

Approved Building Consent Documents

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

Jody McMurdo

From: Singh Kamboj <Singh.Kamboj@jameshardie.co.nz>
Sent: Tuesday, 4 September 2012 4:53 p.m.
To: Jody McMurdo
Subject: Linea Weatherboard Technical Specification

Hi Jodi

Thanks for your query regarding the date of Branz appraisal certificate and Linea Weatherboard technical specification.

In this matter I would like to clarify that the current version of Linea Weatherboard technical specification is January 2012. The cladding system has been tested for 'EH' wind zone and wind pressures up to 2.5KPa and complies with NZBC requirements .

The appraisal certificate is being amended to reflect the suitability of Linea Weatherboard in EH and SED wind zones. I hope this task will be completed in about two week's time. I will send you the updated certificate as soon as it has been issued.

I hope this helps and clarifies. Please feel free to contact in case you have any further queries in this matter.

Regards

James Hardie New Zealand Ltd.

Singh Kamboj, (B.E)civil, GIPENZ

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Ecoply® Barrier System Fact Sheet

July 2012

BC130229
Date Received 4/02/13

Ecoply Barrier is a rigid air barrier system designed for use in drained cavity wall systems in residential and commercial buildings. Ecoply Barrier removes the need for traditional building wrap while providing a superior structural bracing and forming a strong air barrier as a secondary line of defence against moisture penetration into the building envelope.



Top Plate Hold Down Connections using Ecoply® Barrier

Can I use Ecoply Barrier to provide top plate hold down?

Additional nailing of the Ecoply® Barrier to the top plate in accordance with the details shown in fig 1 and described below will provide sufficient top plate hold down capacity to comply with a Type B fixing or 4.7kN uplift capacity as listed in table 8.18, NZS3604:2011.

Fastening

Nails must be 50mm x 2.8mm flat head galvanised or stainless steel as described in the Ecoply® Barrier Specification and Installation Guide for Fastener Durability.

Nailing to the top plate is at 75mm centres and 20mm from the sheet edge.

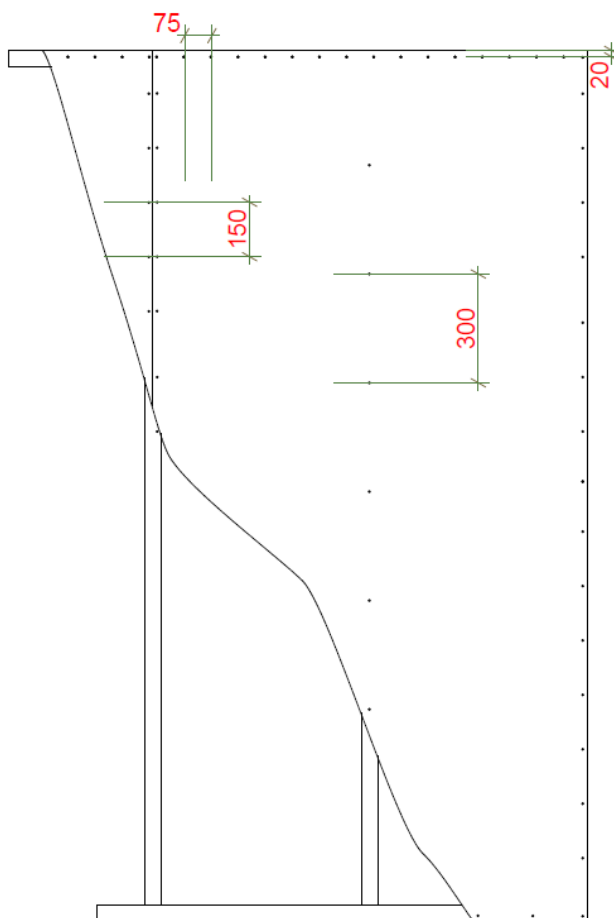
The remainder of the sheet perimeter is fastened at 150 mm centres no less than 7mm from the sheet edge and 300mm at intermediate studs as with standard nailing for Ecoply® Barrier

Standard nailing of the Ecoply Barrier to the top plate in accordance with the Ecoply literature will provide a top plate hold down capacity that exceeds a Type A fixing or 0.7kN uplift capacity as listed in table 8.18, NZS3604:2011.

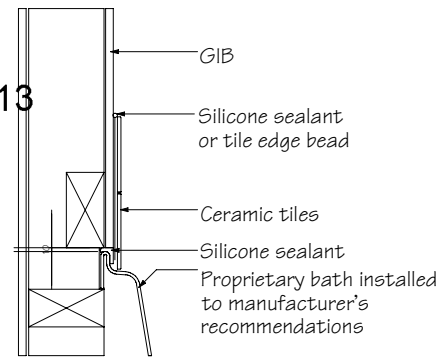
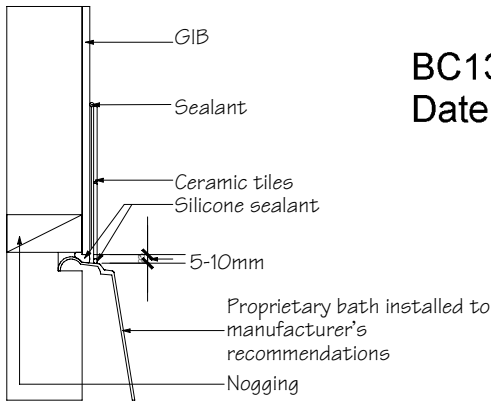
Compliance & Standards

- Ecoply Barrier is suitable for use as a rigid air barrier for buildings within the scope of NZS3604 and meets the NZ Building Code rigid sheathing performance requirements as outlined in Section 9.1.4 and Table 23 of E2/ AS1
- Ecoply Barrier has been tested to 4.5 kPa (ULS) and 1.3 kPa serviceability limit using a 12 mm sheet cladding in accordance with AS/ NZS 4284 Testing of Building Facades
- Ecoply is certified by the Engineered Wood Products Association of Australasia (EWPPA) as compliant with AS/NZS2269

Figure 1

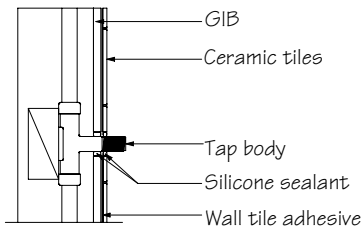


BC130229
Date Received 4/02/13

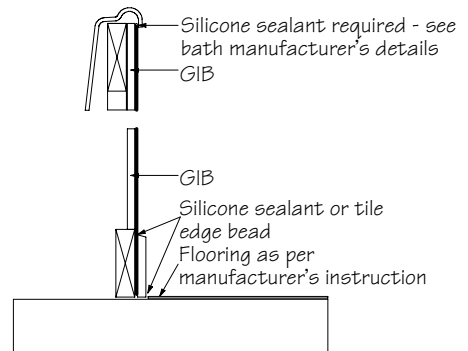


A Bath/Wall Detail
Bath - Tiled Upstand GAW-D013

B Bath/Wall Detail
Bath - Tiled Upstand GAW-D014

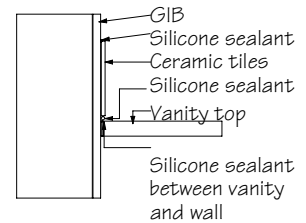
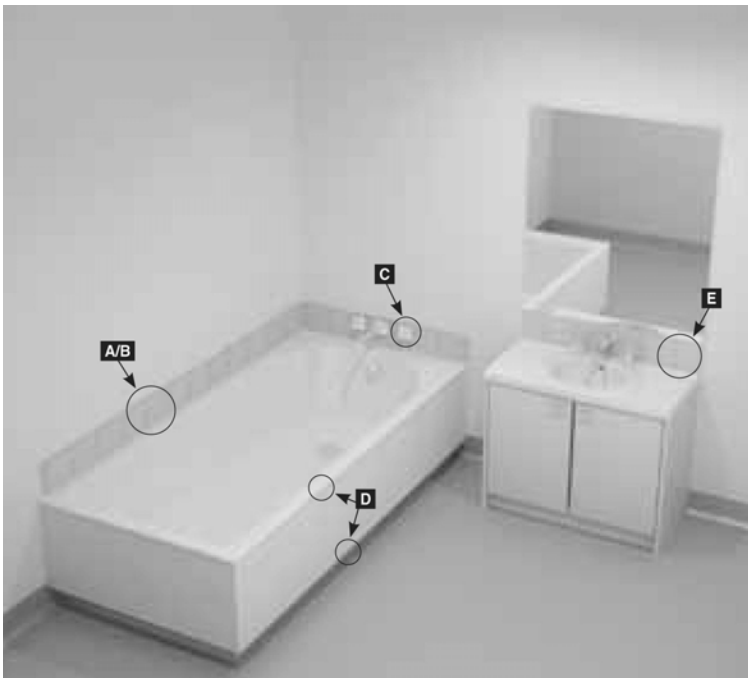


Note:
Where impact noise from pipes is an issue, fix all pipes on resilient brackets.

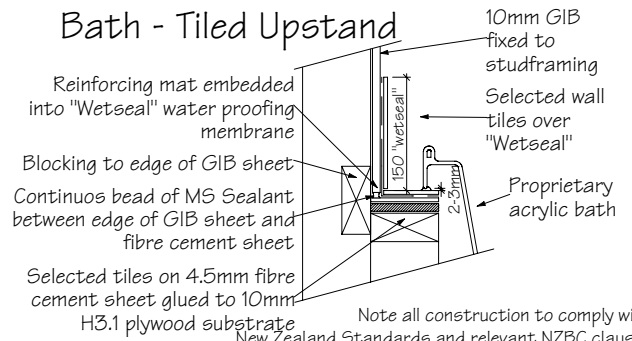


C Penetration Detail
Bath - Tiled Upstand GAW-D015

D Bath Plinth Detail
Bath - Tiled Upstand GAW-D016



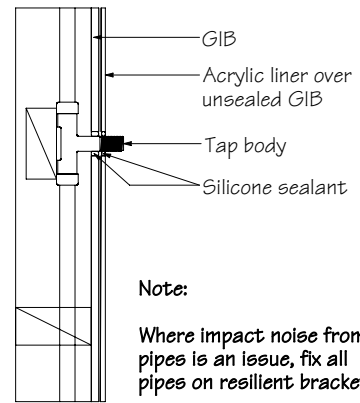
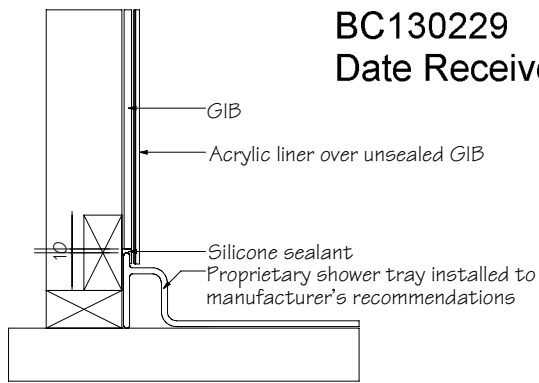
E Vanity Top Detail
Bath - Tiled Upstand GAW-D017



Note all construction to comply with New Zealand Standards and relevant NZBC clauses

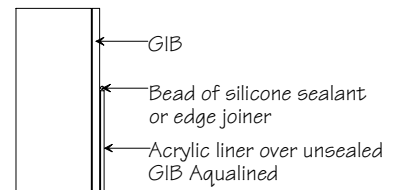
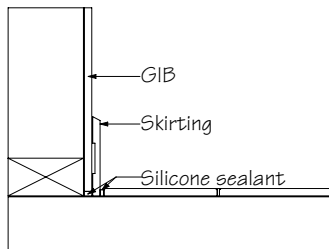
			Title		Bath - Tiled Upstand			
Drawn.		Date		Chk.	Client			Details
SC		14-08-09						
Sales		Plot Date		Scale @ A4				
· HQ		30/03/2010		NTS				
Job Number				00				

BC130229
Date Received 4/02/13



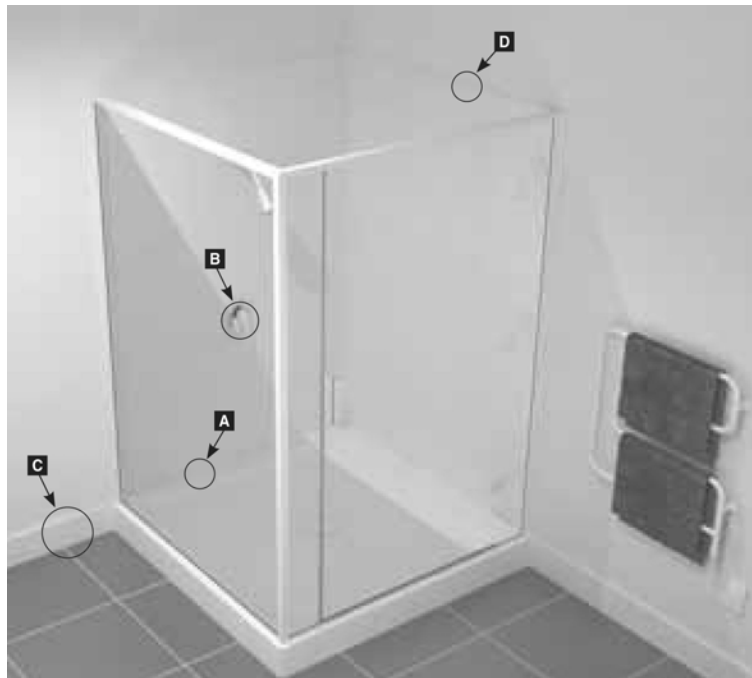
A Shower Wall/Tray Detail
Shower - Tiled Walls and Acrylic Base GAW-DO24

B Penetration Detail
Shower - Tiled Walls and Acrylic Base GAW-DO23



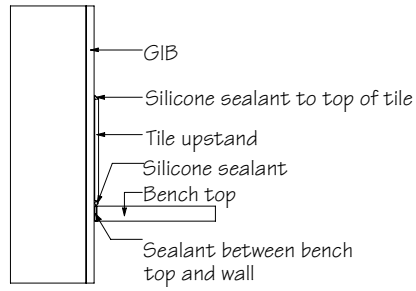
C Wall/Floor Detail
Shower - Tiled Walls and Acrylic Base GAW-DO29

D Liner Top Detail
Shower - Acrylic Liner and Base GAW-DO30



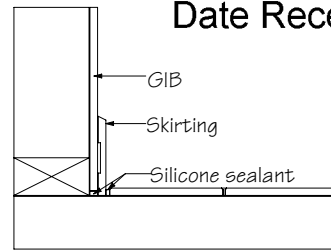
Note all construction to comply with
New Zealand Standards and relevant NZBC clauses

		Title Acrylic Shower			
		Drawn. SC	Date 14-08-09	Chk. Client	
		Sales HQ	Plot Date 30/03/2010	Scale @ A4 NTS	
		Job Number 00		Details	

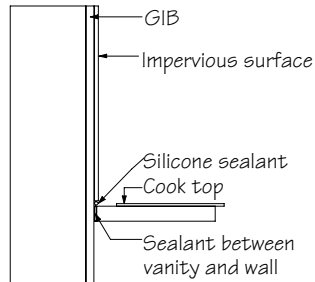


A Bench Top/Wall Detail
Kitchen and Laundry

GAW-D031



C Wall/Floor Detail
Kitchen and Laundry



B Cook Top/Wall Detail
Kitchen and Laundry

Note:
See Wall Surfaces Surrounding
Cooktops on page 7 of Gib wet
area systems booklet.

GAW-D032



Note all construction to comply with
New Zealand Standards and relevant NZBC clauses

		Title Kitchen & Laundry			Details
		Drawn. SC	Date 14-08-09	Chk.	
		Sales HQ	Plot Date 30/03/2010	Scale @ A4 NTS	
		Job Number 00			

Internal Wet Areas

Description

Wet-seal Fibre Coat is a two coat fibreglass re-inforced polyester resin based waterproofing membrane system and is coloured in the Wet-seal Corporate Jade Green. When cured it is a seamless membrane and will not bleed through porous materials. It is specifically designed for **INTERNAL USE** on Concrete Slab, Cement Render, Concrete and Masonry Walls, Compressed Fibre-cement Flooring, Fibre-cement Flooring Overlay, Fibre-cement Wall Lining, Water Resistant Plasterboard, Wall Lining Plywood Flooring and Particleboard Flooring, preceding Tiles.

Application

Wet-seal Fibre Coat is for internal waterproofing areas such as Showers, Bathrooms, Ensuites, Powder Rooms and Laundries. This highly specified system is supply and fix and is only installed by Wet-seal New Zealand's nationwide network of fully trained Franchisees; in accordance with the Wet-seal Installation Manual.

Surface preparation

Fall should be incorporated in the original concrete slab pour where possible. Allow concrete to cure for 28 days and cement render to cure for 7 days prior to application of the Wet-seal Fibre Coat. The plumbing and wall sheets must be installed prior to the application of the Wet-seal Fibre Coat. Drainage flanges are recommended to be installed on suspended floors prior to application of the membrane. Surfaces must be clean, completely dry and without any trace of residue or permanent dampness. All grease, oil, wax, curing compounds, dust, droppings, loose material, paint and any other contaminants must be removed. Fibrous cement sheeting, plasterboard, particleboard and all suitable flooring substrates must be fixed in accordance to manufacturers' specifications. Hobs (if applicable) must be constructed from masonry, concrete or similar material.

Curing time

Minimum of 24 hours at 23°C/55%RH but in cooler conditions 48 hours.

Tiling direct or tiling mortar bed covering

This may be carried out after the Wet-seal Fibre Coat has been allowed to dry.

Please Note: If a hob is used in the shower ensure that hob tiles are grouted with a flexible grout.

Tile adhesive

WIPE OVER the Wet-seal Membrane thoroughly with clean water **PRIOR** to application of recommended adhesives that meet the requirements of AS4992.

Limitations

Wet-seal Fibre Coat membrane is not designed to be used as a decorative finish.

Guarantee

Wet-seal Fibre Coat carries a fifteen (15) year material and workmanship guarantee.

The system when fully cured has

- ✓ Uniformity of thickness
- ✓ Tenacious bond strength
- ✓ Excellent chemical resistance, and;
- ✓ Is free of pitch and does not bleed through porous materials

Physical description and properties

Mass per unit area:	1066 ± 22gm ⁻²	AS 2324	Appendix D
Water absorption:	(%) - 0.40 ± 0.05	AS A121	Appendix K
Mean tensile strength:	45.5 MPA	Std. Dev. 4.9	AS 1145
Loss of volatiles (% volume):	(%) - 0.55 ± 0.01	AS A121	Appendix J
Alkali resistance:	No evidence of degradation	ASTM.D543	1978

Performance properties

Colour:	Wet-seal Jade	Appearance:	Smooth
Cure:	24 hours @ 23°C/55% RH	Specific gravity:	0.95 - 1.15 approximately
Flammability:	Flammable	Application of trafficable products:	48 hours

Precaution

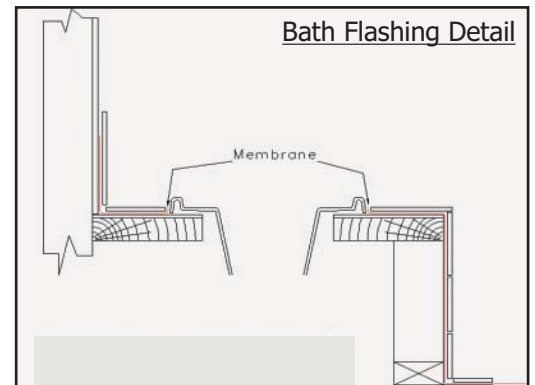
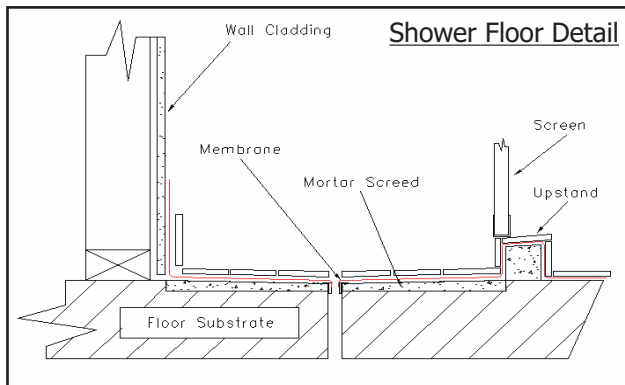
- X This is not a vapour barrier
- X Must not be applied to any contaminated surface
- X This membrane is not designed to stop hydrostatic headwater pressure
- X Must not be applied to a surface with a temperature of less than + 7°C

Health and Safety

The Franchised applicator must comply with the Wet-seal Health & Safety Manual.



Internal Wet Area Details for Wet-seal Waterproofing System



The Wet-seal Fibre Coat System is used for all internal wet areas.

It carries a Branz Appraisal 372 (2000). It has completed the CSIRO requirements, Test No. 3392 (Feb 06), to meet the requirements of AS/NZ 4858 Wet Area Membranes.

Shower base to be constructed with a fall to the waste to prevent ponding as per E3/AS1

Suitable substrate materials are Concrete, H3 Plywood, Particleboard flooring and Fibrous Cement Sheet.

The recommended waste flange is the Allproof Tile Waste, this allows the membrane to return down the waste and provide sub-tile draining.

Shower floors can be constructed with or without upstands. When required they shall be of non porous material and installed by Wet-seal.

When enclosures such as walls, screens, doors or curtains are used they shall be continuous from floor level or top of upstand to a height of 1800mm minimum above floor and not less than 300mm above the shower rose, refer E3/AS1.

Where the shower floor has no upstand or where a wall, screen, door or curtain is omitted, the floor shall have a fall of no less than 1:50 towards the floor waste. The fall shall apply to the floor area within a radius of 1500mm taken from a point vertically below the shower rose, and from any wall within that radius.

The Wet-seal waterproof membrane must be fully dry before any Under Floor Heating is applied. This should only be carried out as per the manufacturer's recommendations.

If the substrate is strip flooring, fibrous cement sheet underlay will need to be installed prior to the Wet-seal membrane. However if the substrate is timber sheet flooring there is no requirement to apply the fibrous cement underlay.

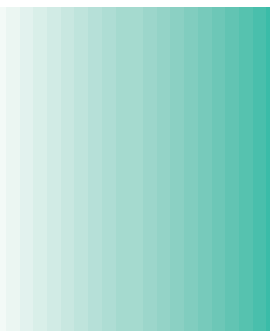
BRANZ Good Tiling Practice recommends laying the mortar screed prior to the application of a waterproof membrane to prevent it retaining moisture and inducing mould. This is only possible if the membrane is able to return down the waste, ie; Allproof Waste.

Wet-seal New Zealand recommend that on concrete substrates all wall/floor junctions are flashed within the room and on timber or fibrous cement sheet flooring the entire floor is to be sealed with the Wet-seal membrane.

In cases where a door is in close proximity to the shower Wet-seal New Zealand will install an aluminium angle in the doorway to prevent water migrating from the room.

Prior to the Wet-seal application the area must be dry and clean with all surface plaster droppings removed.

After tiling is completed, the shower screen should be fitted on the inside edge of the upstand, as shown.



External Wet Areas

Description

Wet-seal Pyure Coat 400 is a one component, highly elastic, moisture curing polyurethane coating and is coloured in the Wet-seal Corporate Jade Green.

Application

Wet-seal Pyure Coat 400 can be applied as an elastic coating for balconies and terraces, a waterproof membrane or coating for pedestrian bridges and stairways, roofs, decks and balconies. Wet-seal Pyure Coat 400 must be over coated with a UV stable coating i.e. Tiles, UV paint, Slatted deck or UV stable paint. This highly specified system is supply and fix and is only installed by Wet-seal New Zealand's nationwide network of fully trained Franchisees; in accordance with the Wet-seal Installation Manual.

Advantages

- ✓ Excellent mechanical resistance
- ✓ Versatile - can be used for a flexible coating and as a waterproof membrane
- ✓ Good crack bridging ability
- ✓ Excellent thermal resistance
- ✓ Can be tiled over
- ✓ Water potable

Surface preparation

Suitable substrate materials are concrete, 17mm (min) CD plywood and fibrous cement sheet. All areas should be clean and dry prior to membrane application and applied in accordance with the manufacturers' specifications.

Surfaces must be clean and free from all traces of loose materials, old coatings, curing membranes, release agents, laitance, oil and greases, etc.

Substrate compressive strength should be at least 25MPa, cohesive bond strength at least 1.5MPa.

Structurally unsound layers and surface contaminants must be mechanically removed by abrasive blast tracking or grinding. Substrates heavily impregnated with oil must be cleaned by torching or suitable solvent cleaning methods.

To check that all traces of oil have been completely removed, sprinkle a few drops of water over the surface. If all the water is quickly absorbed, the surface is sufficiently oil and grease free. If the water forms into globules that remain on the surface, further thorough treatment of surface is necessary.

Wet-seal Pyure Coat 400 acts as a self-levelling coating and will not re-profile irregular substrates. For re-profiling defects on horizontal surfaces a suitable patching mortar is required. The patching mortar can be of epoxy, polyester or cementitious base depending on the scope, particular conditions and requirements of the work.

Tiling direct or tiling mortar bed covering

This may be carried out after the Wet-seal Pyure Coat has been cured for a minimum of 7 days.

Please Note: If using sand/cement mortar bed over Wet-seal Pyure Coat 400 a minimum thickness of 40mm is required.

Guarantee

Wet-seal Pyure Coat 400 carries a fifteen (15) year material and workmanship guarantee.

Technical and Physical Data

Form:	Liquid polyurethane
Density:	1.6kg/litre (DIN 53 217)
Solids content:	88%
Elongation at break:	320% (DIN 53 504 - after 7 days curing at 23°C / 50% RH)
Shore hardness:	Shore D45 (DIN 53 505 - after 7 days curing at 23°C / 50% RH)

Health and Safety

The Franchised applicator must comply with the Wet-seal Health & Safety Manual.



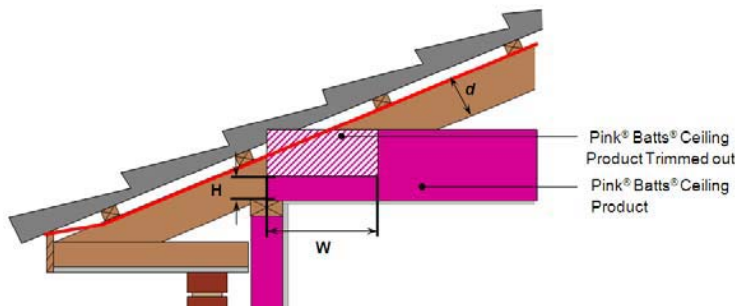
THERMAL INSULATION

Pitched Roof: Roof Underlay and Insulation Clearance

Option 2: Trim Product

The table below details the trimming required of the Pink® Batts® ceiling product located at the perimeter of the roof space.

Option 2: Trim Product



Pink® Batts® Ceiling Product			R 5.0	R 4.6	R 4.0	R 3.6	R 3.2	R 2.6	R 2.2	R 1.8
Pink® Batts® Ceiling Product Nominal Thickness (mm)			200	195	190	180	170	140	115	95
Pitch θ°	d (mm)	H (mm)	(mm)							
15	90	80	447	428	410	372	335	223	130	55
	140	132	254	235	216	179	142	30		
	190	184	61	42	23					
	240		No trimming required, product can be installed to the middle of the top plate and maintain a 25mm clearance							
	290									
20	90	87	310	296	283	255	228	145	77	22
	140	140	164	150	136	109	81			
	190	194	18	4						
	240		No trimming required, product can be installed to the middle of the top plate and maintain a 25mm clearance							
	290									
25	90	95	225	214	203	182	160	96	42	
	140	150	106	96	85	63	42			
	190		No trimming required, product can be installed to the middle of the top plate and maintain a 25mm clearance							
	240									
	290									
30	90	105	165	156	147	130	113	61	17	
	140	163	65	56	47	30	13			
	190		No trimming required, product can be installed to the middle of the top plate and maintain a 25mm clearance							
	240									
	290									

Note: This table is a guide only. The roof construction of each house may vary and the design should be checked on site to ensure the table is applicable.

TECHNICAL UPDATE

providing THE SYSTEM THAT MATTERS

AUGUST 2008

BC130229

Date Received 4/02/13



The **Thermakraft** WINDOW SEALING SYSTEM



The Window Sealing Tape



The Corner Moulded Piece



... with the Aluband Tool



Thermakraft Industries (NZ) Ltd

NCT • New Composite Technology

THE SYSTEM • THE METHOD Installation Guide

- 1** Cut the building wrap/air barrier at 45° away from each corner (*left pic*), fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing (*right pic*).

Trim excess building wrap/air barrier to enable unimpeded access to the opening.



- 2** Fix the **Thermakraft ALUBAND™ Corner Moulded Piece™** (orange in colour) to the sill corners by way of staples or clouts to the two jambs as shown. The flexibility of the corner piece allows for a 5° chamfer (slope) on the timber sill where it is required for direct fix cladding. Now install the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** as in step 3. 150mm wide tape is used for 100mm wide window or door framing. 200mm wide tape is used for 140mm to 150mm wide reveals. With steel framed houses use Double Sided Tape to attach **Thermakraft ALUBAND™ Corner Moulded Piece™** to metal cladding.

Do not fix through the logo on the **Thermakraft ALUBAND™ Corner Moulded Piece™**



- 3** Measure 200mm up both jambs (*left pic*), add 400mm to the length of the window sill and cut the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** to suit that measurement (*right pic*).



- 4** Remove first the polyethylene protective film from the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape**; align the back edge of the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** with the inside edge of sill.

Do not lay **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** onto the interior surface of framing where it may interfere with wall linings.



- 5** Using the **Thermakraft ALUBAND™ Tool**, firmly press the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** onto the building wrap/air barrier to ensure good adhesion. Using the **Thermakraft ALUBAND™ Tool**, ensure that the tape is fitted tightly into the jamb to sill corners.



- 6** At the sill/jamb corners cut the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** from the external edge of the frame outwards. Fold flaps back onto the building wrap/air barrier and press tape firmly for good adhesion.

The **Thermakraft ALUBAND™ Corner Moulded Piece™** is nearly all covered except for the logo showing on the outer bottom edge.



THE SYSTEM • THE METHOD Continued

- 7** Proceed to fix the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** to the top corners of the frame (200mm across lintel x 200mm down jamb). Remove first the backing film from the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape**; align the back edge of the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** with inside edge of lintel. Using the **Thermakraft ALUBAND™ Tool**, ensure that the tape is fitted tightly into the corners. Cut the **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** from the external edge of the frame outwards. Fold flaps back onto the building wrap/air barrier and press tape firmly for good adhesion.

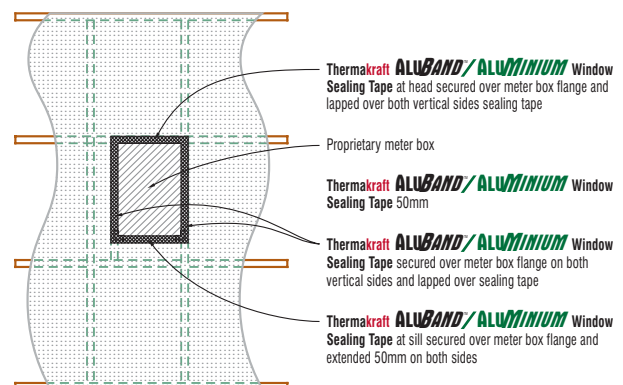


- 8** For the window or door lintel to jamb junction, apply a Butterfly using the 50mm wide x 100mm long **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape**, and fix at a 45° angle to the jamb with an overlap at the corner of 3mm (as per photo on right). The **Thermakraft ALUBAND™/ALUMINIUM Window Sealing System** is now complete (as per this photo alongside).

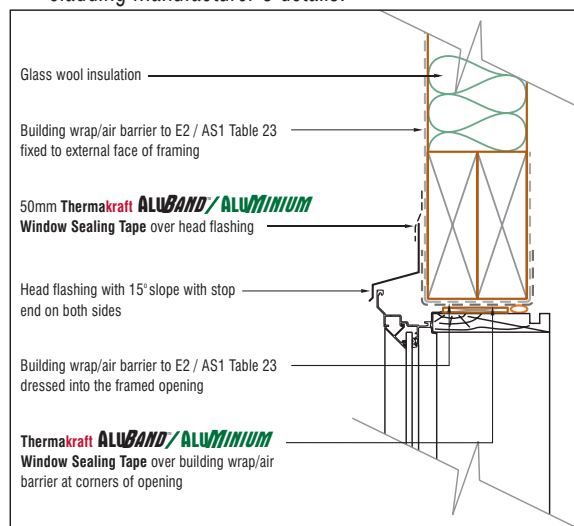


- 9** Meter boxes with built-in flanges, to be taped with 50mm **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** along each flange to the building wrap/air barrier.

