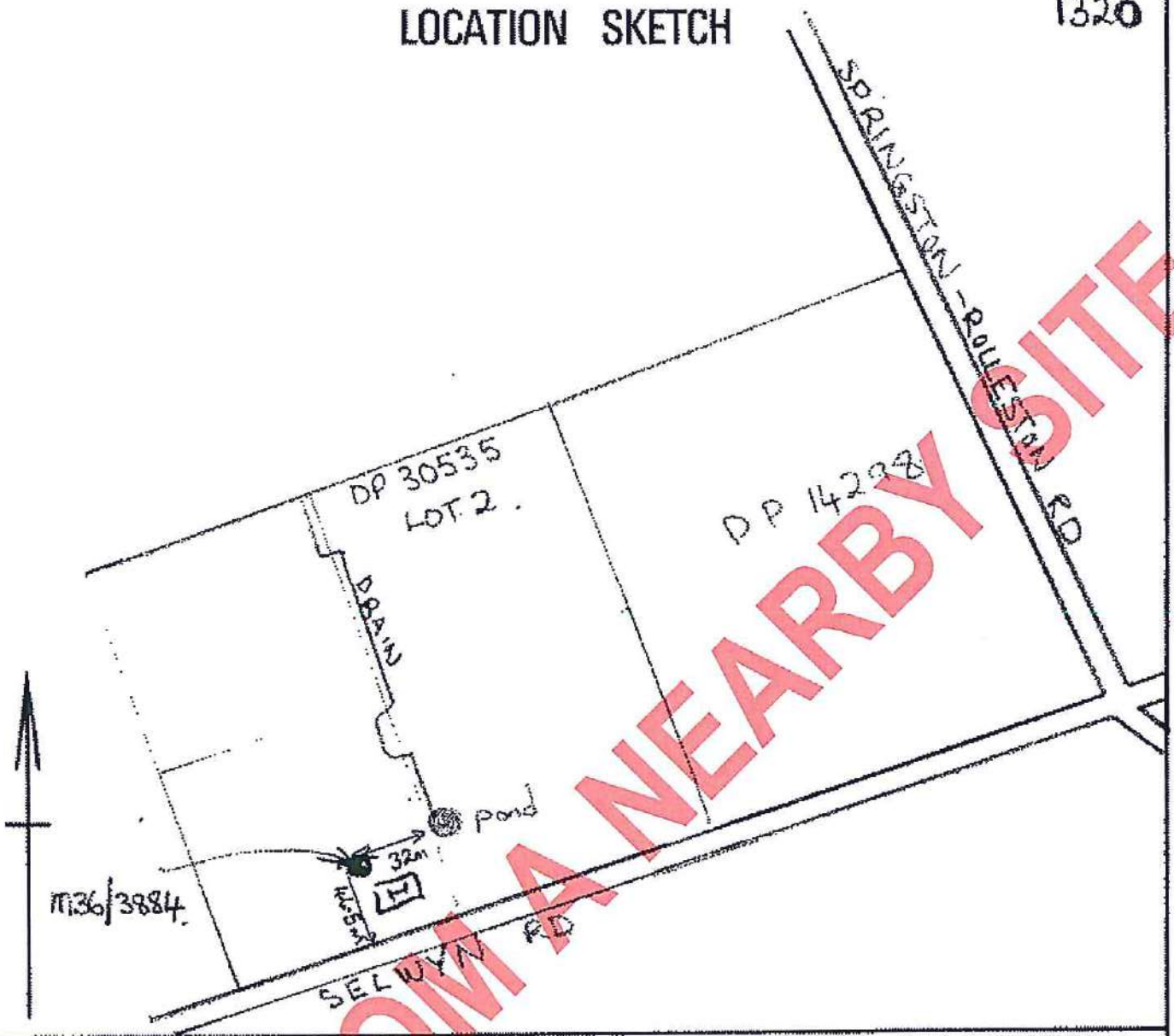
Bore or Well No	M36/3884
Well Name	SELWYN RD
Owner	PALMER AG & ER

Well Number	M36/3884	File Number	CO6C/02405
Owner	PALMER AG & ER	Well Status	Active (exist, present)
Street/Road	SELWYN RD	NZTM Grid Reference	BX23:51397-69641
Locality	ROLLESTON	NZTM X and Y	1551397 - 5169641
Location Description		Location Accuracy	50 - 300m
OWMS Zone	Selwyn - Waihora	Use	Domestic Supply,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	-
Depth	24.00m	Water Level Count	2
Diameter	127mm	Initial Water Level	5.84m below MP
Measuring Point Description	ToC	Highest Water Level	5.81m below MP
Measuring Point Elevation	34.61m above MSL (Lyttelton 1937)	Lowest Water Level	6.77m below MP
Elevation Accuracy	< 2.5 m	First reading	19 Jan 1989
Ground Level	0.40m below MP	Last reading	07 Jun 1989
Strata Layers	10	Calc Min 95%	8.30m below MP
Aquifer Name	Riccarton Gravel	Aquifer Tests	0
Aquifer Type	Unknown	Yield Drawdown Tests	1
Drill Date	18 Apr 1988	Max Tested Yield	1 l/s
Driller	McMillan Drilling Ltd	Drawdown at Max Tested Yield	1 m
Drilling Method	Rotary/Percussion	Specific Capacity	0.73 l/s/m
Casing Material	STEEL	Last Updated	06 Apr 2017
Pump Type	Unknown	Last Field Check	07 Jun 1989
Water Use Data	No		

COPY FROM A NEARBY SITE

LOCATION SKETCH

1320



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COPY FROM A NEARBY SITE

NOTED DATA

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
	Stainless steel	23.1	24				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
8 Apr 1988	1	0.8	10.558547	1.1	1

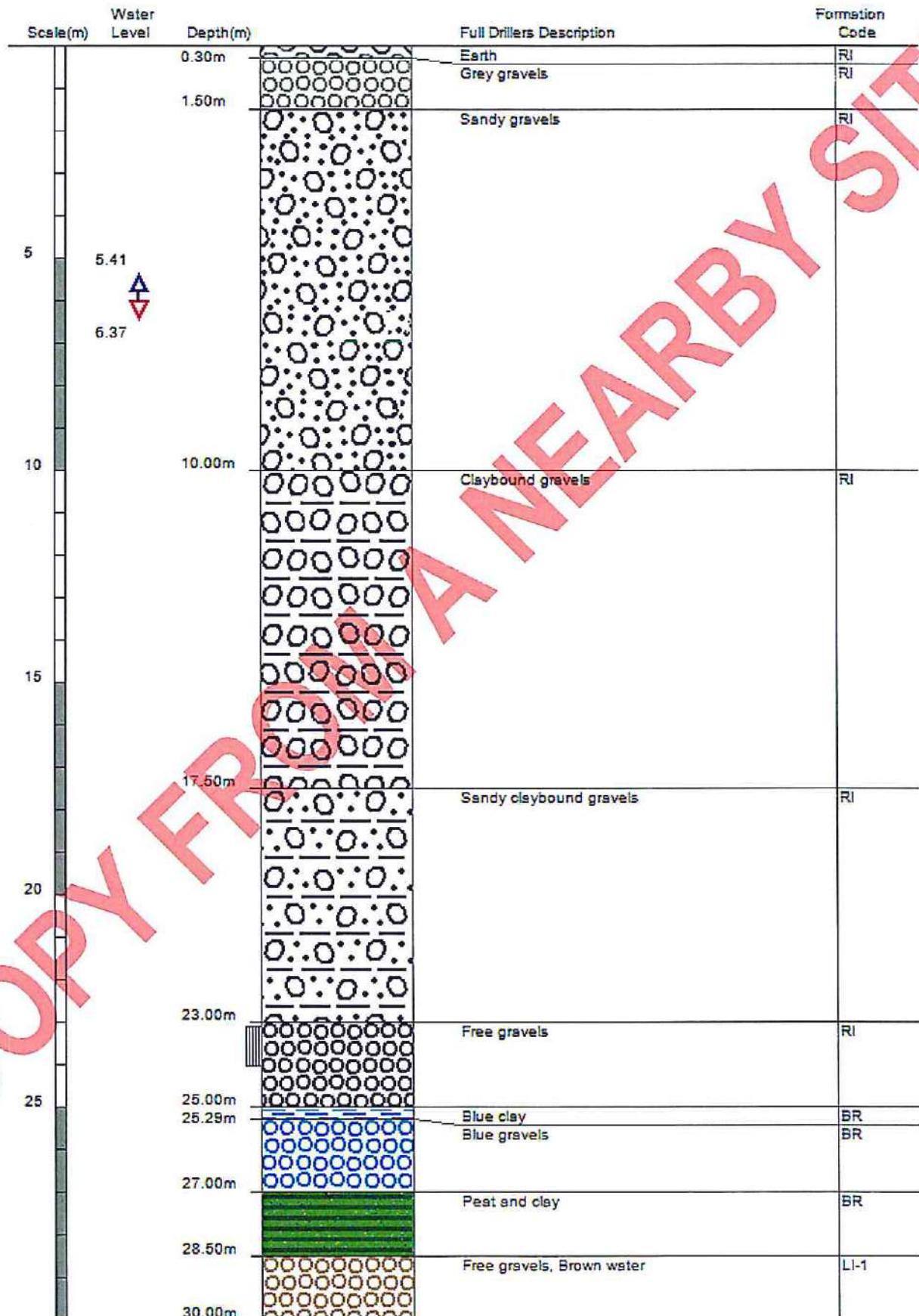
No comments for this well

Borelog for well M36/3884

Grid Reference (NZTM): 1551397 mE, 5169641 mN
 Location Accuracy: 50 - 300m
 Ground Level Altitude: 34.2 m +MSD Accuracy: < 2.5 m
 Driller: McMillan Drilling Ltd
 Drill Method: Rotary/Percussion
 Borelog Depth: 30.0 m Drill Date: 18-Apr-1988



SDC - Approved Building Consent Document - BC180486 - Pg 21 of 226 - 19/04/2018 - edwards



COPY FROM A NEARBY SITE

Bore or Well No	M36/20382
Well Name	CRN EAST MADDISONS & SELWYN ROADS
Owner	I J & B A BURRELL

Well Number	M36/20382	File Number	CO6C/266
Owner	I J & B A BURRELL	Well Status	Active (exist, present)
Street/Road	CRN EAST MADDISONS & SELWYN ROADS	NZTM Grid Reference	BX23:50943-69360
Locality	ROLLESTON	NZTM X and Y	1550943 - 5169360
Location Description		Location Accuracy	10 - 50m
CWMS Zone	Selwyn - Waihora	Use	Domestic and Stockwater,
Groundwater Allocation Zone	Selwyn-Waimakariri	Water Level Monitoring	--
Depth	36.00m	Water Level Count	0
Diameter	150mm	Initial Water Level	7.20m below MP
Measuring Point Description	ToC	Highest Water Level	
Measuring Point Elevation	34.00m above MSL (Lyttelton 1937)	Lowest Water Level	
Elevation Accuracy	< 5 m	First reading	
Ground Level	0.30m below MP	Last reading	
Strata Layers	7	Calc Min 95%	
Aquifer Name		Aquifer Tests	0
Aquifer Type		Yield Drawdown Tests	1
Drill Date	13 Jan 2010	Max Tested Yield	5 l/s
Driller	East Coast Drilling	Drawdown at Max Tested Yield	5 m
Drilling Method	Rotary/Percussion	Specific Capacity	1.04 l/s/m
Casing Material	Steel	Last Updated	08 Nov 2013
Pump Type		Last Field Check	
Water Use Data	No		

Screens

Screen No.	Screen Type	Top (m)	Bottom (m)	Slot Size (mm)	Slot Length (mm)	Diameter (mm)	Leader Length (mm)
1	Stainless steel	34.5	36				

Step Tests

Step Test Date	Step	Yield	Yield GPM	DrawDown	Step Duration
13 Jan 2010	1	5	65.99092	4.8	0

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COPY FROM A NEARBY SITE

Comments

Comment Date	Comment
24 Feb 2010	Gridref changed from: M36:6095-3095 to M36:6093-3096 Bore Compliance Report and Log received.
13 May 2010	Gridref changed from: M36:6093-3096 to M36:60936-30969 and set to an accuracy of QAR 2

COPY FROM A NEARBY SITE



LOG OF TEST PIT TP12

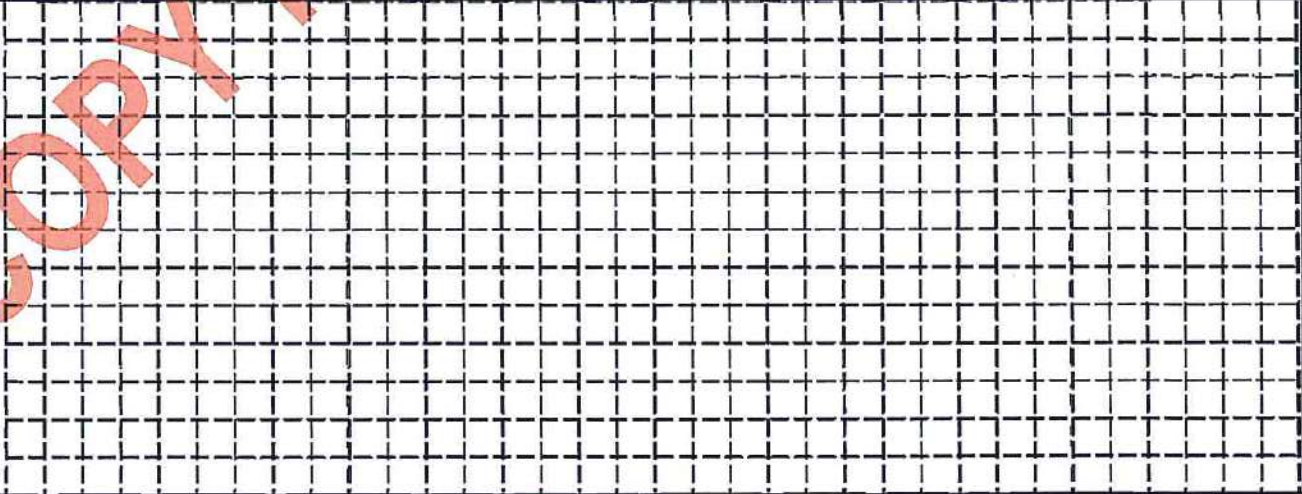
**Faringdon South Subdivision
East Maddisons and Selwyn Road
Rolleston
12903**

Client : Hughes Development Ltd
Date : 05/04/16
Max Test Pit Depth : 3 m
Digger Type/Size : 13 T Hitachi
Bucket Type/Size : 1800 mm

Shear Vane No :
Logged By : RB
Reviewed By : LP
Latitude :
Longitude :

Depth (m)	Excavability (Relative Scale)		USCS Symbol	DESCRIPTION	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density Index	Shear Vane Undrained Shear Strength Peak/Remolded (kPa)	Scala Penetrometer					
	Easier	Harder								Blows per 100mm					
0.0 - 0.1	TS		ML	SILT with trace gravel and rootlets; brown. Low plasticity [TOPSOIL].				S-st							
0.1 - 0.4			ML	SILT; yellowish brown. Low plasticity.				Vst							
0.4 - 1.6	ALLUVIUM		GW	Sandy fine to coarse GRAVEL with minor cobbles; brownish grey. Well graded, subrounded. Sand, fine to coarse, well graded. Pit walls are vertical. Tightly packed. Becomes wet at 1.6 m depth.				M							
1.6 - 3.0								W							
Depth of Excavation: 3 m Termination Condition: Target depth															

GEOSCIENCE TEST PIT LOG HA TEMPLATE - BLANK.GPJ NZ MASTER DATA TEMPLATE.GDT 21/4/16



Test pit met target depth at 3.0 m.
 TS = TOPSOIL
 Standing groundwater was not encountered



18 April, 2018

Unit 8, 357 Madras Street
Christchurch, New Zealand
P.O. Box 13-282
Armagh, Christchurch 8141
New Zealand
Telephone (03) 366-4320
Fax (03) 365-7069
Email eng@lewisandbarrow.co.nz
www.lewisandbarrow.co.nz

File No. 23647

Selwyn District Council
P.O. Box 90
Rolleston 7643

Attention: Building Consents

Dear Sir/Madam,

Re: Potter House, Lot 297 (1 Hurley Drive) Faringdon Subdivision, Rolleston

This letter is to confirm that Lewis & Barrow Ltd will inspect the foundation excavations and provide a Producer Statement Construction Review (PS4).

This assumes that Peter Ray Homes and/or its contractors contacts us at the appropriate time to arrange the inspection.

Yours faithfully,

Nigel Hogg
Engineer

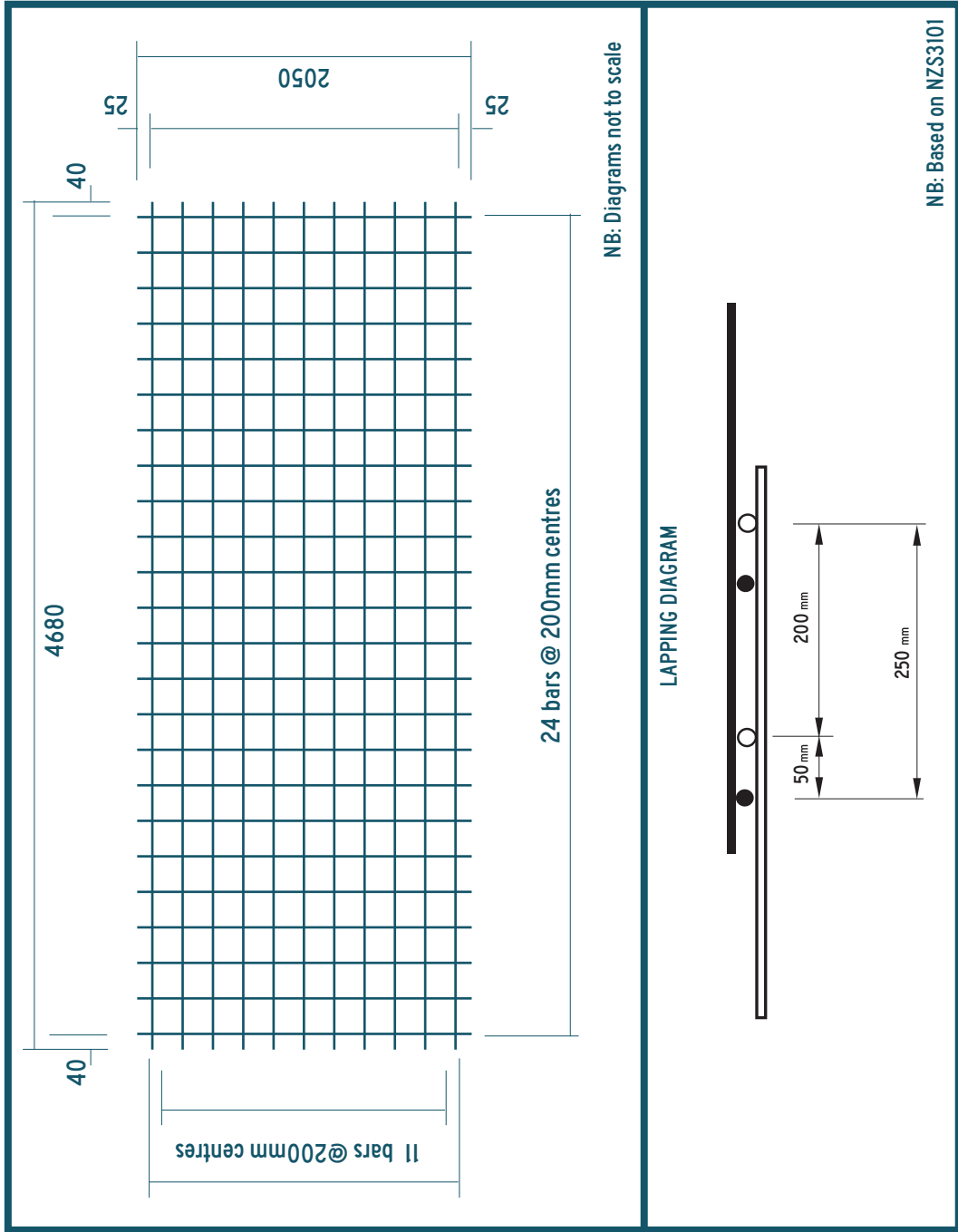
SDC - Approved Building Consent Document - BC180486 - Pg 26 of 226 - 19/04/2018 - edwards



MESH SPECIFICATIONS



Specify and use with confidence.



Stock Code: **SE620-500SMALL**

Product Description: SE 620-500SMALL
XTRA-DUCTILE MESH (4.68M X 2.05M)

Yield Stress: **≥ 500 Mpa**

Cross Section: **146 mm²/m**

KN per metre width: **73 KN/m width**

Uniform Elongation: **≥ 10%**

Weight per SQM: **2.29 kg/m²**

Nett Cover: **7.612m²**

	LONG WIRE I	CROSS WIRE
WIRE DIA (mm)	R6.1	R6.1
CENTRES (mm)	200	200
LENGTH (mm)	4680	2050
No. of WIRES	11	24
O/HANG (mm)	40	25
GROSS WEIGHT PER SHEET	23.1kg	
WIRE Kg/m	0.229	0.229
WEIGHT (kg)	11.81	11.29
GROSS SHEET AREA	9.59 m ²	

Each batch of EuroSteel Xtra-Ductile mesh is tested for compliance with AS/NZS4671:2001. Batch test certificates are available from Euro Corporation.

Each sheet of EuroSteel Xtra-Ductile mesh has an identification tag attached that details the product code and the unique batch number relevant to the sheet. This tag should be left on the sheet when it is placed.

Lap diagrams on all Euro Corporation specification sheets are based on NZS3101 Concrete Structures Standard.

Specifiers, designers, builders, steel placers and other trades, need to verify the correct lap splice required for each specific situation.



W E ' R E R A I S I N G T H E B A R

www.eurocorp.co.nz

SDC - Approved Building Consent Document - BC180486 - Pg 28 of 226 - 19/04/2018 - edwards

Peter Ray
Homes

MADE FOR YOU. BY US.



Date: 19 March 2018
Fabricator: VIP Frames & Trusses
Job Name: Peter Ray Homes
 New House
 Lot 297 Faringdon
 Christchurch

Building Consent No: _____
 (Provided by relevant Consenting Authority at time of Consent application)

Attn: City/District Council

We have been engaged to provide the trusses and frames for the above project.
 To allow completion of the consent application we have supplied the following information.

- (a) Truss Layout and Producer Statement.
- (b) Any slab thickening requirements detailed.
- (c) All truss loaded lintels that are either inside or outside the requirements of NZS3604:2011.
- (d) All roof bracing details as required by NZS3604:2011.

On advice from the building project owner, the structure will be designed under the following parameters:

Wind Zone	<u>High</u>	Altitude	<u>100m</u>
		Snow (Open Ground Load)	<u>0.900 kPa</u>
Roof Material	<u>Longrun</u>	Snow (Basic Roof Load)	<u>0.472 kPa</u>

Treatment Definition:

- External Walls -** H1.2 Treated
- Internals Walls -** H1.2 Treated
- Trusses -** H1.2 Treated

We can advise that the following will be provided at the time of truss manufacture to both the the building owner and your office:

- (1) A full 'as-built' layout and Producer Statement.
- (2) Specific Truss/Truss fixings done as per NZS3604:2011, Clause 10.2.2.6.1
- (3) Specific top plate to stud fixings that comply with NZS3604:2011, Table 8.18
- (4) Specific lintel Fixings outside NZS3604:2011.

It should be noted that the details provided have been designed to comply with the Building Code and the relevant standards. Any increase above these standards is only at the preference and request of the building owner.

Acknowledgement of this letter, along with the Building Consent number, is required by our company as soon as possible.

Council Contacts: _____
 Consents Officer: _____
 Fax #: _____
 Phone: _____

Please forward to:
 Dyers Road ITM
 Ph (03) 373-6049
 Fax (03) 376-6049

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

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

www.mitekznz.co.nz

Printed: 06:55:40 19 Mar 2018

MiTek 20/20 Engineering 4.7.184.0

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **VIP Frames & Trusses**

IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **60373** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

This MiTek 20/20® truss design program has been developed by MiTek New Zealand Limited for the design of MiTek® timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20® are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clauses B1 and B2 of the New Zealand Building Code.

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

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

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

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

On behalf of **MiTek New Zealand Limited**,

Date: Monday, 19 March 2018

Inglis, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited

SDC - Approved Building Consent Document BCT18-486 - 22/03/2018 - 9/04/2018 - enwards

Job: 60373
 Description: New House
 Building Consent No.:
 MiTek 20/20 Engineering 4.7.184.0

Client: Peter Ray Homes
 Phone:

Site: New House
 Lot 297 Faringdon
 Rolleston

Phone:
 Printed: 06:55:40 19 Mar 2018

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **VIP Frames & Trusses**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details	Importance Level :	2	Design Working Life :	50 years	
Truss					
Member Group:	~MSGx45 H1.2	Pitch:	22.500 deg	Nominal Overhang:	600 mm
Material:	Galv Iron .5mm	Ceiling		Wind	
Dead Load:	0.210 kPa	Material:	Rondo screwed to BC	Area:	High (44.0 m/s)
Restraints:	900 mm centres	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Live Load:	Qr = 0.250 kPa Qc = 1.100 kN	Restraints:	600 mm centres	Snow	
		Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.472 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
GE1	1	4170	22.500	900	J32	1	1515	22.500	900	T5	1	11310	22.500	900
GE2	1	4180	22.500	746	P2	1	6482	22.500	900	T6	1	11310	22.500	900
*H1	2	2524	16.325	900	P3	1	6482	22.500	900	V1	1	2084	22.500	900
*H2	3	5069	16.325	900	*R1	1	2701	22.500	900	V2	1	1184	22.500	900
*H3	1	8792	16.325	900	*R2	1	1813	22.500	900	V3	1	2584	22.500	900
*H4	2	1251	16.325	900	*R3	2	913	22.500	900	V4	1	1684	22.500	900
*H5	2	4104	16.325	900	*R4	1	1813	22.500	900	V5	1	4540	22.500	900
*H6	2	3262	16.325	900	*R5	1	913	22.500	900	V6	1	3640	22.500	900
*H7	1	3797	16.325	900	*R6	1	1745	22.500	900	V7	1	2740	22.500	900
*H8	2	3679	16.325	900	*R7	8	913	22.500	900	V8	1	1840	22.500	900
*H9	1	4195	16.325	900	*R8	8	913	22.500	900	V9	1	940	22.500	900
J1	1	2677	22.500	900	*R9	1	1130	22.500	900	V10	1	2175	22.500	900
J2	1	2932	22.500	900	*R10	1	1130	22.500	900	V11	1	1275	22.500	900
J3	1	2932	22.500	900	*R11	1	1435	22.500	900	V12	1	934	22.500	900
J4	1	2932	22.500	900	*R12	1	1435	22.500	900	V13	1	1025	22.500	900
J5	1	2932	22.500	900	*R13	1	901	22.500	900	V14	1	1925	22.500	900
J6	1	2932	22.500	900	*R14	1	1730	22.500	900	J7	1	2932	22.500	900
J8	1	2032	22.500	900	*R15	1	1730	22.500	900	J13	1	2317	22.500	900
J9	1	2032	22.500	900	*R16	1	1195	22.500	900	J16	1	2317	22.500	900
J10	1	2932	22.500	900	S1	1	5633	22.500	900	J28	1	2677	22.500	900
J11	1	2932	22.500	900	S2	1	11310	22.500	900	J30	1	2382	22.500	900
J12	1	2317	22.500	900	S5	3	4680	22.500	764	P1	1	6482	22.500	900
J14	1	1417	22.500	900	S7	1	4180	22.500	746	S11	1	3490	22.500	900
J15	1	1417	22.500	900	S8	3	4180	22.500	746	S15	1	4080	22.500	900
J17	1	1417	22.500	900	S9	4	5633	22.500	849	T2	1	10800	22.500	900
J18	1	1417	22.500	900	S12	2	2677	22.500	699	S4	1	4680	22.500	900
J19	1	2932	22.500	900	S13	1	3490	22.500	699	S10	1	5633	22.500	849 LB
J20	1	1722	22.500	900	S14	1	7972	22.500	900	S21	1	4810	22.500	900
J21	1	1722	22.500	900	S16	2	3042	22.500	743	T1	1D	9740	22.500	900
J22	1	1722	22.500	900	S18	1	4080	22.500	743	T4	1D	11310	22.500	900
J24	1	3042	22.500	900	S19	3	7930	22.500	865	J23	1	3042	22.500	900
J25	1	2017	22.500	900	S20	3	7930	22.500	865	S3	1D	11310	22.500	900
J26	1	2017	22.500	900	S22	1	4810	22.500	900	T7	1	7972	22.500	900
J27	1	2017	22.500	900	S23	1	4170	22.500	900	S17	1	4080	22.500	743
J29	1	2382	22.500	900	S25	2	2382	22.500	809	S24	1	4170	22.500	900
J31	1	1482	22.500	900	T3	1	10800	22.500	900					

Total Quantity : 143

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The computer design input has been carried out by:

Signed: 

Name of Detailer: Lloyd Harwood

On behalf of:

VIP Frames & Trusses

Date: ...Monday, 19 March 2018...

Qualifications and Title: Detailer

Job: 60373
 Description: New House
 Building Consent No.:
 MitTek 20/20 Engineering 4.7.184.0

Client: Peter Ray Homes
 Phone:

Site: New House
 Lot 297 Faringdon
 Rolleston

Phone:

Printed: 06:53:18 19 Mar 2018

TRUSS BEARINGS EXCEEDING 10KN REPORT - Ultimate Limit State Loads

MiTek® Truss List

Legend: ? = input only, Txx = failed design, Ø = non certified, Unmarked trusses = designed successfully

Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN)	
				Down	Uplift
S10	1	5633	I	10.416	8.683
T1	1D	9740	Y	11.697	8.750
T4	1D	11310	A	12.435	9.697
			F	11.933	8.679
S3	1D	11310	A	20.746	17.862
			M	12.835	10.100
S17	1	4080	H	12.509	9.792
S24	1	4170	H	11.542	9.033

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Note:

1) Select appropriate Slab Thickening Detail from the MiTek 'Internal Load Bearing On Concrete Floor Slabs' brochure.

Job: 60373
 Description: New House
 Building Consent No.:
 MiTek 20/20 Engineering 4.7.184.0

Client: Peter Ray Homes
 Phone:

Site: New House
 Lot 297 Faringdon
 Rolleston

Phone:
 Printed: 06:55:30 19 Mar 2018

TRUSS FIXING SELECTION REPORT - Characteristic Loads

Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data)

MiTek® Truss List

Legend: * = detail only, ? = input only, ✕ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
GE1	1	4170	A			Wide	1	No fixing selected
GE2	1	4180	A			Wide	1	No fixing selected
*H1	2	2524						Refer NZS3604:2011 Tables 15.6
*H2	3	5069						Refer NZS3604:2011 Tables 15.6
*H3	1	8792						Refer NZS3604:2011 Tables 15.6
*H4	2	1251						Refer NZS3604:2011 Tables 15.6
*H5	2	4104						Refer NZS3604:2011 Tables 15.6
*H6	2	3262						Refer NZS3604:2011 Tables 15.6
*H7	1	3797						Refer NZS3604:2011 Tables 15.6
*H8	2	3679						Refer NZS3604:2011 Tables 15.6
*H9	1	4195						Refer NZS3604:2011 Tables 15.6
J1	1	2677	A	2.744	1.075	Cross	1	Pair of Wire Dog Staples
			E	1.984	1.109	Butt	1	JH 47x90
			C	0.760	0.506	Butt	1	Pair of 3.15d Nails
J2	1	2932	B	3.913	0.559	Cross	1	Pair of Wire Dog Staples
			G	0.244	0.340	Butt	1	Pair of 3.15d Nails
			D	4.626	2.906	Cross	1	Pair of Wire Dog Staples
			E	2.878	1.947	Cross	1	Pair of Wire Dog Staples
J3	1	2932	B	3.792	0.907	Cross	1	Pair of Wire Dog Staples
			G	1.874	1.470	Butt	1	JH 47x90
			D	0.898	0.556	Butt	1	Pair of 3.15d Nails
			E	0.620	0.135	Cross	1	Pair of Wire Dog Staples
J4	1	2932	B	3.534	0.963	Cross	1	Pair of Wire Dog Staples
			E	0.492	0.346	Butt	1	Pair of 3.15d Nails
			D	3.135	1.727	Cross	1	Pair of Wire Dog Staples
			G	1.366	0.643	Cross	1	Pair of Wire Dog Staples
J5	1	2932	B	3.483	0.761	Cross	1	Pair of Wire Dog Staples
			E	1.230	0.830	Butt	1	Pair of 3.15d Nails
			D	4.108	2.415	Cross	1	Pair of Wire Dog Staples
			G	1.245	0.559	Cross	1	Pair of Wire Dog Staples
J6	1	2932	B	3.964	0.776	Cross	1	Pair of Wire Dog Staples
			E	1.225	0.829	Butt	1	Pair of 3.15d Nails
			D	4.877	3.071	Cross	1	Pair of Wire Dog Staples
J8	1	2032	A	2.072	0.815	Cross	1	Pair of Wire Dog Staples
			E	1.418	0.760	Butt	1	JH 47x90
			C	0.659	0.437	Butt	1	Pair of 3.15d Nails
J9	1	2032	A	1.825	0.903	Cross	1	Pair of Wire Dog Staples
			E	1.171	0.713	Butt	1	Pair of 3.15d Nails
J10	1	2932	B	3.996	0.616	Cross	1	Pair of Wire Dog Staples
			H	0.573	0.386	Butt	1	Pair of 3.15d Nails
			D	3.864	2.378	Cross	1	Pair of Wire Dog Staples
			E	1.515	1.051	Cross	1	Pair of Wire Dog Staples
			F	1.692	1.123	Cross	1	Pair of Wire Dog Staples
J11	1	2932	A	2.939	0.779	Cross	1	Pair of Wire Dog Staples
			E	0.562	0.374	Butt	1	Pair of 3.15d Nails
			C	3.960	2.397	Cross	1	Pair of Wire Dog Staples
			D	1.577	1.069	Cross	1	Pair of Wire Dog Staples
J12	1	2317	B	3.535	1.000	Cross	1	Pair of Wire Dog Staples
			F	1.622	0.980	Butt	1	JH 47x90
			D	0.683	0.406	Butt	1	Pair of 3.15d Nails
J14	1	1417	B	2.671	0.634	Cross	1	Pair of Wire Dog Staples
			D	0.414	0.041	Butt	1	Pair of 3.15d Nails
			C	0.964	0.775	Butt	1	Pair of 3.15d Nails
J15	1	1417	B	2.401	0.809	Cross	1	Pair of Wire Dog Staples
			D	0.603	0.247	Butt	1	Pair of 3.15d Nails
J17	1	1417	B	2.671	0.634	Cross	1	Pair of Wire Dog Staples
			D	0.414	0.041	Butt	1	Pair of 3.15d Nails
			C	0.964	0.775	Butt	1	Pair of 3.15d Nails
J18	1	1417	B	2.401	0.809	Cross	1	Pair of Wire Dog Staples
			D	0.603	0.247	Butt	1	Pair of 3.15d Nails
J19	1	2932	A	2.906	0.858	Cross	1	Pair of Wire Dog Staples
			D	0.849	0.573	Butt	1	Pair of 3.15d Nails
			C	4.416	2.708	Cross	1	Pair of Wire Dog Staples
J20	1	1722	B	2.972	0.765	Cross	1	Pair of Wire Dog Staples
			E	1.049	0.496	Butt	1	Pair of 3.15d Nails
			D	0.825	0.527	Butt	1	Pair of 3.15d Nails
J21	1	1722	B	2.667	0.852	Cross	1	Pair of Wire Dog Staples
			E	0.877	0.510	Butt	1	Pair of 3.15d Nails
J22	1	1722	B	2.667	0.852	Cross	1	Pair of Wire Dog Staples
			E	0.877	0.510	Butt	1	Pair of 3.15d Nails
J24	1	3042	B	4.074	1.377	Cross	1	Pair of Wire Dog Staples
			F	1.838	1.312	Butt	1	JH 47x90
J25	1	2017	B	3.248	0.881	Cross	1	Pair of Wire Dog Staples
			F	1.370	0.740	Butt	1	JH 47x90
			D	0.758	0.463	Butt	1	Pair of 3.15d Nails
J26	1	2017	B	2.988	0.969	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.690	Butt	1	Pair of 3.15d Nails

SDC - Approved Building Consent Document - BC180486 - Pg 33 of 226 - 19/04/2018 - edwards

VIP Frames & Trusses

Job: 60373
 Description: New House
 Building Consent No.:
 MITek 20/20 Engineering 4.7.184.0

Client: Peter Ray Homes
 Phone:

Site: New House
 Lot 297 Faringdon
 Rolleston

Phone:
 Printed: 06:55:30 19 Mar 2018

MITek New Zealand Limited.

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing -----	
							Qty	Selected
J27	1	2017	B	2.988	0.969	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.690	Butt	1	Pair of 3.15d Nails
J29	1	2382	B	3.598	1.026	Cross	1	Pair of Wire Dog Staples
			F	1.635	1.006	Butt	1	JH 47x90
			D	0.701	0.420	Butt	1	Pair of 3.15d Nails
J31	1	1482	A	1.488	0.581	Butt	1	JH 47x90
			C	0.434	0.043	Butt	1	Pair of 3.15d Nails
			B	1.242	0.834	Butt	1	Pair of 3.15d Nails
J32	1	1515	A	1.486	0.755	Cross	1	Pair of Wire Dog Staples
			C	0.675	0.309	Butt	1	Pair of 3.15d Nails
P2	1	6482	G	5.398	3.456	Butt	1	JH 47x90
			C	5.535	3.115	Cross	1	Pair of Wire Dog Staples
P3	1	6482	G	5.173	3.570	Butt	1	JH 47x90
			C	5.361	3.001	Cross	1	Pair of Wire Dog Staples
*R1	1	2701						Refer NZS3604:2011 Tables 15.6
*R2	1	1813						Refer NZS3604:2011 Tables 15.6
*R3	2	913						Refer NZS3604:2011 Tables 15.6
*R4	1	1813						Refer NZS3604:2011 Tables 15.6
*R5	1	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1745						Refer NZS3604:2011 Tables 15.6
*R7	8	913						Refer NZS3604:2011 Tables 15.6
*R8	8	913						Refer NZS3604:2011 Tables 15.6
*R9	1	1130						Refer NZS3604:2011 Tables 15.6
*R1	1	1130						Refer NZS3604:2011 Tables 15.6
*R1	1	1435						Refer NZS3604:2011 Tables 15.6
*R1	1	1435						Refer NZS3604:2011 Tables 15.6
*R1	1	901						Refer NZS3604:2011 Tables 15.6
*R1	1	1730						Refer NZS3604:2011 Tables 15.6
*R1	1	1730						Refer NZS3604:2011 Tables 15.6
*R1	1	1195						Refer NZS3604:2011 Tables 15.6
S1	1	5633	H	4.482	3.307	Butt	1	JH 47x90
			F	5.805	2.413	Cross	1	Pair of Wire Dog Staples
S2	1	11310	A	9.276	5.680	Cross	1	CT400
			K	10.125	5.743	Cross	1	CT400
S5	3	4680	A	3.224	1.990	Cross	3	Pair of Wire Dog Staples
			G	3.995	2.050	Cross	3	Pair of Wire Dog Staples
S7	1	4180	A	2.804	1.736	Cross	1	Pair of Wire Dog Staples
			G	3.568	1.795	Cross	1	Pair of Wire Dog Staples
S8	3	4180	A	2.804	1.736	Cross	3	Pair of Wire Dog Staples
			G	3.568	1.795	Cross	3	Pair of Wire Dog Staples
S9	4	5633	H	4.229	3.120	Butt	4	JH 47x90
			F	5.477	2.277	Cross	4	Pair of Wire Dog Staples
S12	2	2677	B	2.445	1.078	Cross	2	Pair of Wire Dog Staples
			F	1.622	1.056	Butt	2	JH 47x90
S13	1	3490	B	2.946	1.437	Cross	1	Pair of Wire Dog Staples
			F	2.171	1.381	Butt	1	JH 47x90
S14	1	7972	B	7.389	4.067	Cross	1	CT400
			F	6.526	4.002	Butt	1	JH 47x90
S16	2	3042	B	2.848	1.288	Cross	2	Pair of Wire Dog Staples
			K	1.976	1.284	Butt	2	JH 47x90
S18	1	4080	B	3.439	1.740	Cross	1	Pair of Wire Dog Staples
			H	3.439	1.740	Cross	1	Pair of Wire Dog Staples
S19	3	7930	B	7.042	3.884	Cross	3	CT400
			F	7.042	3.884	Cross	3	CT400
S20	3	7930	B	7.069	3.888	Cross	3	CT400
			F	6.236	3.825	Butt	3	JH 47x90
S22	1	4810	A	3.954	2.416	Butt	1	JH 47x90
			G	3.954	2.417	Butt	1	JH 47x90
S23	1	4170	B	4.240	2.153	Cross	1	Pair of Wire Dog Staples
			H	4.240	2.153	Cross	1	Pair of Wire Dog Staples
S25	2	2382	B	2.693	1.017	Cross	2	Pair of Wire Dog Staples
			H	1.637	1.187	Butt	2	JH 47x90
T3	1	10800	B	9.601	5.484	Cross	1	CT400
			I	9.601	5.484	Cross	1	CT400
T5	1	11310	A	9.152	5.680	Cross	1	CT400
			H	9.985	5.743	Cross	1	CT400
T6	1	11310	A	9.200	5.680	Cross	1	CT400
			H	10.040	5.743	Cross	1	CT400
V1	1	2084	A			Wide		No fixing selected
V2	1	1184	A			Wide		No fixing selected
V3	1	2584	A			Wide		No fixing selected
V4	1	1684	A			Wide		No fixing selected
V5	1	4540	A			Wide		No fixing selected
V6	1	3640	A			Wide		No fixing selected
V7	1	2740	A			Wide		No fixing selected
V8	1	1840	A			Wide		No fixing selected
V9	1	940	A			Wide		No fixing selected
V10	1	2175	A			Wide		No fixing selected
V11	1	1275	A			Wide		No fixing selected
V12	1	934	A			Wide		No fixing selected
V13	1	1025	A			Wide		No fixing selected
V14	1	1925	A			Wide		No fixing selected
J7	1	2932	G	1.673	1.430	Butt	1	JH 47x90
			E	6.700	1.757	Cross	1	Pair of Wire Dog Staples
J13	1	2317	B	3.679	1.455	Cross	1	Pair of Wire Dog Staples
			F	1.671	1.102	Butt	1	JH 47x90

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VIP Frames & Trusses

Job: 60373
 Description: New House
 Building Consent No.:
 MITek 20/20 Engineering 4.7.184.0

Client: Peter Ray Homes
 Phone:

Site: New House
 Lot 297 Faringdon
 Rolleston

Phone:

Printed: 06:55:30 19 Mar 2018

MITek New Zealand Limited.

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing	
							Qty	Selected
J16	1	2317	B	3.679	1.455	Cross	1	Pair of Wire Dog Staples
			F	1.671	1.102	Butt	1	JH 47x90
J28	1	2677	A	12.996	7.538	Cross	1	CT400
			C	8.855	5.317	Cross	1	CT400
J30	1	2382	B	4.010	1.542	Cross	1	Pair of Wire Dog Staples
			F	1.982	1.203	Butt	1	JH 47x90
P1	1	6482	H	9.680	5.833	Butt	1	Pair of MultiGrips
			C	6.792	3.811	Cross	1	CT400
S11	1	3490	B	4.596	2.585	Cross	1	Pair of Wire Dog Staples
			F	3.651	2.511	Cross	1	Pair of Wire Dog Staples
S18	1	4080	B	5.445	3.143	Cross	1	Pair of Wire Dog Staples
			F	5.445	3.143	Cross	1	Pair of Wire Dog Staples
T2	1	10800	B	9.658	5.544	Cross	1	CT400
			I	10.263	6.390	Cross	1	CT400
S4	1	4680	A	6.083	3.884	Cross	1	CT400
			E	6.992	3.953	Cross	1	CT400
S10	1	5633	I	16.275	10.853	Butt		No fixing selected. Specific engineering design required for down loads.
			G	11.662	6.090	Cross	1	CT400
S21	1	4810	A	6.520	4.100	Butt	1	JH 47x90
			E	6.818	4.422	Butt	1	JH 47x90
T1	1D	9740	B	10.635	6.105	Cross	1	CT400
			Y	18.276	10.937	Cross	1	CT400
T4	1D	11310	A	19.429	12.121	Cross	1	16kN Truss to Top Plate
			F	18.646	10.849	Cross	1	CT400
J23	1	3042	B	7.869	3.446	Cross	1	CT400
			F	8.628	5.385	Butt	1	Pair of MultiGrips
S3	1D	11310	A	32.415	22.328	Cross		No fixing selected. Specific engineering design required for uplift loads.
			M	20.055	12.625	Cross	1	16kN Truss to Top Plate
T7	1	7972	A	10.407	6.531	Butt	1	Pair of MultiGrips
			F	14.925	9.506	Butt		No fixing selected. Specific engineering design required for down loads.
S17	1	4080	B	6.940	3.940	Cross	1	CT400
			H	19.546	12.241	Cross	1	16kN Truss to Top Plate
S24	1	4170	B	8.684	4.945	Cross	1	CT400
			H	18.034	11.291	Cross	1	CT400

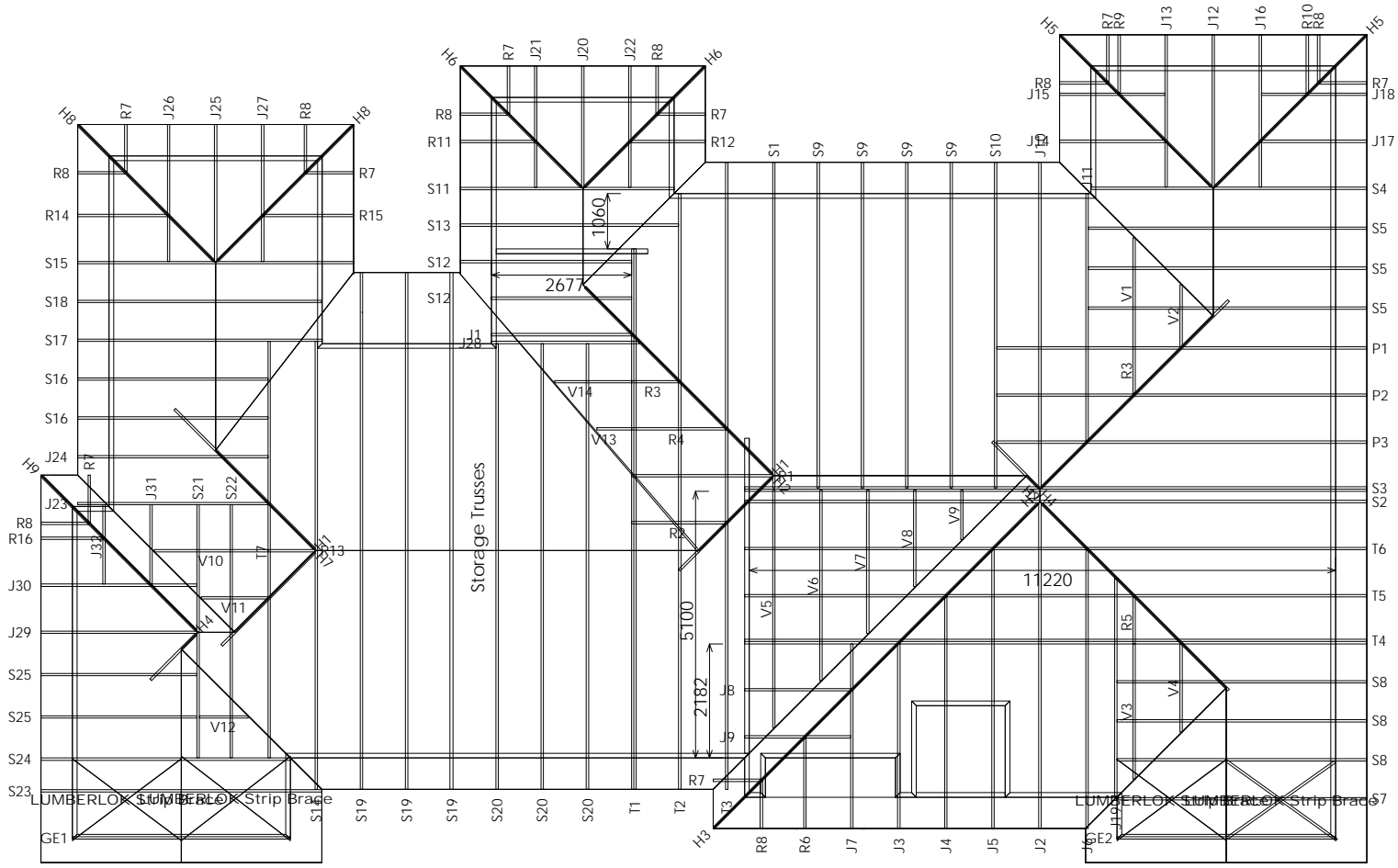
Fixing List

Qty	Selected Fixing
79	Pair of Wire Dog Staples
34	JH 47x90
29	Pair of 3.15d Nails
33	CT 400
3	Pair of MultiGrips
3	16kN Truss to Top Plate
19	No fixing selected

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Note:
 1) Fixings have been selected based on loading only. Please check that selected fixings are practical for each situation and that appropriate nailing can be applied on site.
 2) Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data) with down and uplift characteristic loads of at least the values shown for each joint.

Roof Bracing



200 Maces Road
PO Box 35-193 Christchurch
Ph (03) 389 8200

JOB No 60373

Client: Peter Ray Homes
Job Name: New House
Address: Lot 297 Faringdon
Rolleston

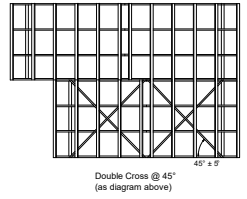
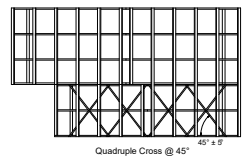
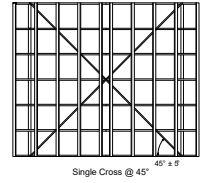
Pitch: 22.500
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.630

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Barry O'Connor

DATE 19 Mar, 2018 | **PAGE** 1 of

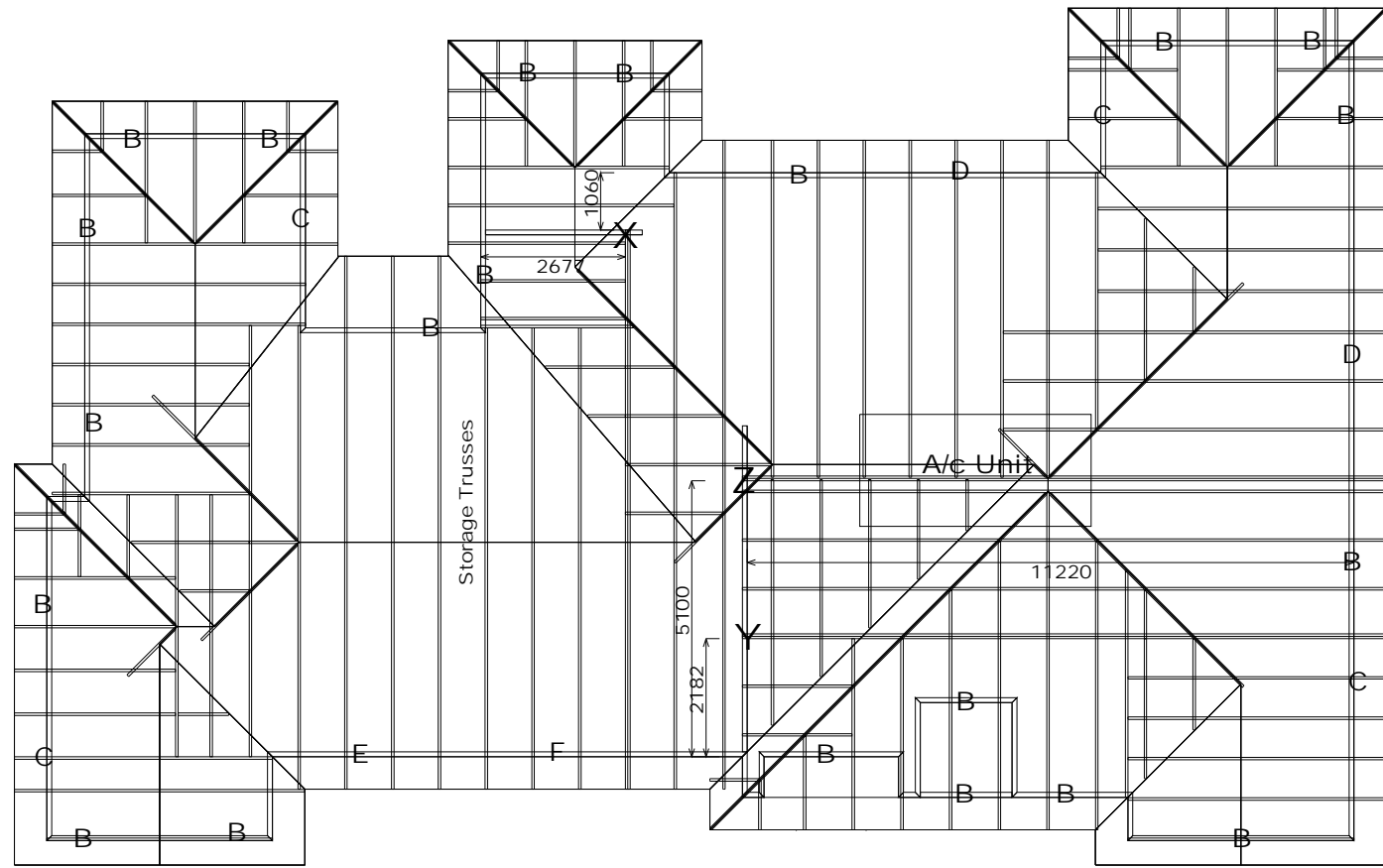
Roof Bracing Details



NOTES:
Refer to:
Lumberlok roof bracing brochure
07/2006

All internal wall shown on this layout are considered to be Load Bearing (loads not exceeding 10 kN)

- X = 11.69kN Download. Type FP1 Slab Thickening Reqd
- Y = 12.43kN Download. Type FP1 Slab Thickening Reqd
- Z = 20.74kN Download. Type FP2 Slab Thickening Reqd



200 Maces Road
PO Box 35-193 Christchurch
Ph (03) 389 8200

JOB No 60373
Client: Peter Ray Homes
Job Name: New House
Address: Lot 297 Faringdon Rolleston

Pitch: 22.500
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.630

Trusses And Rafters At 900 Centres Unless Stated Otherwise

DRAWN BY Barry O'Connor

DATE 19 Mar,2018 | **PAGE** 1 of

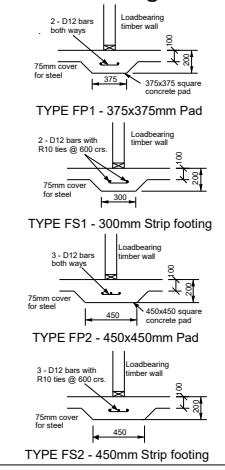
These lintels have been sized as per the GANGLAM and FLITCH BEAM selection manuals as provided by MiTek NZ Ltd.

HYSpan lintels have been sized as per the HYSpan selection charts.

Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	MSG8
B	2/140x45	MSG8
C	2/190x45	MSG8
D	2/240x45	MSG8
E	240x90	PL12
F	250	PFC

Slab Thickening Details





PROLAM SUMMARY

Customer/Project: Worksheet

Physical Address:

Designer: Barry O'connor, Vip Frames and Trusses
65 Wickham St , Bromley, Christchurch
E: Barry@vft.co.nz P: 033898200

Peter Ray Homes - Lot 297 Faringdon , Rolleston - Garage 2

Prolam Lintel Supporting Roof with Attic Truss

Building Type	House	Roof Weight	Light with Ceiling
Timber	Pine, Machined	Roof Load	0.40 kPa
Treatment	H1.2	Live Load	0.25 kPa uniform
Visual	No		1.10 kN concentrated
Exposed	No	Wind Zone	High (44.0 m/s)
Roof Pitch	23 °	Snow Region	Region N4
Eaves	600 mm	Altitude	100 m
Roof Span	8.00 m	Ground Snow Load	0.90 kPa
Lintel Span	2.50 m	Roof Snow Load	0.63 kPa

Use Prolam PL12H1-250100 240 x 90mm PL12

Capacity Ratio	1.7
Long Term Deflection	< 1.0 mm
Max. Bearing Reaction	12.7 kN
Load Combination	1.2G + 1.5Q
Minimum Bearing Length	35 mm
Uplift Fixing Requirements	4.625 kN Characteristic Load

PRODUCER STATEMENT



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

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

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

David King

David King

ME (civil, MIPENZ CPEng (no 145511) IntPE

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

18 March 2018

283 Waiwhero Rd P O Box 413 Motueka New Zealand Phone 03 526 7436 Fax 03 526 7437

Email: info@prowoodnz.com • www.prolamnz.com



PROLAM[®] products are manufactured to the requirements of AS/NZS 1328.1:1998 Glue Laminated Structural Timber, and AS/NZS 1491:1996 Finger Jointed Structural Timber under an approved quality system based on the 150 9000 series of standards. As such if the product is used in accordance with **PROLAM**[®] product literature, it will meet the durability clauses of the New Zealand Building Code B2.

Subfloor Applications:

- PROLAM**[®] may be used where approved practices for clearance and ventilation are used.

External Use:

- PROLAM**[®] is recommended for weather exposed applications if sealed and maintained in accordance with **PROLAM**[®] literature.

Preservative Treatment:

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

Storage of **PROLAM**[®]:

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

Branded **PROLAM**[®]:

- PROLAM**[®] is branded for your protection. Look-alike materials may not perform to the standard of **PROLAM**[®]. For your protection do not accept unauthorized substitution

Date: Monday, 19 March 2018
 Job Number 60373
 Job Name New House
 Client Peter Ray Homes
 Calculated By Barry O'Connor

Roof Weight light + ceiling
 Wind Zone high (44.0 m/s)
 Snow Load 0.472 kPa

Beam Details

Beam Label	Garage
Beam Span (mm)	4800
Roof Span "S" (mm)	8000
Overhang (mm)	600
Wall Type	NA
Wall Height (mm)	
Floor Live load	1.5 kPa
Floor Span "F" (mm)	2400

MITek Bearing Reactions

Not in use in this version	
----------------------------	--

Point Load 1

Girder Span (mm)	9740
Setback (mm)	2500
Location (mm)	3500

Point Load 2

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

Point Load 3

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

Beam Status OKAY

Beam Material	Steel Beams
Beam Size	250PFC
Beam Deflection	3.11mm
Beam Length	4800

VIP Frames And Trusses

Job No: 60373
Job Name: New House

Client: Peter Ray Homes
Building Consent No:

Site: Lot 297 , Faringdon , Rolleston

PRODUCER STATEMENT MiTek Beam Program v1.07 April 2012

Certification of MiTek Beam Program v1.07 April 2012

The MiTek Beam Program v1.07 April 2012 has been developed by MiTek New Zealand Ltd for the design of these beams: Timber, Glulam, GANGLAM and GANG-NAIL FLITCH BEAMS. The beam designs calculated by this program are prepared using sound and widely accepted engineering principles, and in accordance with Compliance Documents of the New Zealand Building Code and Verification Method B1/VM1 to satisfy the requirements of Clause B1 of the Building Code. We believe on reasonable grounds that these beams for the proposed building, if constructed in accordance with the drawings, specifications and other documents provided will comply with the relevant provisions of the NZ Building Code. This is subject to all proprietary products meeting their performance specification requirements; the provision of adequate bracing and fixings; and the correct input of design data carried out by suitably trained personnel.

Summary of MiTek Beam Program v1.07 February 2009 Data and Output

Roof		Wind		Wall	
Weight:	light + ceiling	Area/Speed:	high (44.0 m/s)	Type:	NA
Dead Load:	0.45 kPa				
Live Load:	0.25 kPa	Snow		Floor	
		Area:	0.472 kPa	Live Load:	1.5 kPa

Beam List

Opening Label	Beam Material	Beam Size	Beam Length	Design Status	Opening Label	Beam Material	Beam Size	Beam Length	Design Status
Garage	Steel Beams	250PFC	4800	OKAY					

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

The design input has been carried out by:

Signed:.....

Date: 19/03/2018

Name of Computer Operator: Barry O'Connor

Qualifications and Title: Detailer

Company: VIP Frames And Trusses

Correspondence from: **CHRISTCHURCH**
 20 Kotzikas Place, Sockburn
 PO Box 8387, Riccarton
 Phone: (03) 348 8691
 Fax: (03) 348 0314

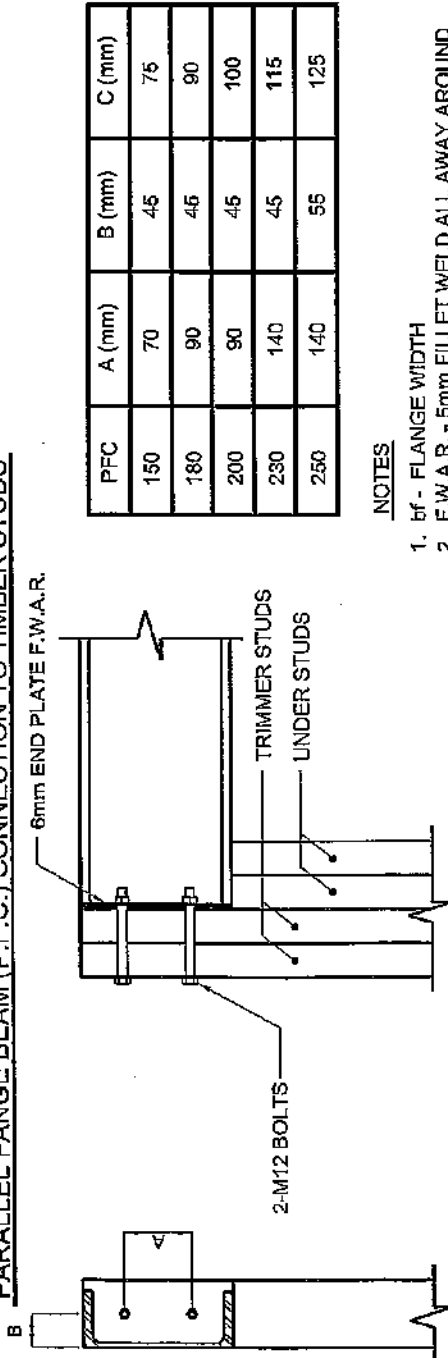
AUCKLAND
 40 Neales Road, East Tamaki
 PO Box 58-014, Greenmount
 Phone: (09) 274 7109
 Fax: (09) 274 7100

HOME OF GANG-NAIL® BUILDING SYSTEMS

www.mitek.nz.co.nz

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PARALLEL FANGE BEAM (P.F.C.) CONNECTION TO TIMBER STUDS

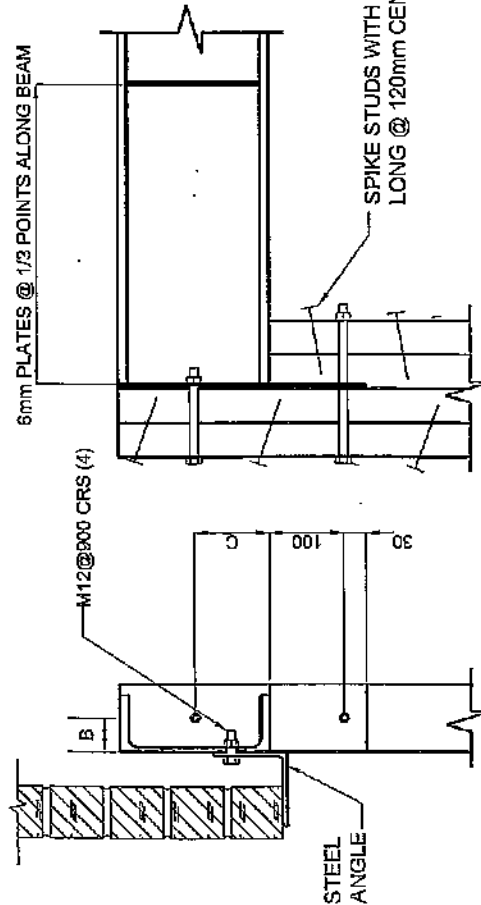


PFC	A (mm)	B (mm)	C (mm)
150	70	46	75
180	90	46	90
200	90	46	100
230	140	45	115
250	140	55	125

NOTES

1. bf - FLANGE WIDTH
2. F.W.A.R. - 5mm FILLET WELD ALL AWAY AROUND
3. $\phi_{Nc} = 28kN$ (4 / 90 X 35 MSG8 STUDS, NOGGED @ 600mm CRS, 3.0m HIGH)
4. ALTERNATIVE TO BOLTING: 150mm LONG 5mm FILLET WELD @ 600mm CRS.

END SUPPORT (SUPPORTING NO VEENER LOADS)



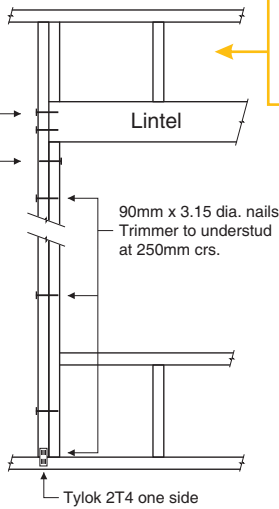
VEENER	STEEL ANGLE SIZE
70	100 x 100 x 6
90	125 x 125 x 10

SCALE 1:10

END SUPPORT (SUPPORTING BRICK VEENER LOADS)

LINTEL FIXING OPTIONS

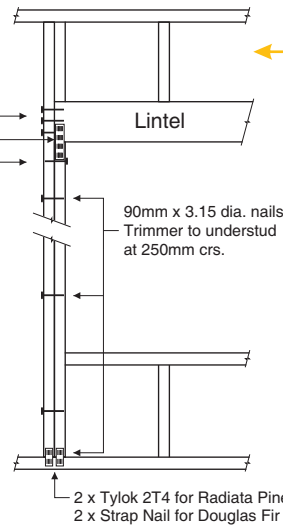
TYPE E 1.4 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

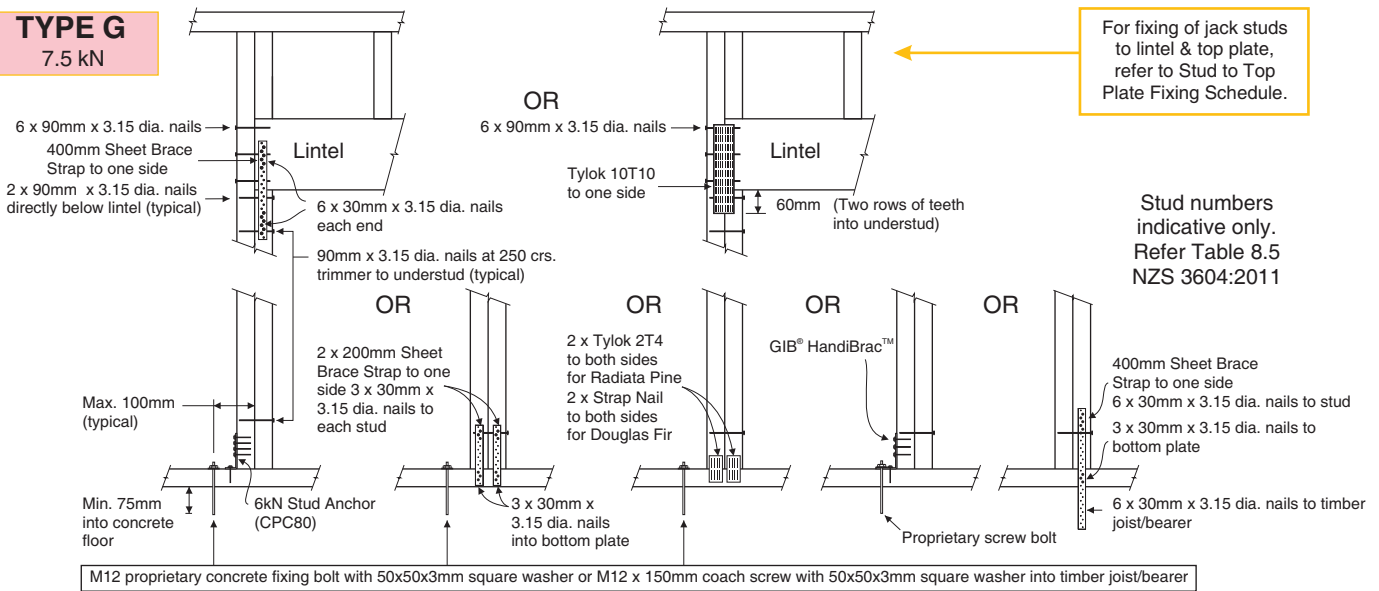
TYPE F 4.0 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

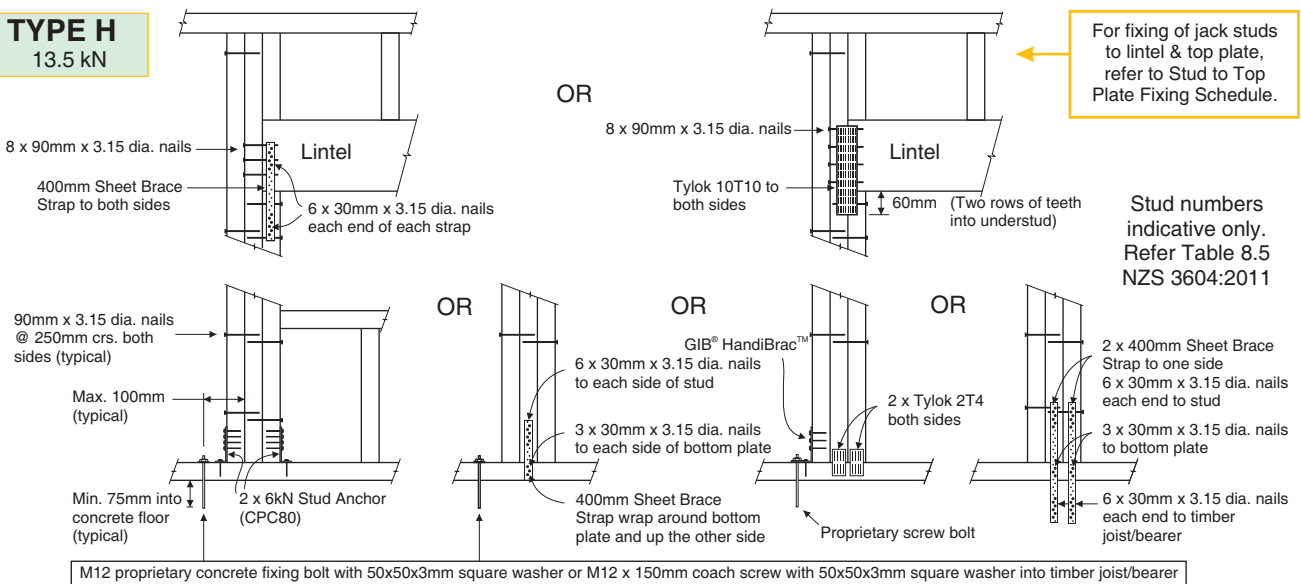
TYPE G 7.5 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

TYPE H 13.5 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only. Refer Table 8.5 NZS 3604:2011

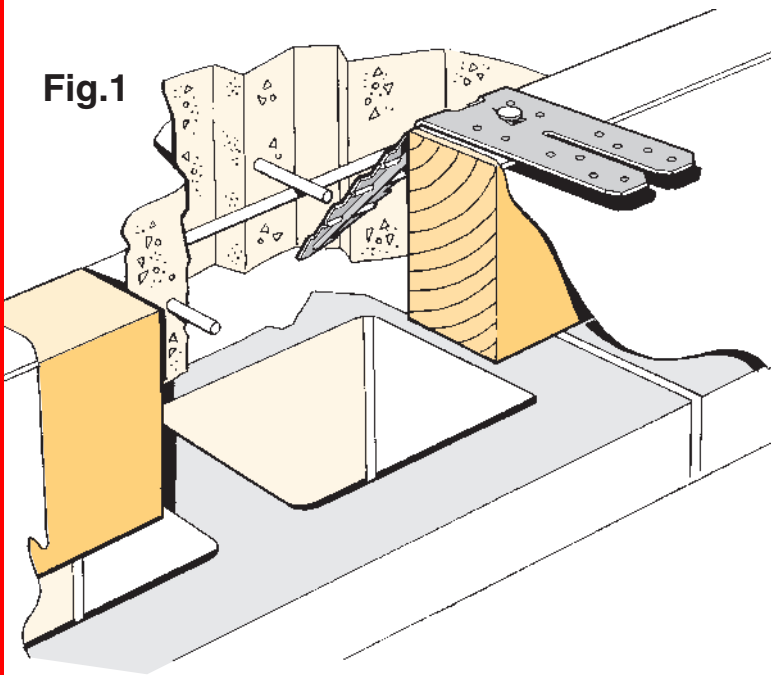
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BOTTOM PLATE FIXING ANCHOR

- ★ Eliminates the drilling of bottom plates
- ★ Makes the fixing of timber framework easier and quicker
- ★ Saves hand trowelling around cast-in anchor bolts or rods
- ★ Use at 900mm centres max.
- ★ Complies with Clause 7.5.12.2 NZS 3604:2011

Fig.1



1. Bottom Plate Fixing Anchors shall be fixed at 900mm centres max. to the boxing for concrete floor slabs, over a continuous vapour barrier.