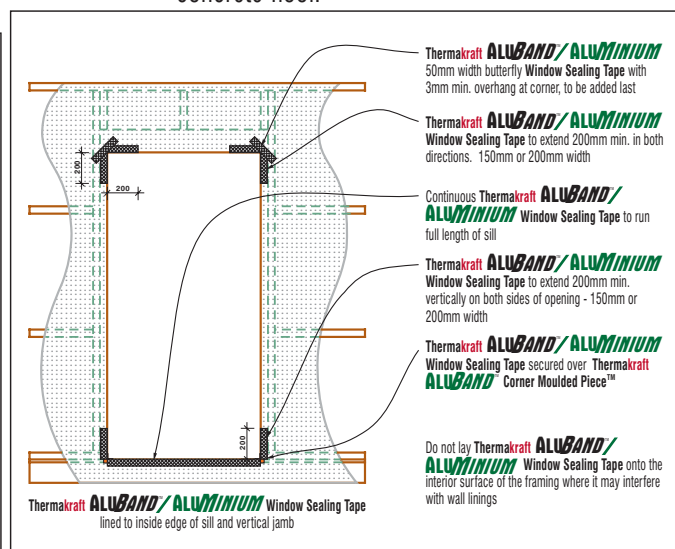
Frame openings for meter boxes without built-in flanges to be treated as for window openings. Refer steps 1-8.



- 10** 50mm **Thermakraft ALUBAND™/ALUMINIUM Window Sealing Tape** is used to seal the up stand of the window head flashing to the building wrap/air barrier. Refer to the cladding manufacturer's details.



- 11** Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.



Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape is a polymeric faced high quality bituminous modified self adhesive tape with a polyethylene release backing and comes in 150mm wide, 200mm wide, 75mm wide & 50mm wide tapes.



The **Thermakraft ALUBAND Corner Moulded Piece** is made from inert orange PE that is used in conjunction with the **Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape** & building wraps, as part of the secondary drainage plane reqd to prevent the ingress of moisture into the framing.



A special **Thermakraft ALUBAND Tool** (green) is used to ensure proper adhesion and a tight fit into corners.



Applications

The **Thermakraft ALUBAND/ALUMINIUM Window Sealing System** is designed to work with all kraft-based building papers that meet the requirements of Table 23 of E2/AS1, and the following synthetic wall underlays: Cover-Up, Diflex 130, Watertight, Tekton, Tyvek Home Wrap and Frameguard G3.

Thermakraft ALUBAND/ALUMINIUM Window Sealing System (the System) is specially designed to provide a sure and lasting moisture proof seal at window and door openings.

Thermakraft ALUBAND/ALUMINIUM Window Sealing System is ideal for sealing head flashings to the building wrap/air barrier as well as around meter boxes with built-in sealed flanges.

The system provides a moisture barrier at the most vulnerable point at the sill/jamb and jamb/lintel intersection.

DOOR FRAMES TO BE TREATED EXACTLY THE SAME AS THE WINDOW FRAME (refer to Step 11 inside).

Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape can be used on the following timber treatments: CCA, Boron & LOSP*.

*If **Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape** is used in conjunction with LOSP treated timber, the solvent must be allowed to flash off before installation. This can be tested by applying a small strip (approx 100mm x 50mm) to the treated timber for one hour. If the tape does not stick well, then the timber must be allowed to flash off for more time.

The **Thermakraft ALUBAND/ALUMINIUM Window Sealing System** must not be exposed to weather for more than 90 days.

The **Thermakraft ALUBAND Corner Moulded Piece** is designed to prevent the ingress of moisture at both the left and right hand window jamb to sill junctions. It is easy to install on timber framing using either staples or clouts fixed into the jambs.

The **Thermakraft ALUBAND Corner Moulded Piece** is flexible allowing for use on sills with a 5° chamfer, required for direct fix cladding systems.

When using **Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape** for jamb/lintel intersections, please ensure a butterfly (100mm x 50mm wide tape) is fixed at 45° angle to the jamb (refer to Step 8 inside).

Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape 50mm to be adhered to the head flashing (refer to Step 10 inside).

Appraised

Thermakraft ALUBAND/ALUMINIUM Window Sealing System has been appraised in New Zealand by BRANZ, Appraisal No. 614 [2008] - appraisal available on request.

Standard Roll Dimensions

Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape is available in the following sizes:

Roll Width	Roll Length	No. per carton
200mm	25.0m	2 rolls
150mm	25.0m	4 rolls
150mm	10.0m	12 rolls
75mm	25.0m	8 rolls
50mm	25.0m	12 rolls

House Pack

3 x 150mm x 25m rolls / 3 x 50mm x 10m rolls / 50 x **Thermakraft ALUBAND Corner Moulded Pieces** / 1 x **Thermakraft ALUBAND Tool** / 1 x Data Sheet.

The **Thermakraft ALUBAND/ALUMINIUM Window Sealing System** is expected to have a serviceable life equal to that of the cladding, when installed in accordance with this data sheet and the technical literature, provided it is not exposed to the weather or ultra-violet (UV) for a total of more than 90 days, or damaged on installation.

Thermakraft ALUBAND/ALUMINIUM Window Sealing System when used with wall wraps listed in this data sheet and in accordance with this data sheet, will meet the Performance **B2.3.1 (b) 15 years** of the New Zealand Building Code.

The **Thermakraft ALUBAND/ALUMINIUM Window Sealing Tape** must not be installed at temperatures of less than 10°C.

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Thermakraft Industries (NZ) Ltd

E. & O. E.

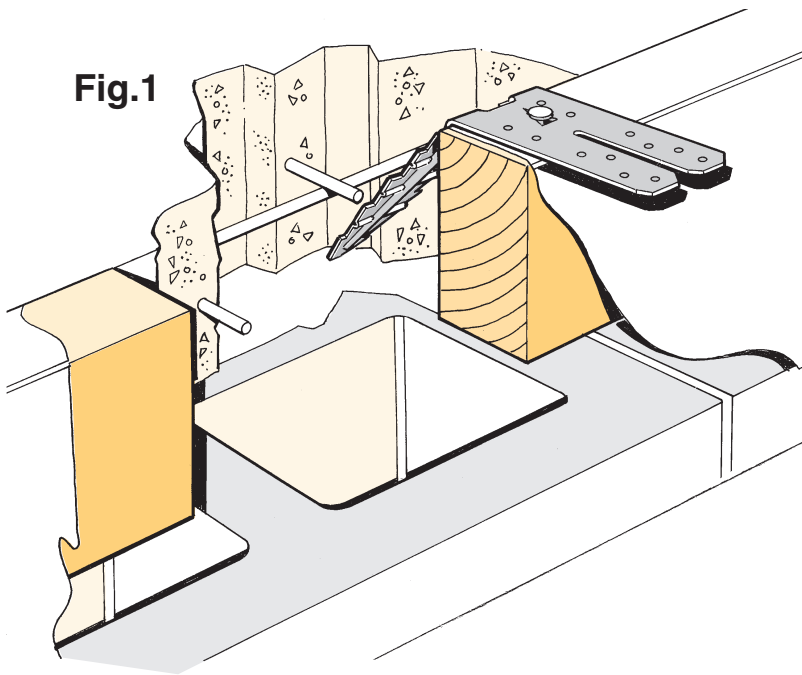
11 Turin Place, East Tamaki, Auckland, New Zealand
P.O. Box 58-112, Greenmount, Auckland, NZ
Freephone: 0800-806 595 Phone: 09-273 3727 Fax: 09-273 3726
Email: sales@thermakraft.co.nz Website: www.thermakraft.co.nz



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

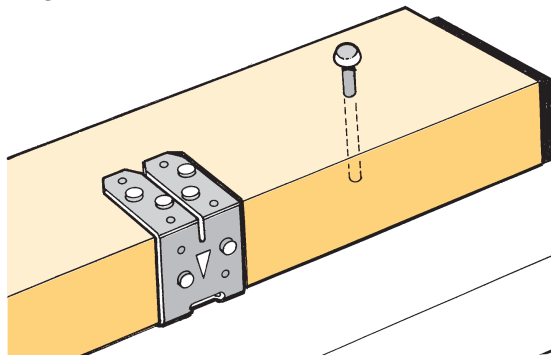
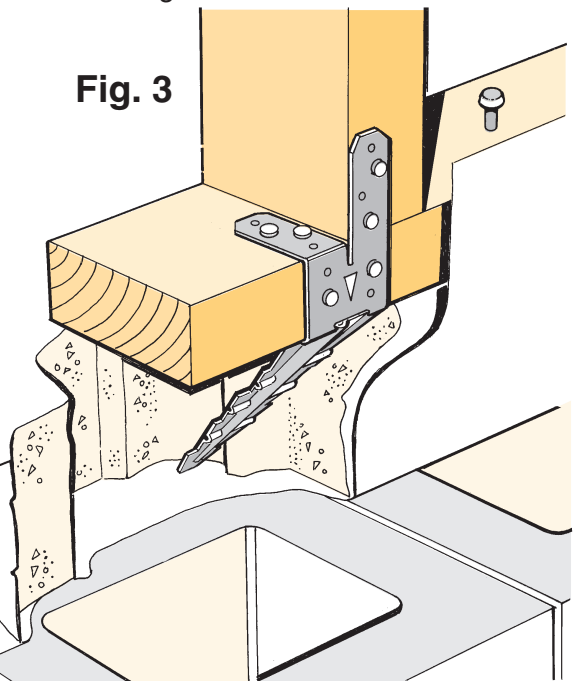
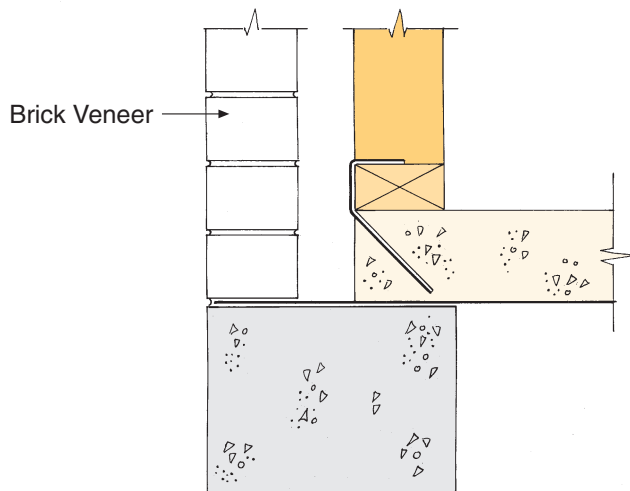
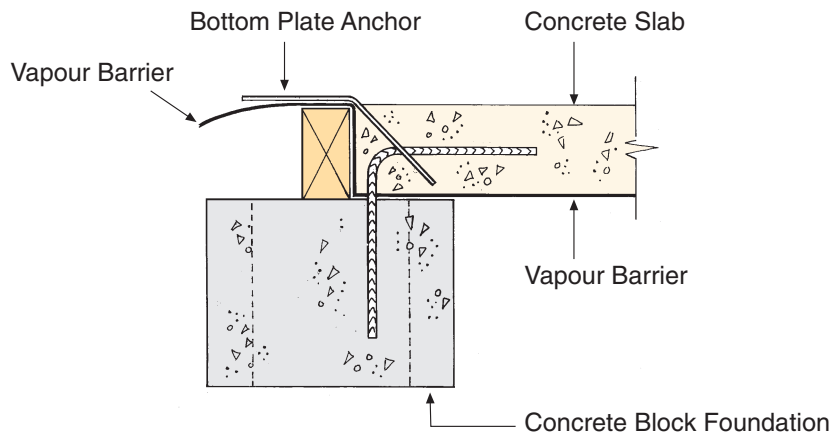


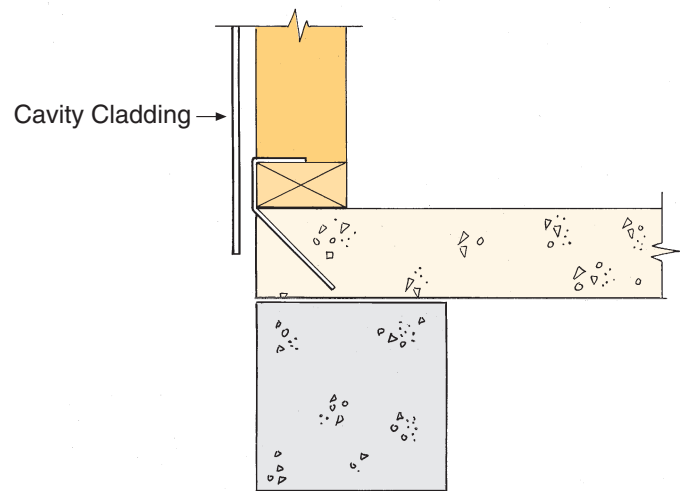
Fig. 3



**Available from leading Builders Supply Merchants
throughout New Zealand**



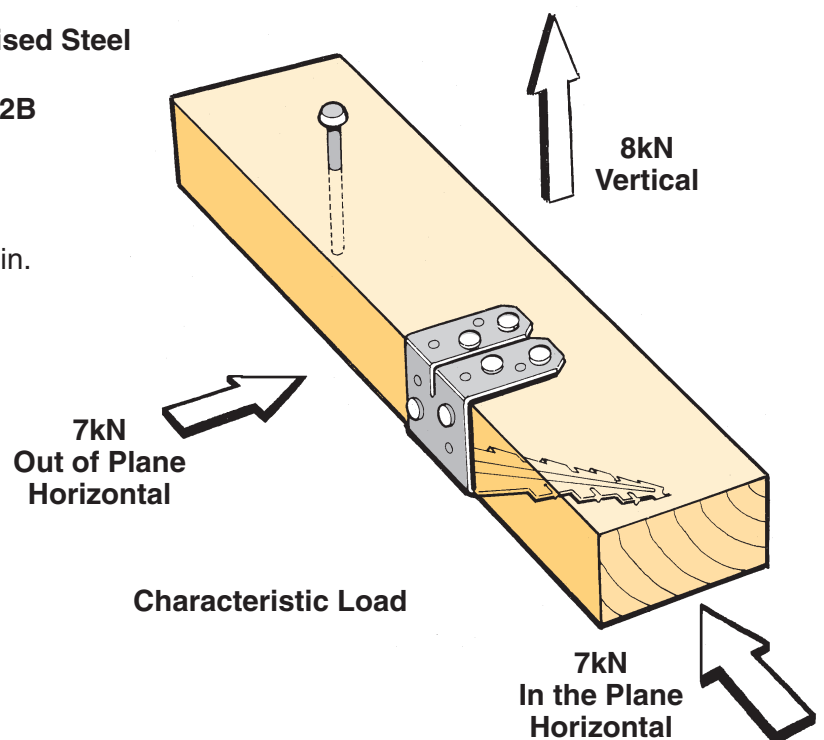
BRICK VENEER



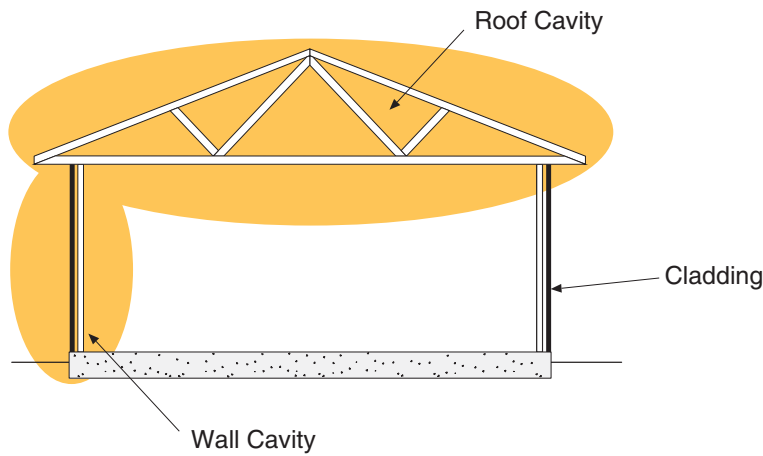
CAVITY CLADDING

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.

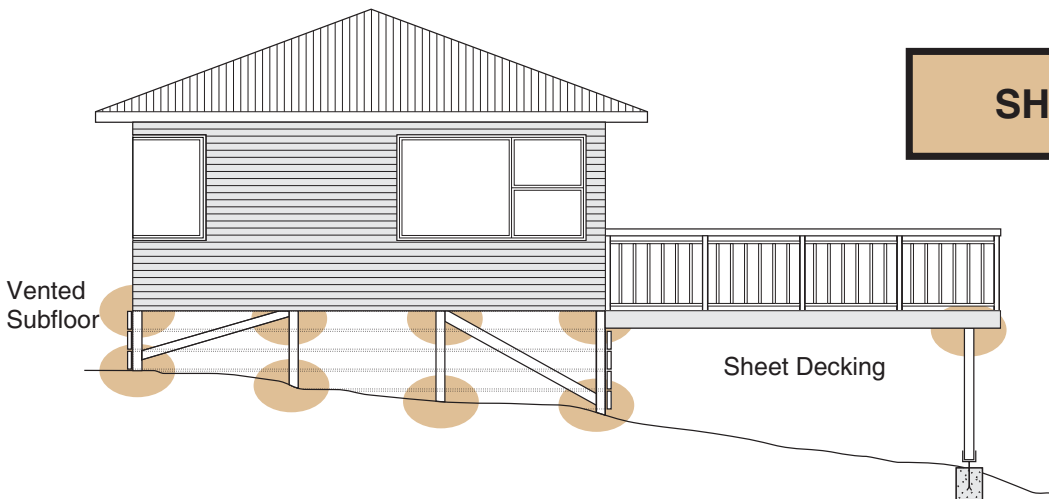


DURABILITY FLOW CHART



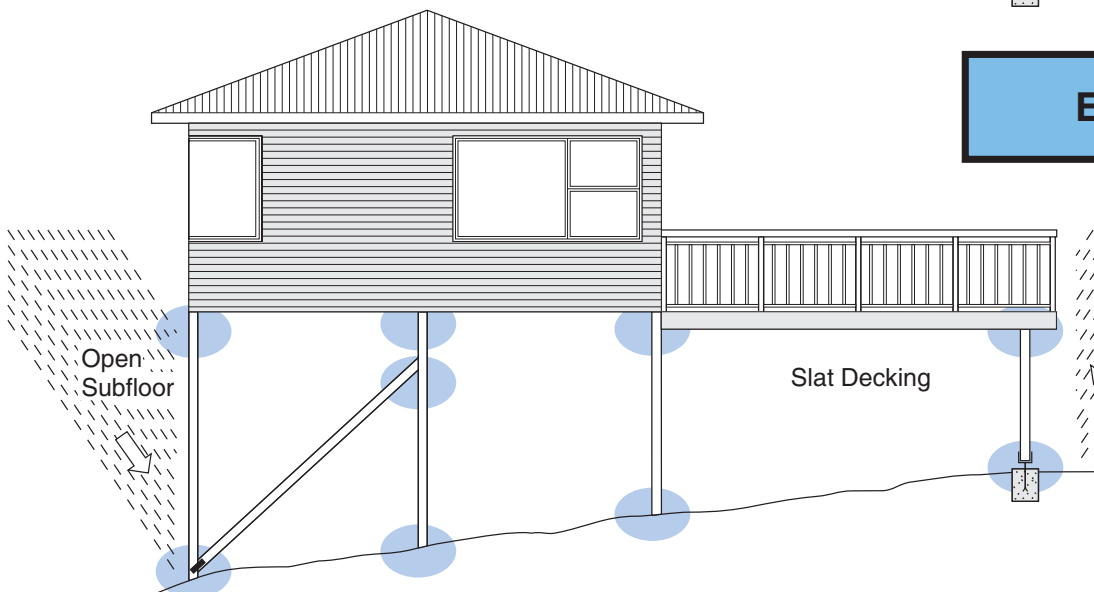
CLOSED

Dry, internal location, not subject to airborne salts or rain wetting.



SHELTERED

Open to airborne salts, but not rain washed.

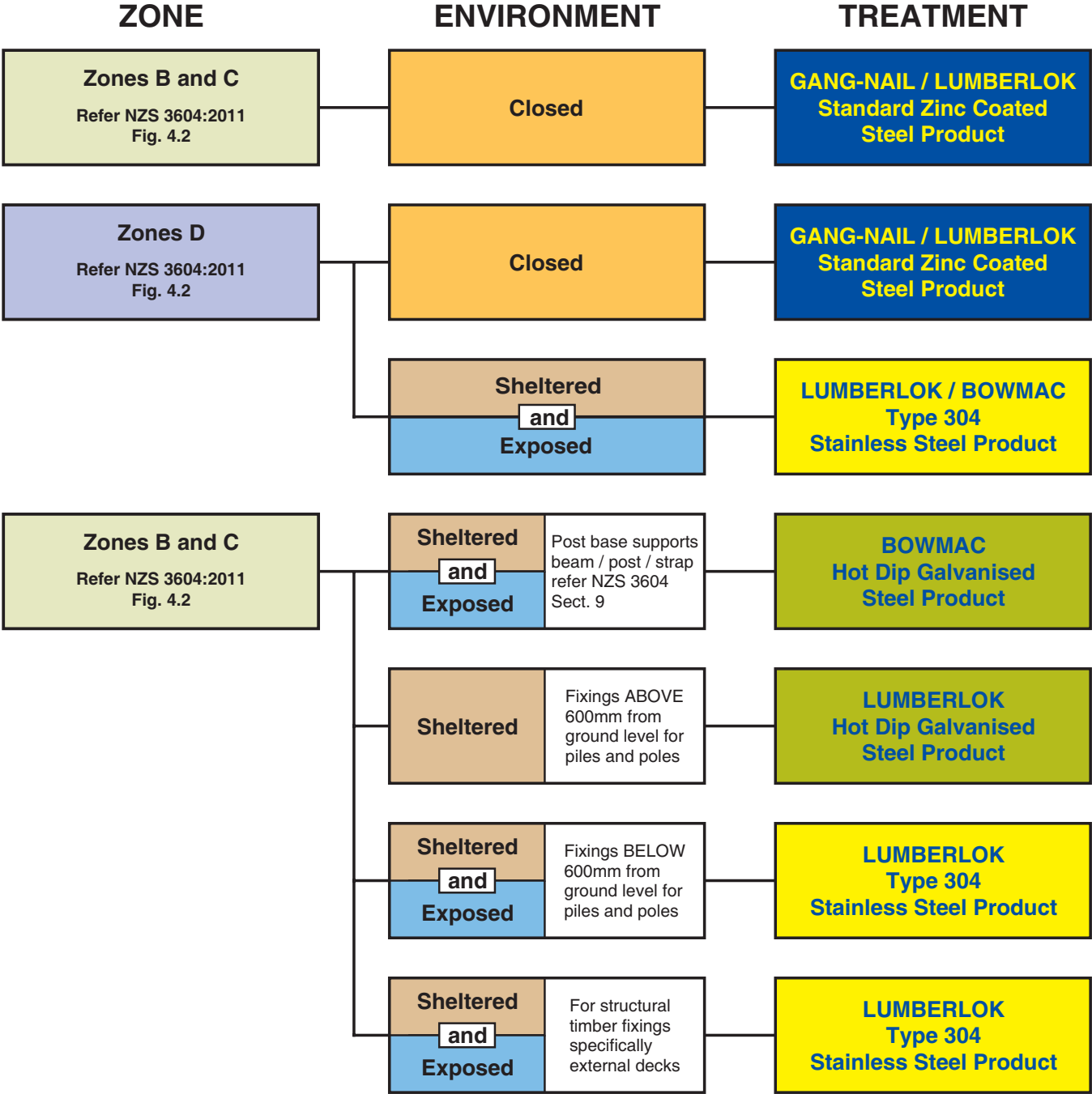


EXPOSED

Open to airborne salts and rain washed.

DURABILITY FLOW CHART

4. DURABILITY



Product Key

Standard Zinc Coated Steel Product

Hot Dip Galvanised Steel Product

Type 304 Stainless Steel Product

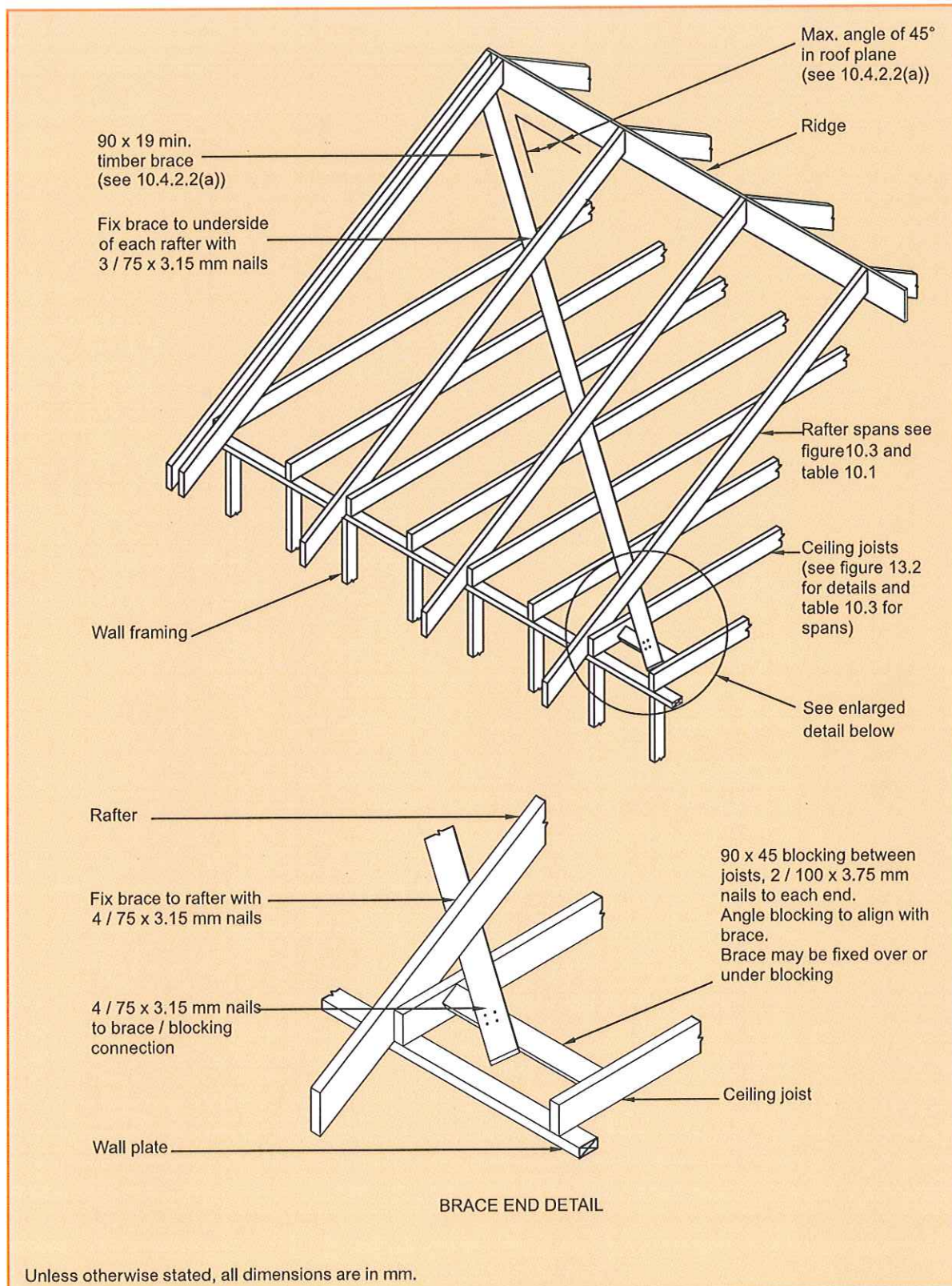


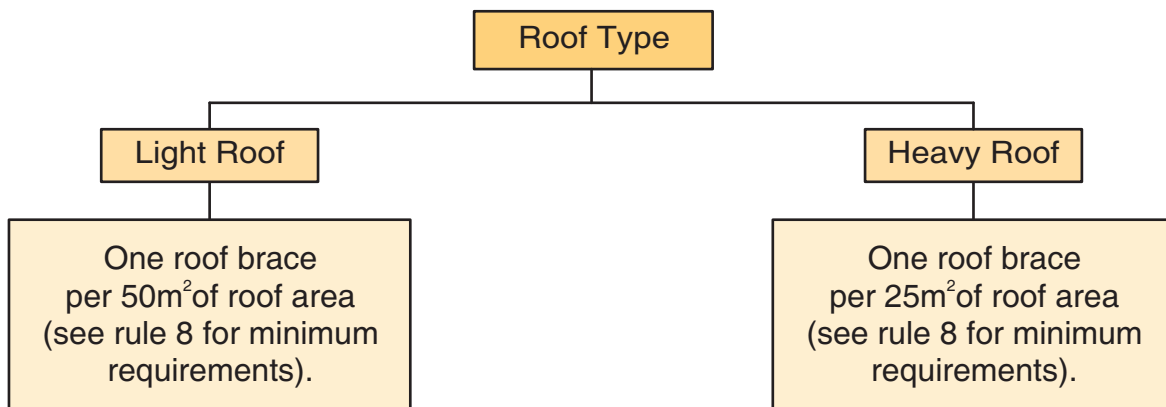
Figure 10.22 – Roof plane diagonal brace – Timber (see 10.4.2)



ROOF BRACING SPECIFICATION AS PER NZS 3604:2011

- ★ 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.

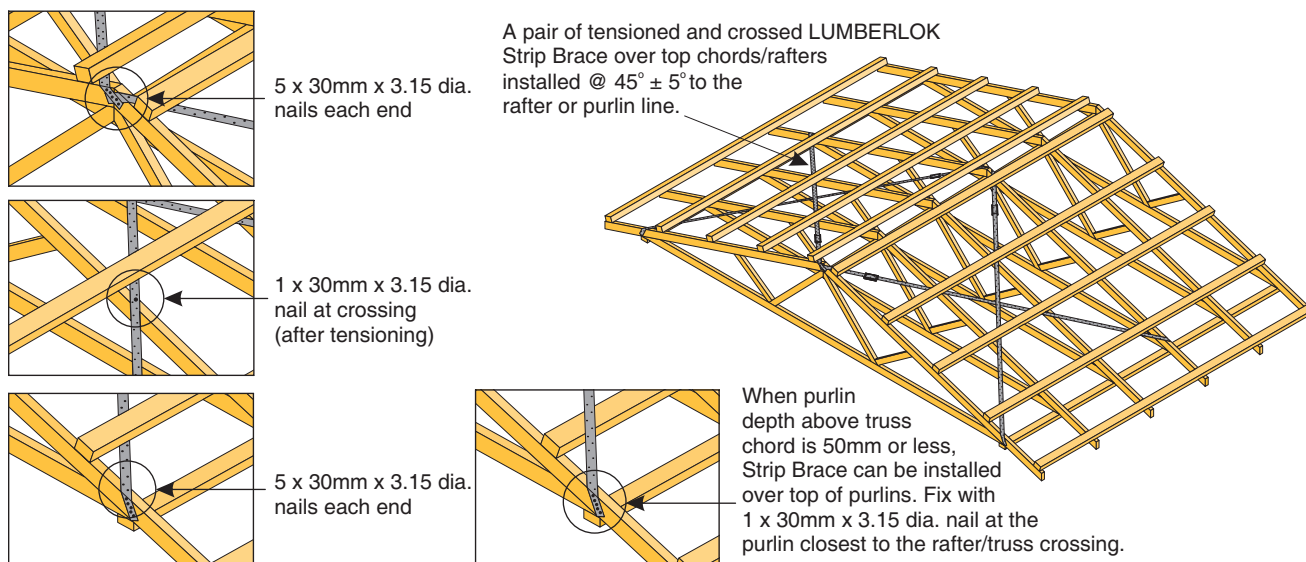
i) ROOF PLANE BRACE

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

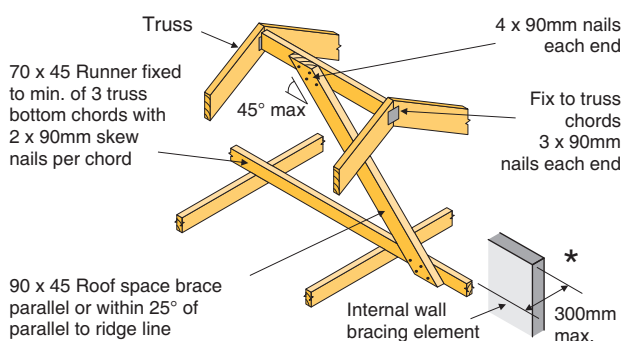
OR

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

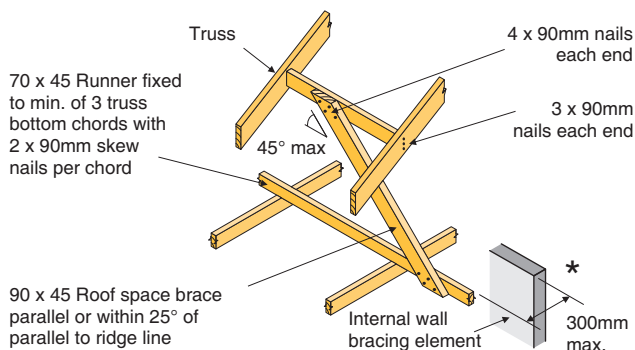


ii) ROOF SPACE BRACE

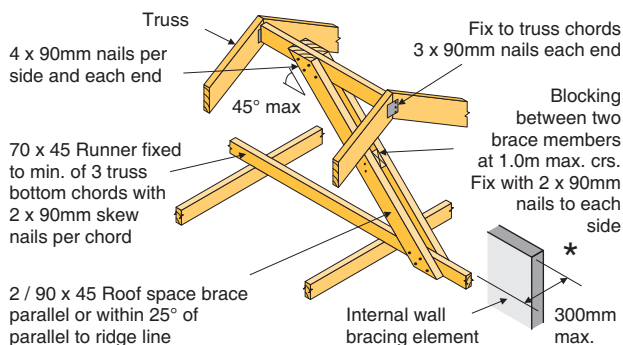
(A) Less than 2m long.