Each Fixing Anchor is nailed prior to concrete pour, and shall be left undisturbed until concrete has hardened ready for timber frames to be installed. (Fig.1).

2. When timber framing is in place, the Fixing Anchors are folded up and over the bottom plate. (Fig. 2).

3. Two LUMBERLOK Product Nails 30mm x 3.15 dia. shall then be driven into the side of the bottom plate and two additional nails applied through each of the lugs. Should a stud coincide with the position of a Fixing Anchor, nail as shown in Fig. 3.

4. A 75mm x 4 dia. concrete nail must be fixed adjacent to each Fixing Anchor, through the bottom plate into the concrete, at no less than 70mm from the concrete edge. When used as a Bracing Wall hold-down, a Fixing Anchor must be positioned within 150mm from the end of that wall. Bracing wall must not exceed 70 BU/m.

Fig. 2

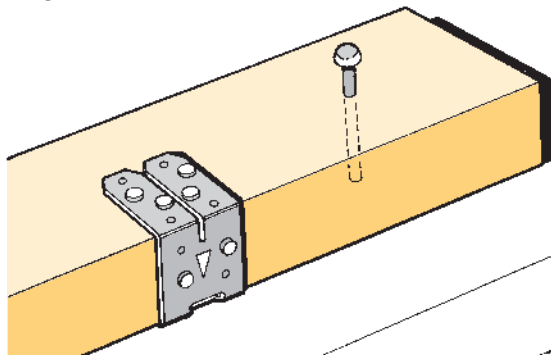
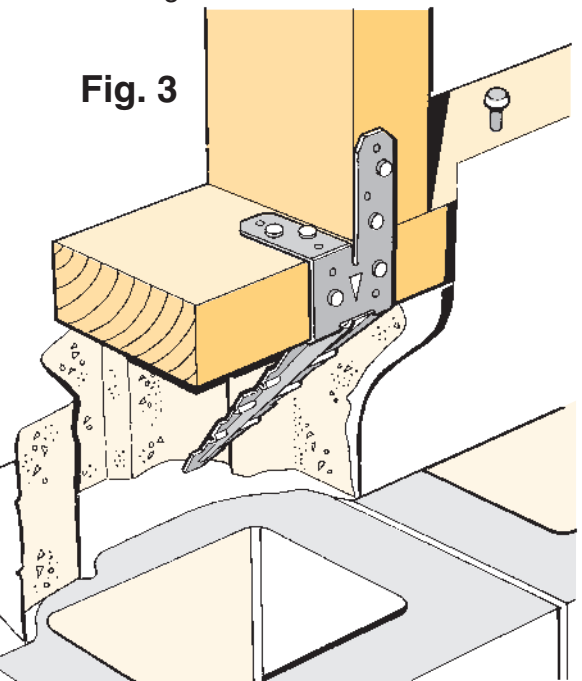
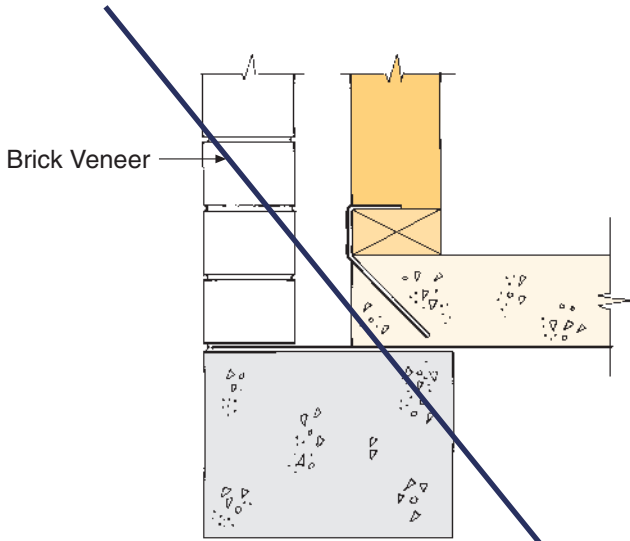
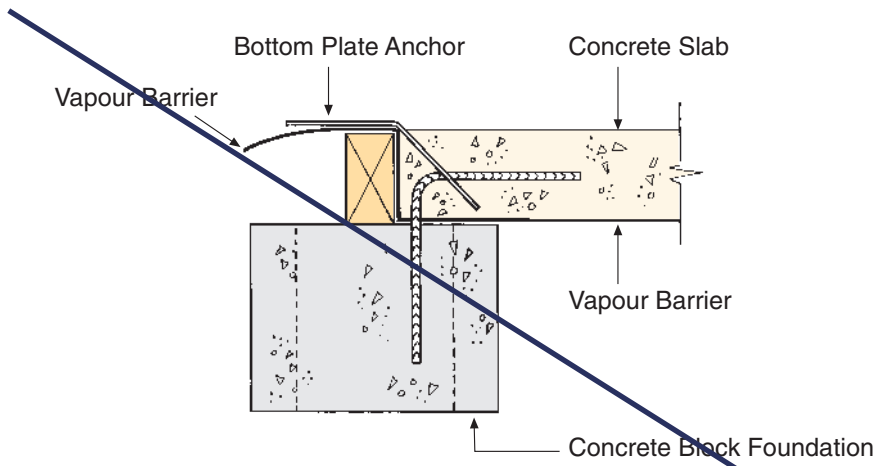


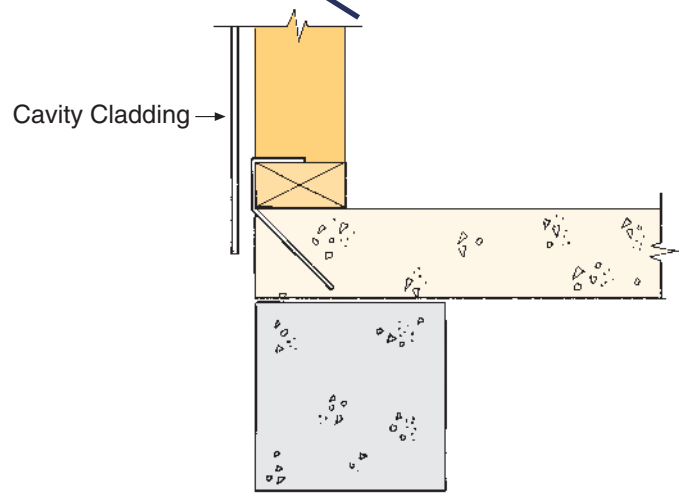
Fig. 3



Available from leading Builders Supply Merchants
throughout New Zealand



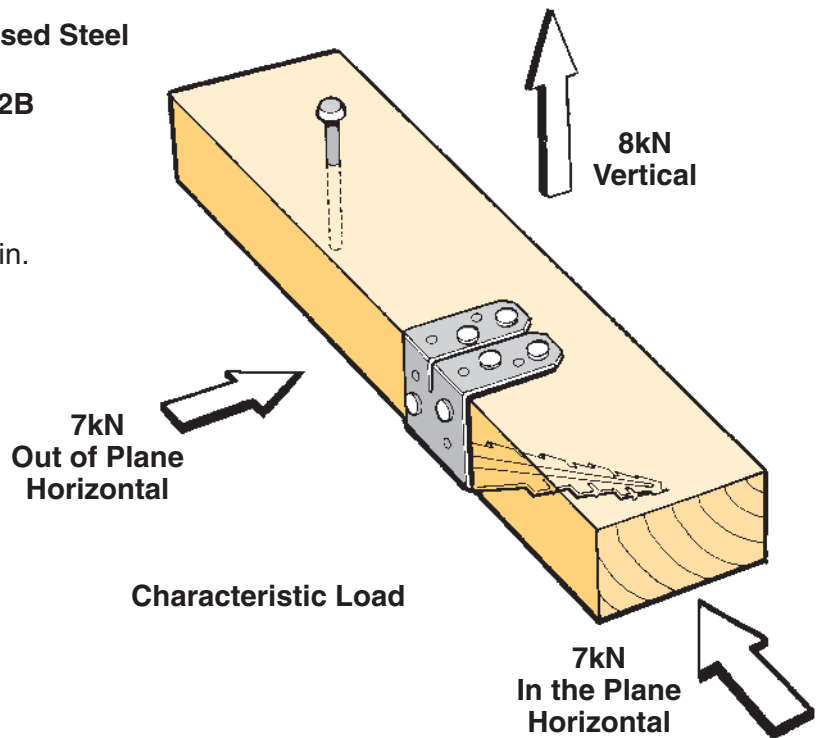
BRICK VENEER



CAVITY CLADDING

Code: BPA
 Material: 0.95mm G300 Z450 Galvanised Steel
 Code: SSBPA
 Material: 0.9mm Stainless Steel 304-2B
 Packaged: 50 per carton

Design Loads
 Concrete compressive strength 20 MPa min.



Characteristic Load

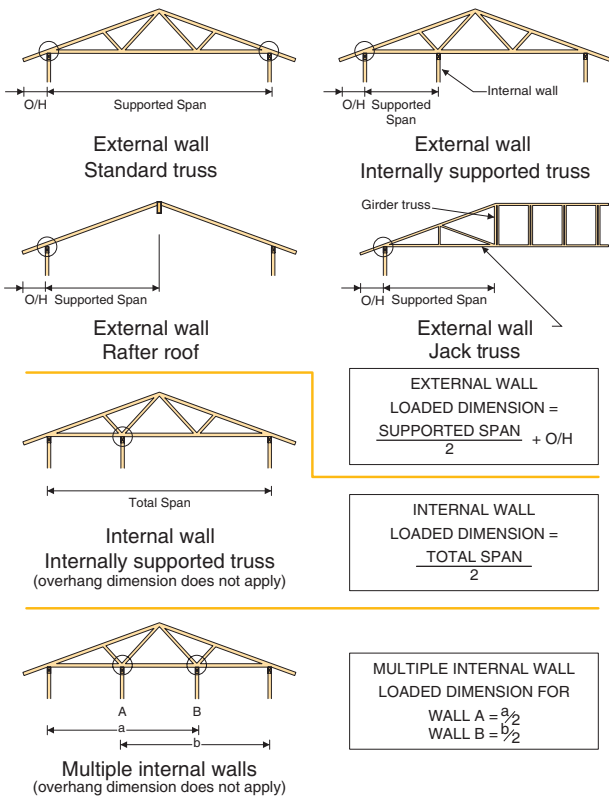


STUD TO TOP PLATE FIXING SCHEDULE ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

NOTE:

- ★ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
- ★ All fixings assume top plate thickness of 45mm maximum.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011.

LOADED DIMENSION DEFINITION



FIXING SELECTION CHART

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

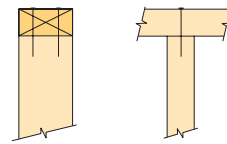
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

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

FIXING OPTIONS

FIXING TYPE A 0.7 kN

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

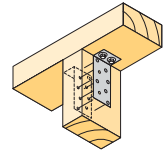
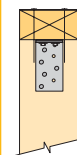
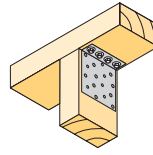
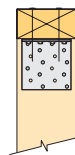


FIXING TYPE B 4.7 kN

CHOOSE ANY OF THE 3 OPTIONS BELOW

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

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

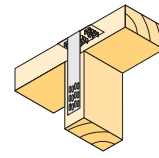
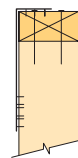


Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

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



Plus
LUMBERLOK
Stud Strap
(one face only)

Note:

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

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8 WALLS



TOP PLATE JOINTING

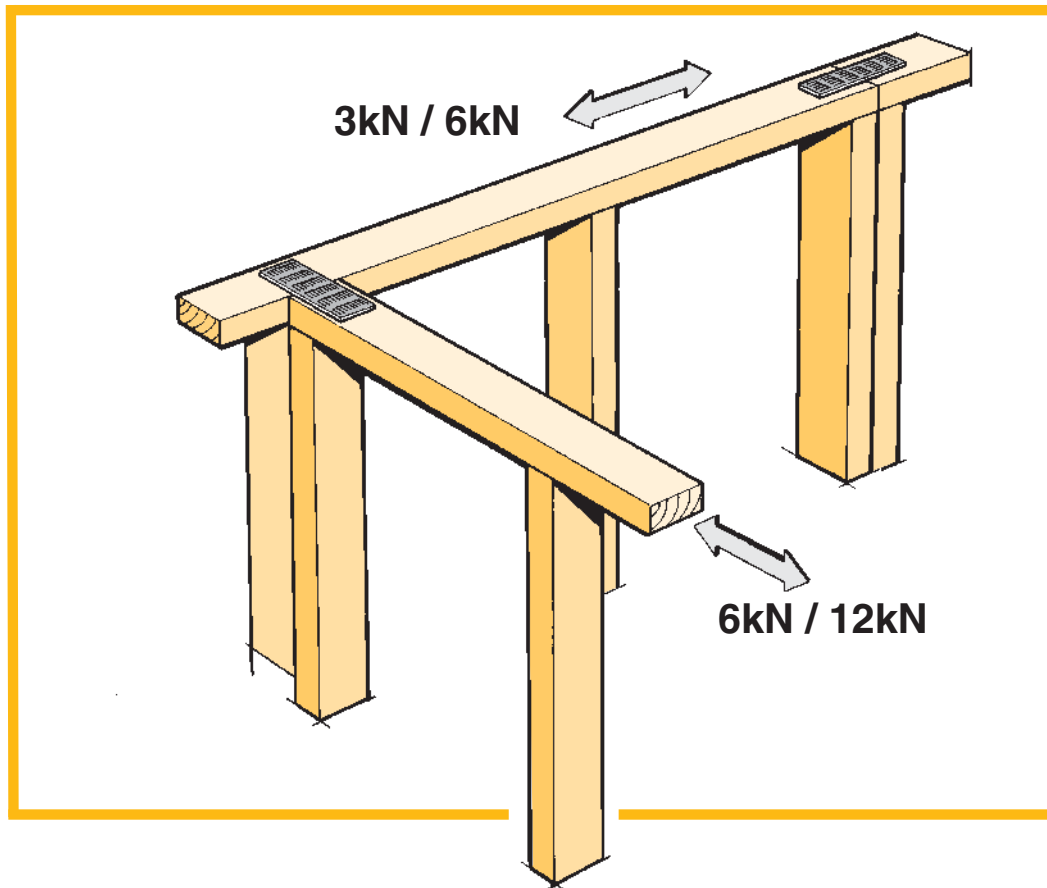
AS PER CLAUSE 8.7.3 NZS 3604:2011

Top Plates at Right Angles

Connection capacity	LUMBERLOK Connector
6 kN	Tylok 6T10 OR 2 x Strap Nails
12 kN	2 x Sheet Brace Straps fixed with 6 x LUMBERLOK Product Nails 30mm x 3.15 dia. per end per strap (24 nails total)

Top Plates in Line

Connection capacity	LUMBERLOK Connector
3 kN	Tylok 6T5 OR Strap Nail
6 kN	Tylok 6T10 OR 2 x Strap Nails



Available from leading Builders Supply Merchants
throughout New Zealand

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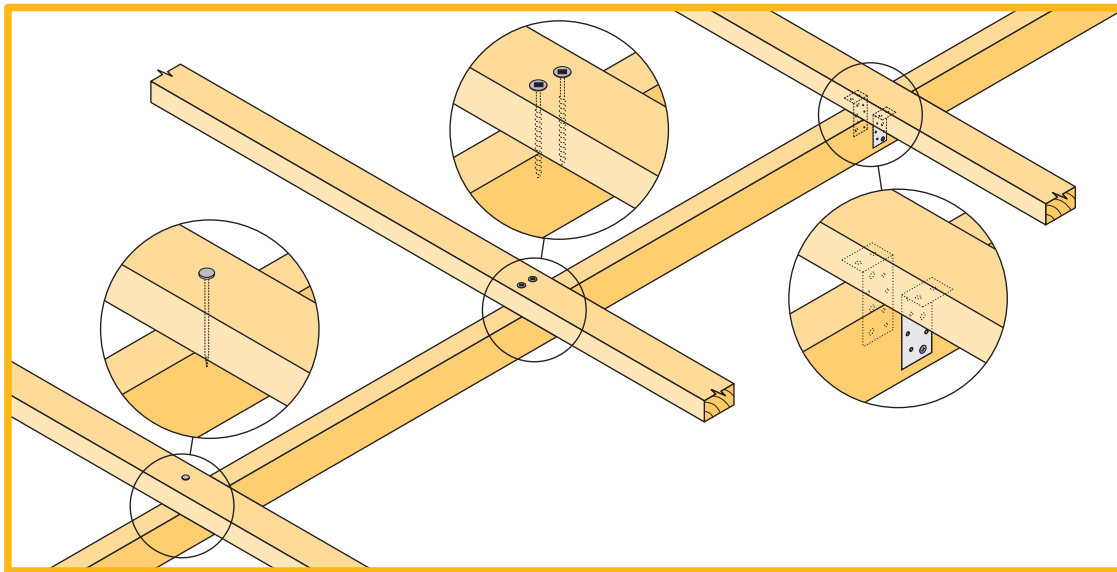
8. WALLS



PURLIN & BATTEN FIXING CHART ALTERNATIVE SOLUTION TO NZS 3604:2011 TABLES 10.10 & 10.12

NOTE:

- ★ All purlin and batten sizes are as per NZS 3604:2011.
- ★ All fixings assume that the purlin and battens are installed on their flat over the top of the rafter or truss.
- ★ The minimum fixing requirements apply to all purlin locations within the roof area.
- ★ The LUMBERLOK BLUE SCREW where specified requires a minimum of 30mm penetration into rafter or truss i.e. it is suitable for rough sawn timber up to 50mm thick at 18% moisture content.



SELECTION CHART FIXING OPTIONS (minimum fixing requirements)

ROOF WEIGHT	MAX. PURLIN SPAN (mm)	MAX. PURLIN CRS. (mm)	WIND ZONE				
			L	M	H	VH	EH
HEAVY ROOF Tile Battens	900	370	A	A	A	A	A
LIGHT ROOF Tile Battens	900	370	A	A	B	C	C
	1200	370	A	B	C	C	C
LIGHT ROOF Purlins	900	900	C	C	C	C	D
	1200	900	C	C	C	D	D
	1200	1200	C	C	D	E	E

Wind Zone:
As per NZS 3604:2011

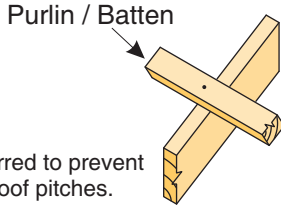
L = Low Wind
M = Medium Wind
H = High Wind
VH = Very High Wind
EH = Extra High Wind

STANDARD FIXING OPTIONS

FIXING TYPE A
0.55kN

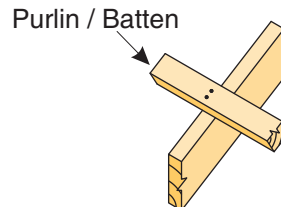
1 NAIL

Note: Two nails maybe preferred to prevent batten rolling over with high roof pitches.



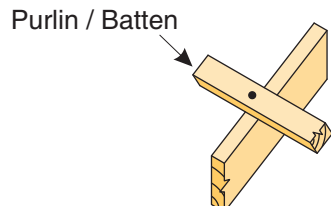
FIXING TYPE B
0.8kN

2 NAILS



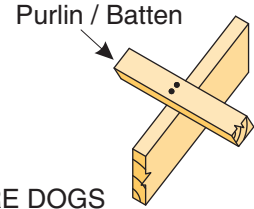
FIXING TYPE C
2.4kN

1 BLUE SCREW



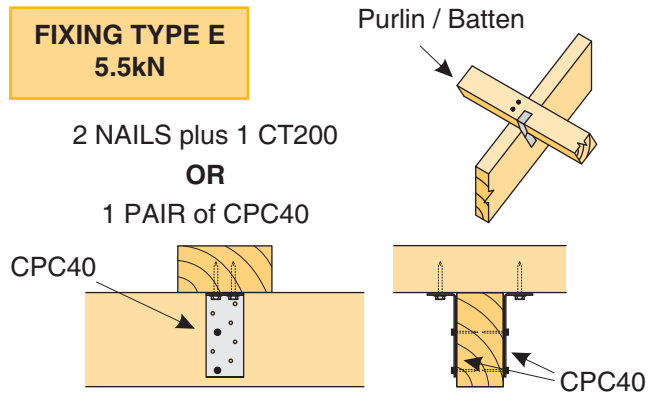
FIXING TYPE D
3.45kN

2 BLUE SCREWS
OR
2 SKEW NAILS plus 2 WIRE DOGS
(for purlin on edge)



FIXING TYPE E
5.5kN

2 NAILS plus 1 CT200
OR
1 PAIR of CPC40



FIXING DEFINITIONS

NAIL = Either 90mm x 3.15 dia. power-driven nail or 100mm x 3.75 dia. hand-driven nail

BLUE SCREW = 80mm x 10 gauge LUMBERLOK BLUE SCREW

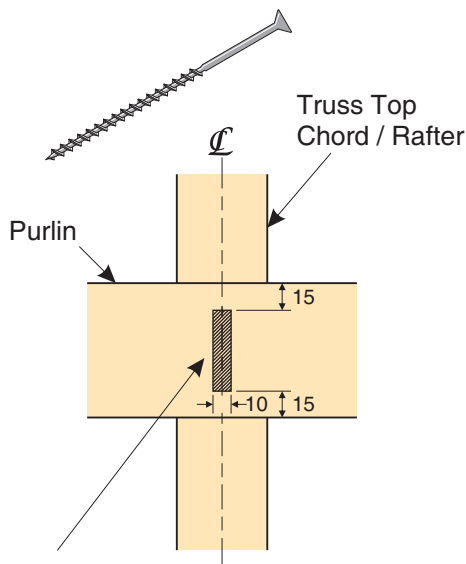
WIRE DOG = LUMBERLOK WIRE DOG either LH or RH

CT200 = LUMBERLOK Ceiling Tie CT200 bend over purlin, 4 x LUMBERLOK Product Nails 30mm x 3.15 dia. each end

CPC40 = LUMBERLOK CPC40 with 2 x Type 17-14g x 35mm Hex Head Screws per flange

FIXING TOLERANCES

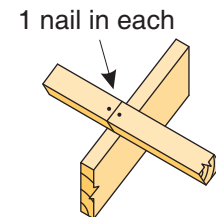
LUMBERLOK BLUE SCREW



NOTE:
Locate fixings within the shaded area. Care to be taken to avoid over tightening of screws.

PURLIN / BATTEN SPLICE FIXING OPTIONS

FIXING TYPE A & B OVER PURLIN SPLICE

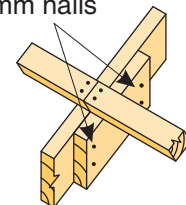


NOTE:
Skew nail when fixing to 35mm rafter or truss

FIXING TYPE C, D or E OVER PURLIN SPLICE

90 x 35mm block fixed to chord or rafter with 4 x 75mm nails

- TYPE C
1 SCREW to each purlin
- TYPE D & E
1 NAIL plus 1 SCREW to each purlin

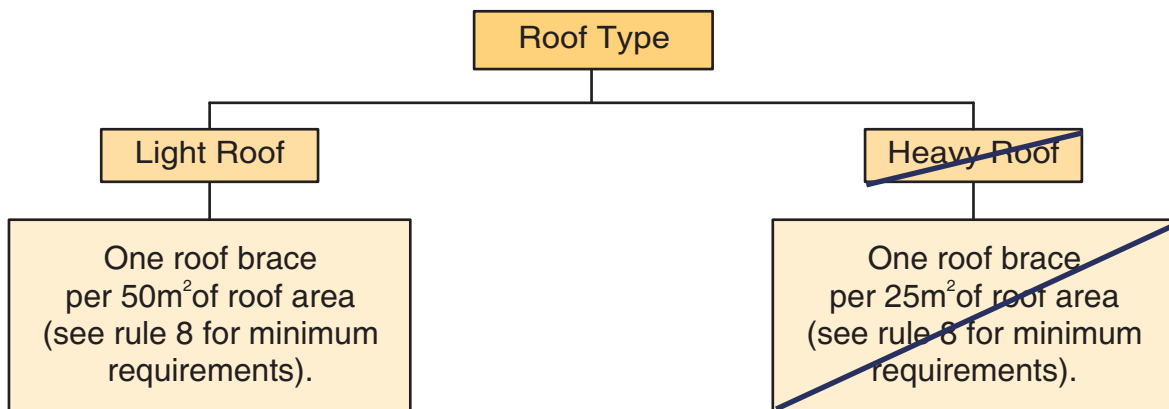


ROOF BRACING SPECIFICATION AS PER NZS 3604:2011

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- ★ Covers roof bracing requirements to resist horizontal loads as set out in NZS 3604:2011 Section 10.
- ★ A definitive guide to the description and installation of Roof Plane Braces and Roof Space Braces.

Roof Bracing Requirements



Roof Bracing - Rules & Definitions

1. The bracing described in this brochure covers both framed roofs and fully trussed roofs.
2. Roof planes less than 6m² (e.g. dormers & porches) do not require bracing.
3. Roof braces can consist of either i) Roof Plane Brace or ii) Roof Space Brace or combination of the two.
4. Roof braces are not required on roofs where sarking is installed as per NZS 3604:2011 Clause 10.4.4 or where a ceiling diaphragm is installed and is attached to the rafters.
5. Roof area is the actual plan area of the roof and includes overhangs.
6. A hip or valley rafter running continuously from ridge to top plate can be classed as one roof plane brace.
7. A pair of crossed LUMBERLOK Strip Brace (preferred for ease of installation) can be classed as one roof plane brace and shall be installed as detailed in this brochure.
8. There must be at least one roof plane brace in each roof plane. Each ridge line shall have a minimum of two roof braces.
9. Every design effort should be made to distribute the roof braces as evenly as possible over the entire roof area and run alternately in opposite directions.

Roof Bracing Options



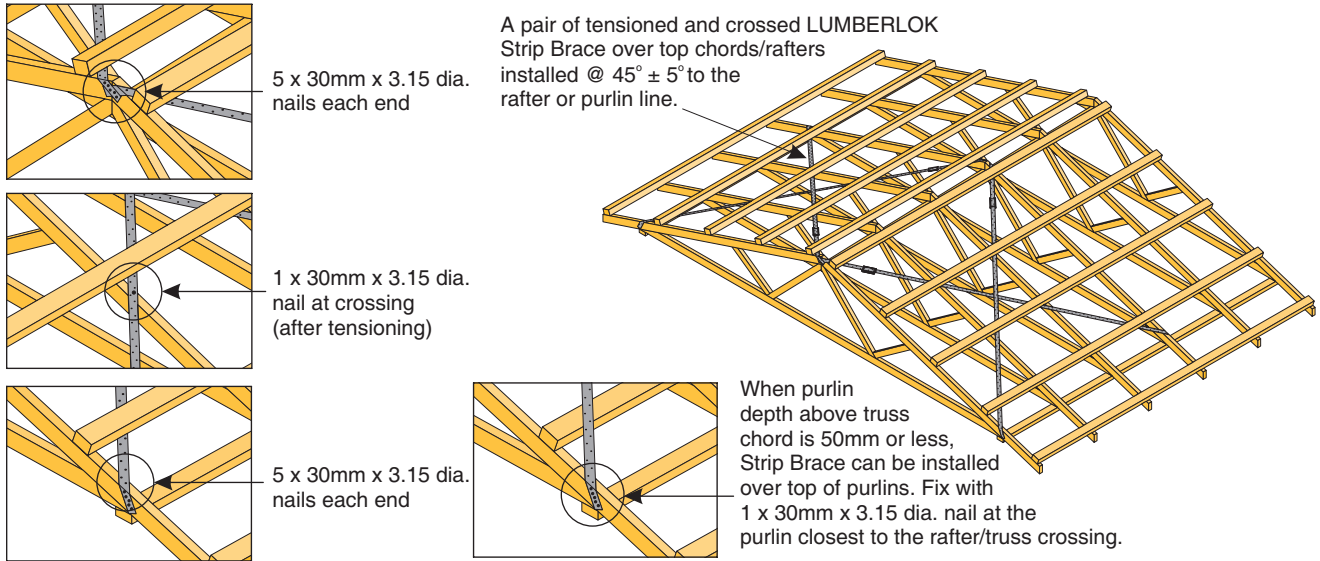
i) ROOF PLANE BRACE

Each roof plane brace can be:

- A hip or valley rafter running continuously from ridge to the top plate in accordance with NZS 3604:2011 Clauses 10.2.1.3.2 or 10.2.1.3.3

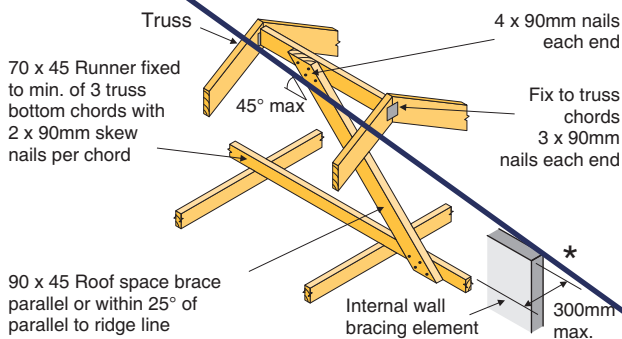
OR

- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.

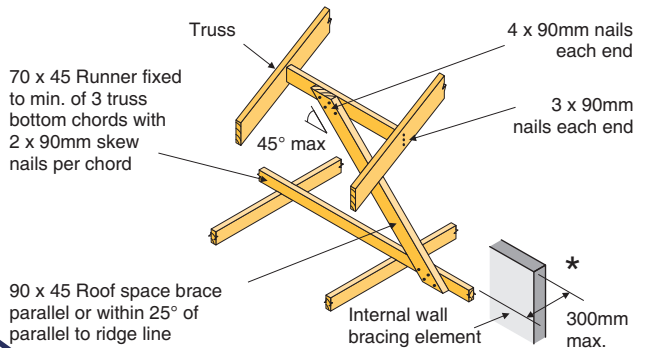


ii) ROOF SPACE BRACE

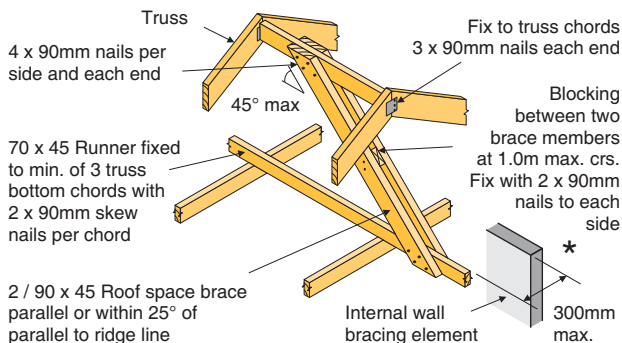
(A) Less than 2m long.



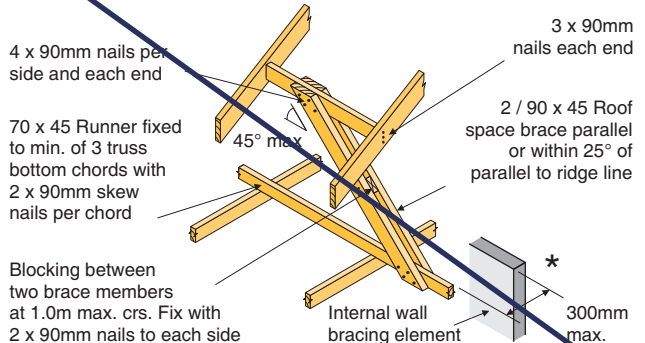
(C) Not directly under the ridge - less than 2m long.



(B) More than 2m long (Max. 4.8m).



(D) Not directly under the ridge - more than 2m long.



* Not required when a ceiling diaphragm complying with Clause 13.5 of NZS 3604:2011 is used.

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MiTek New Zealand Limited

AUCKLAND
PO Box 58-014, Botany 2163
Phone: 09-274 7109
Fax: 09-274 7100

CHRISTCHURCH
PO Box 8387, Riccarton 8440
Phone: 03-348 8691
Fax: 03-348 0314

www.mitek.nz.co.nz

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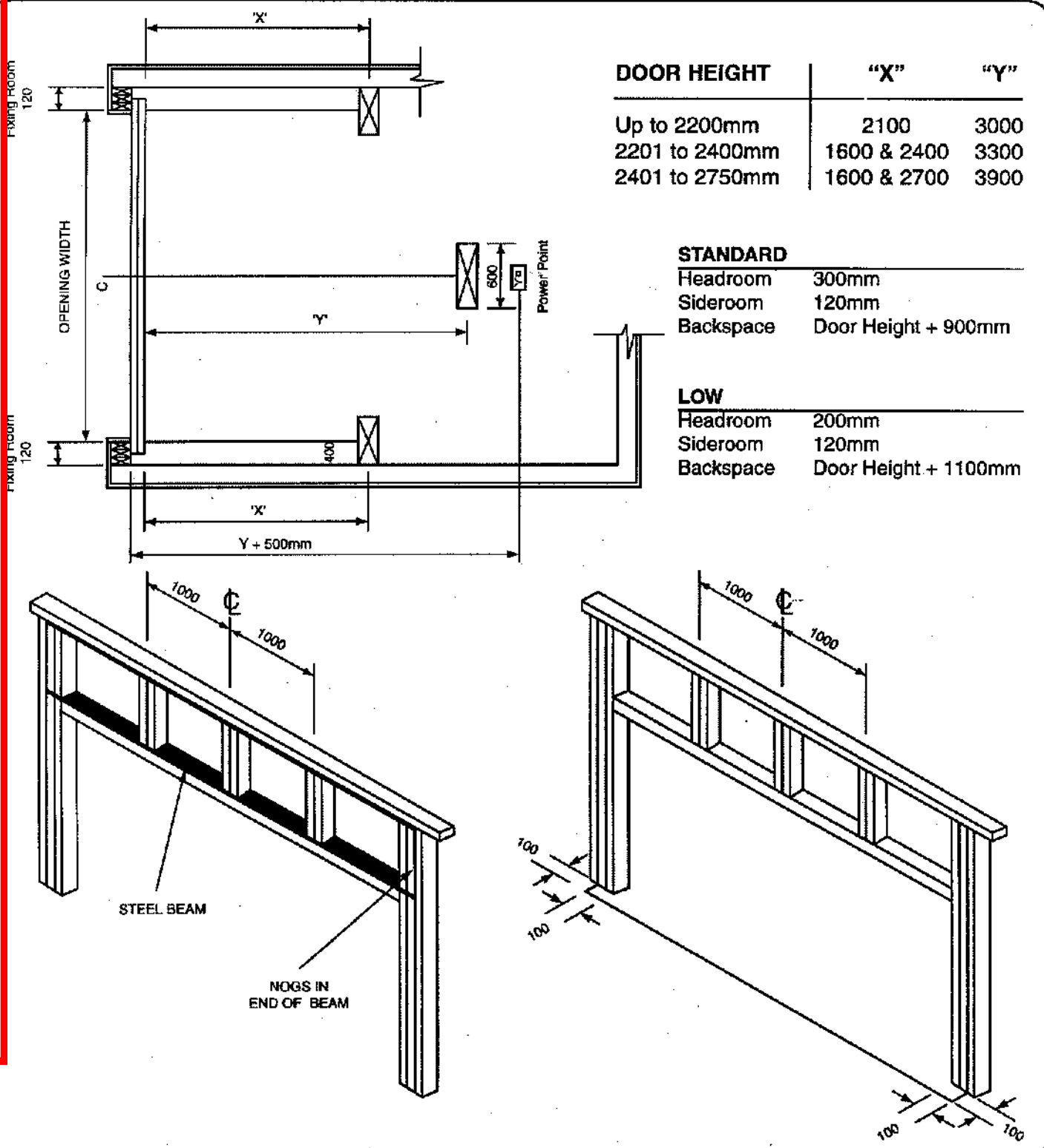
GANG-NAIL® LUMBERLOK® BOWMAC®

WINDSOR DOORS LTD

BUILDERS FIXING DETAILS

SECTIONAL GARAGE DOORS

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DOOR HEIGHT	"X"	"Y"
Up to 2200mm	2100	3000
2201 to 2400mm	1600 & 2400	3300
2401 to 2750mm	1600 & 2700	3900

STANDARD	
Headroom	300mm
Sideroom	120mm
Backspace	Door Height + 900mm

LOW	
Headroom	200mm
Sideroom	120mm
Backspace	Door Height + 1100mm

WINDSOR DOORS LTD, PO Box 4, Takanini, Auckland Tel: 09 298 8655 Fax: 09 298 0626

PLEASE ENSURE GARAGE FLOOR IS CLEAR OF ANY OBSTRUCTIONS BEFORE INSTALLER ARRIVES

Peter Ray
Homes

MADE FOR YOU. BY US.

Demand Calculation Sheet

Job Details

Name: Craig & Camilla POTTER
 Street and Number: 71 Thames Drive
 Lot and DP Number: Lot 297
 City/Town/District: Selwyn District Council
 Designer: M.Bryant
 Company: Peter Ray Homes Ltd
 Date: 19/03/18

Building Specification

Number of Storeys: 1
 Floor Loading: 2 kPa
 Foundation Type: Slab

Single

Cladding Weight: Medium
 Roof Weight: Light
 Room in Roof Space: 0 to 12.5%
 Roof Pitch (degrees): 22.5
 Roof Height above Eaves (m): 2.8
 Building Height to Apex (m): 5.3
 Ground to Lower Floor (m): 0.25

Average Stud Height (m): 2.4
 Building Length (m): 14.93
 Building Width (m): 24.31
 Building Plan Area (m²): 281.77

Building Location

Wind Zone = High

Wind Region: A
 Lee Zone: No
 Ground Texture: Open
 Site Exposure: Exposed
 Hill Ste Category: T1

Earthquake Zone 2

Soil Type: D & E (Deep to Very Soft)
 Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	1370	897

Bracing Units required for Earthquake

	Along & Across
Single Level	1532

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Single Level Along Resistance Sheet

Job Name: Craig & Camilla POTTER

Wind	EQ
Demand	
1370	1532
Achieved	

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Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2690 196%	2398 157%
A	1	1.60		2.4	GSP-H	GIB®	240	240		
	2	0.60		2.4	GS1-N	GIB®	34	35		
	3	1.50		2.4	GS1-N	GIB®	104	90		
	4	0.60		2.4	GS1-N	GIB®	34	35		
External Length = 23.47									412 OK	400 OK
B	1	1.00		2.4	BL1-H	GIB®	118	103		
	2	0.75		2.4	GS1-N	GIB®	45	44		
	3	0.75		2.4	GS1-N	GIB®	45	44		
	4	0.97		2.4	GS1-N	GIB®	62	58		
External Length = 16.15									271 OK	249 OK
C	1	1.50		2.4	GS1-N	GIB®	104	90		
	2	2.90		2.4	GS1-N	GIB®	200	174		
	3	1.20		2.4	GS1-N	GIB®	83	72		
	4	4.10		2.4	GS1-N	GIB®	283	246		
External Length = 23.47									669 OK	582 OK
D	1	1.70		2.4	BL1-H	GIB®	218	177		
	2	1.70		2.4	GS1-N	GIB®	117	102		
	3	1.70		2.4	GS1-N	GIB®	117	102		
External Length = 24.14									452 OK	381 OK
E	1	2.10		2.4	BL1-H	GIB®	269	218		
	2	0.65		2.4	GS1-N	GIB®	38	38		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	4	1.10		2.4	GS1-N	GIB®	74	66		
External Length = 24.14									437 OK	376 OK
F	1	0.50		2.4	GS1-N	GIB®	28	29		
	2	0.50		2.4	GS1-N	GIB®	28	29		
	3	0.50		2.4	GS1-N	GIB®	28	29		
	4	0.80		2.4	GS1-N	GIB®	49	47		
	5	3.00		2.4	GS1-N	GIB®	207	180		
	6	1.60		2.4	GS1-N	GIB®	110	96		
External Length = 24.14									449 OK	411 OK

Single Level Across Resistance Sheet

Job Name: Craig & Camilla POTTER

Wind	EQ
Demand	
897	1532
Achieved	

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Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2548	2279
M	1	0.60		2.4	GS1-N	GIB®	34	35	284%	149%
	2	2.70		2.4	GS1-N	GIB®	186	162		
	3	0.80		2.4	GS1-N	GIB®	49	47		
	4	0.40		2.4	GS1-N	GIB®	21	23		
	External Length = 13.07									291 OK
N	1	0.50		2.4	GS1-N	GIB®	28	29		
	2	2.80		2.4	GS1-N	GIB®	193	168		
	3	1.80		2.4	GS1-N	GIB®	124	108		
	4	2.00		2.4	GS1-N	GIB®	138	120		
	External Length = 13.07									483 OK
O	1	1.70		2.4	GS1-N	GIB®	117	102		
	2	2.60		2.4	GS1-N	GIB®	179	156		
	External Length = 12.64									297 OK
P	1	1.90		2.4	GS1-N	GIB®	131	114		
	2	5.00		2.4	GS2-NOM	GIB®	250	250		
	External Length = 11.55									381 OK
Q	1	4.30		2.4	GS1-N	GIB®	297	258		
	2	3.60		2.4	GS1-N	GIB®	248	216		
	External Length = 11.55									545 OK
R	1	0.60		2.4	GS1-N	GIB®	34	35		
	2	0.60		2.4	GS1-N	GIB®	34	35		
	3	2.60		2.4	GS1-N	GIB®	179	156		
	External Length = 14.79									248 OK
S	1	1.50		2.4	GS1-N	GIB®	104	90		
	2	1.60		2.4	GS1-N	GIB®	110	96		
	3	1.30		2.4	GS1-N	GIB®	90	78		
	External Length = 14.79									304 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Ecoply	EP1-0.4	0.4	80	95
Ecoply	EP1-0.6	0.6	95	105
Ecoply	EP1-1.2	1.2	120	150
Ecoply	EPG	1.2	150	150

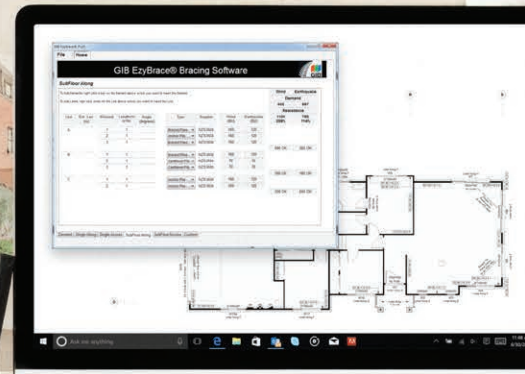
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EzyBrace[®] Systems

Specification and installation manual

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CBI 5113

AUGUST 2016

NATIONAL SUPPORT

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GIB® HELPLINE

0800 100 442

Based on learnings derived from the 2011 Canterbury earthquakes GIB EzyBrace® Systems have been updated to offer improved design flexibility and further simplification of the bracing design and build process.

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

- Improved user interface with simplified bracing design process.
- Increased functionality including exterior line check function, easy insert/deletion of bracing elements and built in software help function.
- Includes the new GIB® Bracing element GS2- NOM
- Allows the GIBFix® Framing System to be used in GIB EzyBrace® designs.

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners¹
- Encourages more even bracing distribution throughout the building.

¹ Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

- Large hole specification updated to use a more conservative methodology.
- Guidance included for fireplace flues and range hoods.

NEW – GIBFIX® FRAMING SYSTEM

- Reduced potential for fastener pop and joint cracking as a result of timber frame movement.
- Reduced potential for on-site call backs.
- Improved thermal performance.
- Reinforced plasterboard junctions.



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GIB EzyBrace® Systems — August 2016

Winstone Wallboards Ltd accepts no liability if GIB EzyBrace® Systems are not designed and installed in strict accordance with instructions contained in this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. Check for the current publication at gib.co.nz/library before using this publication. If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442.

GIB EzyBrace® 2011 software and specification literature remains valid until further notice.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights reserved.

Beware of substitution

The performance of GIB® Systems are very sensitive to design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested or assessed to ensure the required level of performance. It is important to use only GIB® branded components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

For further information call our GIB® Helpline on 0800 100 442.

GIB EzyBrace® Systems have been designed and tested using only the products specified. When additional GIB® plasterboard properties are required the table below provides acceptable alternative options.

Specified GIB® plasterboard	Acceptable alternative GIB® plasterboards								
	GIB® Standard	GIB Ultraliner®	GIB Braceline/Noiseline®	GIB Aqualiner®	GIB Toughliner®	GIB Fyreliner®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

- Note 1** *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*
- Note 2** *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*
- Note 3** *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

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Scope of use

This document is a guide to wall bracing of light timber frame (LTF) buildings constructed in accordance with NZS3604:2011 Timber Framed Buildings and presents a simple and efficient method for calculating and incorporating bracing resistance. This information draws on recent experiences from seismic activity in New Zealand and seeks to minimise earthquake damage to plasterboard linings in LTF buildings.

This document outlines the main principles of bracing design and construction using GIB® plasterboard products and systems. Further detailed information can be found in the GIB® Bracing Supplement by visiting gib.co.nz/library. This 'live' on-line document is updated continuously in response to market feedback and Winstone Wallboards' development initiatives.

Finish quality — framing and substrates

Home owners are increasingly demanding a high quality of interior finish. Finish quality is heavily influenced by the substrate to which linings are fixed. Detailed information on 'Levels of Finish' is given in AS/NZS 2589 and the latest version of the GIB® Site Guide.

New GIBFix® Framing System

With increased NZ Building Code requirements and growing customer demand for thermal efficiency and high quality interior finishes, traditional framing practices present problems such as multiple framing members at wall intersections creating thermal 'bridges' and cavities where insulation cannot be installed effectively.

Figure 1 shows a traditional wall framing layout. Figure 2 shows the alternative GIBFix® Framing System layout.

Multiple timber framing members also take longer to dry resulting in an increased risk of fastener pops and blemishes resulting from timber frame movement.

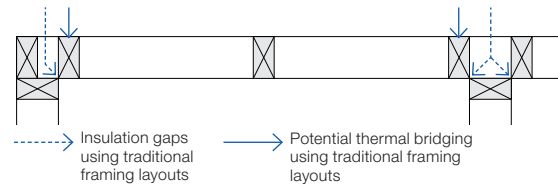
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

The GIBFix® Framing System can be used in conjunction with GIB EzyBrace® Systems.

Bracing resistance is not affected by the GIBFix® Framing System if the use of this alternative timber framing layout is preferred. Refer to the GIBFix® Framing System literature for more information.

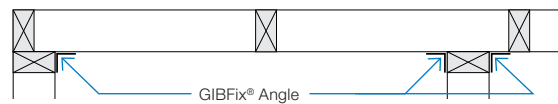
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFix® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

The new GS2-NOM bracing element allows most homes to be braced with a single lining type and less fixings so that a high quality finish is maintained throughout.

GS2-NOM permits the contribution of 'nominally fixed' internal walls. Higher performance elements are commonly specified on external walls and where limited wall area is available or adjacent to significant openings.

Winstone Wallboards recommends the use of the GIBFix® Framing System in conjunction with GS2-NOM elements. Key benefits of this approach include:

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners!
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 – STRUCTURE

The design and material specification for steel and timber framing used in conjunction with this literature must be in accordance with the performance requirements of NZBC Clause B1. GIB EzyBrace® Systems comply with the requirements of NZS 3604:2011, when designed and installed in accordance with this publication and relevant technical literature. NZS 3604:2011 is an acceptable solution to NZBC Clause B1.

NZBC CLAUSE B2 – DURABILITY

Under normal conditions of dry internal use GIB EzyBrace® Systems have a service life in excess of 50 years and satisfy the requirements of NZBC Clause B2. When in conditions of dry internal use, the components specified in this literature satisfy the requirements of NZBC Clause B2.

GIB® EzyBrace® Systems must not be specified in areas where 15 year durability applies and where linings are subject to direct water pressure, e.g. shower cubicle or shower over bath situations.

NZBC CLAUSE F2 – HAZARDOUS BUILDING MATERIALS

Under normal conditions of use, during handling, installation or serviceable life, the products detailed in GIB EzyBrace® Systems do not constitute a health hazard and meet the provisions of the NZBC Clause F2.

NZBC CLAUSE H1 – ENERGY EFFICIENCY

Buildings must be constructed to achieve an adequate degree of energy efficiency and the building envelope must provide adequate thermal resistance. The required thermal resistance (R-value) of timber framed external walls depends on climate zone but is commonly in the range from R 1.9 to R 2.0.

CAD design details

Where applicable drawings related to GIB EzyBrace® Systems have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box. CAD design details can be found at gib.co.nz/library.

Appraisal

GIB EzyBrace® Systems 2016 have been appraised by the Building Research Association of New Zealand (BRANZ), Appraisal No. 928 (2016) GIB EzyBrace® Systems, 2016.

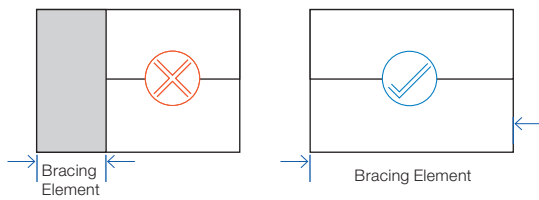
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

When designing the bracing layout, carefully consider the final finished appearance and utilise full wall lengths where possible, avoiding unnecessary fastenings in the centre of a clear wall. Using the available wall length provides additional bracing and achieves improved aesthetics.

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

Distribute bracing by drawing a grid pattern of bracing lines along and across the building. Bracing lines must coincide as much as possible with the wall bracing elements. Pairs of elements may be counted on a single line provided they are no more than 2 metres apart and parallel. See figure 4.

Locate bracing evenly throughout the building and as close as practical to corners of external walls.

Space bracing lines no more than:

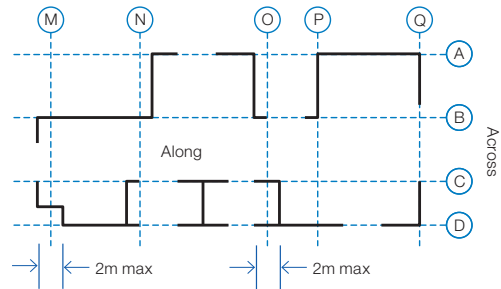
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

The construction of ceiling diaphragms is described in detail on p.18–20.

NZS3604:2011 requires that no bracing line shall have a capacity less than the greater of:

- 100 Bracing Units (BUs), or
- 15 x the external wall length (BUs) for bracing lines coinciding with external walls, or
- 50% of the total demand (D) divided by the number of lines (n) in the direction being considered (BUs).

FIGURE 4: BRACING GRID LAYOUT



The NZS3604 'rules' are merely minimum guidelines and compliance with them does not in itself ensure even distribution. The designer is responsible for checking distribution. Poor distribution can cause torsional effects and localised or more significant damage in an earthquake event.

GIB EZYBRACE® SYSTEMS

The GIB EzyBrace® Specification Numbering System (and sub-components thereof) is protected by copyright and makes specification and identification of GIB EzyBrace® Systems transparent.

- 'GS' stands for GIB® Standard.
- 'BL' for GIB Braceline®.
- 'P' for plywood.
- '1' and '2' for linings one or both sides.
- 'N' stands for 'no specific panel hold-down fixings'.
- 'H' stands for 'specific panel hold-down fixing' required.
- 'NOM' stands for 'nominal plasterboard fixing'. This refers to the standard fixing method used to install plasterboard as shown in the current GIB® Site Guide.

Where specific hold-down fixings are specified, refer to p.15-16. GIB HandiBrac® is fully contained within the framing cavity and does not interfere with lining installation and quality of finish.

Where no specific hold-down fixings are required, the minimum NZS3604:2011 bottom plate fixings apply.

Full bracing element construction details are provided in this technical literature.

Further general design and construction information can also be found in our GIB® Bracing Supplement by visiting gib.co.nz/library.

Specifying GIB EzyBrace® elements (minimum wall length 400mm)

Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

Bracing demand

GIB EZYBRACE® CALCULATOR

The GIB EzyBrace® calculator is a software tool to determine the wind and earthquake bracing demand and to design the bracing resistance for light timber-framed buildings constructed in accordance with NZS 3604:2011.

The updated GIB EzyBrace® calculator combines an up-to-date user-friendly interface with the latest knowledge relating to the performance of GIB® plasterboard in light timber-framed structures when subjected to high winds or earthquakes. The calculator can be down-loaded free of charge by visiting gib.co.nz/ezybrace and can be installed on either Microsoft® or Apple® Mac environments.

DEMAND

Wind and Earthquake 'Demand' calculates the forces a structure must be able to resist during its 'design life'. The GIB EzyBrace® calculator's Demand sheet determines the number of Bracing Units required depending on building location, building dimensions and materials used. The Demand sheet closely follows the familiar format of our Excel based GIB EzyBrace® calculator, and includes additional features such as a pop-up help facility explaining required input.

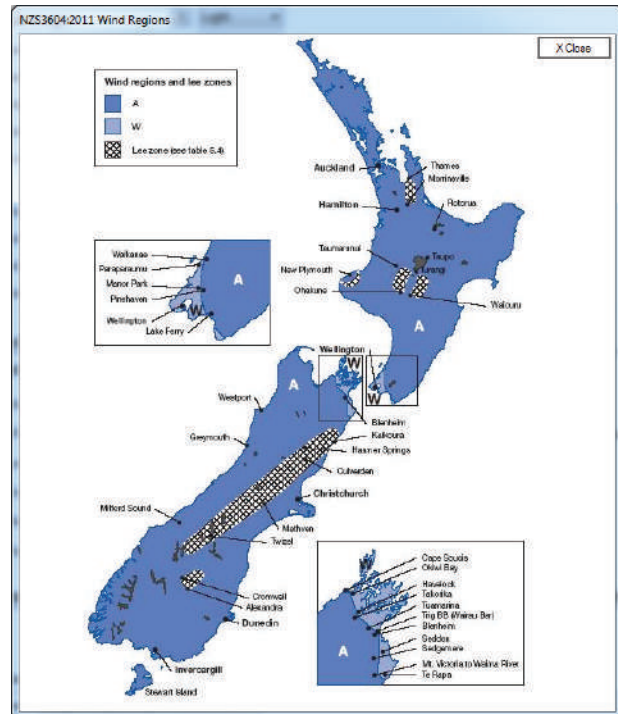
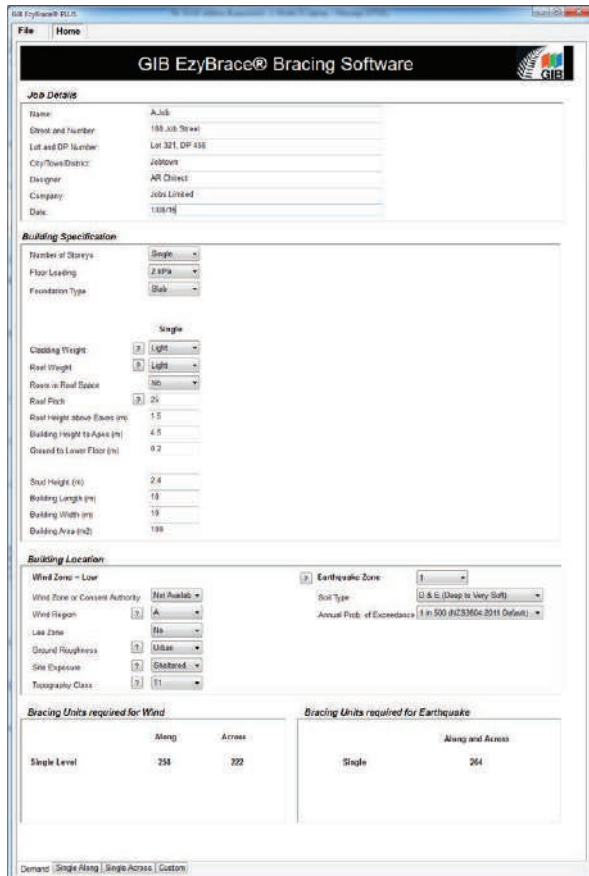
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design life' of a light timber framed residential structure, a 'return period' of 500 years.

Many commercial and public buildings are designed for the more stringent requirement of a 10% probability of exceedance in a 100 or 250 year life expectancy.

A screen shot of the GIB EzyBrace® 2016 Demand Sheet and Help Facility is shown in figure 5.

FIGURE 5: GIB EZYBRACE® 2016 — DEMAND CALCULATION SHEET AND 'POP UP' HELP FACILITY



[Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace](http://gib.co.nz/ezybrace)

Software functionality

Innovations adopted in the GIB EzyBrace® 2016 bracing 'resistance' calculation sheets include the ability to easily add and delete lines and elements during calculations.

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum

bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check.

Designers must additionally check the building layout to ensure adequate bracing distribution.

Figures 6 and 7 show screen shots of the Wall and Subfloor Resistance Sheets respectively.

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FIGURE 6: GIB EZYBRACE® 2016 — WALL BRACING RESISTANCE CALCULATION SHEET

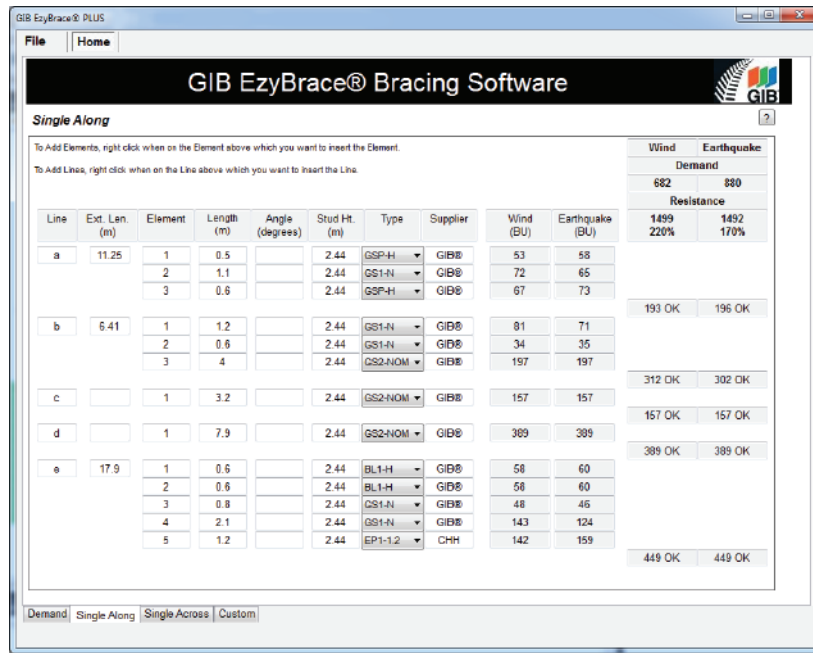
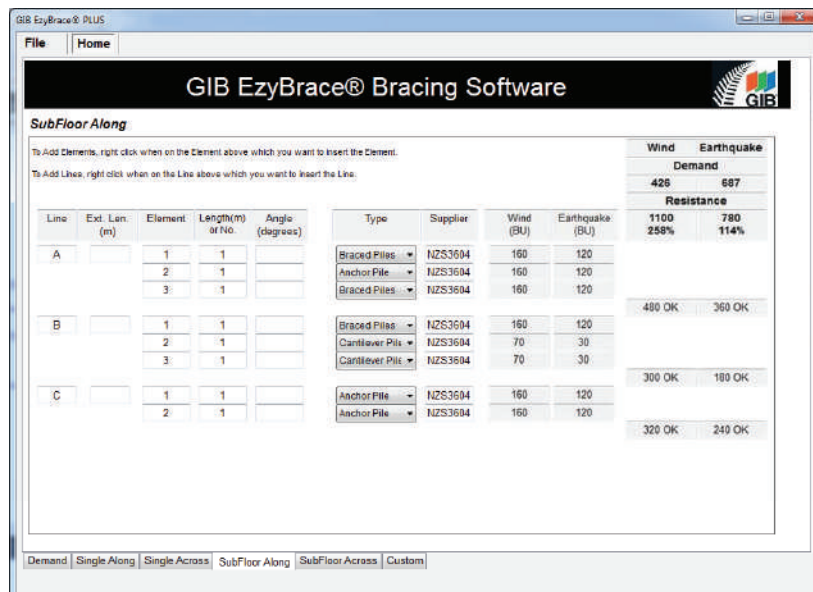


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace



Software functionality

Custom elements can be entered by accessing the 'custom' tab as shown in figure 8.

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET

Supplier	System	Min. Length (m)	Yield (kN/m)	EQ (kN/m)	Element Height (m)	Element Foundation (m)	Import Proprietary Custom Elements
Custom1	CU1-0.4	0.4	80	95	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom1	CU1-0.6	0.6	95	105	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom1	CU1-1.2	1.2	120	135	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom2	CU2-0.4	0.4	90	98	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom2	CU2-0.6	0.6	127	136	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom2	CU2-1.2	1.2	164	135	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Engineer	Portal	1	300	300	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

Help can be accessed by pressing the ? symbol which displays a window with further information.

The GIB EzyBrace® 2016 software has a number of options that can be accessed via the File tab at the top left hand corner of the window. The options include: New, Save, Save As, Open, Recent and Print.

- The New option closes any opened job ready for the input of a new job.
- The Save option saves the currently opened job to the same filename and the Save As option saves the job to a new filename.

- The Open option prompts for the name of an existing job.
- The Recent option displays a list of the ten latest jobs and allows for the selection of one of these jobs to be opened.
- The Print option displays the print screen. In this screen, a print preview is displayed. The print preview can be copied to the clipboard by clicking the right-hand mouse button. Also on the print screen is the option to choose which pages are to be printed and the option to print the output to a portable data format, PDF, file.
- The Print Screen View is shown in figure 9.

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW

Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Demand Calculation Sheet	
Job Data	Example
Project Number	100 Job Street
Lot and DP Number	Lot 100 DP 100
City Street Name	Station Street
Designer	G. B. Bracing
Company	100 Job Street
Date	1/1/13
Building Specification	
Number of Storeys	1
Floor Load (kg)	2.0 kPa
Foundation Type	Shallow
Cladding Height	1.0 m
Roof Height	1.0 m
Roof to Roof Space	NA
Roof P. Adj.	20
Roof Height above Ground (m)	2.0
Building Height to Apex (m)	5
Roof to Lower Floor (m)	0.5
Average Wind Height (m)	2.44
Building Length (m)	17.0
Building Width (m)	11.0
Building Floor Area (m ²)	187
Building Location	
Wind Zone - High	Earthquake Zone 1
Site Type	C (Medium)
Annual Prob. of Exceedance	1 in 500 (AS/NZS 1099:2001 Table B)
Bracing Units required for Wind	
Along	Across
Single Level	682 808
Bracing Units required for Earthquake	
Along & Across	
Single Level	177

GIB® plasterboard linings

When fixing part sheets of GIB® plasterboard, a minimum sheet width of 300mm applies for bracing elements. Horizontal fixing is recommended. If fixing vertically, full height sheets shall be used where possible. Where sheet end butt joints are unavoidable they must be formed over nogs or over the studs and fastened at 200mm centres. Alternatively, and preferably, sheet end butt joints may be back-blocked.

When a GIB® Bracing element has been designated for a section of wall, BU ratings cannot be increased by incorporating additional proprietary bracing elements within that same section of wall.

LIMITATIONS

- GIB® plasterboard must be stacked flat and protected from the weather.
- GIB® plasterboard must be handled as a finishing material.
- GIB® plasterboard in use must not be exposed to liquid water or be installed in situations where extended exposure to humidities above 90% RH can reasonably be expected.
- GIB EzyBrace® Systems must not be used in showers or behind baths.
- It is highly recommended not to install GIB® plasterboard in any situation where external claddings are not in place or the property is not adequately protected from the elements.
- If GIB® plasterboard is installed under these conditions, the risk of surface defects such as joint peaking or cracking is greatly increased.

GIB EzyBrace® Systems in water-splash areas

When GIB® plasterboard is installed in locations likely to be frequently exposed to liquid water it must have an impervious finish. Examples are adhesive fixed acrylic shower linings or ceramic tiles over an approved waterproof membrane over GIB Aqualine®. The NZBC requires 15 years durability in these situations. Bracing elements are required to have a durability of 50 years. Bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members. Otherwise GIB EzyBrace® Systems can be used in water-splash areas as defined by NZBC Clause E3, provided these are maintained impervious for the life of the building.

For further design details refer to the current GIB Aqualine® Wet Area Systems literature.

Renovation

When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in bracing elements

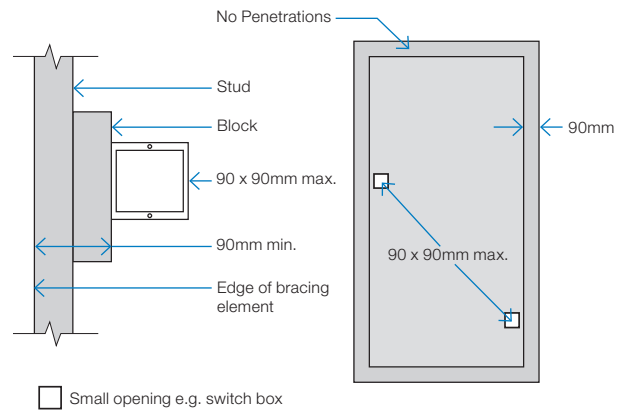
SMALL OPENINGS

Small openings (e.g. power outlets) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element. A block may need to be provided alongside the perimeter stud as shown below.

LARGE OPENINGS

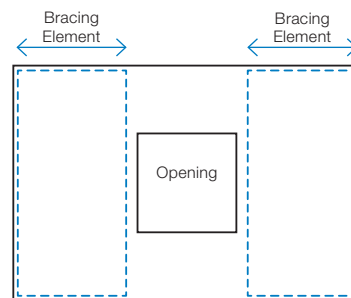
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

General framing requirements such as grade, spacings and installation shall comply with the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 45mm for external walls and 70 x 45mm for internal walls.

As a minimum the use of Kiln Dried Stress Graded timber for all wall, roof and mid-floor framing members is recommended.

GIBFix® Framing System (alternative layout)

Practices recommended as part of the GIBFix® Framing System aim to increase timber framing efficiencies, reduce reliance on unnecessary framing at wall junctions and minimise surface imperfections that commonly arise from constructing plasterboard junctions over multiple timber members. GIBFix® Angles fixed to a single timber framing member are introduced to tie together plasterboard junctions, improving seismic resilience and decrease the risk of future defects due to timber movement. The GIBFix® Framing System can be used in conjunction with the GIB EzyBrace® System.

Note: GIBFix® Angles and 32mm x 7g GIB® Grabber® Dual Thread Screws may also be used in traditional wall framing layouts and in GIB EzyBrace® Systems.

When the GIBFix® Framing System is used a minimum of 2 equally spaced nogs for walls between 2.4m and 3m in height are required at corners and wall junctions.

When used in GIB EzyBrace® systems GIBFix® Angles must run from top to bottom on all applicable studs. If 2 GIBFix® Angles are required on a stud they must be overlapped by a minimum of 300mm with 2/32mm 7g GIB® Grabber® Dual Thread Screws penetrating through both GIBFix® Angles.

For full specification details refer to GIBFix® Framing System literature available at gib.co.nz/gibfix.

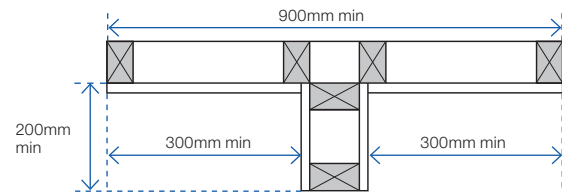
Guidelines for intersection walls

GIB® Bracing Elements may have intersecting walls with a minimum length of 200mm. Fasteners are required around the perimeter of the bracing element. Vertical joints at T-junctions shall be fixed and jointed as specified for intermediate sheet joints. The bracing element length must be no less than 900mm.

Where a Wall Bracing Element is interrupted by a T-junction the element is deemed to be continuous for the whole length (900mm minimum in the example illustrated).

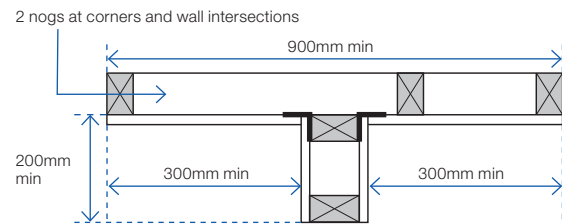
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



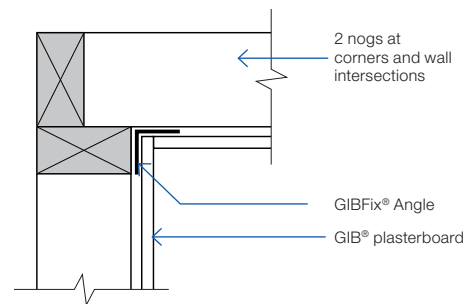
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



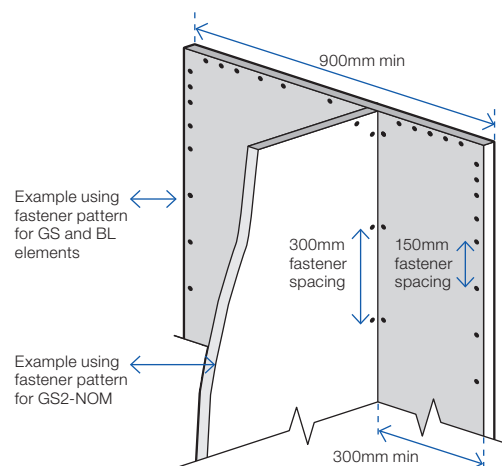
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

Min 32mm x 6g GIB® Grabber® High Thread or 32mm x 7g GIB® Grabber® Dual Thread Screws @ 300mm ctrs each side.

Top plate connections

For top plate connections refer to NZS3604:2011 section 8.7.3.

Parapets and gable end walls

Bracing elements must be fixed from top plate to bottom plate. Fixing to a row of nogs is not acceptable unless either:

A continuous member such as an ex 90 x 45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line, as shown in figure 16.

or

GIBFix® Angle as shown in figure 17. The angle is fixed to a row of nogs with 30 x 2.5mm galv flat head nails or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres.

Bottom plate fixing

TIMBER FLOOR

For elements with an 'N' specification use 2/100 x 3.75mm hand or 3/90 x 3.15mm power-driven nails at 600mm centres.

In addition, for elements with an 'H' specification, use GIB HandiBrac® panel hold-down fixings at each end of the bracing element, see p.16.

CONCRETE FLOOR – EXTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix external wall plates in accordance with NZS 3604:2011.

Use GIB HandiBrac® panel hold-down fixings at each end of bracing elements with an 'H' specification and minimum intermediate fixings as required by NZS 3604:2011.

CONCRETE FLOOR – INTERNAL WALL BRACING ELEMENTS

For bracing elements with an 'N' specification fix plates in accordance with NZS 3604:2011 or use 75 x 3.8mm shot-fired fasteners with 16mm discs spaced at 150 and 300mm from end-studs and 600mm centres thereafter.

For bracing elements with an 'H' specification use GIB HandiBrac® panel hold-down fixings at each end of the element and minimum intermediate fixings as required by NZS 3604:2011.

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

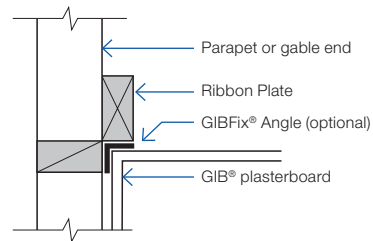
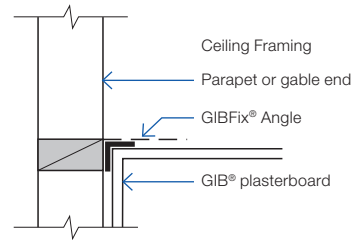


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required.	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm discs, 150mm and 300mm from each end of the bracing element and at 600mm thereafter.	Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011.
GS2-N	Not applicable.		
GS2-NOM			
GSP-H BL1-H BLP-H	Intermediate fastenings to comply with NZS 3604:2011 In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.		Pairs of 100 x 3.75mm flat head hand driven nails or 3/90 x 3.15mm power driven nails at 600mm centres in accordance with NZS 3604:2011. In addition: GIB HandiBrac® fixings or metal wrap-around strap fixings and bolt as illustrated on p.15 and 16.
BLG-H	Not applicable	As for GSP-H, BL1-H, BLP-H on concrete slab as illustrated on p.15 and 16.	

Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and

positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

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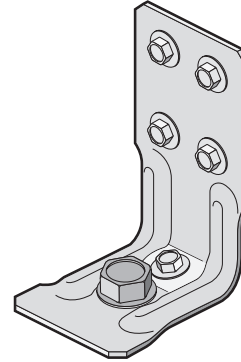
Concrete floor		Timber floor	
<p>400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.</p>			
Internal wall		Internal wall	
<p>GEB004</p>	<p>GEB005</p>		
External wall		External wall	
<p>GEB006</p>	<p>GEB007</p>		
<p>Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.</p>		<p>2/300 x 25 x 0.9mm galvanised straps with six 30 x 2.5mm flat head galvanised nails to each stud and into the floor joist and three nails to the plate. Block to nog fixed with 3/100 x 3.75mm nails to stud.</p>	
		<p>GEB008</p>	
Hold-down fastener requirements			
Concrete floor		Timber floor	
<p>A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.</p>		<p>12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element</p>	

GIB HandiBrac[®] installation

Developed in conjunction with MiTek[™], the GIB HandiBrac[®] has been designed and tested by Winstone Wallboards for use in GIB EzyBrace[®] elements that require hold-downs. The GIB HandiBrac[®] is a substitute for bottom plate hold-down straps.

- Quick and easy to fit.
- May be fitted at any stage before lining.
- Framing face is clear to allow flush lining.
- Easily inspected.

The GIB HandiBrac[®] with BOWMAC[®] blue head screw bolt is suitable for timber and concrete floors constructed in accordance with NZS 3604:2011.



Concrete floor		Timber floor	
External walls	Internal walls	External walls	Internal walls
<p>GEB009</p>	<p>GEB010</p>	<p>GEB011</p>	<p>GEB012</p>
Position GIB HandiBrac [®] as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac [®] at the stud/plate junction and at mid-width of plate.	Position GIB HandiBrac [®] flush with the outside stud face, as close as practicable to the centre of the boundary joist.	Position GIB HandiBrac [®] in the centre of floor joist or full depth solid block.
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or use supplied BT10/140 screwbolt in GIB HandiBrac [®] pack.		12 x 150mm galvanised coach screw or use supplied BT10/140 screwbolt in GIB HandiBrac [®] pack.	

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GIB HandiBrac[®] placement with GIBFix[®] Framing System for concrete floors

Figure 18 shows the preferred positioning of the GIB HandiBrac[®] panel hold-down brackets within the GIBFix[®] Framing System layout and where they are required by bracing systems with an 'H' in the specification code.

Note that, in corners and at wall junctions, a single GIB HandiBrac[®] can serve 'H' type bracing elements in both directions, but additional intermediate concrete anchors may need to be installed to meet the minimum requirements of NZS 3604:2011 for bottom plate fixing.

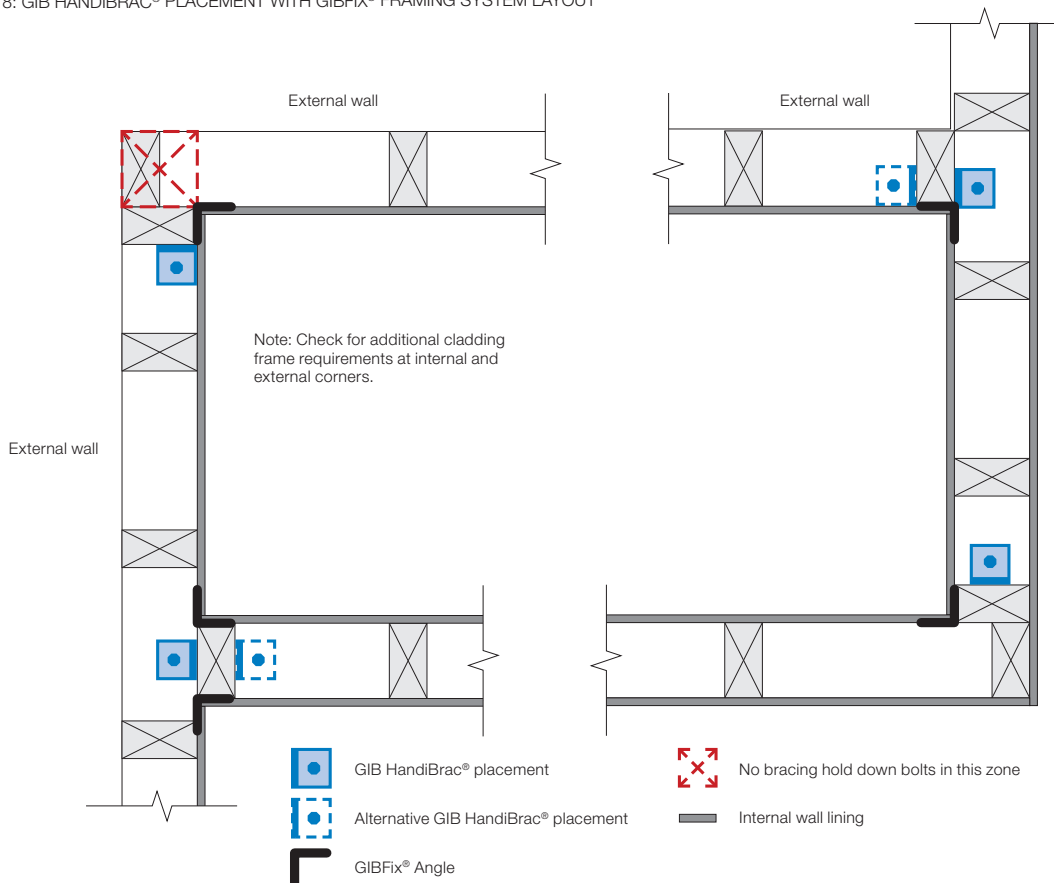
The GIB HandiBrac[®] is fixed to the stud which has the GIBFix[®] Angle.

For bracing elements with sheet material both sides of the wall connect corner studs using 8/90mm gun nails as shown in figure 19.

TIMBER FLOORS

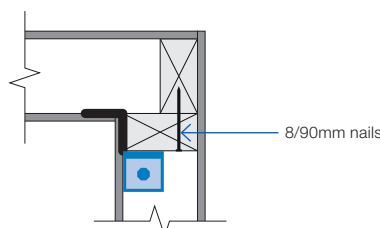
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

FIGURE 18: GIB HANDIBRAC[®] PLACEMENT WITH GIBFIX[®] FRAMING SYSTEM LAYOUT



GEB013

FIGURE 19: STUD CONNECTION FOR 'H' TYPE BRACING ELEMENTS WITH SHEET MATERIAL BOTH SIDES



GEB014

Length of GIB EzyBrace® elements ('N' Type)

The length of GIB EzyBrace® elements with an 'N' extension (requiring standard NZS3604:2011 plate connections) can be taken as the full frame length measured from the outside of the end-stud to the opening face as illustrated in figures 29-32.

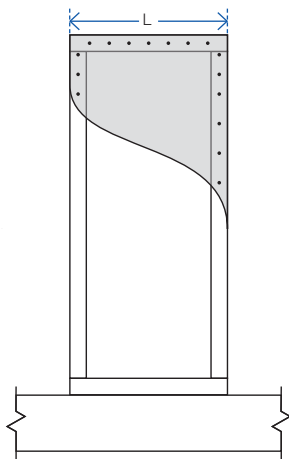
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

The dimension 'L' shall not be less than 400mm.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening.

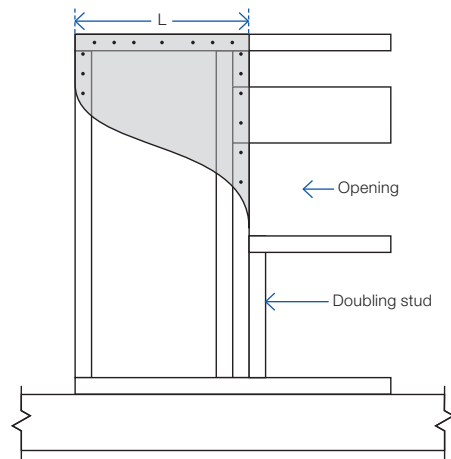
Fastener spacings and diagram scales shown in Figures 29-32 are indicative only. Refer to p.23-30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



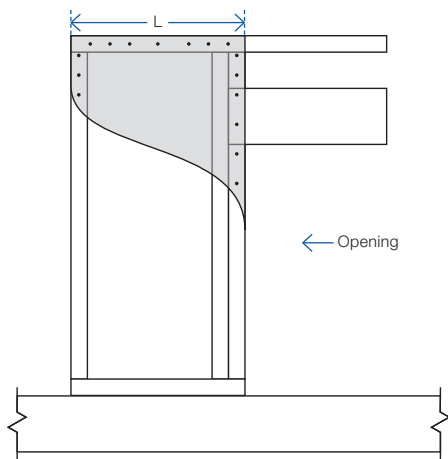
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



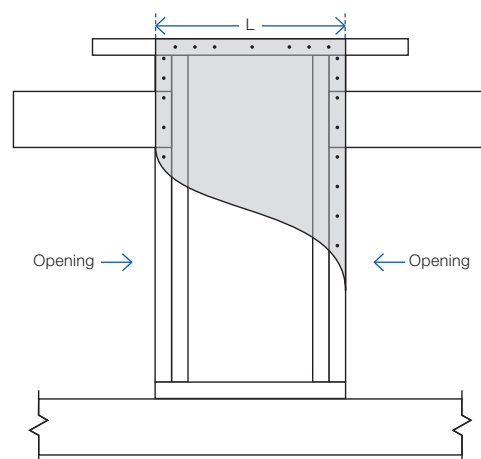
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



GS1-N, GS2-N elements
'L' indicates the length of the bracing element

Length of GIB EzyBrace® elements ('H' Type)

GIB EzyBrace® elements with an 'H' extension (requiring special panel hold-down fixings) can be used when the dimension 'L' as illustrated in figures 33–36 is 400mm or more.

'H' type GIB EzyBrace® elements are identified by GIB® specification numbers GSP-H, BL1-H, BLG-H and BLP-H.

The length of an 'H' type element is not only determined by the sheet material, but also by the placement of the hold-down fixings.

Hold-down fixings cannot be placed closer together than what is shown for the standard panel in figure 33.

Hold-down fixings can be placed under windows provided sill trimming studs beneath the opening are connected to the bracing element using 8/90mm gun nails, as illustrated in figure 34.

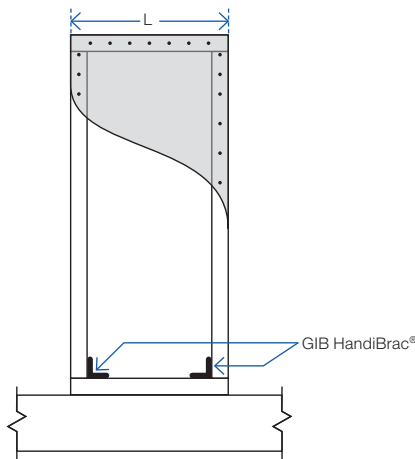
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

Perimeter bracing fixing for linings of both 'H' and 'N' type elements is along the top and bottom plates, end stud, and doubling stud immediately adjacent to the opening as indicated in figures 34-36.

When using bracing straps, installed in accordance with p.17, fix the strap to the same framing member as shown for the GIB Handibrac® below, and install the adjacent anchor bolt in the same position as the GIB Handibrac® bolt.

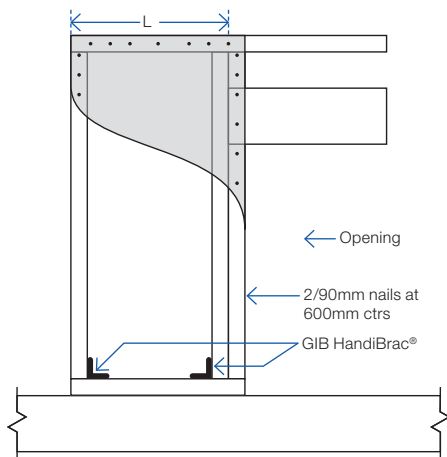
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



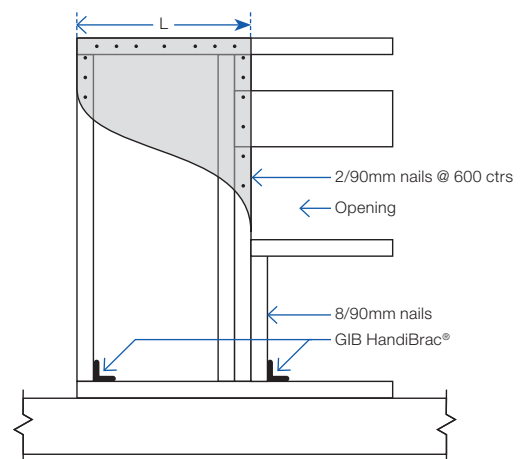
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



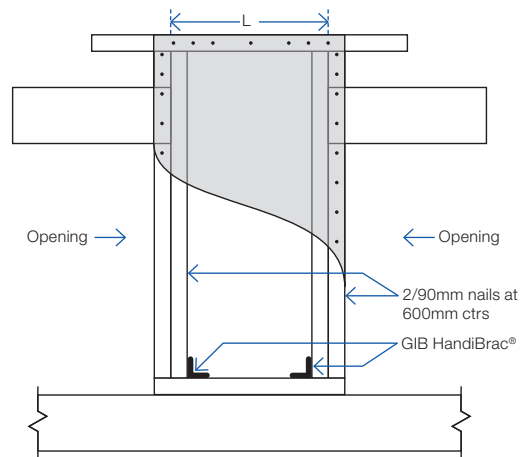
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



'H' type elements with specific hold downs
'L' indicates the length of the bracing element

GIB EzyBrace® Systems specification GS1-N

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Specification code	Minimum length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 – Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 – Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Internal Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for internal wall plate fixing or 75 x 3.8mm shot fired fasteners with 16mm discs spaced at 150mm and 300mm from end studs and 600mm centres thereafter.

External Wall Bracing Lines: In accordance with the requirements of NZS 3604:2011 for external wall bottom plate fixing.

WALL LINING

- Any 10mm or 13mm GIB® plasterboard lining.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

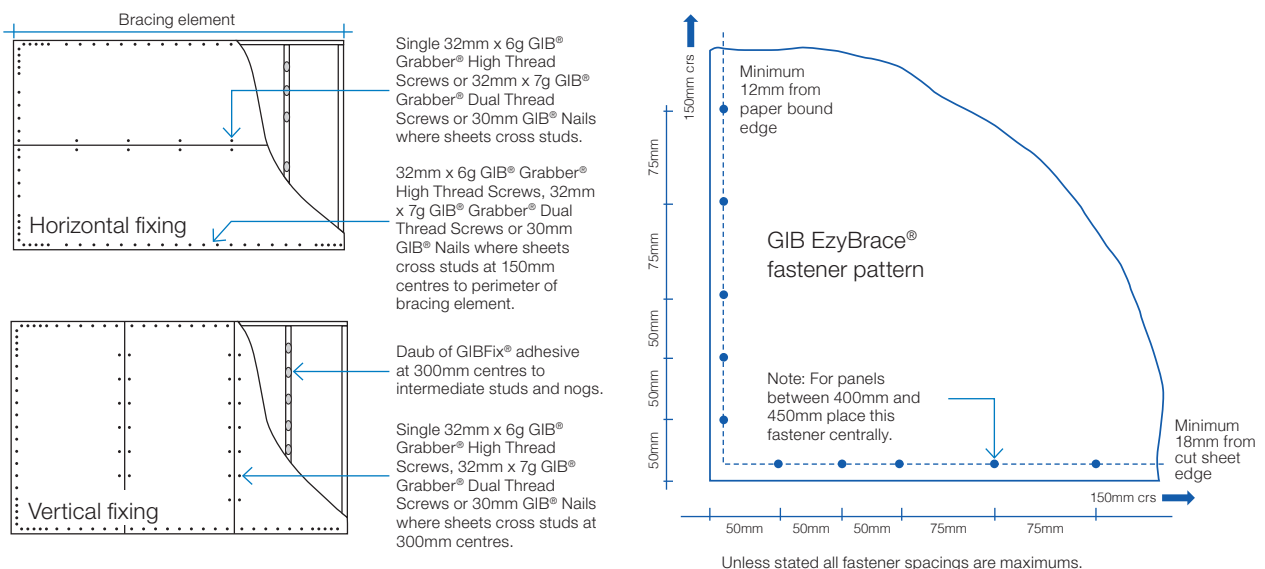
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

GIB EzyBrace® Systems specification BL1-H

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Specification code	Minimum length (m)	Lining requirement	Other requirements
BL1-H	0.4	10mm or 13mm GIB Braceline® to one side only	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 – Structure B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 – Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of NZS 3604:2011.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline®
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

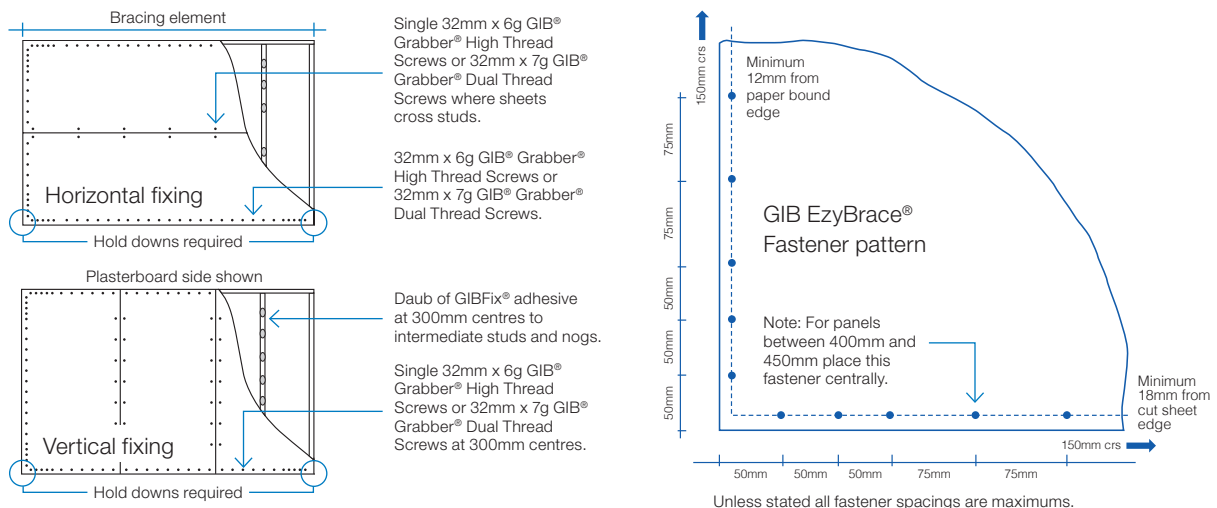
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

50,100,150, 225, 300mm from maximum each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the sheet joint. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems



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Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERT}™

The Global GreenTag^{Cert}™ certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag^{Cert}™

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

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Winstone Wallboards asserts its moral rights and reserves all other intellectual property rights in the materials contained in this brochure and related to GIBFix® Framing System and GIB EzyBrace® Systems.

TRADEMARKS

The names GIB®, GIB Fyrelite®, GIB Ultralite®, GIB Braceline®, GIB Toughline®, GIB Noiseline®, GIB Aqualine®, GIB Nail®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, the colour mauve for GIB Toughline®, GIB HandiBrac®, GIB EzyBrace®, the colour blue for GIB Braceline®, the colour pink for GIB Fyrelite®, the colour green for GIB Aqualine®, and the shield device are registered trademarks of Fletcher Building Holdings Limited.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.



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FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

J24
~~R28~~
~~R31~~
~~D27~~
~~D31~~

Attic Stairs

Installation Instructions

Important

Strong springs aid the operation of these stairs! Care must be exercised during installation and operation so these springs are not released in an uncontrolled manner as this could lead to damage to the stair or personal injury to the operator/installer.

Tools Required

The Timbertight screws supplied with this stair require a 5/16" socket for easy installation. This can be used with a 9 volt (or stronger) battery drill or a standard power drill. Apart from this only standard carpentry tools are required.

Choosing the Location

When choosing the location for the installation of the attic stair a compromise between where you would like it to be located in relation to the floor plan and what is possible in relation to the roof structure may be required. The considerations for this compromise are set out below.

1. Choose a location that will give good headroom at the top of the stairs.
2. Choose a location with good access at the bottom of the stairs.
3. Choose a location that will allow for movement around the stair when in the down position.
4. Allowance must be made for the operation of the stairs, as they require a greater space to open than indicated by the opening in the ceiling (figure 1). *All dimensions in mm.*

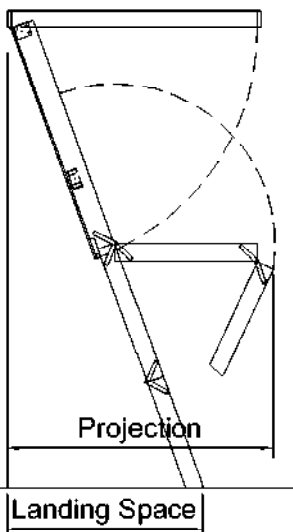


fig 1



fig 2



fig 3

Model	Required Opening	Landing Space	Projection
J24	1135 x 560	1050	1490
R28	1370 x 650	1180	1570
R31	1370 x 650	1300	1760
D27	1370 x 650	1600	1900
D31	1440 x 650	1880	2100

5. The area for the opening must be clear of wiring, plumbing and structural members such as beams and trusses with a minimum clear height above the ceiling of 320mm for the J24, R28 and R31 models (figure 2) and 420mm for the D27 and D31 (figure 3).

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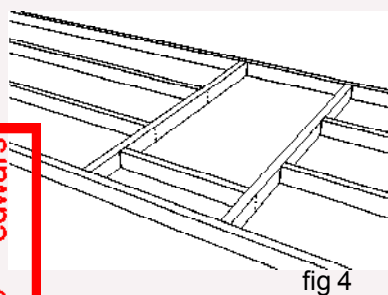


fig 4

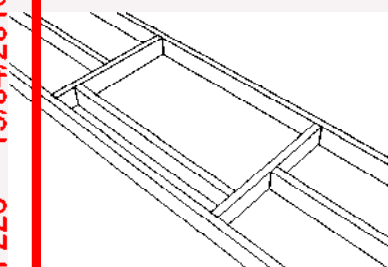


fig 5

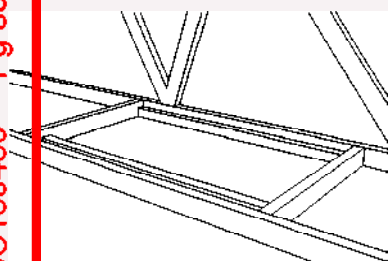


fig 6

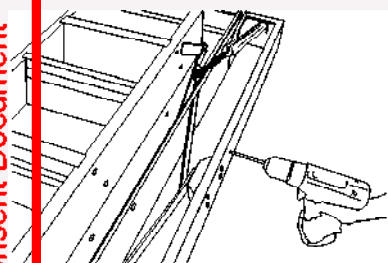


fig 7

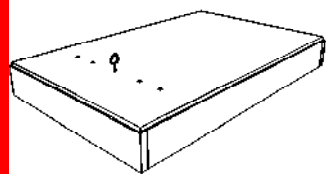


fig 8

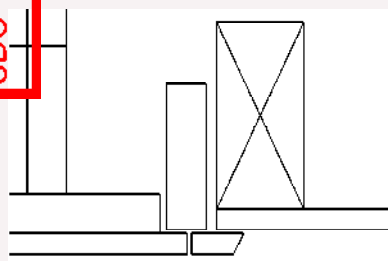


fig 9

Preparing the Opening

1. Mark out on the ceiling the opening required for the model stair purchased in the selected position. Then cut out the ceiling lining ensuring that the opening is square.
2. Using timber of a compatible size to the existing ceiling framing, ie 100 x 50 or 150 x 50 H1 treated, machine gauged radiata pine, frame up the opening. It may be necessary to cut through some existing ceiling joists to achieve the required size. Ensure these are properly supported during and after cutting. Three possible arrangements are shown in figures 4, 5 and 6.
3. DO NOT CUT TRUSSES without engineering approval.

Preparing the Stairs

1. Remove the stair from its packaging and place it lid down on a bench or saw stool. It's less likely to damage the lid there than laying it on the ground as well as being better for your back!
2. Drill 4 x 6mm (1/4") holes in the outside frame in the following positions:-
 - One in each side of frame near the blocks that hold the stays on to the side frame
 - One in each frame side 160mm in from the opening end.

These holes must be positioned so the screws going through them will fix into solid timber. They will be 45 – 60mm from the bottom of the frame (figure 7).

3. Turn the lid over so the lid is facing up.
4. You may choose to prepare the lid for painting by filling and sanding the screw holes now as it is easier now than later, when the unit is in the ceiling.
5. Fit the screw eye which is taped to the operating rod to the lid 100mm in from the opening end, midway across the width (figure 8).

Installing the stairs

Note; The stairs are designed to be installed with the outside frame flush with the underside of the ceiling lining. An architrave will cover the gap between the stair frame and the ceiling lining while also hiding the edge of the lid from view (figure 9).

Optional; If the stair is to be installed as the house is being built and before the ceiling lining is fitted you may choose to fit the stair frame flush with the bottom of the ceiling battens (figure 10). A "J" channel is then fitted to the stair frame and ceiling lining fitted into the "J" frame to achieve a square stop finish.

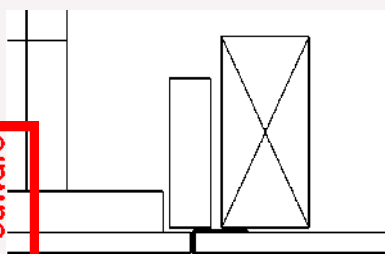


fig 10

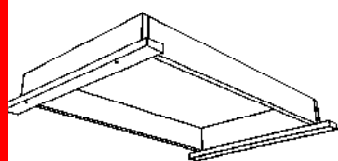


fig 11

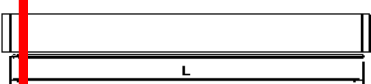


fig 12

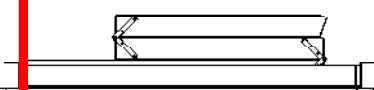


fig 13

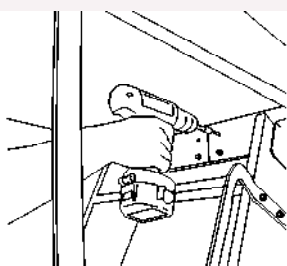


fig 14

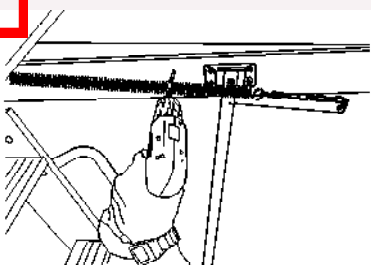


fig 15

1. Screw two temporary cleats that are the full width of the opening to the ceiling (figure 11). Fix one cleat at the hinge end protruding 15mm into the opening. The other, at the opening end, must protrude 15mm into the opening also. The distance between these cleats must be $L + 10\text{mm}$ as seen in figure 12.

The cleats must be securely fixed as they carry the full weight of the stairs

Note; If the stairs are to be installed before the ceiling lining is in place, the cleats must be packed down the thickness of the intended ceiling lining unless a "J" channel is being used.

2. Lift the stairs through the opening into the attic space. Then lower them down squarely into the opening so the frame of the stair rests on the temporary cleats (figure 13). This is normally best done from below and can be done by one person, but it is very much easier and safer with two people.
3. Check and confirm there is plenty of frame sitting on the cleats before proceeding further. Adjust if necessary. **The stairs must not be allowed to fall, as this could cause SERIOUS PHYSICAL DAMAGE.**
4. Carefully open the stair, checking that the frame remains securely on the cleats. Adjust if necessary. **DO NOT PUT ANY WEIGHT ON THE STAIR AT THIS STAGE.**
5. From a step ladder or saw stool or similar (**not the attic stair**), fix the hinge end of the stair to the ceiling framing through the two outer predrilled holes in the hinge plates (figure 14). Use the 65mm Timbertight screws supplied or something similar. Do not fit tight yet.
6. Carefully close the stairs and check for square. Wedges may be needed at one side of the hinge strip to square the unit in the opening. This may require reopening the stairs and loosening or tightening one of the screws a little.
7. With the stairs open screw through the holes you previously drilled in the side frame into the ceiling frame (figure 15). Do not fit tight yet.
8. Remove temporary cleats.
9. Carefully close the stairs and check that an even amount of the stair frame is showing around the lid. Adjust the side fixings and fit packing as necessary between the stair frame and the ceiling frame. Make sure the sides stay plumb and straight.
10. Now tighten all screws and check again. Fit more screws through the predrilled holes in the hinge plate.
11. With the top and middle sections of the stair open and the bottom section tucked in behind, measure the distance from the bottom of the middle section, to the floor at the same angle as the stairs (figure 16). Do this on both sides.

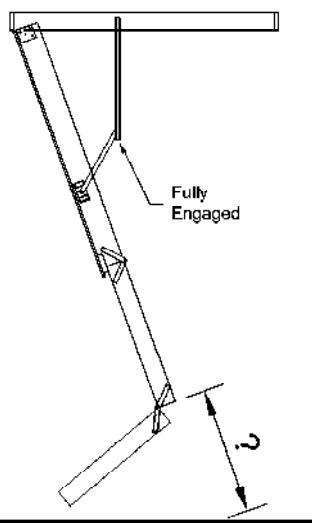


fig 16

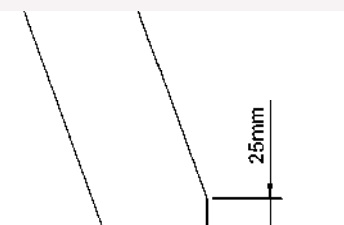


fig 17

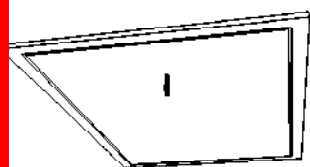
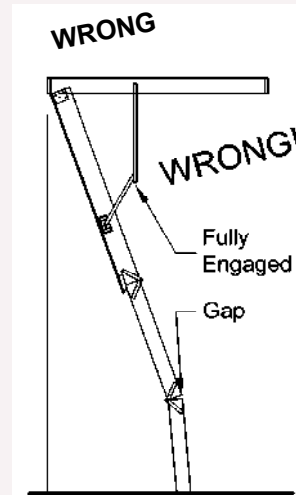
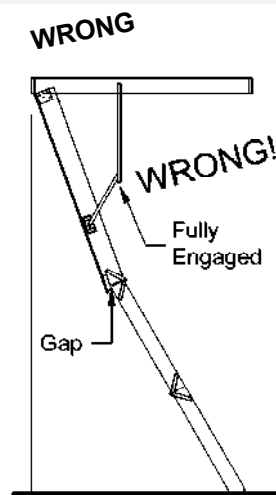
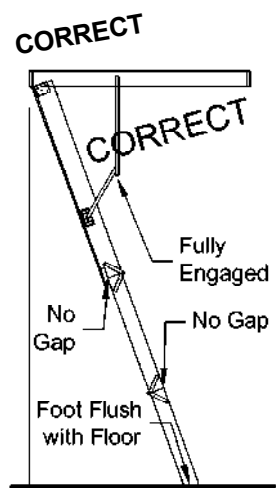


fig 18



12. Transfer these measurements to the front of the appropriate side of the bottom section of the stair. Mark the cut off back from these points at the same angle as the treads.
 - Measure twice
 - Cut Once
13. **Important: Cut the front corners back 25mm** - this can make the stair easier to close and can also prevent damage to the stair if dropped during opening (figure 17).
14. Fix a suitable architrave around the lid leaving a 2-3mm gap or fit "J" channel for flush finish (figure 18).
15. Finish and paint as required.

These instructions are not intended to be a complete lesson in the installing of attic stairs but a procedural guide to competent trades people or home do it yourself people.

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www.sellwood.co.nz

**Peter Ray
Homes**

MADE FOR YOU. BY US.

8 March 2018

Peter Bee
Peter Ray Homes Ltd
PO Box 8184
Christchurch

Dear Peter

SOAK PIT SIZING FOR LOT 297 FARINGDON SOUTH, ROLLESTON

1. Introduction

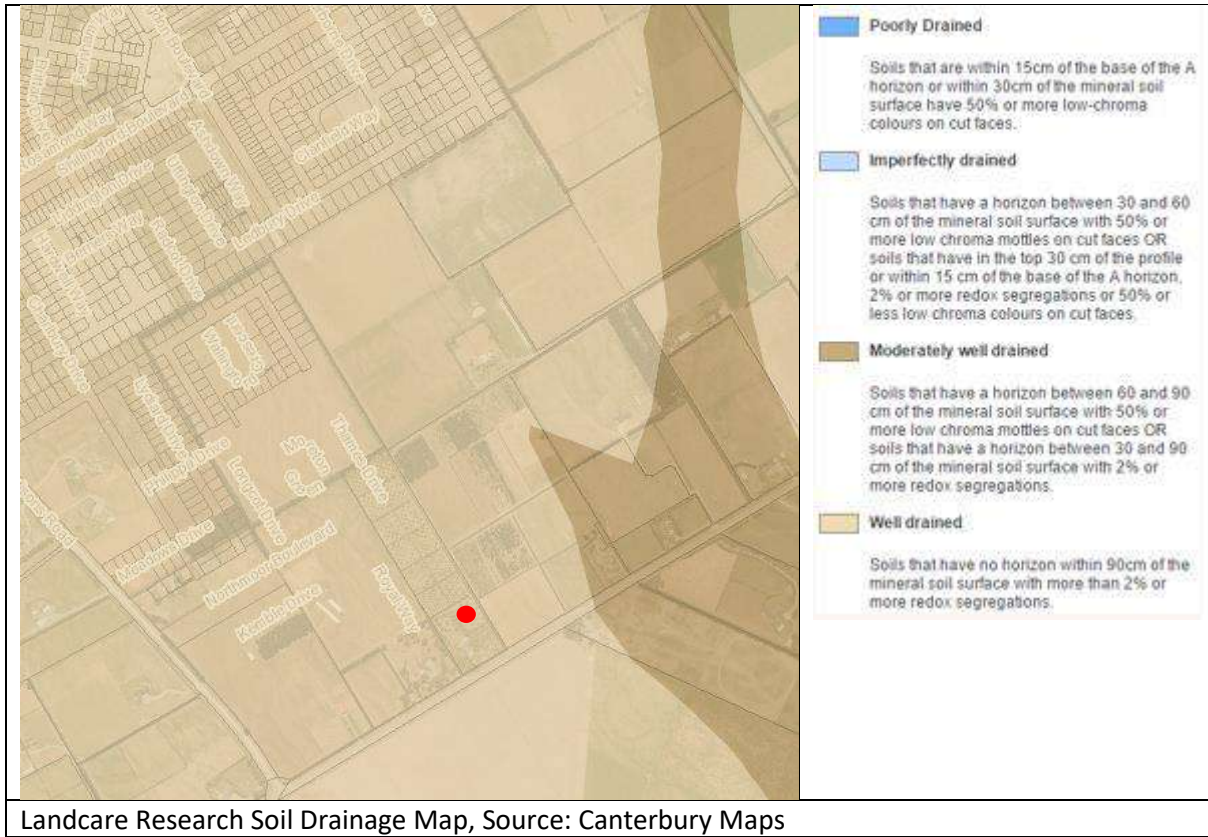
The Selwyn District Council (SDC) requires specific soak pit design for new soak pits. Soak pits can either be designed using actual soakage test results from the site to show compliance in accordance with E1/VM1 or using an Alternative Solution. If an Alternative Solution is used, then evidence and supporting documentation is required to support the design soakage rate used to size the soak pits.

The discharge of stormwater at this site need to meet the conditions of the stormwater consent for the subdivision (CRC173292). Condition 7 of this consent requires roof water soak pits to be sized contain and dispose of all stormwater from 10 yr (10% AEP), 1 hr design storm and there must be 1 m between the base of the soak pit and the highest expected groundwater level.

The site is shown on the Landcare Research soils mapping database SMaps to be well drained (see below; red dot marks the general site location). So the soakage rate is expected to be relatively high, which is consistent with many parts of Rolleston. Testing of sites by Whiterock Consulting Ltd in the Farrington Subdivision has found that the soakage rate ranged from 2,000 mm/hr to over 20,000 mm/hr.

For this site a soakage rate of **1,000 mm/hr** has been used to size the soak pits. This is expected to be conservatively low to allow for partial blockage of the soak pit over time and to account for the natural variation of the gravels in the general area. However, the drain layer will be responsible for confirming free draining gravels are present.

With respect to the separation depth to groundwater, there are no nearby water level recorders. The nearest well to the site (M36/3392) is located approximately 50 m south had an initial water level reading of 4.6 m below ground level. The soak pit is estimated to be 2- 3 deep and therefore there will be 1 m separation to the highest expected groundwater.



2. Soak Pit Sizing

The SDC Engineering Code of Practice, Part-5-Stormwater has been used to select the rainfall data. This is summarised below:

- Rolleston scaling factor: 1.03 * Christchurch Aero Rainfall
- Additional scaling: + 16% for climate change

Design rainfall depth for site (10 yr, 1 hr): $1.03 * 19 \text{ mm/hr} * 1.16 = \mathbf{22.7 \text{ mm/hr}}$.

The site details used to size the soak pit are presented in Table 1.

Parameter	Value	Unit
Total roof area	342.8	m ²
Total hardstand area (drive to go to soak pit)	60	m ²
Runoff C	0.9	
Design infiltration rate (base only)	1,000	mm/hr
Design i (10 yr, 1 hr)	22.7	mm/hr

(SDC rainfall data +16% for climate change)

Table 2 presents the minimum soak pit size for the proposed soak pit. It is recommended that the soak pit be located near the drive. This makes any future maintenance or replacement easier.

Table 2: Soak Pit Details:	
Contributing Area [m ²]: roof + drive [m ²]	403
Length (minimum - can be longer) [m]	3.0
Width (minimum - can be wider) [m]	1.5
Depth (This is an assumed depth, drainlayer to check and excavate to free draining gravels) [m]	2.5
Soak Pit base area [m²]	4.5
Total Soak Pit volume [m³]	11.3
Porosity	0.38
R _c : Volume of water to soak pit [m ³]	8.2
V _{soak} : Volume infiltrated [m ³]	4.5
V _{stor} : Storage volume in soak pit [m ³] [L*W* D-0.3 m*0.38] Note: it is assumed that the top 0.3 m of the soak pit is not available for storage	3.8
Total volume discharged/stored [m ³]	8.3
Volume exceeding soak pit storage (needs to be 0 or <0) [m ³]	0.0

change dimensions until 'Volume remaining' is 0 or <0

3. Summary and Recommendations

A soakage test has not been undertaken at the site. A design infiltration rate of 1,000 mm/hr has been adopted for the design of the soak pit at this property. The soak pit size based on this assumption is presented in Table 2. The length and width of the soak pit can be altered to suit the site, but the base area and total volume presented in Table 2 must be maintained. The depth presented in the table is assumed and the **drainlayer is to ensure that the base of the soak pit is installed into free draining gravels.**

If you have any questions please do not hesitate to contact me.

Yours Sincerely

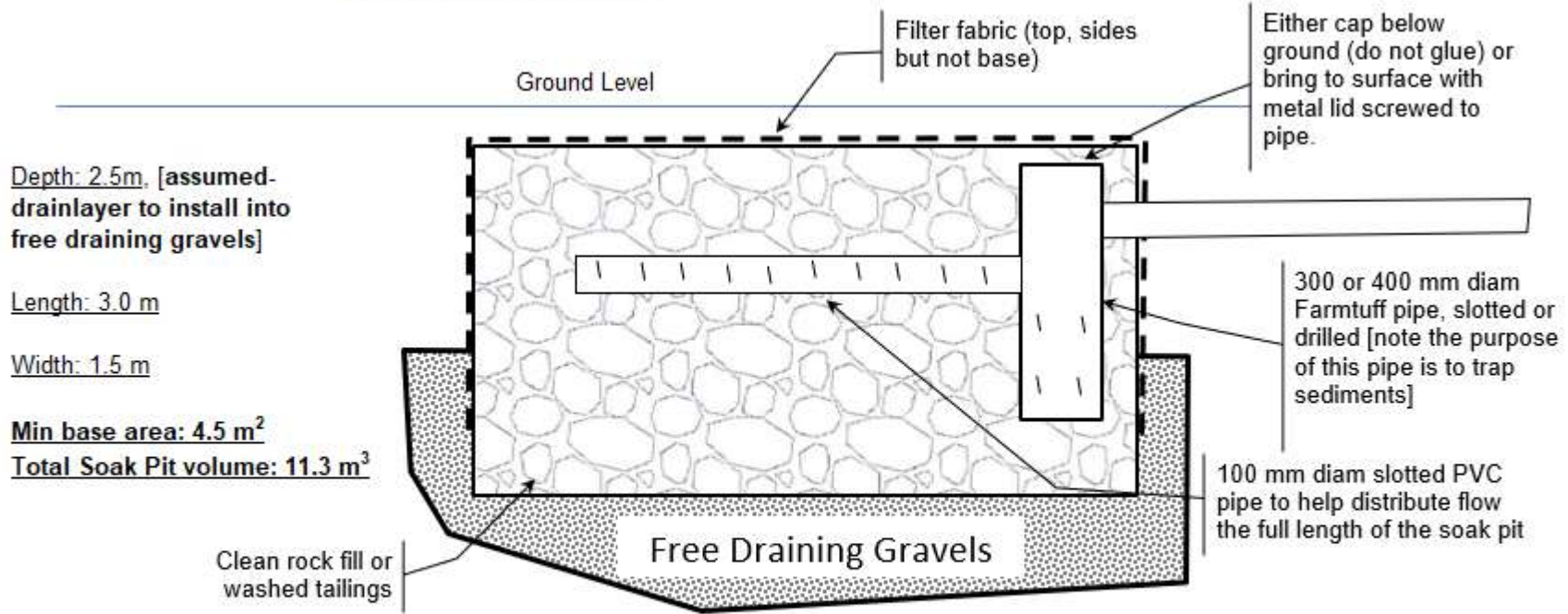
WHITEROCK CONSULTING LTD



Fiona Ambury

Natural Resources Engineer, Director
CPEng, CMEngNZ, IntPE(NZ)

Soak Pit Cross Section



NOT TO SCALE

Prepared by: Whiterock Consulting Ltd
Date: 8/03/18

Bitumac® 750

Heavy Duty Non Fire Retardant Kraft Roof Underlay

Application

Bitumac® 750 is a heavy duty kraft recommended for use as self-supporting roof underlay where fire retardant properties are not important

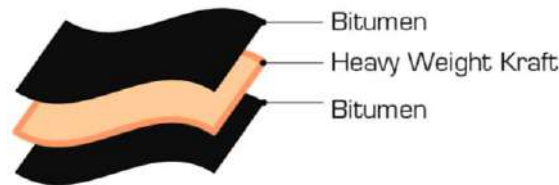
Suitable for:

- All roof cladding types including concrete and clay tiles, profiled metal and pressed metal tiles
- Direct fixing under absorbent and non absorbent roof claddings such as profiled metal

Features and Benefits

- Self-supporting heavy duty product that can be installed without support for spans up to 1200mm
- Absorbent allowing it to be used with all cladding types
- Vapour permeable allowing vapour to pass through preventing the build up of condensation

Technical Data



NZBC E2/AS1 Table 23 Classification	Requirement	Performance
Absorbency	≥ 100g/m ²	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Tensile Strength MD >12.5 kN/m, CD>7.5 kN/m Edge Tear MD >80 N, CD>80N	Heavy Duty
Air resistance	≥ 0.1 MN s/m ³	Pass
Additional Information NZS 2295:2006 Classifications for Self-supporting Roof Underlays		
Flammability Index	≤5	Non Fire Retardant
NZS 2295:2006 Classification	R2	Self-supporting
Wind load zone	R2	Up to Very High

New Zealand Building Code (NZBC) and Limitations

When used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause E2: External Moisture

Bitumac® 750 meets the requirements of NZBC E2/AS1 Table 23 for use as a:

- Roof underlay
- Wall wrap
- Air barrier

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

Limitations

To meet the above Bitumac® 750 must be:

- Installed as specified on this data sheet
- Kept dry at all times and not allowed to remain wet during construction or in service
- Maintained in a cavity where it is subject to intermittent wetting only and not exposed to sustained humidities in excess of 90% RH i.e:
 - where timber moisture content > 18%,
 - or where other building elements are releasing moisture (e.g: drying concrete)

Installation

When installed on metal deck roofs or roofs with purlins Bitumac® 750 must be:

- Run vertically

When installed on tile roofs (metal/clay/concrete/other) with tile battens Bitumac® 750 must be:

- Run horizontally

Additional support (galvanised wire netting) is required where Bitumac® 750 is installed:

- On pitches below 8°, where anti-ponding boards must also be installed
- Under dark coloured metal cladding
- Where support spans are > 1200mm

For all roof types Bitumac® 750 must be:

- Fixed across its width and secured adequately in place with 8mm staples or 20mm clouts at no greater than 600mm centres across the width of the paper capturing *all* edges by the fastenings
- Lapped by 150mm and face away from the prevailing wind
- Run at lengths no greater than 10m
- Run over any ridges by no less than 150mm
- Sufficiently tensioned to ensure ponding does not occur
- Clad on the same day as installation (7 days maximum if Bitumac® 750 can be kept dry and undamaged)

Penetrations

- Underlay must fit tightly and be lap taped around penetrations, allowing for free drainage of condensation

Repairs

- Any damage must be repaired with a new piece of underlay that is captured on all edges by at least 300mm centres
- The covering piece must begin under the over lap of the upper sheet or at the ridge
- The covering piece must also cover the damaged area by at least 150mm on each side

Installation with LOSP treated timber

Suitable for use with LOSP treated timber, conditional upon the solvent in LOSP treated timber having had sufficient time to evaporate (usually 4 days after treatment under appropriate environmental conditions)

Specification Notes

State the following: Product required: Bitumac® 750 Non Fire Retardant Roof Underlay

Product Specification

Description	Product Code	Roll Size	Area	GSM
Bitumac® 750	7886033	1200mm x 33.4m	40m ²	400gsm
Bitumac® 750	7886040	1250mm x 40m	50m ²	400gsm

Bitumac® 750 replaces Bitumac® 860. Product manufacture and properties are identical. Classifications updated to meet NZBC E2/AS1 Table 23

Storage

Bitumac® 750 must be protected against damage and weather. Rolls must be stored on end, under cover in a clean, dry environment. Do not crush product

Accreditations/Appraisals/Certification

Tasman Insulation New Zealand Ltd
Certified QMS

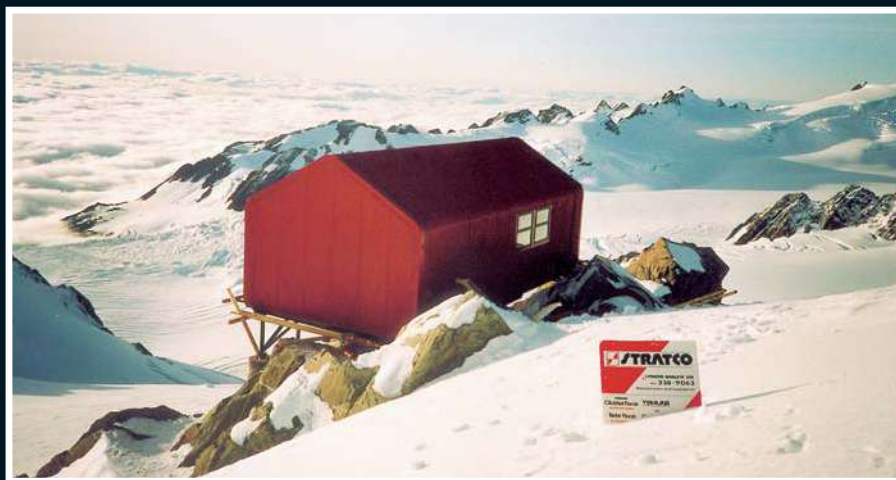


Tasman Insulation New Zealand
Limited
9-15 Holloway Place, Penrose,
Auckland,
New Zealand

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ROOFING AND CLADDING

Corrugate ■ Superdek ■ Trimline®

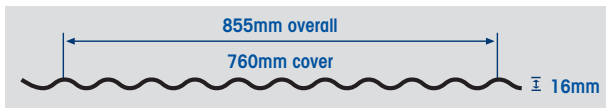
ROOFING AND CLADDING

PRODUCT

Stratco have a wide range of metal roofing and cladding profiles designed to meet specific building requirements. This is backed by a comprehensive range of accessory products designed to make your next project purchases easy.

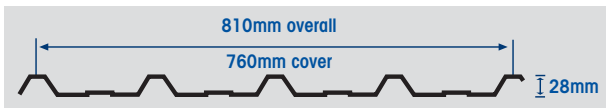
■ Corrugate

Corrugate is a high tensile steel sheeting which is commonly found throughout New Zealand. It has the advantages of high strength and adaptability. Corrugate is a practical and versatile roofing/walling material. Its design enables it to blend in with old and new style homes, industrial buildings or even industrial sheds. In addition corrugate has always been a popular sheeting to use in domestic fencing. Corrugate can also be curved to produce architecturally attractive roof forms.



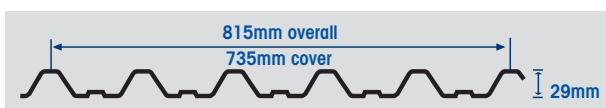
■ Superdek

Stratco Superdek is a high tensile steel profile sheet, guaranteed to meet New Zealand's tough building requirements. Superdek is particularly suitable for fencing, roofing and wall cladding applications because of high strength and its clean, modern, good looking appearance. In fact, the popular Stratco Good Neighbour fence is constructed of Superdek fencing sheets. Superdek is also economical to use due to its low material cost and easy fixing methods. It has relatively low rib height (28mm) which makes it attractive to use but also enables Superdek to span further than most roofing materials such as corrugate profiles.



■ Trimline®

Trimline® is an extremely versatile cladding product that can be used in either domestic or industrial applications. The six rib profile of Trimline® gives it a bold, strong appearance, and makes it an excellent product to use on garage doors. Additionally Trimline® can be press crimp formed to produce our Flocurve product. The curved appearance of Flocurve makes it a particularly attractive addition to any commercial building.



COLOUR OPTIONS

Roofing and cladding products are available in Galvanised and Zinalume® finish. A full range of colour finishes are also available to suit any building design. For walling applications, a range of double sided colours are stocked.



MINIMUM ROOF PITCH

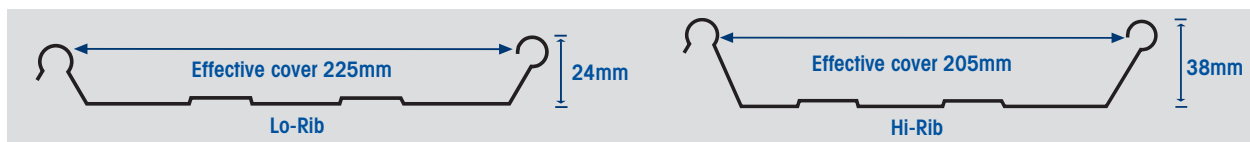
When designing a roof, consideration should be given to the pitch of the roof to ensure there is sufficient runoff. In general, the longer the roof span then the greater the roof pitch should be to ensure blowback and the overflow of side laps does not occur. On very low pitch roofs the chance of ponding is increased which can lead to the accelerated corrosion of Zincolume® material.

Profile	Non-snow zone	Snow Zone
Corrugate	8°	10°
Superdek	3°	5°
Trimline®	3°	5°

Note: when using minimum pitches the pan of the sheet should be turned down at gutter end and up at top to stop capillary action of water into the roof cavity.

MINIDEK

Also available for low pitch roofing is Stratco Minidek which is a strong tray roofing profile. Minidek utilises a secret fix clip system, therefore all fastening is concealed. Minidek is available in low rib (225mm cover) and high rib (205mm cover).



LAYING PROCEDURE

The roofing sheets are laid directly from the pack with the short rib overlapping. Sheets should be laid into the prevailing wind as shown. Typically the pans of the roof sheet should be turned up at the ridge or apron line, and on low roof pitches down at the eave or gutter line. Roof sheets should overlap the gutter line by at least 50mm.



THERMAL MOVEMENT

For roofing sheets exceeding 8m in length the expansion and contraction of the metal due to temperature changes should be considered. Light coloured steel will move less than darker colour finishes. This may require oversize holes or special fastening methods such as sliding washers. Please contact Stratco for further advice.

UNDERLAY

Breather type roofing underlay should be used under roofing to remove and absorb moisture due to condensation. Underlay must conform to NZS 2295: 1988.

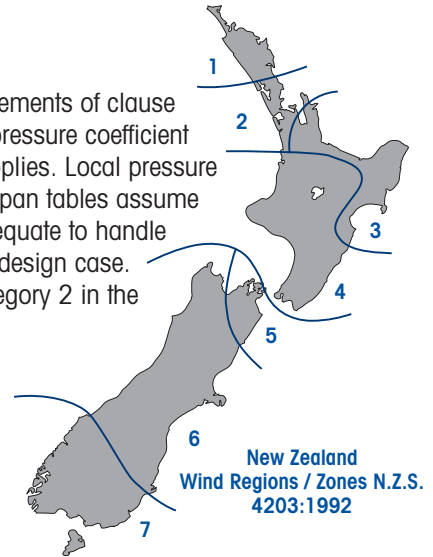
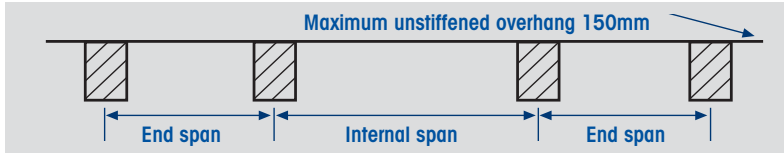
LENGTHS

Products are rolled to lengths to suit your specific requirements. Sheeting longer than 10m requires special transport, handling facilities and onsite labour to assist in unloading these sheets.



DESIGN CRITERIA

The span table values have been calculated to conform with the relevant requirements of clause B1 of the New Zealand Building Code 1992. For domestic roofing an internal pressure coefficient $C_{p,i}=+0.2$ has been used, and for industrial roofing and walling $C_{p,i}=+0.6$ applies. Local pressure factors have also been included in the determination of allowable spans. The span tables assume that the purlins and substructure to which the cladding material is fixed are adequate to handle the applied loadings. V_p refers to the permissible wind speed for the particular design case. Cat 3 refers to terrain category 3 in the loading code. Cat 2 refers to terrain category 2 in the loading code (more severe).



Material Specification

Material	Base Metal Thickness mm	Coating	Grade MPa	Approximate Mass kg/m ²	
				Superdek/Corrugate	Trimline®
Colour	0.35	AZ 150	G550	3.93	4.07
Colour	0.40	AZ 150	G550	4.43	4.59
Colour	0.55	AZ 150	G300	5.99	6.19
Zincalume®	0.35	AZ150	G550	3.84	3.97
Zincalume®	0.40	AZ150	G550	4.36	4.50
Zincalume®	0.55	AZ150	G300	5.91	6.11
Galvsteel™	0.40	Z450	G550	4.75	4.91
Galvsteel™	0.55	Z450	G300	6.30	6.52

Span Tables

MAXIMUM PURLIN / GIRT SPACING (allowable spans are in mm)
CORRUGATE

Zone 1 & 7 (up to 500m altitude and 500m to 1000m altitude)					
Terrain Category	Span Type	0.4mm BMT Domestic Roofing	0.4mm BMT Industrial Roofing	0.4mm BMT Industrial Walling	0.35mm BMT Industrial Walling
Category 3 $V_p=31m/s$	End Span	900	900	1400	950
	Internal Span	1200	1200	1750	1450
Category 2 $V_p=37m/s$	End Span	800	650	1100	500
	Internal Span	1200	900	1350	1000

Zone 5 (up to 500m altitude and 500m to 1000m altitude)					
Terrain Category	Span Type	0.4mm BMT Domestic Roofing	0.4mm BMT Industrial Roofing	0.4mm BMT Industrial Walling	0.35mm BMT Industrial Walling
Category 3 $V_p=33m/s$	End Span	900	800	1200	800
	Internal Span	1200	1200	1550	1300
Category 2 $V_p=40m/s$	End Span	650	500	1000	na
	Internal Span	1100	825	1250	na

Zone 2, 3, 4 & 6 (up to 500m altitude and 500m to 1000m altitude)					
Terrain Category	Span Type	0.4mm BMT Domestic Roofing	0.4mm BMT Industrial Roofing	0.4mm BMT Industrial Walling	0.35mm BMT Industrial Walling
Category 3 $V_p=29m/s$	End Span	900	900	1450	1100
	Internal Span	1200	1200	1800	1500
Category 2 $V_p=35m/s$	End Span	850	750	1150	700
	Internal Span	1200	1200	1500	1150

SUPERDEK

Zone 1 & 7 (up to 500m altitude and 500m to 1000m altitude)

Terrain Category	Span Type	0.4mm BMT		0.35mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=31m/s	End Span	1400	1150	1400	1300
	Internal Span	1750	1700	1800	1750
Category 2 Vp=37m/s	End Span	1000	950	1050	950
	Internal Span	1550	1250	1400	1350

Zone 5 (up to 500m altitude and 500m to 1000m altitude)

Terrain Category	Span Type	0.4mm BMT		0.35mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=33m/s	End Span	1200	1050	1150	1050
	Internal Span	1750	1500	1700	1650
Category 2 Vp=40m/s	End Span	950	850	950	850
	Internal Span	1250	1050	1250	1200

Zone 2, 3, 4 (up to 500m altitude and 500m to 1000m altitude) & zone 6 (up to 500m altitude)

Terrain Category	Span Type	0.4mm BMT		0.35mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=29m/s	End Span	1500	1350	1500	1400
	Internal Span	1800	1800	1900	1850
Category 2 Vp=35m/s	End Span	1100	1000	1050	1000
	Internal Span	1700	1400	1600	1550

Zone 6 (500m to 1000m altitude)

Terrain Category	Span Type	0.4mm BMT		0.35mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=28m/s	End Span	1250	1250	1550	1500
	Internal Span	1550	1550	1950	1900
Category 2 Vp=34m/s	End Span	1150	1000	1100	1050
	Internal Span	1550	1450	1650	1600

TRIMLINE®

Zone 1 & 7 (up to 500m altitude)

Terrain Category	Span Type	0.4mm BMT		0.55mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=31m/s	End Span	1800	1800	2250	2800
	Internal Span	2100	2100	2850	3500
Category 2 Vp=37m/s	End Span	1800	1800	1900	2800
	Internal Span	2100	2100	2400	3500


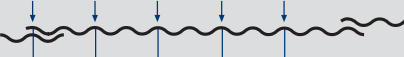


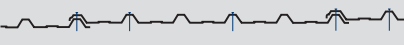

Zone 5 (up to 500m altitude)

Terrain Category	Span Type	0.4mm BMT		0.55mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=33m/s	End Span	1800	1800	2150	2800
	Internal Span	2100	2100	2700	3500
Category 2 Vp=40m/s	End Span	1800	1800	1750	2350
	Internal Span	2100	2100	2200	2950

Zone 2, 3, 4 & 6 (up to 500m altitude)

Terrain Category	Span Type	0.4mm BMT		0.55mm BMT	
		Domestic Roofing	Industrial Roofing	Industrial Walling	Industrial Walling
Category 3 Vp=29m/s	End Span	1800	1800	2450	2800
	Internal Span	2100	2100	3100	3500
Category 2 Vp=35m/s	End Span	1800	1800	2000	2700
	Internal Span	2100	2100	2550	3400

FIXING RECOMMENDATIONS

Application	Fixing Location	Fixing to Steel	Fixing to Timber
Corrugate Roofing	<p>Intermediate spans in moderate locations, 3 fasteners per sheet</p>  <p>Ends and severe locations, fix every second rib</p> 	12 x 35 self drilling screw, Class 3 finish with seal washer.	60mm spiral shank galvanised steel nail with seal washer or 12 x 50mm Type 17 screw, Class 3 finish with seal washer.
Superdek Roofing	<p>Intermediate spans in moderate locations, 3 fasteners per sheet</p>  <p>Ends and severe locations, fix every rib</p> 	12 x 45 self drilling screw, Class 3 finish with seal washer.	75mm spiral shank galvanised steel nail with seal washer or 12 x 65mm Type 17 screw, Class 3 finish with seal washer.
Trimline® Roofing	<p>Intermediate spans in moderate locations, 3 fasteners per sheet</p>  <p>Ends and severe locations, fix every rib</p> 	12 x 45 self drilling screw, Class 3 finish with seal washer.	75mm spiral shank galvanised steel nail with seal washer or 12 x 65mm Type 17 screw, Class 3 finish with seal washer.
Walling all Profiles	Pan fixing only with above intervals	10 x 16 self drilling screw, Class 3 finish with seal washer.	12 x 25 Type 17 screw, Class 3 finish with seal washer.

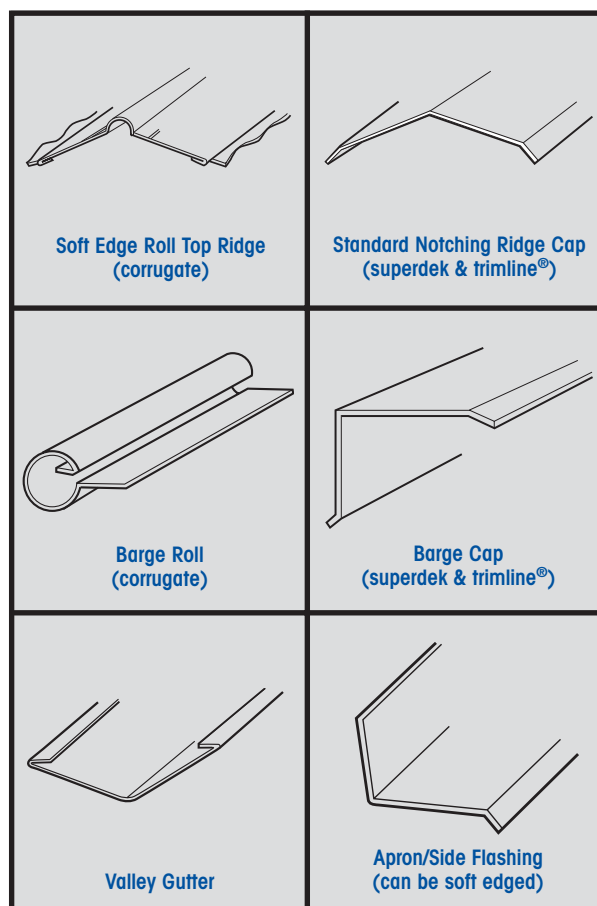
Please Note: All fasteners should comply with AS3566: 1990-Class 3. In certain environments different grades of fastener may be required

SIDE LAP FIXING

For Superdek and Trimline® roof spans exceeding 1500mm side lap fixing is necessary to maintain a weather proof seal and to secure the overlap, especially when the roof is walked on occasionally. This is best done with either 8 x 12mm self drill stitching screws or a 4.8mm aluminium rivet (rivets should be sealed to prevent water penetration with a neutral cure silicone sealant).