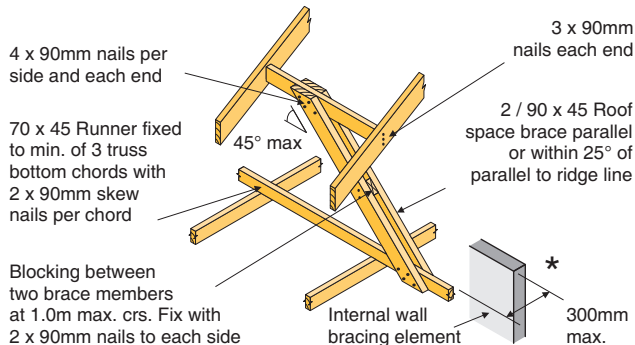
(C) Not directly under the ridge - less than 2m long.



(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.

SECTION 10 – ROOF FRAMING

NZS 3604:2011

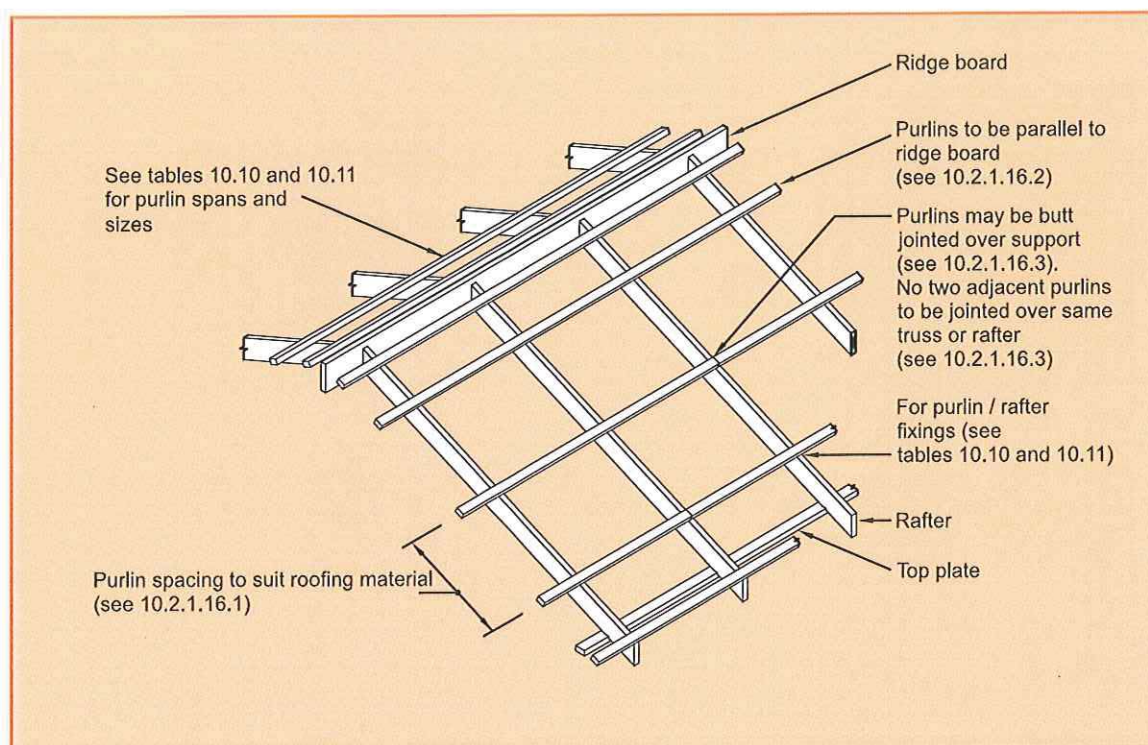


Table 10.12 – Tile battens for all wind zones (see 10.2.1.16.7)

Tile batten size	Max. span	Maximum spacing and fixing in the following wind zones									
		Low		Medium		High		Very high		Extra high	
		Spacing	Fixing	Spacing	Fixing	Spacing	Fixing	Spacing	Fixing	Spacing	Fixing
(mm)		(mm)		(mm)		(mm)		(mm)		(mm)	
Light roof cladding											
50 x 40	900	370	R	370	R	370	S	370	S	370	T
50 x 50	1200	370	R	370	S	370	T	370	T	370	T
Heavy roof cladding											
50 x 25	480	370	R	370	R	370	R	370	R	370	R
50 x 40	600	370	R	370	R	370	R	370	R	370	R
50 x 50	900	370	R	370	R	370	R	370	R	370	R
Fixing type		Description							Alternative fixing capacity (kN)		
R		1 / 90 x 3.15 gun nail							0.55		
S		2 / 90 x 3.15 gun nails							0.8		
T		1 / 10g self-drilling screw, 80 mm long							2.4		

10.2.1.17 Dummy rafters**10.2.1.17.1**

Dummy *rafters* may be laid over sheet *sarking* or ceiling *lining* material which is a maximum of 20 mm thick (see [figure 10.20](#)).

10.2.1.17.2

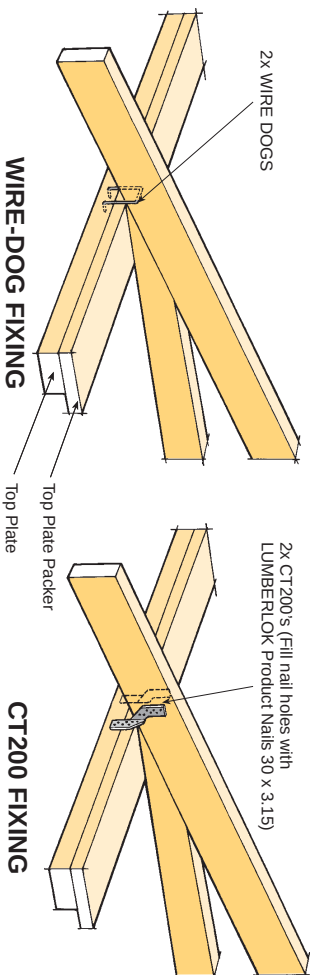
Purlin to dummy *rafter* and dummy *rafter* to *rafter* fixings shall be as given by [table 10.13](#) and [figures 10.19](#) and [10.20](#).



LUMBERLOK TRUSS FIXING CHART

RAFTER TRUSS TO TOP PLATE FIXINGS

(All WIRE DOG & CT200 fixings are into the top plate NOT the packer)



WIRE-DOG FIXING

LOAD DETAILS
Truss Span 3000 - 10000 Low to Medium Wind
Roof Weight Heavy or Light
Truss Centres 900 max.
Snow Load to 1.0 kPa

CT200 FIXING

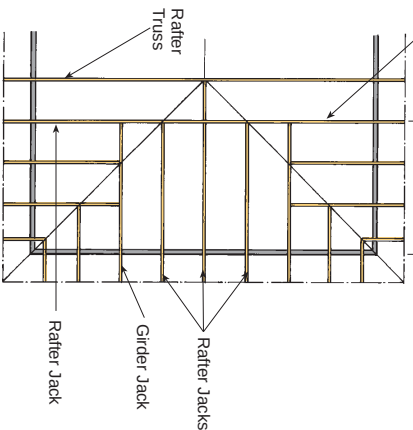
LOAD DETAILS
Truss Span 6000 - 15000
Wind Low to Very High
Roof Weight Heavy or Light
Truss Centres 900 max.
Snow Load to 1.0 kPa

GIRDER TRUSS TO TOP PLATE FIXING

All girder trusses up to a span of 9000 and the above load details are to be fixed to the top plate using the CT200 FIXING shown above

JACK TRUSS FIXINGS

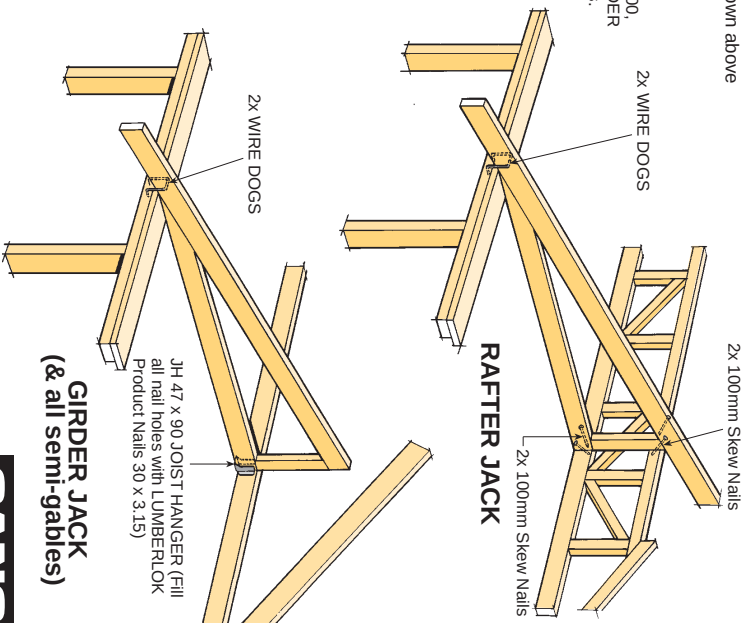
Truncated Girder (or semi-gable) *3100 max. JACK for all load cases. *For setbacks up to 4000, use fixings as per GIRDER JACK



LOAD DETAILS

Truss Span 3100
Max. Wind High
Roof Weight Heavy or Light
Truss Centres 900 max.
Snow Load to 1.0 kPa

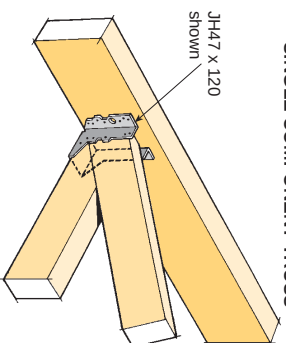
*For Very High Wind, fix rafter jack as per GIRDER JACK



GIRDER JACK (& all semi-gables)

RAFTER TRUSS TO TRUSS FIXINGS

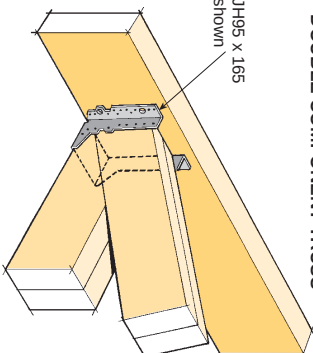
1. RIGHT ANGLE JOINTS SINGLE COMPONENT TRUSS



LOAD DETAILS SINGLE & DOUBLE COMPONENT TRUSS

Truss Span 12000
Wind Low to Very High
Roof Weight Heavy or Light
Truss Centres 900 max.
Snow Load up to 1.0 kPa
Max. Supported Truss Span 12000

DOUBLE COMPONENT TRUSS

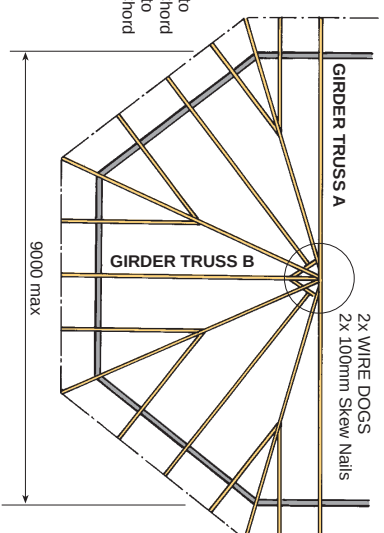
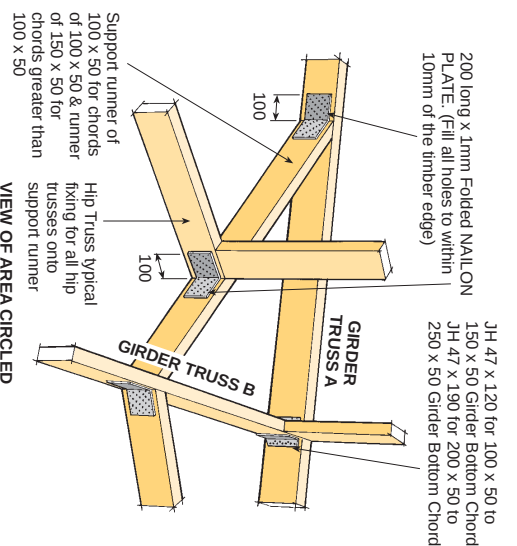


Joist Hanger Size Single Component Truss

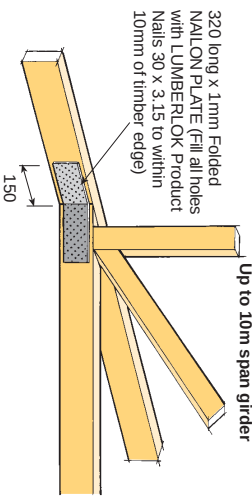
JH 47 x 120 on Girder Bottom Chords up to 150 x 50 deep
JH 47 x 190 on Girder Bottom Chords of 200 x 50 deep and above
In all cases the max. area of roof supported (i.e. setback x supported truss span) not to exceed 48m²
Joist Hanger Size Double Component Truss - JH 95 x 165
Fill all holes with LUMBERLOK Product Nails 30 x 3.15

2. ANGLE JOINTS - Octagonal Roof

LOAD DETAILS
Max Supported Truss Span 9000
Wind Low to Very High
Roof Weight Heavy
Supported Truss Centres 900 max.
Snow Load to 1.0 kPa



Boomerang Roof



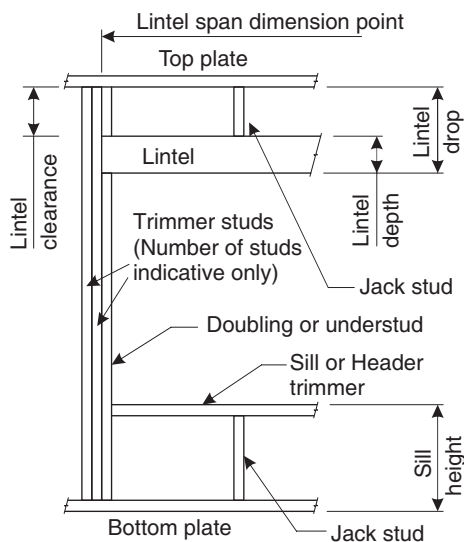


LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

NOTE:

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

DEFINITIONS



Lintel Supporting Girder Trusses:

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

Notes:

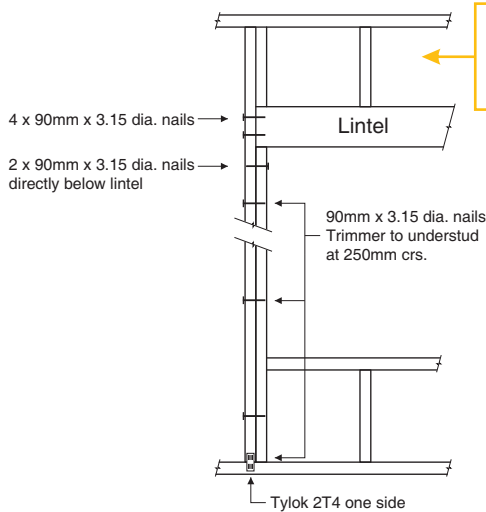
- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
- 2) Assumed girder truss is at mid-span or middle third span of lintel
- 3) Use similar fixings for both ends of lintel
- 4) All other cases require specific engineering design

SELECTION CHART FOR LINTEL FIXING

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

LINTEL FIXING OPTIONS

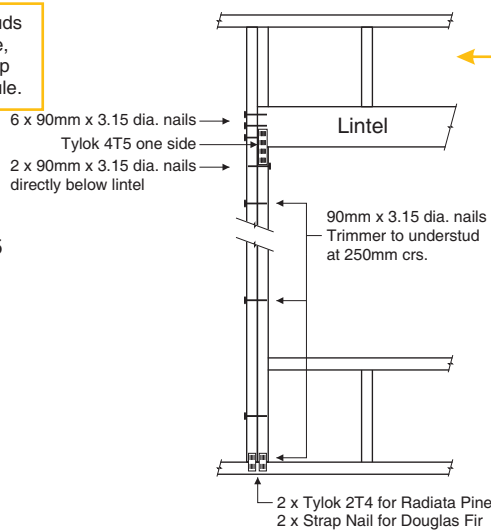
TYPE E 1.4 kN



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

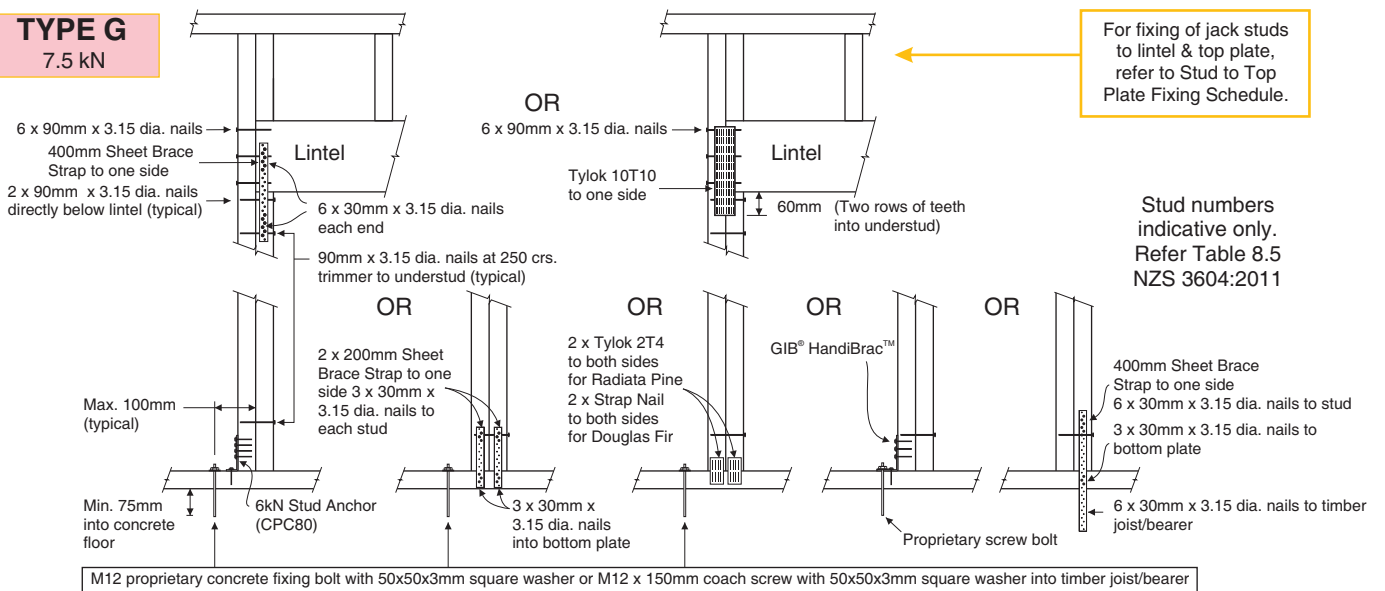
TYPE F 4.0 kN



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

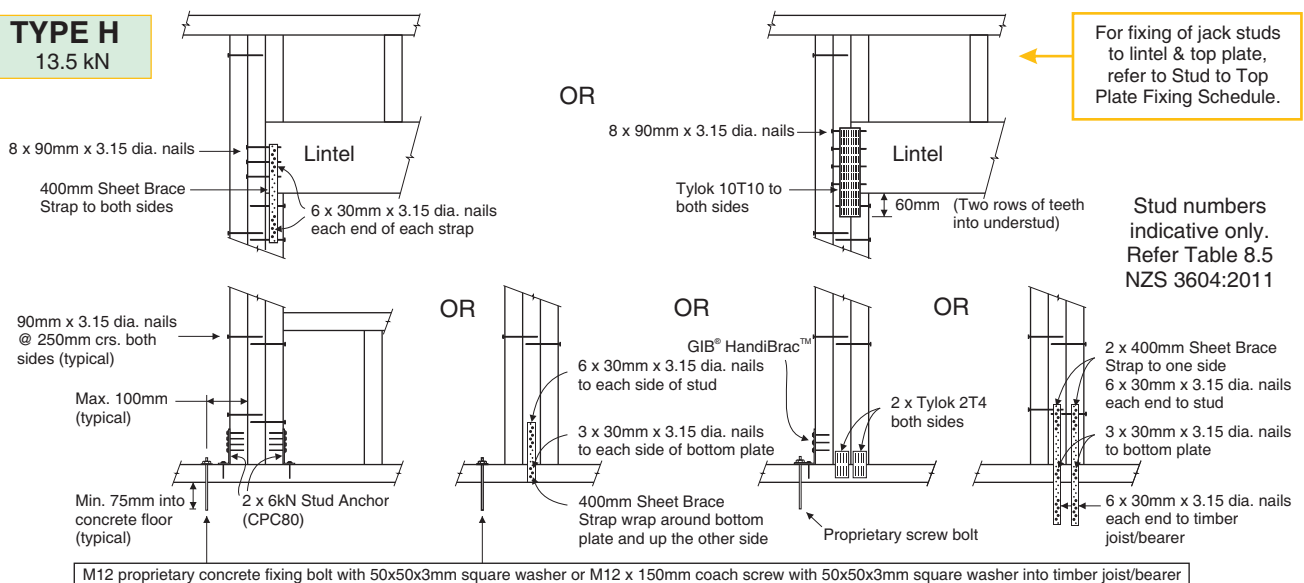
TYPE G 7.5 kN



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

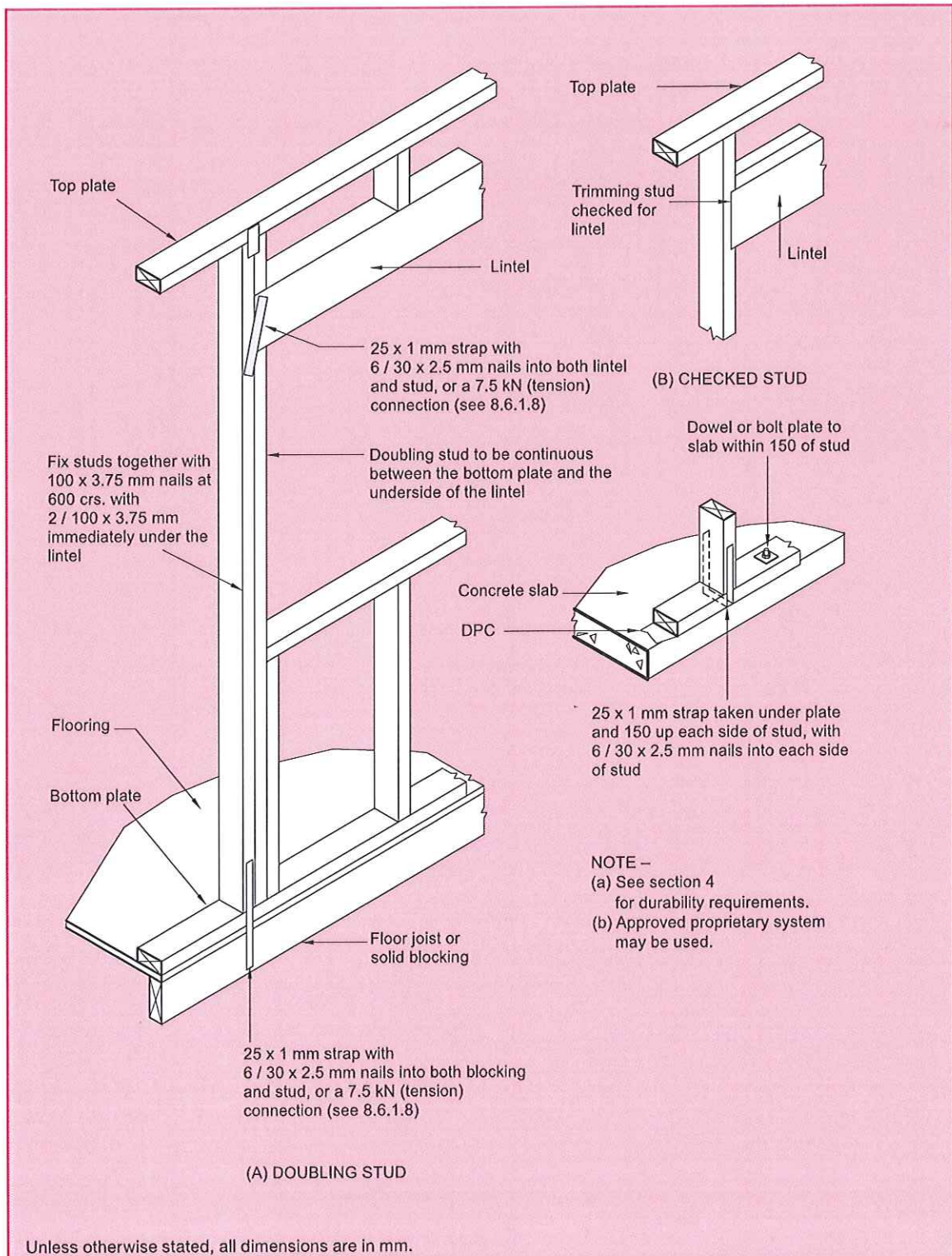


Figure 8.12 – Lintel fixing to prevent uplift (see 8.6.1.8 and table 8.14 (a) and (b))

THERMAKRAFT 215

BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

APPLICATION AND INSTALLATION

Product Description

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY is specifically designed for use in Domestic and Commercial type buildings.

THERMAKRAFT 215 is a breathable, absorbent bituminous wall and roofing underlay.

THERMAKRAFT 215 will provide the following functions:

- Reduce wind entry into the cavity, thereby assisting the performance of thermal insulation.
- Highly water vapour permeable, thereby allowing excess water vapour which might otherwise condense in the structure, to escape.
- Provides a temporary protection against wind, dust, rain and other weathering elements until the external cladding is applied.

Applications

THERMAKRAFT 215 is suitable as a wall and roofing underlay where Fire Retardancy is **NOT** required, and with all cladding types.

THERMAKRAFT 215 is self supporting to 1200mm rafter/purlin spacing.

THERMAKRAFT 215 can be used as an Air Barrier.

THERMAKRAFT 215 must not be left exposed to the elements for more than 7 days.

Cladding on the same day is recommended. If Fire Retardancy (FI <5) is required, use

Thermakraft COVERTEK407.

Installation Roofing

THERMAKRAFT 215 may be run vertically over purlins with a 150mm lap if roof pitch >8 degrees. Fix securely to purlins with 8mm staples or 20mm clouts. The membrane should be firmly laid to avoid excessive dishing between purlins.

THERMAKRAFT 215 may be run horizontally across rafter/trusses with a 150mm lap for roof pitches above 3 degrees. Fix securely with 8mm staples or 20mm clouts.

Control of Condensation

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

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

Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer MRM Code of Practice for details.

Storage

THERMAKRAFT 215 should be stored on end in dry conditions. Protect from the weather and direct sunlight.

Roll Dimensions

1250mm x 40.0m = 50m ²	20kg
1250mm x 20.0m = 25m ²	10kg (2 per pack)
1450mm x 34.5m = 50m ²	20kg

For more information regarding **Thermakraft COVERTEK407 FIRE RETARDANT SELF SUPPORTING ABSORBENT BREATHABLE SYNTHETIC NON WOVEN ROOFING UNDERLAY** refer to the "DESIGNER and USER GUIDELINES" - Direct and Cavity Fix, or contact **Thermakraft Customer Services on 0800 806 595.**

THERMAKRAFT 215

BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

TECHNICAL SPECIFICATIONS

Technical Data

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY complies with the requirements of NZBC E2/AS1 Table 23.

Nominal Grammage 400g/m²

NZBC E2/AS1 TABLE 23 AS A WALL UNDERLAY REQUIREMENTS

NZBC E2/AS1 TABLE 23 WALL UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥100 gsm	Pass
Vapour Resistance	≤7 MN.s/g	Pass
pH of Extract	≥6 and ≤9	Pass
Shrinkage	≤0.5%	Pass
Water Resistance	≥100mm	Pass
Air Barrier	≥0.1 MN.s/m ³	Pass
Duty		Heavy

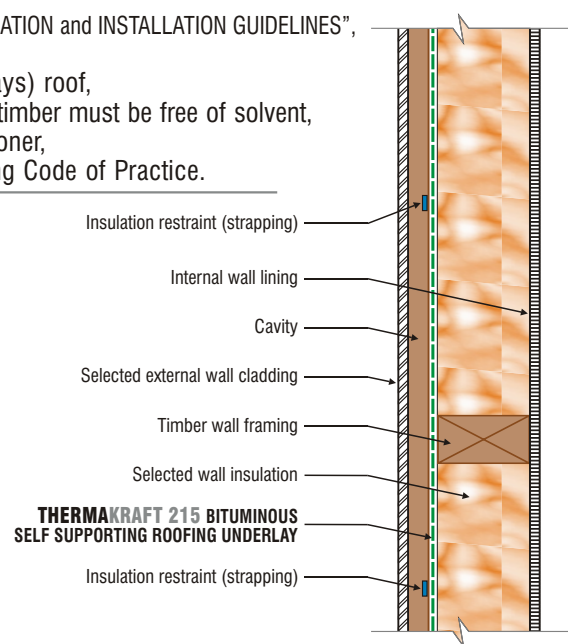
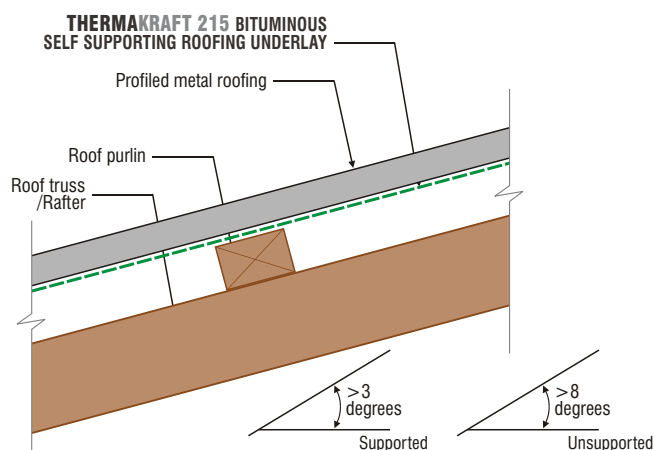
NZS2295:2206 Classification

Flammability Index		Non Fire Retardant
Wind Zone	R2	Up to Very High
NZS2295:2006 Classification	R2	Self Supporting

Durability/Limitations

For **THERMAKRAFT 215** to meet the Performance Requirements of NZBC Clause B2, Durability B2.3.1(a) 50 years and B2.3.1(b) 15 years, E2 External Moisture, **THERMAKRAFT 215**:

- must be installed in accordance to the "APPLICATION and INSTALLATION GUIDELINES",
- run length no greater than 10 metres,
- is not left exposed for more than (7 days) roof,
- when used on LOSP treated timber, the timber must be free of solvent,
- installed by a licensed building practitioner,
- installed in accordance with the Roofing Code of Practice.