FLASHINGS

Flashings should be made from the same type of material as the roof cladding. Soft edge flashings such as ridgecaps should be of a compatible material such as aluminium or soft zinc for zincalume® base cladding (note lead or copper cannot be used with zincalume®). Flashings are made to custom lengths from site measurements up to 10m long. Generally 300mm extra is allowed on top of the neat measurement to allow for cutting and joining of the ends of flashings. Where possible flashings are primary fastened to the structure, such as a purlin for ridging. If thermal movement is a consideration flashings may be secondary fastened to the cladding with rivets. Where flashings are end lapped, they should be overlapped by a minimum of 150mm, and sealed with a neutral cure sealant. Shown opposite are some typical flashing details.



MATERIAL RECOMMENDATION

Environment	Moderate	Severe	Very Severe
Definition	Subject to little or no salt deposits, or little or no industrial fallout. Typically 500-1000m from surf.	Frequent smell of salt air or of industrial chemicals. Typically 100-500m from surf.	Subject to heavy salt deposits or close to corrosive industrial emission or breaking surf. Typically 0-100m from surf or heavy industry.
Material	Zincalume® Colorsteel® G2Z Colorsteel® VP Colorcote® ZR8 Colorcote® ZRX	Colorsteel® G2Z Colorsteel® VP Colorcote® ZR8 Colorcote® ZRX	Colorsteel® VP Colorcote® ZRX

PRODUCERS STATEMENT FOR ROOFING AND CLADDING

SPECIFICATIONS

Stratco Roofing & Cladding is rollformed from high tensile G550 Zincalume® and galvanised coated steel.

Zincalume® coated steel

THICKNESS	0.35,0.40	mm BMT
YIELD STRENGTH	550	MPa
COATING MASS	150	g/m ²

Galvanised coated steel

THICKNESS	0.35,0.40	mm BMT
YIELD STRENGTH	550	MPa
COATING MASS	450	g/m ²

0.55mm BMT material is also available on request.

CORRECT USE

For further details on installation methods refer to the Profiled Metal Roofing Handbook or contact your nearest Stratco Office.

Zincalume® steel is a zinc/aluminium alloy coated steel offering a high corrosion resistance. Zincalume® must not come into contact with lead or copper products.

The correct steel type should be selected for the particular environment or application. Colour finish Zincalume® product is not recommended for use in very severe environments eg. within approximately 100m of breaking surf, corrosive industrial emissions or geothermal zones. Consult Stratco for the correct material recommendation for very severe environments or refer to BHP New Zealand Steel technical bulletin "Environmental Categories" September 1993.

Unwashed areas exposed to the environment such as garage doors require increased maintenance. Failure to maintain a regular maintenance programme may result in a significantly reduced life span. **For further information on handling and maintenance please refer to the "Selection, Use and Maintenance of Stratco Steel Products" brochure.**

IMPORTANT NOTICE

The information in this brochure is based on a typical situation and is a guide only. It does not apply to every situation. If in doubt, or if using Stratco products in unfamiliar or unusual situations, advice should be obtained before use.

MANUFACTURER'S STATEMENT

This brochure is produced in the interest of customer education and good consumer relations. Stratco have endeavoured to provide the most technically correct and up-to-date advice possible. Alteration in the recommendations may occur from time to time. Please contact Stratco for the most up-to-date advice available prior to using this information. Additional information is available from steel manufacturers, other Stratco technical bulletins, trade schools and other competent bodies and these should be consulted prior to purchase and installation of Stratco steel products. Consumers should satisfy themselves that they are using the correct materials, approach and techniques. A copy of these specifications and information should be passed through to the owner or building manager who should be made aware of the standards that will be achieved and the maintenance requirements associated with the use of this product. This will avoid any doubt as to the suitability of the product for each specific project and contract. Stratco may change its product or cease to supply at any time. If a guaranteed supply is required, this should be arranged with Stratco before use.

CONFORMITY TO BUILDING CODES

Stratco's internal testing programme and certification by independent structural engineers indicates that the materials, forms of construction, and systems to which these span tables relate will, if installed and maintained in accordance with these recommendations, conform, as at the date of this brochure to the requirements of the New Zealand Building Code. To obtain a long useful life from your roofing product it must be used in accordance with the specifications, maintenance and handling criteria outlined in this brochure. This will ensure that the performance criteria of Clause B1 and B2 of the New Zealand Building Code, for a period of not less than 15 years will be met. Subject to the rights of consumers under the Consumers Guarantees Act any claim relating to Stratco Roofing and Cladding will be subject to Stratco's conditions of sale.

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OTHER APPLICATIONS



■ Stratco Good Neighbour Modular Fencing



■ Stratco Garden Sheds



■ Stratco Garages



■ Stratco Flocurve



■ Stratco Curved Corrugate



■ Stratco Rainwater Tanks

STRATCO ROOFING & CLADDING DISTRIBUTED BY:





Concept™ Fascia

The new improved Stratco Concept Fascia System.

Concept Features

Stratco have designed and developed the Concept Fascia System to become the best complete fascia system available on the market today. Features include:

Suspension Clips

Concept Fascia suspension clips allow the user to adjust the fall of the gutter to the amount required.



Internal and External Mitres

New die-cast internal and external mitre junctions are precise, create a superior moulded finish and are quick and easy to install.



Barge Moulds

The new die-cast Concept Fascia barge moulds are designed to provide visual continuity between the fascia and a 20 to 30 degree barge junction.



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Accentuate your home with smooth, modern curves.

Crafted With Style

The trend setting, contemporary style of Concept™ Fascia will set your home apart from the rest. Its smooth flowing lines and modern curves will accentuate the architecture of your home, giving it the visual appeal and fresh, uncluttered finish that only Concept Fascia can provide.

The rounded base on Concept Fascia provides a smooth finish that is complimented by bold, crafted stiffening ribs. The smooth appearance also has a practical purpose of being easier to clean.

Concept Fascia is available in a full spectrum of colours to compliment your home and environment. Its clean, attractive curves will blend with both modern and heritage styled buildings.

Installing Concept Fascia on a new or existing home is easy because the Concept Fascia System is compatible with both modern and traditional styled buildings.

Lasting Quality

Unlike timber, the Stratco Concept Fascia System will provide a consistent, quality product that does not warp, knot or crack and will keep looking good for many years to come.

Stratco Concept Fascia is manufactured from 0.45mm hi-tensile steel. It is engineered with stronger and deeper stiffening ribs to reduce any rippling effects in the face of the fascia. Larger bend radii minimises the risk of paint cracking. The extra width at the top of the Concept Fascia provides added stiffness, which will assist in maintaining straightness and minimise any bowing that could occur along the length of the fascia. This extra width will provide better support for the back of the gutter and also makes the installation process easier.

Concept Fascia has been designed and tested to comply with the relevant Australian/New Zealand Standards.



Accessories

Concept Fascia is finished with die-cast internal and external corner mitres. They are designed to continue the smooth form of the fascia around the corners of the house. The die-cast mitres are strong and stiff, with accurate angles and are easy to install.

Stratco manufactures a wide range of gutters that are compatible with the Concept Fascia System. These include the OG, Quad, Smoothline® and Square gutters.

Gutters & Downpipes

YOUR COMPLETE GUIDE TO INSTALLING STRATCO GUTTERS AND DOWNPIPES.

Stratco Gutters and Downpipes are both fashionable and functional accessories, that enhance the look of your home and minimise the risk from water damage. Stratco offer a range of quality gutter and downpipe products and all the advice and tools you need to do a competent job for yourself. Do not underestimate the damage poor gutters and downpipes cause, take these handy tips and replace them now. For information on installing High Fronted Gutters please refer to the Stratco 'High Fronted Gutters Information Guide' on the Stratco website.

TOPICS COVERED INCLUDE

- BEFORE YOU START
- TOOLS REQUIRED
- GUTTER STYLES
- COMPONENTS & ACCESSORIES
- INSTALLATION
- REMINDERS

BEFORE YOU START

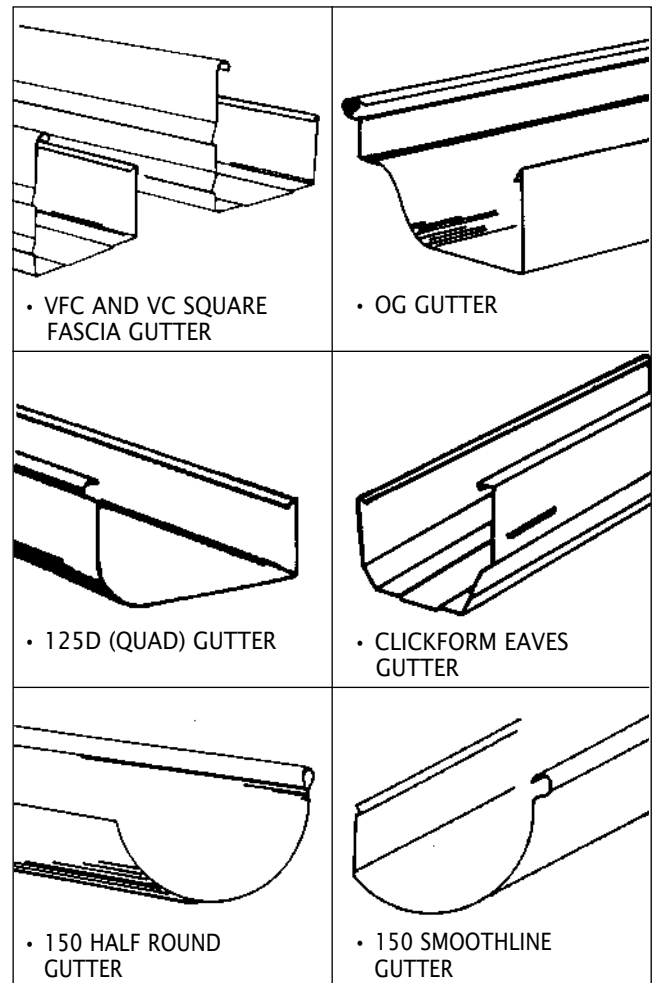
When your material has arrived on site, check each piece against the cartnote supplied. Carefully read this leaflet to ensure that you are familiar with all the steps involved. Ensure you have adequate tools for the job.

TOOLS REQUIRED

- HACKSAW
- TAPE MEASURE
- TIN SNIPS
- RIVET GUN
- DRILL / DRILL BITS
- SPIRIT LEVEL
- STRING LINE
- HACKING KNIFE
- HAMMER
- SILICONE
- WALKING PLANKS
- RIVETS 1/8"X1/8"
- 30mm GALV. CLOUTS
- LADDERS & SCAFFOLD

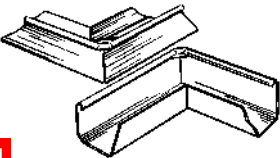

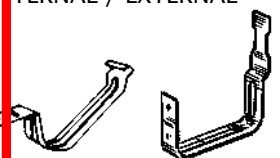
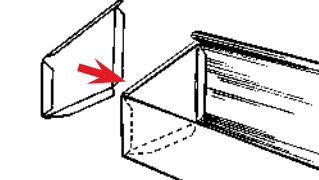


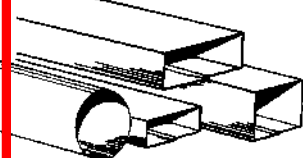

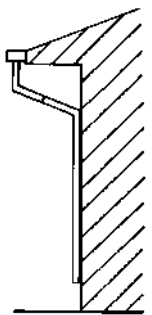
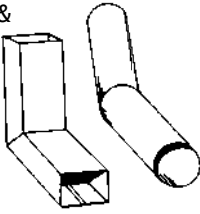
GUTTERS

Stratco has designed an extensive choice of gutter styles, from the more traditional colonial styles to today's modern contemporary designs. Most of Stratco's gutters have the revolutionary suspension rib. This enables the gutter if used with either Clickfast®, or Clickform™ steel fascia, to be fixed with the Stratco Suspension Clip, the system which has proudly received an Australian Classic Design Award. When using timber fascia the suspension rib can be used with timber fix clips.



Note: Many gutters are available slotted to prevent overflow water from entering the eaves. Check with your local Stratco office to confirm if this is available in your gutter profile.

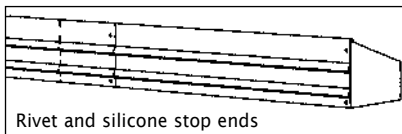
ACCESSORIES

MITRES INTERNAL/EXTERNAL 	MITRE GUSSETS 
GUTTER STRAPS: INTERNAL / EXTERNAL 	STOP ENDS 
SUSPENSION CLIPS 	P CLIPS 
DOWNPIPES 	GUTTER OUTLETS  DOWNPIPE OFFSETS 
ELBOWS & SHOES 	

PRE-INSTALLATION

MEASURING

Measure length of fascia, allowing enough for mitres and any joints that may be required. Generally, external corners will require at least twice the width of the gutter to be sacrificed making the mitre, but internal corners require no extra material. Joints should overlap approx 100mm. If installing pre-made stop ends no extra length is required, but "return" stop ends require the width of the gutter to be added for each stop end.

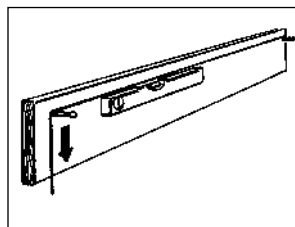


DETERMINE GUTTER SUPPORT

- There are 4 basic methods of supporting a gutter.
 - External brackets.
 - Internal straps and P clips.
 - Internal straps and scotia.
 - Suspension clips and internal straps.

DETERMINE GUTTER FALLS

- Using a string line, nail one end to the fascia, running string line from corner to corner, making sure the string line is taut.
- The fall of the gutter should be calculated (correct fall is 1:500). Check the fall with a spirit level. The fall must run towards the gutter outlet.



PRE-ASSEMBLE MITRES, STOP ENDS AND OUTLETS.

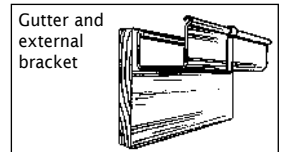
Determine method of supporting and strengthening gutter on the fascia. Gutter support can include external brackets, or internal straps used in conjunction with either P-clips, timber scotia or suspension clips.

- Cut required length with hacksaw and tinsnips.
- Fit stop ends where required.
- Cut holes (outlets) for gutters with a hacking knife, and rivet outlet into position.
- Cut mitres where needed. Pre-made mitres are available. See the section on making mitres if you wish to make your own.
- Remove all swarf and debris from inside of gutters. If gutters are pre-coloured steel remove plastic from outside of gutters prior to installation.
- Seal internally all stop ends, gutter outlets and mitres with silicone sealant.
- Make downpipe offsets. Pre-made downpipe offsets are available, however see section on making offsets if you wish to make your own.

INSTALLATION OF BRACKETS

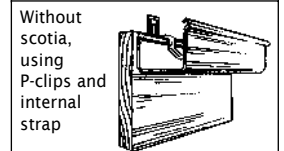
EXTERNAL BRACKETS

Nail External brackets at 1.2 metre centres, following string line. Once all brackets have been installed, place gutters into external brackets. Bend tag over bead to hold in place



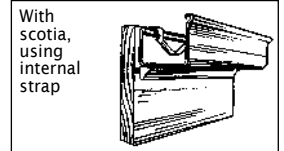
P - CLIPS

Install P-clips if required using the same method as external brackets. Once P-clips have been installed, sit gutters onto P-clip lip then bend small tag of P-clip over back of gutter to hold the gutter into position.



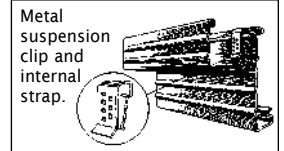
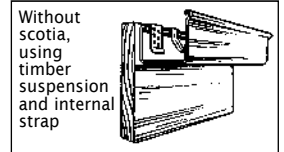
INTERNAL STRAPS

Install internal straps at 1.2 metre centres to hold face of gutter into position. Install pre-made mitres into corners. Internal straps can also be used in conjunction with gutter suspended on timber scotia nailed to a timber fascia.



SUSPENSION CLIPS

This can be used on steel & timber Fascia with Internal Straps. No string line is required. For timber fascia nail your timber suspension clip into place by placing a clout into the allocated hole in the top of the clip and driving the clout into the top of the timber fascia, holding the clip into position. Clips are to be placed at maximum of 1.2m centres. Steel fascia suspension clips are rolled over the top of steel fascia and placed into position at 1.2 m centres. (See section on steel fascia).



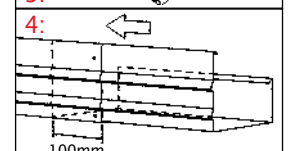
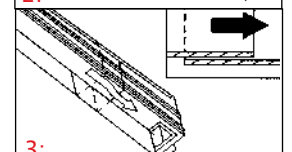
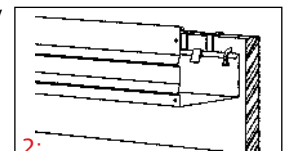
INSTALLATION OF GUTTER

1: Ensure all gutter outlets and stop ends are fitted at the correct locations prior to installation of the gutter.

2: Place gutter on P-clips or scotia already installed and hold into place by driving a galvanised nail into the fascia just above the back of the gutter. Bend the nail down to hold the gutter but allow expansion and contraction.

3: To install the next length of gutter, determine the fall of the gutter. Joints should always be overlapped to allow water to flow "over" the joint instead of "into" the joint. Open the bead of the "outside" gutter with a pair of pliers, and close up the bead of the "inside" gutter.

4: Slide the upstream gutter (inside) into the downstream gutter (outside) allowing a 100mm lap. Rivet and silicone the two gutters together, ensuring that all metal filings (swarf) are first cleaned from the gutter. Silicone should be smoothed to ensure that the passage of water is not impeded.



GUTTER INSTALLATION CONTINUED

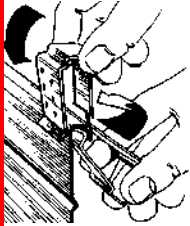
- 5: Fit pre-made gutter mitres as required.
- 6: Roll internal straps into the bead of the gutter if being used and fasten to the top of the fascia. Use the gutter strap to ensure the bead remains parallel to the fascia.
- 7: Fit downpipe, downpipe accessories and straps.

INSTALLATION OF GUTTERS USING SUSPENSION CLIPS

Gutter is pulled upwards until the suspension clip engages into the suspension rib of gutter. Place internal gutter strap into position. The fall of the gutter is obtained by a series of teeth placed on the suspension clip. The highest end of the gutter should be in the top tooth. The lowest end in the second to bottom (minimum 1: 500 fall required).

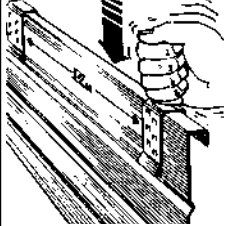
ROLL IN CLIPS.

Push suspension clip up from rear and into the vertical position as shown.



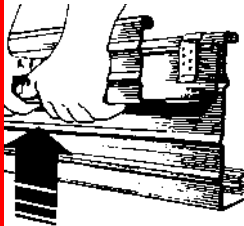
2 CLIP SPACING

Knock suspension clip down with fist. Place at 1.2 metre intervals.



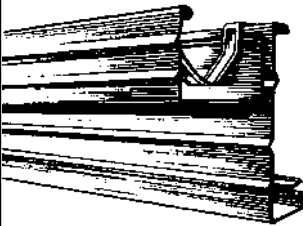
3 INSTALL GUTTER

Pull gutter upwards until suspension clip engages.



4 FIX INTERNAL STRAPS

Roll gutter strap into bead & press over top of fascia.

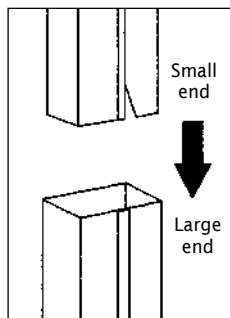


FIXING DOWNPIPE TO GUTTER

1: Measure the distance between the bottom of the gutter to the ground level (leave enough to fit a shoe or PVC fitting).

2: Slide the small end of one downpipe (marked by a cut V or dot one end) into the big end of the other. Rivet the downpipe at the back as not to show the rivet head, then use a hacksaw to cut to the desired length.

3: Fit the downpipe to the existing outlet using rivets, then using downpipe straps, fix against wall or post using screws or masonry nails.



MAKING 'RETURN' STOP ENDS

1: Determine if the end is to be left or right.

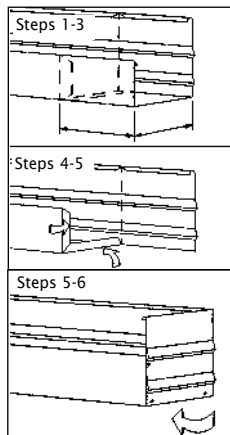
2: Mark a line completely around the outside of the gutter at a distance from the end, equal to the width of the gutter.

3: Mark a tag-line parallel to the first approximately 10mm toward the end of the gutter, across the back and the base of the gutter.

4: Cut the back and the base from the gutter leaving the 10mm tags in place. Fold these up at 90 degrees.

5: Cut a 45° notch in the bead of the gutter at the marked line, and fold the face of the gutter to form the end.

6: Rivet and silicone.

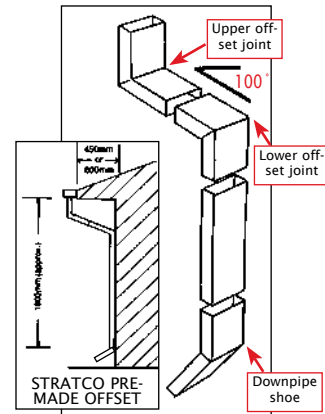


DOWNPIPE OFFSETS

When installing downpipes, sometimes the eaves overhang will require the use of a downpipe offset. There are two ways of producing a downpipe offset.

1: Stratco produce a complete downpipe offset, which is suitable for your nominated eaves dimension. This has a slip joint to make it adjustable for small variances in eaves sizes, which may vary on your home.

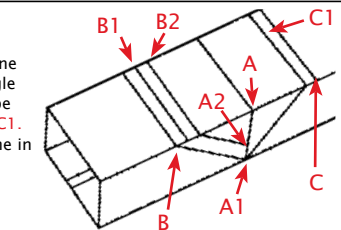
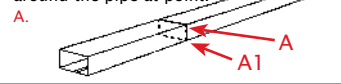
2: Elbows and shoes can also be pre-made and then riveted onto your downpipe length producing your own downpipe offset. Alternately, one piece downpipe offsets can be made on the site.



MAKING A DOWNPIPE OFFSET

CREATING THE "LOWER OFFSET" JOINT.

1 Measure from the wall to the outside of the gutter outlet. Add to this measurement 100mm plus twice the width of the downpipe.

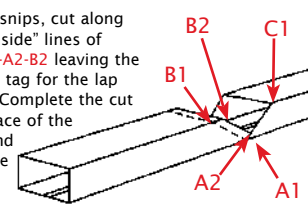
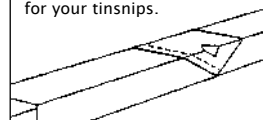


2 Place this measurement along the downpipe starting from the "Big End," and mark this completely around the pipe at point A.

3 Measure the width of the downpipe. Mark this width on the face of the downpipe either side of the centre line to points B and C. To achieve an angle of approx. 100° (which allows for downpipe fall) come in 10mm both sides to B1 and C1. On the big end side of the centre line come in a further 10mm for a lap to point B2. Join points B-A1, C1-A1, and draw a line parallel to B-A1 to intersect A-A1 at A2.

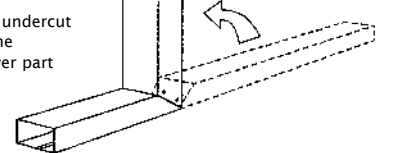
4 Using a hacksaw, cut a small section out inside the lines, big enough to gain access for your tinsnips.

5 Using snips, cut along the "inside" lines of C1-A1-A2-B2 leaving the 10mm tag for the lap joint intact. Complete the cut across the face of the downpipe and repeat on the other side.



6 Bend the downpipe along the undercut side to allow the big end of the downpipe to fit inside the lower part of the offset.

Rivet and silicone.

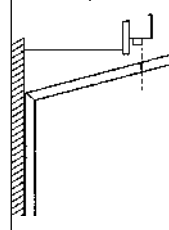


CREATING THE "UPPER OFFSET" JOINT

1 Place completed "Lower Offset" joint against the wall with the large end of downpipe towards the gutter outlet.

Using a plumb line mark from the outside of the gutter outlet, completely down the side of downpipe. This point becomes the centre point of the cut of the upper offset joint, to be marked out. Cut and seal as per steps 3 to 6 above. It is important to note that for the "Upper Offset" the opposite face of the downpipe is used so the seam is cut.

Before riveting the top of the offset joint completely, check to make sure the top of the offset joint is parallel to the bottom part of the downpipe offset.

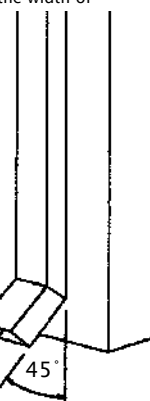


CREATING THE "SHOE"

1 Using a second length of downpipe, measure in from the "small" end of the downpipe, the length required to bring the downpipe into the stormwater pipe, allowing for a slip joint, and mark this distance completely around the pipe using a square. To create a 45 degree angle, mark a distance equal to half the width of the downpipe on either side of this centre line on the face of the downpipe.

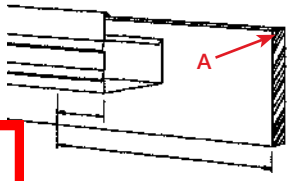
Mark out, cut and seal as per steps 3 - 6 above.

Slide the upper and lower offsets together to form the final finished offset.

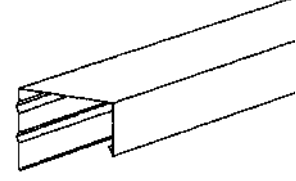


TO MAKE A GUTTER MITRE

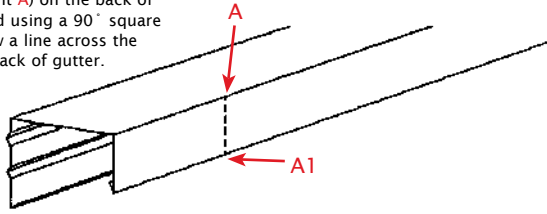
- 1** Measure fascia from the corner of the fascia to existing gutter allowing 100mm for gutter lap.



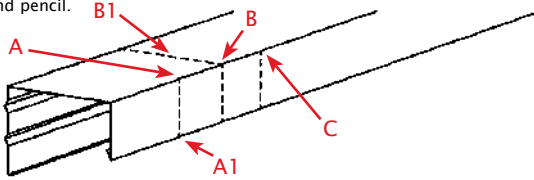
- 2** Place length of gutter upside down on the ground so that the base of the gutter is facing you.



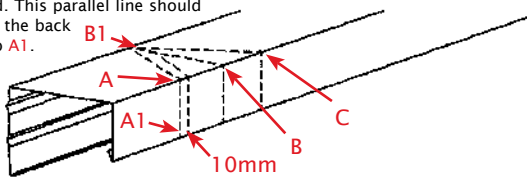
- 3** Mark where the fascia corner will occur (point A) on the back of gutter, and using a 90° square and pencil, draw a line across the outside of the back of gutter.



- 4** On the back of the gutter place a further 2 marks, each equal to the width of the gutter (at points B and C) to extend beyond the fascia corner. The central mark B should be extended completely around the outside of the gutter using the 90° square and pencil.



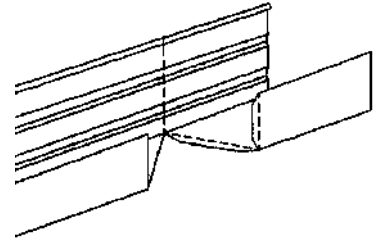
- 5** On the base of gutter, draw a line to connect the continuous line from B1 to both A and C. Mark a line 10mm away from, but parallel to A-B1, and extend this across the back of the gutter. This will produce a "lap" when the gutter mitre is formed. This parallel line should also extend up the back of the gutter to A1.



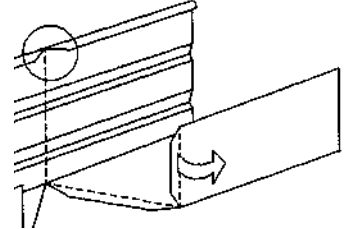
REMEMBER TO

- Waterproof each rivet with silicone sealant applied on the "weather" side.
- The minimum fall of guttering to the downpipe end is 1 in 500 (or 12mm every 6m).

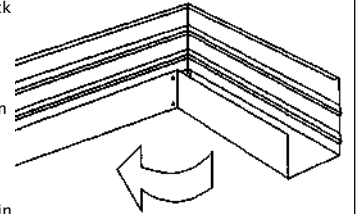
- 6** Using tinsnips, cut along the line on one side and on the other side, cut on the parallel line which is 10mm in from the original line drawn connecting A-B1. You will cut out the complete V marked into the gutter. In addition, remove excess material at A and B1 to allow the outside of the gutter to fold easily, and the tags to overlap.



- 7** For a square gutter cut a 45° notch into the bead of the gutter using a hacksaw and tin snips at B1 directly in line with the point of the V on the base of the gutter. For gutters with an external bead, such as quad (D) or OG, a single hacksaw cut is used to cut the bead. A mitre gusset must then be attached to complete the bead line.



- 8** Fold the gutter around until the back sections touch each other. Fold tag inside the back gutter. Rivet and silicone. You have produced an external gutter mitre. To produce an internal gutter mitre, reverse your V line marks on the gutter so that point B1 is exchanged for point B and the face of the gutter is cut out not the back. Then follow the above steps. With some gutters a mitre gusset will be required to cover any gap in the gutter bead.



COMPLY WITH REGULATIONS

All building work must be carried out in accordance with the Building Code of Australia (BCA). This code refers to various Australian Standards, which provides acceptable standards of product manufacture and building practice. These include:

- AS/NZ 3500.3 Plumbing and Drainage, Stormwater Drainage
- AS/NZS 3500.5 National Plumbing and Drainage, Domestic Installations

Prospective users of Stratco materials should first ensure that they understand these requirements and any other state or territory specific regulations that may apply. In some states of Australia (eg. NSW and Victoria) work involving the installation of roofing, rainwater goods and drainage may need to be installed by a suitably qualified tradesperson, and comply with statutory warranties. (Refer www.deus.nsw.gov.au/water/plumbing.asp)

Care should also be taken in the design and installation of roof drainage systems given the wide range of factors such as rainfall intensity, gutter capacity and selection, number and placement of downpipes and sumps. Care should also be taken to select the most suitable gutter style. Gutters that have a front higher than the back are popular to hide the exposed ends of roofing, but unless manufactured with optional slots or fixed with the bead lower than the top of the fascia may contravene building regulations. Other fixing options can be used to eliminate overflow from the back of a gutter into a building. These include additional overflow weirs placed either in the gutter or stop end, rainheads with overflow weirs, custom back flashings, leaving a gap between the fascia and gutter back, or other proprietary systems or trade solutions.

Up to date information about Stratco products, spans, installation requirements and technical advice can be found on our website at www.stratco.com.au and it is advisable to obtain current information prior to ordering any materials. If additional information is required contact the Stratco office in your state.



Barricade™

Building Wrap



1. HT Green Concrete Underlay
2. Hydro™ Seal Bituminous treatment
3. Dry-Fix DPC
- 4. Building Wrap**
5. Wrapstrap™
6. Window Tape
7. Air Tight P.E.F Backing Rod

SPECIFICATION

PRODUCT DESCRIPTION

Barricade Building Wrap is a hydrophobic non-woven fabric that has a unique clear breathable overlay, which allows moisture and condensation to run off the face and then evaporate in the cavity area.

PHYSICAL PROPERTIES

Barricade Building Wrap is a 90 gsm hydrophobic non-woven breathable composite building wrap. The following tests have been carried out 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
- Resistance to water penetration in accordance with AS/NZS 4201.1.4
- Surface Water absorbency in accordance with AS/NZS 4201.6
- Air resistance to BS 6538.3
- Shrinkage in accordance with AS/NZS 4201.3
- pH of extract in accordance with AS/NZS 1301.421s

COMPATIBILITY

***Barricade Wall 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; and,
- With absorbent wall claddings directly fixed to the frame; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm 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'

***Barricade Wall 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 18mm 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'

***Barricade Wall 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; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm 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 'Extra High'

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Barricade™



Building Wrap

INSTALLATION

- Masons Building Wrap* must be fixed (with the printed side out) to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- Masons 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.
- 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 underlay may be cut off flush with the internal face of the wall frame. *Masons Flashing Tape* needs to be installed around the openings prior to fitting the doors and windows.
- Masons Building Wrap* must be restrained from bulging into the drained cavity in accordance with NZBC Acceptable Solution E2/ AS1, Paragraph 9.1.8.5. Installing *Masons WrapStrap* - horizontal at 300mm centres - prevents the wrap and insulation from bulging.
- Masons Building Wrap* can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.7(e).
- When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- Any damaged areas of *Masons 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 with *Masons Flashing Tape*.

Provided *Masons Wrap* is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the manufacturers instructions and the cladding remains weather resistant, the wrap is expected to have a serviceable life equal to that of the cladding.

DURABILITY



Barricade Building Wrap has been BRANZ appraised to ensure it 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.

BRANZ Appraised
Appraisal No.795 [2012]

STORAGE

- Masons Wrap* whether on or off site should
- Be stored on end under a cover, in a clean and dry area
 - Do not crush the rolls
 - The rolls must be protected from damage

Masons Building Wraps	Roll Sizes	Masons Code
Masons Barricade Building Wrap - 50m ²	H 2.74 m x L 18.24 m	MPBBW50 2.74m
Masons Barricade Building Wrap - 100m ²	H 2.74 m x L 36.49 m	MPBBW100 2.74m
Masons Barricade Building Wrap - 100m ²	H 1.37 m x L 73 m	MPBBW100 1.37m
Masons Barricade Building Wrap - 50m ²	H 1.37 m x L 36.50 m	MPBBW50 1.37m
Masons Barricade Building Wrap - 25m ²	H 1.37 m x L 18.25 m	MPBBW25 1.37m

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1. HT Green Concrete Underlay
2. Hydro™ Seal Bituminous treatment
3. Dry-Fix DPC
4. Building Wrap
5. Wrapstrap™
- 6. Window Tape**
7. Air Tight P.E.F Backing Rod

40 Below™

Flashing Tape

SPECIFICATION

PRODUCT DESCRIPTION

40 Below™ Flashing Tape is a self adhesive flashing tape to seal around windows, doors, and other joinery openings as a secondary defense against water penetration.

PHYSICAL PROPERTIES

40 Below™ Flashing Tape:

- Is suitable for timber framed buildings
- Has been tested and passed by **CodeMark**
- For a risk score between 0-20 in accordance with NZBC Acceptable Solution E2/AS1
- Passed NZS3604 Building Wind Zones up to and including **'Extra High'**
- Compatible with all building wraps
- 0.2mm thick adhesive layer
- Low temperature adhesion. Can be applied as low as -40°C (up to 65°C)
- *Corner Guard* is easy to install and increases protection to framing

DURABILITY

Provided it is not exposed to the weather or ultra-violet light for a total of more than 6 months, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the MASONS 40 Below™ Window Flashing System is expected to have a serviceable life equal to that of the cladding.

STORAGE

40 Below™ Window Tape must be:

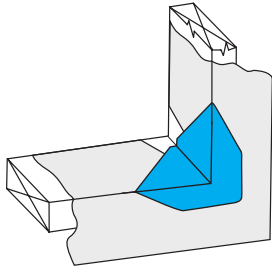
- Stored on end under a cover, in a clean and dry area

40 Below™ flashing tape	Roll Sizes	Masons Code
40 Below flashing tape 75mm	H 75mm x L 20m	40BELOW75x20
40 Below flashing tape 100mm	H 100mm x L 20m	40BELOW100x20
40 Below flashing tape 150mm	H 150mm x L 20m	40BELOW150x20
40 Below flashing tape 230mm	H 230mm x L 20m	40BELOW230x20
Hydro corner guards	50	HYDROCG50

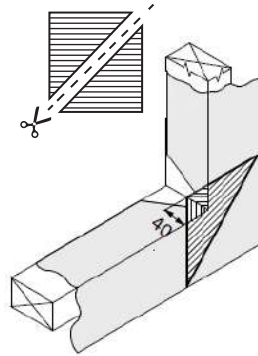


INSTALLATION

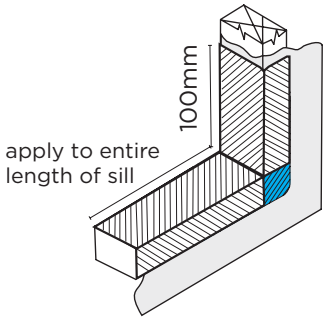
Window Sill Installation Instructions



1. Corner Guard *option 1*
Place the *Masons Corner Guard* over the building wrap and into the **bottom** corners of the window or door sill, staple to the jamb. With steel frames use double sided tape to attach the *Corner Guard* to the metal.

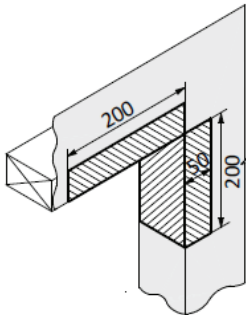


1. Corner Guard *option 2*
Cut a 150mm square of *Flashing Tape* into two equal triangular pieces. Install these at the **bottom** corners of the frame opening. The triangle needs to reach 40mm in from the extreme end of the window sill. With the remainder overlapping the building paper.

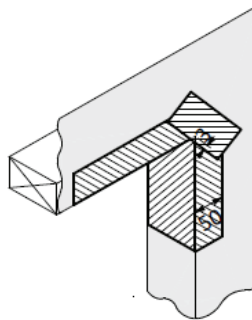


2. Sill Guard
A. Install sill tape flush with the interior face of the opening. Apply along entire length of sill, continue up each jamb with a minimum of 100mm
B. IMPORTANT: Press tape firmly into the corner over the *Corner Guard* first, then fold around onto the frame face.
C. Fold remainder *Flashing Tape* against outer face of frame/building. Smooth out all creases & press firmly for good adhesion.

Window Head Installation



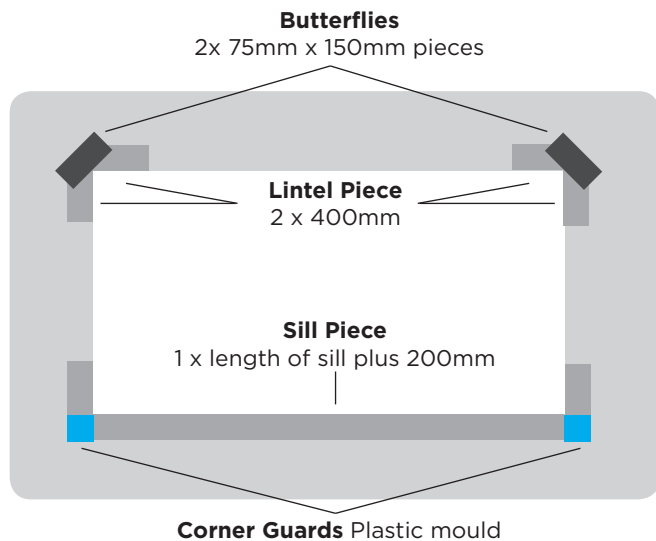
1. Lintel Piece
Install Lintel pieces on top corners of opening, 200mm along the lintel and 200mm down the jamb. Slit at each corner & fold onto outer face of building wrap (at least 50mm).



2. Butterflies
To create a seal at corner junction, Install butterflies at 45° across the corner of head/jamb.

Window Head Flashing Installation

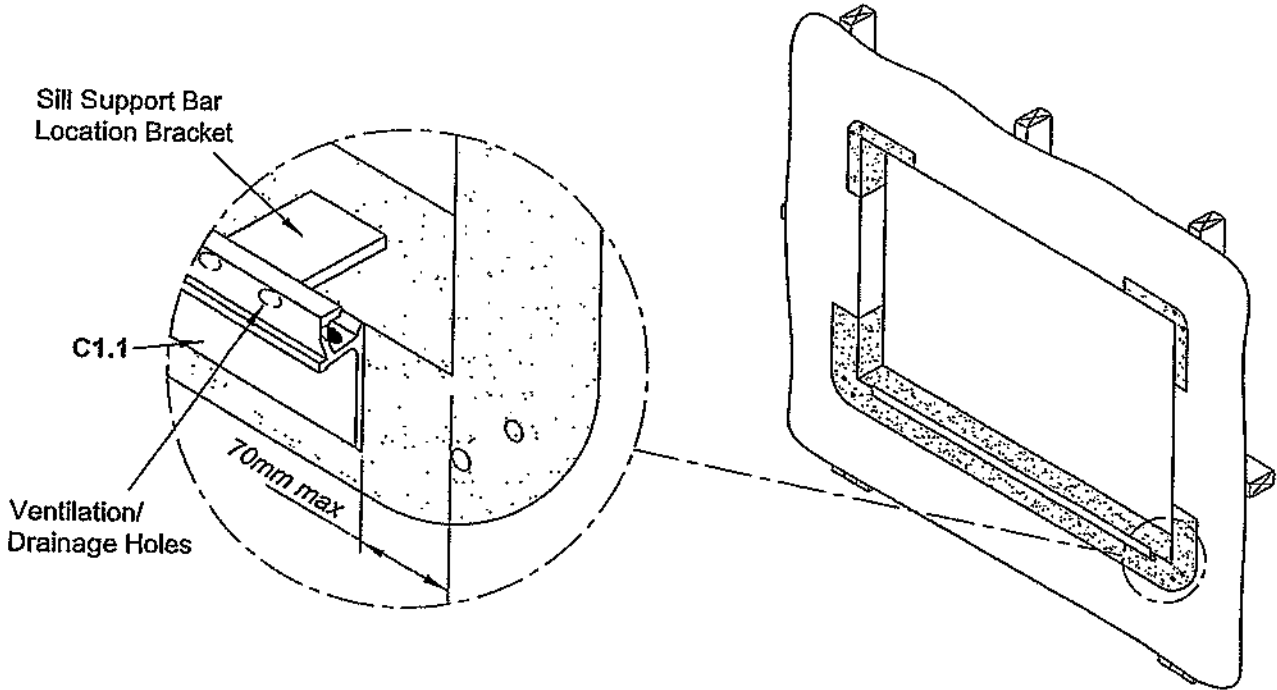
Apply *Masons Flashing Tape* to top of window head flashing, up-stand and building wrap. Refer to window & cladding details for specific application.



Cutting Diagram:

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STEP C1 - Unit Support for Openings within Wall Framing

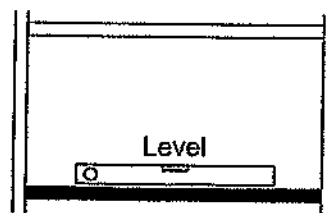
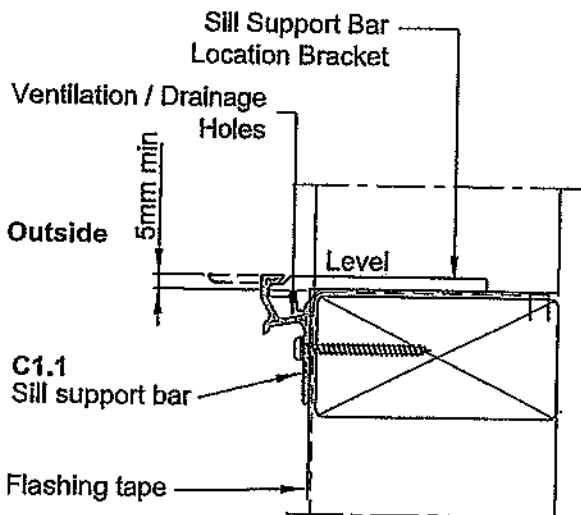


Sill Support Bar Location Brackets are used to provide a quick method of ensuring the support bar is positioned at the correct height of 5mm above the sill trimer.

Using two brackets located at each end of the support bar, position the support bar into the trim opening and nail through the support brackets to hold the correct position while screw fixing the support bar. The bracket can then be removed, or left in place as a packer/frame support.

NOTE: The APL Sill support bar has been tested (BRANZ EM6) to provide support for the loads imposed by the windows & doors and is required for all units. The sill support bar includes built in drainage and ventilation as required by NZBC Clause E2. Sill support bars are required on all window and door units over 600mm wide.

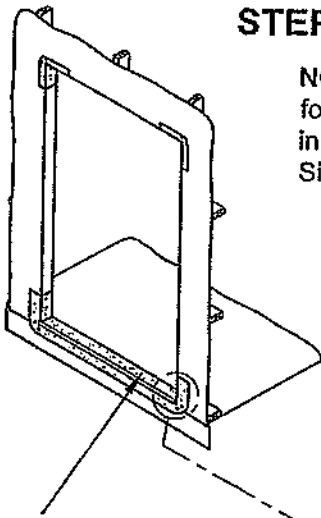
C1.1 Position Sill Support Bar under the opening and extending 5mm above sill framing. To enable the unit to be positioned correctly ensure that the support bar is level. The Support bar can finish up to 70mm short of the trim opening to allow for corner soakers, though care should be taken to ensure the bar still runs under the frame support blocks.



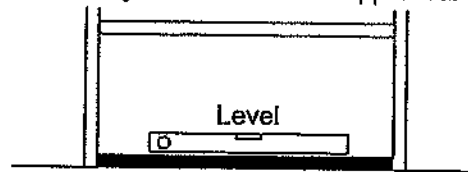
C1.2 Fix at centres as required or to manufacturers details (typically 150 max from each end and 300 max between centres, using M10 x 75mm Stainless steel Pan head screws).

STEP C1a - Unit Support for Openings at Floor Level

NOTE: The Sill support bar has been tested (BRANZ EM6) to provide support for the loads imposed by the windows & doors. The Sill support bar includes built in drainage and ventilation as required by NZBC Clause E2. Sill support bars are required on all window and door units over 600mm wide.

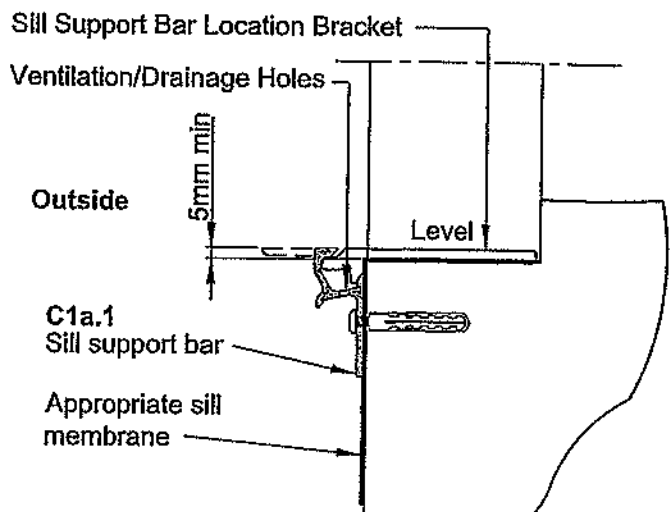
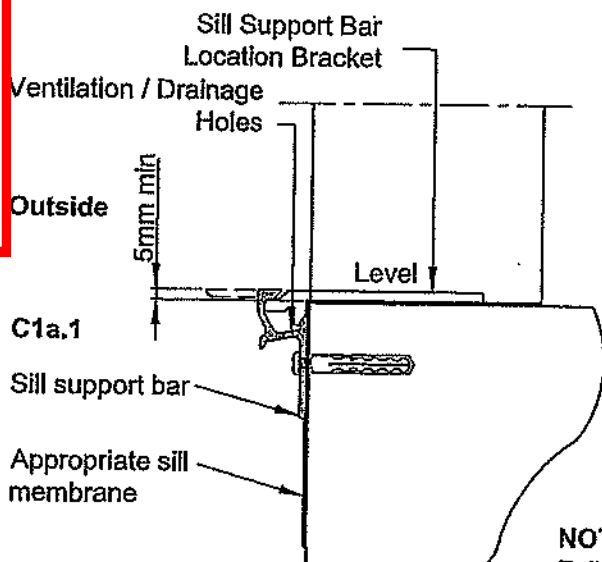
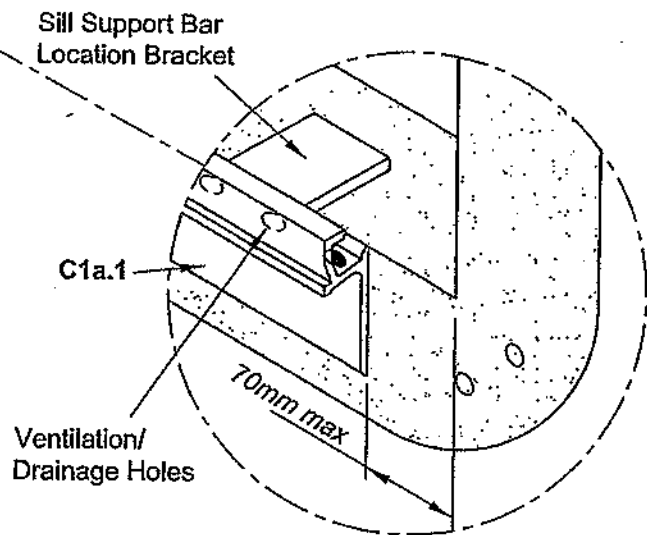
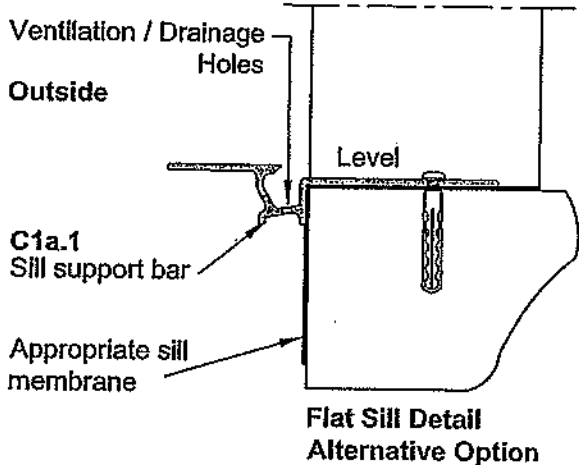


C1a.1 Position Sill Support Bar under the opening and extending 5mm above sill framing. To enable the unit to be positioned correctly ensure that the support bar is level.



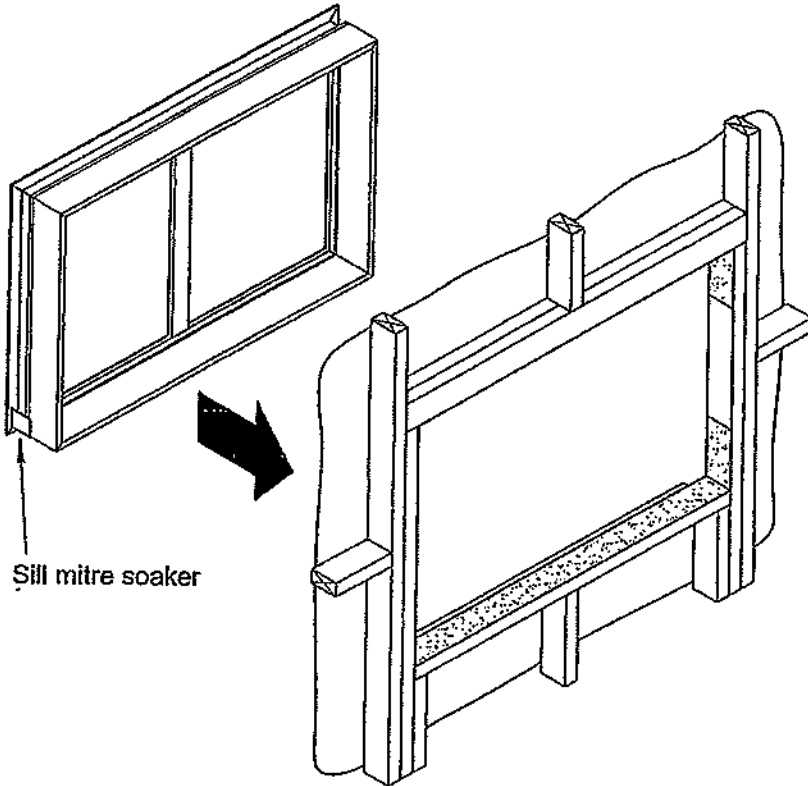
For concrete floors use an approved sealer / primer before fitting the sill membrane.

C1a.2 Fix at centres as required or to manufacturer's details (typically 150 max from each end and 300 max between centres, using fixings suitable for the substrate).



NOTE:

STEP C2 - Position Unit In Opening

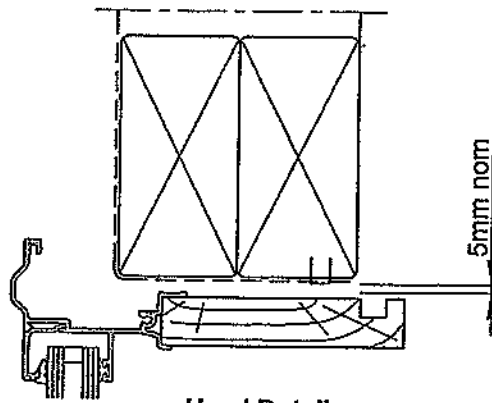


Before positioning unit into opening ensure that, where applicable, the sill corners have been filled with corner soakers that comply with clause 9.1.10.5c of E2/AS1.

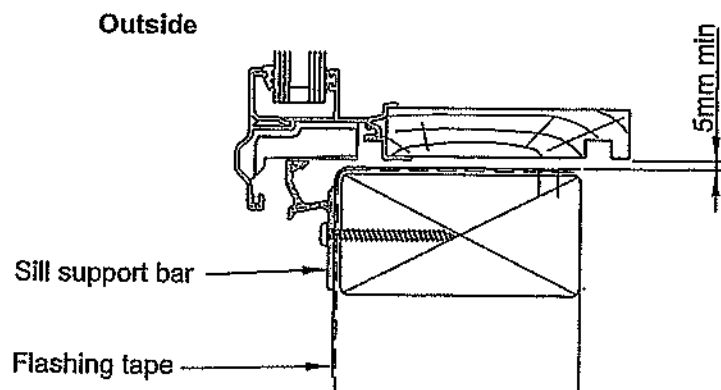
C2.1 Position unit into opening.

C2.2 Ensure unit is positioned so that:

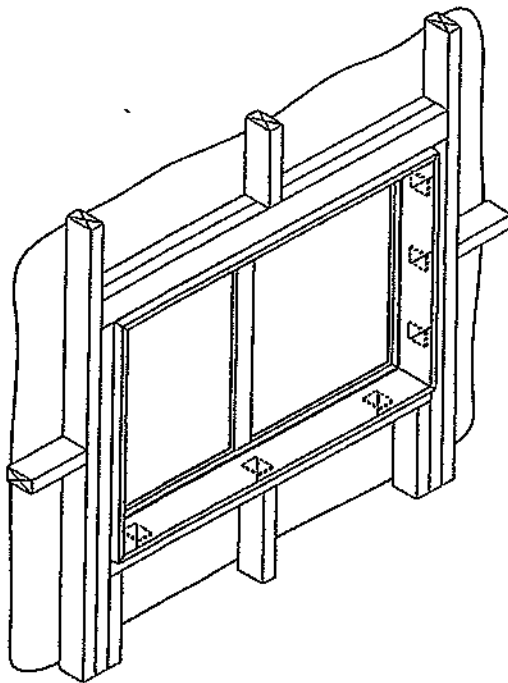
- i) interior linings finish in the correct plane.
- ii) unit sill is correctly supported by the Sill Support Bar.
- iii) a 5mm nominal gap is maintained between unit and trimmer.



Head Detail



STEP C3 - Fixing Unit



C3.1 Insert flat packers between wall framing and jambliner at sill and jambs.
Do not use wedges.

NOTE:

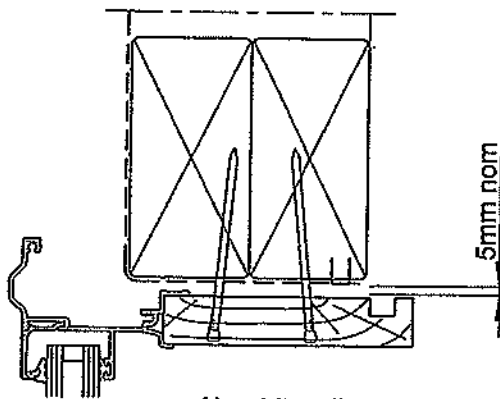
Unit sill must always rest on solid support

C3.2 Fix through jambliner and packers into wall framing with 75 x 3.15 galvanised jolt head nails or use other approved fixing methods such as Jamb Ties. For larger units, or those subjected to higher windloads, additional fixings may be required. If in doubt, contact your window manufacturer to confirm.

NOTE:

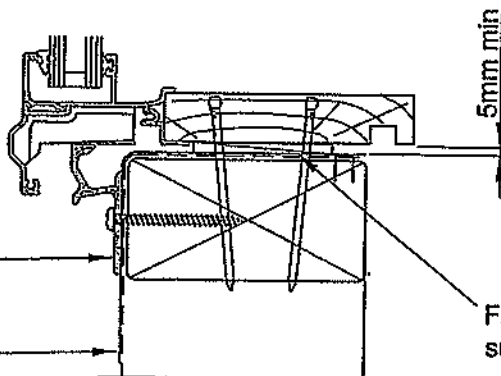
Mechanical fixings only. 150mm from corners and at 450mm centres.

Expandable foam is NOT an approved fixing method.



Head Detail

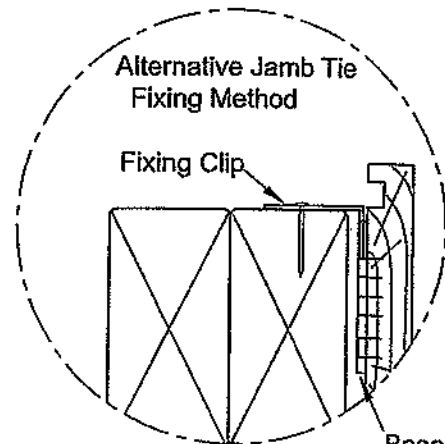
Outside



Sill support bar

Flashing tape

Flat packers to support unit

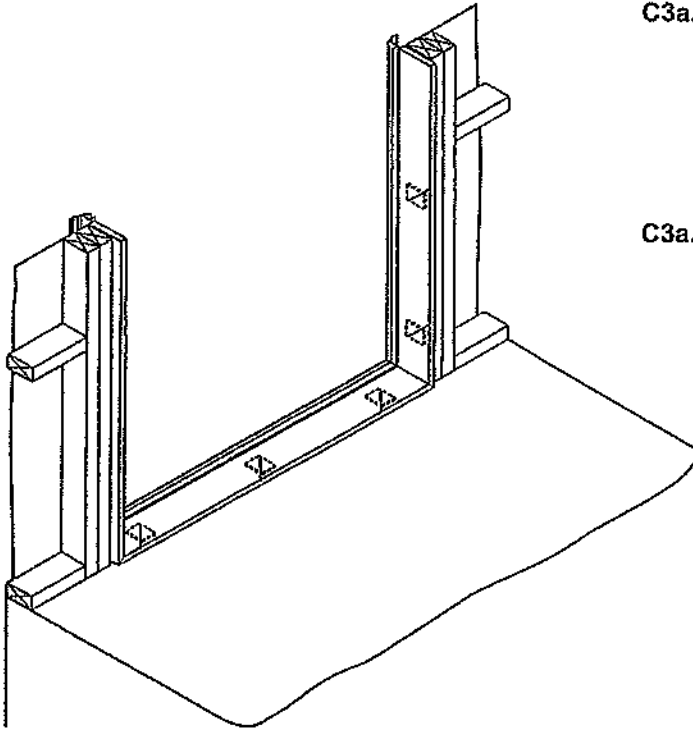


Alternative Jamb Tie Fixing Method

Fixing Clip

Base Plate

STEP C3a - Fixing Unit



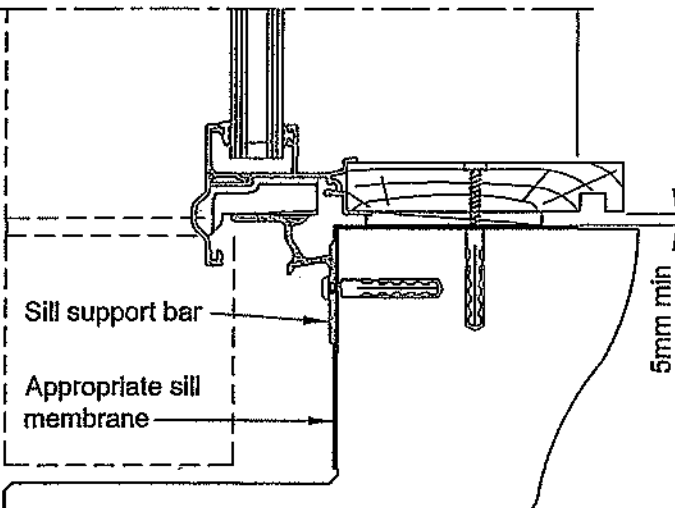
C3a.1 Insert flat packers between wall framing and jambliner at sill and jambs.
Do not use wedges.

NOTE:
Unit sill must always rest on solid support

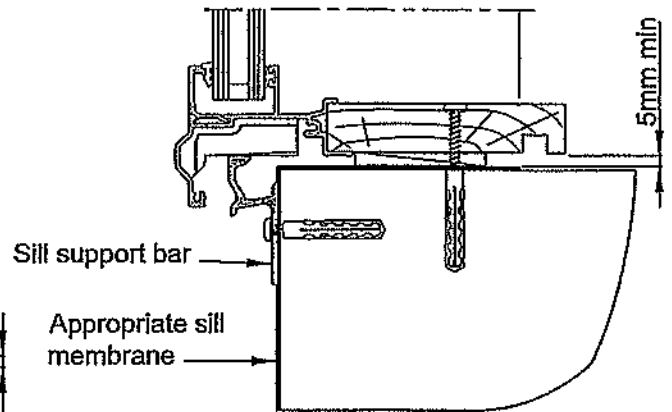
C3a.2 Fix through jambliner and packers into wall framing with 75 x 3.15 galvanised jolt head nails, or use other approved fixing methods such as Jamb Ties. Fixings along sill should be suitable for the substrate. For concrete floors use 10g stainless screws into Rawlplugs (or similar) or 6mm masonry anchors. For larger units, or those subject to higher windloads, additional fixings may be needed. If in doubt, contact your window manufacturer to confirm.

NOTE:
Mechanical fixings only. 150mm from corners and at max 450mm centres.

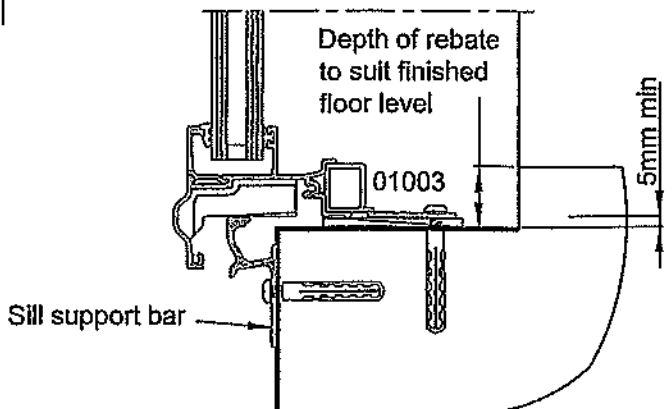
Expandable foam is NOT an approved fixing method.



Typical Brick Veneer Sill Detail



Flat Sill Detail



NOTE:
Follow manufacturer's specification when fixing into concrete floors

Dektite

Design features

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Flexible Cone Sleeve

Dektite cone shape eliminates seal breakdown due to vibration or expansion and contraction, while isolation of pipe from sheeting dampens noise levels.

Stress Isolation Points

Unique to Dektite, two flexible shoulders absorb distortion and stop transfer of stresses from base to cone, as unit is formed over roofing profile.

Bonded Aluminium Flange

Corrosion-resistant, malleable flange, evenly distributes fastening pressure and allows ease of hand-shaping on most sheet profiles.

Integrity of Flashing Shape

Minimal distortion after installation, maintains natural flashing shape and seal around pipe, while water run-off is improved.

UV Protection

Dektite products are resistant to ultraviolet light damage and will remain fully flexible under all conditions.

Easily Identified Sizing

Pipe diameter rings are clearly marked on the cone sleeve (metric and imperial) for cutting to match the appropriate pipe diameter.

Low Profile Design

Sleek, unobtrusive shape is designed to minimise silhouette on roofline, while managing to provide generous internal clearance for steep, angular installations.

Improved Waterproofing

Designed to strengthen sealant bond and improve waterproofing, the ribbed base also has a tapered edge to improve runoff and contribute to a superior waterproof seal.

Perfect for approved flues!

Dektite polymer flashings have been officially tested and conform to all Australian and New Zealand Standards on approved flue systems. EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently. Silicone withstands temperatures from -60°C to 200°C and up to 250°C intermittently.

Dektite Premium

the versatile solution

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Code:	Code:	Code:	Base (mm)	Pipe (mm)	Pitch
Black EPDM	Grey EPDM	Red Silicone			
DFE100MB			71 x 71	0-20	0-60
DFE100B	DFE100G		100 x 100	0-35	0-60
DFE100BS		DFE200RES	100 x 100	0-35	0-60
DFE101B	DFE101G		139 x 139	5-55	0-45
DFE101BS		DFE201RES	139 x 139	5-55	0-45
DFE102BA	DFE102GA	DFE202REA	181 x 181	50-70	0-45
DFE103B	DFE103G	DFE203RE	218 x 218	5-127	0-45
DFE104B	DFE104G	DFE204RE	279 x 279	75-175	0-45
DFE105B	DFE105G	DFE205RE	309 x 309	100-200	0-45
DFE106B	DFE106G	DFE206RE	363 x 363	125-230	0-45
DFE107B	DFE107G	DFE207RE	456 x 456	150-300	0-45
DFE108B	DFE108G	DFE208RE	495 x 495	170-355	0-45
DFE109B	DFE109G	DFE209RE	680 x 680	230-508	0-45



Dektite Premium

the versatile solution

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Most extensive range of Dektites for flashing penetrations 0 - 510mm, available in black and grey EPDM and silicone red for high temperatures.

Designed to enable practically any pipe flashing operation to be carried out within minutes, simple to install and very effective.

The low profile cone not only looks good but provides a generous internal clearance, so even the steepest roofs are handled with ease.

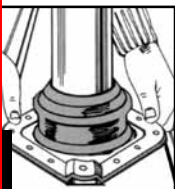
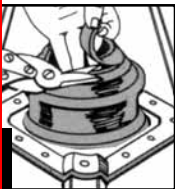
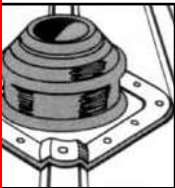
Suitable for flashing pipes that penetrate wall claddings.

Can also be used to flash square penetrations. Just add 30% to the pipe diameter and trim the cone to suit.

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



Installation Instructions:

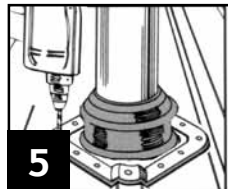
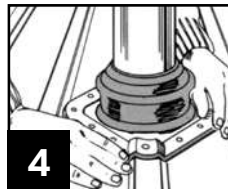
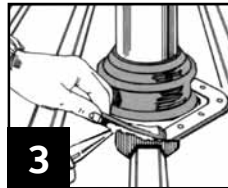


NOTE:

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

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

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



Apply a neutral-cure silicone sealant by turning back the flexible flange. The following silicones have been trialled and provided a suitable bond:

- OCI Roof & Gutter N-192
- Selseys roof & Gutter
- Bostik Findley Roof & Gutter
- Dow Corning 791
- Sikasil AP Multi Purpose

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

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

Dektite Premium Solar Flashings

Perfect for flashing pipes and cables on any roof type

The multi-application flashing is a highly durable EPDM or silicone, edged with a flexible aluminum band, flashes pipes and cables on all roofs. The square base fits most roof profiles.

Dektite Premium DFE101BM

- ✓ Incorporates 12 Cable nipples
- ✓ Ideal for Solar PV installations
- ✓ Black EPDM High UV resistant cone



Dektite Premium DFE100

- ✓ Incorporates 3 Cable nipples
- ✓ Suitable for pipes and/or cables
- ✓ Available in black, grey or red silicone



Dektite Premium DFE101

- ✓ Versatile flashing accommodates up to 5 penetrations
- ✓ Suitable for pipes and/or cables
- ✓ Available in black, grey or red silicone



Solar Kit DSK200 KIT Components:

DEKITE FLASHING ADHESIVE (Silicone Dektites only)

Dektite Flashing Adhesive (50ml) is a one part dual cure (non acid) engineering grade Silicone adhesive. This primerless adhesive adheres to most substrates and is formulated for use with Dektite Silicone Flashings only. The adhesive reacts with atmospheric moisture to produce a long life seal that is resistant to UV and will remain flexible and withstands temperatures from -50°C to 165°C. Ideal for tile roofs.



DEKTITES (2pcs)

2 x Silicone Dektites
 0 - 35mm plus 2 x cable nipples.
 Red silicone will withstand constant temperatures at the roofline or -50°C to 200°C and up to 250°C intermittently.

ROOFING SCREWS (16 pcs)

10 Gauge, 16mm, class 4, mechanically plated roofing screws. 16 screws in solar kit.

CODE	No CODE	TO FIT PIPE SIZE	PACK QTY
DFE100BS (Black EPDM)	SOLAR MINI #0	0 - 35	20
DFE101BS (Black EPDM)	SOLAR #1	5 - 55	15
DFE200RES (Silicon Red)	SOLAR MINI #0	0 - 35	20
DFE201RES (Silicon Red)	SOLAR #1	5 - 55	20
DFE101BM (Black EPDM)	MULTI CABLE	12 X 4-8MM	1
DSK200RES (Red Silicon)	SOLAR KIT	0 - 35	1
DFA050G (Grey)	ADHESIVE		1
DFE050RE (Red)	ADHESIVE		1

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Dektite Combo

Wash over or around. A standard Dektite and Retrofit all in one.

The unique cone design makes the combo range suitable for both standard and retrofit applications.

When retrofit is required just cut and apply clips for ease of application. **Clips included.**

Suitable for roof pitches up to 40°.

Provides 10 - 20mm continuous contact with finished pipe providing a watertight seal.

Clear markings makes for easier cutting to pipe size.

Size ranges - Numbers 1 - 10 (5 - 750mm)

Available in black EPDM.

Just fit it and forget it - we've got you covered.

EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently.



Combo Selection Guide

Code	Description	Pipe (mm)	Base (mm)	Roof Pitch
DC01BC	Dektite Combo #1	5-60mm	139 x 139mm	0-40°
DC02BC	Dektite Combo #2	45-85mm	177 x 177mm	0-40°
DC03BC	Dektite Combo #3	5-127mm	221 x 221mm	0-40°
DC04BC	Dektite Combo #4	75-175mm	285 x 285mm	0-40°
DC05BC	Dektite Combo #5	108-190mm	366 x 366mm	0-40°
DC06BC	Dektite Combo #6	125-230mm	366 x 366mm	0-40°
DC07BC	Dektite Combo #7	150-280mm	454 x 454mm	0-40°
DC08BC	Dektite Combo #8	175-330mm	454 x 454mm	0-40°
DC09BC	Dektite Combo #9	240-508mm	705 x 705mm	0-40°
DC10BC	Dektite Combo #10	400-750 mm	965 X 965mm	0-40°

Combo Square Selection Guide

Code	Description	Pipe (mm)	Base (mm)	Roof Pitch
DCS103BC	Dektite Combo Square	20-125 mm	221 x 221mm	0-40°

Dektite Combo

Flash over or around. A standard Dektite and Retrofit all in one.

Installation Instructions

Standard Application

- 1 Trim the cone to suit pipe size using sharp tin snips.
- 2 Slide down pipe using water as a lubricant.
- 3 Apply a liberal bead of silicone sealant on underside of flexible aluminium base (refer to page 13 for silicone types).
- 4 Press base to the roof profile by hand. Smooth out any awkward creases. Don't fully extend to allow for vibration.
- 5 Fasten using self drilling washered screws or sealed rivets.

Retrofit Application

- 1 Trim cone to suit pipe size then cut seam and aluminium base using sharp tin snips.
- 2 Apply a liberal bead of silicone to one side of the cut seam.
- 3 With seam in downstream position wrap cone around pipe and engage 1st double clip at top of seam using multigrips.
- 4 Engage remaining clips working down from top of cone to base making sure that you do not over crimp.
- 5 Apply liberal bead of silicone sealant to underside of Dektite Combo and shape to roof by hand (refer to page 15 for silicone types). Screw down using self drilling washered screws or sealed rivets
- 6 Fasten flashing down by placing a fastener either side of seam first then secure rest of base working outwards in opposing pairs.
- 7 Apply sealant to top of base closure and any other potential leak areas.

Dektite Flatseal

For flat and low pitch roofs

- For Flat and low pitch roofs with single ply or bitumen coverings.
- No special tools or fittings are needed.
- Flatseal EPDM snaps tight to pipe without clips.
- Seals to roof with hot or cold liquid bitumen.
- Black EPDM for maximum UV and Ozone resistance.



Code	Base (mm)	Pipe (mm)	Colour
FS25-175	345	25-175	BLACK (EPDM)



Dektite Retrofit

When it has to flash around and not over...



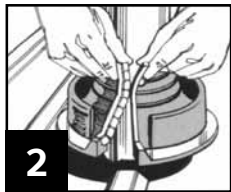
- ✓ Wraps around existing or difficult to access pipes, installations are a breeze.
- ✓ The built-in crimps mean no loose clips or rivets, snaps together in seconds.
- ✓ Made from quality polymer compounds, grips tight and stays tight.
- ✓ The supple aluminium base conforms like magic for easy profile moulding.
- ✓ Can also be used to flash square penetrations. Just add 30% to the pipe diameter and trim the cone to suit.
- ✓ EPDM withstands temperatures from -50°C to 115°C and up to 150°C intermittently.
- ✓ Red Silicone will withstand constant temperatures at the roofline of -50°C to 200°C and up to 250°C intermittently
- ✓ For pipes over 100mm Ø use a stainless steel support / hose clamp.

Code:	Code:	Base	Pipe	Pitch
Grey EPDM	Red Silicone	(mm)	(mm)	
RF 801G	RF901	160	20-70	0-40°
RF 802G	RF902	273	50-185	0-40°
RF 803G	RF903	369	85-255	0-40°

Installation Instructions:



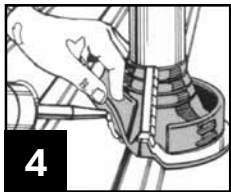
1 Measure outside pipe diameter and trim cone to match exactly where indicated.
For square pipes add 30%.



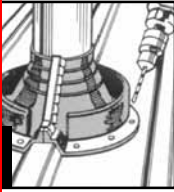
2 With clip in down-stream position, tension top of cone around pipe and engage metal teeth in opposing pockets.



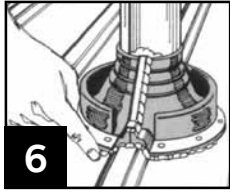
3 To assist in locating clip into pocket, place hand behind the seam. Fasten clip with pliers or multi-grips, working from top to base. **Do not overcrimp.**



4 Press the Dektite base to contour of roof sheet profile, then apply neutral silicone sealant to the underside.



5 Fasten flashing with washered self drilling screws. As per diagram, secure clip by placing a fastener either side of the clip first.

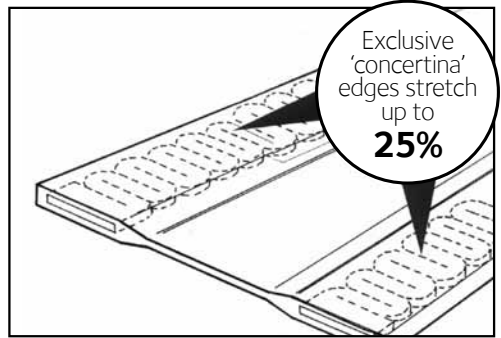
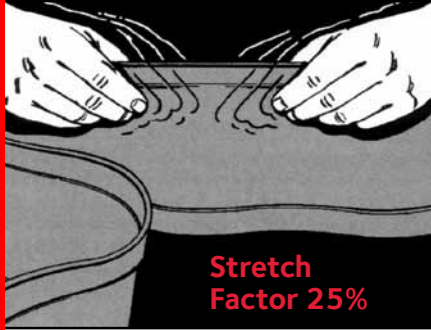


6 Apply sealant to top of crimp closure and any other potential leak areas. (refer to page 15 for silicone types).

Dekstrip Flashing

With the amazing patented stretch edge

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The Dekstrip edges contain an expanding aluminium strip (in concertina form) totally encased by the EPDM flashing.

Dekstrip can be stretched and formed around most roof profiles and maintain that shape.

Typical applications include bullnosing, where two different profiles intersect, curved parapet flashing, expansion joints in gutters, change of pitch and large round pipe penetrations.

Fastening is done through the aluminium strip using suitable fasteners with a minimum 10mm head. In case of rivets use a 10mm washer under head.

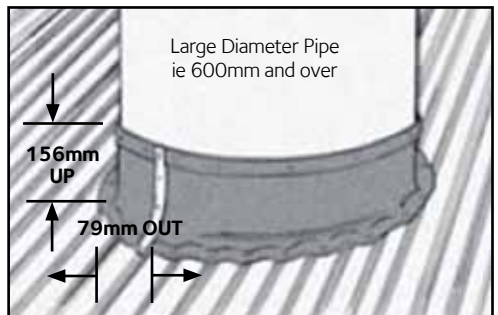
EPDM based thermoplastic elastomer (TPE) will withstand temperatures from -50°C to 115°C and up to 150°C intermittently.

Dekstrip can be painted (contact DLM for technical advise).

Large Round Pipes

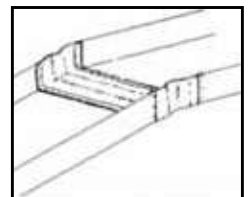
- 1 Mark a line on the pipe, 156mm above the roof. Take this mark from the valley. Circle the pipe.
- 2 Fasten Dekstrip (after applying sealant) at this line. Overlap ends by 50mm.
- 3 Stretch the entire unfastened bottom edge.
- 4 Seal and fasten bottom edge, allowing same overlap at bottom as at top - suggest valley fixing.

All listed measurements are for 235mm wide strip flash. If using other widths use a ratio of 2/3 up the pipe 1/3 over the roof profile.



Expansion Joints

The flexibility of Dekstrip makes it ideal for joining box guttering. No problems with movement or leaking.



Model	Length (m)	Width (mm)	Material
DS3-235	3.1	235	EPDM based grey Thermoplastic Electomer (TPE)
DS10-180	10	180	
DS10-235	10	235	
DS10-305	10	305	Price and availability on application
DS23-180	23	180	
DS23-235	23	235	
DS23-305	23	305	
DS15-450	15	450	

Fast Flash

Self Adhesive and very workable lead replacement



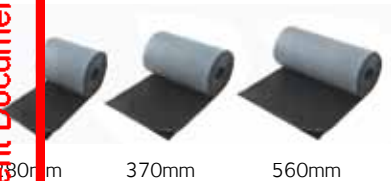
Easy to install being light weight, easy to trim and fully self-adhesive
 Slow set adhesive allows time for repositioning
 Flexible, malleable and stretchable making Fast Flash very workable and able to dress well to all profiles.
 Product range includes rolls in three standard sizes, and colours Black, Grey and Brick Red
 Environmentally friendly aluminium stretch netting cast in polymer rubber



Fast Flash - quick weatherproof flashing

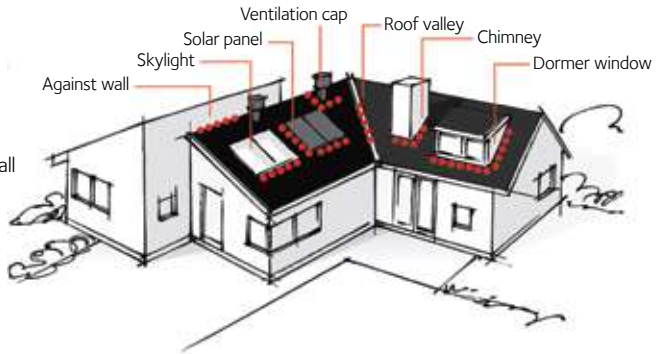
Fast Flash consists of aluminium stretch netting cast in environmentally friendly polymer rubber. Fast Flash is self-adhesive on the reverse and protected by a clear foil that is removed before installation. Fast Flash is available in rolls in three standard sizes and comes in grey, black and brick red.

Code	Length (m)	Width (mm)	Weight (kg)	Colour
FFR5-280	5	280	4.7	Grey Black Brick Red
DS10-180	5	370	5.9	Grey Black Brick Red
DS10235	5	560	9.2	Grey Black Brick Red



Self-adhesive flashing

Fast Flash is ideal for a quick and secure flashing solution. Fast Flash can be installed on roofs with a slope of min. 5° and on almost all roof materials. Fast Flash is environmentally friendly and easy to install as the reverse is self-adhesive, as well as being flexible and very workable.



Helpful Hints

Dektites

- When cutting do not use a knife. Sharp tin snips will provide the smoothest finish.
- Always cut where sizes are indicated. Incorrect point of cutting may result in poor fit.
- Hand form aluminium edge before fastening.
- Fasten from vertical centre to outside.
- When pulling the Dektite down a pipe, lubricate the pipe with water first.

Benefits & Combos

- Do not overcrimp seam.
- For pipes over 100mm diameter use a stainless steel support clip.

General Points - Applicable to all Deks flashing products

- ✓ Always ensure that a liberal amount of sealant is applied **UNDER** any perimeter aluminium-backed edge.
- ✓ **Seamed Pipes:** When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of the cowl to the top of Dektite cone.
- ✓ Where multiple skin flues are used, EPDM Dektite are appropriate.
- ✓ Under **NO** circumstances should any Dektite product be used on an unapproved (**i.e. single skin**) flue discharging from a wood combustion appliance.
- ✓ Overstretching of EPDM compound products can lead to shortened life expectancy.
- ✓ Please note that the outside temperature of the pipe is usually significantly lower to the exit temperature of the appliance.

Look at this Performance

ASTM Method	Test Description	Spec. Required	Test Results Black EPDM Dektite	Test Results Grey EPDM Dektite
D2240	Shore 'A' Hardness:	60+/-5	60	60
D412	Tensile Strength (MPa min):	7.0min	10.5	10.5
D412	Elongation @ Break (% min):	350min	650	650
D624	Tear Resistance Die C (KN/m min):	20.0 min	31.5	32.0
D624	Trouser Tear (KN/m min):	10.0min	14.0	14.5
D573	Heat Resistance 70hrs @ 100°C			
	Change in Hardness (points):	+/-10	+1	+3
	Change in Tensile (%):	+/-25	+3.5	-5.0
	Change in Elongation (%):	+/-25	+14.0	-16.0
D395	Compression Set 22hrs @ 70°C after (%max):		14.0	14.5
D1171	Resistance to Ozone	100ppm No Cracks	Passed	Passed
D2137	Low Temp. Brittleness 3 mins @ -50°C:	Non Brittle	Passed	Passed
U.L. 94	Flame Resistance	U.L.94H.B.	Passed	Passed

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Silicone Sealants



The following silicones have been trialled and have been found to provide a satisfactory bond between the Dektite and Silicone Dektites and most commonly used roofing materials.

• CCI Professional Roof and Gutter N-192, Silicone Sealant

- Saskil AP Multipurpose Silicone Sealant
- Silleys Roof & Gutter Silicone Sealant
- Bostik Findley Roof & Gutter Silicone Sealant
- Dow Corning 791 Silicone Weatherproofing Sealant

Code	Description	Box	Colour
N-192	All purpose neutral silicone	20	TRANSPARENT

- For adequate bonding all surfaces must be clean and dry.
- The base of the Dektite should be moulded by hand to form a snug fit to the roof profile.
- The Dektite should then be lifted clear and a continuous bead of silicone applied to the whole of the ribbed underside of the Dektite. For an effective seal a 1-3mm bead of silicone is sandwiched between the two surfaces.
- Pull the Dektite down to sit snugly on the roof profile and fasten with washered screws / Hex screws. NB: Screw coatings of class 4 or 5 are required.
- Remove excess silicon and collect any swarf.

Dektite Pipe Flashing Warranties

This warranty on Dektite Pipe Flashing is given by Consolidated Alloys (NZ) Ltd 55 Maurice Road, Penrose Auckland, New Zealand for the periods and under the terms and conditions listed below.

DLM warrants that all Dektite pipe flashings will perform in accordance with our published specifications and will be free from defects in material and workmanship for a maximum period of 20 years, commencing from the date of delivery to the user.

Under this warranty DLM will, at its option, repair or replace any defective Products. Any claim should be made in writing within 90 days following the discovery of any defect. DLM shall not be liable for any costs incurred in the removal of defective items or installation of replacement items nor cost of freight and other associated charges.

This warranty shall not apply where:-

- (a) the Product has not been installed in strict accordance with our published recommendations;
- (b) the Product has been installed in an area which has been exposed at any time during the warranty period to corrosive

conditions including but not limited to, corrosive chemicals, ash, fumes or condensates or harmful substance generated within or about the building(s) or fixture(s) to which the Product has been applied;

(c) any damage to the Product has been caused as a result of the negligence or misuse of the Product by the claimant.

(d) any modification to the specification of the Product has been made, save and except where any modification is reasonably necessary in adopting the Product to size.

(f) defects are a result of acts of God or other external forces, including but not limited to, failure to provide free drainage of water from around the areas in which the Product has been installed.

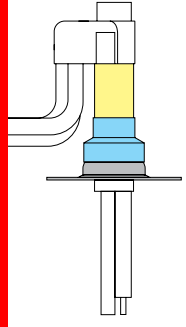
3. To the extent permitted by law, this warranty is given in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose. Where so permitted, the remedies stated herein are exclusive remedies and DLM shall not be responsible for any indirect, consequential or incidental damages or further loss of any kind whatsoever except as expressly provided by in this Warranty.

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Top Hat Roof Penetration Kit

For use with air conditioning units, heat pumps & solar panels

Top Hat Roof Kit



Compliant Penetration



Code

RF PN 50	50
RF PN 65	65
RF PN 65 Twin	65 Twin
RFPN80SC	80
RFPN110FC	110

Size (mm)



For other options on solar penetrations refer to Dektite premium solar products on page 4.

Installation Instructions:

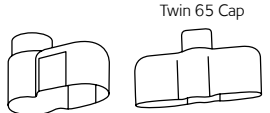
Position the PVC tube. Fix it to a batten or rafter.



Fit the Dektite flexible flashing as per the installation instructions.



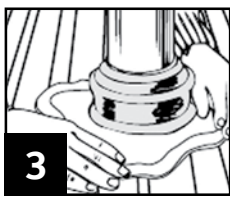
Slide the PVC cover flashing into position and glue/



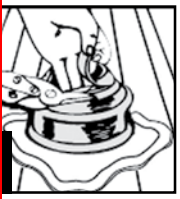
Install all pipe work and secure the cap with stainless steel self tapping screws.



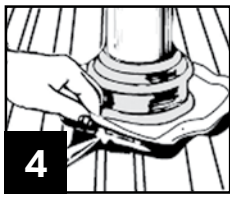
For more effective drainage always fit the Dektite on the Diamond as shown.



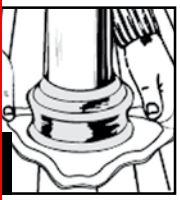
Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



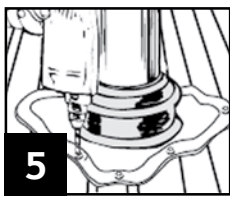
Cut a neat hole in the roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips (where necessary, support cut sections of sheet with additional timber framing).



Apply a neutral cure silicone sealant by turning back the flexible flange (refer to page 15 for silicone types).



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



Fasten using class 4 coating washered screws. Fit fasteners progressively outward in opposing pairs.

FLASHGUARDz

the superior edge flashing



Designed and manufactured in NZ by DLM from imported materials

- Compatible
- Extremely malleable and very quick to install
- Weatherproof and birdproof
- Available in the most popular Colour Steel fashion colours + primer
- 3 sizes available: 43mm, 63mm and 75mm
- NZ Patent 290485

FLASHGUARDz is a soft edged roof weatherseal flashing, for lock seaming to Zinalume, Galvanised, Aluminium and Zinc roof flashing sheets. This unique product will expand and readily shape snugly to the contours of the roofing profile.

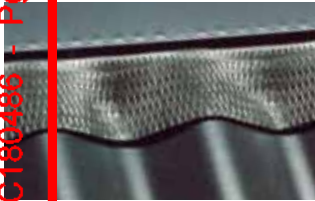
FLASHGUARDz is suitable for installation over pressed metal tiles, long run corrugated and trapezoidal roofing profiles, which do not exceed 32mm in height.



Description

FLASHGUARDz comprises an expandable aluminium strip with a specially formulated synthetic compound, bonded to the underside. The black synthetic compound provides a weather sealing membrane on the underside of the aluminium strip. It has a service temperature service range of between -40°C and +90°C and contains only 1% carbon black by weight. A layer of soft paper is applied to the underside of the rubber to prevent it sticking to the roll formers machinery and to provide protection when handling.

FLASHGUARDz is available in 75mm for trapezoidal profiles, 63mm width for both trapezoidal and corrugated profiles and 43mm width for corrugated and very low profiles.



Extremely malleable – FLASHGUARDz is so easy to install, it can be dressed down using finger pressure only, so there is no need for special tools. There is no need for hammering onto roof profile, no need for cutting or forcing to shape and hence no risk of scratching, denting or paint damage to the roof.

Very quick to install – Because of the ease of fitting FLASHGUARDz, reduces installation time will result in major savings in labour costs.

Weatherproof and birdproof – The special rubber backing provides a weather sealing membrane with excellent stretch characteristics and resistance to moisture. FLASHGUARDz perfectly hugs the contour of the roof profile, preventing birds from gaining access.

Compatible – Compatible with zinalume, aluminium, galvanised steel and Zinc roofing materials.

Rainable – FLASHGUARDz is available etch primed, ready for top coating in any other roofing colour not currently in the range.

Installation and Handling

- 1) Fold the FLASHGUARDz out by hand, using minimal force. Do not remove paper backing.
- 2) As is normal trade practice, ensure that on the top edge of the longrun sheets, the pans are “turned up” to provide a stop end.
- 3) Affix the flashing to the roof before dressing FLASHGUARDz into the roof profile.
- 4) Dress the lower edge of the FLASHGUARDz into the roof profile, using finger pressure only.

Start from the centre of the pan and work towards the ribs on either side.

Maintenance

The paint coating should be maintained for the duration of the life of the roof. Normal rain washing will remove most of the accumulation of dirt and salt. It is recommended, however, that FLASHGUARDz should be cleaned with a soft bristle nylon brush and clean water at least once a year, and more often in severe environments. When installed correctly and maintained, FLASHGUARDz satisfies the 15 years durability requirement of the NZ Building Act. Painting FLASHGUARDz after installation will extend the durability up to 30 years.

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Plascourse DPC

An effective moisture barrier



An effective moisture barrier for use as a dampcourse material and concealed flashing.

Plascourse is a thick, high impact low density black polyethylene strip with an embossed surface on both sides that reduces slippage in use.

Plascourse will provide an effective moisture barrier for use as a dampcourse material and also as a concealed flashing.

Plascourse is manufactured to Australian and New Zealand Standard 2904 - 1995

Plascourse meets the test requirements for impact resistance AS/NZ 4347.6

Plascourse is embossed both sides with dimensions between 3mm - 10mm maximum in both machine and transverse direction and it's thickness is measured in accordance with AS/NZ 4347.9

Plascourse may be used as a damp course in brick or block work.

Plascourse may be used as a concealed flashing under timber, window frames or door frames.

Plascourse may be used when separation between different materials is required.

Plascourse MUST NOT be used in applications where it is exposed to direct sunlight.

Malthoid

Damp proof course

Malthoid Damp Proof Course is a Kraft saturated in multiple layers of a Bituminous coating then a light sand coating

Malthoid may be used when separation between different materials is required

Malthoid may be used as a damp course in brick or block work or Aluminium

Malthoid may be used as a flashing under timber jack studs and timber piles



Malthoid is manufactured to meet the following provisions of the NZBC:

NZBC Clause E2 External moisture

Malthoid Damp Proof Course satisfies the requirements of E2/AS1 Table 23, NZBC 3604 2.3(b)

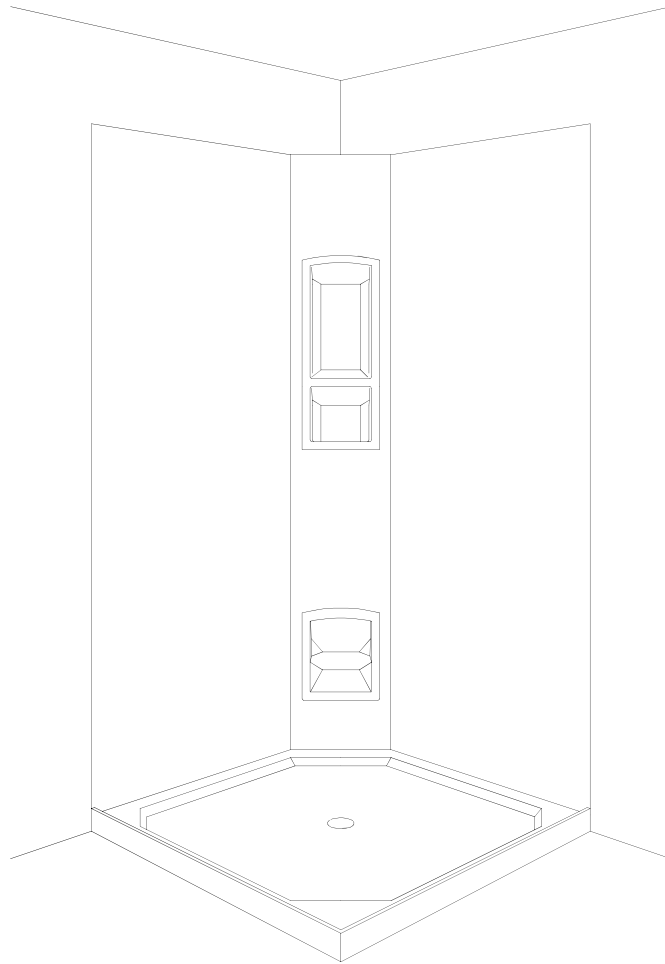
NZBC Clause B2 Durability

Malthoid Damp Proof Course will meet the durability requirements of NZBC E2/AS1 Table 1 - Damp Proof Course. Malthoid must not be exposed to extended periods of direct sunlight, or prolonged contact with chemicals or solvents.

Code	Length (m)	Width (mm)	Carton Qty
MAL50	20	50	8
MAL75	20	75	8
MAL90	20	90	6
MAL100	20	100	6
MAL150	20	150	4
MAL200	20	200	2
MAL300	20	300	2



Acrylic Shower Tray and Shower Wall Lining Installation Instructions



Dear Purchaser/Installer

Thank you for purchasing a Clearlite Bathrooms product. We are proud to be 100% NZ owned and operated with over 30 years experience in the Bathroomware industry. We hope you enjoy your Clearlite Bathroom experience.

You are about to install a Clearlite Bathrooms product. The unit that you have purchased has been designed and manufactured to the highest possible standard. Please read and ensure that you fully understand the installation principals and how they apply to your unit. Bear in mind that useful old adage "measure twice and cut once".

Please note that before wrapping this product it was cleaned and polished under bright lights.

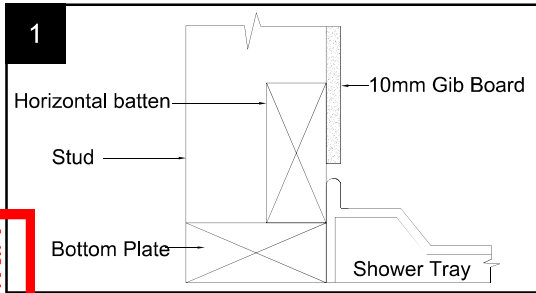
For your own peace of mind, please unwrap and check the product carefully as we cannot accept responsibility for damage that may occur in handling or installation.

Important note for Tiled Wall Installations.

Please check for any special installation requirements that may be required for the doors. Some doors will require the wall receivers to be fitted on top of the waterproof membrane prior to tiling application

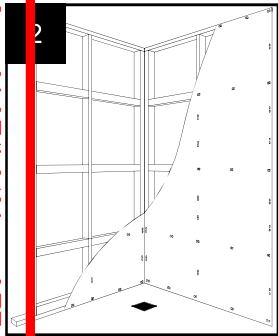
Please read these Instructions carefully

Installing the Shower Tray



To achieve optimum results when installing the shower it is important that the floor and walls are level and plumb.

As a guide - for every 1 mm that the floor is out of level, adjustment of the enclosure will be reduced by 2mm. If the floor is out of level by 5mm there may be insufficient adjustment in the door set during installation. Under no circumstance should the tray be packed, the tray must be fully supported. To level a concrete floor use leveling compounds. For timber floors, either sand or use leveling compounds

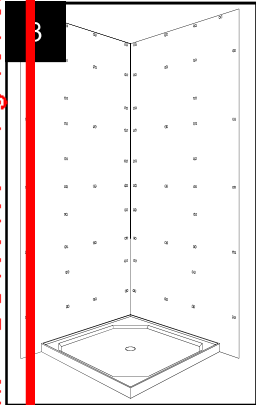


Have the Plumber install the shower fittings

Use 10mm Wet Wall Gib Board to line the walls and double nail to the studs/nogs at 200mm centres. **Do not Gib stop, seal, sand or paint the Gib Board surface as this will affect adhesion of the wall liner to the Gib Board.**

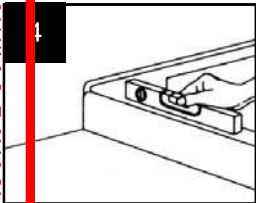
The hole cutout in the floor for the waste must be backfilled to ensure the tray is fully supported. For concrete floors backfill with concrete or a similar solid fill material. For timber floors either add additional nogs or use a leveling compound.

IMPORTANT: Warranty will be void if the tray is not fully supported



Place the shower tray in position and using a pencil mark the tray's profile on the Gib board.

Cut away the Gib Board 10mm above the pencil line. Place the tray into the rebate and check that the front face of the tray's upstand does not protrude further than the Gib board surface. (This may be a result of the two walls not being set 90 degrees to each other). If the upstand protrudes further than the Gib board face the tray will need to be rebated further into the bottom plate

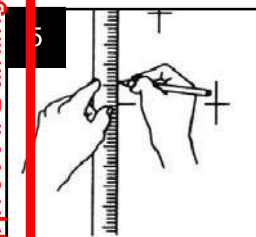


Check that the tray is level and that the waste outlet aligns with the waste that has already been installed in the floor. (If tray is not level refer to Step No.1)

Peel the protective masking away from the sides & the upstand of the tray. Leave the masking in place over the floor area.

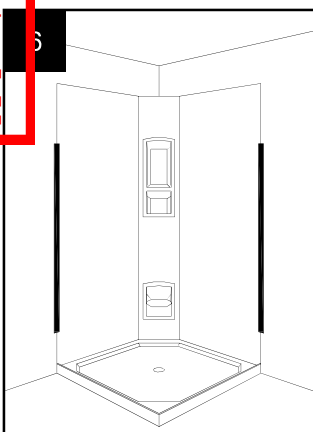
Remove the tray and apply a construction adhesive such as "Liquid Nails" to the rings on the underside of the tray. Apply a bead of silicone sealant to the face of the Bottom plates (prevents possible squeaking). Place the tray back into position.

The tray should now be left for 24hrs to allow cure of the construction adhesive

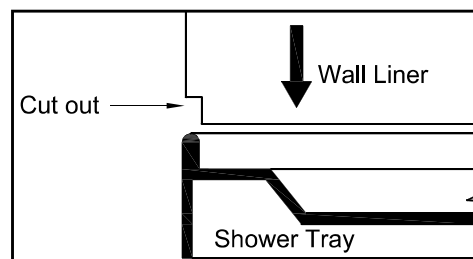


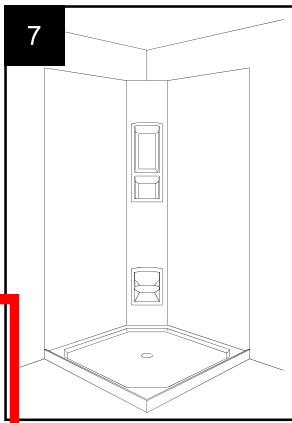
Installing the Wall Liner

Carefully measure and mark the positions of any plumbing fittings on the wall lining. Carefully drill holes in the wall liner. Refer to Cutting and Drilling details at the end of these instructions



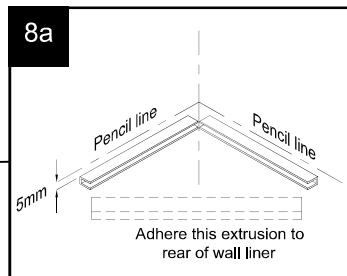
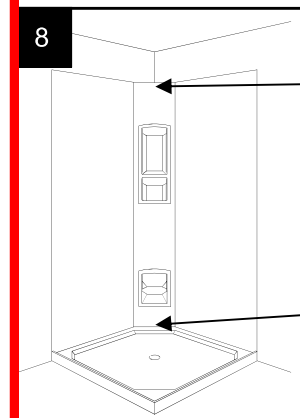
Trial fit the wall liner by taping it temporarily in position. If for any reason the wall liner requires cutting to the bottom corners use a fine tooth hacksaw. Any edges may be finished off by sanding with a medium grit sandpaper





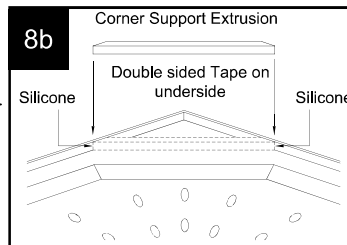
With the wall liner in position mark around its perimeter with a pencil. Remove the wall liner then wipe down the Gib board surfaces and the rear of the wall liner with a clean cloth to remove any dirt, dust and any contaminants. Check that there are no nails or screws protruding from the wall

Special instruction for Cezanne, Millennium & Platinum walls



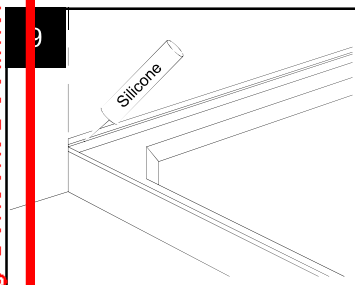
Mark the Gib board where the wall liner cuts across the rear corner and fit the two 170mm support extrusions (supplied with the liner) 5mm below the pencil line as shown

Attach the third 170mm support extrusion to the rear of the wall liner 5mm down from the top

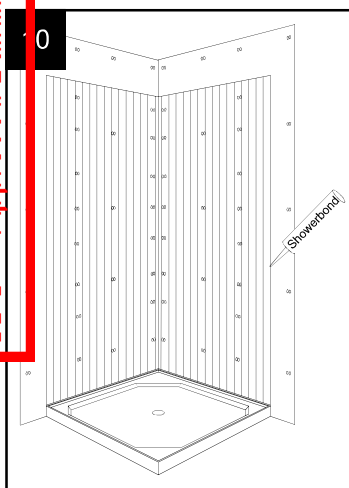


Fit the bottom diagonal support extrusion to the tray. This should be set at 45° across the corner and double sided taped in position, this will support the diagonal lower edge of the wall liner. Seal the extrusion junctions to the tray using silicone **Refer to the section on “Detail application of silicone NG”**

Installing the Wall Liner – All types



Apply a generous & continuous bead of Silicone NG sealant along the top front edge of the shower tray upstand. If fitting a Millennium or Platinum wall liner also apply a continuous bead across the top of the diagonal wall support extrusion.(8b) **Refer to the section on “Detail application of silicone NG”**



Using the Showerbond adhesive supplied (Warning : Do not use any other adhesives as warranty will be voided).

Starting 10 mm in from the edge of the wall liner apply a 5-6 mm vertical bead of adhesive, continue to apply adhesive in vertical lines at approximately 50 mm centres.

Place the wall liner in position and apply firm pressure over the entire area of the wall liner to ensure complete contact has been made with the beads of adhesive. **Wall liner must be fitted within 15 minutes of applying the Showerbond to avoid premature curing.**

If fitting a Millennium or Platinum Wall liner install the triangular plastic corner infill to the wall support extrusions (8a) using silicone. Once in place seal the perimeter with silicone to prevent moisture entering the cavity

To the top edge of the wall lining seal with a paintable sealant such as Selleys “No More Gaps”

It is recommended that 3 sided wall liners be braced in position. Bracing should remain in position for a minimum of 18 hrs.

The shower door set can now be installed.



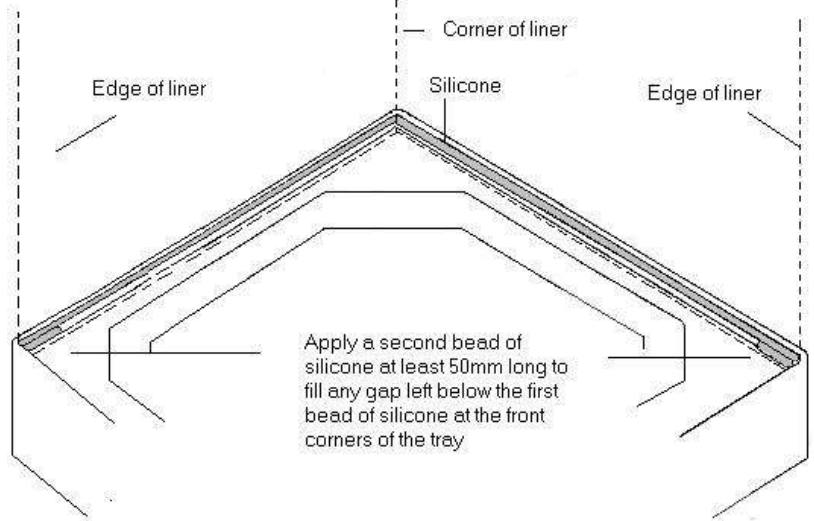
Allow the adhesives and sealants to cure for a minimum of 24hrs

DETAILED APPLICATION OF SILICONE NG

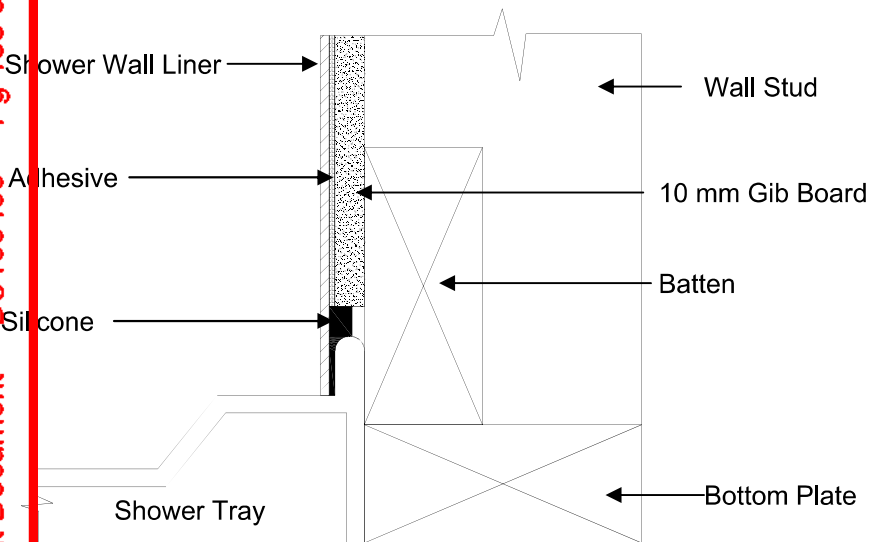
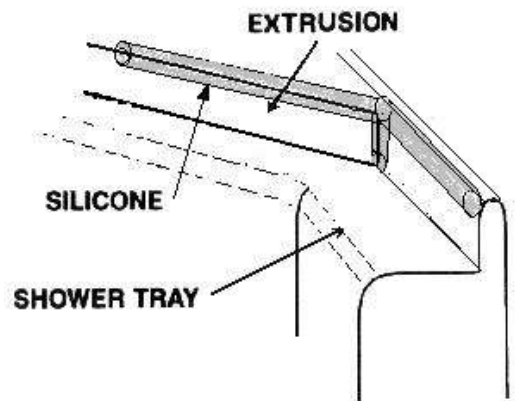
NOTE

No silicone should be visible from the inside of the shower

Silicone Application



**Corner Support Extrusion
Millennium & Platinum Corner Moulded Only**



In line with BRANZ recommendation, we suggest that a sealant such as “Selley’s No More Gaps” be applied to the top of the acrylic liner. This is to prevent any moisture penetrating down behind the lining.

If the acrylic is to be cut, use a fine tooth hacksaw and very carefully cut the acrylic. To smooth edges off use a fine tooth file or a medium grade sand paper. For a high sheen finish, use an abrasive cleaner such as Brasso to burnish. Small holes can be drilled using a twist drill with the cutting edge backed off with an oilstone (the sharp edge dulled) to prevent ‘grabbing’. For larger holes, use a fine tooth hole-saw.



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For further information contact:
Clearlite Bathrooms
54-58 Hillside Road
Private Bag 40902 Glenfield
Auckland 1310 New Zealand



Telephone: (09) 444 3780
Facsimile 0800 88 00 11
Email: info@clearlite.co.nz
Website: www.clearlite.co.nz

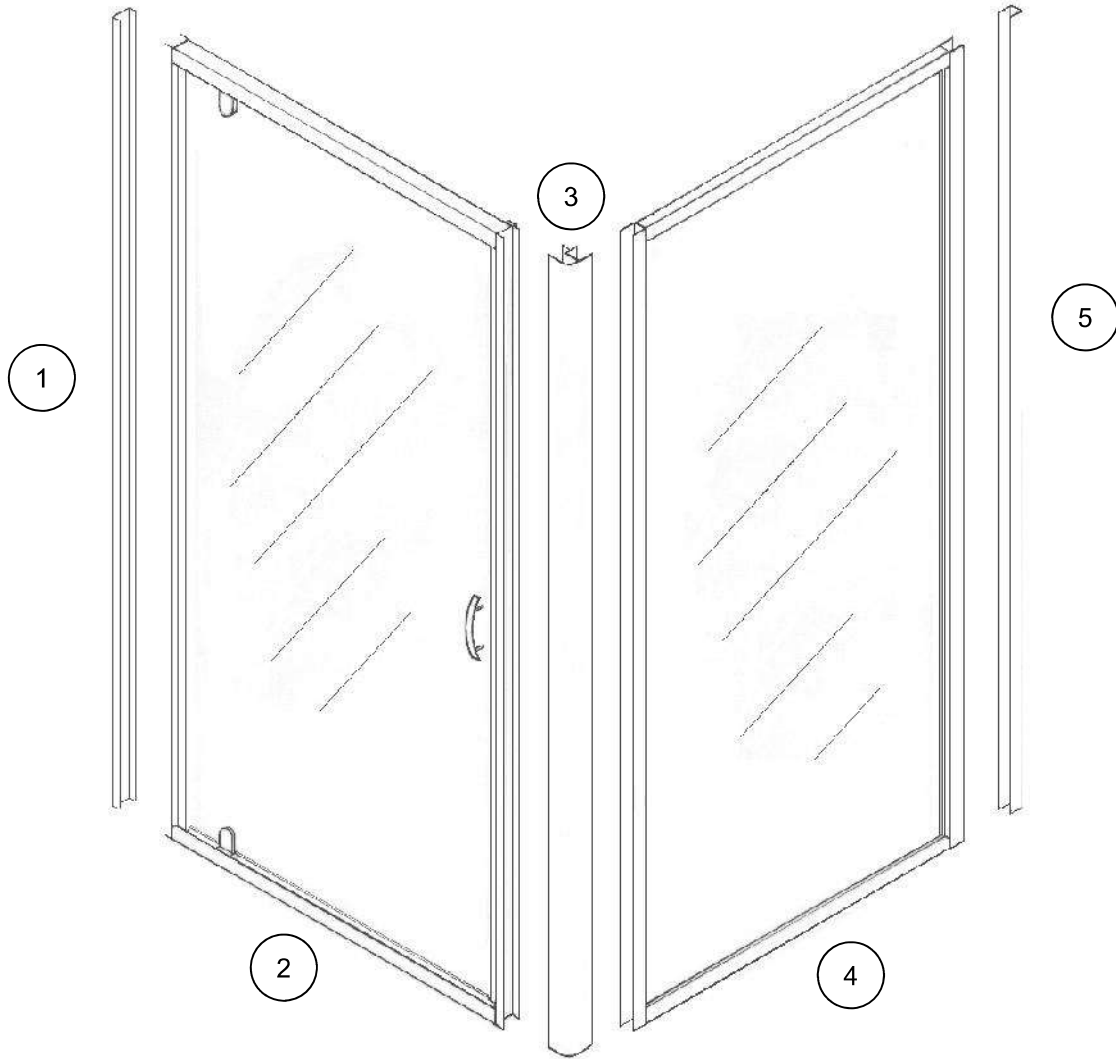
Installation Instructions

Door & Return

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Please read these Instructions carefully



Components:

- 1. Door Wall Receiver
- 2. Door assembly
- 3. Corner section 90-degree– attached to the Return Panel
- 4. Return panel
- 5. Return Wall Receiver
- 6. Cover trim (not shown) - available on selected models

The following tools are required:

- Drill
- Spirit level
- Tape measure
- Screwdriver (#1 square drive)
- Cleaning cloth
- NG Silicone sealant (supplied with liner)
- 3.0mm & 4.5mm drill bits
- Caulking gun
- Masking tape
- Pencil

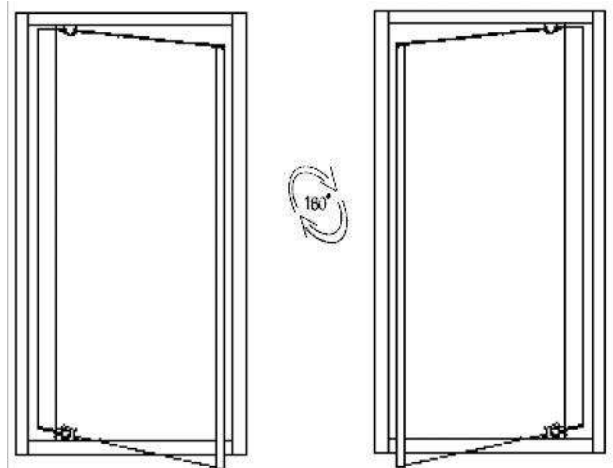
Installation components:

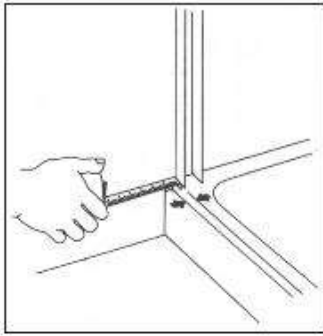
- No.6 x 38mm stainless steel screws (6) (Use 3.0mm drill)
- No.6 x 10mm stainless steel screws (9) (Use 3.0mm drill)
- Screw cover caps (12)
- Handle or Knob set where applicable
- Plastic drip strip

Note:

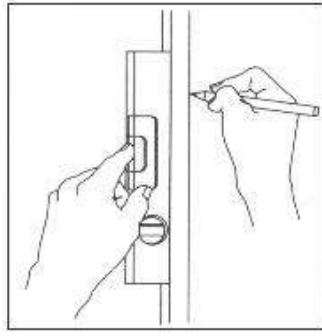
Your shower Door can be installed to open from the left or right hand side by rotating the door 180 degrees, and the Return Panel can be fitted on either side. You must decide which way the door is to open before starting the installation.

For your safety, the door is designed to open to 90 degrees do not force it to open past this point.

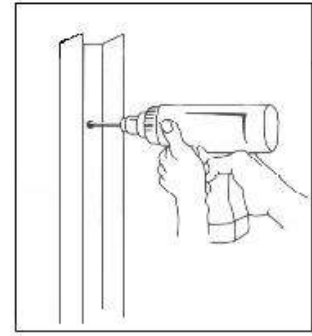




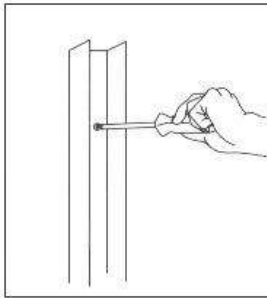
- 1) Position the Wall Receivers hard against the inside edge of the tray upstand
NOTE: If the shower walls are to be tiled the Wall Receivers must be installed to the Water proof membrane before tiling. This ensures the doors will fit within the lip of the tray



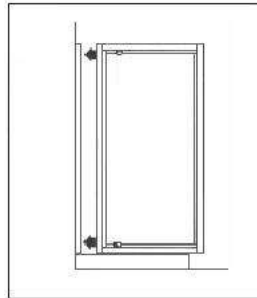
- 2) After determining which side the door is to be installed, plumb up the Door Wall Receiver using a spirit level. Mark the position with a pencil line.



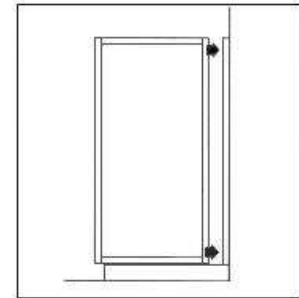
- 3) Pre drill three equally spaced clearance holes (i.e. top, bottom and centre) in the Door & Return Wall Receivers using a 4.5mm drill bit. Reposition the Wall Receivers to the pencil line on the wall. Drill into the wall through the clearance holes using the 3.0mm drill bit.
N.B. The holes preferably locate into a stud or nog. As an alternative, a toggler system can also be used.



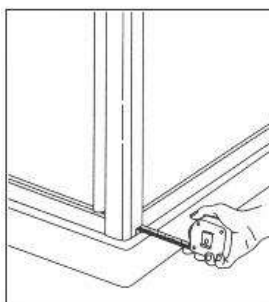
- 4) Fix the Wall Receivers to the walls using the No.6 x 38mm stainless steel screws
NB As an extra precaution seal holes with silicone.



- 5) Ensure the Door is facing the correct way with the door opening outwards
 Lift the door onto the shower step and slide into the Door Wall Receiver



- 6) Position the Return Panel into the Return Wall Receiver ensuring the Corner Post engages over the door section, but do not fix in place at this time.



- 7) For Sureseal trays the Door and Returns panels should be hard against the inside edge of the upstand of the tray.
 For other applications, check that the doors are parallel with the front edge of the tray.

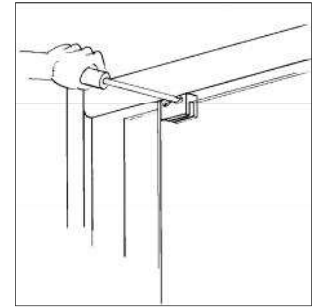
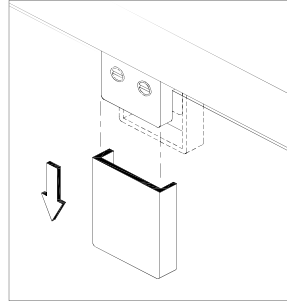


- 8) Ensure that each section is square to the shower base and plumb.
This is a very important part of the installation. Mark the plumb positions with your pencil.



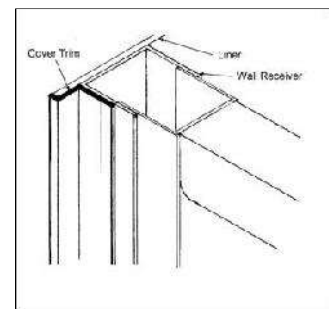
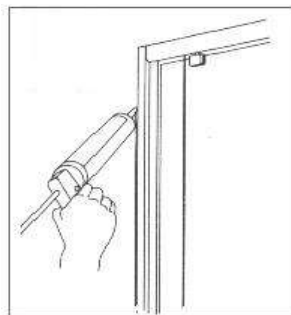
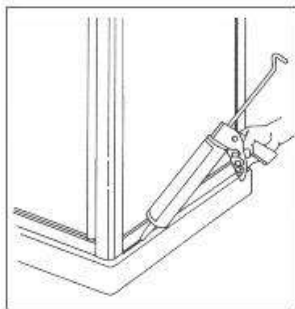
- 9) From the inside using a 3.0mm drill bit; drill through the vertical sections of the Door and Return into the Wall Receivers. Fix the Door and Return Panel to the Wall Receivers. You must have a minimum of 10mm overlay and the holes must be drilled no more than 5mm from the edge of the vertical aluminium sections.
 Fix in place using the 6 gauge x 10mm screws. Cover screw head with cover caps provided.

All Screw fixings are made from inside the shower



10) Using the 3.0mm drill bit, drill through the corner section and into the aluminium frame. (Use the "V" line as a guide)
Fix in place using the No.6 x 10mm screws. Cover screw heads with cover caps provided.

11) Slide the outside Clamp Block Covers off the Pivot Clamp. Using a screwdriver, adjust the door as required, by loosening the screws on each pivot block.
Once the door adjustment is complete ensure the screws are retightened and reinstall the Clamp Block Covers
Trim and fit the Drip Strip along the bottom edge of the door. The flexible vertical blade will face towards the inside of the shower

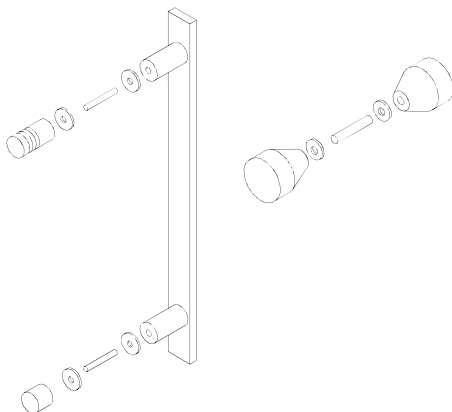


12) Test the operation of your door and make a final check that everything is square and plumb. The Door and Return can now be sealed in place using silicone sealant. Seal between the tray upstand and your door set along the bottom outside edges. Ensure all surfaces are first cleaned with dry clean cloth.
Note MASKING the area to be sealed will give you a better finish

13) Seal the vertical edges of the Door and Wall Liner. Ensure all surfaces are first cleaned with dry clean cloth.

14) **Cover Trim– (selected models only)**
The Cover Trim is provided to cover the exposed vertical edge of the wall liner and is the final step of the installation.
To fit the Cover trim apply small vertical beads of silicone down the Wall Receiver and the exposed wall lining outside of the Wall Receiver. Embed the Cover trim into the silicone
If the liner extends more than 10mm it will need to be trimmed prior to fitting the Cover Trim

IMPORTANT: DO NOT apply sealant to the inside of the shower



Fitting Handles or Knobs – where applicable

Fitting of the handles can be done at any time. First take note of how they are pre-assembled.
Note the washers must go between the handles and the glass on both sides of the door to prevent metal to glass contact

For further information contact:
Clearlite Bathrooms
Telephone: (09) 444 3780
Facsimile: 0800 88 00 11
Email: info@clearlite.co.nz

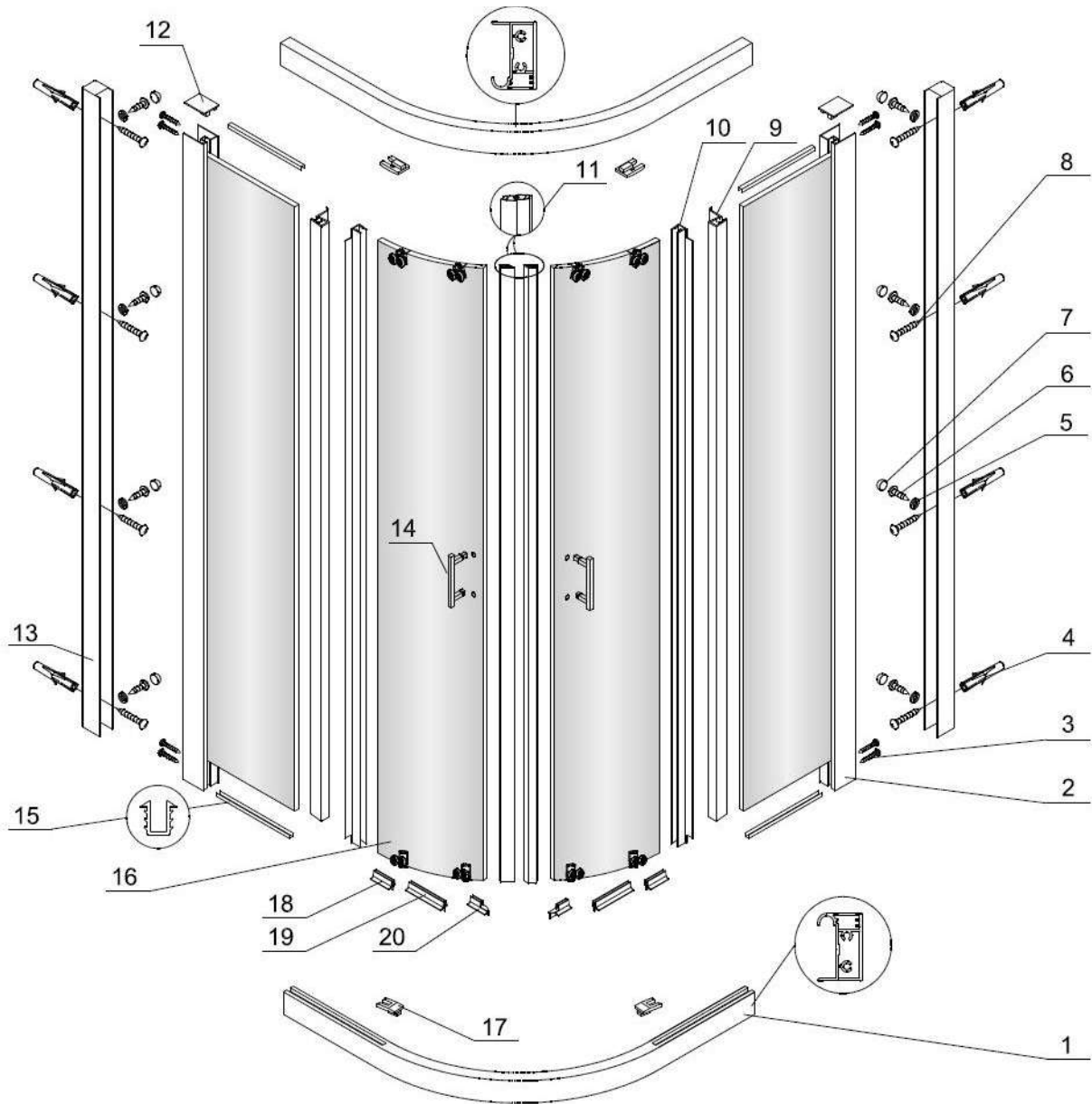


Cezanne Shower Door Installation Instructions



Please read these Instructions carefully

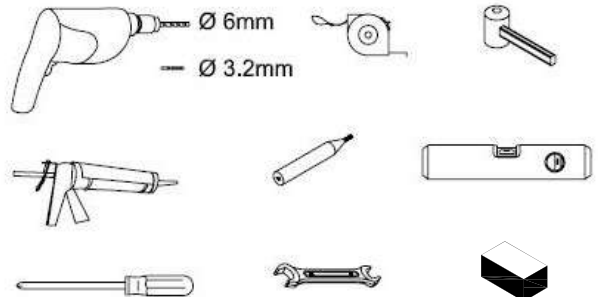
Cezanne Exploded Parts Diagram



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No.	Description	Qty
1.	Door Head & Sill	2
2.	Fixed Glass Panel	2
3.	Stainless Steel No.6x30 screw	8
4.	Wall Anchors	8
5.	Washer	8
6.	Stainless Steel Screw No.6x12	8
7.	Screw Covers	8
8.	Stainless Steel Screw No.6x50	8
9.	Fixed Panel Vertical seal	2
10.	Door Vertical Seal	2
11.	Magnetic Door Closing seal	2
12.	Adjustable Profile Cap (LH/RH)	2
13.	Wall Receiver	2
14.	Handle Set	1
15.	Glazing Gasket	4
16.	Glass Door Panel	2
17.	Head and Sill cap	4
18.	Drip Seal 81mm	2
19.	Drip Seal 188mm	2
20.	Drip Seal—precut Left and Right	2

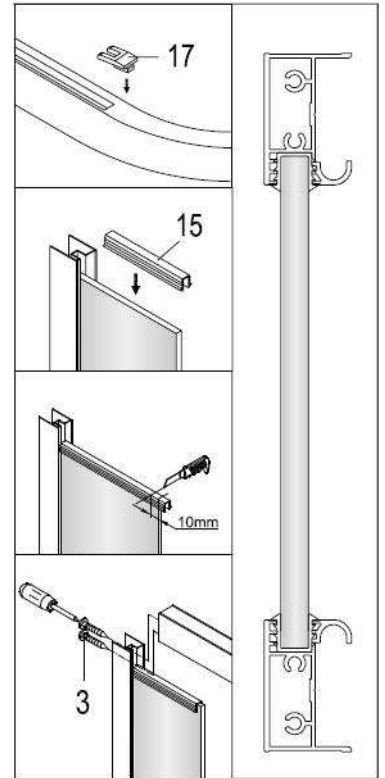
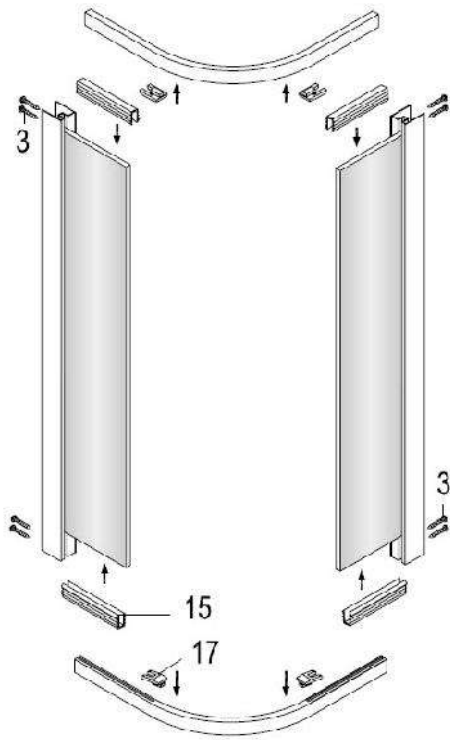
Tools & Materials Required



Wood blocks x 3
Minimum height—30mm

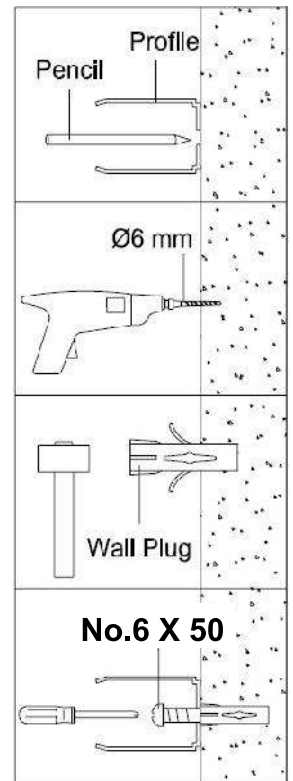
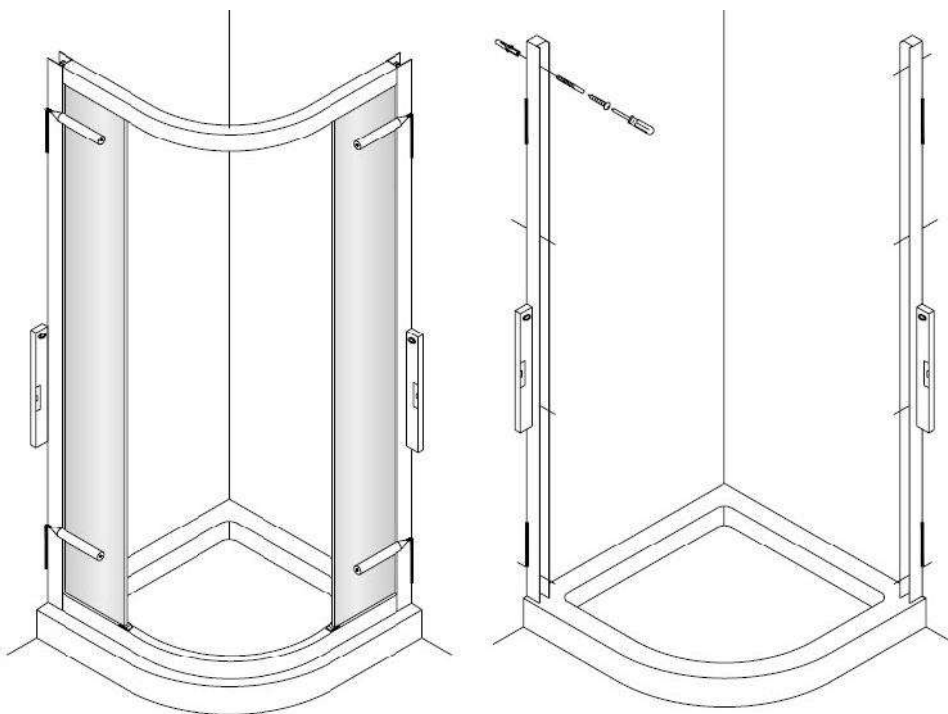
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Step 1 Assembling the Door Frame



Step 2 Installing the Wall Receivers

If there is no solid Stud available

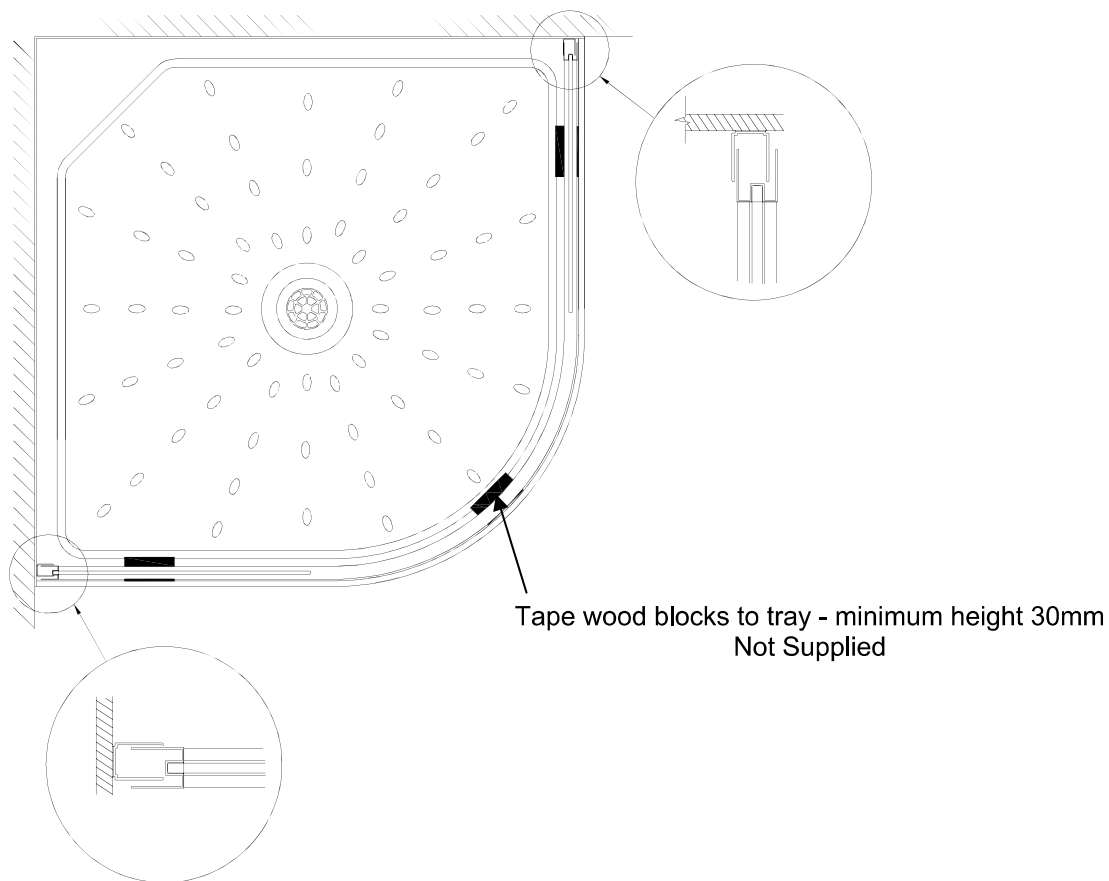


When lifting the Door Frame assembly, hold it by the vertical edges of the glass. Under no circumstance lift by the Head and Sill as this may cause the glass to fall out of the glazing gaskets

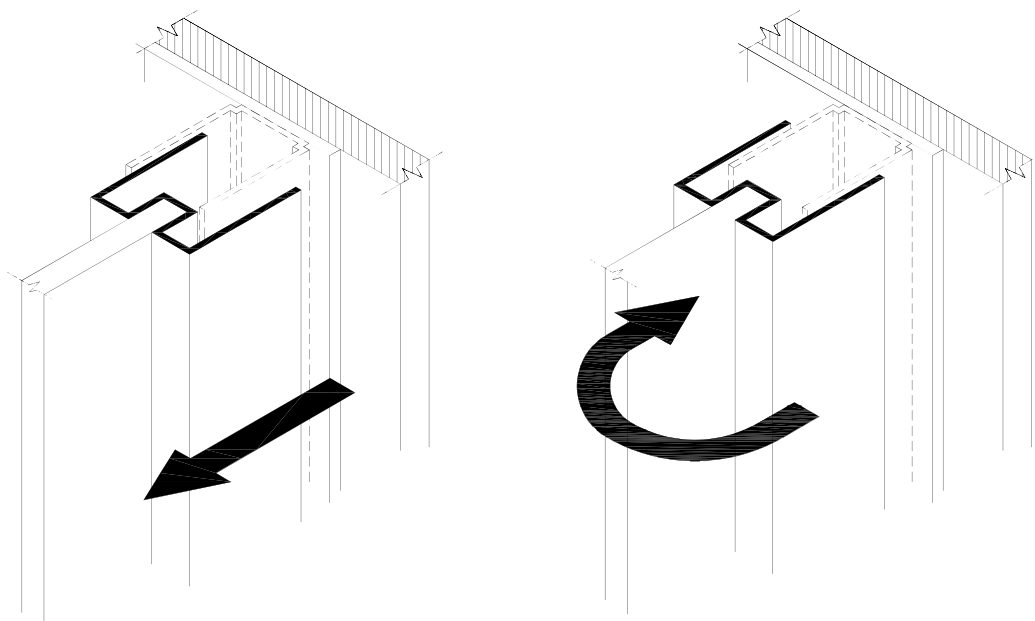
IMPORTANT: If tiling the walls, the Wall Receivers must be installed to the waterproof membrane before tiling. Failure to do so may result in the Shower Door set not fitting the shower tray. When Tiling leave a 2mm gap either side of the Wall Receiver to allow fitment of the Door Frame assembly