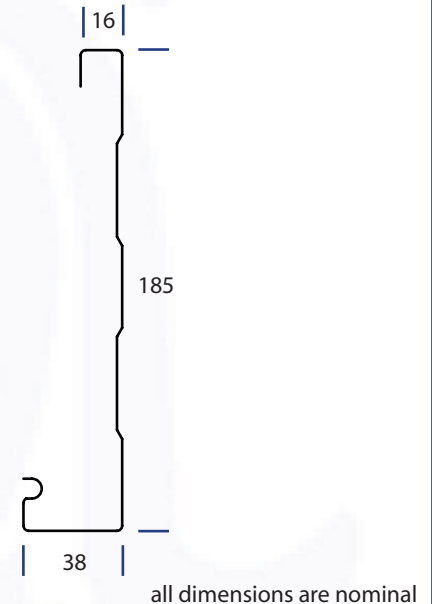
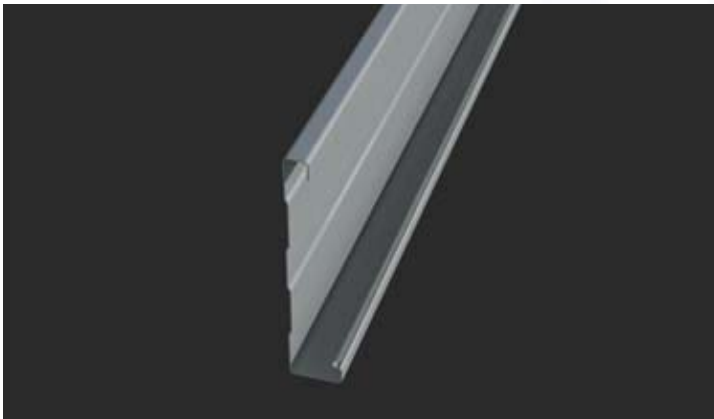
The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards.

Metalline Fascia 185mm

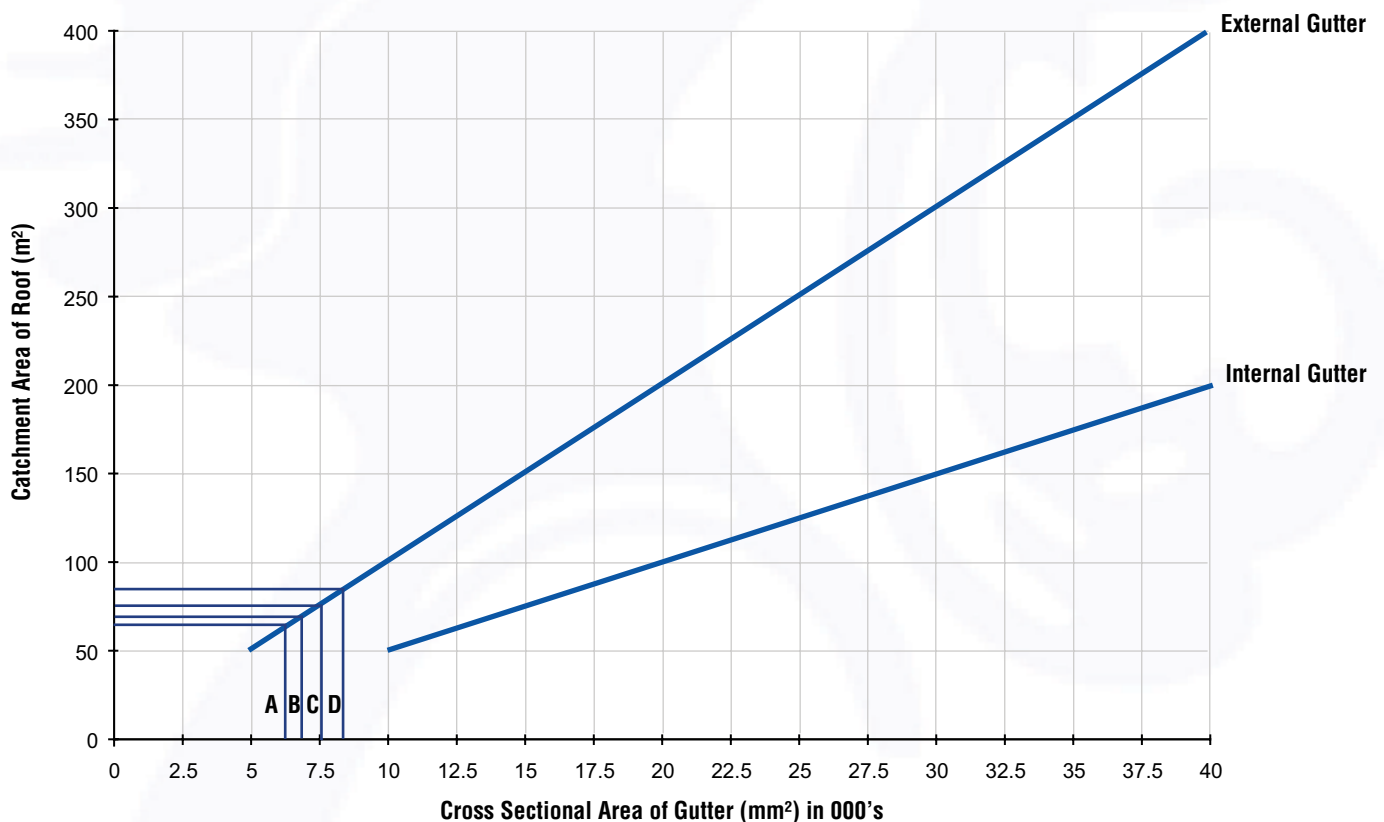
Metalline Fascia 185mm is used on both eave line and gables in conjunction with Metalline Quad Gutter to provide a quality Fascia and Gutter Solution. Metalline Fascia is also compatible with most gutter profiles and looks great with any residential roof finish. Metalline Fascia is available in Zinalume, Colorsteel Endura and Colorsteel Maxx. Please consult your nearest Metalcraft branch for timberwork set out details if you are unsure as there is some variances between different sized fascia systems.

Cross-sectional Area:

- Metalline Fascia 185mm with Metalline Quad Gutter = 5550mm² (A)
- Metalline Fascia 185mm with Squareline Gutter = 6090mm² (B)
- Metalline Fascia 185mm with Hiline Gutter = 7550mm² (C)
- Metalline Fascia 185mm with Box Gutter 125mm = 8435mm² (D)



Catchment Area of Roof v Cross Sectional Area of Gutter



Note: The graph is based on a rainfall intensity of 100mm / hour and roof pitches less than 10 degrees.
For more information on roof catchment areas and the effect of gutter cross sectional areas download the document on Roof Drainage

Manufacturing Locations Auckland, Christchurch

Metalline Fascia 185mm is available for purchase from all Metalcraft branch locations

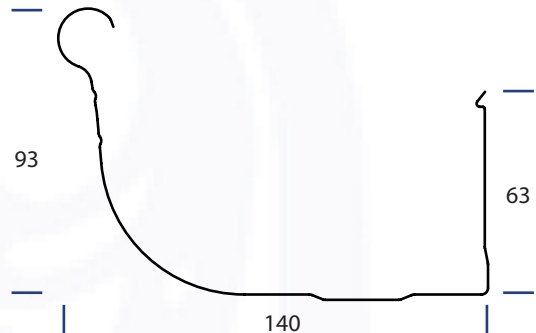
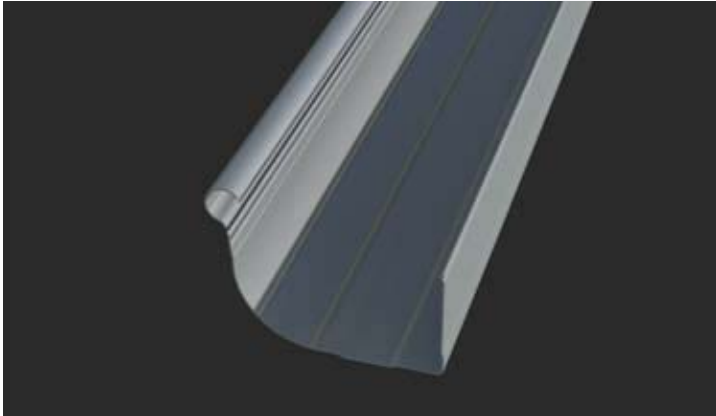
www.metalcraftroofing.co.nz

Metalline Quad Gutter

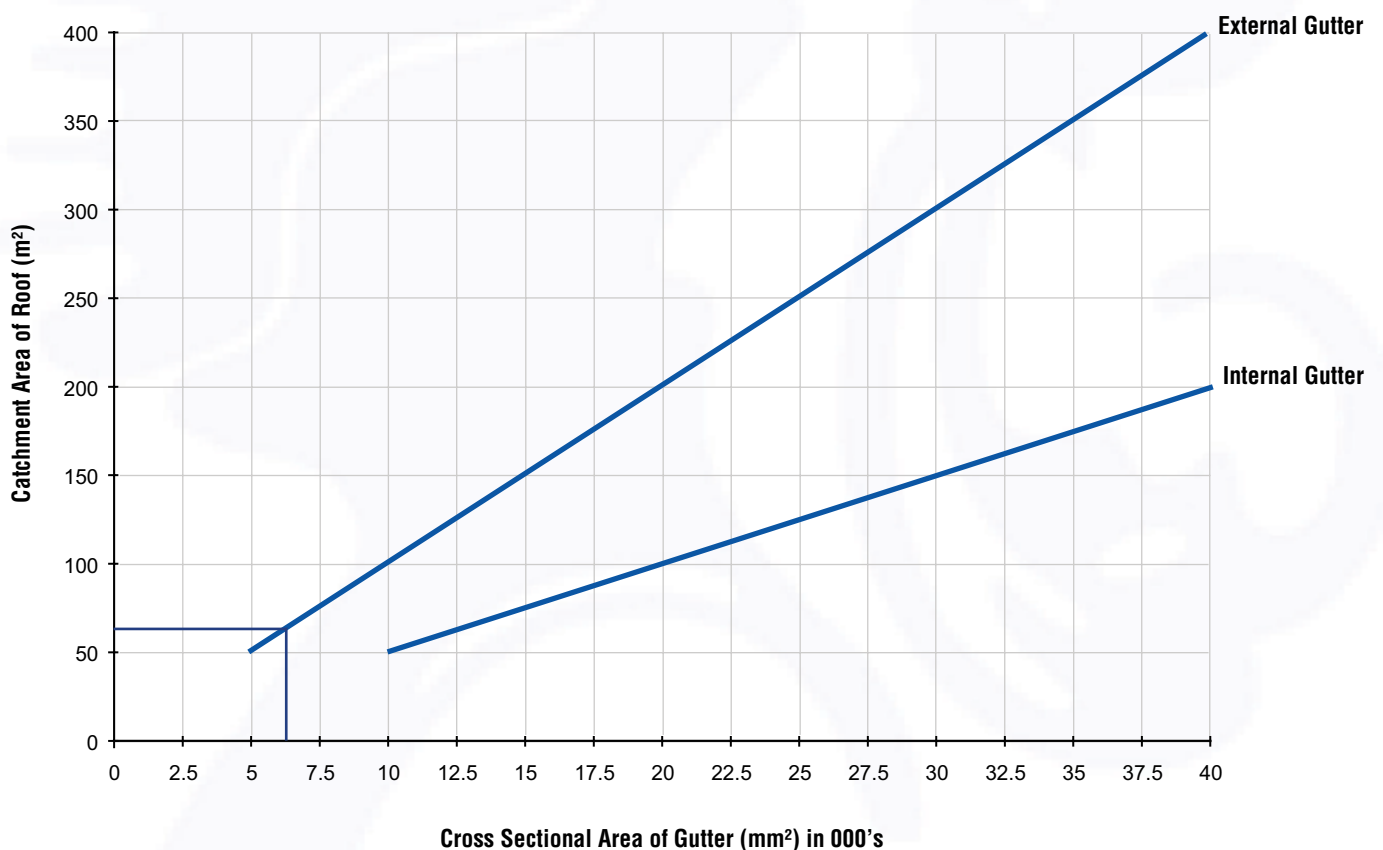
In Christchurch product is known as Colonial Quad Gutter

Metalline Quad Gutter is our most popular residential profile. Whether you are renovating or involved in a new build, this profile will enhance the appearance of your home. The Metalline system uses concealed brackets and is compatible with Metalcraft Metalline Fascia or timber fascia. Metalline Quad Gutter is available with overflow slots to prevent flooding from blockages, and snow straps are stocked to suit this profile if required. Metalline Quad Gutter is available in Zincalume, Galvsteel, Colorsteel Endura and Colorsteel Maxx.

Cross-sectional Area: 5550mm²



Catchment Area of Roof v Cross Sectional Area of Gutter



Note: The graph is based on a rainfall intensity of 100mm / hour and roof pitches less than 10 degrees.
For more information on roof catchment areas and the effect of gutter cross sectional areas download the document on Roof Drainage

Manufacturing Locations Auckland, Christchurch

Metalline Quad Gutter is available for purchase from all Metalcraft branch locations

www.metalcraftroofing.co.nz

Round Downpipe

Round downpipe is a simple yet effective method for transporting water from the gutter to the drain and is available in a range of sizes. Round downpipe is available in plain and painted with a variety of metal substrates.

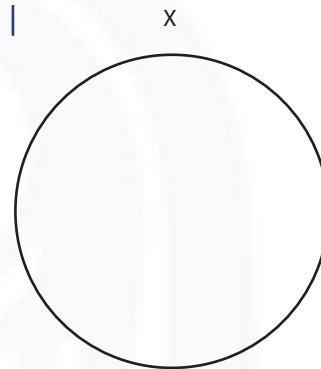
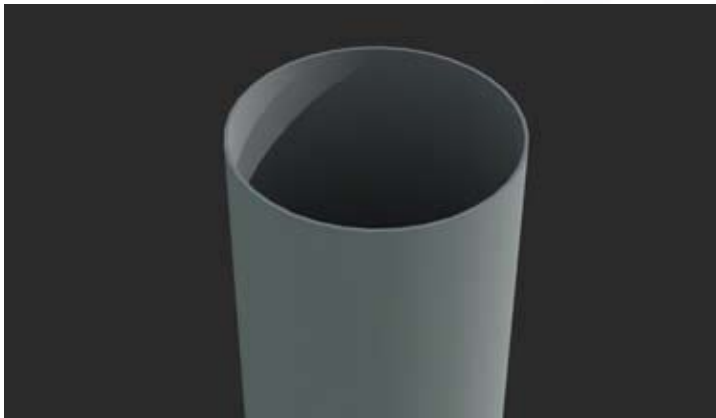
Cross-sectional Area:

Round Downpipe 65mm = 3318mm² (A)

Round Downpipe 80mm = 5027mm² (B)

Round Downpipe 100mm = 7854mm² (C)

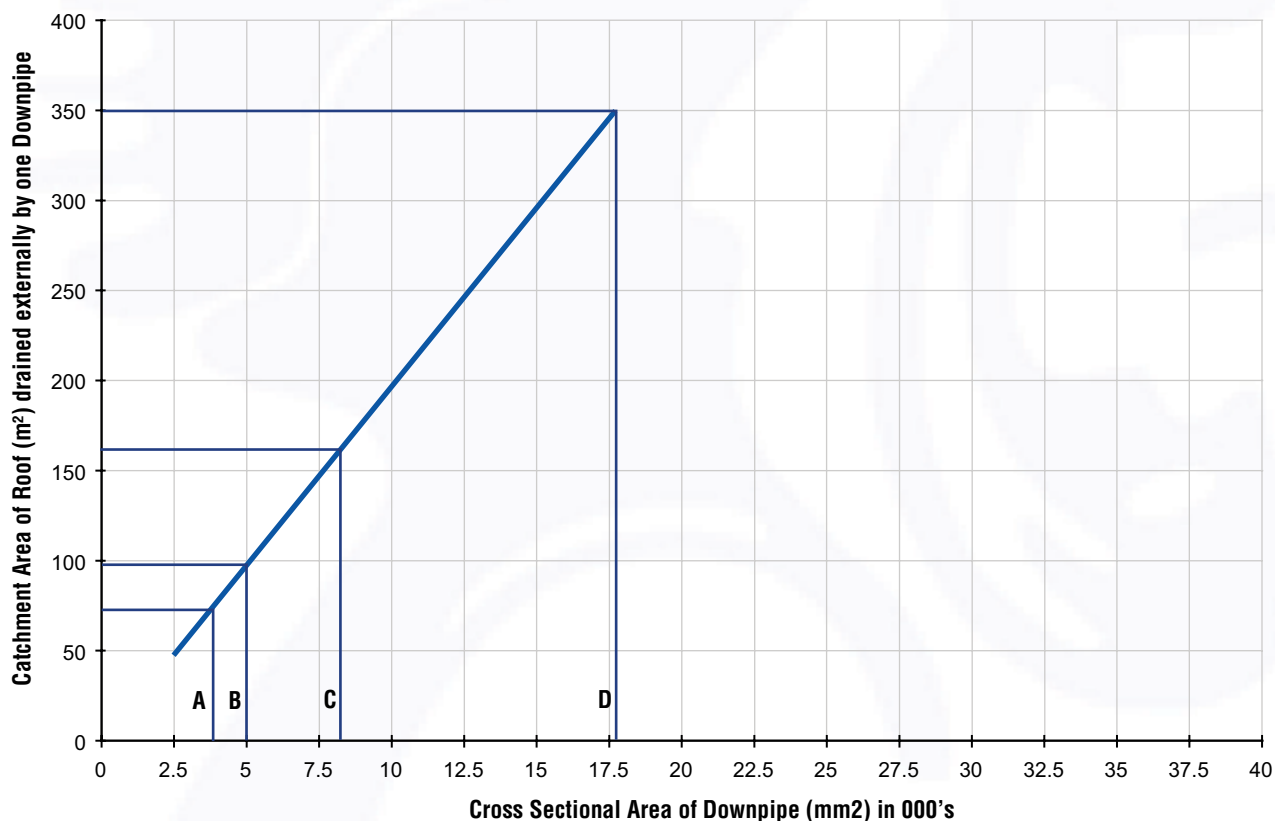
Round Downpipe 150mm = 17671mm² (D)



X = 65mm
80mm
100mm
150mm

Please note: PVC Downpipes are also available and can be sourced in sizes greater than 150mm

Catchment Area of Roof v Cross Sectional Area of Downpipe



Note: The graph is based on a rainfall intensity of 100mm / hour and roof pitches less than 10 degrees. For more information on roof catchment areas and the effect of gutter cross sectional areas download the document on Roof Drainage

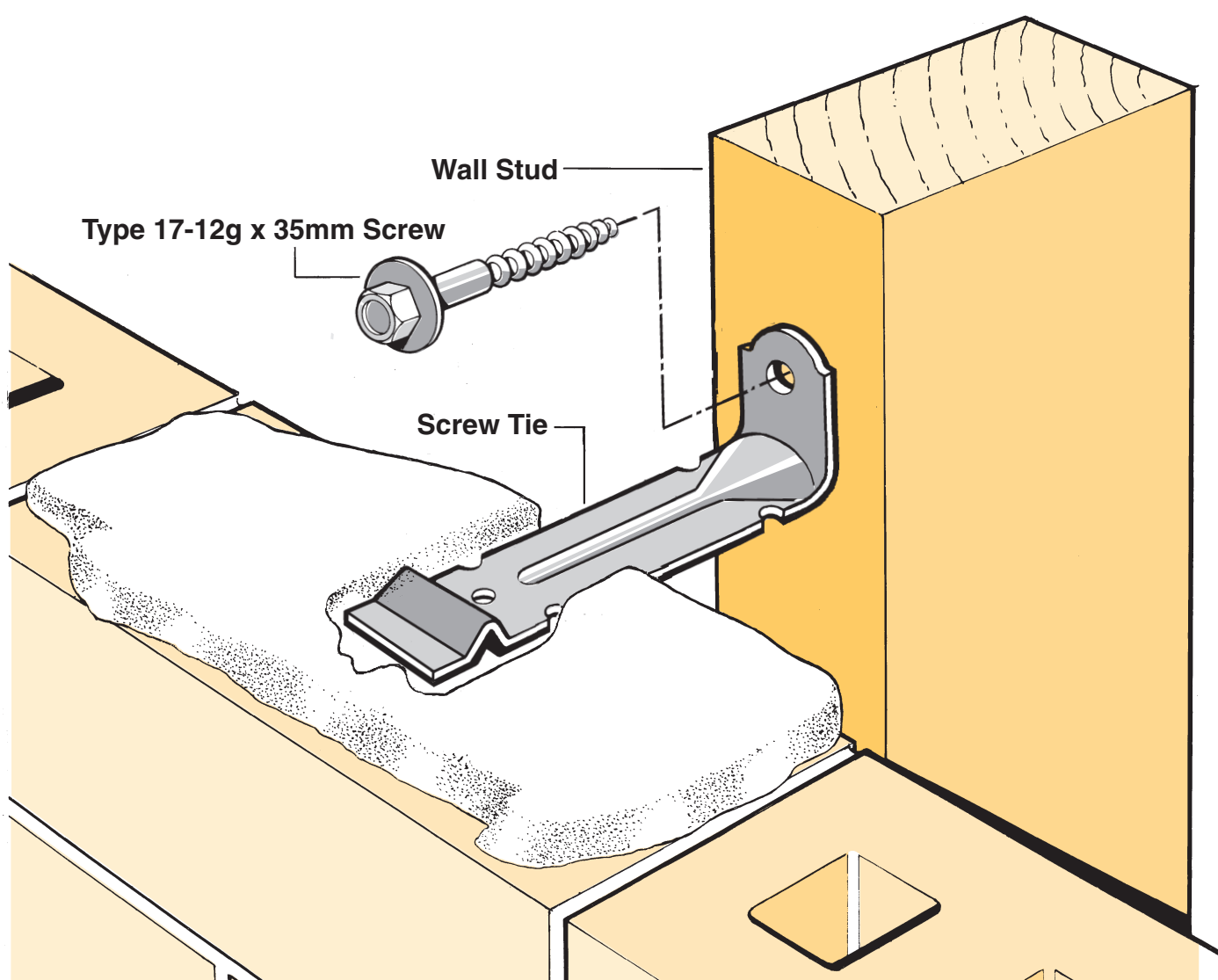
Manufacturing Locations Metalcraft does not currently manufacture Round Downpipe but has access to the product via secondary suppliers.

Round Downpipe is available for purchase from all Metalcraft branch locations

www.metalcraftroofing.co.nz

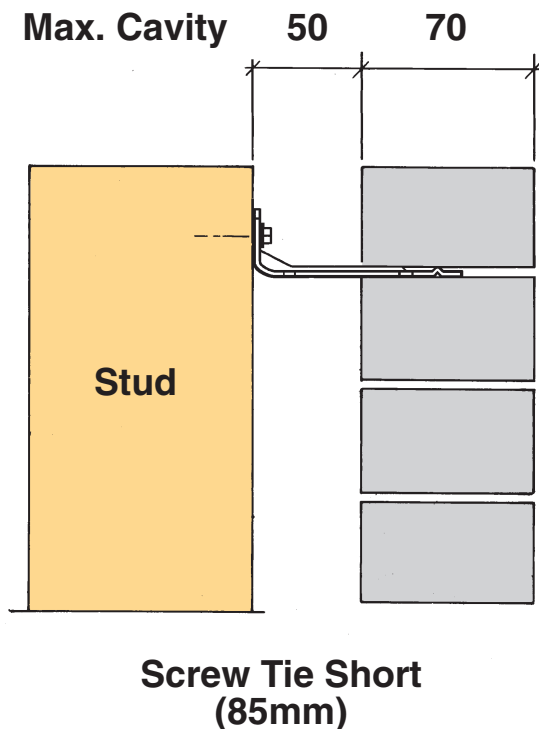
SCREW TIES FOR BRICK VENEER FIXING

- ★ Medium duty (EM) classification
- ★ Tested by BRANZ in accordance with AS/NZS 2699.1:2000
- ★ BRANZ test report No. ST0725 November 2007
- ★ Suitable for both 'dry bedding' and encapsulated mortar
- ★ Hot Dip Galvanised ties for Zones B & C, and Stainless Steel Grade 316 ties for Zone D meet NZS 3604:2011 Sect. 4 Durability
- ★ Available in 85mm and 105mm sizes

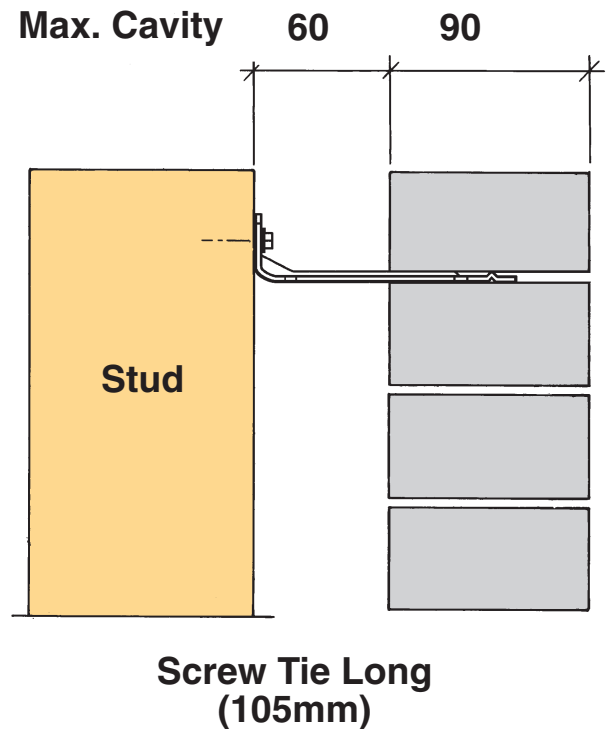


**Available from leading Builders Supply Merchants
throughout New Zealand**

70 SERIES BRICK



90 SERIES BRICK



- ★ All brick work must be constructed in accordance with NZS 4210:2001 Masonry Construction:Materials and Workmanship. Screw Ties must be applied accordingly and are not to be hammered into timber framing.
- ★ Water shedding shoulder prevents transfer of the moisture from tie to building.
- ★ Nail hole for Oamaru Stone.
- ★ Angled neck encourages increased tie embedment in mortar.

Material: 1.2mm NZCC-SD Hot Dip Galvanised Steel
Screws: Type 17-12g x 35mm Hex Head Hot Dip Galvanised Screws
Packaging: 250 ties per box including screws

Also available in Stainless Steel Grade 316 for Zone D.



Battens

Ceiling diaphragms may be constructed using steel or timber ceiling battens.

Battens shall be spaced at a maximum of:

- 500mm for 10mm GIB® Plasterboard
- 600mm for 13mm GIB® Plasterboard

Timber battens shall be fixed in accordance with the requirements of NZS 3604:2011.

Steel battens shall be GIB® Rondo® battens or similar with a minimum base metal thickness (BMT) of 0.55mm with two external flanges of 8mm to allow direct screw fixing to roof framing.

Steel battens shall be fixed with 2/32mm x 8g GIB® Grabber® wafer head self tapping screws to supporting framing.

Steel battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten.

For steel battens a steel channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® wafer head self tapping screws at 300mm centres maximum.

The linings are fastened to the perimeter channel in case (a) with 25mm x 6g self tapping screws at 150mm centres and in case (b) to the 140mm x 35mm top plate with 32mm x 6g GIB® Grabber® high thread screws at 150mm centres. Within the diaphragm area sheets may be fastened as described in 'General Fixing Requirements for GIB® Ceiling Diaphragms'.

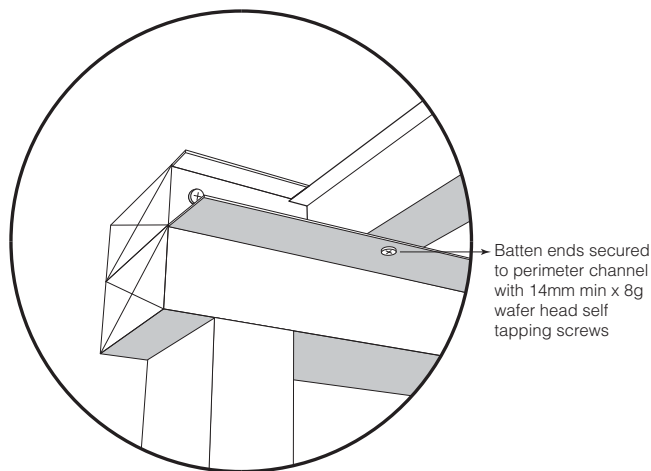
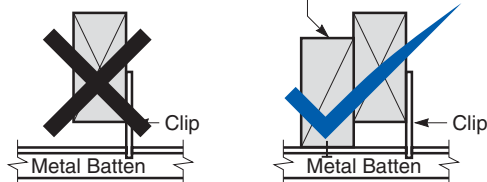
Perimeter fastenings shall be spaced at:

- 150mm for ceiling diaphragms up to 7.5m and not steeper than 15 degrees
- 100mm for ceiling diaphragms 7.5m–12m or steeper than 15 degrees

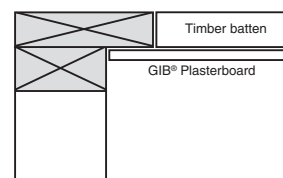
Coved ceiling diaphragms can be achieved by attaching a folded metal angle to the junction. The metal angle shall be;

- min 0.55mm BMT
- fastened at 300mm centres on each edge using 30mm GIB® Nails or 32mm x 8g GIB® Grabber® wafer head self tapping screws or similar to the roof framing.
- linings are fastened to the folded angle as specified for the perimeter at 150mm centres with 25mm x 6g self tapping screws.

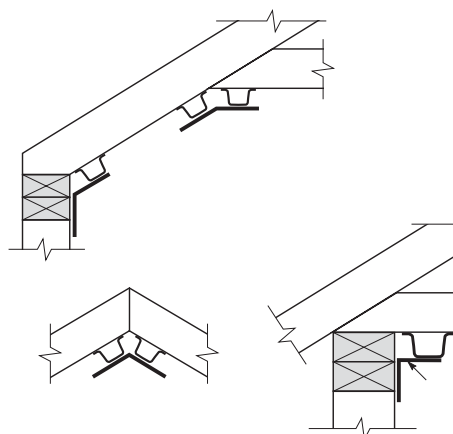
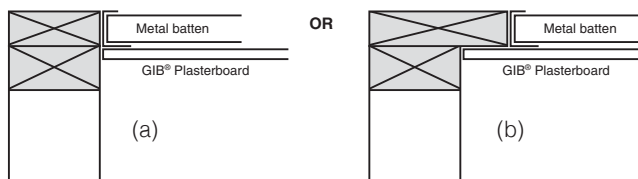
Block or continuous
Timber member
min 300mm fixed
with min 4 x 100mm
x 3.75mm Nails



Timber battens example



Steel battens with perimeter channel example





GIB® Plasterboard Linings

When fixing part sheets of GIB® Plasterboard, a minimum 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, the sheet end butt joints may be back-blocked.

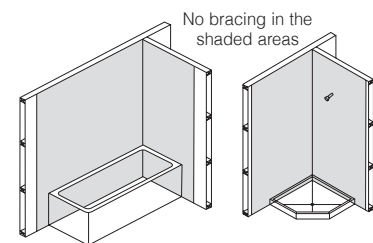
Plasterboard bracing element sheets must be fixed directly to the wall framing, eg bracing must be provided by the inner layer of a multilayer system. When a GIB® bracing element has been designated for a section of wall, BU ratings can not be increased by incorporating additional proprietary bracing 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.

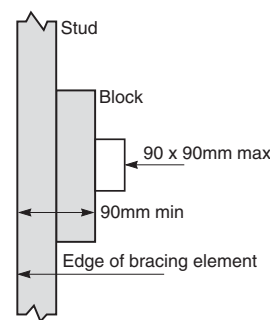
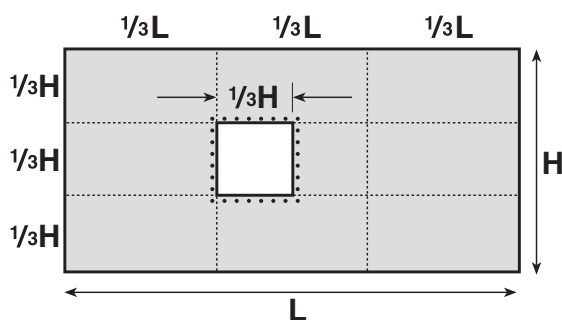


Renovation

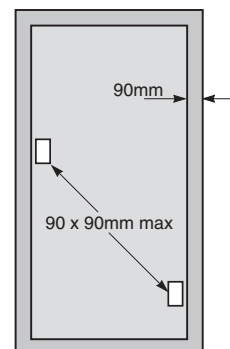
When relining walls during the process of renovation, ensure that bracing elements are reinstated (check the building plans).

Openings in Bracing Elements

Openings are allowed within the middle third of a wall bracing element's length and height. Neither opening dimension shall be more than one third of the element height. Wall linings are fixed to opening trimmers at 150mm centres. 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.



□ Small opening e.g. switch box





Framing

General framing requirements such as grade, spacings and installation shall comply with the New Zealand Building Code and the provisions of NZS 3604:2011. To achieve the published bracing performance the minimum actual framing dimensions are 90 x 35mm for external walls and 70 x 45mm for internal walls. Wall bracing tests on GIB EzyBrace® Systems were undertaken without nogs. Nogs are not considered to add to the bracing performance of the wall.

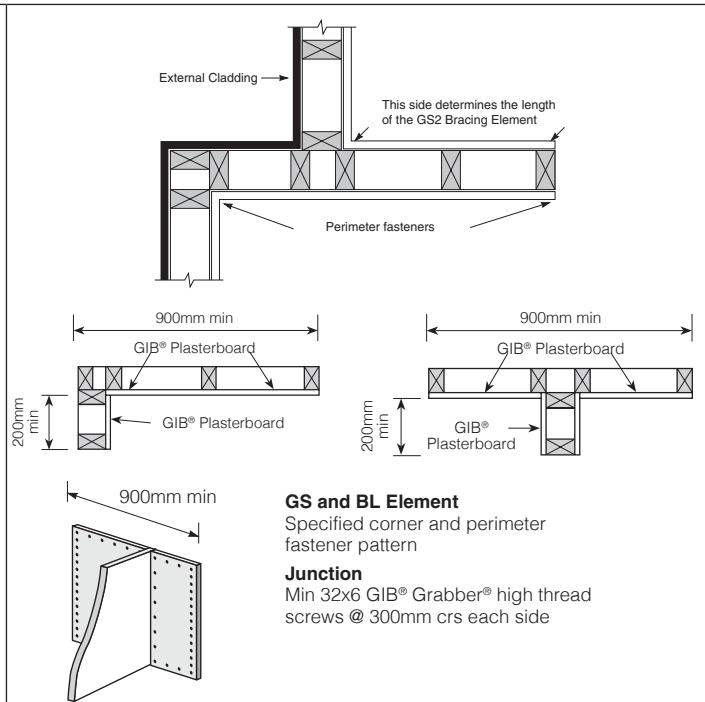
Guidelines for intersection walls

Where the lining on a double lined internal GS2 Bracing Element is shorter on one side, the length of the element is taken as the shorter wall length but bracing fasteners can still follow the wall perimeter on both sides.

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 or L junction the element is deemed to be continuous for the whole length (900mm in the example illustrated).

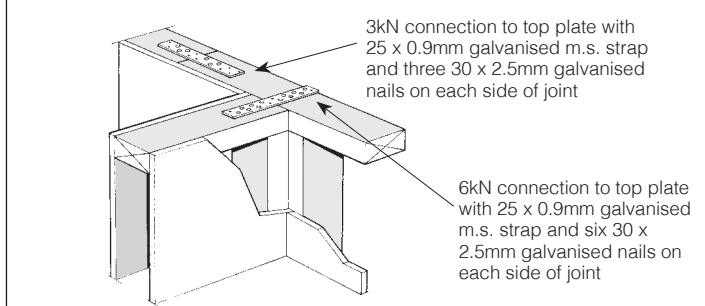
When fixing part sheets of GIB® Plasterboard, a minimum width of 300mm applies for bracing elements.



Top Plate Connections

The top plate of a wall that contains one or more wall bracing elements shall be jointed according to the rating of the highest-rated individual wall bracing element as follows:

- Rating not exceeding 100 bracing units: A 3kN connection as shown or by an alternative fixing of 3kN capacity in tension or compression along the plate;
- Rating exceeding 100 bracing units: A 6kN connection as shown or by an alternative fixing of 6kN capacity tension or compression along the plate.



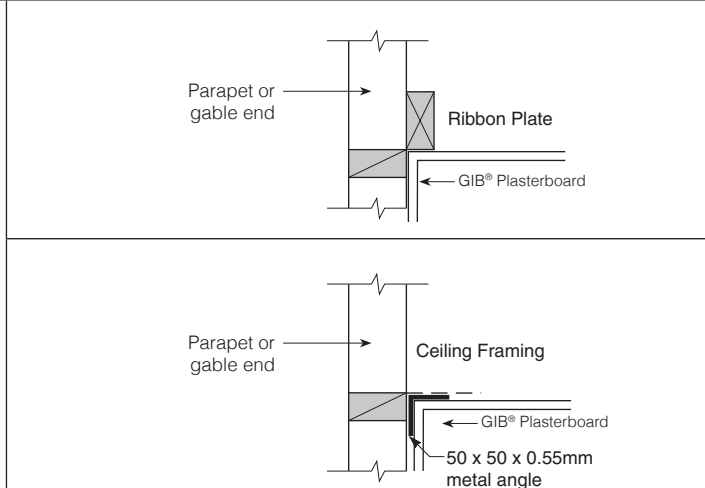
Parapets and Gable End Walls

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 90x45mm ribbon plate is fixed across the studs just above a row of nogs at the ceiling line.

OR

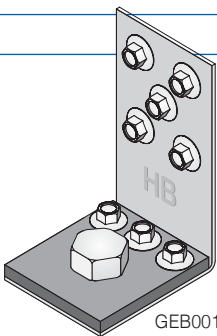
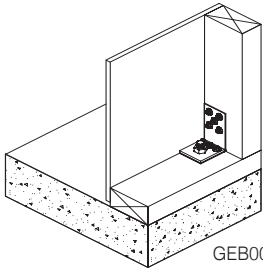
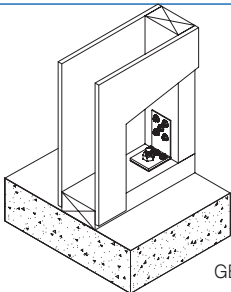
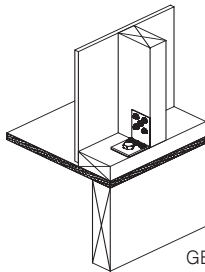
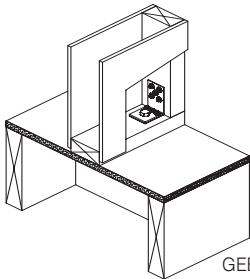
A minimum 50x50x0.55mm metal angle is installed as shown. The angle is fixed to a row of nogs with 30x2.5mm galv FH nails at 300mm centres.



	Bottom Plate Fixing	JUNE 2011
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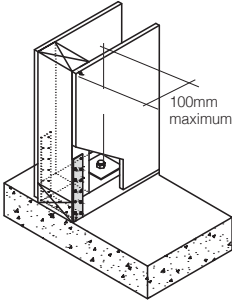
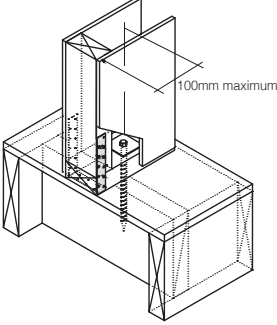
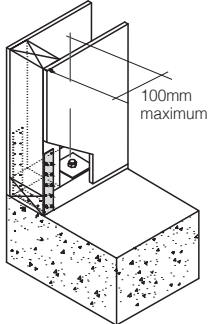
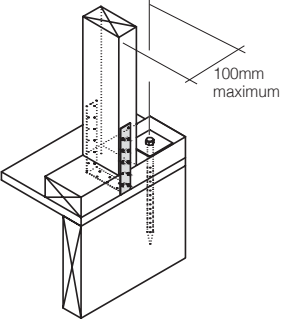
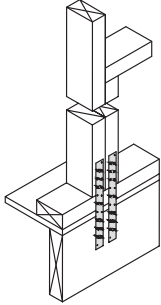
Bottom plate fixings for GIB® Bracing Elements			
Brace type	Concrete slabs		Timber floors
	External wall	Internal wall	External and Internal walls
GS1-N	As per NZS 3604:2011. No specific additional fastening required	As per NZS 3604:2011. Alternatively use 75 x 3.8mm shot-fired fasteners with 16mm washers, 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		
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 pages 19 and 20.		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.
BLG-H	Not applicable	As for GSP-N, BL1-H, BLP-H on concrete slab above	In addition: GIB Handibrac® fixings or metal wrap-around strap fixings and bolt as illustrated below.

	Panel Hold-down Details
---	-------------------------

GIB HandiBrac® – RECOMMENDED METHOD			
Developed in conjunction with MiTek™ NZ, the GIB HandiBrac® has been designed and tested for use as a hold-down in GIB® BL and GSP bracing elements. • The GIB HandiBrac® registered design provides for quick and easy installation • The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps • The GIB HandiBrac® is suitable for both new and retrofit construction • The design also allows for installation and inspection at any stage prior to fitting internal linings			 GEB001
Concrete Floor		Timber Floor	
External walls	Internal walls	External walls	Internal walls
 GEB002	 GEB003	 GEB004	 GEB005
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate		Position GIB HandiBrac® in the centre of the perimeter joist or bearer	
Position GIB HandiBrac® at the stud / plate junction		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.		12x150mm galvanised coach screw	

Refer to gib.co.nz/cad for CAD details.



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. It should be positioned in such a way that the important 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 important corner fastenings to be installed without having to penetrate the bracing strap.	
Concrete Floor	Timber Floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30x2.5mm flat head galvanised nails to each side of the stud. Three 30x2.5mm flat head galvanised nails to each side of the plate. Hold down bolt to be fitted within 100mm of the end of the element.	
Internal wall	
 GEB006	 GEB007
External wall	
 GEB008	 GEB009
NB: 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 the web address gib.co.nz/cad	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.
	 GEB010
Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element.	12x150mm galvanised coach screw fitted with a 50x50x3mm square washer within 100mm of the ends of the bracing element

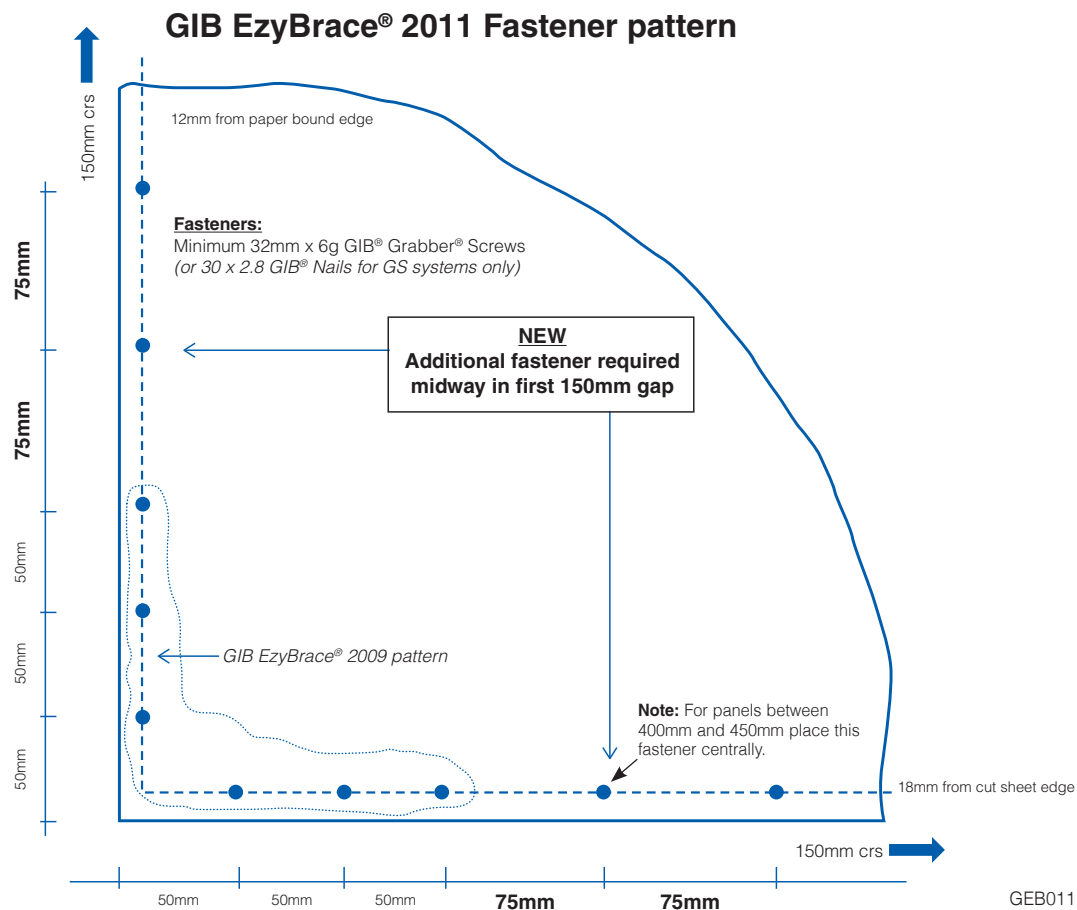
Refer to gib.co.nz/cad for CAD details.



Revised Fastener Pattern for *all four corners* of GIB EzyBrace® Elements

As GIB Braceline® screws are no longer required for BL bracing elements, two additional fasteners must be installed in ***all four corners*** of GIB EzyBrace® GS and BL elements, as shown.

Fasteners must be placed no closer than 12mm from the paper bound sheet edge and no closer than 18mm from sheet ends or cut edges.



Refer to gib.co.nz/cad for CAD details.

PERMITTED GIB® PLASTERBOARD SUBSTITUTIONS IN GIB EZYBRACE® SYSTEMS

GIB Ezybrace® Systems have been designed and tested using only the products specified. Occasionally additional properties may be required to be provided by a different GIB® Plasterboard product. The following table provides acceptable substitution options.

Specified	Permitted alternative GIB® Plasterboard products								
	GIB® Standard	GIB Ultraliner®	GIB Braceliner/ Noiseline®	GIB Aqualiner®	GIB Toughliner®	GIB Fyreliner®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	OK	NOTE 2		
GIB Braceliner®	X	X		NOTE 1	OK	X	NOTES 1 and 2		

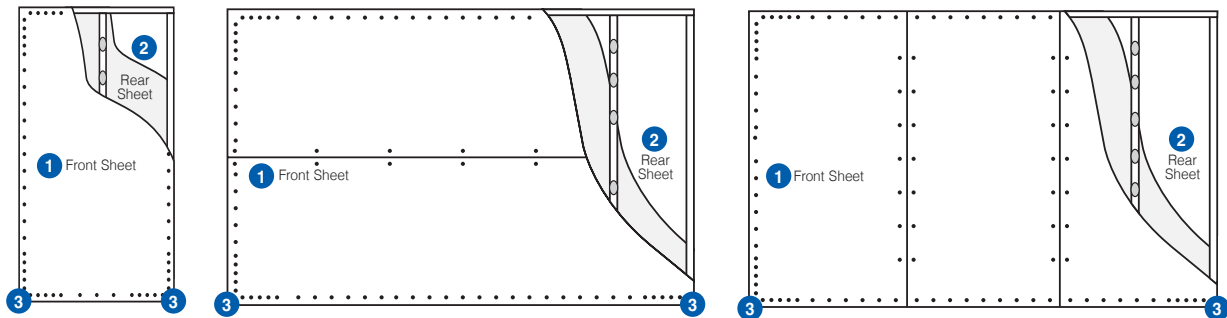
NOTE 1 The element must be 900mm or longer. Use 32mm x 6g GIB® Grabber® drywall screws at **100mm** centres to the perimeter of the bracing element. The bracing corner fastening pattern, as illustrated above, applies to all four corners of the element. Panel hold-down fixings are required.

NOTE 2 The fastener type and length must be as required for the relevant FRR system but the fixing pattern must be as shown above.



Construction Details

JUNE 2011



System	Lining one side ❶		Lining opposite side ❷		Panel Hold-Down Fixings ❸	Fastener spacing
	Lining	Fasteners	Lining	Fasteners		
GS1-N	Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws	Not required	Not required	Not required	<i>GIB® Plasterboard</i> Corner fastening pattern as illustrated above Fasteners at 150mm to bracing element perimeter, and: • at 300mm centres to intermediate sheet joints for vertical fixing, or • at stud / sheet junction for horizontally fixed elements, and • GIBFix adhesive daubs at 300mm crs to intermediate framing <i>Plywood</i> Fasteners at 150mm around the perimeter of every sheet and at 300mm centres to intermediate studs. Place fasteners no closer than 7mm from sheet edges. Plasterboard corner fastener pattern does not apply to plywood.
GS2-N			Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws		
GSP-H			Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm Flat head galvanised or stainless steel nails	Yes, see Pages 19 and 20	
BL1-H	10mm or 13mm GIB Braceline®	minimum 32mm x 6g GIB® Grabber® high thread screws	Not required	Not required		
BLG-H		Any 10mm or 13mm GIB® Plasterboard	30mm GIB® nails, or minimum 32mm x 6g GIB® Grabber® high thread screws			
BLP-H		GIB Braceline® Nails may be used for 10mm GIB Braceline® ONLY	Minimum 7mm Ecoply manufactured to AS/NZS 2269	50mm x 2.8mm flat head galvanised or stainless steel nails		



GIB EzyBrace® System Specification – GS1-N

JUNE 2011

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; AS1 Clause 3 Timber (NZS 3604:2011)
 - NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)
- Framing dimensions and height as determined by NZS 3604 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 3.15 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 for external 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 SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING**Fasteners**

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.

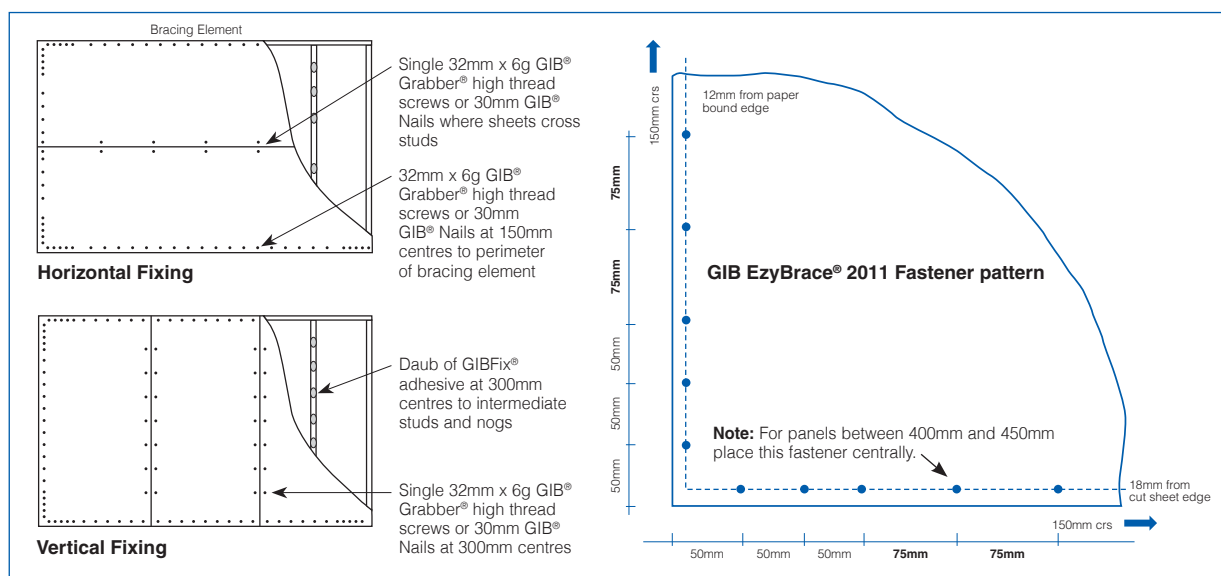
For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

Use daubs of GIBFix® adhesive at 300mm 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

All fastener heads stopped and all sheet joints paper 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 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).





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GANG-NAIL® LUMBERLOK® BOWMAC®

Producer Statement – BOWMAC® Screw Bolt

ISSUED BY: MiTek New Zealand Ltd

IN RESPECT OF: BOWMAC® Screw Bolt

DESCRIPTION: BOWMAC® screw bolts M10 x 140mm are identified with blue hexagonal heads and a marking “10/140 mm” stamped on the head. They are manufactured from heat treated carbon steel with a nominal tensile strength $f_u = 1000$ MPa and yield strength $f_y = 900$ MPa. They have a nominal shank diameter of 10mm. The underhead shank length is 140mm of which 95mm is threaded. They are protected with nominal zinc plating of 5 micron.

USE: To be used in conjunction with GIB HandiBrac® for fixing proprietary bracing systems to concrete and timber floors.

CHARACTERISTIC WITHDRAWAL STRENGTH: 1) In Concrete = 15 kN 2) In Timber = 12 kN

REFERENCE TESTS:

- 1) Powers® FASTENERS Test Ref Number: BTNZ120710.1 Screw Bolt tests in concrete masonry header block dated 27 July 2010.
 - 2) MiTek New Zealand Ltd Test Report for BOWMAC® Screw Bolt in Timber Joist dated 30 November 2010.
- Tests were carried out in accordance with BRANZ EM1

On behalf of MiTek New Zealand Ltd and subject to:

1) Fixing to concrete floor or concrete masonry header block

- 1.1. Minimum concrete strength shall be 17.5 MPa
- 1.2. Minimum edge distance to centre of screw bolt shall be 59mm
- 1.3. Minimum embedment depth in concrete shall be 88mm
- 1.4. Drill 10mm diameter hole x 96mm minimum depth
- 1.5. In sea-spray zones, masonry header blocks shall be waterproofed/weather-proofed to the requirements of NZS4210:2001

2) Fixing to timber floor

- 2.1. Minimum timber grade shall be MSG8, VSG8 or SG8
- 2.2. Moisture content of timber joist shall be less than 18%
- 2.3. Minimum joist size shall be 140x45 mm on edge
- 2.4. Minimum embedment depth in joist shall be 66mm
- 2.5. Drill 8mm diameter hole x 74mm minimum depth on centreline of joist

3) General Requirements

- 3.1. BOWMAC® screw bolts can be used in **ALL ZONES** in a “Closed” environment in accordance with Table 4.1 of NZS3604:2011
- 3.2. Installation shall be in accordance with the manufacturer's technical literature and “GIB HandiBrac® Panel Hold-Down Bracket” brochure packed with product
- 3.3. All proprietary products meeting their performance specification requirements

I BELIEVE ON REASONABLE GROUNDS that the use of BOWMAC® screw bolts in buildings if constructed in accordance with the drawings, specifications, and other documents provided, will comply with Clause B1 and B2 of the NZ Building Code.

For and on behalf of MiTek New Zealand Ltd

In Ling Ng
Technical Services Manager
BE (Hons), CPEng, IntPE
MIPENZ (ID: 146585)

Date: 3 MARCH 2011

3.3 ECOPLY® BRACING SPECIFICATION – EPI

BC130229
Date Received 4/02/13

SINGLE SIDED STRUCTURAL PLYWOOD BRACE

Specification No.	Minimum Wall Length	Lining Requirements	BU's/m Wind	BU's/m Earthquake
EPI	0.6 m	7 mm Ecoply® or Ecoply Barrier one side	125	130

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe®, is recommended.

Bottom plate fixing

Use GIB Handibrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

One layer of 7 mm Ecoply plywood or Ecoply® Barrier fixed directly to framing or over cavity battens. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening the Ecoply®

Fasteners

Fasten with 50 x 2.8 mm galvanised or stainless steel flat head nails for direct fix, or 60 x 2.8 mm over cavity battens. Place fasteners no less than 7 mm from sheet edges.

Fasteners for H3.2 CCA treated Ecoply

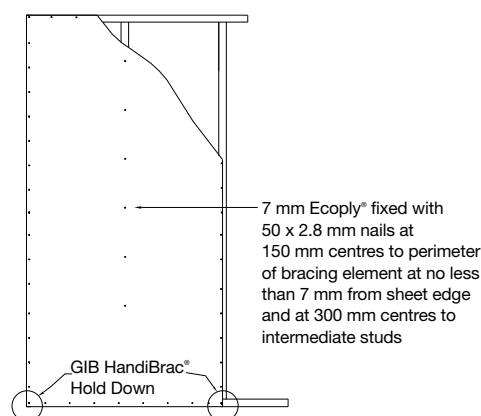
Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners shall be a minimum of hot dip galvanised.

In certain circumstances stainless steel fasteners may be required. Refer to table 8 of the Ecoply Specification and Installation Guide for these circumstances and further fastener selection advice.

Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Ecoply® Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply and Laserframe SG8 timber framing manufactured by

Carter Holt Harvey Limited trading as CHH Woodproducts New Zealand, and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB Handibrac® are registered trade marks of Fletcher Building Holdings Ltd.

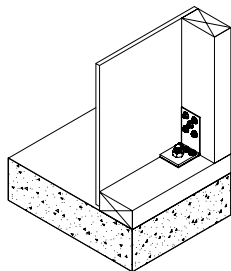
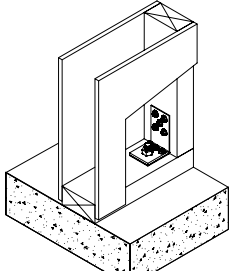
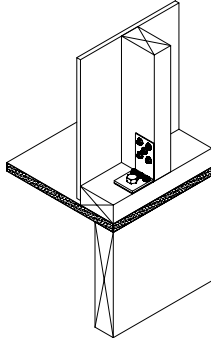
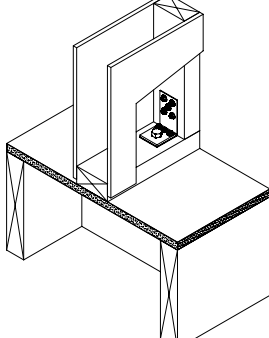
3.7 GIB HANDIBRAC® - RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek™ NZ, the GIB HandiBrac® has been tested for use as a hold-down in all EP bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings

because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps

- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings

Concrete Floor		Timber Floor	
External walls	Internal walls	External walls	Internal walls
			
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate		Position GIB HandiBrac® in the centre of the perimeter joist or bearer	
Position GIB HandiBrac® at the stud/plate junction		Position GIB HandiBrac® in the centre of the floor joist or full depth solid block	
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket		12 x 150 mm galvanised coach screw or screw bolt supplied with the bracket	

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3.8 STRUCTURAL CEILING DIAPHRAGMS

Diaphragms are used to transfer lateral loads to braced walls and allow for greater spacing between bracing lines. Diaphragms do not have a BU rating themselves.

Plywood diaphragms are an acceptable solution as described in section 13 NZS 3604 13.5.2 and allows for plywood not less than 6 mm thick and a minimum of three ply for:

- Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 10 metres long under light or heavy roofs and;
- Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs

Ceiling Diaphragms are constructed as follows:

- The length of diaphragm shall not exceed twice its width measured between supporting walls
- The ceiling lining must consist of plywood over the entire area of the diaphragm
- Complete sheets with a minimum size of 1800 x 900 must be used
- Framing size and spacing must comply with NZS 3604
- Fastener size should comply with Table 7 of this publication. E.g. 40 mm x 2.5 mm flat head nails for 7 mm and 9 mm Ecoply
- Fastening is at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing
- Fixings are no closer than 10 mm from sheet edges
- Perimeter ceiling framing must be connected to wall framing by a perimeter 140 mm x 35 mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55 mm thick steel angle or proprietary steel channel

Tip: To get the saw started, drill holes at each of the corners but within the opening. In some cases the saw can simply be pushed through the sheet without the need for holes.

Attaching GIB® plasterboard sheets

BC130229

Date Received 4/02/18

The best practice for fixing GIB® plasterboard involves the use of screws for timber wall and ceiling applications. Adhesive is used to fix the areas in the centre of the sheet that come into contact with framing while screws are used around the perimeter of the sheet. For ceilings the same process is used. However, additional screws are required down the centre of the sheet. Sheet edges at door or window openings can be fixed with adhesive or mechanically fastened unless the edge forms part of the perimeter of a bracing element, in which case it must be fixed with the appropriate nails or screws. GIB® Nails can also be used in place of screws. These nails are specially designed for use with GIB® plasterboard. The nailing of ceilings is not recommended due to the 'springiness' in some timber ceiling battens. Provide a 5-10mm gap at the wall/floor junction.

Tip: Do not fix nails or screws through or closer than 200 mm to adhesive as this can cause the nails or screws to 'pop' as the adhesive dries and shrinks.

Adhesive

GIBFix® All Bond is a solvent based adhesive suitable for most surfaces except polystyrene (Minimum application temperature 5°C).

GIBFix® One is an acrylic based adhesive with an ultra low VOC content, compatible with timber and steel framing (Minimum application temperature is 10°C)

1. Make sure that the framing is clean and free from oil or dirt
2. Apply adhesive at the appropriate spacing. An adhesive daub approximately the diameter of the framing timber should be used (see page 30)
3. Fix the sheet immediately after applying the adhesive to avoid 'skinning', resulting in poor adhesion

Screwing

1. Hold the sheet tight against the framing
2. Sink screws to just below the sheet surface, leaving the paper intact

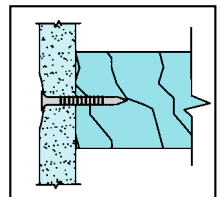
Tip: Use an electric drywall screwgun equipped with an adjustable depth control head and Philips bit. If a screw is overdriven and the paper and/or core of the GIB® plasterboard is damaged, insert a second screw approximately 50 mm from the first and then remove the first screw. Do not screw within 200 mm of any adhesive daubs as this can lead to problems such as 'popping'.

Nailing

Although screws are the preferred method of fixing plasterboard, GIB® Nails can be used for fixing to timber wall framing.

Tip: Galvanised clouts lack holding power and are not recommended.

1. Drive the nail into the GIB® plasterboard so that a shallow dimple is formed by the last blow of the hammer.
2. Drive nails in straight, not on an angle. Do not overdrive or countersink nails as this results in breaking of the face paper and fracturing of the GIB® plasterboard core.



Tip: If damage does occur, drive a second nail approximately 50 mm from the first. Then drive the first nail until it is just below the surface of the board using a nail punch. Do not nail within 200 mm of any adhesive daubs as this can lead to problems such as 'popping'. Remove any loose or damaged plaster prior to stopping.



Vent Selection Chart



Vent Selection Chart

Application	Room Size (m ³)	Wall/Ceiling Fans		Thru Wall Fan Kits		Heat/Fan/Light Kits	
		Standard	Pro Series	Standard	Pro Series	Standard	Pro Series
- Toilets - Laundries - No drier - Cellar - Offices	5m ³						
	10m ³						
	15m ³						
	These rooms require up to 10 air changes per hour						

- Toilets - Laundries - No drier - Cellar - Offices	5m ³	XF125	XFLP125	XP125	XPLP125	Heat 'n Vent 2
	10m ³	XF125	XFLP125	XP125	XPLP125	Heat 'n Vent 2
	15m ³	XF150	XFLP150	XP150	XPLP150	Heat 'n Vent 4
	These rooms require up to 10 air changes per hour					

- Bathrooms - Showers - Ensuites	6m ³	XF150	XFLP150	XP150	XPLP150	Heat 'n Vent 2
	12m ³	XF150	XFLP150	XP150	XPLP150	Heat 'n Vent 4
	18m ³	XF150	XFLP150	XP150	XPLP150	Heat 'n Vent 4 (12)
	These rooms require between 11 and 15 air changes per hour					

- Kitchens - Laundries - With drier	5m ³	XF150	XFLP150	XP150	XPLP150	
	10m ³	XF150	XFLP150	XP150	XPLP150	
	15m ³	XSF230		XPS230		
	These rooms require between 15 and 20 air changes per hour					



Selecting the Right Fan is as easy as... 1,2,3



Select your required application

Eg: Bathrooms
(11 - 15 air changes per hour)



Calculate the volume of the room in cubic metres (m³) by multiplying the length x width x height.