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Step 3 Installing the Door Frame Assembly

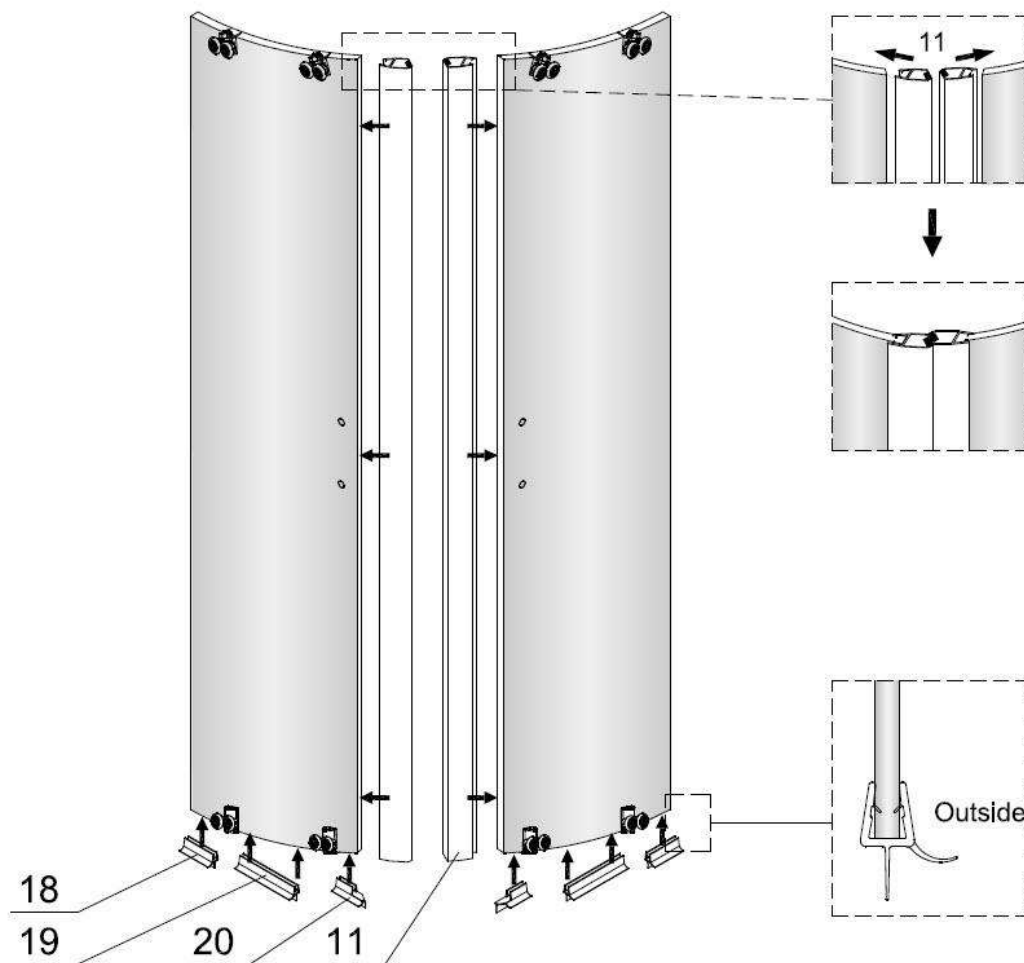


Lift Door Frame assembly onto wood blocks and place into Wall Receivers as shown
When lifting the Door Frame assembly, hold it by the vertical edges of the glass or door frame.
Under no circumstance lift by the Head and Sill as this may cause the glass to fall out of the glazing gaskets

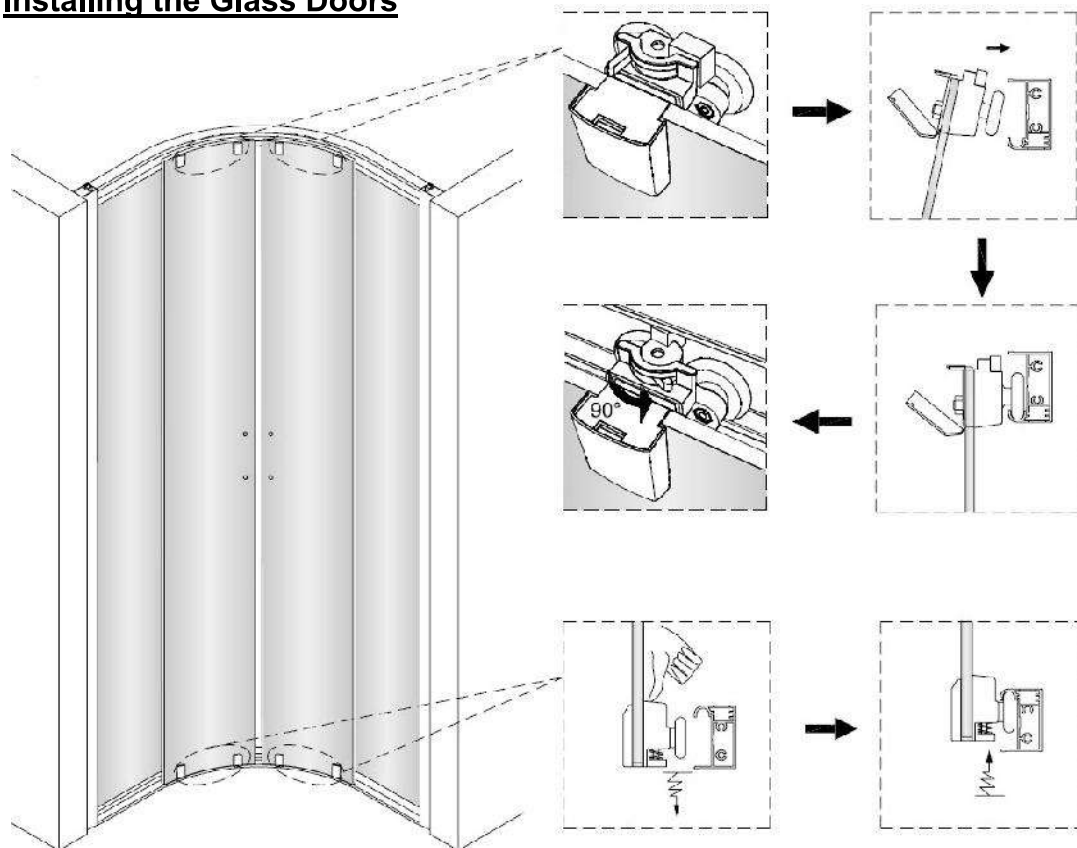


While still resting on the wood blocks "Spring" the Door Frame assembly so it sits over the legs of the Wall Receiver. Repeat for other side.
Remove wood blocks and let the assembly slide down until it rests on the tray

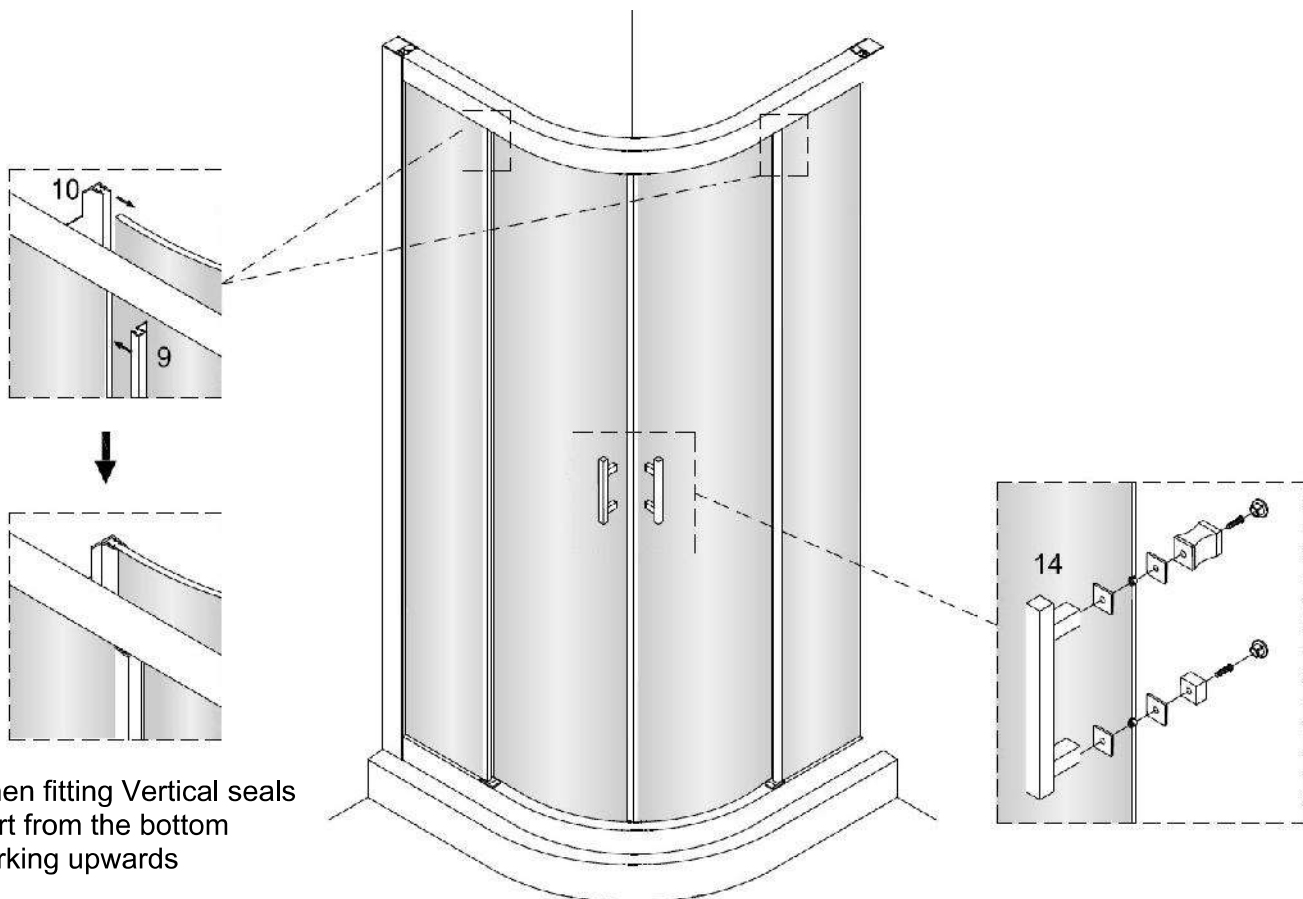
Step 4 Fitting the Magnetic Door Closing Seal & Drip Seals



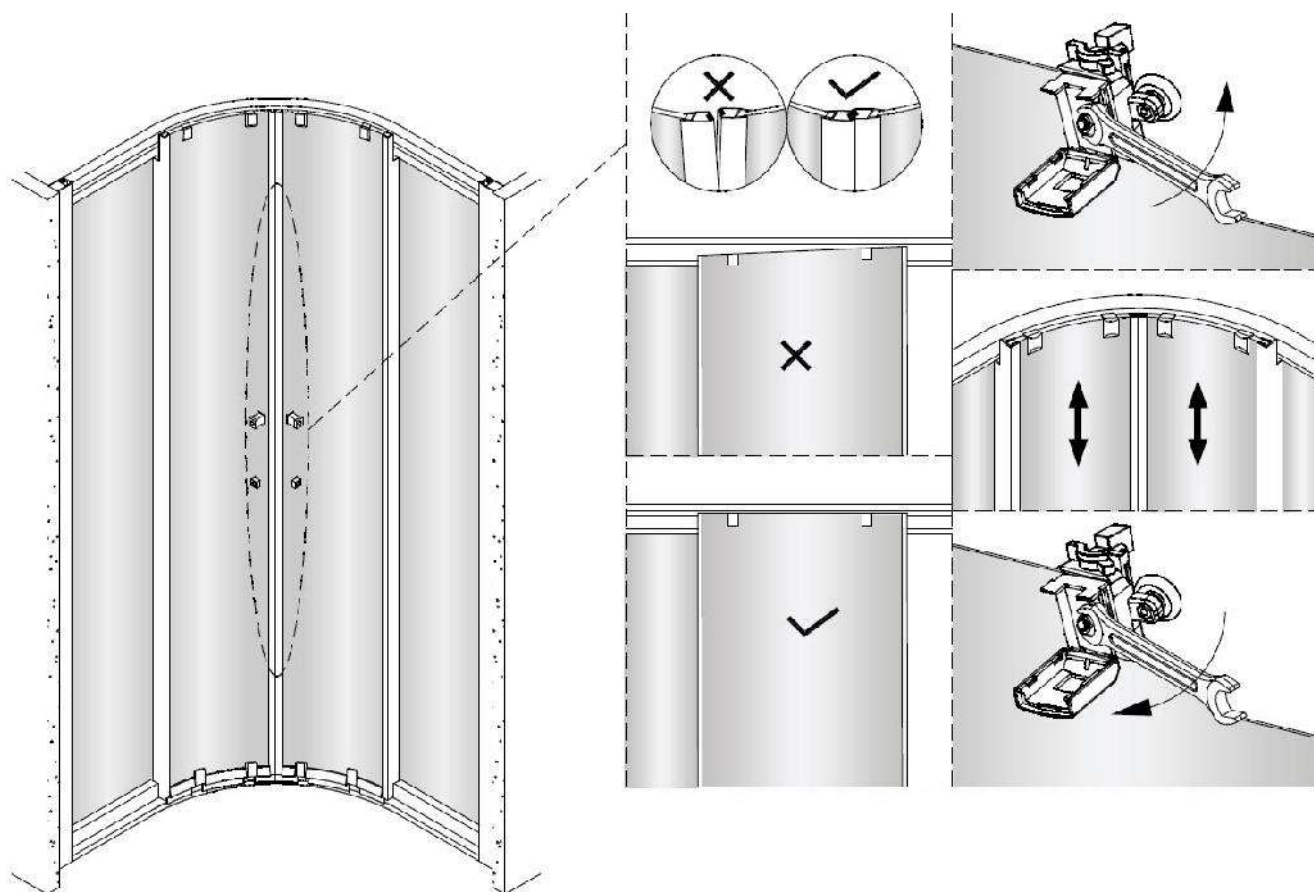
Step 5 Installing the Glass Doors



Step 6 Installing the Door Handle & Vertical Seals

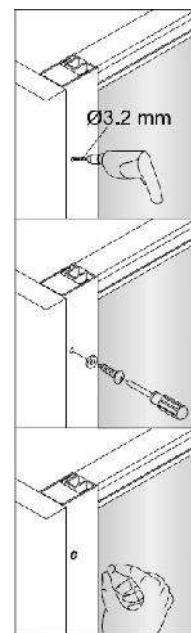
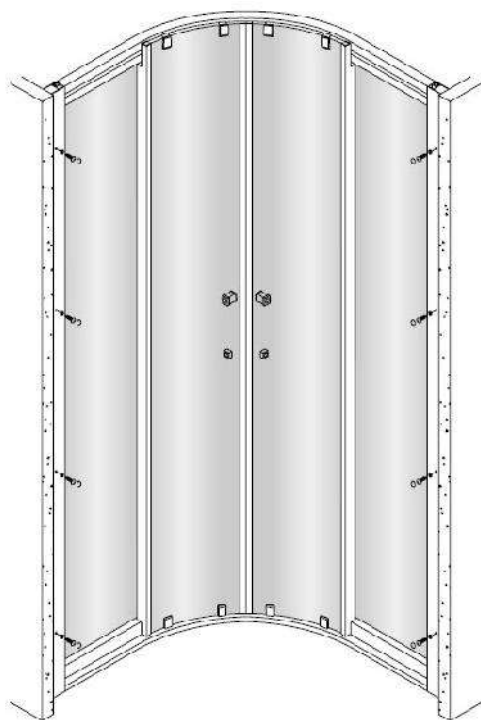


Step 7 Adjusting the Door

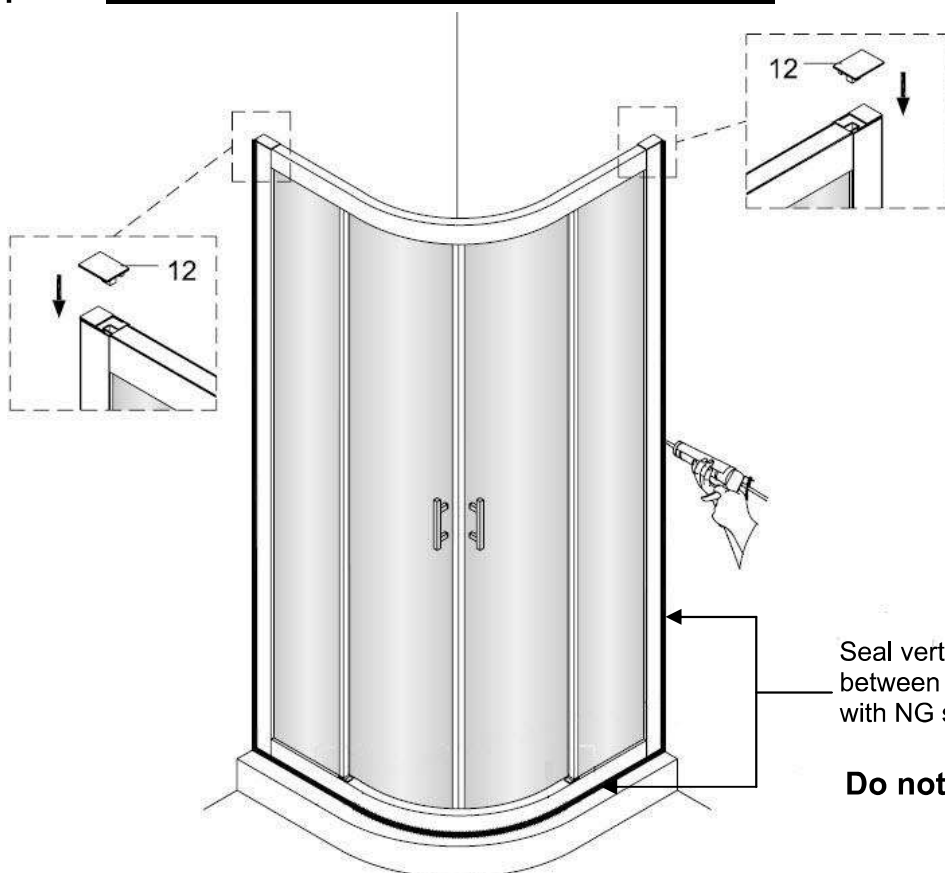


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Step 8 Final Fixing



Step 9 Sealing the Enclosure & Fitting Profile Caps



Seal vertically up each Wall Receiver and between the Sill and Upstand of the tray with NG silicone sealant

Do not apply sealant of the inside of the shower

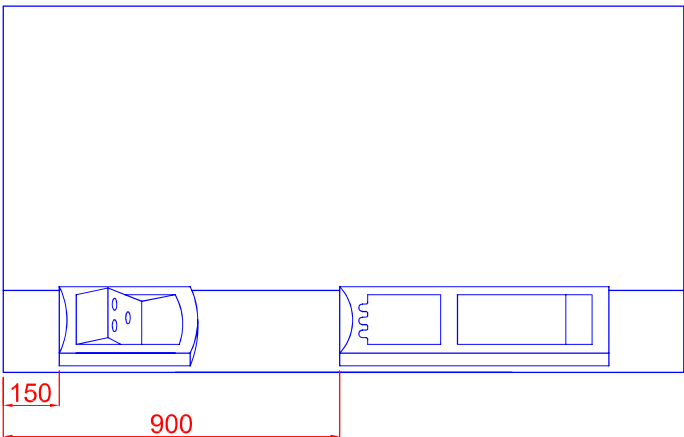
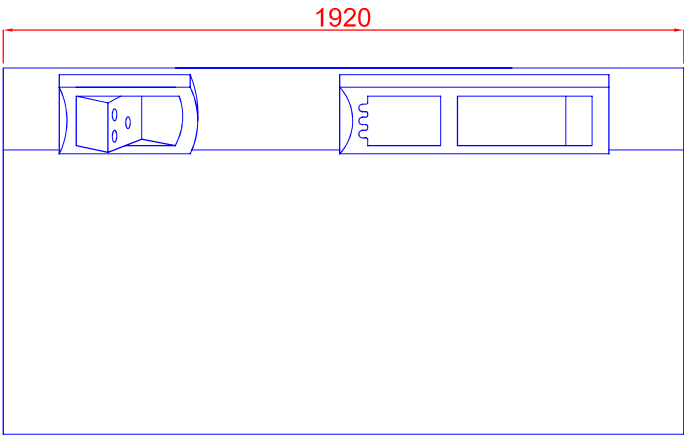
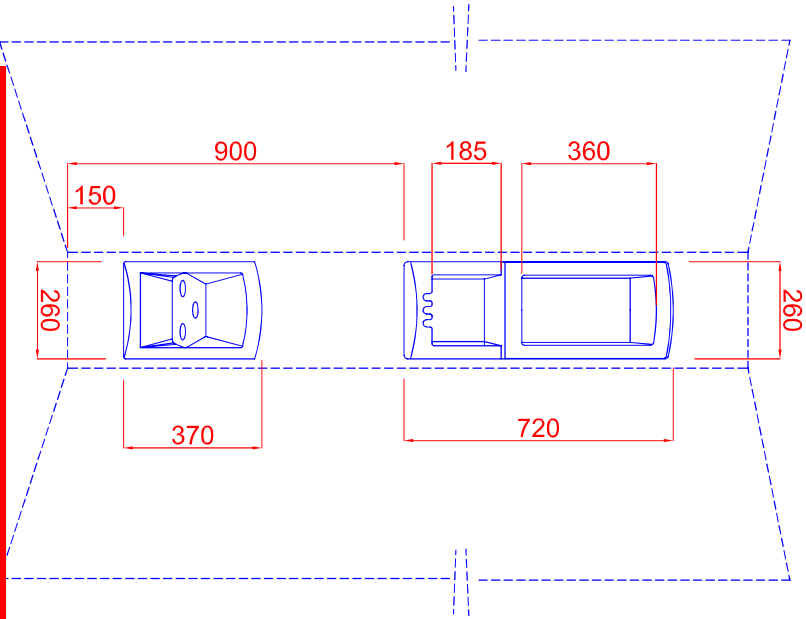
For further information contact:

Clearlite Bathrooms
54-58 Hillside Road
Private Bag 40902 Glenfield
Auckland 1310 New Zealand

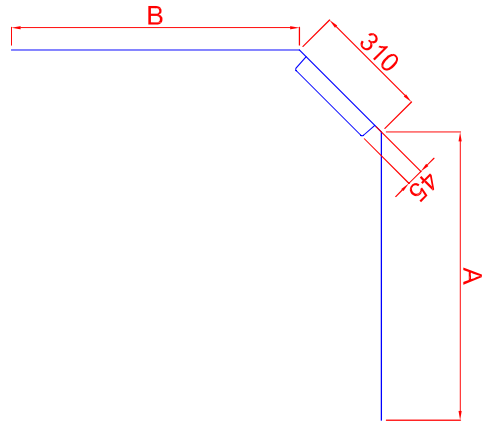


Telephone: (09) 444 3780
Facsimile: 0800 88 00 11
Email: info@clearlite.co.nz
Website: www.clearlite.co.nz

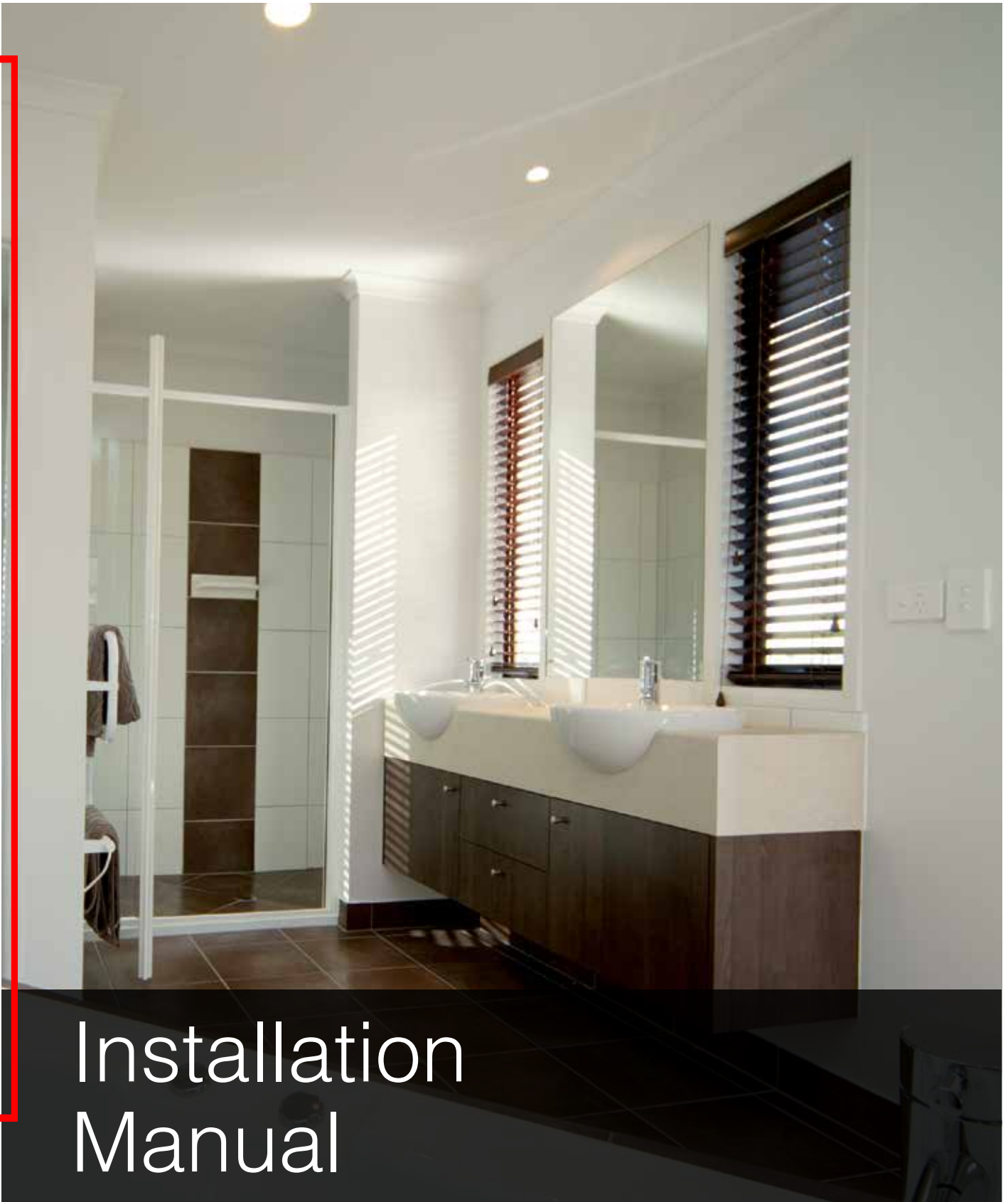
1920mm - 2 SIDED WALL LINER



1920 mm 2 Sided Moulded Wall		
Size	Dimension A (mm)	Dimension B (mm)
900x900	667	667
1000x1000	765	765
900X1200	970	667
1200x900	667	970



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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



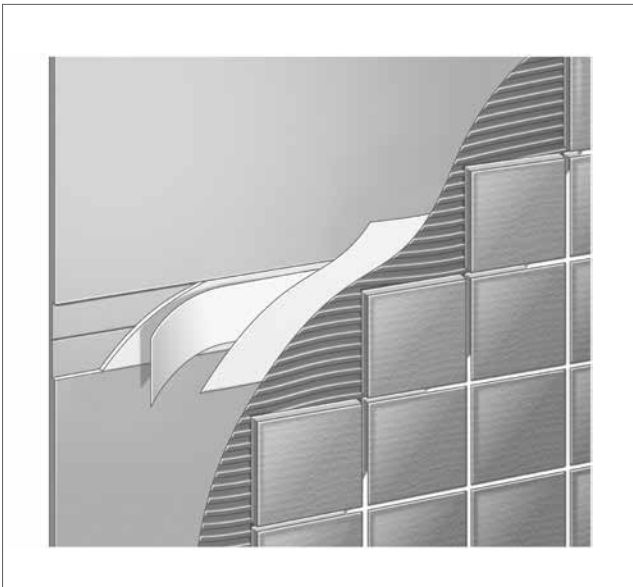
1 Introduction

James Hardie Villaboard® Lining is a premium sanded fibre cement sheet with recessed edges for flush jointing, or square edge sheet for butt jointing. Villaboard Lining is an ideal lining for bathrooms, laundries, kitchens and other high traffic areas.

The main features of Villaboard Lining are:

- Durable internal lining suitable for wet areas.
- Creates suitable surface for tiles, paint or wallpaper.
- Long edges recessed for easy flush-jointing.
- Reliable impact resistant lining. Ideal for wall lining in commercial applications where walls are prone to damage.
- Suitable for use in fire and acoustically rated systems.

This manual covers the use of Villaboard Lining in internal wall and ceiling applications. Further information relating to Villaboard Lining is also available in the following James Hardie manuals:



- Eaves and Soffit Linings Installation Manual.
- Fire and Acoustic Design Manual.
- Bracing Design Manual.

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.

Note: James Hardie Villaboard Lining is not suitable for exterior wall applications.

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 or Ask James Hardie™ on 0800 808 868.

1.1 BRACING

Villaboard Lining can be used to achieve structural bracing. For further information refer to Bracing Design Manual.

For dry area internal applications the standard hot dipped galvanised nails can be used.

For wet area internal application stainless steel nails must be used.

1.2 STRUCTURAL CEILING DIAPHRAGM

Villaboard Lining can be used as structural ceiling diaphragms in accordance with NZS 3604. For further information refer to Bracing Design Manual.

1.3 HEAT SHIELD

9mm Villaboard Lining can be used as a heat shield. For further information refer to Heat Shield - Villaboard Lining 9mm Accel™ Technical Supplement.

Table 1

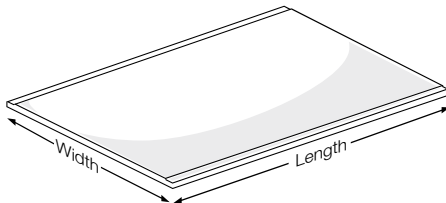
Villaboard Lining sheet sizes				
Product	Length	Width		
		Smooth fibre cement internal lining for tiled and untiled applications  Villaboard Lining 6mm has no chamfer on square edge sheet. Villaboard Lining 9mm has small chamfer on square edge sheet.	1200mm	
	4 recessed edges		2 recessed edges (long)	Square edges
6mm thickness				
2400	✓		✓	✓
2700			✓	
3000			✓	✓
9mm thickness				
2400	✓		✓	✓
2700			✓	
3000			✓	✓

Table 2



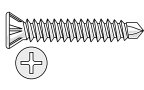

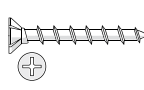
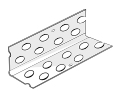
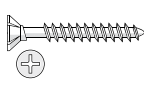
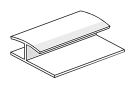
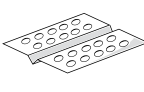

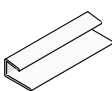


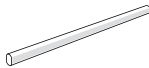



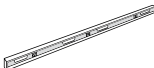

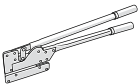
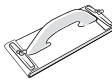



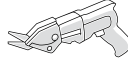
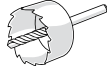



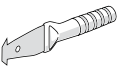


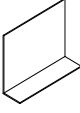
Product / accessories / tools					
Components supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	HardieBlade™ Saw Blade Ø185mm poly crystalline diamond blade, for fast, clean cutting of James Hardie fibre cement.	300660		James Hardie Base Coat Base compound for flush finished jointing.	4kg - 304490 15kg - 304491
	FibreZip® Screw For fastening to 0.55mm -1.0mm BMT steel frames. <small>® denotes a registered mark of Buildex</small>	Box 1000 - 303840		James Hardie Top Coat Topping compound for flush finished jointing.	3kg - 304492 15kg - 304493
	Villadrive Screw 6g x 30mm For fastening to timber frames	5kg - 300993 100/jar - 300992 Collated/1000 - 300994		uPVC Perforated Corner Mould 30mm x 30mm. For finishing internal and external corners.	3000mm - 300669
	HardieDrive™ Screw S/S 316 30mm x 7g For fastening to timber frames	100/jar - 300928		HardieJointer™ 6mm	3000mm - 300734 2400mm - 300730
	Control Jointer 2700	300978		HardieJointer™ 9mm (2 piece)	3000mm - 300736
	HardieFlex™ Cap Mould 6mm Capping edge of Villaboard Lining	2400mm - 300539 3000mm - 300540			

Table 3

Components not supplied by James Hardie

James Hardie recommends the following products for use in conjunction with Villaboard 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.

Accessories	Description	Accessories	Description
	Galvanised/Stainless Steel HardieFlex™ nails 40 x 2.8mm fibre cement nails		Second Coat Trowel 200mm For installing second coats on set joints.
	Backing Rod Backing to sealant in movement joints.		Finishing Coat Trowel For installing top coats on set joints.
	Perforated Paper Tape Joint reinforcing tape. e.g. GIB® paper tape, Strataflex tape or similar.		Corner Tool For setting of internal corners.
	Level/Straight Edge For checking straightness of frame.		Hawk To assist in the application of compounds especially with the use of trowels.
	Hand Guillotine Guillotine for cutting fibre cement.		Hand Sander For sanding set joints.
	Broadknife 150mm For setting of joints on Villaboard Lining.		Notched Trowel For applying tile adhesive to face of Villaboard Lining.
	Collated Screw Gun For speedy installation of Villaboard Lining.		Electric Shear/Fibreshear For cutting of James Hardie fibre Cement.
	Hole Saw For clean cut circular holes.		Paper Faced Corner Mould 'Goldline' mouldings
	Bondbreaker Tape Sellotape 5850 Super Mask 18mm		Waterproofing Admixture Multiplast Resin by Plaster Systems. Used in diluted form over sheet edges to control moisture suction.
	Score and Snap Knife Scoring tool for easy cutting.		Lumberlock Studsaver
	Wet Wall Cavity Wet Wall Caddy Wall penetrating sealing device eg Aquatite Wetwall cavity protectors		Support Angle To support tiles Is fixed over the lining to main frame

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 which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'score and snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods — never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

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James Hardie recommended safe working practices

CUTTING OUTDOORS

1. Position cutting station so wind will blow dust away from the user or others in working area.
2. Use one of the following methods based on the required cutting rate:

BEST

- Score and snap
- Hand guillotine
- Fibreshear

BETTER

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

GOOD

- Dust reducing circular saw with HardieBlade™ Saw Blade.

CUTTING INDOORS

- Cut only using score and snap, hand guillotine or fibreshears (manual, electric or pneumatic).
- Position cutting station in a well-ventilated area.

SANDING/REBATING/DRILLING/OTHER MACHINING

When sanding, rebating, drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES

1. For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best" — level cutting methods where feasible.
2. NEVER use a power saw indoors.
3. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
4. NEVER dry sweep — Use wet suppression or HEPA vacuum.
5. NEVER use grinders.
6. ALWAYS follow tool manufacturers' safety recommendations.

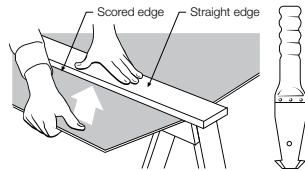
P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

Working instructions

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

Score and snap

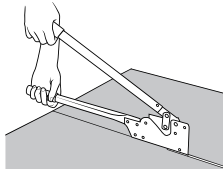
Score and snap is a fast and efficient method of cutting James Hardie building products using special tungsten tipped score and snap knife.



Preferably score on the face side of the product. Score against a straight edge and repeat the action to obtain adequate depth for clean break — normally one third of sheet thickness. Snap upwards to achieve break. Smooth any rough edges with a rasp.

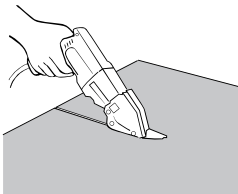
Hand guillotine

Make guillotine cut on the off-cut side of line to allow for the thickness of the blade.



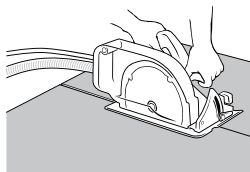
Fibreshear heavy duty

An electrically powered, fast, clean and effortless way of cutting James Hardie building products, especially around curves such as archways. Make fibreshear cut on the 'off-cut' side of the line to allow for the thickness of the shear.



HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw connected to a HEPA vacuum allows for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector which can be 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.

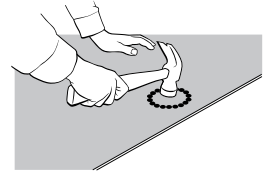


Hole-forming

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 the sheet edges are properly supported.

Storage and handling

To avoid damage, all James Hardie building products should be stored with edges and corners of the sheets protected from chipping.

James Hardie building products must be installed in a dry state and protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water, moisture, etc.

Quality

James Hardie conducts stringent quality checks to ensure any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

3 Framing / substrate

3.1 GENERAL

Villaboard Lining can be fixed to either timber framing, light gauge domestic type steel framing and battens fixed over masonry. The framing and substrate used must comply with the relevant building regulations and standards and the requirements of this manual.

For untiled walls the studs spacing must not exceed 600mm centres and noggings 1200 centres maximum.

For tiled wall applications studs spacing must be closed to 400mm for a 6mm Villaboard Lining, and between 400mm to 600mm centres for a 9mm Villaboard Lining. Refer Table 10 for further information.

At sheet joint the studs must be minimum 45mm wide.

Notes

1. Stud spacings restrict the thickness of tiles used to finish Villaboard Lining. For more information refer to the Finishes and Maintenance section on page 25.
2. In internal and external corners use a PVC perforated corner mould or paper faced rigid moulding.
3. Ensure a 6mm building tolerance gap is provided at the floor and ceiling junctions with the Villaboard Lining.

3.2 TIMBER

Timber framing must at a minimum comply with the requirements of NZS 3604 'Timber Framed Buildings'.

The timber framing treatment and moisture contents must comply with the requirements of NZS 3602.

3.3 STEEL

The minimum size for steel stud framing should be 64mm deep x 35mm wide and 0.55mm base metal thickness (BMT) minimum.

Steel framing shall comply with the minimum stiffness requirements of NZS 3604. Refer to NASH 3405 document for further guidance on steel framing or contact steel framing supplier for information.

Steel sections shall be suitably galvanised zinc coated to comply with the durability requirements of NZBC. Refer to framing manufacturer for further information. Studs must not be less than 35mm wide at joints.

For tiled applications it is recommended to use a 0.75mm thick steel framing to achieve the required rigidity/stiffness.

3.4 MASONRY SUBSTRATE

Always ensure the substrate is given adequate time to dry out before the installation of Villaboard Lining. The wall surface must be clean, dry and free of any material that will affect the straightness of the battens. Refer to page 13 for further information.

3.5 SKILLION ROOF DESIGN

When installing Villaboard Linings direct to skillion roof framing, refer to Eaves and Soffit Linings Installation Manual.

3.6 FRAME TOLERANCES

Ensure the 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.

Figure 1: Frame straightness



A suggested maximum tolerance of between 3mm and 4mm in any 3000mm length of frame will give best results. Villaboard Lining will not straighten excessively warped or distorted frames and any warping may still be visible after the internal lining is installed.

3.7 MASONRY WALL

Cut Villaboard Lining approximately 12mm less than floor to ceiling height to allow for building tolerances. Ensure a 6mm building tolerance gap is provided at the floor and ceiling junctions with the Villaboard Lining. Refer to page 14 for specific substrate requirements.

4 Sheet layout

3.8 CURVED WALLS

Villaboard Lining may be bent to accommodate curved walls. The minimum bending radii are shown below.

Table 4

Curved wall minimum bending radii		
	Along Length (mm)	Across Width (mm)
Villaboard Lining 6mm	1800 (1200)	2400
Villaboard Lining 9mm	3000 (1800)	4000

Notes

1. The bending radii given above require no special pre-wetting of the sheet and may be used on internal or external curves.
2. With extra care, the sheet can be bent to the radius shown in the brackets.

To maintain the smoothness of the curve, studs must be closed to spacings as shown below.

Table 5

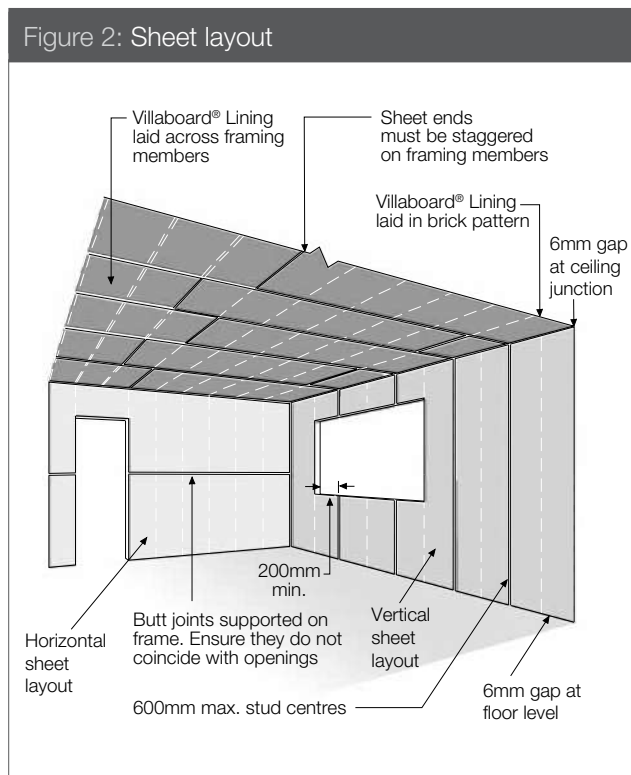
Curved lining — stud spacing	
Range of Radii (mm)	Stud Spacing (mm)
1200 to 3000	300
Above 3000	*400

*or at one third of the sheet width, whichever is the lesser.

Install Villaboard Lining across the framing either vertically or horizontally.

Sheet joints must coincide with the centre line of the framing member.

At door and window openings fix sheets around the opening in a way that the sheet joints do not coincide with the edges of openings. The sheet joint must be 200mm minimum away from the opening edge. See Figure 2.



Notes

1. The sheets should be installed vertically on the inner face of external walls where the exterior cladding is installed on cavity battens. For cavity construction method the nogs are generally fixed at 800mm centres max.
2. Sheets with two long edges recessed are most suitable for vertical installation.
3. When the space above the window/door is less than 250mm then a control joint must be provided on either side of opening. Refer to Figure 18.
4. 3-4mm packers can be fixed on the framing where required to suit the window reveals or in wet areas.
5. All sheet edges must be supported by the framing.
6. Joints can be staggered.

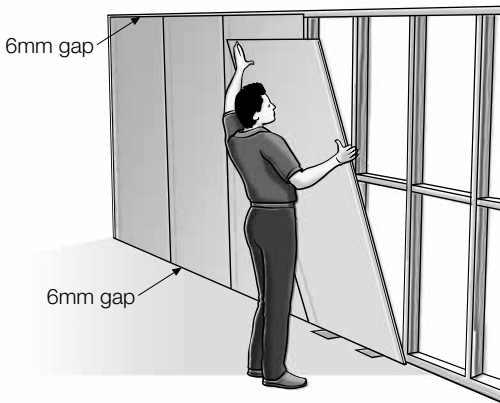
5 Installation

5.1 GENERAL

Place 6mm packers along the floor as temporary support for sheets. This will allow for any frame movement/shrinkage. Put sheets in place as shown.

Ensuring the sheet is level, fix starting from the centre of sheet and working outwards to avoid any drumminess.

Figure 3: First sheet



Provide 1-2mm gap between Villaboard Lining sheets at vertical, horizontal, internal or external corner joints.

Fix the remaining sheets in a similar sequence.

Notes

1. For fastener selection and spacings see pages 10 -13.
2. Do not fix sheets to the bottom chord of roof trusses. Instead, fix to ceiling battens or furring channels.

Figure 4: Fixing remaining sheets



5.2 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 collated screws for quick installation of Villaboard Linings. Alternatively the Villaboard Lining can also be fixed with HardieDrive stainless steel screws or 40 x 2.8mm HardieFlex nails.

For fixing Villaboard Lining to 0.55 – 1.0mm BMT steel framing, use 30mm Buildex FibreZip Class 3 collated screws. These screws must not be used in sea spray zones.

Nails must be finished flush (Figure 5). Screws can be driven 0.5mm below the sheet surface to achieve the required finish level (Figure 5). 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 6.

Refer to Section 6 – Step 7, for finishing of fasteners.

Figure 5: Fastener depth

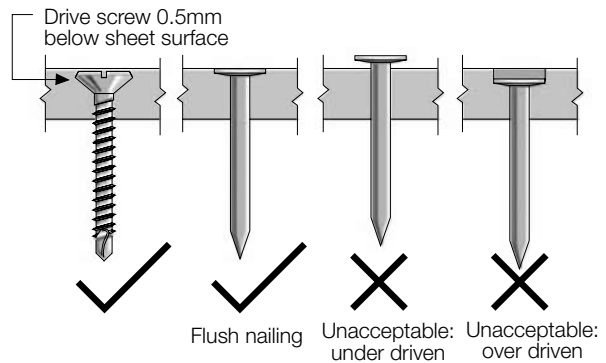
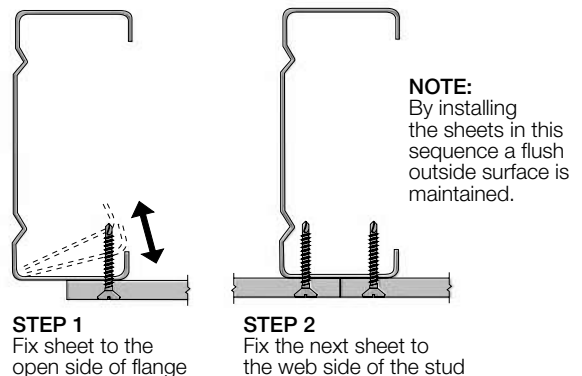


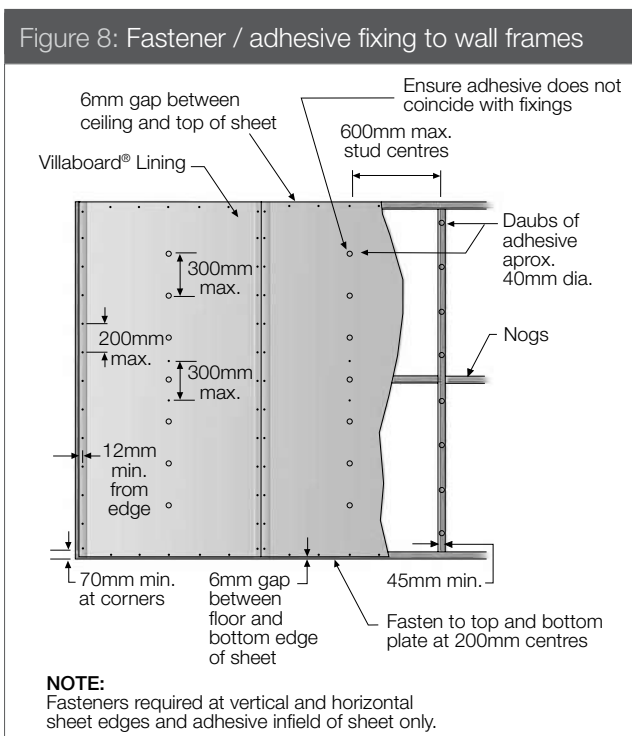
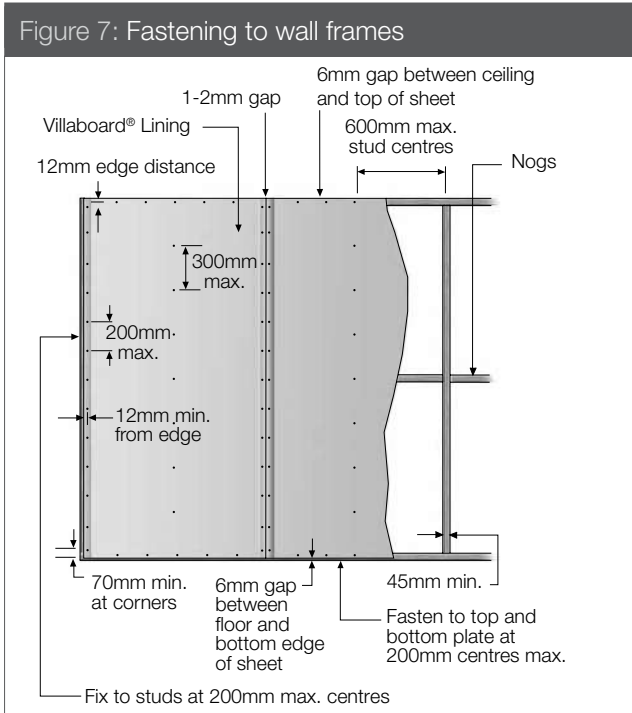
Figure 6: Screw fastening



5.3 FIXING TO FRAMED WALLS

Untiled walls

Where Villaboard Lining is to be left untiled, the sheets can be fixed with fasteners or a combination of fasteners and adhesive, see Figures 7 and 8 respectively.



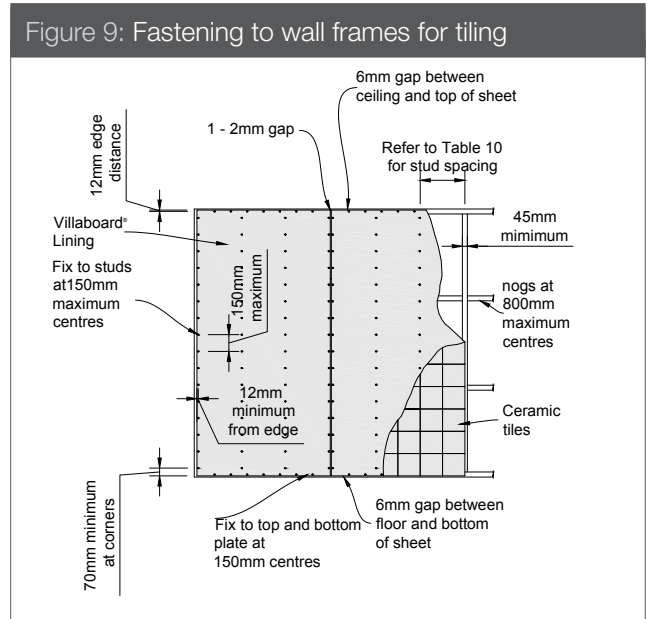
Notes

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.

Tiled walls

Where Villaboard Lining is to be finished with tiles, the sheets must be fixed with fasteners only as shown in Figure 9.

For tiled wall applications studs spacing must be closed to 400mm for a 6mm Villaboard Lining, and between 400mm to 600mm centres for a 9mm Villaboard Lining. Refer Table 10 for further information.



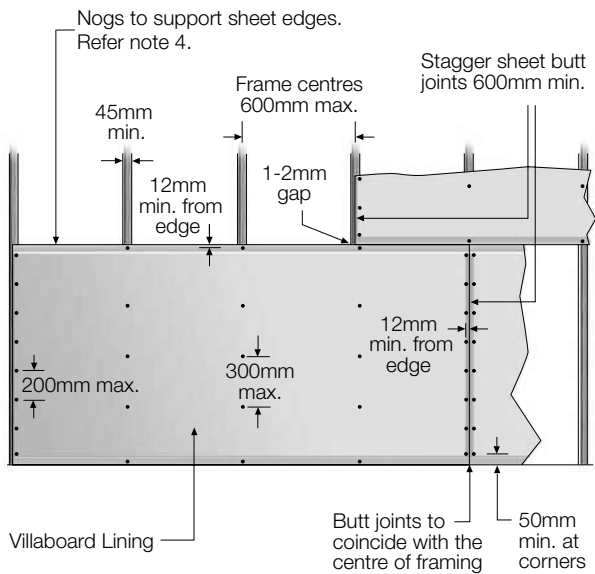
Notes

1. It is good practice to install Villaboard Lining horizontally for tiled applications.
2. When tiling in wet areas, apply water proofing membranes before tiling on walls. Ensure water proofing membranes manufacturers recommendations are followed.
3. The recessed edges are required to be stopped with James Hardie Base Coat as per Section 6. The top coat is not required behind the tiles. The square sheet joint can be sealed with a flexible sealant before the installation of tiles. Refer Figure 16.
4. When installed horizontally full perimeter sheet support and fixing is required. The vertical sheet joints can be staggered.
5. Fixings not to be staggered at the joint. Refer Figure 9.

5.4 FIXING TO FRAMED CEILINGS

For ceiling applications either the fastener or fastener/adhesive method can be used. Refer to Figures 10 and 11 respectively.

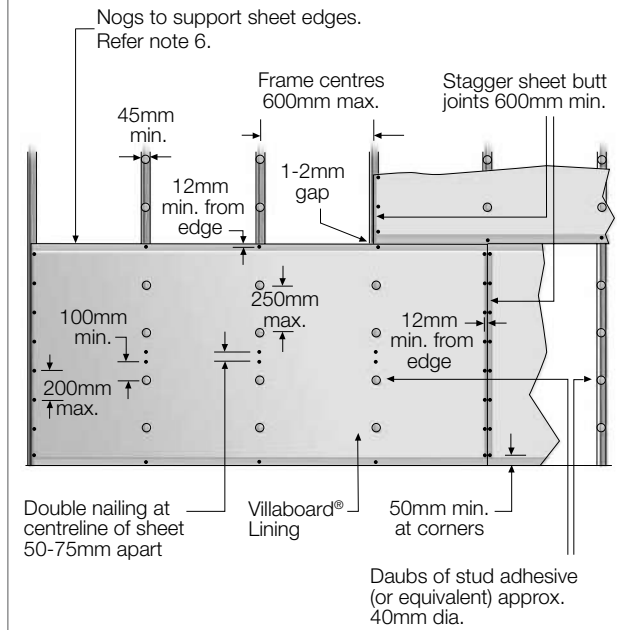
Figure 10: Fastening to ceiling frames



Notes

1. Do not install tiles in ceiling applications.
2. Do not fix sheets to the bottom chord of trusses. Batten these out first with timber battens or steel ceiling battens.
3. It is recommended that flush stopping of joints is suitable when using recessed edge Villaboard Lining.
4. When nogs not installed for perimeter support, 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 centered between the framing.
5. For external soffit applications refer to James Hardie Eaves and Soffit Linings Installation Manual.

Figure 11: Fastener / adhesive fixing to ceiling frames



Notes

1. Do not install tiles in ceiling applications.
2. Do not use adhesive only. Ensure sheet perimeter is fastened as shown.
3. All surfaces to receive adhesive must be clean, free of dust, oil, etc.
4. Ensure daubs of adhesive never coincide with permanent fastener points, as adhesive shrinkage may cause fastener head protrusion.
5. It is recommended that flush stopping of joints is suitable when using recessed edge Villaboard Lining.
6. When nogs not installed for perimeter support, 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 centered between the framing.
7. For external soffit applications refer to James Hardie Eaves and Soffit Linings Installation Manual.

6 Joints

6.1 GENERAL

Villaboard Lining joints are set with proprietary jointing compounds reinforced with perforated paper tape. Both recessed edge, square edge and butt joints are finished by using the jointing products outlined in this manual.

The performance of joints is the responsibility of the installer, as this is governed by the installation practices and the standard of workmanships applied. However, James Hardie considers that the recommendations provided in Table 6 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.

James Hardie Base Coat has been specifically developed for use with Villaboard Lining and offers superior joint strength when compared with the gypsum jointing compound alternatives.

All site cut and site recessed sheet edges must be sealed with Dulux Acraprime 501/1 or Dulux Primacryl or similar.

In addition, provision for movement needs to be made by the installation of control joints. See Figure 18.

Table 6

Jointing recommendations				
		Application	Base Compound	Topping Compound
Dry area walls	Recessed Edge	Untiled	James Hardie Base Coat with perforated paper tape	James Hardie Top Coat, Plaster Systems compound or Gypsum topping compound
		Tiled	James Hardie Base Coat with perforated paper tape	N/A
	Butt Edge	Untiled	Silicone Joint	N/A
		Tiled	Silicone Joint	N/A
Wet area walls	Recessed Edge	Untiled	James Hardie Base Coat with perforated paper tape	James Hardie Top Coat
		Tiled or Shower Lining	James Hardie Base Coat with perforated paper tape	N/A
	Butt Edge	Tiled or Shower Lining	James Hardie Base Coat with perforated paper tape	N/A
			Silicone Joint	N/A

Figure 13: Vertical flush joint setout

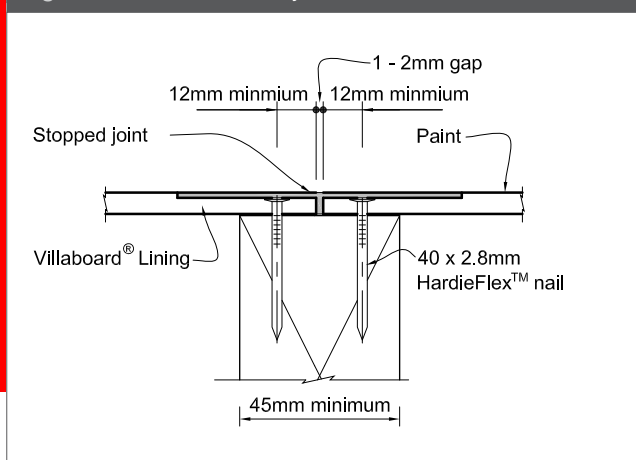
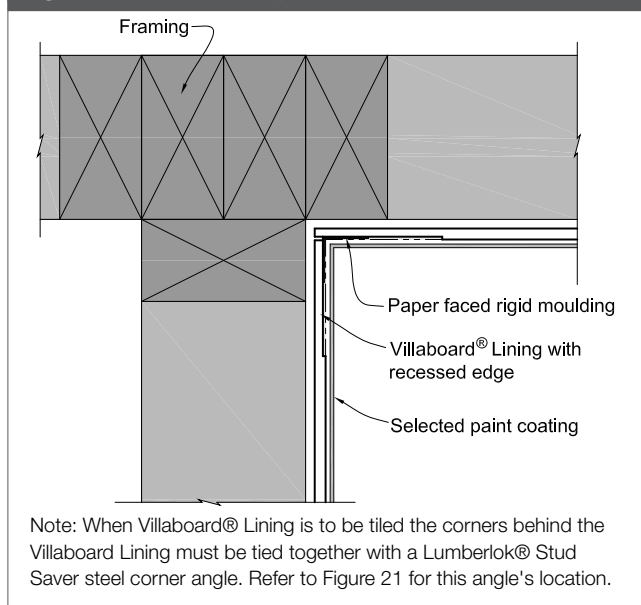
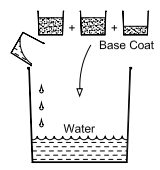


Figure 14: Wall to wall junction



6.2 JAMES HARDIE BASE COAT MIXING INSTRUCTIONS

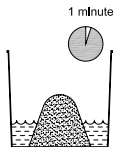


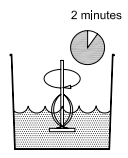
Step 1

First, add 1 part of clean water into bucket.

Then add 2½ parts James Hardie Base Coat powder

Allow to soak for 1 minute.



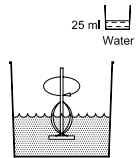


Step 2

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, humidity and wind etc 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.)

The 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 Primercryl 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 to the sheet edges. Mix the resin as per the manufacturer's 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.

6.2.1 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.

6.3 SET RECESSED EDGE JOINTS

Step 1 – Preparation

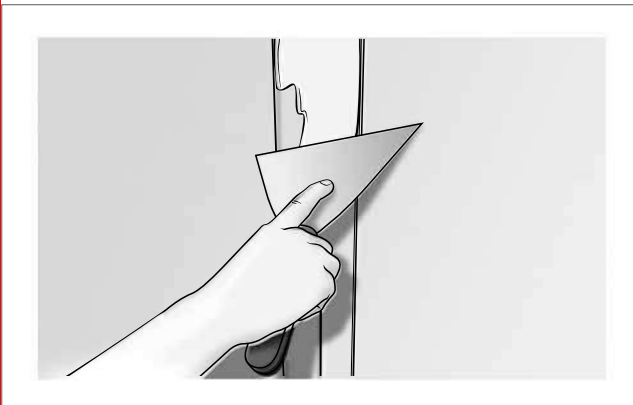
Ensure that the recesses are clean and free of dust and contaminants. Sheet edges must be sealed prior to stopping with Multiplast Resin water proofing admixture or other similar products. If working conditions are hot and dry, dampen the area around the joint prior to working.



Note: The jointing method shown on page 16 and 17 provides a level 4 finish. For more information about this and other finishes refer to Table 9.

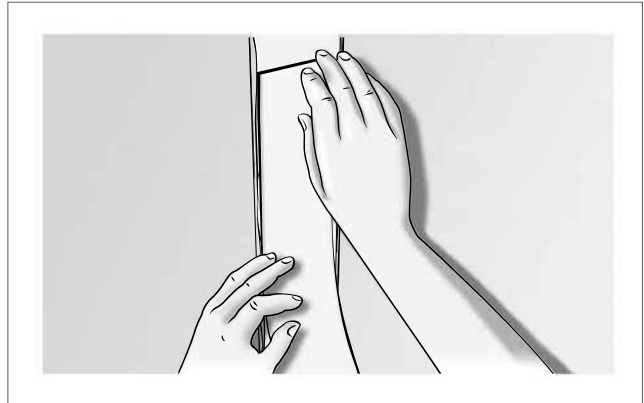
Step 2 – First coat

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



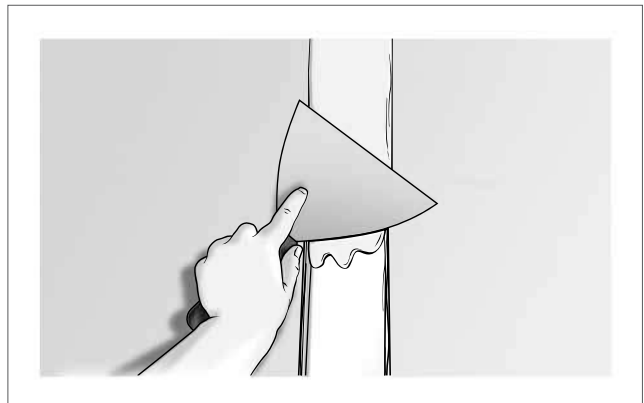
Step 3 – Embed tape

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 compound.



Step 4 – Thin layer

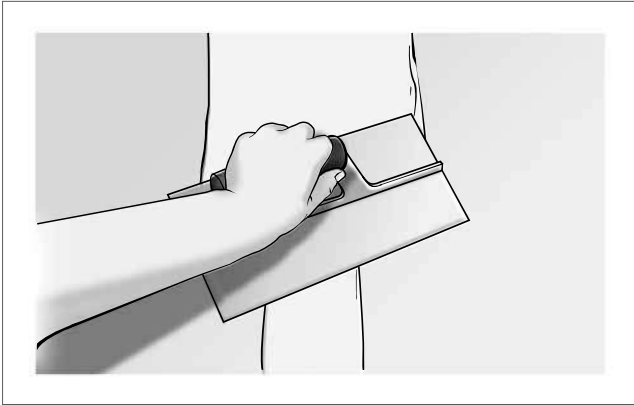
Immediately fill joint covering tape with a layer of James Hardie Base Coat applied with a 150mm broadknife.



Note: Steps 5, 6 and 7 are only required for paint and wall paper finishes up to a level 4 finish. Refer Table 9 for level 5 finish.

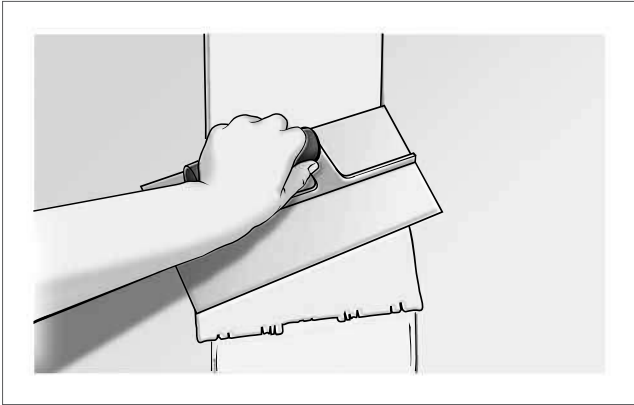
Step 5 – Second coat (untiled walls only)

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.



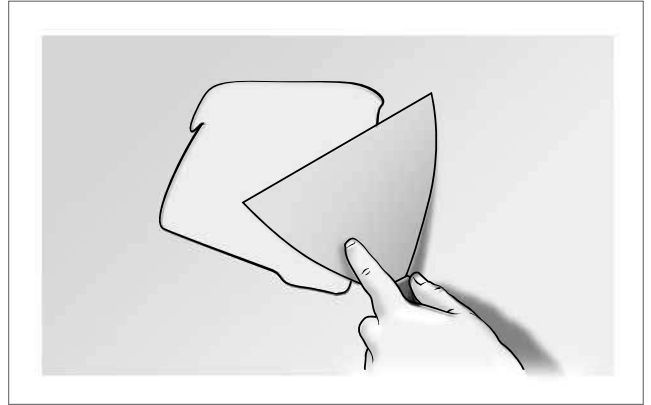
Step 6 – Finishing coat (untiled walls only)

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.



Step 7 – Fastener heads (untiled walls only)

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

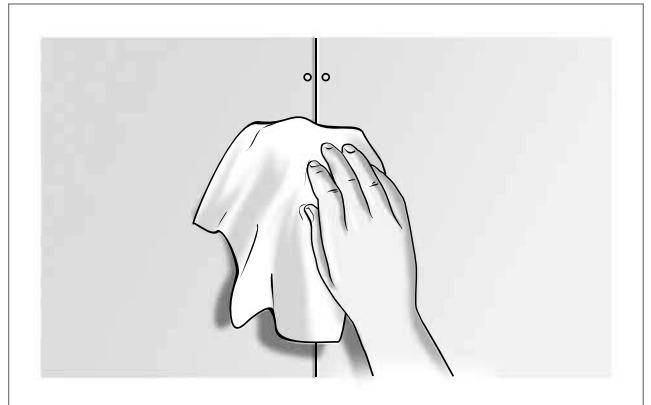


6.4 SET SQUARE EDGE JOINTS

As an alternative to setting the recessed edge joints, square edge Villaboard Lining can also be jointed and stopped on stud as shown below. This detail will achieve a level 3 finish.

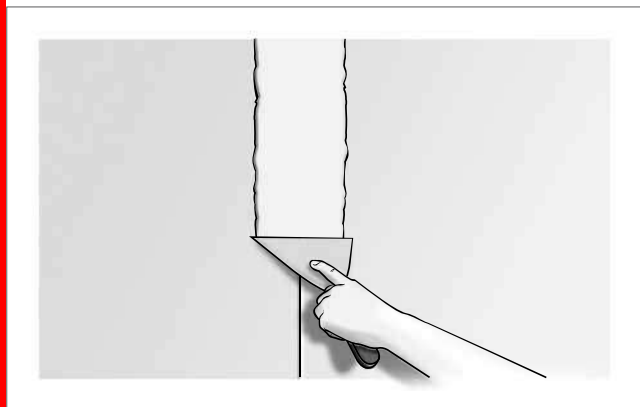
Step 1 – Preparation

When jointing un-recessed sheet joint, ensure that sheet edges are clean and free of dust and contaminants. Sheet edges must be sealed prior to stopping 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.



Step 2 – First coat

Apply James Hardie Base Coat centrally over butt joint to 200mm wide with a 150mm broadknife.



Step 3 – Embed tape

Firmly embed the perforated paper tape centrally using a 50mm broadknife. Ensure that there are no voids under the tape and remove excess compound.



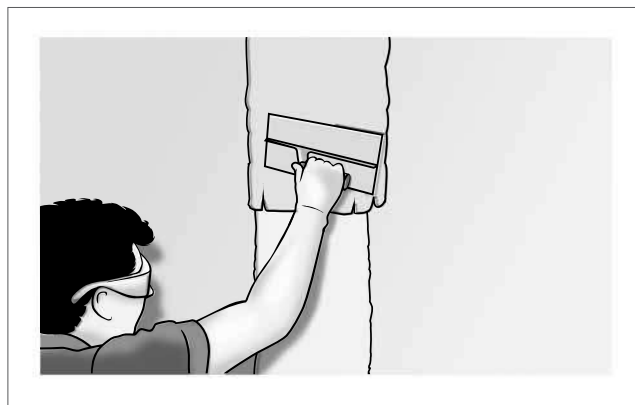
Step 4 – Thin layer

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



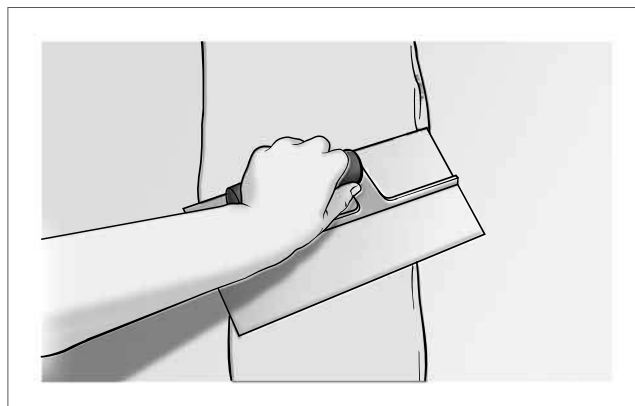
Step 5 – Second coat (untiled walls only)

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 300mm wide.