Eg: 2.3m x 2.2m x 2.4m = 11.6m³

(Select a room volume greater than 12m³)



Follow the 12m³ row across and select one of the fan kits available based on your mounting requirements (see top headings and photo's)

Eg: If you require a Thru Wall Kit then you can choose any of the XP150 or XPLP150 kits

In-Line Fan Kits					Window Fans	Thru Roof Fan Kits
Standard	Pro Series	Standard	Standard	Pro Series	Standard	Standard
						

SF125	SFLP125	MKLP100	EL100	ELLP125	WF150	HYPER
SF125	SFLP125	MKLP100	EL125	ELLP125	WF150	HYPER
SF150	SFLP150	MKLP125	EL150	ELLP150	WF150	HYPER

SF150	SFLP150	MKLP100	EL150	ELLP125	WF150	HYPER
SF150	SFLP150	MKLP100	EL150	ELLP150	WF150	HYPER
SF150	SFLP150	MKLP125	EL150	ELLP150	WF150	ULTRA

SF150	SFLP150	MKLP100	EL150	ELLP125	WF150	HYPER
SF150	SFLP150	MKLP125	EL150	ELLP150	WF150	HYPER
		MKLP150			WF230	ULTRA

Note: All selections are based on installed fan performance and maximum air change rates (figures in brackets show actual air changes stated if less than maximum)

 Fax: (09) 259 1661 • Email: sales@securimax.co.nz • Website: www.securimax.co.nz

 Fax: (09) 259 1661 • Email: sales@securimax.co.nz • Website: www.securimax.co.nz



Technical Data

BC130229

Date Received 4/02/13

HEAT/FAN/LIGHT Models

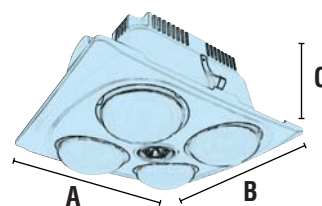
GENERAL INFORMATION

Models	Cut-Out Size	Exterior Grille	Duct Type	Duct Length
PS Heat 'n Vent 4	300mm x 300mm	White Eggcrate	Aluminium	3m supplied (can be extended to 6m)
PS Heat 'n Vent 2	390mm x 210mm	White Eggcrate	Aluminium	3m supplied (can be extended to 6m)
Heat 'n Vent 2	380mm x 200mm	White Eggcrate	PVC	3m supplied (can be extended to 6m)
Light 'n Vent	270mm x 270mm	White Eggcrate	PVC	3m supplied (can be extended to 6m)

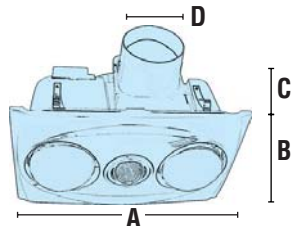
DIMENSION INFORMATION

Models	A	B	C	D
PS Heat 'n Vent 4	338	338	170	120
PS Heat 'n Vent 2	435	260	185	120
Heat n Vent	400	250	195	100
Light n Vent	310	310	205	100

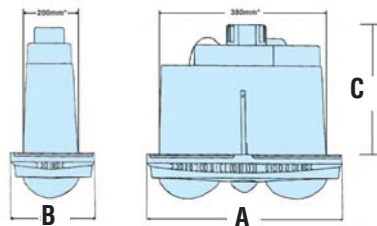
Dimensions - PS Heat 'n Vent 4



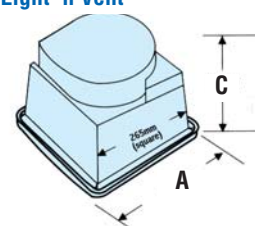
Dimensions - PS Heat 'n Vent 2



Dimensions - Heat 'n Vent 2



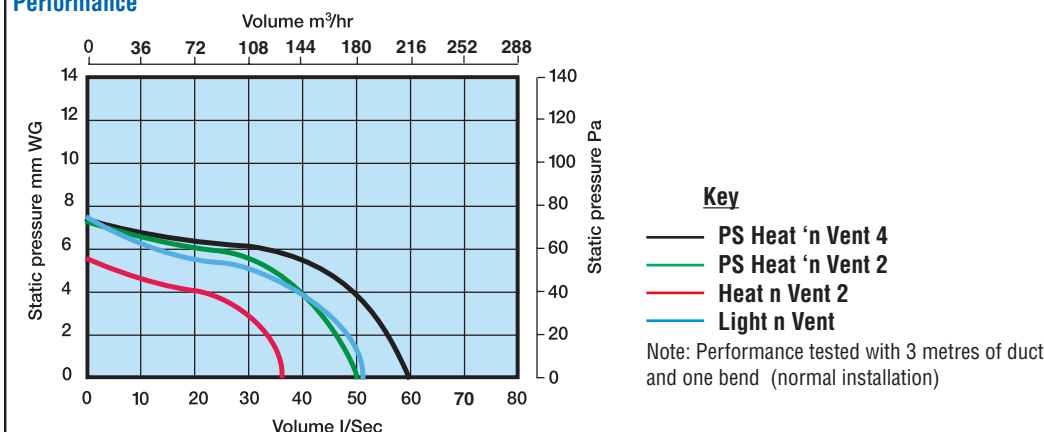
Dimensions - Light 'n Vent



TECHNICAL SPECIFICATION

Models	PS Heat 'n Vent 4	PS Heat 'n Vent 2	Heat 'n Vent 2	Light 'n Vent
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Fan Performance	60l/s, 216m³/hr	50l/s, 180m³/hr	35l/s, 126m³/hr	51l/s, 184m³/hr
Heat Lamps	4 x 275W	2 x 275W	2 x 275W	-
Light	GU10 Halogen	GU10 Halogen	ES Bulb	ES Bulb
Total Wattage	1180W	635W	630W	90W
Light Wattage	50W	50W	60W	60W
Switch Plate	4 sw. (supplied)	3 sw. (supplied)	3 sw. (supplied)	2 sw. (supplied)
Warranty	5 Years	5 Years	5 Years	5 Years

Performance





Technical Data

BC130229

Date Received 4/02/13

IN-LINE FAN KITS - SF Shower Fan Models

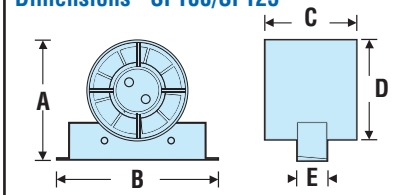
GENERAL INFORMATION

Models	Grille Cut-Out	Interior Grille	Exterior Grille	Duct Type	Length of Duct included
SF100	115mm	White Eggcrate	White Fixed Louvre	Flexible PVC	3m supplied (should not be extended)
SF200	115mm	White Eggcrate	White Fixed Louvre	Flexible Alum.	3m supplied (can be extended up to 6m)
SF125	140mm	White Eggcrate	White Fixed Louvre	Flexible PVC	4m supplied (should not be extended)
SF150	160mm	White Eggcrate	White Fixed Louvre	Flexible PVC	5m supplied (can be extended up to 12m)

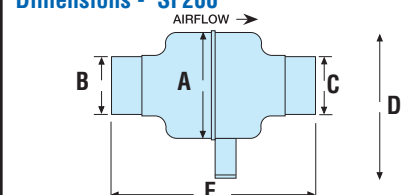
DIMENSION INFORMATION

Models	A	B	C	D	E
SF100	130	155	90	100	27
SF200	155	100	100	195	258
SF125	150	155	99	118	27
SF150	200	143	170	185	-

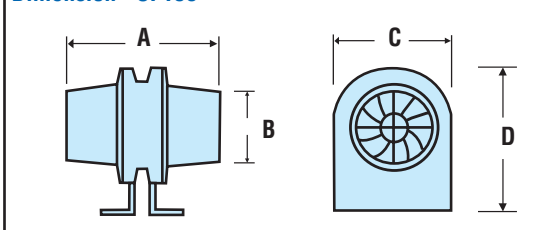
Dimensions - SF100/SF125



Dimensions - SF200



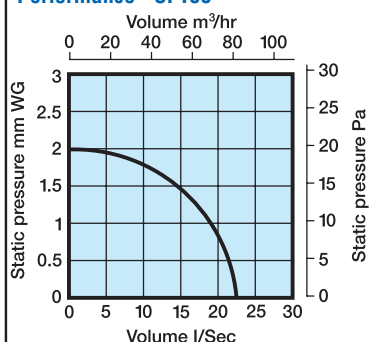
Dimension - SF150



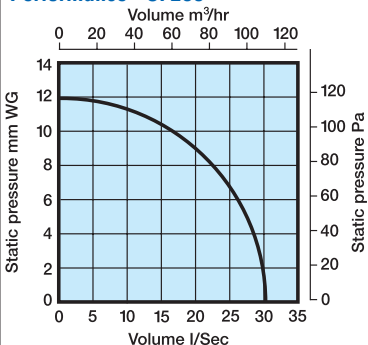
TECHNICAL SPECIFICATION

Models	SF100	SF200	SF125	SF150
Fan	ID100	CFD200	ID125	Hyper
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan Performance	23l/s, 85m ³ /hr	31l/s, 110m ³ /hr	36l/s, 130m ³ /hr	89l/s, 320m ³ /hr
Fan Wattage	20W	45W	25W	38W
Maximum Pressure	20Pa	120Pa	35Pa	135Pa
Fan Speed	2400 rpm	1400 rpm	2000rpm	2650 rpm
Sound Level	41 dB(A)	45 dB(A)	41 dB(A)	46 dB(A)
Max Operating Temp	40°C	40°C	40°C	70°C
IP Rating	IPX4	IPX4	IPX4	IPX2

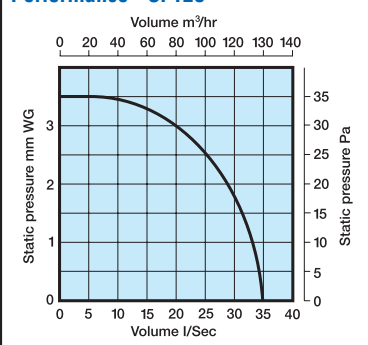
Performance - SF100



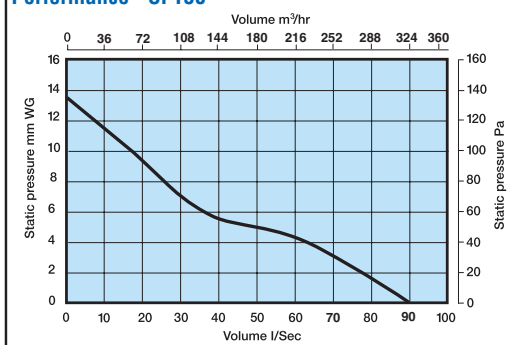
Performance - SF200



Performance - SF125



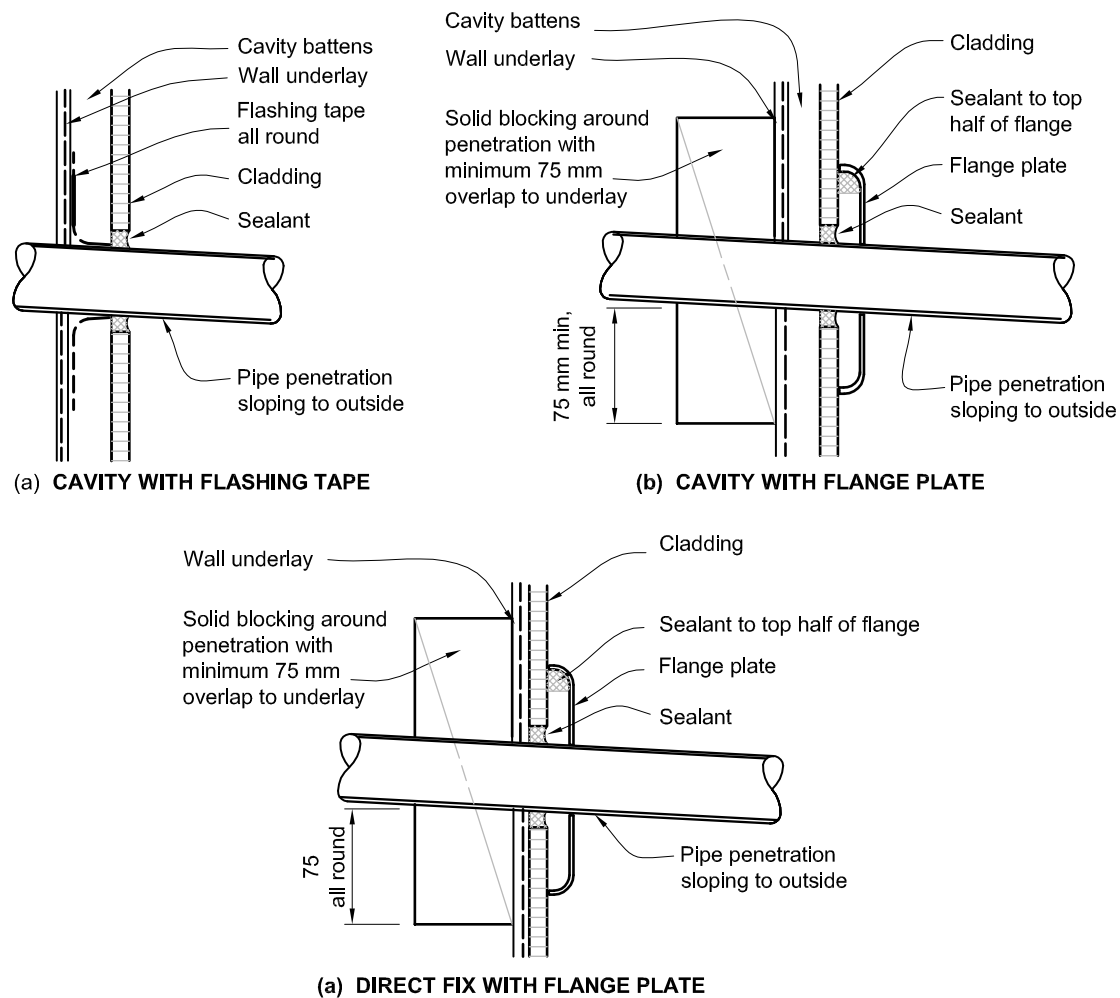
Performance - SF150



Note: PERFORMANCE - ID Fans maximum fan performance stated, this can vary depending on the length of ducting used.



Figure 68: General pipe penetration
Paragraph 9.1.9.3, Figure 126



Amend 5
Aug 2011

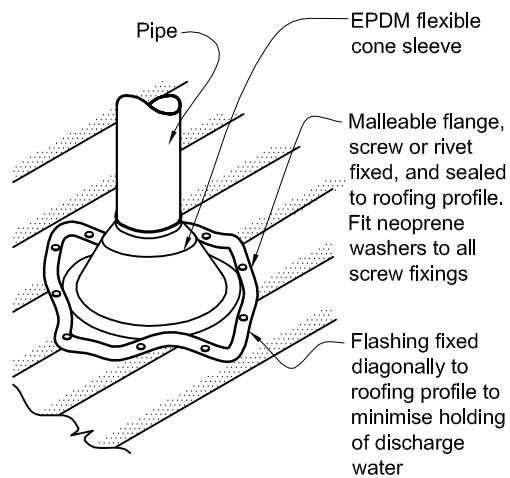
Amend 5
Aug 2011

Amend 5
Aug 2011

COMMENT:

Where possible, pipe penetrations, meterboxes and similar penetrations should be located in sheltered areas of the *building*, such as a porch, or be installed behind a weatherproof glazed panel.

Figure 53: Flashing for small pipes
Paragraphs 8.3.10, 8.4.17, 9.6.8.5
and 9.6.9.6



NOTE:

- (1) Max. roof pitch for this flashing 45°, minimum pitch 10° if base of flange covers one or more complete troughs.
(2) For pipes up to 85 mm diameter.

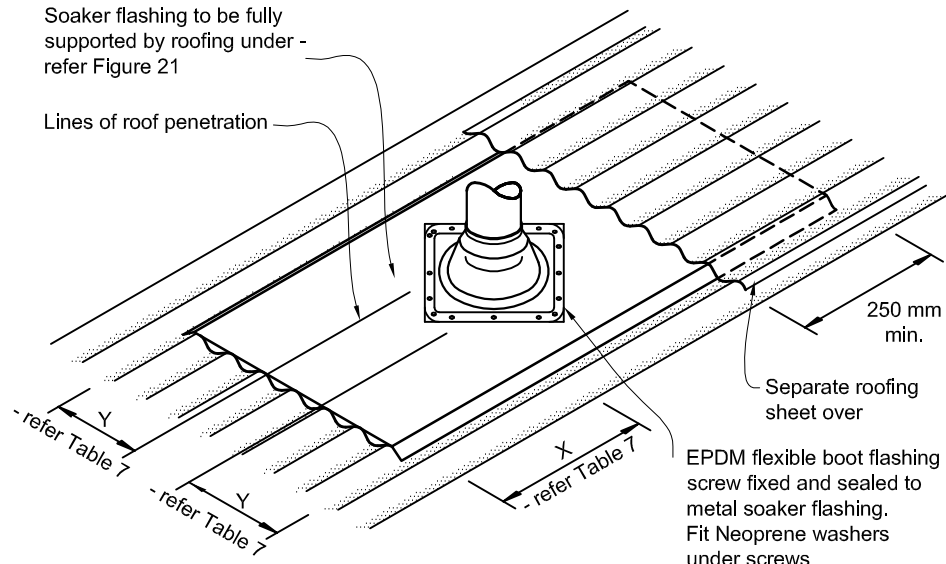
Amend 5
Aug 2011

Figure 54: Soaker flashing for pipe penetrations
Paragraph 8.4.17

- NOTE:** (1) Suitable for pipes from 86 mm to 500 mm diameter.
(2) Suitable only for roof pitches of 10° or more.

Soaker flashing to be fully supported by roofing under - refer Figure 21

Lines of roof penetration



Errata 2
Dec 2011

Amend 2
Jul 2005

Amend 2
Jul 2005

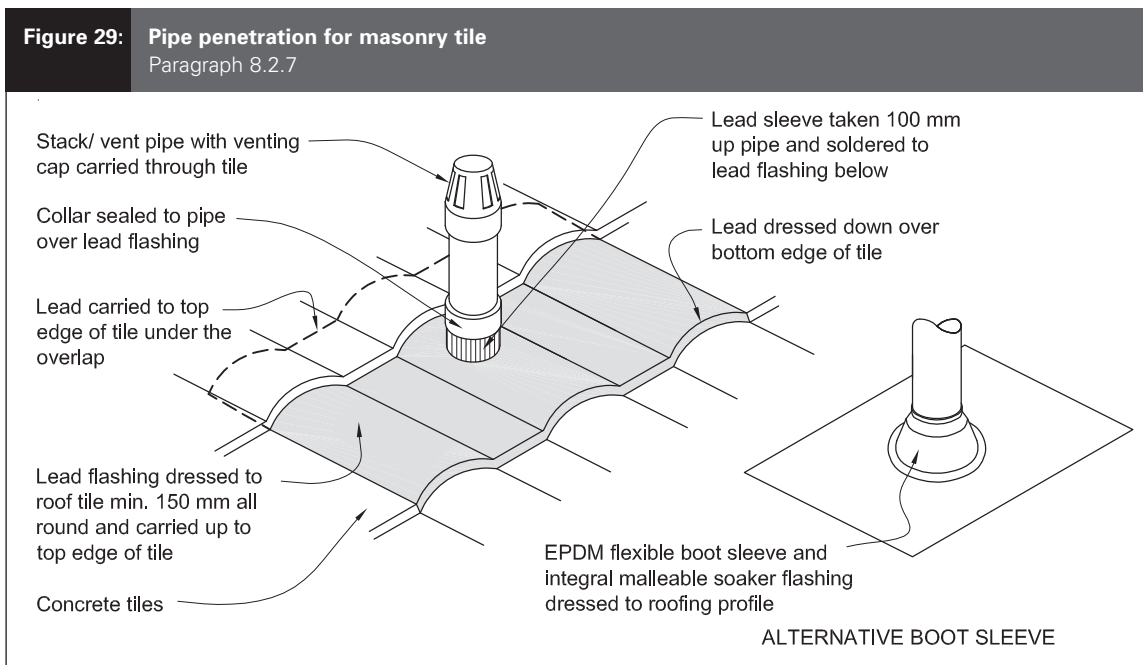
Amend 5
Aug 2011

8.2.7 Penetrations

Penetrations shall be flashed as shown in Figure 29 to Figure 31.

Amend 5
Aug 2011

Holes in tiles for pipe penetrations shall be machine-cut to minimise the size of the hole.



Amend 2
Jul 2005

Amend 5
Aug 2011

Dektite®



The versatile solution for hundreds of applications.

Designed to enable practically any pipe flashing operation to be carried out within minutes, **Dektite®** is simple to install - and very effective. Providing the perfect weatherproof, flexible seal, **Dektite®** protects against leakage on a wide range of pipe or vent projections, and is designed to conform to most roof profiles and pitch. For a maintenance-free seal on pipes from 0 - 440mm diameter, it's much more than a flexible solution to pipe flashing. It's a means of saving **time and money!**

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
DB 0-35 DG 0-35	0-35	99x99	0 - 60°	BLACK (EPDM)* DB GREY (EPDM)* DG
DB 5-55 DG 5-55	5-55	137x137	0 - 45°	
DB 50-70 DG 50-70	50-70	178x178	0 - 45°	
DB 5-120 DG 50-120	5-120	218x218	0 - 45°	
DB 110-170 DG 110-170	110-170	284x284	0 - 45°	
DB 160-220 DG 160-220	160-220	365x365	0 - 45°	
DB 160-300 DG 160-300	160-300	453x453	0 - 45°	
DB 290-440 DG 290-440	290-440	581x581	0 - 45°	

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

*** DEKTITE® Pipe Flashings can also be used to flash square pipes.**
Just add 30% to the pipe diameter and trim the cone to suit.

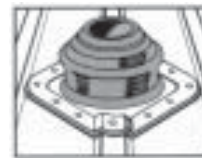


EPDM - Perfect for approved flues!

Dektite® EPDM polymer flashings have been officially tested by the Coal Corporation of Victoria, Australia and conform to all Australian and UK Standards on approved flue systems. Under no circumstances should any polymer flashing be installed on a non approved flue or an 'active' combustion heater flue.

INSTALLATION INSTRUCTIONS

For more effective drainage always fit the Dektite on the Diamond or bias.



1 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 necessary, support cut sections of sheet with additional framing.



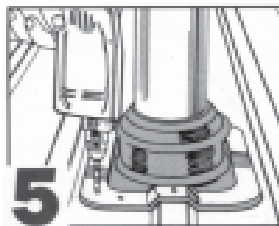
2 Slide Dektite® flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



3 Apply a neutral cure silicone* sealant by turning back the flexible flange.



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



Dektite®

First and the Best!

***Refer to page 28 for silicone usage**

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Colours



GREY EPDM



BLACK EPDM



Silicone Sealants

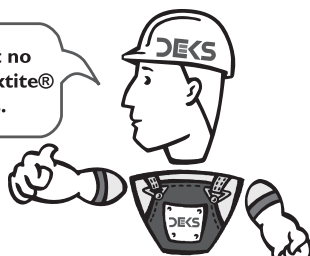
Use only Neutral Cure, Alcohol free, Low Modulus Sealant (Silicone). Deks Industries have trialed the following silicone sealants and found them to provide a satisfactory seal between the EPDM and most commonly used roofing materials.

- OCI Roof and Gutter N-192, Silicone Sealant
- Selleys® Roof & Gutter Silicone Sealant
- Sikasil®-C Multipurpose Silicone Sealant
- Bostik Findley Roof & Gutter Silicone Sealant
- Dow Corning® 791 Silicone Weatherproofing Sealant

Look at this performance

ASTM Method	Test Description	Spec. Req.	Test Results Black EPDM Dektite®	Test Results Grey EPDM Dektite®
D2240 D412 D412	Shore 'A' Hardness: Tensile Strength (MPa min): Elongation @ Break (% min):	60 +/-5 7.0 min 350 min	60 10.5 650	60 10.5 650
D624	Tear Resistance Die C (KN/m min): Trouser Tear (KN/m min):	20.0 min 10.0 min	31.5 14.0	32.0 14.5
D573	Heat Resistance 70hrs @ 100°C Change in Hardness (points): Change in Tensile (%): Change in Elongation (%):	+/- 10 +/-25 +/-25	+1 +3.5 +14.0	+3 -5.0 -16.0
D395	Compression Set 22hrs @ 70°C (%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.94 H.B.	Passed	Passed

There's just no mistaking Dektite® Flashings.



Helpful Hints

Getting the best results from the DEKS range of flexible flashing products.

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, wet the pipe first.

SOAKERS

- Hand preform aluminium metal flange prior to cutting roof.
- Fasten from vertical centre to outside. Fasten sides last.
- In particular circumstances, we recommend use of Soakers **particularly** where roof pitch is below 1.5° or above 45° and pipe sizes are in excess of 100mm.
- Use of a stainless steel band at pipe / soaker join is only necessary in extreme roof pitch situation 55 - 60°

RETROFITS

- Do not overcrimp seam.
- For pipes over 150mm diameter use a stainless steel support clip.

TILE FLASHING

- Dress to profile, avoiding unnecessary beating.
- In flue applications, apply a liberal coating of sealant* over worm drive mechanism.

STRIP FLASHING

- Stretch expanding sides only when necessary and just before fastening.
- Due to the flexibility of the expanding edges and providing that a liberal amount of sealant is used underneath these edges, it is recommended to 'valley' fix where possible.
- Use only neutral-cure, alcohol free, low modulus sealant* (silicone).
- Avoid contact between strip flashing and sharp exposed metal edges.

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:** Where these are found, always apply a bead of sealant from the Dektite point of contact along the entire seam length.
- Where multiple skin flues are used, E.P.D.M. 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 E.P.D.M. compound products can lead to shortened life expectancy.

*Refer to previous page for silicone usage

The diagram illustrates the installation of Jackstuds for a suspended ceiling. Key components and dimensions are labeled as follows:

- Jackstuds:** The vertical supports, labeled "JACKSTUDS" at the bottom.
- Opening Dimensions:**
 - Opening Height:** Indicated as "20mm (APPROX)".
 - Opening Width:** Indicated as "REBATE WIDTH = OPENING WIDTH + 200mm".
 - Side Room:** The area to the left of the opening.
 - Headroom:** The vertical clearance above the opening, with a note "200 min 300 std".
- Structural Details:**
 - Infill to ceiling:** Points to the top horizontal members.
 - Securely fixed centre support for springs and automatic unit (3 x 100mm x 50mm):** A support for the ceiling mechanism.
 - 800 mm Single 1200 mm Double:** Dimensions for the horizontal members.
 - Double Studs to ceiling or infill (100 x 50):** The vertical studs supporting the ceiling.
 - 100mm:** Dimension for the base of the double studs.
- Note:** "Inside surface of opening should be flush".

The diagram illustrates the installation of a door track and automatic system. It shows a side view of the door assembly. The track is labeled 'TRACK' and the automatic system is labeled 'AUTOMATIC'. The distance from the door edge to the first roller is labeled 'X'. The distance from the first roller to the second roller is labeled 'Y'. The distance from the second roller to the end of the track is labeled '300'. The label 'NOG' is also present near the second roller.

DOOR HEIGHT	"X"	"Y"
UP TO 2200mm	2100	3000 mm
2201 TO 2400mm	2100 & 2350	3300 mm
2401 TO 2750mm	2100 & 2600	3900 mm



The home you deserve

SPECIFICATION

of work to be done and materials to be used in carrying
out the works shown on the accompanying drawings

Michael Bailey & Ting Liu
(owner's name)

Lot 84 Faringdon
Rolleston
(project address)

Job number: 122798

Date: 31 January 2013

CONSTRUCTION SCHEDULE

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Construction Schedule to be read in conjunction with the "Factory Order". The Factory order is to take precedence over construction schedule. Any Alterations to the Construction Schedule / Consented documentation shall be forwarded to the local Council for approval.

SINGLE STOREY

For the following site/project information refer to the lower section of the title block on the plans:
- Snow zone, Earthquake zone, Corrosion zone, Roof type, Wall types & Wind Zone (Refer to bracing calculation sheet "building location" section for wind zone analysis).

These drawings to be read in conjunction with any supplementary engineer's documentation (i.e. Truss design, floor framing layout)

All construction to comply with NZS 3604, NZBC & local council policy.

All timber treatment to comply with NZS 3602

FOUNDATION:

Floor Slab: 100mm concrete (MPa as per details, at 28 days standard curing)

Foundations: Concrete (MPa as per details, at 28 days standard curing)

Rods and starters as per details

Sub floor: DPM on AP40 compacted at 150mm layers

Where the DPM is likely to be damaged from the granular fill then protection shall be provided by no more than 25mm sand blinding in accordance with NZS 3604 clause 7.5.6.2.

Min. external cover to reinforcement

(a) Against ground 75mm

(b) Against formwork 50mm

(c) Top cover to United Steel SE73DE, 30 min.

Plaster finished foundation face

ALL FRAMING (unless stated otherwise on the drawings)

SG8 Pinus Radiata – Kiln dried

Exterior walls: H1.2, Bottom plate - 90x45 & Double top plate - 90x45 + 140x35

Interior walls: H1.2, Bottom plate & Top Plate - 90x45, refer to ceilings for double top plate requirements

Bottom plate fixings: 125mm x 12mm thru bolt with 50mm square washer at 900mm crs on all external walls (600mm crs when used on slab edges formed by masonry header blocks) and interior load bearing walls (Bolts also 150mm for each end of bottom plate) minimum cover 40mm. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:

Ground Floor

Exterior & Interior Loadbearing wall: 90x45mm studs @ 600 crs

Dwangs Ext: 90x45 @ 1200crs

Non loadbearing: 90x45mm studs @ 600mm crs

Dwangs Int: 90x45mm @ 800mm crs

Lintels: Lintels are shown on the Truss design. (All Lintels SG8 unless stated otherwise).

Building Wrap: Ecoply Barrier with Aluband flexible flashing tape

Air Barrier to unlined wall and gables: Ecoply Barrier

INSULATION, ENERGY EFFICIENCY:

Exterior Walls: Pink Batts - Refer to H1 Schedule, Energy Efficiency Calculations

Ceilings: Pink Batts - Refer to H1 Schedule, Energy Efficiency Calculations

Glazing: Double glazing to all windows, excluding garage

Air Seals: PEF Rod & Low expansion foam.

Lighting: All lighting recessed into ceilings to be closed and abutted type.

TRUSSED ROOF AREA: (An as built truss design will be provided at time of manufacturing)

Metal Tile - Battens: 50x40 SG6 H1.2 @ 370crs (Fixings in specification)

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Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated on Timber Treatment Plan)
Fascia & Gutter system:
Refer to manufacturers specification attached, provide Snow straps
Down pipes: Marley 65Ø PVC
Soffits: 4.5mm Hardiflex to Ribbon boards, sprockets & packers ex50

CEILINGS:

Interior Walls: Walls running parallel to battens to be double top plate - 90x45 + 140x35
Battens: Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip).

Finish garage: 13mm Gib board, Level 3 plaster finish

Flat Ceilings: 13mm Gib board throughout unless specified different on the plans & Level 4 finish to all rooms in flat ceiling areas

FLOOR FINISHES

Note: Floor surfaces of any space containing "sanitary fixtures or sanitary appliances must be impervious and easily cleaned." (Seal floor when Laundry is in garage)

Carpet: Non-slip and have a slip (wet) coefficient value of 0.55-0.70 for tufted or loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.

Floor Tiles: Non-slip and have a slip (wet) coefficient value of 0.35-0.65 for grit finished ceramic tiles. (NZBC D1/AS1 Table 2)

Vinyl: Non-slip and have a slip (wet) coefficient value of 0.25-0.5 for smooth or Imprinted. (NZBC D1/AS1 Table 2)

Entry through external doors to have a max step of 190mm (Riser height and tread depth for all steps in one flight, shall be uniform within the tolerance of ± 5 mm measured at the centreline on straight flights and at the pitch line on curved and spiral flights.)

With outward opening doors, a landing shall be provide with a clear space of at least 400mm from the leading of the door and the full width of the landing.

Build up this area with AP40 and compact, to have a cross fall of no less than 1:100 and fall away from building. (By Others, Coefficient of friction, wet - 0.6 - 0.9)

WET AREAS

Standard Gib with Enamel paint finish, refer to details attached.

Waterproofing: Flooring to all first floor wet areas, bath plinths to be sealed with "Wetseal" fibreglass waterproofing membrane BRANZ appraisal 372 (2000)

KITCHEN JOINERY

Bench top – Melamine, Cupboards – Melteca/Melamine

Bathroom Joinery

Top – Vitreous China, Cupboards – Polyurethane coated

Minimum Requirements for sinks:

Kitchen Sink: 300mm dia min X 125mm min depth. (As per NZBC G3/AS1)

Laundry tub: No less than 35 litres. (As per NZBC G2/AS1)

VENTILATION:

Mechanical ventilation to be discharged outside via the soffit to comply with NZBC G4/AS1. (Manrose 120Ø FAN 0940)

Smoke Alarms (Hush type) To comply with NZBC F7/AS1. Smoke detectors to be fitted within 3.0m of sleeping areas and on Escape routes, as indicated on plan. (Proof of compliance will be required for final inspection and issue of Code Compliance Certificate).