Step 6 – Finishing coat (untiled walls only)

Ensure the second coat is fully dry. Using a finishing trowel, apply a coat of James Hardie Top Coat 500mm wide centrally over the joint and feather out the edges. Allow to fully dry before sanding.



6.5 BUTT JOINT

Figure 15: Butt joint detail (dry area)

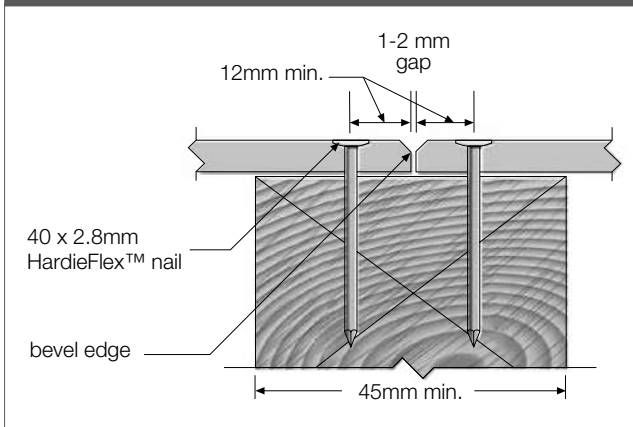
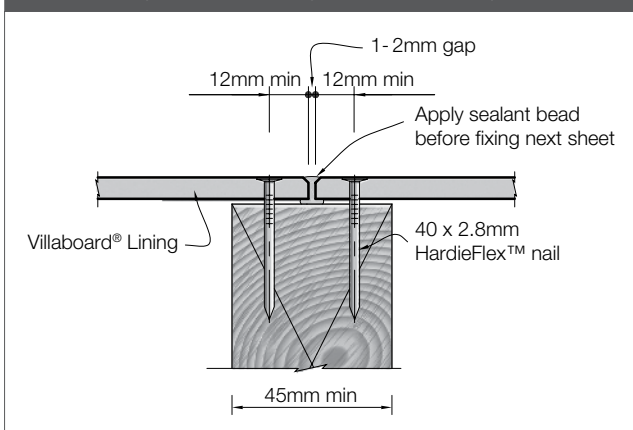
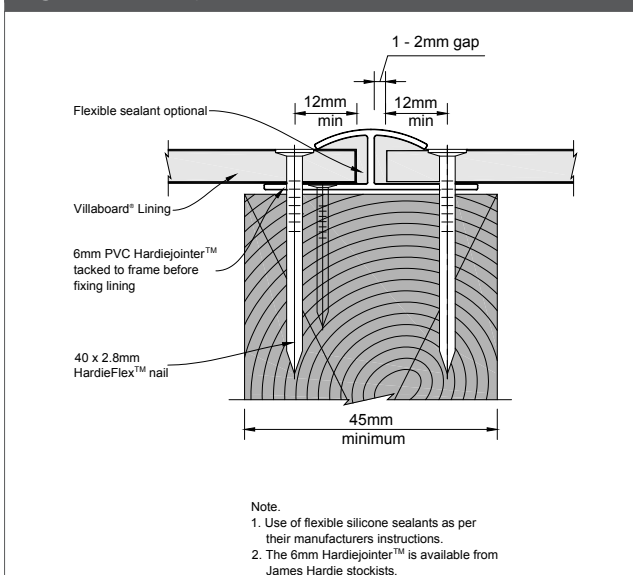


Figure 16: Butt joint detail (tiled over in dry and wet areas)



6.6 PVC JOINT

Figure 17: Butt joint detail



6.7 INTERNAL CORNERS

The internal corners can be formed as per one of the following two methods;

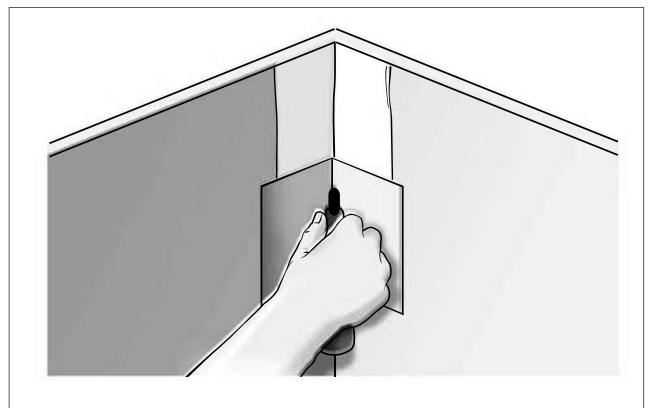
Method A:

1. Apply James Hardie Base Coat to both sides of the corner using a 70mm broad knife. Fold the perforated paper tape to form a corner and embed it into the corner using 50mm wide corner trowel.
2. Cover the paper tape with James Hardie Base Coat using a 100mm corner trowel. Allow the base coat to dry. This will normally take up to 24 hours depending upon the temperatures and humidity conditions.
3. Once the base coat has dried then apply a thin finishing coat over it with a corner trowel and smooth it out. Allow the compounds to fully dry before sanding.

Note: Step 3 is only required for untiled walls.

Method B:

Embed and fix a paper faced rigid spine corner mould (Goldline) in the corner and then stop over it using a James Hardie Base Coat. Follow steps 2 and 3 mentioned above to finish the corner joint.

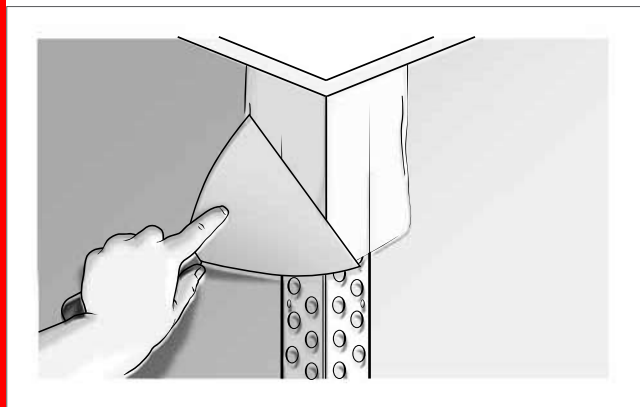


6.8 EXTERNAL CORNERS

Setting of external corners is required for untiled applications only as follows:

- Fit a perforated corner angle supplied by James Hardie or a paper faced rigid spine corner mould (Goldline) over the external corner and ensure straightness before fixing with HardieFlex nails at 300mm centres.
- Apply James Hardie Base Coat to both sides of the corner angle to a width of 150mm using a broad knife. Allow to dry before applying a second coat.
- Using a straight trowel, build up the edges to 250mm from the corner. Allow to dry.

- When dry, use the straight trowel to apply a thin finishing coat, 300mm wide, to both sides of the corner angle, feathering out the edges.
- Allow to fully dry before sanding.



6.9 CONTROL JOINTS

Control joints are required in long runs of Villaboard Lining walls or ceilings in either direction. These joints are designed to take up the structural movement between the sheets and the building frame. They may also be required in ceilings where they change direction or continue into passage ways. Control joints should also be provided at frame junctions / joints such as wall intersections.

See Table 8 for maximum control joint spacings and Figure 18 for a typical detail.

Table 8

Maximum spacing for control joints (m)			
	Steel framing		Timber Framing
	0.55 – 0.75mm BMT	greater than 0.75 – 1.6mm BMT	
General	9.0	6.0	7.2
Tiles walls	4.8		4.2*

*The maximum wall area should be restricted to 10m² between control joints

Figure 18: Control joint

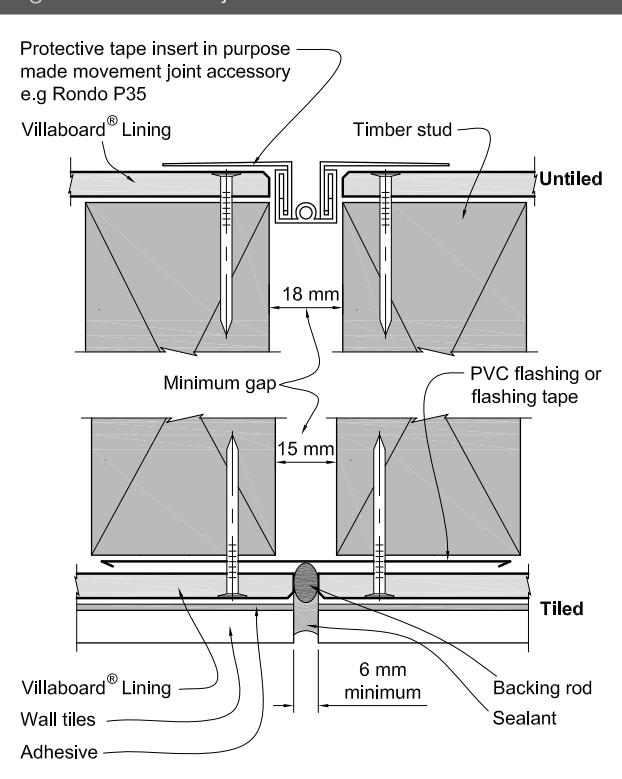
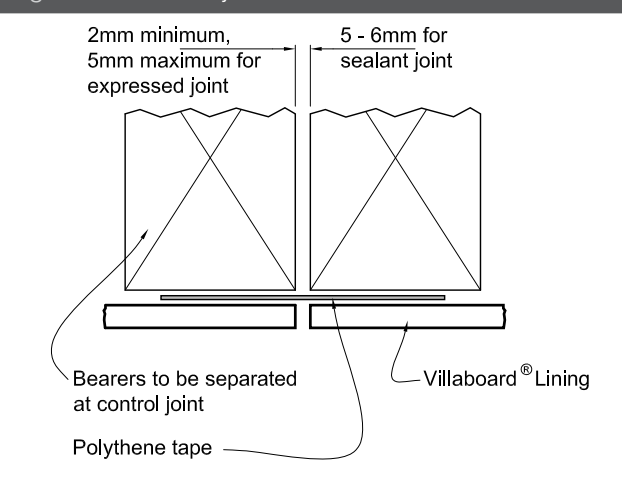


Figure 19: Control joint



Note: Alternatively a PVC control jointer supplied by James Hardie can also be used to form a control joint.

7 Wet area application

7.1 BATHROOM AREAS

Villaboard Lining is most suitable for use in wet area applications. Villaboard Lining must be covered with a water proofing membrane in a shower application before the installation of tiles.

Note: Paints are not suitable for wet area applications (splash zone) and must not be relied upon to achieve water tightness.

7.2 INTERNAL SWIMMING POOL APPLICATION

To fix Villaboard Lining in internal swimming pool areas;

- The sheets must be back and edge sealed before installation.
- All sheet joints to be stopped.
- Only stainless steel fasteners must be used.
- Full perimeter fixing required.

In addition, it is recommended that H3.1 treated timber framing and ceiling battens are used to enhance the durability considering the high condensation levels.

Figure 20: Sealing around splash zones (showers)

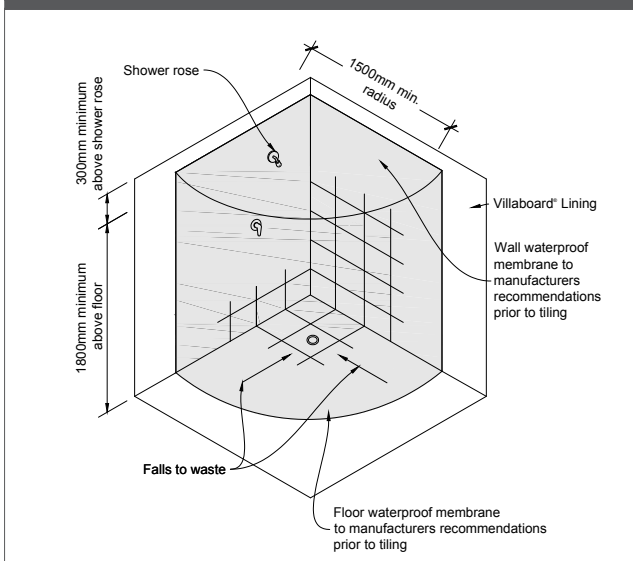


Figure 21: Sealing around splash zones (vanities)

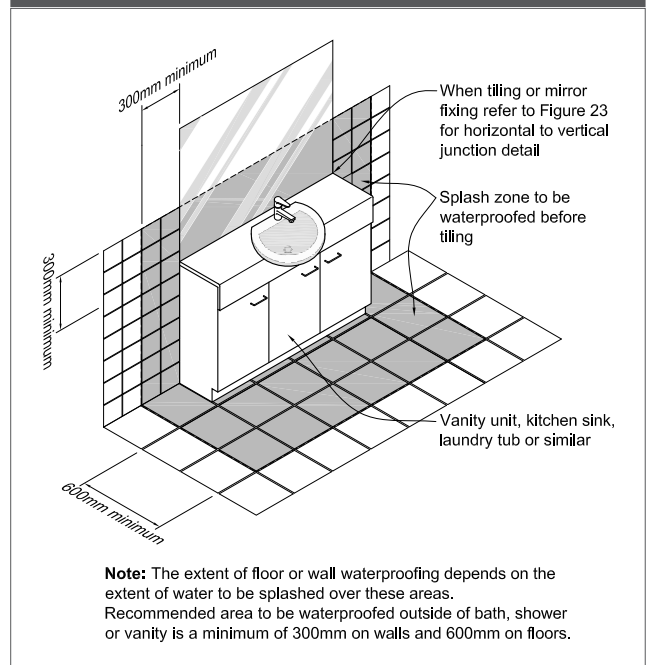


Figure 22: Wall to wall wet area tiled wall internal corner

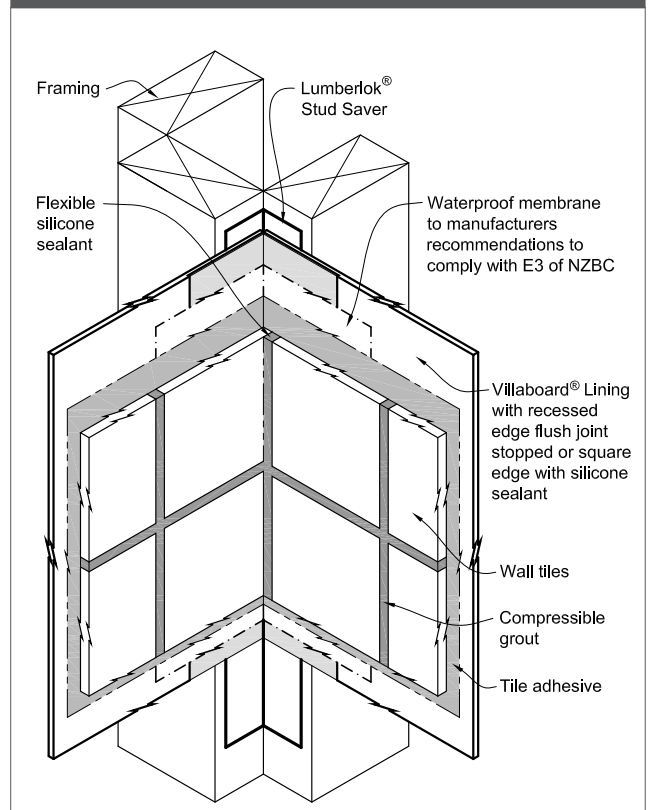
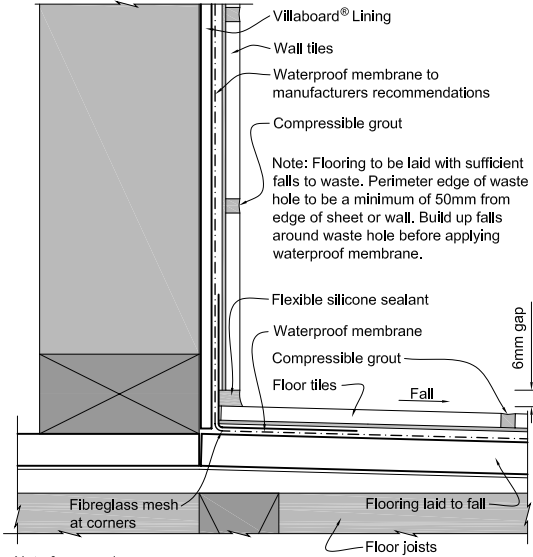


Figure 23: Wall to floor junction



Note for screeds:

1. The thickness of screeds should be applied to achieve the desired slope in accordance with the manufacturers recommendations.
2. Clean down the surface of the sheet flooring thoroughly. Apply a coat of bonding chemical to improve the bonding of the mortar bed to the floor.
3. To prevent cracking of the floor tiles, the mortar bed must be reinforced over all joints in floor sheets with 150mm wide galvanised mesh placed centrally over joints and in the centre of bedding.
4. Control joints in the flooring must be continued through the tiles.
5. Epoxy mortar screeds may also be used.

Note: Refer to Clause 8.5 for further information

Figure 24: Wall to acrylic bath/shower

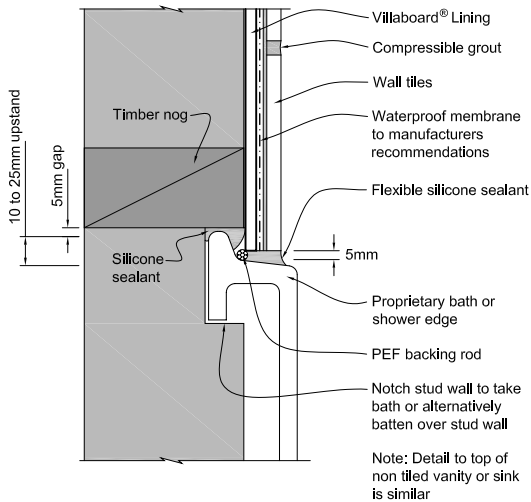
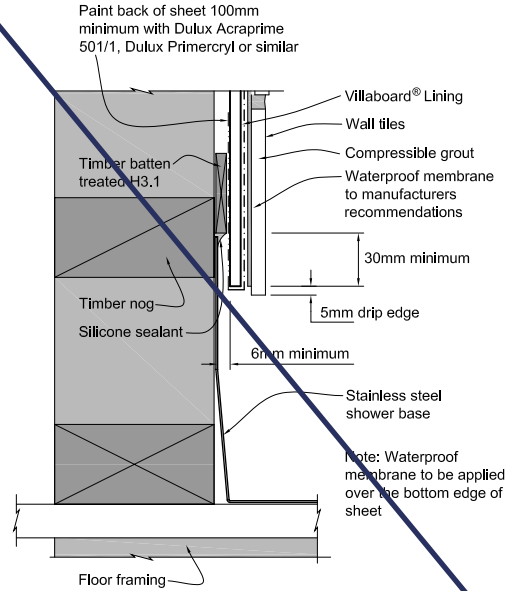


Figure 25: Wall to stainless steel shower

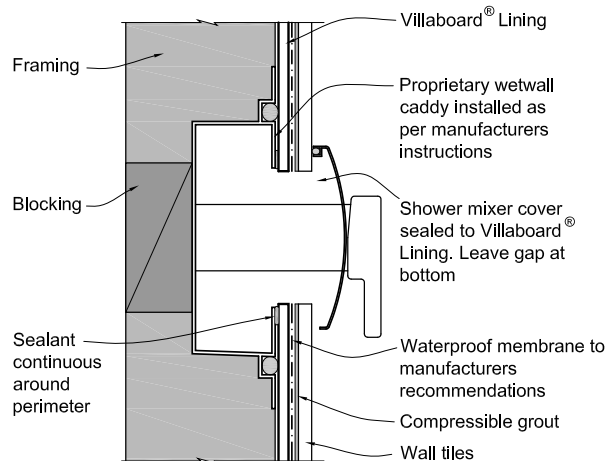


7.3 WATERPROOFING MEMBRANE

A waterproofing membrane must be applied to Villaboard Lining when used in wet area or water splash area applications. A reinforcing fibre glass/band must be used in corners and walls to floor junctions. Always follow the recommendations of waterproofing membrane manufacturers. BRANZ appraised water proofing membranes are recommended for use in this application.

7.4 WET AREA PENETRATION

Figure 26: Wet wall caddy



Note: Seal cut edges of Villaboard Lining

8 Finishes and maintenance

8.1 GENERAL

Villaboard Lining is finished with either paint, tiles or wallpaper as per application requirements. The application and maintenance of these finishes must be in accordance with the manufacturer's specifications.

Notes

1. For wet areas, the waterproofing requirements of all relevant codes, standards and regulations must be met.
2. Refer to the manufacturers' specifications on application, compatibility and suitability of waterproofing membranes.

8.2 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 walls and ceilings (e.g. down-lights in ceilings above set joints in walls). Ceilings and wall joints should run in the direction of the light source (at right angles to windows).

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

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

8.3 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 Lining referred to above. A description of the various levels of finishes and the jointing/coating requirements can be found in Table 9.

Table 9

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 non-critical lighting.	Refer to flush jointing recommendations on page 16–17, steps 1–7 recessed edge joints. 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 or 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 16 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, semi-gloss, 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'

8.4 PAINT FINISHES

Prior to the 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.

Note: Use of a 'sealer coat' or 'preparation undercoat' is recommended.

8.5 TILED APPLICATIONS

Before commencing tiling it is suggested that you refer to BRANZ 'Good Tiling Practice' guide to fully understand the substrate preparation/installation before tiling, also refer Table 10 for Villaboard Sheet thickness, stud spacing and tile thickness.

Refer to Clause 5.3 Tiled Walls for fixing Villaboard Lining to Framed walls.

Control joints must be provided to accommodate thermal/framing movement and stresses which will generate during the life of the building. Control joints must be carried out through the tiles to the exterior face. Refer Figure 18.

James Hardie only recommends the use of flexible tile adhesive for tile applications. Refer to adhesive manufacturer for suitability and application information. The size of tiles used over Villaboard Lining are restricted based on thickness of sheet. Refer Table 10 below.

Square edge sheets can be used for tiled applications. The sheet joint can either be stopped as per Figure 13 or it can be filled with a sealant as per Figure 16.

Note

1. Do not tile ceilings.
2. Tiling must not exceed 3m in height.
3. Provide control joints as per Table 8.
4. The Villaboard Lining joints can be staggered.

Table 10

Villaboard Thickness (mm)	Tile Thickness (mm)	Sizes		Stud Spacing
		Maximum Tile Weight per m2 (Kg)	Tile Size Max	
6	≤ 8mm	Up to 15	300 x 300mm	400mm centres maximum
9	> 8mm	15 - 30	300 x 600mm/ 400 x 400mm	600mm centres maximum
9	> 8mm	31 - 60	300 x 600mm/ 400 x 400mm/ 300 x 900mm	400mm centres maximum

Support angles are required to transfer the weight of tiles to the framing.

A support angle must be fixed at the base of the wall into the bottom plate. When tiling the full height of the wall, it is recommended that an intermediate support angle fixed into framing is also used to support the weight of tiles. The overall mass of tiles and the support required must be considered and the c/c distance between the support angles should be reduced for tiles thicker than 18mm. Refer Table 11 for recommended spacing of angle supports.

Table 11

Guidance for consideration	
Tile Weight per m2 (Kg)	Vertical Spacing of Support Angles (Metres, Max.)
20 - 30	1.6
31 - 42	1.2
43 - 60	0.8

8.6 MAINTENANCE

James Hardie recommends that the cleaning and maintenance of all finishes be undertaken regularly as per the recommendations of the manufacturer. Joints must also be maintained and be free of dirt and grime. Special attention must be given to water proofing membranes and tile adhesives. These must be suitable for the intended application and compatible with other materials they are used in conjunction with.

9 Product information

9.1 GENERAL

Villaboard Lining is a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water.

Villaboard Lining is manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets').

Villaboard Lining is classified Category 3, Type B in accordance with AS/NZS 2908.2.

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

9.2 PRODUCT MASS

Based on equilibrium moisture content the approximate mass of Villaboard Lining is:

- 6mm thick — 8.3kg/m²
- 9mm thick — 12.4kg/m²

9.3 DURABILITY

Resistance to Moisture/Rotting

Villaboard Lining has demonstrated resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

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

9.4 FIRE PROPERTIES

Maximum service temperature for the Villaboard Lining is 60°C.

Villaboard 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/m².

Villaboard Lining has a 'Group Number' classification of 1-S as per the requirements of clause C of the NZBC.

Product Warranty

Villaboard®
LINING

September 2014

James Hardie New Zealand ("James Hardie") warrants for a period of 15 years from the date of purchase that the Villaboard® 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 Villaboard® Lining when installed in accordance with the Villaboard® 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

February 2013

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- 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.

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THIS PUBLICATION

This publication is not intended as the definitive guide on wet area construction and wet area systems, but rather as a helpful guide to best practice around areas where there is intermittent water exposure and splash zones within residential and non-residential buildings – in particular, areas covered by the New Zealand Building Code (NZBC), Clause E3 Internal Moisture. The information herein is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZBC and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

It is important to introduce materials and systems which have been specially designed to cope with the conditions that are common in wet areas, and to ensure they are installed correctly, using best practice, and are compatible to form a complete wet area system.

The code numbers shown with each “typical detail”, e.g. GAW-D030, match the code numbers for drawings available as downloads on the GIB® website at www.gib.co.nz

The reference numbers (e.g. GAW-D030) stand for:

GAW	D	030
GIB Aqualine® Wet Area System	Detail	Drawing Number

WHAT IS A WET AREA?

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Wet areas fall into two categories; these are well explained and documented in the NZBC, Clause E3.

1. Water splash areas – These are areas subject to intermittent splash of liquid water around sanitary fittings and appliances such as baths, vanities, laundry tubs, sinks, etc. These areas are required to have an impervious, easily cleaned surface.
2. Shower enclosures – These are areas subject to more frequent, larger quantities of water, and include shower enclosures and shower over bath areas. The NZBC E3/AS1 requires these areas to be impervious, and specifically excludes any paint and wallpaper finishes. Where ceramic tile or stone finishes are applied, E3/AS1 requires that they “shall be laid on a continuous impervious substrate or membrane”.

The requirements of these wet areas are described on page 6 of this publication and in full in Clause E3 of the NZBC. Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management, which will require separate consideration. Ongoing maintenance of wet areas is also important to maximise the life of the wet area.

GIB AQUALINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or moisture.

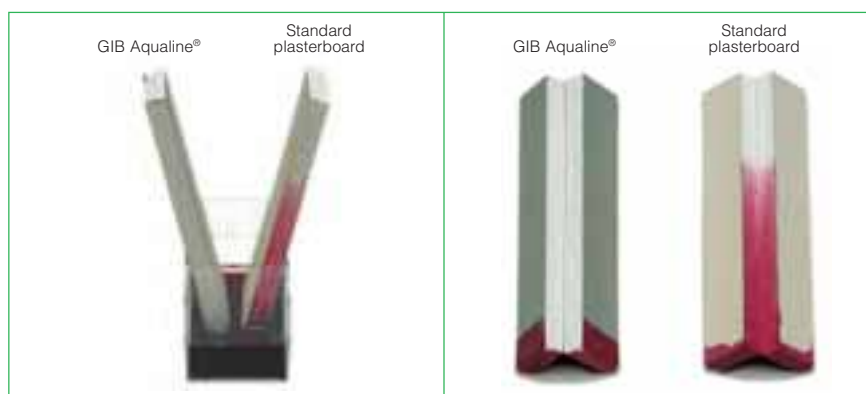
The NZBC does not call for water resistant linings in wet areas but it is highly desirable to incorporate lining materials which will maintain their integrity longer when exposed more frequently to water or steam and particularly to one-off events such as leakages or flooding of a room.

GIB Aqualine® is ideal in such situations because it features a water resistant wax polymer impregnated core.

Unlike other commonly used substrates, the GIB Aqualine® core not only resists penetration of water through the lining into the framing behind, but also resists water “wicking” up the core, a common cause of long-term damage where a water resistant lining has not been used.

GIB Aqualine® will maintain its integrity for extended periods, particularly where wicking over large areas can destroy the integrity of the interface between the lining and paint or wallpaper surfaces or between the lining and the tile adhesive.

The illustrations below graphically show the difference between GIB Aqualine® and standard plasterboard after a two-hour soak test in red dye.



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Introduction/Design Considerations

GIB AQUALINE® *continued*

Where to Use GIB Aqualine®

Though not required by NZBC, it is highly desirable to include GIB Aqualine® in all areas at risk of water or moisture damage, in order to prolong the life expectancy of that space.

They include:

	WALLS	CEILINGS
BATHROOMS	✓	✓
SHOWERS	✓	✓
LAUNDRY	✓	✓
KITCHEN	✓	
TOILET	✓	

Benefits

- Water resistant and durable to help protect against water damage
- Proven substrate for paint, wallpaper, tiles, sheet vinyl and rigid sheet shower linings with installations in over 300,000 bathrooms in New Zealand
- Suitable for both residential and non-residential applications
- Dimensionally stable, will not buckle or warp, hence an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains fibreglass and other additives for strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB® Noise Control Systems (see Compliance with the NZBC, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details
- Green face paper for ease of recognition.

Sheet Dimensions and Weights

SHEET DIMENSIONS (ALL SHEETS 1200mm WIDE AND TE/TE)		MAXIMUM WEIGHT/m ²
Thickness (mm)	Length (mm)	
10	2400, 2700, 3000, 3600	7.8kg
13	2400, 2700, 3000, 3600	10.2kg

Handling and Storage

- GIB Aqualine® must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB Aqualine® must be handled as a finishing material.

APPRAISAL

The document entitled *GIB Aqualine® Wet Area Systems 2007* has been appraised by BRANZ, Appraisal Certificate, No. 427 (2007).

COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC)

Structure – Clause B1

The design and material specification for steel and timber framing used in GIB Aqualine® systems must be in accordance with the performance requirements of NZBC Clause B1 (Structure). See Bracing in Wet Areas on page 5.

Durability – Clause B2

When installed and maintained in accordance with this literature, GIB Aqualine® tiled or vinyl covered systems have a serviceable life of at least 15 years. They comply with the requirements of NZBC Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB Aqualine® systems have a serviceable life of at least 50 years and comply with NZBC Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

Spread of Fire – Clause C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZBC Clause C3 (Spread of Fire). When GIB Aqualine® is substituted into fire rated systems in place of the equivalent thickness GIB Fyrelite®, the Fire Resistance Rating (FRR) of that system will be maintained.

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GIB AQUALINE® WET AREA SYSTEMS



COMPLIANCE WITH THE NEW ZEALAND BUILDING CODE (NZBC) *continued*

Internal Moisture – Clause E3

When installed in accordance with this literature, tiled or vinyl covered GIB Aqualine® systems may be used in areas directly exposed to liquid water, such as showers, to provide an impervious and easily cleaned wall surface. These systems comply with the requirements of NZBC Clause E3 (Internal Moisture).

Hazardous Building Materials – Clause F2

At no stage during handling, installation, or serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZBC Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

Ventilation – Clause G4

NZBC Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

Airborne and Impact Sound – Clause G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZBC Clause G6 (Airborne and Impact Sound). 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. For further information contact the GIB® Helpline 0800 100 442.

LIMITATIONS

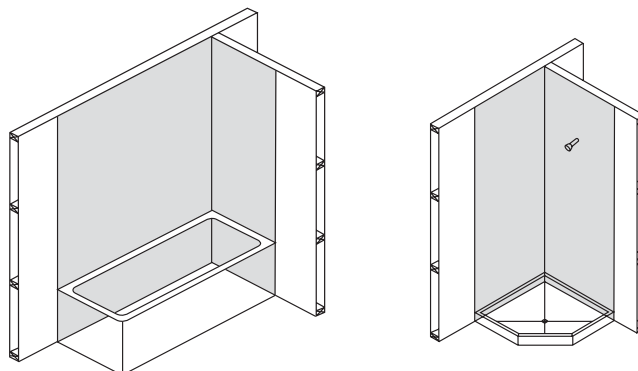
- GIB Aqualine® must not be used for bracing purposes in shower cubicles or above baths (see Bracing in Wet Areas below)
- Do not use GIB Aqualine® where it may be exposed for extended periods to humidities of 90% RH and above. Such areas include group shower or steam rooms as well as moisture and chlorine rich environments such as indoor swimming pools
- GIB Aqualine® must not be directly applied to solid plaster (gypsum or cement), wood based sheet linings or similar materials, masonry or concrete. GIB Aqualine® may only be applied to these materials where timber strapping or steel furring channels are installed
- GIB Aqualine® must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details.

BRACING IN WET AREAS

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members.

Otherwise, GIB® Bracing Systems can be used in water-splash areas as defined by NZBC Clause E3/AS1, provided these are maintained impervious for the life of the building.

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 900mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100mm centres, using the GIB Braceline® corner fixing pattern.



No bracing in the shaded areas.

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NEW ZEALAND BUILDING CODE

E3.3.4 requires impervious and easily cleaned surfaces to all surfaces adjacent to sanitary fixtures or laundering facilities.

E3.3.5 requires that surfaces of building elements likely to be splashed or contaminated in the course of the intended use of the building must also be impervious and easily cleaned.

E3.3.6 requires that surfaces of building elements likely to be splashed must be constructed in a way that prevents water from penetrating behind linings or into concealed spaces (e.g. wall cavities).

Walls in wet areas therefore need to be addressed according to whether they fall within the scope of one of the following descriptions:

1. Wall surface likely to be splashed
2. Shower walls. Although not a requirement of NZBC it is highly recommended that the wall surfaces within 150mm of the top edge of a bath, and the vertical faces immediately under the edge of a bath, are treated in the same way as for a shower wall.

WALL SURFACES IN AREAS LIKELY TO BE SPLASHED

Suitable linings include:

- a. Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints
- b. Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use
- c. Cement based solid plaster or concrete having a steel trowel or polished finish (semi-gloss or gloss paint must be used if a paint finish is required)
- d. Cork tile or sheet sealed with waterproof applied coatings
- e. Monolithic applied coatings having a polished, non-absorbent finish (e.g. terrazzo)
- f. Sheet linings finished with vinyl coated wallpaper, or semi-gloss or gloss coating
- g. Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin
- h. Modular or multiple lining units which are themselves *impervious* and easily cleaned, and are installed with *impervious* joints
- i. Timber or timber-based products such as particleboard sealed with waterproof applied coatings.

NB: Floor surfaces and floor/wall junctions are required by E3 to be impervious.

SURFACES IN SHOWERS AND AROUND BATHS

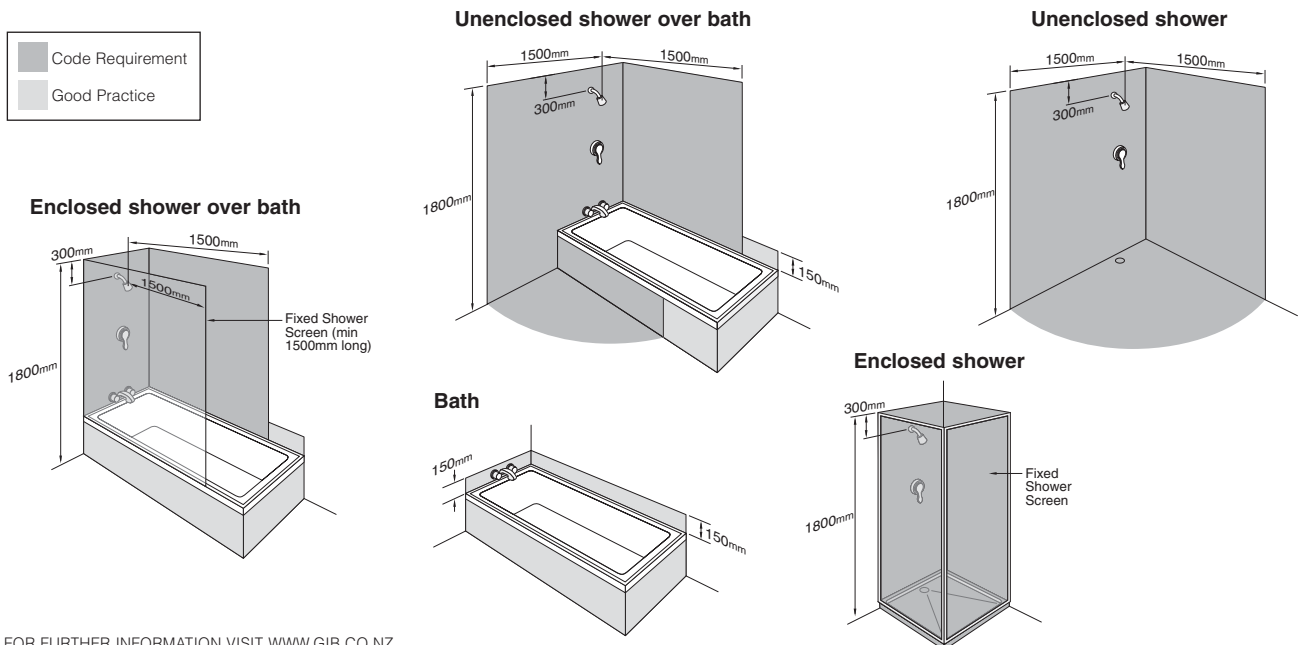
Suitable linings include all of the above, but **NOT including items (d) and (f) from the above list.**

Note that a waterproof membrane complying with AS/NZS 4858: 2004 **MUST** be applied to all lining materials used under ceramic tiles in these areas.

The waterproof membrane must extend to a 1500mm horizontal radius from a shower rose unless the shower is contained within a fixed enclosure. A shower curtain does not constitute a fixed enclosure.

Particleboard manufacturers recommend that in wet areas, panels should be protected with a suitable wet area membrane or an integrally waterproof sheet material. Some local authorities call for this treatment on all timber based floors. Local requirements should be checked before proceeding.

Dark grey shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membranes prior to tiling. Light grey shaded areas represent good practice.



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WALL SURFACES SURROUNDING COOKTOPS

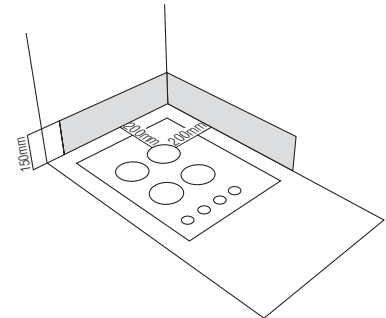
The protection of combustible surfaces surrounding gas cooking appliances is covered by NZS 5261. Consult the current version of this standard to ensure compliance.

However, as a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm ceramic tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the requirements of Clause 2.6.2.6 of NZS5261.

Because of the moisture generated by cooking, it is highly recommended that GIB Aqualine® is used in kitchen areas.

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. However, it would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.



PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Sealants should be of a mould inhibiting type and be neutral cure. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Gun a bead of silicone sealant to the full depth of the GIB Aqualine® in the following locations:
 - Around all tap/pipe bodies
 - The gap between the bath rim and the bottom edge of the GIB Aqualine®
 - Between the upstand of preformed shower bases and the bottom edge of the lining
 - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the GIB Aqualine® wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable then refer to the publication *Penetrations in GIB® Fire Rated Systems*. Always use tested and approved proprietary solutions.

WATERPROOF MEMBRANES

- A waterproof membrane must be applied to **all** lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane over the lining and the jointed areas shown shaded on page 6
- Only in-situ waterproofing materials which are manufactured to AS/NZS 4858:2004 "Wet Area Membranes" are recommended and applied to manufacturer's recommendations. Typically, these types of membranes are not suitable for paint and wallpaper finishes
- Waterproof membranes must be fully cured and dry prior to application of tiling adhesives
- Embed reinforcing mats in the membrane at all internal corners of the shower (including floor/wall junctions)
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this technical literature are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane.

TILING

GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10mm GIB Aqualine® up to 20kg/m²
- 13mm GIB Aqualine® up to 32kg/m².

Note: Most ceramic and porcelain tiles weigh less than 20kg/m².

For further information on tiling consult the BRANZ *Good Practice Guide – Tiling*.

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FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine® is a suitable substrate for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures for the GIB Aqualine® substrate shall be as per page 10 or 11, except that the lining gap at the floor should be reduced to 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles (32 x 32 x 0.55mm) behind internal GIB Aqualine® corners is recommended for sheet vinyl applications in showers or shower over bath situations (see illustration page 14)
- The GIB Aqualine® lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph through even a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended for the wall finish in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of the flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/manufacturers of the vinyl.

RIGID SHEET SHOWER LININGS

- The manufacturers/suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- **Do not preseal or paint** areas which are to be covered by the rigid shower linings
- The wall surface must be free of dust before installation of the lining
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service
- Care must be taken to ensure that rooms are adequately ventilated and the adhesive is fully cured before the shower is used
- Consult the manufacturer/supplier of the shower lining for full installation details.

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture within those spaces.

In most cases when renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them with GIB Aqualine®. This allows for a completely new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation and water resistant linings where appropriate
- Make the job easier.

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often very expensive failure of components and building elements within wet areas.

It is important to regularly inspect and repair any potential problem before it becomes a major problem and expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and recoated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out.



If bracing, noise control or fire rating considerations exist, consult the relevant GIB® technical publication, e.g. *GIB® Fire Rated Systems*, *GIB® Noise Control Systems*, *GIB® Bracing Systems*, for the appropriate information.

Wall Framing

Framing dimensions must comply with the requirements of NZS 3604:1999.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems.

Fasteners

- 10mm GIB Aqualine® – minimum 25mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails
- 13mm GIB Aqualine® – minimum 32mm x 6g GIB® Grabber® High Thread Drywall Screws or 30mm x 2.8mm GIB® Nails.

Fastener Centres

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element.

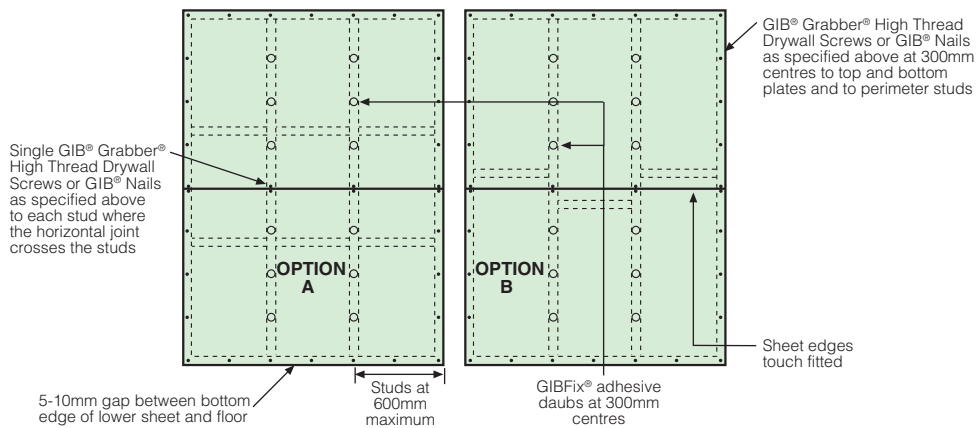
Lining

- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

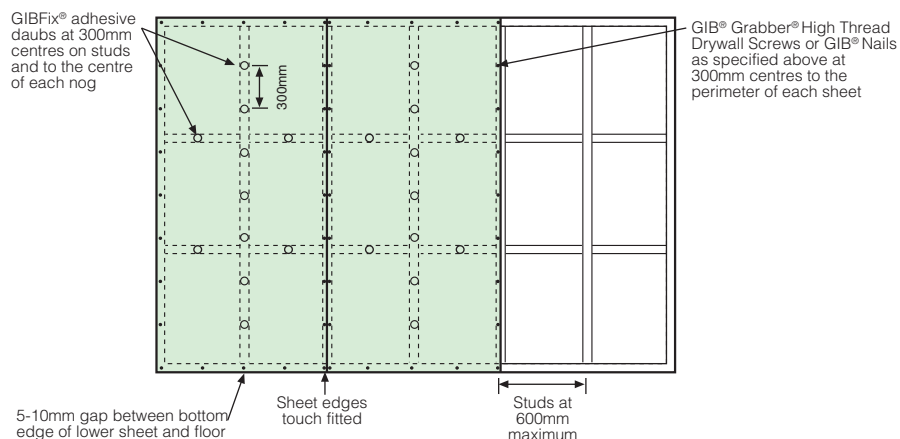
Jointing

- Jointing shall be carried out in accordance with the instructions in the *GIB® Site Guide*; GIB® AquaMix is recommended for the first two coats.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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Ceiling Framing

Framing dimensions and spacing must comply with the requirements of NZS 3604:1999 or relevant NZ Standard. If bracing, noise control, fire rating considerations exist consult the relevant GIB® publication for appropriate information.

Fasteners

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping Drywall screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber High Thread Drywall screws.

Adhesives

- Steel battens – GIBFix® All-Bond
- Timber battens – GIBFix® Wood Bond (not suitable for LOSP treated timber).

Fasteners Centres

- Single screws to the edges and centre of the sheets across each batten
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw or nail pops.

Lining

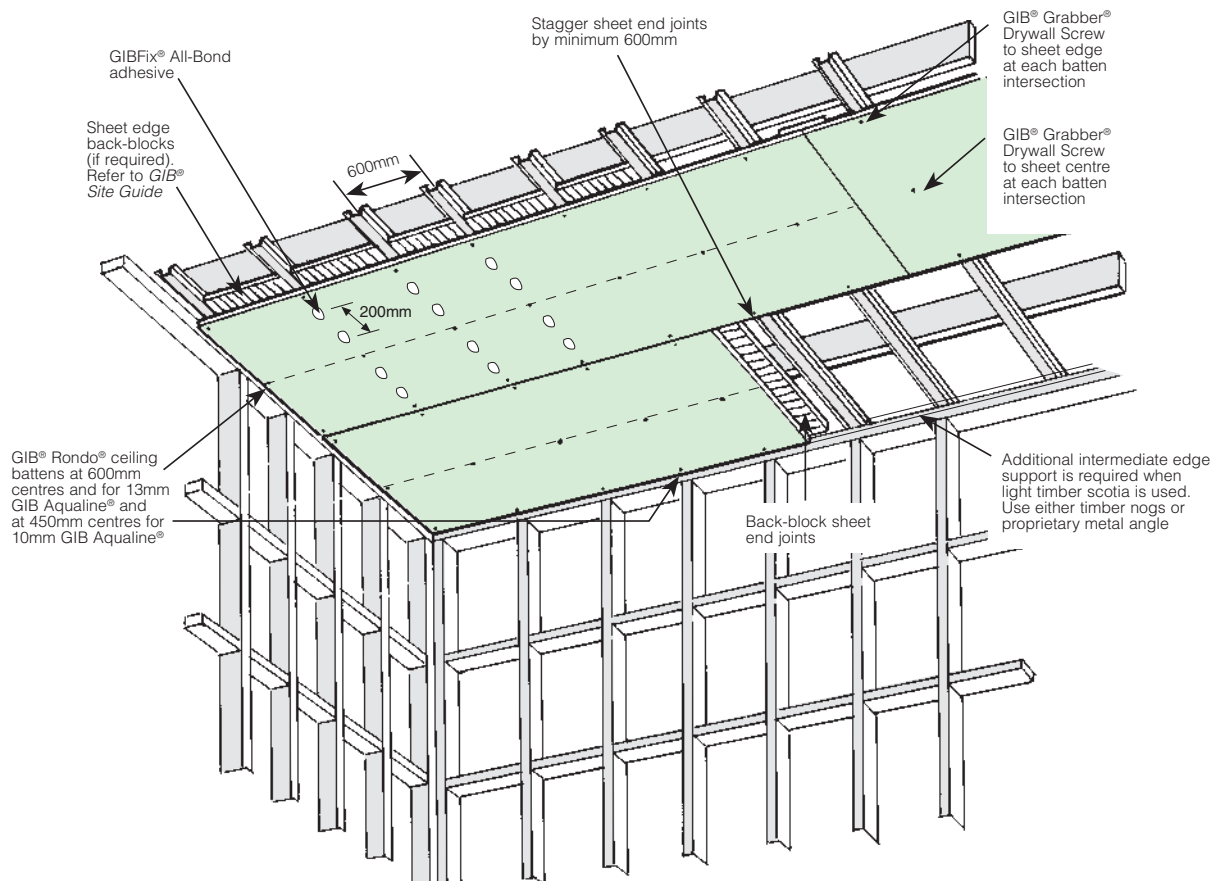
- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements.

Batten Spacings

- 13mm GIB Aqualine® plasterboard – 600mm centres max
- 10mm GIB Aqualine® plasterboard – 450mm centres max.

Jointing

- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the *GIB® Site Guide*. Water resistant GIB® AquaMix is recommended for the first two coats.
- Do not fix tiles to GIB® plasterboard ceilings.

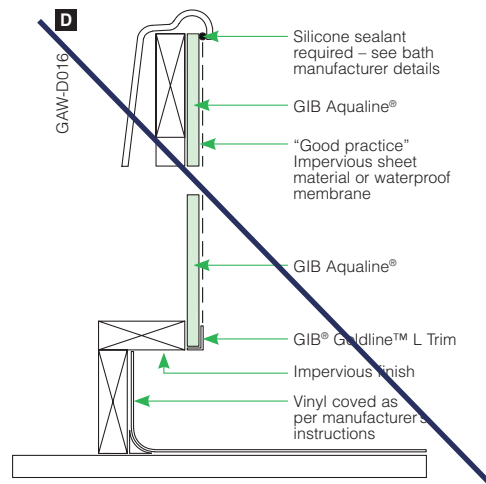
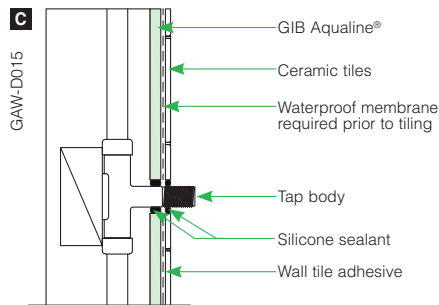
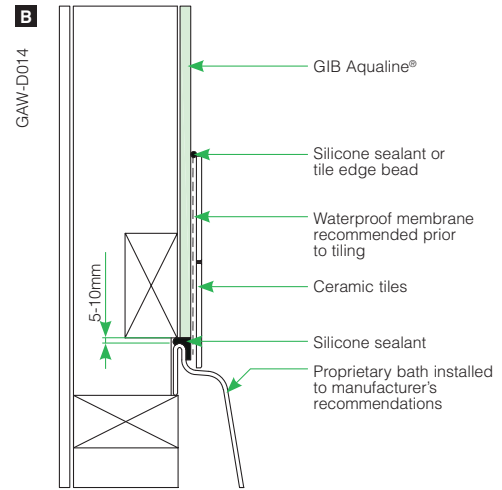
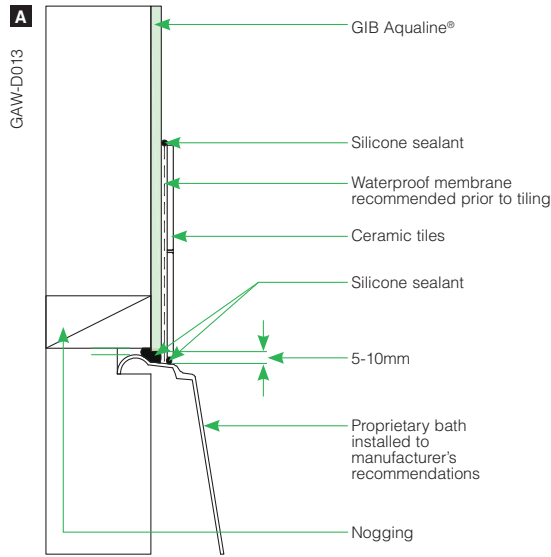


GIB AQUALINE® WET AREA SYSTEMS – TYPICAL DETAILS

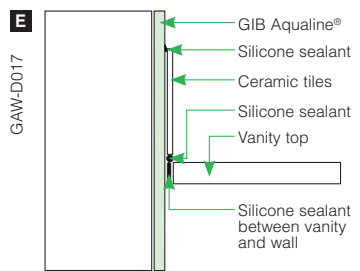


Bath – Tiled Upstand

MARCH 2007



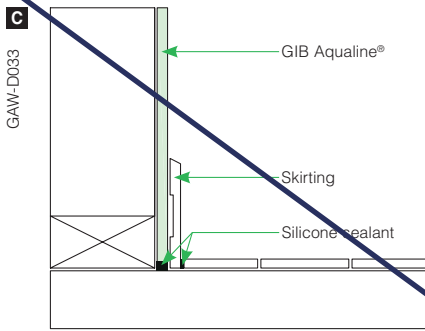
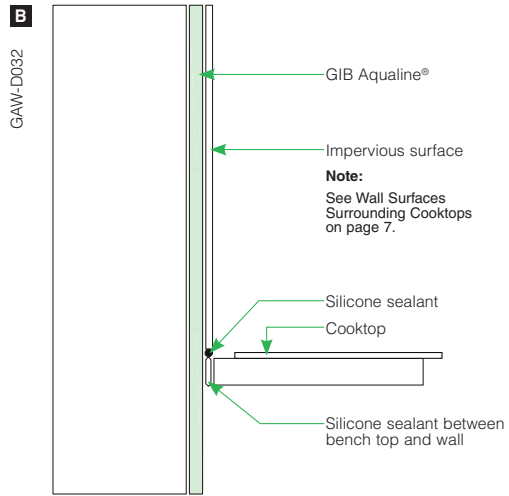
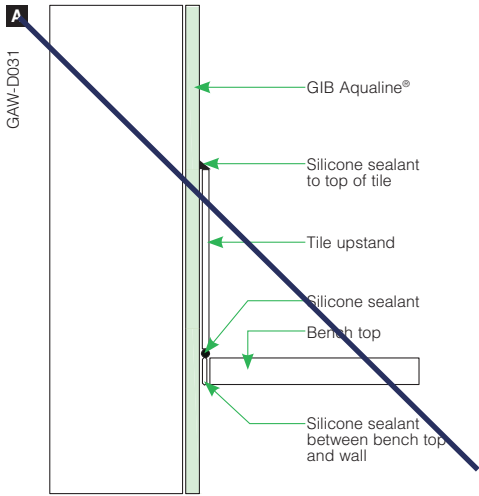
Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.



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GIB AQUALINE® WET AREA SYSTEMS – TYPICAL DETAILS

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HYDRO BAN®

DS-663.0-0115

**Globally Proven
Construction Solutions**



1. PRODUCT NAME

HYDRO BAN®

2. MANUFACTURER

LATICRETE International, Inc.
1 LATICRETE Park North
Bethany, CT 06524-3423 USA

Telephone: +1.203.393.0010, ext. 235
Toll Free: 1.800.243.4788, ext. 235
Fax: +1.203.393.1684
Internet: www.laticrete.com

3. PRODUCT DESCRIPTION

HYDRO BAN is a thin, load bearing waterproofing/crack isolation membrane that DOES NOT require the use of fabric in the field, curves or corners. HYDRO BAN is a single component self-curing liquid rubber polymer that forms a flexible, seamless waterproofing membrane. HYDRO BAN bonds directly to a wide variety of substrates.

Uses

- Interior and exterior
- Swimming pools, fountains and water features
- Shower pans, stalls and tub surrounds
- Industrial, commercial and residential bathrooms and laundries
- Spas and hot tubs
- Kitchens and food processing areas
- Terraces and balconies over unoccupied spaces
- Countertops and facades
- Steam rooms (when used in conjunction with a vapor barrier)

Advantages

- Allow for flood testing in 2 hours at 70°F (21°C) or higher*
- Does not require the use of fabric[^]
- Bonds directly to metal, PVC and ABS plumbing fixtures only
- Thin; only 0.020–0.030" (0.5–0.8 mm) thick when cured
- Changes in color from a light sage to an olive green when cured
- Anti-fracture protection of up to 1/8" (3 mm) over shrinkage and other non-structural cracks
- "Extra Heavy Service" rating per TCNA performance levels (RE: ASTM C627 Robinson Floor Test)
- Exceeds ANSI A118.10 and A118.12
- IAPMO approved
- Equipped with anti-microbial technology
- Rapid drying for a faster time to tile
- Lighter color for ease of inspection
- Safe—no solvents and non-flammable
- Install tile, brick and stone directly onto membrane

[^] For gaps 1/8" (3 mm) or less see DS 663.5 for complete instructions

¥ Refer to cautions section for more information on curing

Suitable Substrates

- Concrete
- Concrete & Brick Masonry
- Cement Mortar Beds
- Cement Plaster
- Gypsum Wallboard*
- Exterior Glue Plywood*
- Ceramic Tile & Stone**
- Cement Terrazzo**
- Cement Backer Board***
- Poured Gypsum Underlayment†

* Interior applications only.

** If skim coated with a Latex Thin-Set Mortar.

***Consult cement backer board manufacturer for specific installation recommendations and to verify acceptability for exterior use.

† Interior use only. Follow TCNA Guidelines/ Methods: F200, RH111, RH122, F180

Packaging

Commercial Unit: 5 gal (18.9 L) pail liquid (36 commercial units/pallet)

Mini Unit: 4 x 1 gal (3.8 L) pails of liquid packed in a carton (30 cartons/pallet)

Approximate Coverage

Commercial Unit: 250 ft² (23.2 m²)

Mini Unit: 50 ft² (4.6 m²)

Shelf Life

Factory sealed containers of this product are guaranteed to be of first quality for two (2) years* if stored at temperatures >32°F (0°C) and <110°F (43°C).

Limitations

- DO NOT bond to OSB, particle board, interior glue plywood, luan, Masonite® or hardwood surfaces.
- Adhesives/mastics, mortars and grouts for ceramic tile, pavers, brick and stone are not replacements for waterproofing membranes. When a waterproofing membrane is required, use HYDRO BAN®.
- Do not use as a primary roofing membrane over occupied space.
- Do not use over dynamic expansion joints, structural cracks or cracks with vertical differential movement (See HYDRO BAN Installation Instructions, DS 663.5 for complete instructions).
- The installation of Waterproofing Membranes in submerged applications must be installed in a manner that creates a continuous "waterproof pan effect" without voids or interruptions. Therefore, applying waterproofing membranes in limited areas (e.g. solely at the waterline) in submerged applications is not recommended.
- Do not use over cracks >1/8" (3 mm) in width.
- Do not use as a vapor barrier (especially in steam rooms).
- Do not expose unprotected membrane to sun or weather for more than 30 days.
- Do not expose to negative hydrostatic pressure, excessive vapor transmission, rubber solvents or ketones.
- Must be covered with ceramic tile, stone, brick, dry pack thick bed mortar beds, terrazzo or other traffic-bearing finish. Use protection board for temporary cover.
- Obtain approval by local building code authority before using product in shower pan applications.
- Do not install directly over single layer wood floors, plywood tubs/showers/fountains or similar constructs.
- Not for use beneath cement or other plaster finishes. Consult with plaster manufacturer for their recommendations when waterproofing membrane is required under plaster finishes.
- Not for use under self-leveling underlayments or decorative wear surfaces.

Note: Surfaces must be structurally sound, stable and rigid enough to support ceramic/stone tile, thin brick and similar finishes. Substrate deflection under all live, dead and impact loads, including concentrated loads, must not exceed L/360 for thin bed ceramic tile/brick installations or L/480 for thin bed stone installations and L/600 for all exterior veneer applications where L=span length.

Cautions

- Consult SDS for more safety information.
- Allow membrane to cure fully (typically 24 hours at 50°F – 69°F (10°C – 21°C) and 70% RH and 2 hours at 70°F (21°C) or higher and 50% RH before flood testing); flood test prior to applying tile or stone.
- Maximum amount of moisture in the concrete/mortar bed substrate should not exceed 5 lbs/1,000 ft² (283 µg/s m²)/ 24 hrs per ASTM F-1869 or 75% relative humidity as measured with moisture probes.
- During cold weather, protect finished work from traffic until fully cured.
- For white and light-colored marbles, use a white Latex Portland Cement Thin Set Mortar.
- For green and moisture sensitive marble, agglomerates and resin backed tile and stone use LATAPOXY® 300 Adhesive (refer to DS 633.0).
- Wet coat thickness is 0.015 to 0.022" (0.4 to 0.6 mm) per coat. Use a wet film thickness gauge to check thickness.

- Allow wet mortars to cure for 72 hours at 70°F (21°C) prior to installing HYDRO BAN. Allow HYDRO BAN a minimum 2 hours cure at 70°F (21°C) prior to flood testing in these conditions.
- Protect from exposure to traffic or water until fully cured.
- HYDRO BAN will go from a light sage green to a darker olive green when fully cured. The second coat should not be applied until the first coat is fully cured. All flood test times should be after the second coat is fully cured with no light sage areas showing.

4. TECHNICAL DATA

Approval

- ICC Evaluation Service Report ESR-2417
- IAPMO/Uniform Plumbing Code File No.3524
- Los Angeles Board of Building and Safety Commissioners File Number: M-070162
- City of Philadelphia Plumbing Advisory Board Case Number: 4624
- City of Tampa Construction Services Division

VOC/LEED Product Information



This product has been certified for Low Chemical Emissions (ULCOM/GG UL2818) under the UL GREENGUARD Certification Program. For Chemical Emissions. For Building Materials, Finishes and Furnishings (UL 2818 Standard) by UL Environment.

Applicable Standard

ANSI A118.10 and A118.12

Specifications are subject to change without notification. Technical data shown in LATICRETE product data sheets and technical data sheets are typical but reflect laboratory test procedures conducted in laboratory conditions. Actual field performance and test results will depend on installation methods and site conditions. Field test results will vary due to critical job site factors

Physical Properties

Physical Property	Test Method	HYDRO BAN®
7-day Hydrostatic Test	ANSI A118.10	Pass
7-day Breaking Strength	ANSI A118.10	265–300 psi (1.8–2.1 MPa)
7-day Water Immersion	ANSI A118.10	95–120 psi (0.7–0.8 MPa)
7-day Shear Bond	ANSI A118.10	200–275 psi (1.4–1.9 MPa)
28-day Shear Strength	ANSI A118.10	214–343 psi (1.5–2.3 MPa)
System Crack Resistance Test	ANSI A118.12.5.4	Pass (High)
Water Vapor Transmission	ASTM E 96–00 ^{E1} Procedure B	0.515 grains/h • ft ² (0.3602 g/h • m ²)
Water Vapor Permeance	ASTM E 96–00 ^{E1} Procedure B	1.247 perms 71.21 (ng/Pa • s • m ²)
System Performance	ANSI A118.10; ASTM C627; TCA Rating	cycles 1–14 "Extra Heavy"
Ability of Water Applicable to Waterproofing Systems	NBR 12170:2009 (Technical Norm from Brazil)	Pass
Tensile Strength for Elongation		250%
Thickness (Dried)		20–30 mils (0.5–0.8 mm)

The data in the above table shall be used by the Project Design Professional to determine suitability, placement, building code conformance and over-all construct appropriateness of given installation assembly.

Time to Tile

Substrate	Time to Tile (min.)****
Concrete	50
Cement Board	30
Fiber Cement Underlayment	15

****After second coat is applied at 70°F (21°C) and 50% RH. The time to tile will vary depending on substrate, temperature and relative humidity.

Working Properties

HYDRO BAN® can be applied using a paint brush, roller or trowel. All areas must have two coats to ensure waterproofing capabilities. When using a paint roller, substrate will not show through HYDRO BAN if coated with 0.020 – 0.030" (0.5 – 0.8 mm) of dried membrane. Color changes from a light sage to olive green **when fully cured**.

INSTALLATION

Refer to DS 663.5 for complete installation instructions prior to using product

Surface Preparation

Surface temperature must be 50 – 90°F (10 – 32°C) during application and for 24 hours after installation. All substrates must be structurally sound, clean and free of dirt, oil, grease, paint, laitance, efflorescence, concrete sealers or curing compounds. Make rough

or uneven concrete smooth to a wood float or better finish with a underlayment. Do not level with asphalt based products. Maximum deviation in plane must not exceed 1/4" in 10 ft (6 mm in 3 m) with no more than 1/16" in 1 ft (1.5 mm in 0.3 m) variation between high spots. Dampen hot, dry surfaces and sweep off excess water— installation may be made on a damp surface. New concrete slabs shall be damp cured and a minimum of 14 days old before application.

- Surfaces must be structurally sound, stable and rigid enough to support ceramic/stone tile, think brick and similar finishes. Installer must verify that deflection under all live, dead and impact loads of interior plywood floors does not exceed industry standards of L/360 for ceramic tile and brick or L/480 for stone installations and L/600 for all exterior veneer applications where L=span length.
- Minimum construction for interior plywood floors.
SUBFLOOR: 5/8" (15 mm) thick exterior glue plywood, either plain with all sheet edges blocked or tongue and groove, over bridged joints spaced 16" (400 mm) o.c. maximum; fasten plywood 6" (150 mm) o.c. along sheet ends and 8" (200 mm) o.c. along intermediate supports with 8d ring-shank, coated or hot dip galvanized nails (or screws); allow 1/8" (3 mm) between sheet ends and 1/4" (6 mm) between sheets edges; all sheet ends must be supported by a framing member; glue sheets to joints with construction adhesive.
UNDERLAYMENT: 5/8" (15 mm) thick exterior glue plywood fastened 6" (150 mm) o.c. along sheet ends and 8" (200 mm) o.c. in the panel field (both directions) with 8d ring-shank, coated or hot dip galvanized nails (or screws); allow 1/8" (3 mm) to 1/4" (6 mm) between sheets and 1/4" (6 mm) between sheet edges and any abutting surfaces; offset underlayment joints from joints in subfloor and stagger joints between sheet ends; glue underlayment to subfloor with construction adhesive. Refer to Technical Data Sheet 152 "Bonding Ceramic Tile, Stone or Brick Over Wood Floors" for complete details.

Bonding to TCNA Compliant Poured Gypsum Underlayment

Poured gypsum-based underlayments must meet TCNA requirements for compressive strength and the performance requirements of ASTM C627 for the anticipated service level designated by the design professional. Poured gypsum underlayment thickness and application varies, consult the manufacturer for specific recommendations. The underlayment must be dry and properly cured following the manufacturer's recommendations to achieve a permanent installation. Surfaces to be covered must be clean, structurally sound and meet the maximum allowable deflection standard of L/360 for ceramic tile and L/480 for stone under total anticipated load. Expansion joints must be installed in accordance with ANSI/TCNA guidelines. Prime all surfaces to receive HYDRO BAN with properly applied manufacturer's sealer or with a primer coat of HYDRO BAN, consisting of 1 part HYDRO BAN, diluted with 4 parts clean, cool tap water. In a clean pail, mix at low speed to obtain a homogeneous solution. The primer can be brushed, rolled or sprayed to achieve an even coat. Apply the primer coat to the floor at a rate of 250 to 300 ft²/gallon (6.1 to 7.5 M²/L) of diluted HYDRO BAN. Allow the primer coat to dry completely (approximately 24 hrs., depending on substrate and air temperature and humidity). When dry apply two full coats of

HYDRO BAN to the primed area following the guidelines in this data sheet and DS 663.5 HYDRO BAN Installation Instructions.

apply a liberal coat^{^^} of HYDRO BAN to over the first wide coat, using a paint roller or paint brush, and allow to dry. Treat closest joint to the crack, saw cut, or cold joint in the tile or stone installation with LATASIL.

^{^^} Wet coat thickness is 15 – 22 mils (0.4 – 0.6 mm) consumption per coat is -0.01/gal/ft² (-0.4 l/m²); coverage per coat is – 100 ft²/gal (-2.5m²/l). Use wet film gauge to check thickness.

Final Application

Allow any pre-treated areas to dry to the touch. Apply a liberal coat^{^^} of HYDRO BAN with brush or roller over substrate including pre-treated areas. Apply another liberal coat^{^^} of HYDRO BAN over the first coat of HYDRO BAN. Let topcoat dry to the touch, approximately 1–2 hours at 70°F (21°C) and 50% RH. When last coat has dried to the touch, inspect final surface for pinholes, voids, thin spots or other defects. HYDRO BAN will dry to an olive green color when it's dry to touch. Use additional HYDRO BAN to seal defects.

Movement Joints

See HYDRO BAN Installation Instructions DS 663.5.

Note: Apply a liberal coat^{^^} of HYDRO BAN, approximately 8" (200 mm) wide over the areas. Then embed and loop the 6" (150 mm) wide Waterproofing/Anti-Fracture Fabric and allow to bleed through. Then top coat with a second coat^{^^} of HYDRO BAN.

Protection

Provide protection for newly installed membrane, even if covered with a thin bed ceramic tile, stone or brick installation, against exposure to rain or other water for a minimum of 2 hours at 70°F (21°C) and 50% RH.

Flood Testing

Allow membrane to cure fully before flood testing, typically 2 hours after final cure at 70°F (21°C) and 50% RH. Cold and/or wet conditions will require a longer curing time. For temperatures 50 – 69°F (10 – 21°C) allow 24 hours after final cure prior to flood testing.

Installing Finishes

Once HYDRO BAN has dried to the touch, ceramic tile, stone or brick may be installed by the thin bed method with a Latex Thin-Set Mortar. Allow HYDRO BAN to cure 2 hours at 70°F (21°C) and 50% RH before covering with, thick bed mortar, epoxy adhesives, terrazzo or moisture sensitive resilient or wood flooring. Do not use solvent-based adhesives directly on HYDRO BAN.