WATER PIPES

Water pipe from hot water heater to be 15mmØ with no more than 2 litres total volume (as per NZBC G12/AS1 Table 4 and NZS 4305 cl. 3.2.1 and Table 5) and closed cell foam polymer insulation which is preformed to the shape of the pipe and not less than 13 mm thick, is acceptable material for preventing pipes less than or equal to 40 mm diameter from freezing (as per NZBC G12/AS1)

Acceptable pipe lengths as per NZS 4305 table 5

10 mmØ = 78ml/m (25m max, total)

15mmØ = 176ml/m (12m max, total)

20mmØ = 214ml/m (7m max, total)

NZBC 7.5 Watertightness

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7.5.1 The water supply system shall be tested to ensure watertightness.

An acceptable testing method is to:

- a) Subject the hot and cold system to a pressure of 1500 kPa for a period of not less than 15 minutes, and
- b) Inspect the system to ensure that there are no leaks.

RAINFALL CATCHMENT AREA CALCULATION

Rainfall Intensity: as per Appendix A, E1/AS1

Gutter Type & Downpipe Size: As noted above in "Truss Roof area" note in Construction Schedule.

Cross Sectional Area: Refer to manufacturers specification attached

Roof Pitch: As noted in the project information on the plan.

Maximum Catchment Area: 26° - 35° = 50m^2 as per NZBC E1/AS1 Table 5

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PRELIMINARIES AND GENERAL

BC130229

Date Received 4/02/13

THE PROJECT

The works are as described in this specification and as shown on the drawings.

SITE

The site of the works, the site address and the legal description are shown on the drawings. Confine access and work to the area of site indicated on the drawings.

BUILDING CONSENT COMPLIANCE

It is an offence under the Building Act 2004 to carry out any work not in accordance with the building consent. Refer the resolution of matters concerning compliance to the main contractor for direction. Where building consent approval is affected refer any change to the territorial authority.

STATUTORY OBLIGATIONS

Comply with all statutory obligations and regulations of regulatory bodies controlling the execution of the works.

BUILDING CONSENT

Obtain the original or copies of the building consent form and documents from the main contractor and keep on site. Liaise with the territorial authority for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

PRODUCER STATEMENTS

When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Producer statements to be in the form required by the Territorial Authority to comply with the Building Act.

SET-OUT AND DATUM

Set out the works to conform with the drawings. Establish a permanent site datum to confirm the proposed building ground floor level and its relationship to all other existing and new building levels.

PREPARATION AND GROUNDWORK

BC130229
Date Received 4/02/13

Documents referred to in this section are:

NZBC

B1 Structure

B2 Durability

E2 External Moisture

NZS 3604

Timber framed buildings

OSH: Approved code of practice for safety in excavation and shafts for foundations

GRANULAR FILL

Approved screened crushed gravel or scoria, graded in size from 20 mm to 7 mm, clean. When tested with a standard sieve of 4.75 opening no material is to pass.

SURFACE PREPARATION

Comply with NZS 3604 section 3.5. Remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area to be built on.

STOCKPILE TOPSOIL

Stockpile excavated topsoil on site where directed. Keep separate from other excavated materials. Spreading and levelling of the topsoil at completion of work is the owners responsibility. Clients will be encouraged to landscape and cover exposed soil on their site as soon as possible, refer to "Erosion & Sediment Control Plan" at the end of this specification.

GENERAL EXCAVATION

Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.

FOUNDATION EXCAVATION

Take foundation excavations to depths shown on plans. Keep trenches plumb and straight, bottoms level and solid, stepped as detailed and clean and free of water.

INADEQUATE BEARING

If supplied, Engineers Ground Bearing and Foundation report takes precedence over the following:

When bearing is inadequate, excavate further and backfill as per below.

Confirm any changes with the territorial authority.

Below slabs on grade: Hardfill

Below footings: 10 MPa concrete

Service trenches: Hardfill

If excavation exceeds the required depths, backfill and compact to the correct level with material as listed.

GRANULAR BASE FOR SLABS

To conform with NZS 3604 (Details noted on the plans). Consolidate with a vibrating roller ready to receive a dampproof membrane.

GENERAL BACKFILLING

Obtain written confirmation from the owner & the main contractor before using any excavated material (An Engineer will need to be involved and Council Approval will be required. Compact approved backfilling in 150 mm layers with the last 200 mm in clean topsoil, lightly compacted and neatly finished off to a Maximum depth of 600mm.

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CONCRETE

BC130229
Date Received 4/02/13

Documents referred to in this section are:

NZS 3101	Concrete structures standard, Part 1 The design of concrete structures.
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber framed buildings
AS/NZS 4671	Steel reinforcing materials

FALSEWORK AND FORMWORK

Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss.

DAMPPROOF MEMBRANE

0.25 mm minimum polyethylene to NZS 3604 clause 7.5.4 Damp-proof membrane.

Apply polythene membrane to prepared base course with 150 mm laps between sheets. Tape seal laps and penetrations with 50 mm wide pressure sensitive plastic tape.

REINFORCEMENT

Bars to AS/NZS 4671. Grade Ductility Class E, all deformed other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh to AS/NZS 4671.

Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109 clause 3.3 Hooks and bends. Do not rebend bars without written approval.

Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109 clause 3.6 Spacing of reinforcement.

Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on the drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101 table 5.5 minimum required cover. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109 clause 3.9 Tolerances for reinforcement.

Length of laps where not dimensioned on the drawings in accordance with the Manufacturers Specification. Increase laps of plain round steel by 100%. Tie all lapping bars to each other.

REINFORCEMENT LAPS

<u>Bar Diameter</u>	<u>Lap</u>
10 mm	400 mm
12 mm	500 mm
16 mm	650 mm

TYING WIRE - Mild drawn steel wire not less than 1.2 mm diameter.

SPACERS AND CHAIRS - Precast concrete or purpose made moulded PVC to approval. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.

PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the territorial authority inspector.

NORMAL CONCRETE

Normal concrete 20 MPa grade, maximum aggregate size 19 mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

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PRESCRIBED MIX CONCRETE

Prescribed mix concrete 17.5 MPa grade minimum strength, using either separate batching of sand and builder's mix or coarse aggregate to NZS 3104 table 3.1 Grading recommendations for combined and uncombined coarse aggregates.

Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Unless detailed, obtain written confirmation of the type and pattern of all joints.

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109 clause 7.4 Handling and placing and 7.6 Compaction. Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

Use power operated vibrators on foundations, vertical constructions and beams.

Concrete slab-on-ground floors in timber buildings constructed to NZS 3604 clause 7.5 lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3 mm gradual deviation over a 3 metre straight-edge, to NZS 3109 clause 104 Surface tolerances.

CASTING IN

Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100 mm in length. Location and form of conduits to be approved in writing by the owner. Minimum cover 40 mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25 mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

CONSTRUCTION JOINTS

Locate and construct as per NZS 3604

Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring.

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Documents referred to in this section are:

AS/NZS 1748	Mechanically stress-graded timber
AS/NZS 1859	Reconstituted wood based panels, 1859.1: Particleboard
AS/NZS 2269	Plywood - Structural
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber framed buildings
AS/NZS 1328 1&2	Glued laminated structural timber
NZS 3631	New Zealand national timber grading rules

Refer to Production Specification for Durability requirements.

TIMBER FRAMING, FOR INTERIOR USE

Timber treatment as per "All Framing" section, machine stress graded timber to AS/NZS 1748, with moisture content at supply of 18% or less.

TIMBER FRAMING, FOR EXTERIOR USE

Timber treatment as per "All Framing" section, machine stress graded timber to NZS 3631 and to NZS 3602, table 1 with moisture content to NZS 3602 table 4

CEILING BATTENS

GIB® Rondo™ Galvanised Steel Ceiling Battens

TIMBER TRUSSES

Moisture content at supply: 18%.

DAMPPROOF COURSE

2-ply/3-ply Kraft felt strip saturated and coated with bitumen.

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NAILS

Steel, stainless steel and galvanised steel of pattern to suit the location.

Type to NZS 3604 section 4 Durability, and of the size and number for each particular types of joint as laid down in the nailing schedules of NZS 3604 sections, 6 Foundations, 7 Floors, 8 Walls, 9 Posts, 10 Roof framing and 15 1.5 kPa and 2 kPa snow loading. Except that when hand driving nails into Timber the nail lengths and diameters should be generally as for power driven nails.

BOLTS AND SCREWS

Steel, stainless steel and galvanised steel of pattern to suit the location.

NAIL PLATES

As per manufacturer's design for the particular locations as shown on the drawings.

CONNECTORS

Galvanised steel connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

MOISTURE CONTENT

Maximum allowable equilibrium moisture content (EMC) for framing supporting interior linings 18%

FRAMING WALLS

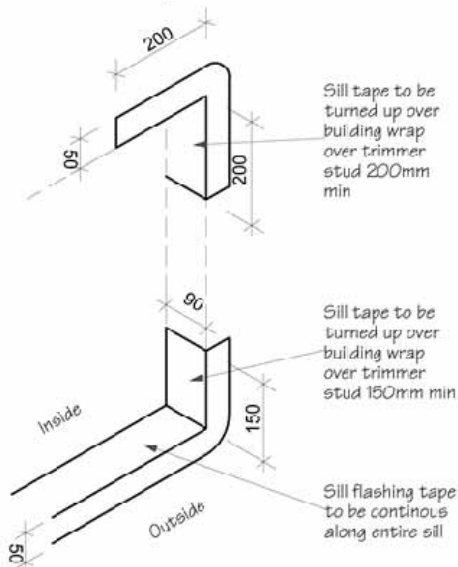
Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604 sections 8 & 15.

FRAMING ROOFS

Frame to required loading and bracing complete with valley boards, ridge boards and purlins/battens. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604 sections, 9 Posts, 10 Roof framing and 15 1.5 kPa and 2 kPa snow loading.

INSTALLING CEILING BATTENS

Fabricate and fasten to as per manufacturers recommendation.



Trim all building wrap to finish flush with inside face of stud frame wall

Sill Tape Flashing Detail

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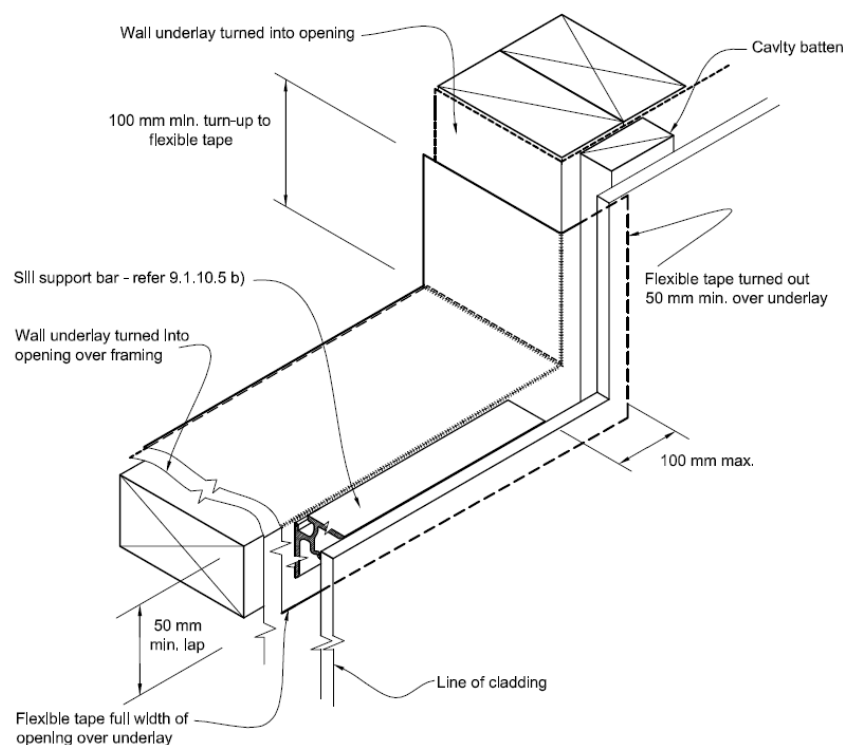
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Figure 72B: General window and door opening with drainage cavity
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128

NOTE:

- (1) Detailed *cladding* omitted for clarity, refer to specific *claddings*.
- (2) Head to be treated similarly with continuous *wall underlay* and *flexible tape* at corners.
- (3) Refer individual cladding details for jamb flashings.



BRICK VENEER CLADDING

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Documents referred to in this section are:

NZBC B1/AS1	Structure general
AS/NZS 2699	Built in components for masonry construction
NZS 3103	Sands for mortars and plasters
NZS 3112	Specification for pigments for Portland cement and Portland cement products
NZBC E2/AS1	External Moisture
NZS 3604	Timber-framed Buildings
NZS 4210	Masonry construction: Materials and workmanship
NZS 4236	Masonry veneer wall cladding

BRICKS

To AS/NZS 4455. Size: 230 mm x 76 mm x 70 mm

Lay bricks to NZS 4210. Ensure bricks are dry when laid. Use bricks equally off all pallets as work proceeds. Distribute facing bricks of varying colour randomly throughout so no patches or striping appears.

Stretcher bond, single width unless detailed or stated otherwise.

Rake out joints as work proceeds. Joints tooled concave after initial mortar stiffening.

Cavity 40mm min. – 75mm max. Pipes and services not to be placed within the cavity.

Weep holes to E2/AS1 clause 9.2.6 Cavities. (Approximately 800 crs & to be a minimum of 1000mm² per meter)

DAMPPROOF MEMBRANE

Apply bituminous brush-on liquid applied membrane as a primer and 2 coats, to drain water effectively out of the cavity.

VENEER TIES

To NZS 4210

Wall ties shall be placed within 5° of a right angle to the plane of the masonry, fix to face of studs without otherwise piercing or damaging the building wrap. Ties placed and spaced to E2/AS1 table 18A. Corrosion protection for masonry wall ties as per E2/AS1 table 18C.

Table 18C: Corrosion protection to masonry wall ties Paragraph 9.2.7		
	316, 316L, or 304 stainless steel	470 g/m² galvanising on mild steel
Zone B	Yes	Yes
Zone C	Yes	Yes
Zones D and E	Yes	-

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Table 18B: Placement of wall ties
Paragraph 9.2.5 and 9.2.7

Location	Placement of masonry ties
Unsupported panel sides and edges of openings	Within 300 mm of panel side or edge.
Top of veneer panels and top of panels under openings	Within 300 mm or two courses (whichever is the smaller) of top of veneer
Bottom of veneer panel in masonry rebate sealed with liquid applied <i>damp-proof course</i>	Within 300 mm or two courses (whichever is the smaller) from bottom of veneer
Bottom of veneer panel supported on steel angle lintel	
Bottom of veneer panel in masonry rebate with <i>membrane damp-proof course</i>	In each of the first two courses

NOTES:

Ties are to be screw fixed (ie. non-impact method) using screws outlined in Table 24.

Table 18A: Specification of maximum tie spacings for type B (4) veneer ties
Paragraph 9.2.7

Seismic zone Refer NZS 3604	Masonry veneer Less than 180 kg/m²			Masonry veneer 180 – 220 kg/m²			Masonry veneer more than 220 kg/m²
	Tie type (4)(5)	Maximum spacings (1)		Tie type (4)(5)	Maximum spacings (1)		
		Horizontal	Vertical		Horizontal	Vertical	
1	EL	600	400	EM	600	400	SED (2)
2 (6)	EM	600	400	EH (3)	600	400	SED (2)
3	EH (3)	600	400	EH (3)	600	400	SED (2)
4	SED (2)	SED (2)	SED (2)				

NOTES

(1) Maximum masonry tie spacings of 600 mm horizontally and 400 mm vertically

(2) Spacing of ties to be determined by specific engineering design

(3) EM may be used if the horizontal spacings do not exceed 400 mm and the vertical spacings do not exceed 300 mm

(4) Type B and Prefix E indicate masonry ties manufactured to AS/NZS 2699.1

(5) L (Light), M (Medium), H (High) indicate strength capability of ties in AS/NZS 2699.1

(6) Use seismic zone 2 (minimum) for Christchurch region comprising Christchurch City, Waimakariri District and Selwyn District.

SAND FOR MORTAR

Sand to comply with NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.

Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210 clause 2.2. Obtain written approval of admixture to be used. Also obtain written approval if intending to use cement mortar as a damp proof course and where, or if intending to use hydrated lime in the mortar.

To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1½ hours of mixing.

Joint thickness: 10 mm ±1 mm.

Add mineral oxide pigment conforming to NZS 3117 and to requirements of NZS 4210 clause 2.2.2.2(f).

WATER

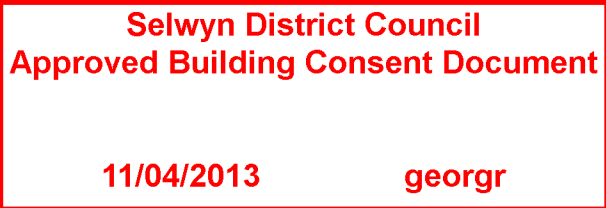
Clean, fresh and free from excess alkali, salt, silt and organic materials. Water from a local authority water supply is acceptable.

STORAGE

Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.

KEEP CAVITY AND TIES CLEAR

Keep cavity and ties clear of mortar droppings and clean the brickwork face of any marking as the work proceeds. Repair damage to building paper immediately it occurs.



JAMES HARDIE® LINEA® WEATHERBOARD CLADDING**GENERAL**

This section deals with the supply and fixing of James Hardie® fibre cement Linea® weatherboard cladding and James Hardie® weatherboard cladding.

DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E2/AS1	External moisture, 9.0 Wall claddings
NZBC E2/VM1	Weathertightness
AS/NZS 1170.2	Structural design actions - Wind actions
AS/NZS 2908.2	Cellulose-cement products - Flat sheet
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber framed buildings
NZS 1170	Structural design actions

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

MANUFACTURER'S DOCUMENTS

James Hardie® documents relating to work in this section are:

Linea® weatherboard technical specification
Eaves and Soffits technical specification
BRANZ Appraisal certificate No. 447 Linea® weatherboard cavity construction

NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by James Hardie® technical specification and the wind loads on various wall areas as given by NZS 1170.

BUILDING WRAP

Refer to Construction Schedule

EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 45 mm wide x 18 mm thick, H3.1 treated, height to match timber framing studs. To NZS 3602, table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

18 mm minimum thickness drained cavity to NZBC E2/AS1: 9.0 Wall claddings, where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs under the building wrap. Seal the top of the cavity and install vermin-proofing at base. Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

EXTERIOR CAVITY VERMIN-PROOFING

Perforated uPVC, with upstands.

LINEA® WEATHERBOARDS

James Hardie® Linea® weatherboards, 16 mm thick, pre-primed, manufactured from a reduced density cellulose fibre cement formulation and cured by high pressure autoclaving, manufactured to AS/NZS 2908.2, tested to NZBC E2/VM1 for weathertightness and complying with the NZBC.

Cut weatherboards to required lengths and fit joints off-stud using tongue and groove ends. Fit internal corners and weatherboards as per Linea® weatherboard technical specifications. Fit and fix external corners and joint soakers as required.

LINEA® WEATHERBOARDS

Brand/type:	James Hardie® Linea® weatherboard
Thickness:	16 mm

Width: 180 mm
Fixing: 60 mm x 3.15 mm diameter jolt head

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LINEA® WEATHERBOARD CORNERS
Type: Soaker
Soaker type: Zinc

FASTENER TYPE

Fasteners to minimum durability requirements of the NZBC. Refer to NZS 3604, section 4 Durability, for requirements for fixing's material to be used in relation to the exposure conditions.

Exposure conditions & nail selection prescribed by NZS 3604, section 4, table 4.3

Steel items such as nails and screws used for framing and cladding.

Building location	Nail or screw use				
	Cladding that acts as bracing (50-year durability)	Non-structural cladding (15-year durability)	Framing in "Closed" areas ⁽¹⁾ including roof spaces	Framing in "Sheltered" areas ⁽¹⁾	Framing in "Exposed" areas ⁽¹⁾
Zone D	Stainless steel ⁽²⁾ or silicon bronze or protected galvanized steel ⁽³⁾	Galvanized steel ⁽⁴⁾	Mild steel ⁽⁵⁾	Galvanized steel ⁽⁶⁾	Stainless steel ⁽²⁾
Zones B & C	Galvanized steel ⁽⁴⁾	Galvanized steel ⁽⁴⁾	Mild steel ⁽⁵⁾	Galvanized steel ⁽⁶⁾	Galvanized steel ⁽⁶⁾

(1) For definitions of "closed", "sheltered", and "exposed" see table 4.1 and figure 4.3(a) and (b).
(2) Stainless steel nails shall be minimum Type 304 and shall have annular grooves to provide similar withdrawal resistance to hot-dipped galvanized nails.
(3) Protection of galvanized steel nails shall consist of putty and an exterior painting system consisting of a primer undercoat and 2 top coats of oil-based or acrylic paint.
(4) Where the cladding is a corrosive timber, such as western red cedar or redwood, or is treated with copper-based ACQ or CuAz preservatives, use stainless steel⁽²⁾ or silicon bronze.
(5) Steel fixings in timber treated with copper-based preservatives shall be as per 4.4.4.
(6) Irrespective of the above, nails and screws shall be compatible with any fixing plate that is used with them.
(7) Nails and screws and other fixings into piles within 600 mm of the ground shall be stainless steel.
(8) Galvanized nails shall be hot-dipped galvanized to a minimum of 320 g/m²; galvanized screws shall be mechanically zinc plated in accordance with AS 3566: Part 2, Class 4.
(9) Type 304 stainless steel is sufficient to comply with NZBC requirements, but may have surface rust. Type 316 may be used where appearance is a consideration but exceeds the requirements of the NZBC.

GALVANIZED NAILS

60 mm x 3.15 mm diameter jolt head

SEALANT

Fosroc MS sealant or similar. Refer to James Hardie® technical specifications for application requirements.

SUBSTRATE

Do not commence work until the substrate is of the standard required by James Hardie® for the specified finish; plumb, level and in true alignment. Moisture content of timber framing must not exceed the requirements specified by NZS 3602 to minimise shrinkage and movement after sheets are fixed.

PENETRATIONS AND FLASHINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- Building wrap appropriately incorporated with penetration and junction flashings.
- Materials lapped in a way that water tracks down to the exterior face of the building wrap.
- Wall cladding underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- Claddings neatly finished off to all sides of openings
- Installation of flashings (those required to be installed prior to installation of penetrating elements).

Install flashings at all wall openings, penetrations, junctions, connections, window sills, heads and jambs to NZBC E2/AS1.

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METAL TILE ROOFING

Documents referred to in this section are:

NZBC B1, B2 E1.

NZBC E2/AS1 External moisture

AS 1397 Steel sheet and strip - hot-dipped, zinc-coated, or aluminium/zinc-coated

NZS 3602 Timber and wood-base products for use in building

NZS 3604 Timber framed buildings

NZS 4217 Pressed metal tile roofs

QUALIFICATIONS

Carry out roofing work using experienced, competent roofers familiar with the materials and techniques specified.

TILE BATTENS

Radiata pine to NZS 3602, table 1E. Size to NZS 3604, section 10. (Refer to Construction Schedule).

Install the tile battens to the roofing manufacturer's requirements and with all joints fully supported and staggered.

SET-OUT

Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.

UNDERLAY

Type: Heavy weight self supporting roofing underlay. (Thermakraft 215)

Lay underlay horizontally or vertically with a 150 mm side lap, over sailing the spouting and/or gutters by 10-20 mm. Fit and lap roofing underlay over the netting to the underlay manufacturer's requirements.

To NZBC E2/AS1: 8.1.5 Underlays, NZS 3604, section 11.2.2 and the roofing manufacturer's requirements.

METAL ROOFING TILES

Pressed steel sheet aluminium/zinc coated to AS 1397. Finish as specified. Accessories, cappings, flashings, and fixings to match and to the roofing manufacturer's requirements.

Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface.

Cut with tools specified by the roofing manufacturer. Fold ends and seal cut edges of tiles and accessories without damaging their integrity or finish, all to the roofing manufacturer's requirements.

Lap metal tiles and fix complete with matching accessories, flashed to roof features and penetrations; all to the roofing manufacturer's requirements and NZS 4217.

NAILS, SCREWS AND FASTENINGS

Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604, section 4: Durability.

Refer to the roofing manufacturer's literature for fixing details and to NZS 3604 for fixings durability requirements.

INSTALL COVERS AND FLASHINGS

Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC E2/AS1: 4.0 Flashings, 5.0 Roof/wall junctions and 6.0 Parapets.

PENETRATIONS AND JUNCTIONS

Flash and overflash all penetrations through the roof.

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof.

Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).

USE OF SEALANTS

Select and use sealants only as recommended by the roofing manufacturer.

COMPLETE

Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

REMOVE FILINGS

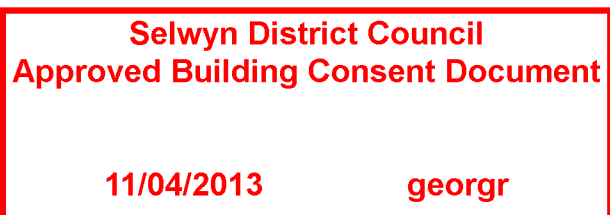
Remove metal filings from roofing surfaces at least daily.

CLEAR

Clear trade rubbish and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes, ensuring that metal filings, metal scraps and loose fixings are removed.

REPLACE

Replace damaged or marked elements. Remove unused materials from the site.



ALUMINIUM WINDOWS AND DOORS

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DOCUMENTS

Documents referred to in this section are:

NZS 3604	Timber framed buildings
NZS4211	Specification for Performance of Windows
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications

WINDOW AND DOOR SECTIONS

Form all aluminium members from extruded sections. Folded sections are restricted to flashings and concealed members only.

FLASHINGS GENERALLY

Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail jamb facings by 20 mm at each end.

FIXINGS

Ensure all fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.

CONFIRM PREPARATION OF WALL OPENINGS

Confirm that wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall cladding building wrap to openings finished and dressed off ready for the installation of window and door frames
- claddings neatly finished off to all sides of openings
- interior linings neatly trimmed ready for installation of jamb liners and completion of air seals to all sides of openings
- installation of flashings (those which are required to be installed prior to frames, including Flexible flashing tape).

FIX FRAMES

Fix frames rigidly in place without distortion, to the window manufacturer's and WANZ Aluminium window handbook requirements, plumb, true to line and face, weathertight and with all openings operating freely.

COMPLETE AIR SEAL

Form an air-tight seal by means of proprietary expanding foam, compressible foam strips, or sealants used with backing rods, applied deep within the reveal to completely fill the gap between joinery and structural framing. Ensure that in combination with the internal linings a complete air seal is created.

WINDOWS AND DOORS TYPE

Manufacturer:	First Aluminium (ChCh)
Type/model:	First Aluminium Extrusion

WINDOW AND DOOR JAMB LINERS, TIMBER

Timber species:	Pine
Grade/treatment:	Finger jointed H3
Thickness:	ex40mm
Finish:	Paint grade
ORGANIC POWDER COATING FINISH	
Minimum thickness:	40 microns

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GLAZING

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Documents referred to in this section are:

NZBC B1/AS1	Structure, 7.0 Glazing
NZBC F2/AS1	Hazardous building materials, 1.0 Glazing
NZBC F4/AS1	Safety from falling, 1.0 Barriers in buildings
AS/NZS 2208	Safety glazing materials in building
NZS 3604	Timber framed buildings
NZS 4223	Glazing in buildings
	Part 1: The selection and installation of glass in buildings
	Part 3: Human impact safety requirements
	Part 4: Dead, wind and snow loading
NZS 4211	Performance of windows
AS/NZS 4666	Insulating glass units
AS/NZS 4667	Quality requirements for cut-to-size and processed glass

GLASS

Processed glass to AS/NZS 4667, thickness to NZS 4223 parts 1, 3 and 4 unless otherwise specified:

- Clear float glass: Clear annealed transparent float glass
- Patterned glass: Translucent, annealed, rolled glass with a decorative pattern on one surface.
- Laminated glass: Grade A safety glazing material to AS/NZS 2208 with PVB or CIP resin interlayer.
- Toughened glass: Grade A safety glazing material to AS/NZS 2208.

SAFETY GLASS

All windows noted with "SG" on the elevations require Grade A safety glass. (All glazing in bathrooms <2m requires Grade A safety glass)

MIRROR GLASS

Float mirror glass to NZS 4223, part 1, clause 101.2.2.2: Silvering quality (selection S), with silver and copper plating and 2 coats of protective paint.

GLASS SCREENS

Proprietary shower/bath screens, formed to shape before toughening, complete with matching hardware.

GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

MIRROR ADHESIVE

Adhesive mirror-mastic and double-sided adhesive tape.

INSTALL GLASS SCREENS

Install shower and bath screens and doors to manufacturer's requirements. Fix wall channel with silicone sealant.

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Table 3.7 – Glazing protecting a difference in level in any building

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Ceiling

	TYPE A	TYPE B		TYPE C		
Household units	Safety glazing material to table 3.1 or annealed glass to column 1 of table 3.2	Safety glazing material to table 3.1 or annealed glass to column 2 of table 3.2 with 5 mm minimum thickness†		Select glass thickness by reference to wind design charts in Part 4. Table 3.3 of this Part is the minimum requirement.‡		
All other buildings§	Safety glazing material to table 3.1 or annealed glass to column 2 of table 3.2	Safety glazing material to table 3.1 or annealed glass to column 3 of table 3.2 with 5 mm minimum thickness		Select glass thickness by reference to wind design charts in Part 4. Table 3.3 of this Part is the minimum requirement.‡		

* Crash rails should be designed to discourage people from sitting on them.

† If a transom is fitted, the upper panel can be type C.

‡ Refer also to section 307.

§ For high-risk activity areas, refer to 303.10. For stairwells, refer to section 313.

NOTE –

- (1) Thickness of glazing materials shall also be checked for wind loading.
- (2) Glazing materials shall be contained in accordance with 303.2.
- (3) For opening windows – refer to Clause F4/AS1 of the NZBC for window opening restrictions not related to this Part.

NZS 4223:Part 3:1999

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INSULATION

BC130229

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Documents referred to in this section are:

NZBC H1/AS1	Energy efficiency, 2.0 Building thermal envelope
NZS 4214	Methods of Determining the total thermal resistance of parts of buildings
NZS 4218	Energy efficiency – Small building envelope
NZS 4243	Energy efficiency – Large buildings

FIT THERMAL INSULATION

Lay, install, fit and fix insulation to NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope. Install in housing to NZS 4218 and in large buildings to NZS 4243.

Friction fit insulation in place to completely fill the whole of the cavities with no gaps and with no folds. Slightly oversize length for friction fit and cut across pad and fill cavity. Cut smaller pieces for smaller spaces and around penetrations. Leave no gaps between, and maintain full thickness of the insulating segments over the whole of the installation. Do not cover vents. No clearance required to CA type lighting fixtures.

THERMAL INSULATION, WALLS

Location:	Exterior walls (excluding garage)
Brand:	Refer to H1 Schedule
R Value:	Refer to H1 Schedule, Energy Efficiency Calculations

THERMAL INSULATION, CEILING

Location:	Ceilings (excluding garage)
Brand:	Refer to H1 Schedule
R Value:	Refer to H1 Schedule, Energy Efficiency Calculations

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GIB® PLASTERBOARD LININGS

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Refer to GIB® EzyBrace™ Systems installation information attached to specification.

Documents referred to in this section are:

AS/NZS 2588 Gypsum linings in residential and light commercial construction - Application and finishing,
Part 1: Gypsum plasterboard

BRANZ technical paper P21: A wall bracing test and evaluation procedure

MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section are:

General: GIB® Site Guide

Wet area: GIB Standard® Wet Area Systems

Bracing: GIB EzyBrace® Systems

Ceilings: GIB® Rondo® Metal Batten Systems

GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS 2588.

CEILING BATTENS

GIB® Rondo™ galvanised steel ceiling battens and perimeter channel and GIB® Direct Fix Clip. Install in accordance with GIB® Rondo™ Metal Ceiling Batten Systems.

SCREWS

GIB® Grabber™ drywall screws.

NAILS

GIB® Nails (gold passivated).

TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on paper tape and galvanised steel trims and edges and/or GIB® UltraFlex high impact corner mould.

ADHESIVE

GIBFix® All Bond wallboard adhesive.

JOINTING COMPOUND

Bedding compound: GIB Tradeset®, GIB® Lite Blue and GIB ProMix® Taping compound

Finishing compound: GIB ProMix® GIB ProMix®, Lite, GIB® All Purpose and GIB Plus 4®

JOINTING TAPE

GIB® paper jointing tape.

CHECK SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Moisture levels not to exceed 18% at the time of lining.