Drains & Penetrations

Use LATASIL and foam backer rod to seal space between drain or penetration and finish. Do not use a grout or joint filler mortar.

Control Joints

Ceramic tile, stone and brick installations must include sealant- filled joints over any control joints in the substrate. However, the sealant-filled joints can be offset horizontally by as much as one tile width from the substrate control joint location to coincide with the grout joint pattern.

Movement Joints

Ceramic tile, stone and thin brick installations must include expansion at coves, corners, other changes in substrate plane and over any expansion joints in the substrate. Expansion joints in

Pre-Treat Cracks & Joints

Fill all substrate cracks, cold joints, and control joints to a smooth finish using a Latex Fortified Thin-Set. Alternatively, a liberal coat^{^^} of HYDRO BAN[®] applied with a paint brush or trowel may be used to fill in non-structural joints and cracks. Apply a liberal coat^{^^} of HYDRO BAN approximately 8" (200 mm) wide over substrate cracks, cold joints, and control joints using a paint brush or roller (heavy napped roller cover). 6" (150 mm) Waterproofing/Anti-Fracture Fabric can be used to pretreat cracks, joints, curves, corners, drains and penetrations with HYDRO BAN.

Pre-Treat Coves and Floor/Wall Transitions

Fill all substrate coves and floor/wall transitions to a smooth finish and changes in plane using a latex fortified thin-set mortar. Alternatively, a liberal coat^{^^} of HYDRO BAN applied with a paint brush or trowel may be used to fill in cove joints and floor/wall transitions <1/8" (3 mm). Apply a liberal coat^{^^} of HYDRO BAN approximately 8" (200 mm) wide over substrate coves and floor/wall transitions using a paint brush or roller (heavy napped roller cover).

Pre-Treat Drains

Drains must be of the bonding flange or clamping ring type, with weepers and as per ASME A112.6.3. Apply a liberal coat^{^^} of HYDRO BAN Waterproofing Membrane liquid around and over the bonding flange or the bottom half of drain clamping ring. Cover with a second coat^{^^} of HYDRO BAN. When dry, apply a LATASIL[™] bead where the HYDRO BAN meets the drain throat. Install top half of drain clamping ring.

Pre-Treat Penetrations

Allow for a minimum 1/8" (3 mm) space between drains, pipes, lights or other penetrations and surrounding ceramic tile, stone or brick. Pack any gaps around pipes, lights or other penetrations with a Latex fortified thin-set mortar. Apply a liberal coat^{^^} of HYDRO BAN liquid around penetration opening. Cover with a second coat^{^^} of HYDRO BAN. Bring HYDRO BAN up to level of tile or stone. When dry, seal flashing with LATASIL.

Crack Isolation (Partial Coverage) Crack suppression must be applied a minimum of 3 times the width of the tile or stone being installed. The tile installed over the crack cannot be in contact with the concrete.

Follow TCNA Method F125 for the treatment of hairline cracks, shrinkage cracks, and saw cut or control joints: Apply a liberal coat^{^^} of HYDRO BAN to a minimum of three (3) times the width of the tile using a paint roller or paint brush and allow to dry. After the first coat has dried to the touch, install a second liberal coat^{^^} of HYDRO BAN over the first coat.

As an alternative; Apply a liberal coat^{^^} of HYDRO BAN liquid, 3 times the width of the tile over the crack using a paint roller or paint brush and immediately apply the 6" (150mm) wide Waterproofing/Anti-Fracture Fabric into the wet liquid over the crack. Press firmly with brush or roller to allow complete "bleed through" of liquid. Immediately apply another liberal coat^{^^} of HYDRO BAN liquid over the fabric and allow to dry. When the first treatment has dried,

ceramic tile, stone or brickwork are also required at perimeters, at restraining surfaces, at penetrations and at the intervals described in the Tile Council of North America, Inc. (TCNA) Handbook Installation Method EJ171. Use LATASIL and backer rod.

Spray Application of HYDRO BAN®

Follow all installation and surface preparation requirements outlined in this document and DS 663.5 and TDS 410.

The sprayer being used for the application of HYDRO BAN® should be capable of producing a maximum of 3300 psi (22.8 MPa) with a flow rate of 0.95 to 1.6 GPM (3.6 to 6.0 LPM) using a 0.521 or a 0.631 reversible tip. Keep the unit filled with HYDRO BAN to ensure continuous application of liquid. The hose length should not exceed 100' (30 m) in length and 3/8" (9 mm) in diameter.

Apply a continuous HYDRO BAN film with an overlapping spray¹. The wet film has a sage green appearance and dries to a darker olive green color. When the first coat has dried to a uniform olive green color, approximately 45 to 90 minutes at 70°F (21°C), visually inspect the coating for any voids or pinholes. Fill any defects with additional material and apply the second coat² at right angles to the first. The wet film thickness should be checked periodically using a wet film gauge. Each wet coat should be 0.015 – 0.022 inches (0.4 – 0.6 mm) thick. The combined dried coating should be 0.020 – 0.030 inches (0.5 – 0.8 mm) thick.

Check application thickness with a wet film gauge periodically as the HYDRO BAN is being dispensed to ensure that the appropriate thickness and coverage is achieved. Bounce back and overspray will consume more product. To achieve the required film thickness, the coating must be free from pinholes and air bubbles. Do not back roll the spray applied coating. Allow the HYDRO BAN to cure in accord with the instructions in this document, DS 663.5 and TDS 410 prior to the installation of the tile or stone finish.

It is important to note that areas not scheduled to receive the HYDRO BAN should be taped off and protected from any potential overspray. Expansion and movement joints should be honored and treated as outlined in this document, DS 663.5 and TDS 410.

¹ Wet coat thickness is 15 – 22 mils (0.4 – 0.6 mm) consumption per coat is -0.01/gal/ft² (-0.4 l/m²); coverage per coat is - 100 ft²/gal (-2.5m²/l). Use wet film gauge to check thickness.

Cleaning

While wet, HYDRO BAN can be washed from tools with water.

6. AVAILABILITY AND COST

Availability

LATICRETE® and LATAPOXY® materials are available worldwide.

For Distributor Information, Call:

Toll Free: 1.800.243.4788, ext. 235
Telephone: +1.203.393.0010

For on-line Distributor Information, visit LATICRETE at www.laticrete.com.

Cost

Contact a LATICRETE Distributor in your area.

7. WARRANTY

See 10. FILING SYSTEM.

DS 230.13:	LATICRETE Product Warranty
A component of:	
DS 230.05:	LATICRETE 5 Year System Warranty (United States and Canada)
DS 230.15:	LATICRETE 15 Year System Warranty for Steel or Wood Framed Exterior Facades (United States and Canada)
DS 025.0:	LATICRETE 25 Year System Warranty (United States and Canada)
DS 230.99:	LATICRETE Lifetime System Warranty (United States and Canada)

8. MAINTENANCE

Non-finish LATICRETE and LATAPOXY installation materials require no maintenance but installation performance and durability may depend on properly maintaining products supplied by other manufacturers.

9. TECHNICAL SERVICES

Technical Assistance

Information is available by calling the LATICRETE Technical Service Hotline:

Toll Free: 1.800.243.4788, ext. 235
Telephone: +1.203.393.0010, ext. 235
Fax: +1.203.393.1948

Technical and Safety Literature

To acquire technical and safety literature, please visit our website at www.laticrete.com.

10. FILING SYSTEM

Additional product information is available on our website at www.laticrete.com. The following is a list of related documents:

DS 230.13:	LATICRETE Product Warranty
DS 230.05:	LATICRETE 5 Year System Warranty (United States and Canada)
DS 230.15:	LATICRETE 15 Year System Warranty for Steel or Wood Framed Exterior Facades (United States and Canada)
DS 025.0:	LATICRETE 25 Year System Warranty (United States and Canada)
DS 230.99:	LATICRETE Lifetime System Warranty (United States and Canada)
DS 633.0:	LATAPOXY 300 Adhesive
DS 663.5:	HYDRO BAN Installation Instructions
DS 6200.1:	LATASIL™
TDS 152:	"Bonding Ceramic Tile, Stone or Brick Over Wood Floors"
TDS 410:	Spraying HYDRO BAN



MCB™ A-50



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MCB™ A-50 is a high strength, fast setting, polymer modified, flexible, cement based adhesive which has been specially developed for installing most types of tiles. It can be used for internal and external situations for floor and wall tiling. The non slip/slump characteristics make it ideal for installing large and heavy tiles.

PRODUCT FEATURES

- High bond strength
- Extended open time
- Fast setting time
- Non slip / slump
- Good flexibility
- Self priming
- White
- Excellent rheology
- Water washable
- Low VOC

SUITABLE TILE TYPES

- Terracotta
- Ceramic
- Porcelain
- Natural Stone: including marble, granite, limestone & travertine
- Glass mosaics

AREAS OF USE

- Interior & exterior applications
- Walls & floors
- Concrete
- Sand / cement screeds
- Cement render
- Fibrous cement sheeting
- Compressed fibrous cement sheeting
- Plasterboard
- Tiling over CTA™ certified waterproofing membranes
- Continuous immersion applications

SURFACE PREPARATION

General

Ensure that the surface is dry and clean. Remove any loose material and all contaminants such as grease, oil and dust prior to applying. Make certain that there are no undulations in the surface that may require MCB™ A-50 to be applied at a thickness in excess of 10mm. If necessary, level floors using ECO SYSTEMS™ ECO LEVEL FS.

PERFORM THE SUBSTRATE TEST

No water absorbed	Mechanically prepare the surface / Use Eco Prep n Prime
Moderate water absorbed	Clean with a damp sponge and fresh water
All water absorbed	Broom on liberal amounts of water

This simple indicative test is performed after vacuuming or sweeping a number of test areas and applying a single drop of fresh drinking water from the end of your finger. This should be approximately 10 to 20mm wide when it first hits the floor – if it beads and remains whole then “No water is absorbed”. If it loses all gloss within 20 to 60 seconds then “Moderate water is absorbed”. If the gloss disappears instantly or within 20 seconds then the substrate has “All water absorbed”. Look for different surface appearances in your floor and test each to ensure your test is representative of the whole area. Perform test in both a cool shaded area and an exposed sunny area if tiling externally.

SUBSTRATES / BACKGROUNDS

Concrete Floors

Allow at least 28 days for the concrete to cure. Concrete should be left with an open surface – standard helicopter finishes are generally acceptable if they display the “Moderate water absorption” in the substrate test. Wood float or broom finish is preferred where possible. All traces of curing compounds (or sealers) should be removed prior to tiling as these can act as release agents. The surface should be flat and even unless falls are incorporated where required.

Sand / Cement Screeds and Renders

The screeds and / or renders must conform with the appropriate standard and should be left with a wood float finish and left to cure for at least 7 days per 25mm thickness.

Sheet Walls

Plasterboard and fibrous cement sheeting must be solidly fixed in accordance with the manufacturer's instructions specifically for tiling and should be wiped with a damp sponge prior to tiling particularly where a jointing compound has been used.

Compressed Fibrous Cement Sheeting

Boards must be solidly fixed in accordance with manufacturer's instructions specifically for tiling - and should be wiped with a damp sponge prior to tiling.

CTATM Certified Waterproofing Membranes

Waterproofing membranes must be allowed to cure as per the product's specification.

MIXING

Put room temperature, potable water into a clean mixing container before slowly adding the adhesive powder. A 20kg bag of MCBTM A-50 will require approximately 6 litres of water. Always add powder to the water and mix until a smooth toothpaste consistency is achieved. Allow mixture to stand for 5 minutes to allow the chemicals to slake – then restir and the product is ready for immediate use. **DO NOT ADD MORE WATER.** Restirring may be necessary from time to time within this period.

APPLYING

- Tiles should be fixed in accordance with Australian Standard AS3958.1 – 2007.
- Ensure the back of each tile is clean and free from dust or other contaminants.
- The adhesive should be applied in areas not exceeding one square metre at a time to ensure the adhesive does not skin prior to fixing. Notch on the adhesive with the correct sized trowel in a straight line avoiding swirls.
- While pressing the tiles into the adhesive, slide them at 90 degrees to the direction of the notches for about the distance of the notch; i.e. 10mm for a 10mm notched trowel. This ensures that the whole back of the tile is in contact with the adhesive.
- It is advisable to remove tiles regularly to check that the whole of the back of the tile has maximum coverage as per the Standard. Contact CTATM if you are unsure of the requirements. Large tiles may require “back-buttering” to ensure full adhesive contact with the back of the tile.
- All adhesive residue must be removed from the face of tiles, joints and fittings before the adhesive sets.

OPEN TIME

30 minutes at 23°C and 60% relative humidity.

POT LIFE

3.5 hours at 23°C and 60% relative humidity.

CURING

Tiles can accept foot traffic and can be grouted after 8 hours. This is dependent on the density of the background and tiles and the ambient temperature and humidity.

GROUTING

Tiles should be grouted using the appropriate POLYBLENDTM premium grout. Select colour and range to suit joint width and preferred finish.

CLEANING

Tools and equipment can be washed using clean water before the adhesive has set.

INCORPORATING MOVEMENT JOINTS

Movement Joints must be installed according to Australian Standard AS3958.1 - 2007.

COVERAGE

Notched Trowel Size	Coverage Per 20kg bag
6mm	10m ²
10mm	6m ²

STORAGE

When MCB™ A-50 is stored in its original unopened package in a dry area off the ground at a temperature of 23°C and a relative humidity of 60%, it should be usable for approximately 12 months.

HANDLING

CTA™ supports best practice in material handling: Gloves, mask and protective clothing should be worn. If the product comes into contact with the skin, wash off with warm soapy water. Avoid inhaling the dust by wearing a dust mask and provide adequate ventilation. If swallowed drink plenty of water and seek medical advice. In case of contact with the eyes, rinse with an eye wash or wash away with plenty of clean water. For further information refer to product MATERIAL SAFETY DATA SHEET.

PACK SIZE

Available in 20kg paper bags & 5kg plastic bags.

LIMITATIONS

- MCB™ A-50 cannot be used directly over tongue and grooved timber flooring, particleboard, medium density fibreboard or masonite.
- MCB™ A-50 is not suitable for use with moisture sensitive tiles or stone.
- MCB™ A-50 must not be used directly over solvent based polyurethane waterproofing membranes.
- MCB™ A-50 can only be used over high quality water based waterproofing membranes that have been certified by CTA™.
- Special fixing techniques are required when tiling externally at heights that exceed 2.7 metres.
- The performance of MCB™ A-50 will be compromised when tiling in temperatures below 5°C and above 35°C.
- Suspended concrete slabs intended for tiling must comply with the relevant standard. The use of a flexible adhesive is recommended for applications over post tensioned concrete slabs.
- Contact CTA™ for advice if further information is required.

WARRANTY

Construction Technologies Australia warrants its products for a period of twelve (12) years from the date of sale. Visit www.ctaust.com.au to view the full terms and conditions of this warranty.

Manufactured by:



NEW SOUTH WALES
2 Prime Drive (Corner Powers Road)
Seven Hills NSW 2147
T 02 9674 1004 F 02 9674 2002

QUEENSLAND
70 Platinum Street
Crestmead QLD 4132
T 07 3489 3000 F 07 3489 3099

WESTERN AUSTRALIA
Unit 2 / 51 Wittenberg Drive
Canning Vale WA 6155
T 08 9256 1074 F 08 9256 1076

SOUTH AUSTRALIA
PO Box 872
Brighton SA 5048
T 08 8387 2356 F 08 8387 9268

VICTORIA
Unit 28/283 Rex Road
Campbellfield VIC 3061
T 1300 656 202 F 1300 964 202

NEW ZEALAND
Unit D, 150 Harris Road
East Tamaki, Auckland
T +64 9 274 9112 F +64 9 274 6661



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Product Name **MCB A50**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name **MCB PRODUCTS**
Address P.O Box 1135, Browns Plains, Queensland, AUSTRALIA, 4118
Telephone (07) 3489 3000
Fax (07) 3489 3099
Emergency (07) 3489 3000
Email info@mcbproducts.com.au

Synonym(s) A50 • MCB A-50

Use(s) CERAMIC ADHESIVE • TILE ADHESIVE
MSDS Date 11 Feb 2009

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO ASCC CRITERIA

RISK PHRASES

R36/37/38 Irritating to eyes, respiratory system and skin.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

SAFETY PHRASES

S24/25 Avoid contact with skin and eyes.
S28 After contact with skin, wash immediately with plenty of water.
S3 Keep in a cool place.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No. None Allocated DG Class None Allocated Subsidiary Risk(s) None Allocated
Packing Group None Allocated Hazchem Code None Allocated EPG None Allocated

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content
SILICA, CRYSTALLINE - QUARTZ	Si-O2	14808-60-7	30-60%
PORTLAND CEMENT	Not available	65997-15-1	30-40%
ETHYLENE VINYL ACETATE COPOLYMER	C6H10O2	24937-78-8	10-20%
NON HAZARDOUS INGREDIENTS	Not Available	Not Available	remainder

Product Name **MCB A50**

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

Inhalation Due to product form / nature of use, an inhalation hazard is not anticipated.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre or a doctor.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.

Advice to Doctor Treat symptomatically

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases if strongly heated.

Fire and Explosion No fire or explosion hazard exists.

Extinguishing Prevent contamination of drains or waterways.

Hazchem Code None Allocated

6. ACCIDENTAL RELEASE MEASURES

Spillage Use personal protective equipment. Contain spillage, then cover / absorb spill with non-combustible absorbant material (vermiculite, sand, or similar), collect and place in suitable containers for disposal. CAUTION: Spill site may be slippery.

7. STORAGE AND HANDLING

Storage Store in cool, dry, well ventilated area, removed from moisture, oxidising agents (eg. hydrogen fluoride, phosphorus oxide), acids, ethanol, interhalogens (eg. chlorine trifluoride) and foodstuffs. Ensure packages are adequately labelled, protected from physical damage and sealed when not in use.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds	Ingredient	Reference	TWA		STEL	
			ppm	mg/m3	ppm	mg/m3
	Vinyl acetate monomer	ASCC (AUS)	10	--	--	--
	PORTLAND CEMENT	ASCC (AUS)	--	10	--	--
	Silica, Crystalline Quartz	ASCC (AUS)	--	0.1	--	--

Biological Limits No biological limit allocated.

Engineering Controls Avoid inhalation. Use in well ventilated areas. Maintain dust levels below the recommended exposure standard.

PPE Wear PVC or rubber gloves and safety glasses. Where a dust inhalation risk exists (eg. if allowed to dry out), wear a Class P1 (Particulate) respirator. When using large quantities or where heavy contamination is likely, wear: rubber boots and coveralls.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance FINE GREY TO BLACK POWDER **Solubility (Water)** INSOLUBLE

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Product Name MCB A50

Odour	SLIGHT ODOUR OF ACRYLIC AND CEMENT	Specific Gravity	NOT AVAILABLE
pH	ALKALINE	% Volatiles	NOT AVAILABLE
Vapour Pressure	NOT AVAILABLE	Flammability	NON FLAMMABLE
Vapour Density	NOT AVAILABLE	Flash Point	NOT RELEVANT
Boiling Point	NOT AVAILABLE	Upper Explosion Limit	NOT RELEVANT
Melting Point	NOT AVAILABLE	Lower Explosion Limit	NOT RELEVANT
Evaporation Rate	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended conditions of storage.
Conditions to Avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to Avoid	Incompatible with oxidising agents (eg. hypochlorites), ethanol, interhalogens (eg. chlorine trifluoride) and acids.
Hazardous Decomposition Products	May evolve toxic gases if heated to decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Slightly corrosive. Avoid eye or skin contact or dust inhalation. This product has the potential to cause acute and chronic health effects with over exposure. In the wet state, this product does not present an inhalation hazard. Silica quartz can cause silicosis (lung disease) with chronic over exposure. Both crystalline silica and hexavalent chromium compounds are classified as carcinogenic to humans (IARC Group 1).
Eye	Corrosive - irritant. Contact may result in pain, redness, corneal burns and ulceration with possible permanent damage.
Inhalation	Slightly corrosive - irritant. Over exposure may result in irritation of the nose and throat, coughing and bronchitis. Hexavalent chromium is reported to cause respiratory sensitisation, however due to the trace amount present, a hazard is not anticipated under normal conditions of use.
Skin	Slightly corrosive. Contact with powder or wetted form may result in rash and dermatitis. Potential sensitising agent.
Ingestion	Slightly corrosive. Ingestion may result in burns to the mouth and throat, nausea, vomiting and abdominal pain. Ingestion is considered unlikely due to product form.
Toxicity Data	SILICA, CRYSTALLINE - QUARTZ (14808-60-7) LCLo (Inhalation): 300 ug/m ³ /10 years (human) LDLo (Intratracheal): 200 mg/kg (rat) LDLo (Intravenous): 20 mg/kg (dog) TCLo (Inhalation): 16 000 000 particles/ft ³ /8 hours/17.9 years (human-fibrosis)

12. ECOLOGICAL INFORMATION

Environment	Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.
Ecotoxicity	Not classified as dangerous to the aquatic environment.
Persistence / Degradability	Limited information was available at the time of this review.
Mobility	Limited information was available at the time of this review.

13. DISPOSAL CONSIDERATIONS

Waste Disposal	No special precautions are required for the disposal of this product.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

NOT CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	None Allocated				
UN No.	None Allocated	DG Class	None Allocated	Subsidiary Risk(s)	None Allocated
Packing Group	None Allocated	Hazchem Code	None Allocated	EPG	None Allocated

Product Name **MCB A50**

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information **RESPIRATORS:** In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

CEMENT CONTACT DERMATITIS Individuals using wet cement, mortar, grout or concrete could be at risk of developing cement dermatitis. Symptoms of exposure include itchy, tender, swollen, hot, cracked or blistering skin with the potential for sensitisation. The dermatitis is due to the presence of soluble (hexavalent) chromium.

ABBREVIATIONS:

ADB - Air-Dry Basis.

BEI - Biological Exposure Indice(s)

CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.

CNS - Central Nervous System.

EINECS - European INventory of Existing Commercial chemical Substances.

IARC - International Agency for Research on Cancer.

M - moles per litre, a unit of concentration.

mg/m³ - Milligrams per cubic metre.

NOS - Not Otherwise Specified.

NTP - National Toxicology Program.

OSHA - Occupational Safety and Health Administration.

pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm - Parts Per Million.

RTECS - Registry of Toxic Effects of Chemical Substances.

TWA/ES - Time Weighted Average or Exposure Standard.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Material Safety Data Sheet ('MSDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this MSDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS.

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Web: www.rmt.com.au

MSDS Date: 11 Feb 2009

End of Report

Page 4 of 4

RMT

Reviewed: 11 Feb 2009

Printed: 11 Feb 2009

VOC Content Test Certificate

Thursday February 12th, 2009

Manufacturer: MCB Products Pty Ltd (70 Platinum Street, Crestmead Queensland 4132)

Sample Description: A50 micro cement based mastic ceramic tile adhesive

Date Tested: February 2009

Test Method: SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

Test Data:

<p align="center">Specification</p> <p>Green Building Council of Australia Green Star Office Design V2 IEQ-13 Green Star Office Interiors V1.1 IEQ-11</p>	<p>A50</p>
Ceramic Tile Adhesive 65 grams per Litre	8 grams per Litre as VOC content per coating
<p align="center">Specification</p> <p>Green Building Council of Australia Green Star Office Design V3 IEQ-13</p>	<p>A50</p>
Ceramic Tile Adhesive 65 grams per Litre	8 grams per Litre as VOC content per coating



Dr. Vyt Garnys
PhD, BSc(Hons) AIMM, ARACI, ISIAQ
ACA, AIRAH, FMA
Managing Director and Principal Consultant

F0902-04

VOC Content Test Certificate

Friday April 18th, 2008

Manufacturer: MCB Products Pty Ltd

70 Platinum Street

Crestmead Queensland 4132

Sample Description: A66 ceramic tile adhesive

Date Tested: April 2008

Test Method: SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

Test Data:

Specification	
Green Building Council of Australia	A66
Green Star Office Design V2 IEQ-13	
Green Star Office Design V3 IEQ-13	
Green Star Office Interiors V1.1 IEQ-11	
Ceramic Tile Adhesive 65 grams per Litre	17 grams per Litre



Dr. Vyt Garnys
PhD, BSc(Hons) AIMM, ARACI, ISIAQ
ACA, AIRAH, FMA
Managing Director and Principal Consultant

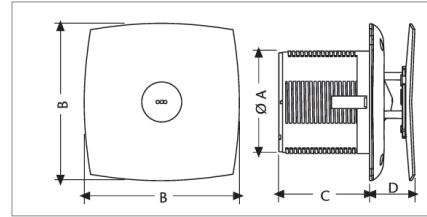
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TECHNICAL DATA

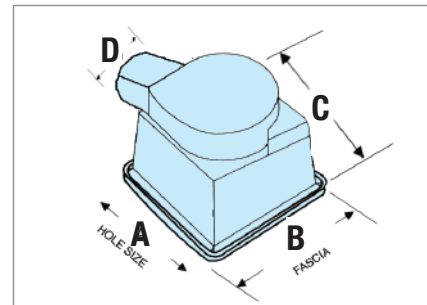
DIMENSION INFORMATION (MM)

Models	A	B	C	D
SD150	148	194	120	38 (max)
WhisperVent	240	290	172	98
WhisperVent	240	290	172	98

▶ Dimensions - Designer Simx



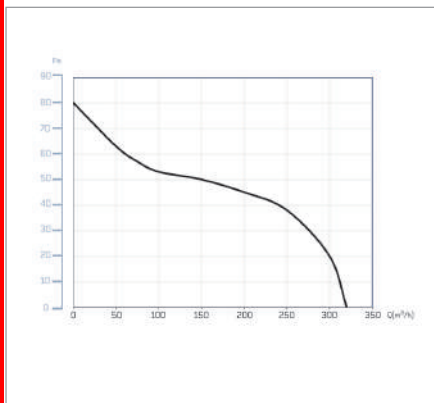
▶ Dimensions - WhisperVent



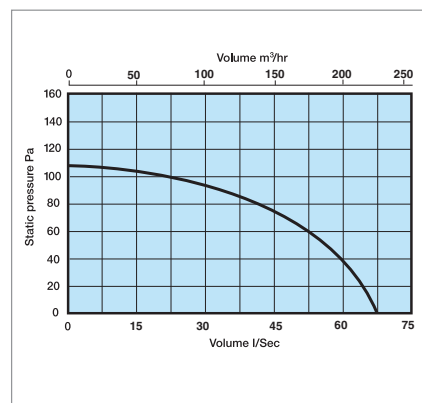
TECHNICAL SPECIFICATION

Models	SD150	WhisperVent
Power	220 - 240V	220 - 240V
Fan Performance	89 l/s, 320m³/hr	63 l/s, 225m³/hr
Fan Wattage	25W	30W
Maximum Pressure	80 Pa	105 Pa
Fan Speed	2100 rpm	2500 rpm
Sound Level	42 dB(A)	38 dB(A)
Max. Operating Temp	40°C	40°C
IP Rating	IPX4	IPX4

▶ Performance - Designer Simx



▶ Performance - DESIGNER





INSTALLATION INSTRUCTIONS & OWNERS GUIDE

RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS

Congratulations for choosing a Rheem Water Heater

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

If you require any further information or your water heater needs to be serviced, please contact the Rheem Service Department on 0800 657 335, or the nearest service centre (look in the Yellow Pages under Plumbers)

Important to the Installer

Do not leave this booklet inside the element cover after installation

Please leave the booklet with the water heater's owner

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IMPORTANT INFORMATION

GENERAL

The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.

This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

ABOUT YOUR WATER HEATER

DOES THE WATER QUALITY AFFECT THE WATER HEATER?

Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please read page 7.**

HOW HOT SHOULD THE WATER BE?

The Optima features a user adjustable thermostat (temperature range of 60 – 75°C), which allows you to choose the most suitable temperature for your hot water needs.

The Rheemglas models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments.

For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a temperature setting of not less than 60°C.

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

Refer to the installation requirements on page 4.

HOW LONG WILL THE WATER HEATER LAST?

There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 8).

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

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

Rheemglas	8 years
Optima	10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 7).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

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

NON-SIMULTANEOUS ELEMENT MODELS

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

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

SAFETY

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

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

WARNING: The operation of the thermal cut-out indicates a possible dangerous situation. Do not reset the thermal cut-out until the water heater has been serviced by an authorised service person.

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

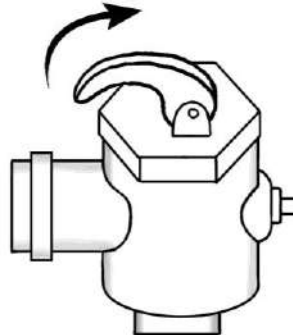
REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF VALVE:

Valve manufacturers recommend that you operate the easing lever (see diagram. 1) on the Temperature and Pressure Relief valve once every six months. **It is very important that you raise and lower the lever gently.**

WARNING: To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater bursting.

DIAGRAM 1
Lift until water flows from the drain line – lower gently



Drain line

Water Heater

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

GOING ON HOLIDAYS:

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

SAVE A SERVICE CALL

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

WATER DISCHARGING FROM EXPANSION CONTROL VALVES

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

Continuous dribble

Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.

Heavy flow of hot water until the water is cold – then stops while the water reheats

Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre to arrange an inspection.

A steady flow of water (often at night)

This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

Is the electricity turned on?

Check the switch marked 'water heater' at the switchboard and the water heater isolating switch. Check the fuse marked 'water heater'.

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

Do you have the correct size heater for your requirements?

Refer to the sizing guide in the Rheem sales literature or the Rheem website.

Is one outlet (especially the shower) using more hot water than you think?

Carefully review the family's hot water usage and if necessary, check the shower flow rate. For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute. This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.

Ensure the thermostat setting is appropriate.

HIGH ELECTRICITY BILLS

Is one outlet (especially the shower) using more hot water than you think?

Is there a leaking hot water pipe, dripping hot water tap, etc?

Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

Is either of the expansion valves discharging too much water?

Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.

INSTALLATION

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

The water heater must be installed by an authorised service person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements.

WATER HEATER LOCATION

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

CONNECTION SIZES

- Hot water connection: RP ¾/20.
- Cold water connection: RP ¾/20.
- Relief valve connection: RP ½/15.

INLET/OUTLET CONNECTIONS

A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.

NON RETURN VALVE

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

PIPE SIZES

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

COLD WATER EXPANSION VALVE

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

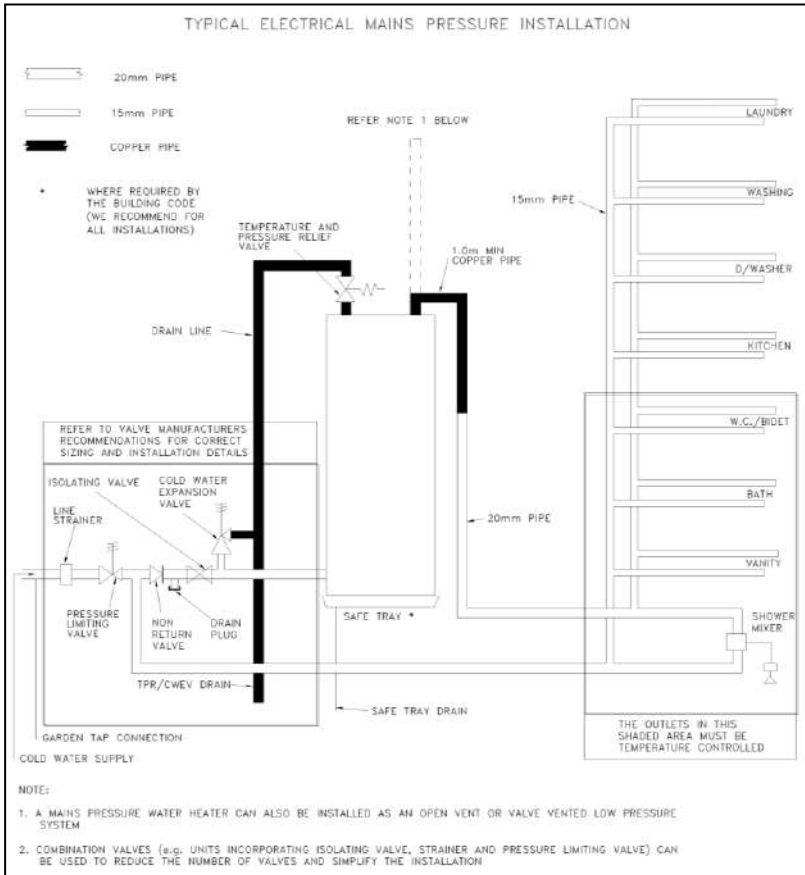
TEMPERATURE AND PRESSURE RELIEF VALVE

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

In locations where the pipe exceeds 3 metres unbroken length, or freezing could occur, an air break must be provided within 300 mm of the TPR valve.

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

DIAGRAM 2:



PRESSURE LIMITING/REDUCING VALVE

If the water supply pressure exceeds the rated pressure, a pressure limiting or reducing valve is to be fitted in the installation.

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

CONNECTIONS - ELECTRICAL

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

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

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory Megger reading is obtained.

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

Switch on the electrical supply at the isolating switch to the water heater.

TO TURN OFF THE WATER HEATER

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

Switch off the electrical supply at the isolating switch to the water heater.

Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

Switch off the electrical supply at the isolation switch to the water heater.

Close the cold water isolation valve.

Operate the relief valve easing lever to release the pressure in the water heater.

Drain the water heater through the drain valve or plug.

Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain.

WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. If you are unsure of your water quality, you can obtain information from your local water supply authority.

HARSH WATER AREAS

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

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

CAUTION

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

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

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

SATURATION INDEX

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

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

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

WARRANTY

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

Component	Installation	Model	Warranty Period (since installation)	Warranty
All Components Except Inner Cylinder	All Installations	All Models	First 12 Months	New component or water heater (at Rheem's sole discretion) free of charge, including labour
		Optima	First 3 years	New component or water heater (at Rheem's sole discretion) free of charge, including labour
Inner Cylinder	Water heater installed in a single-family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 3 years	New water heater free of charge, including labour
			Years 4 & 5	New water heater free of charge, with installation and labour costs the responsibility of the owner
		Optima	First 5 years	New water heater free of charge, including labour
			Years 6 – 10	New water heater free of charge, with installation and labour costs the responsibility of the owner
	Water heater installed in any other than a single family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 12 months	New water heater free of charge, including labour
			Years 2 & 3	New water heater free of charge, with installation and labour costs the responsibility of the owner
Optima	First 12 months	New water heater free of charge, including labour		
	Years 2 – 5	New water heater free of charge, with installation and labour costs the responsibility of the owner		

DURABILITY

- Your Rheem water heater meets the durability requirements of New Zealand Building Code provided the water heater is:
- installed in accordance with the New Zealand Building Code and the Rheem Installation Instructions.
- Maintained in accordance with these instructions.
- Not damaged in any way.
- Stored correctly prior to use, and
- Your water quality remains within the requirements stated in the Installation Instructions.

WARRANTY CONDITIONS

- The water heater must be installed and maintained in accordance with the Rheem Installation Guides supplied with the water heater, and comply fully with all the requirements of the New Zealand Building Code.
- The warranty applies to the faulty manufacture of the water heater only and does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the water heater, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.

WARRANTY INFORMATION

WARRANTY EXCLUSIONS:

- The Rheem Warranty does not cover repair or replacement work to the water heater or its components caused directly or indirectly by:
- Accidental damage
 - Acts of God
 - Failure due to misuse
 - Incorrect installation
 - Attempts to repair the water heater, other than by a Rheem Authorised Service Centre, or the Rheem Service Department
 - Excessive water pressure, negative pressure or excessive heat input
 - Non-compliance with a) the Rheem Installation Instructions, b) relevant statutory regulations, c) New Zealand Building Code requirements.
- This warranty does not include any additional costs, for removing a heater where dismantling or removal of other materials is required, that is, walls, doors or roofs. Rheem New Zealand Limited will not pay claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to leakage or other causes from a water heater.
- Repairs to the water heater due to chemical/scale formation in waterways when the heater has been connected to a harmful water supply as outlined on page 7 of the owners manual.
- Service under this warranty can be provided by a **RHEEM AUTHORISED SERVICE CENTRE**.
- Such services will be provided during their normal business hours.
- Additional mileage and cartage charges shall be made for any water heater installed in a location exceeding 25km from the nearest Rheem Service Centre.

Note: You may have other rights in addition to this warranty under the "Consumer Guarantees Act 1993".

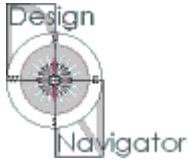
RHEEM SERVICE DEPARTMENT, 475 Rosebank Road Avondale, Auckland Phone: 0800 657 335, Fax: 09 829 0222

Or consult the Yellow Pages under "Plumbers" for your nearest Rheem Authorised Service Centre

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**Peter Ray
Homes**

MADE FOR YOU. BY US.



Design Navigator H1 Compliance Report

Project Summary

H1 Report created by:	Peter Ray Homes
Project Name:	Potter RESIDENCE
Client:	Craig & Camilla
Lot No:	297
Comment:	1 Hurley Drive Faringdon Rolleston
Project Id:	110169
Report Date:	20/03/2018

Compliance Result

This report shows compliance of the design with Clause H1 Fourth edition Amendment 3 from January 2017 and the R-value targets of Clause E3 Second edition Amendment 6 from January 2017.

This building complies with H1 via the following methods:

- the Schedule Method in NZS4218:2009
- the Calculation Method in NZS4218:2009

H1 Compliance Details

NZS4218:2009 Schedule Method Compliance

The use of the Schedule Method is permitted .

In order to comply the R-values for all the construction elements must be the same or larger than the permitted minimum R-values. This design **complies** with the NZS4218:2009 Schedule Method.

Non-Solid Construction			
	Permitted Minimum	Proposed Minimum	
Floor:	1.3	1.45	✓
Non-solid Walls:	2	2.21	✓
Glazing in Non-solid Walls:	0.26	0.26	✓
Roof:	3.3	3.85	✓
Skylights:	0.31		✓

Notes:

If multiple solid wall types levels are used the table shows the requirements for the corresponding walls and windows in them. For solid timber and for other solid constructions two options are shown for each. But the components of these options can not be mixed, i.e. it is not permitted to use the solid timber wall R-value from option 1 and the solid timber window R-value from option 2.

NZS4218:2009 Calculation Method Compliance

The use of the Calculation Method is permitted .

In order to comply the Actual Heat Loss must be the same or smaller than the Reference Heat Loss AND all component R-

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values must be the same or larger than 50% of the R-values in the '50% Rule' table below. This design **complies** with the NZS4218:2009 Calculation Method.

HeatLoss:

Reference building	Proposed building
705	588

Minimum R-values ("50% rule"):

	Permitted Minimum	Proposed Minimum	
Floor:	0.65	1.45	✓
Non-solid Walls:	1	2.21	✓
Roof:	1.65	3.85	✓

The Reference building has the following areas and R-values.

		Non-solid	Solid Timber	Other Solid
		100.0	0.0%	0.0%
Floor:	Area: 281.8 m ² R-values:	1.3	1.3	1.5
Walls excl. glazing:	Area: 179.1 m ² R-values:	2	1.4	1.2
Glazing (up to 30%):	Area: 76.8 m ² R-values:	0.26	0.26	0.26
Glazing (surplus of 30%):	Area: 0 m ² R-values:	0.4	0.34	0.34
Roof:	Area: 342.8 m ² R-values:	3.3	3.5	3.5
Heat Loss:		705	738	730

For mixed constructions the heat loss of the reference building is calculated as the sum of the heat losses for each type of wall construction multiplied by the fraction of the wall area of each type. This approach is based on clause 4.2.6 of NZS4218:2009. There are no skylights in the reference building. The reference building roof area is the sum of the proposed building roof and skylight areas.

Compliance with Clause E3

This building complies with the R-value targets in NZBC Clause E3 .

Component	Minimum R-value	Project R-value
Framed wall constructions with cavities	1.5	2.21
Single skin masonry wall without a cavity	0.6	
Solid timber wall no less than 60 mm thick	0.6	
Roof or ceilings	1.5	3.85

Design Details

Building Dimensions

Floor Area	<input type="text" value="281.8"/> m ²
Gross Wall Area	<input type="text" value="255.9"/> m ²
Net Wall Area	<input type="text" value="197.5"/> m ²
Wall (North) Area	<input type="text" value="54"/> m ²
Wall (East, South and West) Area	<input type="text" value="143.5"/> m ²
Gross Roof Area	<input type="text" value="342.8"/> m ²
Net Roof Area	<input type="text" value="342.8"/> m ²
Glazing Area	<input type="text" value="58.4"/> m ²
Window (North) Area	<input type="text" value="18.1"/> m ²
Window (East, South and West) Area	<input type="text" value="40.3"/> m ²
Skylight Area	<input type="text" value="0"/> m ²

Glazing Areas

Total Vertical Glazing Percentage	<input type="text" value="22.8"/> %
East, South and West Window Percentage	<input type="text" value="21.9"/> %
Total over 30%	<input type="text" value="no"/>
East, South and West over 30%	<input type="text" value="no"/>
Total over 50%	<input type="text" value="no"/>
max. Skylight Area for Schedule Method	<input type="text" value="5.14"/> m ²
Skylights over Schedule Method Limit	<input type="text" value="no"/>
Decorative Glazing	<input type="text" value="0"/> m ²
Decorative Glazing over 3m ²	<input type="text" value="no"/>

Information required for BPI calculation

Living Floor Area	<input type="text" value="0"/> m ² Note: This includes also internal floors.
Average Room Height	<input type="text" value="0"/> m

Thermal Mass Level

Suspended timber floor with timber framed walls or a heavily carpeted slab floor with timber framed walls.

Climate

Location	<input type="text" value="Selwyn District"/>
Climate Zone	<input type="text" value="3"/>

Heat Loss Details

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
<i>Floors</i>										
	Floor 1	Floor			281.8	281.8	1.45	194.3		
<i>Walls</i>										
	Wall 1	North	N	30.1	2.4	72.1	54.0	2.46	22.0	C
	Window 1-1	W1		0.8	1.5		1.2	0.26	4.6	0.00
	Window 1-2	W2		0.8	1.5		1.2	0.26	4.6	0.00
	Window 1-3	W3		1.4	1.0		1.4	0.26	5.4	0.00
	Window 1-4	W4		0.6	1.0		0.6	0.26	2.3	0.00
	Window 1-5	W5		1.4	1.0		1.4	0.26	5.4	0.00
	Window 1-6	W6		0.6	1.0		0.6	0.26	2.3	0.00
	Window 1-7	W7		1.3	1.6		2.1	0.26	8.0	0.00
	Window 1-8	D1		2.1	2.6		5.7	0.26	21.9	0.00
	Window 1-9	W8		2.2	0.9		2.0	0.26	7.5	0.00
	Window 1-10	W9		2.2	0.9		2.0	0.26	7.5	0.00
	Wall 2	East	E	38.5	2.4	92.4	74.0	2.46	30.1	C
	Window 2-1	W1		1.8	1.5		2.7	0.26	10.4	0.00
	Window 2-2	D1		2.2	2.4		5.2	0.26	20.0	0.00
	Window 2-3	W2		2.2	0.7		1.5	0.26	5.8	0.00
	Window 2-4	D2		2.2	2.1		4.5	0.26	17.3	0.00
	Window 2-5	D3		2.2	2.1		4.5	0.26	17.3	0.00
	Wall 3	South	S	12.8	2.4	30.7	24.0	2.46	9.7	C
	Window 3-1	W1		0.6	1.3		0.7	0.26	2.8	0.00
	Window 3-2	W2		0.6	1.3		0.7	0.26	2.8	0.00
	Window 3-3	D1		2.2	1.6		3.4	0.26	13.0	0.00
	Window 3-4	W3		1.3	0.8		1.0	0.26	4.0	0.00
	Window 3-5	W4		0.7	1.3		0.9	0.26	3.5	0.00
	Wall 4	South Linea	S	2.5	2.4	6.0	2.9	2.21	1.3	C
	Window 4-1	W1		2.2	1.4		3.0	0.26	11.7	0.00
	Wall 5	West	W	22.8	2.4	54.6	42.6	2.46	17.3	C
	Window 5-1	W1		0.6	1.4		0.8	0.26	3.2	0.00
	Window 5-2	W2		1.0	1.1		1.1	0.26	4.2	0.00
	Window 5-3	W3		1.0	0.8		0.8	0.26	3.1	0.00
	Window 5-4	D1		2.2	2.1		4.5	0.26	17.3	0.00
	Window 5-5	W4		1.3	1.2		1.6	0.26	6.0	0.00
	Window 5-6	W5		2.2	1.5		3.3	0.26	12.5	0.00
<i>Roofs</i>										
	Roof 1	Roof			342.8	342.8	3.85	89.0		

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ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
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Total Heat Loss

588.2

* Any concrete slab-on-ground floor regardless of its dimensions can be assumed to have an R-value of at least R-1.3 (H1/AS1 2.1.5).

** The Shading Coefficient is only required for BPI calculations.

*** C: Cavity Construction (any construction that is not solid), T: Solid Timber, S: Other Solid Construction (Note that the use of solid timber and other solid construction types is discretionary, i.e. solid timber walls and other solid walls can be treated as if they are non-solid (NZS4218:2009 section 4.1.3.))

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Floor Construction Details

Name:	Floor	1.45 m ² °C/W
Type: Floor: Slab Floor		
internal surface 0.09		
Flooring :		
none (Example: polished surface of a concrete floor) ▼		
R-value: 0.00		
Slab Insulation		
Slab floor area [m ²):	281.77	
Perimeter length [m]:	106.630	
External wall thickness [mm]:	90 i	
Soil conductivity [W/m °C]	1.2 i	
Underslab insulation:	none ▼	Insulation : i
Piles Footings: Number:		Penetration Diameter: i
Slab edge insulation:	none ▼	Insulation : i

Wall Construction Details

Name:	Integra Cladding	2.46 m ² °C/W
Type: Wall: Timber Frame with vented Cavity		
external surface 0.03		
Cladding : Rockcote Integra Cavity Plus Render ▼		
R-value: 0.42		
Air Barrier : Building paper ▼		
R-value: 0.01		
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm ▼		
Wall Frame Area: 14.4%		Cavity Area: 85.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	
Framing : R-value: 0.75	Insulation : 2.6	
	still Airgap: none ▼ R-value: 0.00	
Wall Lining : Gypsum plasterboard 10mm ▼		
R-value: 0.04		
internal surface 0.09		

Name: Linea Cladding 2.21
m²C/W

Type: Wall: Timber Frame with vented Cavity

external surface 0.03	
Cladding : Linea weatherboard ▼ <i>R-value: 0.04</i>	
Air Barrier : Building paper ▼ <i>R-value: 0.01</i>	
Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm ▼ <i>Wall Frame Area: 14.4% Cavity Area: 85.6%</i>	
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : <i>R-value: 0.75</i>	Insulation : 2.6
	still Airgap: none ▼ <i>R-value: 0.00</i>
Wall Lining : Gypsum plasterboard 10mm ▼ <i>R-value: 0.04</i>	
internal surface 0.09	

Roof Construction Details

Name: Longrun Roof 3.85
m²C/W

Type: Roof: Timber framed Roof, direct fixed or battened flat Ceiling

external surface 0.03	
Roofing : Corrugate iron with building paper ▼ <i>R-value: 0.01</i>	
Insulation : 3.6	
Timber Frame & Cavity : 90mm rafters or joists @ 900mm, battens covered with insulation ▼ <i>Roof Frame Area: 5.0% Cavity Area: 95.0%</i>	
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : <i>R-value: 0.75</i>	Insulation :
Roof Lining : Gypsum plasterboard 13mm ▼ <i>R-value: 0.06</i>	
internal surface 0.09	
Non-IC-rated recessed downlights	
Ceiling Area [m ²]: 342.76	Number of downlights: 55
	Clearance from lamp holder side [m]: <input type="text"/> <input type="text"/>

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	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m ²)	APPROX. COVERAGE PER BALE* (m ²)
ROOF - Thermal							
Pink® Batts® Classic R1.8 Ceiling	✓		7110118	1220 x 432	95	13.7	14.4
Pink® Batts® Classic R2.2 Ceiling	✓		7110122	1220 x 432	115	12.6	13.3
Pink® Batts® Classic R2.6 Ceiling	✓		7110126	1220 x 432	140	10.5	11.1
Pink® Batts® Classic R3.2 Ceiling	✓		7110132	1220 x 432	170	8.4	8.8
Pink® Batts® Classic R3.6 Ceiling	✓	✓	7110136	1220 x 432	180	7.4	7.7
Pink® Batts® Ultra® R4.0 Ceiling	✓	✓	7110140	1220 x 432	195	6.3	6.6
Pink® Batts® Ultra® R4.6 Ceiling	✓	✓	7110146	1220 x 432	205	5.3	5.5
Pink® Batts® Ultra® R5.0 Ceiling	✓	✓	7110150	1220 x 432	210	4.2	4.4
Pink® Batts® Skillion Roof R3.2	NEW ✓		7110232	1220 x 432	115	3.7	3.9
Pink® Batts® Skillion Roof R3.6	NEW ✓		7110236	1220 x 432	165	6.3	6.6
WALL - Thermal							
Pink® Batts® Classic R1.8 Wall	✓		7120118	1140 x 580	90	17.2	19.6
Pink® Batts® Classic R2.2 Wall	✓		7120122	1140 x 580	90	13.9	15.8
Pink® Batts® Classic R2.4 Wall	✓		7120124	1140 x 580	90	10.6	12.1
Pink® Batts® Ultra® R2.6 Wall	✓	✓	7120126	1140 x 580	90	9.92	11.3
Pink® Batts® Ultra® R2.8 Wall	✓	✓	7120128	1140 x 580	90	6.61	7.5
Pink® Batts® R1.0 Masonry Wall	✓		7160110	1220 x 580	40	21.2	-
Pink® Batts® R1.2 Masonry Wall			7160134	1220 x 580	50	16.98	-
Pink® Batts® R3.2 140mm Wall	NEW ✓		7120132	1140 x 580	140	9.9	11.3
Pink® Batts® R3.6 140mm Wall	NEW ✓		7120136	1140 x 580	140	7.3	8.3
Pink® Batts® R4.0 140mm Wall	NEW ✓		7120140	1140 x 580	140	5.3	6.0
Pink® Batts® Steel R2.2 Wall	NEW ✓		7160214	1220 x 610	90	15.63	15.6
Pink® Batts® Steel R2.6 Wall	NEW ✓		7160215	1220 x 610	90	9.67	9.7
WALL - Acoustic							
Pink® Batts® Silencer® 100mm			7310001	1140 x 580	100	13.2	14.9
Pink® Batts® Silencer® 75mm			7310003	1140 x 580	75	17.2	19.5
FLOOR - Thermal							
Pink® Batts® Classic R1.6 SnugFloor® Narrow	✓		7134816	1220 x 480	70	9.4	8.8
Pink® Batts® Classic R1.6 SnugFloor® Wide	✓		7135816	1220 x 580	70	11.3	11.3
Pink® Batts® Ultra® R2.6 SnugFloor® Narrow	✓		7131451	1220 x 480	110	8.8	8.2
Pink® Batts® Ultra® R2.6 SnugFloor® Wide	✓		7131601	1220 x 580	110	10.6	10.6
FLOOR - Acoustic							
Pink® Batts® Silencer® Midfloor			7310051	1140 x 432	150	4.93	5.2
ACCESSORIES							
Pink® Batts® R1.3 Hot Water Cylinder Wrap 4.5m			7140000	4500 x 1200	60	5.4	-
Pink® Batts® R1.3 Hot Water Cylinder Wrap 3.0m			7140002	3000 x 1200	60	3.6	-

* Coverage relates to standard structures and actual coverage may vary.



* Please refer to www.pinkbatts.co.nz for specific product appraisals and accreditation details.

This document supersedes all previous versions and may have been superseded; is a guide only and the purchaser should ascertain the suitability of this product for the end-use situation intended and when used in conjunction with other products; and is provided without prejudice to Tasman Insulation New Zealand Ltd (Tasman) standard terms of sale. Tasman retains the right to change specification without prior notice. Refer to www.pinkbatts.co.nz or consult Tasman for further information. Do not use this product for any application not detailed in this document or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. June 2012 RevF 3015

Roof

PINK® BATTSS® CEILING INSULATION

PRODUCT DATA SHEET

Application

Pink® Batts® ceiling insulation is a lightweight flexible glasswool insulation product designed to:

- Reduce heat loss through the roof in new homes, be retrofitted into existing homes with no insulation or over existing insulation for better thermal performance
- Fit easily into standard roof constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- BRANZ appraised, a durable product for 50 years as required by the NZBC
- Energy saving – a well insulated home can save up to \$1,800¹ on energy bills annually
- Non-combustible, will not burn for a safer environment
- R-values up to R5.0, to assist in keeping homes above 18°C, as per the World Health Organisation recommendation for a healthy and comfortable home
- Absorbs sound for a quieter more relaxing home

¹ Department of Building and Housing, Your guide to a smarter home, 2008, p. 28

Environment

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Green Star New Zealands Credits

Green Star New Zealand is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute to points under Green Star New Zealand.

Environmental Choice

Higher R-value Pink® Batts® insulation products have Environmental Choice New Zealand Accreditation (refer to the product specifications).

- Independently assessed for:
 - Waste Minimisation: Recycled content, and recycling of process waste
 - Energy Management: Effective energy management policies and procedures
 - Manufacturing Process: Not manufactured using blowing agents with a global warming potential (GWP) or ozone-depleting potential (ODP)
 - Product Characteristics: Durability and performance



Licence No 2504017.
Thermal (resistive type)
building insulants.

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® insulation products are manufactured in the same environmentally considerate way. Certification and further information is available at www.nzgbc.org.nz.

² (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)

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Health & Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies the glass wool formulation used to manufacture Pink® Batts® insulation as Group 3: 'Not classifiable as to its carcinogenicity to humans'
- This the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- Pink® Batts® insulation has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme. Insulating with Pink® Batts® insulation is beneficial to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



³ Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results	
Combustibility	Non-Combustible	✓	NZS/AS 1530.1:1994		
Flammability	Non-Flammable	✓	NZS/AS 1530.3:1993	Ignitability (Range 0-20)	= 0
				Spread of Flame Index (Range 0-10)	= 0
				Heat Evolved Index (Range 0-10)	= 0
				Smoke Developed Index (Range 0-10)	= 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002		
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glasswool exempt		
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt		
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt		

* Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in ceilings and walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting these requirements

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® insulation **MUST** be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006: Energy Efficiency-Installing Insulation in Residential Buildings

Pink® Batts® insulation should **NOT** be:

- Crushed or folded

Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® insulation performance is not compromised.

Safety:

Prior to installation check for all hazards that may cause injury. Carry out repair work without delay.

- Ensure there is adequate lighting to identify any hazards
- Treat all electrical cables as live
 - Repair damaged, exposed or hanging cables immediately
 - Be careful not to cut or expose cables and wires
- Beware of other sharp objects (protruding nails, splinters etc.), pests (bees and wasps), loose boards and pipe work
- Avoid installing during the warmest part of the day. The roof cavity temperature can increase to uncomfortable levels

Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf

Equipment required:

- Protective loose fitting, long sleeve clothing
- Dust mask
- Rubber faced gloves
- Rubber soled footwear
- Safety glasses
- Step ladder
- Knife and cutting board
- Planks (long enough to span across joists)
- Lamp and extension cord (15m long)
- Install rod (25mm diameter, 1m long) for tight spaces

Roof

PINK® BATT® CEILING INSULATION

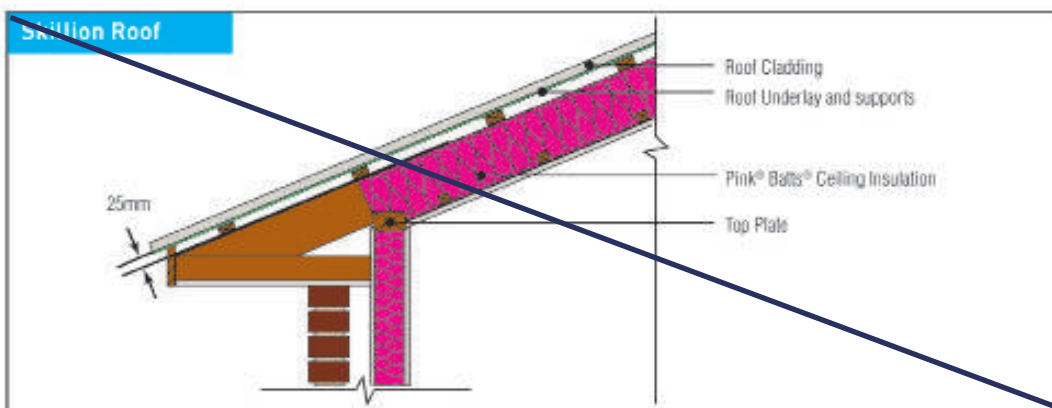
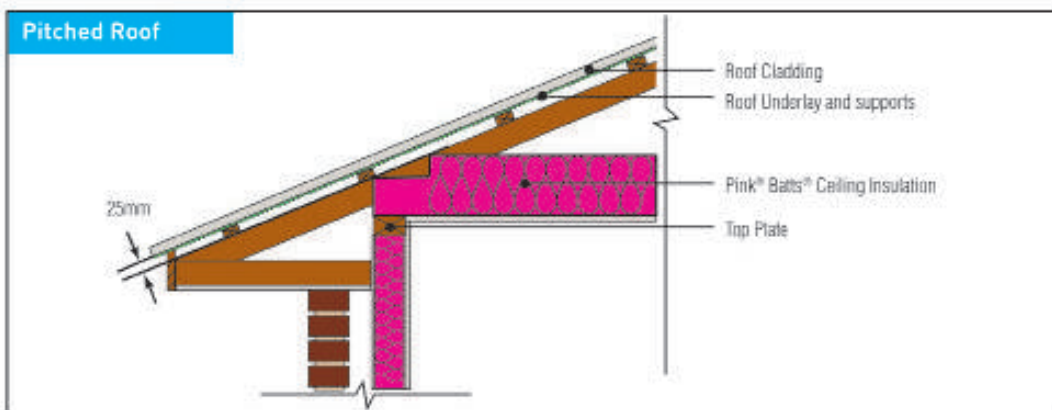
PRODUCT DATA SHEET

Installation Instructions continued...

Installation:

Confirm the correct product and R-value is used for the ceiling application. Refer to drawings/specifications where available. Ceiling insulation may only be installed in roof cavities and is not suitable for installation in walls.

- Ensure the product is installed dry. If the product is wet, replace it before installing
- Use planks laid across joists to walk and work on
- Any existing insulation should be levelled and refitted and any damp insulation to be removed
- Adhere to correct clearances around electrical fittings, heat sources etc. where required (refer to table overleaf)
- Ensure there are no gaps, folds or compression of product
- Start installation at point furthest away from the ceiling manhole
- Insulate the entire area up to the outer edge of the top plate
- Friction fit product between framing, ensuring there are no gaps, folds or compression of product
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- For retrofitting, install over framing where insulation already exists or where appropriate. Any open air pockets beside joist/truss cord ends at the roof perimeter to be blocked off with insulation off-cuts
- Fit insulation behind electrical wiring and plumbing work



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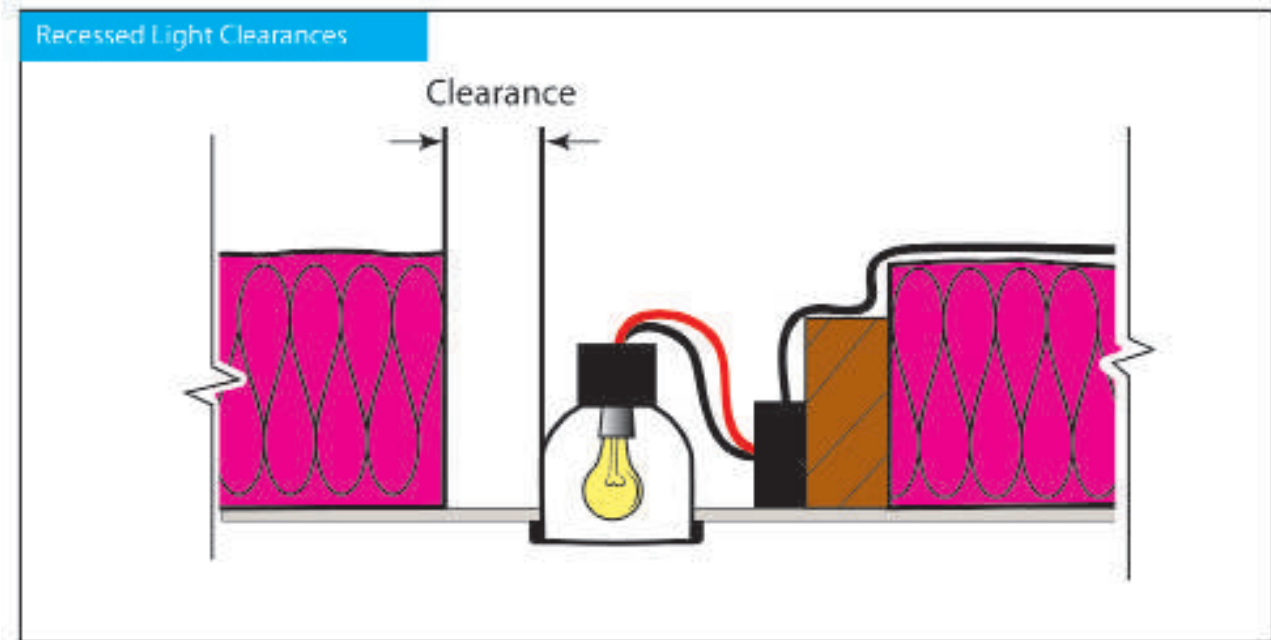
Roof

PINK® BATTS® CEILING INSULATION

Installation Instructions continued...

- Adhere to the clearances below to reduce risk of fire

Area	Minimum Clearance	Comments
Incandescent light	50mm	
CA Rated light	Nil	Do not install over the top
Unknown lights & Halogen	200mm	From outer edge of downlight, to ALL other insulation including existing insulation (Transformers can sit in the clearance zone, but MUST NOT be covered)
Extractor Fans	200mm	From outer edge of extractor fan to ALL other insulation including existing insulation
Flues	50mm	From outer edge of flue to ALL other insulation including existing insulation
Chimneys	50mm	From outer edge of chimney to ALL other insulation including existing insulation
Roofing material	25mm	To the roofing material i.e. - to the roof itself and building paper



Caution: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989.

Tip: To verify Building Code Compliance, staple a product label at an easy to find location – away from any hot items such as downlights or water cylinders.

Specification Notes

State the following:

Product Required: Pink® Batts® ceiling insulation and required R-value

Product Specifications

	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS** (mm)	NOMINAL TOTAL AREA PER PACK (m2)	APPROX COVERAGE PER PACK* (m2)
Pink® Batts® Classic R1.8 Ceiling	✓		7110118	1220 X 432	95	13.70	14.39
Pink® Batts® Classic R2.2 Ceiling	✓		7110122	1220 X 432	115	12.65	13.28
Pink® Batts® Classic R2.6 Ceiling	✓		7110126	1220 X 432	140	10.54	11.07
Pink® Batts® Classic R3.2 Ceiling	✓		7110132	1220 X 432	170	8.43	8.85
Pink® Batts® Classic R3.6 Ceiling	✓	✓	7110136	1220 X 432	180	7.38	7.75
Pink® Batts® Ultra® R4.0 Ceiling	✓	✓	7110140	1220 X 432	195	6.32	6.64
Pink® Batts® Ultra® R4.6 Ceiling	✓	✓	7110146	1220 X 432	205	5.27	5.53
Pink® Batts® Ultra® R5.0 Ceiling	✓	✓	7110150	1220 X 432	210	4.22	4.43

*Coverage relates to standard structure and actual coverage may vary.

**Designers should allow for an additional 10% increase for restricted cavities e.g. skillion roofs.

Storage

Pink® Batts® insulation must be protected from damage and weather. Store under cover in clean dry conditions. The installed product must remain dry at all times. The roof area should be inspected each year for leaks and excessive dampness. If the product has become wet or damp, the source of the dampness (e.g. leak in roof) must be repaired immediately and insulation replaced with new product of an equivalent R-value.

Accreditations/Appraisals/Certifications



* Please refer to www.pinkbatts.co.nz for specific appraisal and accreditation details.



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Wall

PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily in standard wall constructions, or be easily cut to fit in non standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- Comfort – Reduces heat loss for a warmer home and absorbs sound for a quieter, more relaxing, home
- Cost Saving – A well-insulated home can save up to \$1,800¹ on energy bills annually
- Sustainability – Made locally from up to 80% recycled glass Pink® Batts® insulation reduces dependence on virgin materials and reduces emissions associated with the importing of overseas manufactured product
- Healthy Living – R-values up to 4.0 assist in keeping homes above 18°C as per the World Health Organisations recommendation for a healthy and comfortable home
- Product Safety – Pink® Batts® insulation is non-combustible and will not easily burn therefore creating a safer living environment
- Assurance – BRANZ appraised giving independent assurance of the 50 year durability requirements of the New Zealand Building Code

¹ [Department of Building and Housing, Your guide to a smarter home, 2008, p. 28]

Environment

Pink® Batts® insulation is a sustainable, energy efficient product.

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Green Star New Zealand Credits

Green Star NZ is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute to points under Green Star New Zealand.

Environmental Choice

Higher R-value Pink® Batts® Wall insulation products have Environmental Choice New Zealand Accreditation (refer to the product specifications)

- Independently assessed for:

- Waste Minimisation: Recycled content, and recycling of process waste
- Energy Management: Effective energy management policies and procedures
- Manufacturing Process: Not manufactured using blowing agents with a global warming potential
- Product Characteristics: Durability and performance

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® Thermal Insulation Products are manufactured in the same environmentally considerate way.

² [Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005]



Licence No 2504017.
Thermal (resistive type)
building insulants.

Wall

PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

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Health & Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in providing a healthy and comfortable home by maintaining the minimum temperature of 18°C recommended by the World Health Organisation
- Pink® Batts® insulation has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme because of the benefit Pink® Batts® insulation provides to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



³ (Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460)

Technical Data

Properties	Result		Test/Method/Standard	Test Results	
Combustibility	Non-Combustible	✓	NZS/AS 1530.1:1994		
Flammability	Non-Flammable	✓	NZS/AS 1530.3:1993	Ignitability (Range 0-20)	= 0
				Spread of Flame Index (Range 0-10)	= 0
				Heat Evolved Index (Range 0-10)	= 0
				Smoke Developed Index (Range 0-10)	= 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002		
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glasswool exempt		
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt		
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt		

* Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

Wall

PINK[®] BATTS[®] WALL INSULATION

PRODUCT DATA SHEET

New Zealand Building Code (NZBC) and Limitations

Pink[®] Batts[®] wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E2: External Moisture

Contributes to meeting these requirements

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink[®] Batts[®] wall insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006: Energy Efficiency-Installing Insulation in Residential Buildings

Pink[®] Batts[®] wall insulation should NOT be:

- Crushed or folded

Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink[®] Batts[®] wall insulation performance is not compromised.

Safety:

Prior to installation check for all hazards that may cause injury. Carry out repair work without delay.

- Treat all electrical cables as live. Be careful not to cut or expose cables and wires
- Beware of other sharp objects (protruding nails, splinters etc)

Note: Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf.

Equipment required:

- Protective loose fitting, long sleeved clothing
- Safety glasses
- Dust mask
- Rubber soled footwear
- Rubber faced gloves
- Step ladder
- Knife and cutting board

Installation:

Use only wall products for installing in wall applications, ceiling products are not suitable. However, wall products may be used in ceilings - particularly those with restricted space. (Please refer to Pink[®] Batts[®] Skillion Roof product data sheet for further information on insulation suitable for restricted roof cavities.) Refer to drawings/specifications where available for R-value selection.

- Ensure the product is installed dry. If the product is wet, replace it before installing
- Friction fit product between framing
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- Ensure there are no gaps, folds or compression of product
- Fill gaps around windows and doors with off-cuts
- Do not cover vents. Insulate around vents to allow unhindered ventilation
- Fit insulation behind electrical wiring* and plumbing work. Partially cut insulation and place around wires or pipes if necessary

***CAUTION:** Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989.

Wall

PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

Specification Notes

State the following:

Product Required: Pink® Batts® wall insulation and required R-value

Product Specifications

	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER PACK (m2)	APPROX COVERAGE PER PACK* (m2)
Pink® Batts® R1.8 Wall	✓		7120118	1140 X 580	90	17.2	19.6
Pink® Batts® R2.2 Wall	✓		7120122	1140 X 580	90	13.9	15.8
Pink® Batts® R2.4 Wall	✓		7120124	1140 X 580	90	13.9	15.8
Pink® Batts® Ultra® R2.6 Wall	✓	✓	7120126	1140 X 580	90	9.9	11.3
Pink® Batts® Ultra® R2.8 Wall	✓	✓	7120128	1140 X 580	90	6.6	7.5
Pink® Batts® R3.2 140mm Wall	✓		7120132	1140 X 580	140	9.9	11.3
Pink® Batts® R3.6 140mm Wall	✓		7120136	1140 X 580	140	7.3	8.3
Pink® Batts® R4.0 140mm Wall	✓		7120140	1140 X 580	140	5.3	6.0

*Coverage relates to standard structure and actual coverage may vary.

Storage and Maintenance

Pink® Batts® insulation must be protected from damage and weather. Store under cover in clean dry conditions. The installed product must remain dry at all times. If the product has become wet or damp, the source of the dampness (e.g. leak in plumbing) must be repaired immediately and insulation replaced with new product of an equivalent R-value.

Accreditations/Appraisals/Certifications



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