MOISTURE CONTENT

Maximum allowable moisture content in accordance with AS/NZS 2589.1 for:

Framing at lining: 18% for plasterboard linings

PROTECT

Protect all surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

LEVELS OF FINISH

Provide the scheduled plasterboard surfaces to the levels of finish specified in AS/NZS 2589

Before commencing work, agree in writing upon the expectation for the final quality of finish. The specified level of finish for each area should be appropriate for the type of decoration and the type and angle of the primary source of illumination specified in that area.

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TILING

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Documents referred to in this section are:

NZBC	D1/AS1 – Slip resistance
AS 2358	Adhesives - For fixing ceramic tiles
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958	Ceramic tiles, 3958.1: Guide to the installation of ceramic tiles
BS 6431	Ceramic floor and wall tiles
BRANZ	Good practice guide: Tiling

QUALIFICATIONS

Carry out tiling work using competent tilers, experienced with the materials and techniques specified.

TEMPERATURE

Do not carry out tiling where the ambient temperature is below 5°C, or onto a substrate with a temperature higher than 40°C.

SUBSTRATE

Ensure that all services and accessories are in place and located to suit the tile layout, with the substrate required for tiling work. Commencement of the work means the substrate and environment are accepted by the tile layer as satisfactory.

CONCRETE FLOORS PREPARATION

Remove from the surfaces all contaminants such as paints, oils, release and curing compounds. Remove all projections, unevenness and loose material to leave a clean, dust and dirt-free surface. Remove all existing finishes down to the concrete & prepare surfaces and carry out the tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

LIQUID WATERPROOFING MEMBRANE (refer to Construction Schedule - "Wet Areas" for system used)

Install waterproofing membrane between the tile adhesive and the substrate. Reinforce all junctions of the waterproofing membrane as per the manufacturer's recommendations. Install waterproof membranes as follows: -

To walls behind bath - Two tiles high

CEMENT BASED SCREED

Mix of 3:1 Portland cement, wash-mix sand, gauged with liquid polymer additive to the tile manufacturer's requirements.

Apply a proprietary cement slurry bond coat over the whole of the floor to the tile manufacturer's requirements. Mix and place a 40 mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. Form screeds with a deviation from plane of not more than 5 mm over 3 metres.

In waterproofed areas where the cement screed has been laid over the waterproofing membrane, prepare the screed surface by applying a further waterproof coating before laying tiles.

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5 mm over 3 metres. Unless otherwise specified form screeds at 1: 40 minimum.

TILE ADHESIVE

To BS 6431, parts 1 to 23 inclusive & AS 2358.

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

Apply and float thick bed cement-based adhesive to a maximum 6 mm bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press tiles and beat it into place with 3 mm joints, and to obtain required coverage of adhesive on the back of each tile.

GROUT

Cement based, compressible and to suit the particular location and use.

Remove spacers. Prepare joints, mix and apply proprietary grout and finish off to the grout manufacturer's requirements. Grout to finish uniform in colour, smooth and without voids, pinholes or low spots.



CARPETING

BC130229

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Documents referred to in this section are:

AS/NZS 2455.1

Textile floor coverings - Installation practice, Part 1: General
The New Zealand Carpet Manufacturers' Association Conditions of
Warranty and installation guide

QUALIFICATIONS

Carpet layers to be experienced competent workers, familiar with the materials and the techniques specified and with AS/NZS 2455.

EDGE GRIPPER, TAPES, FIXING BARS

To AS/NZS 2455.

BINDER BARS

Anodised aluminium section with a fluted face.

SUBSTRATE

Before starting work inspect the substrate to ensure it will allow work of the required standard and that all fittings and fixtures around which the carpet is to be scribed, are in place.

PROTECTION

Protect adjoining work surfaces and finishes during installation and make good any damage to same.

TAPE

Tape for binding and seaming to be the type and width required by AS/NZS 2455 to suit the specified carpet and the standard of performance required.

LAYOUT

Plan the carpet layout so that seams run lengthways, traffic runs along the seam, light from windows is not across the seam and pile faces away from the main natural light source.

TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

PREPARE FLOOR SURFACE

Prepare floors for laying to AS/NZS 2455 requirements.

INSTALLATION, UNDERLAY

Installation to AS/NZS 2455 Lay at right angles to the carpet direction.

INSTALLATION, TAPED JOINTS

Tape carpet joints, fix grippers to floor, install underlay and carpet, to AS/NZS 2455.

FIX TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to AS/NZS 2455. Ensure that all junctions with other materials are neatly formed, with bars and trims securely fastened to the substrate, 20 mm from each end and at maximum 100 mm centres.

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PAINTING

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Documents referred to in this section are:

Resene: One-Line Specifications and Product Data Manual

PAINT TYPES

All paint coatings to be **Resene** products (which are guaranteed for consistency and performance under ISO 9001 and APAS) prepared, mixed and applied as directed in the One-Line Specifications and Product Data Manual.

GAP FILLERS

Use suitable gap fillers to match the surface being prepared. Any special primers required of the fillers must be satisfied. Refer to **Resene** surface preparation sheets in the One-Line Specifications and Product Data Manual.

INSPECT

Inspect all surfaces to be painted and report any that will not, after the preparation as laid down in the **Resene** surface preparation sheets; allow work of the required standard.

PRIMING AND SEALING

Ensure that all priming and sealing work necessary before or during construction is carried out when required.

ENVIRONMENTAL CONDITIONS

Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of **Resene**.

SHARP EDGES, CRACKS AND HOLES

Sharp edges, cracks and holes if present: remove and/or repair as outlined in the preamble to the **Resene** One-Line Specifications and Product Data Manual.

PREPARE ALL SURFACES

Prepare all surfaces to be coated to the requirements of the **Resene** surface preparation sheets. Use suitable gap fillers to match the surface being prepared. Any special primers required of the fillers must be satisfied. Refer to **Resene** surface preparation sheets.

APPLICATION

Apply paint by brush and/or roller to the requirements of **Resene** to obtain a smooth, even coating of the specified thickness, uniform gloss and colour. Do not spray on site without express permission.

RESENE SPECIFICATIONS

Refer to the **Resene** One-Line Specifications and Product Data Manual for surface preparation, coating sequence and application requirements as they apply to each system. Correct defective work immediately, with any recoating following the system's requirements.

SCUFF BETWEEN COATS

Between all coats remove any dust pick-up, protruding fibres and coarse particles.

FINISHED PAINT SURFACES

All finished paint surfaces to show uniformity of gloss and colour, to have the correct thickness for each coat, and freedom from painting defects such as tackiness and conspicuous brush marks. Finished work to be clean and free of any disfigurement.

PAINT SYSTEMS TO WET AREAS (Plasterboard firstly apply a sealer coat)

Undercoat & Top Coat:	Lustercryl D310	walls/ceilings
Trim:	Lusterglo	architraves, skirting, sills

PAINT SYSTEMS TO INTERIOR AREAS

Undercoat:	Resene ceiling "Flat white"	walls/ceilings
Top coat:	Resene Acrylic "Low sheen"	walls/ceilings
Trim:	Lusterglo	architraves, skirting, sills

PAINT SYSTEMS TO EXTERIOR AREAS

Undercoat:

Resene SpaceCote "Flat white"

Top coat:

Resene SpaceCote "Flat white"

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HOT AND COLD WATER SYSTEM

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Documents referred to in this section are:

NZBC G12/AS1	Water supplies
AS/NZS 2642	Polybutylene pipe fittings
NZS 3501	Specification for copper tubes for water, gas and sanitation
NZS 4606	Storage water heaters
NZS 4607	Installation of thermal storage electric water heaters
NZS 4617	Tempering (3-port mixing) valves
DIN 8077	Polypropylene (PP) Pipe dimensions
DIN 8078	Polypropylene (PP) Pipes Types 1, 2 & 3, General Quality
NZS 4305	Energy efficiency domestic hot water systems

Plumbers, Gasfitters and Drainlayers Act 2006

Note: Floor surfaces of any space containing sanitary fixtures or sanitary appliances must be impervious and easily cleaned. (Seal floor when Laundry is in garage)

QUALIFICATIONS

Plumbers to be experienced competent craftsman plumbers, or registered plumbers working under the direction of a craftsman plumber, familiar with the materials and techniques specified.

WATER MAIN POLYETHYLENE

High density polyethylene pipe complete with rubber ring compression type fittings.

POLYBUTYLENE WATER PIPE

Polybutylene tubing to AS/NZS 2642.2 and AS/NZS 2642.3 complete with fittings and accessories brand-matched.

EXPOSED PIPES

Chrome plated copper pipe with chrome plated brass nuts and fittings.

Faucet hoses covered with stainless steel braid and fitted with stainless steel nuts.

White polyethylene composite pipe with white nuts and accessories.

Selected pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings. All cold water pipework installed in external walls or exposed to the elements to be lagged and protected from frost.

VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1: Water supplies. (Set to 55°) The storage water heater control thermostat shall be set at a temperature of not less than 60° C to prevent the growth of Legionella bacteria.

15mm copper pressure relief valve from HWC (100mm max straight or bent) to discharge into 20mm @ 1:40 copper relief drain. The drain to discharge to over GT with 25mm air gap. (As per NZBC G12/AS1 cl.6.7 and Fig 12)

Tempering valve to NZS 4617 to NZBC G12/AS1: Water supplies.

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions.

GAS HOT WATER HEATER, CONTINUOUS FLOW TYPE

Continuous flow unit with an integral gas burner and flue.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Complete the flue installation in accordance with the heater manufacturer's details and requirements.

ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

WATER MAIN

Lay a minimum of 500 mm below ground level (600 mm under driveways) from the utility network operator's supply through a gate valve and meter toby box to the building. Lay marker tape above the water main in backfill.

POLYBUTYLENE/POLYETHYLENE WATER SUPPLY

Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC G12/AS1. Conceal pipework and pressure test before the wall linings are fixed.

INSTALLING HOT WATER PIPE INSULATION

Insulate all hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanised steel wire ties.

PENETRATIONS

Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

INSTALL TAPS AND FAUCETS

Install taps and faucets in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

TESTING OF PLUMBING**NZBC G12/AS1 7.5 Watertightness**

7.5.1 The water supply system shall be tested to ensure watertightness. An acceptable testing method is to:

- Subject the hot and cold system to a pressure of 1500 kPa for a period of not less than 15 minutes, and
- Inspect the system to ensure that there are no leaks.

WATER MAIN

Material: Polyethylene
Internal diameter: (ID)20mm/ (OD)25mm

WATER PIPE

Material: Polybutylene
Nominal bore: (ID)20mm/ (OD)25mm

INSULATION FOR HOT WATER PIPES

Brand/type: Euro lagging
Inside diameter: 16/22 mm

GAS HOT WATER

Brand/model number: Rinnai Infinity
Capacity: 24 litres

NZBC G12/AS1

Table 7: Water Supply Pipework Support Spacing Paragraph 7.1.3			
Pipe material	Pipe diameter (mm)	Maximum distance between supports (m)	
		Vertical pipe	Graded and horizontal pipe
Copper	10 – 15	1.5	1.2
	20 – 25	2.0	1.5
Galvanised steel	15 – 20	2.0	1.5
	25	3.0	2.5
uPVC	15 – 20	2.0	1.0
	25	2.4	1.2
Polyethylene and polybutylene (cold water supply)	15 – 20	1.5	0.75
	25	1.8	0.9
Polybutylene (hot water supply)	15 – 18	1.0	0.6
	20 – 22	1.4	0.7
Note: The spacing for these pipe materials is based on the pipes being located within the <i>building</i> structure.			

RAINWATER SYSTEMS

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Documents referred to in this section are: -

NZBC B1, B2, E1 & E2

AS 1397 Steel sheet and strip - hot-dipped, zinc-coated or aluminium/zinc-coated

Workers to be either competent craftsman plumbers, or registered plumbers working under the direction of a craftsman plumber, or roofers, familiar with the materials and techniques specified.

Aluminium/zinc alloy coated pre-painted steel

ALUMINIUM/ZINC ALLOY PRE-PAINTED SHEET STEEL

0.55 mm sheet steel coated to AS 1397, pre-painted.

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Profile, jointing, brackets and fittings brand matched and complete to the spouting manufacturer's specifications.

DOWNPIPES

Complete with stand-off brackets and galvanised screws.

FLASHINGS GENERALLY

0.55 mm sheet steel galvanised to AS 1397, aluminium/zinc coated to AS 1397, 1.8 mm (20 kg/m²) copperised pure lead, 0.5 mm half hard copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 304 Flashing design.

Aluminium/zinc alloy coated pre-painted steel

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL FASCIA

Shape/size: Refer to construction schedule

Brand/type: Coloursteel

Paint coating type: Endura/Max

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL SPOUTING

Shape/size: Multiline Quad (Cross Sectional Area – Refer to construction schedule)

Brand/type: Coloursteel

Paint coating type: Endura/Max

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES

Shape/size: Refer to construction schedule

Paint coating type: Endura/Max

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SANITARY PLUMBING

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Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - sanitary plumbing
NZBC H1/AS1	Energy Efficiency – hot water systems
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent application
Plumbers, Gasfitters and Drainlayers Act 2006	

QUALIFICATIONS

Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.

UPVC WASTE, SOIL AND VENT PIPES

UPVC pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.

White polybutylene or PVC, including all associated fittings.

SEALANT, SANITARY FIXTURES

For between sanitary fixtures and accessories and adjacent floor or wall surfaces.

1-part, silicone, containing mildew resistant agents.

Colour: White

EXECUTION GENERALLY

Carry out this work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and G13/AS1.

ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

INSTALL SANITARY FIXTURES

Fit and install sanitary fixtures and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

INSTALL TRAPS, WASTE AND VENT PIPES

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to NZBC G13. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework. Penetrations to the DPM under the slab to be sealed with DPM tape. Wall penetrations as per E2/AS1 Figure 68.

Metal Tile roof penetrations as per E2/AS1 Fig 53 & 54

NZBC G13/AS1

Table 7: Distances Between Supports Paragraph 6.2.1			
Material	Pipe diameter (mm)	Maximum distance between supports (m)	
		Vertical pipe	Graded pipe
Copper pipes	32 to 50	3.0	2.5
	greater than 50	3.5	3.0
uPVC pipes	32 to 50	1.0	0.5
	65 to 100	1.2	1.0
	greater than 100	1.8	1.2

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DRAINAGE

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Documents referred to in this section are:

NZBC B1/AS1	Structure – general
NZBC E1/AS1	Surface water
NZBC G13/AS2	Foul Water
AS/NZS 1254	PVC pipes and fittings for storm and surface water applications
AS/NZS 1260	PVC pipes and fittings for drain, waste and vent applications
AS/NZS 4130	Polyethylene pressure pipes (PE)
AS/NZS 4058	Precast concrete pipes (pressure and non-pressure)
NZS 3104	Specification for concrete production
NZS 7643	Installation of unplasticised PVC pipe systems
	Plumbers, Gasfitters and Drainlayers Act 2006

QUALIFICATIONS

Drainlayers to hold a current licence within the terms of the Plumbers Gasfitters & Drainlayers Act 2006 and be experienced, competent and familiar with the materials and techniques specified.

CONCRETE

17.5 MPa ordinary grade to NZS 3104.

uPVC PIPES

uPVC Pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

GULLY TRAPS

To NZBC G13/AS2: 3.3, complete with grating. (NZBC G13 Fig 2)

DRAINAGE AND FILLING MATERIALS

CHECK FRANCHISE LIST FOR Hardfill (delete this note)

Granular: Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm & AP40 compacted at 150mm layers under slab. (use AP40 compacted at 150mm layers under slab as drain bedding)

Selected: Fine grain soil or granular material suitable for bedding; excluding topsoil.

Ordinary: Top soil or other excavated materials.

STORMWATER

Dispose of stormwater on site as shown on the drawings.

CONCRETE ENCASEMENT

Concrete encase shallow drains and drains under driveways, on a 100 mm deep 17.5 MPa concrete bed reinforced with three 10 mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100 mm 17.5 MPa concrete.

BEDDING AND BACKFILL

Backfill drain lines in 150 mm layers, well tamped but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above the finished ground line. As per NZBC G13/AS2 Bedding and backfilling

SUPPORT AND THERMAL MOVEMENT

The plumbing system shall accommodate without failure the expected longitudinal movement in pipes resulting from temperature changes. All copper and PVC-U pipes shall incorporate expansion joints to comply with clause NZBC G13/AS1 6.3.1

TESTING OF DRAINAGE

NZBC G13/AS1 - 7.0 Watertightness

7.1 Test methods

7.1.1 All above ground sanitary plumbing pipework shall be tested by water test or air test to verify that the system is watertight.

7.1.2 Water test: The method described in Section 10 of NZS 7643 may be used for ensuring watertightness of above ground sanitary plumbing pipework.

7.1.3 Air tests may be carried out in accordance with either clause 12.3.2 of AS/NZS 3500.2.2 or Paragraph 8.3 of E1/VM1.

NZBC G13/AS2 - 6.0 Watertightness

6.1 Testing

6.1.1 All sections of the drainage system shall be tested by water test or air test to ensure watertightness.

COMMENT:

Testing should be undertaken before backfilling for the easy identification of any leaks.

6.1.2 Water test

NZS 7643 Section 11 gives an acceptable method for ensuring watertightness of below ground uPVC drainage pipework.

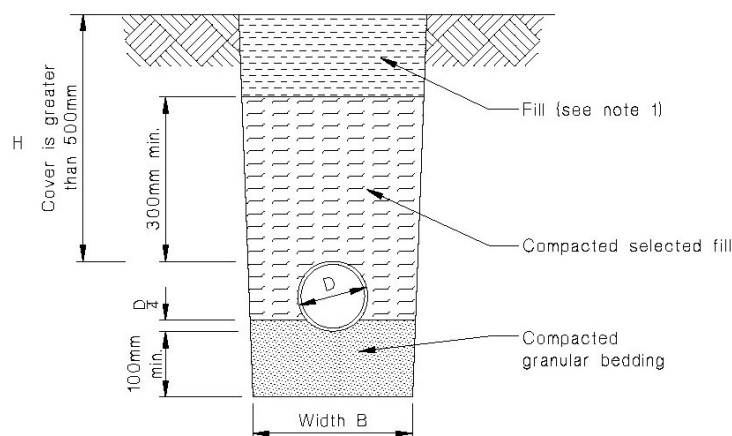
6.1.3 Air tests may be carried out in accordance with either clause 12.3.2 of AS/NZS 3500.2.2 or Paragraph 8.3 of E1/VM1.

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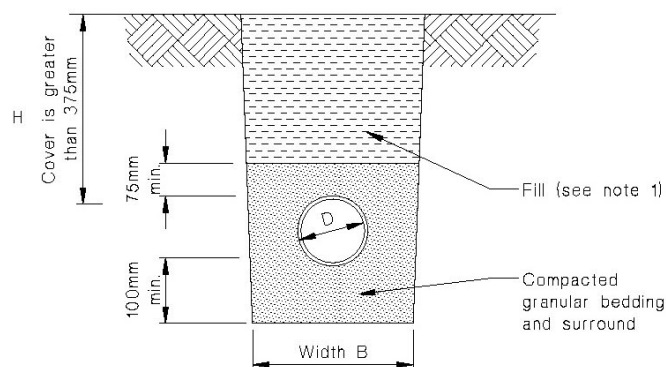
NZBC G13/AS2

Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



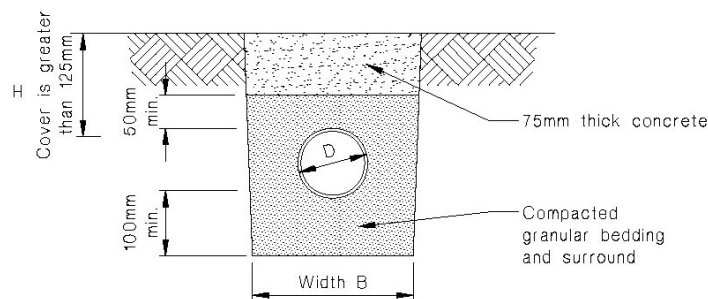
(a) Bedding type 'B' of NZS 7643

Cover greater than 500mm



(b) Bedding type 'D' of NZS 7643

Cover greater than 375mm



(c) Cover between 125mm and 375mm

NOTE:

1. Fill shall be:

-Ordinary fill where drains are located below gardens and open country.

-Compacted selected fill where the drains are located below residential driveways and similar areas subject to light traffic.

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Documents referred to in this section are:

NZBC G10/AS1	Piped services (Gas)
NZS 5258	Gas distribution
NZS 5261	Installation of gas burning appliances and equipment
NZS 7646	Polyethylene pipes and fittings for gas reticulation
Electricity Regulations 1997	
Hazardous Substances and New Organisms Act 1996	
Gas Regulations 1993	
Plumbers, Gasfitters and Drainlayers Act 1976	

REGULATIONS

Comply with the Gas Regulations, Electricity Regulations and other network utility operator's requirements.
Give notices for inspections and carry out tests as required.

PRIMARY CONNECTION

Include for the cost of the primary gas connection, complete with excavation and backfilling.

QUALIFICATIONS

Gasfitters to be experienced competent craftsman gasfitters, or registered gasfitters working under the direction of a craftsman gasfitter, familiar with the materials and techniques specified.

PIPING DESIGN

Design the piping system with pipe sizes to give a minimum pressure at any appliance inlet of 1.13 kPa for natural gas, when all appliances are in use; and with a maximum design pressure drop from meter outlet to any appliance of 80 Pa. All to NZS 5261.

PRESSURE TEST

Pressure test the system for leakage to NZS 5261 before pipework is concealed by linings.

FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the gas retailer that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

CERTIFICATION CERTIFICATE

Provide a Gasfitting Certification Certificate as required by Regulation 24 of the Gas Regulations 1993.

COPPER PIPE

Complete with fittings to NZS 5261.

POLYETHYLENE PIPE

To NZS 7646 and complete with fittings to NZS 5261.

ISOLATING VALVES

Manual shut-off valves to NZS 5261.

METER

Primary meter to suit design load, supply pressure and pressure drop, supplied and installed by the network utility operator.

EXECUTION GENERALLY

Carry out the whole of this work to the requirements of NZBC G10/AS1 and NZS 5261.

INSTALL PIPING

Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to NZS 5261. Confirm the type of pipe to be used and its location.

INSTALL GAS APPLIANCES

Fit and connect the gas appliances to NZS 5261, complete with flues where required and to the appliance manufacturer's requirements.

Gas Hob with Heat resistant splash back

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CONNECT GAS HOT WATER HEATER

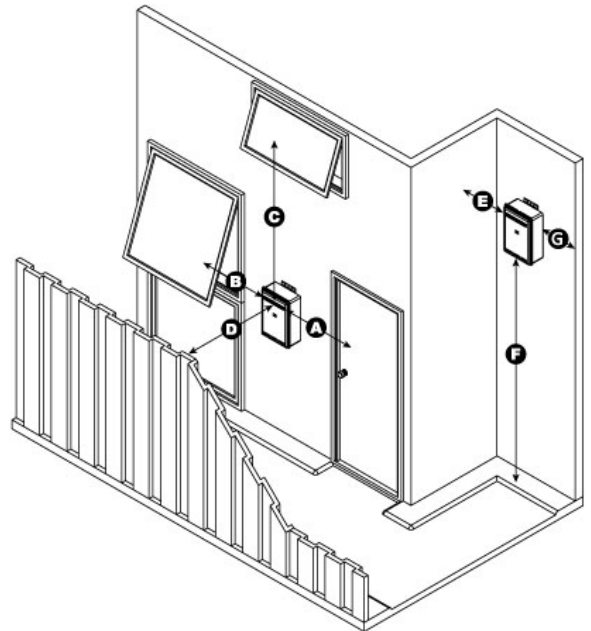
Connect the following gas hot water heater supplied and fitted under HOT AND COLD WATER SYSTEM, to NZS 5261 and the heater manufacturer's requirements.

Note that gas hot water is to be set at 55 degrees max at delivery point.

GENERAL CLEARANCES

The diagram opposite is to assist in determining where an External continuous flow water can be installed.

- A = min 500mm
- B = min 500mm
- C = min 1500mm
- D = min 500mm
- E = min 300mm
- F = min 300mm
- G = min 300mm



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ELECTRICAL

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Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundrying – Service connections
NZBC G3	Food Preparation and Prevention of Contamination
NZBC G8	Artificial Light - Illuminance
NZBC G9/AS1	Electricity, 1.0 Electrical Installations within domestic dwellings
AS 1670	Part 6: Smoke Alarms
AS/NZS 3000	Wiring Rules
AS/NZS 3008	Electrical installations - Selection of cables
	3008.1.2: Typical New Zealand installation conditions
AS/NZS 5000.2	Electric cables - Polymeric insulated - For working voltages up to and including 450/750 V
NZECF 51:2004	New Zealand Electrical Code of Practice for Homeowner/Occupier's Electrical Wiring Work in Domestic Installations

PVC-insulated cables for electric power and lighting

Electricity Regulations

New Zealand electrical codes of practice (ECP)

Illuminance at floor level shall be no less than 20 lux as per NZBC G8.3 - Performance requirement.

Minimum requirement: 1 standard lighting fixture per 10m² minimum. (per room) Hallway requires 1 lighting fixture per 4.7 lineal meters minimum. Lighting areas based on 100w closed abutted (CA80 or CA135) down light, 100w batten holder & 100w ceiling pan. (Where energy efficient bulbs are used they shall have an equivalent wattage to the minimum stated)

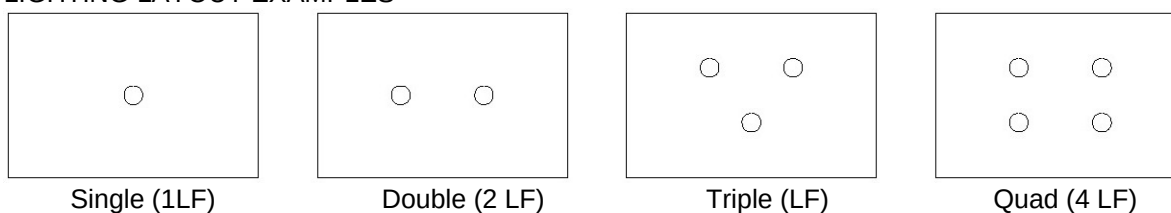
LIGHTING SCHEDULE (Minimum per area/room)

2 LF/room	Living, kitchen, dining, family, activity, media, lounge & bedroom.
1 LF	Hall (1 LF per 4.5 lineal metres min.)
1 LF/bay	Garage
1 LF	Entry, toilet, bathroom, laundry, WIR, store.
1 LF	Other rooms (1 LF per 10m ² min.)

KEY

LF	Standard Lighting Fixture – 100w Down light (CA80 or CA135), 100w Batten holder or 100w Ceiling Pan
H	Halogen – 50w (1 H per 5m ² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Lighting to be spaced out evenly.

Note: The above lighting schedule is the minimum requirement. The final layout is by owner on site but will not be less than the above schedule.

COMPLY

Comply with the referenced Electricity Regulations, Standards and the New Zealand electrical codes of practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection.

QUALIFICATIONS

Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations.

CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance to the owner, as required by the Electricity Regulations, and in particular, clauses 16, 34 and 35. Allow the network utility operator to test before the meter installation, listed work inspection, polarity check and livening of supply.

MAINS SUPPLY, SINGLE PHASE

Tough plastic sheathed neutral screened cable to AS/NZS 5000.2 and AS/NZS 3008.1.2, with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

MAIN EARTH - Provide a plastic toby box or UPVC tube to contain and protect the earth pin. Fix the connecting earth wiring securely against wall surfaces. Earth Bar to be bonded to the reinforcing mesh.

RCD protection to AS/NZS 3000

Bond together and to earth all plumbing fittings not adequately isolated, to the Electricity Regulations and to the fitting manufacturer's requirements.

CABLES

Tough plastic sheathed copper conductors to AS/NZS 5000.2, stranded above 1.0 mm², and to AS/NZS 3008.1.2. Minimum sizes. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the connected load, or produce an excessive voltage drop.

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions may be above 35°C.

METER BOX

Proprietary manufactured, zinc plated powder coated metal case, weatherproof if mounted outdoors, and complete with meter mounting, main switch and fuse.

DISTRIBUTION BOARD

Proprietary manufactured heavy duty plastic fire resistant enclosed construction, complete with neutral and earth busbars, MCBs, 30 mA RCDs and 60 amp main switch, complete with 20% spare capacity to AS/NZS 3000. All protective devices: 6kA MCBs of the appropriate rating.

MINIATURE CIRCUIT BREAKERS

Miniature moulded case circuit breakers

WALL BOXES

Standard size in plastic, with 2 or more gang size, all screw fixed.

SWITCH UNITS

Sixteen amp minimum rated, 230 volt polycarbonate flush plate units.

Fit all single and double switch units and socket at the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000 mm & at least 500mm from corners.

Socket Units: 150 mm above work benches,

Mount switches vertically and socket units horizontally. Label all switch units that control electrical equipment by colour filled engraving on the switch plate.

HOT WATER SYSTEM SWITCH

One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.

SWITCHED SOCKET UNITS

Ten amp, 230 volt polycarbonate flush plate 3 pin flat NZS combination switch units, single or multi gang.

SMOKE ALARMS

To AS 1670 & Smoke alarms shall be installed on or near the ceiling in accordance with AS 1670.6 and the manufacturer's instructions.

LAUNDRY

No less than 1x 10amp socket outlet to be provided adjacent to space provided for washing machine.

KITCHEN

No less than 1x 10amp socket outlet to be provided in space behind Refrigerator.
Provide 1x fixed outlet to cooking appliance

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GARAGE DOOR CONTROLLERS

Provide single switched socket outlet for the door controller to plug into.

LIGHT FITTINGS

All fittings complete with lamps, install light fittings in locations as directed by the owner, and in accordance with the fitting manufacturer's requirements and no less than the lighting schedule.

All downlights to be closed and abutted, halogen downlights to have factory heat shields.

CIRCUIT PROTECTION

Install MCBs to protect each final sub circuit sized for circuit maximum loading.

Domestic

Install RCD protection at the switchboard of final sub circuits controlling socket outlets and lighting except for:

- Fixed cooking equipment, heating, HWC and A/C units

SET-OUT

Unless specifically detailed, confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring with the owner. Fix outlet items level, plumb and in line.

CABLING

Install with a maximum of 17 light outlet units or 6 double or single switched socket units on any circuit. Minimum 2 lighting circuits per installation. Separate circuits for all electric heating appliances. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member. Install cable in conduits where required to pass through concrete or underground.

Complete all labelling in clear machine printed permanent manner. Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

WALL BOXES

Flush mounted in cavity construction.

EXTRA LOW VOLTAGE LIGHTING

Where remote transformers are used for ELV lamps, connect from transformer to lamp with minimum 2.5 mm² conductor, to ensure voltage drop in transformer and conductor does not exceed 0.8 volts. Connect lamps 50 watt or greater matched to no more than one per transformer, located as close as practicable to the lamp. Ensure transformers and rear of light fittings are adequately ventilated and clear of any thermal insulation.

COMPLETION

Leave work operating correctly, with equipment clean and all lamps operational.

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Management of Site Safety

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The main contractor to undertake best practice systems to manage health and site safety. Building supervisors are all site safe qualified. The contractors are inducted on our Health and Safety policy and also provide the main contractor with documentation on their Health and Safety Management systems and also fill out a health and safety questionnaire.

The main contractor (Noted on specifications cover sheet) undertakes to manage hazards by elimination, isolation or minimisation in that order.

There is a Hazard Register posted on site at all times and all sub trades and suppliers required to record any potential hazards introduced onto site.

Earthworks and trenching will generally be back filled on same day but if this is not possible, barriers will be erected to minimise hazard.

To ensure site is clear, work areas are to be kept clean and tidy with receptacles provided and areas allocated areas for waste and refuse.

Chemicals and paints will be stored in original containers in a secure and well ventilated place appropriate to the product.

Building materials stored on site will be stacked so they cannot fall or protrude dangerously.

Public visiting site are instructed to report to site foreman who will ensure public are provided with a high visibility vest which must be worn on site at all times. Site foreman to ensure public are detoured from hazardous areas.

Fencing to keep out unauthorised personnel. Under NZBC F5 – Construction and Demolition Hazards Clause 1.1.1, a 2.0 metre fence is required for protection of public.

Non-work Periods

The main contractor and sub contractors have responsibility to ensure public is not endangered in any way and site is safe during non-work periods

All sites have sign posted at entry stating 'Authorised personnel access only and please report to site foreman.

Tools locked away at end of day.

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EROSION AND SEDIMENT CONTROL PLAN

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(Please also refer to the Drainage Plan and Rainwater & Drainage Sections of this Specification.)

The main contractor will use the relevant erosion and sediment control measures to meet the requirements for this site.

Provide protection for neighbouring sites from rubbish or sediment contamination.

Erosion Control

Minimum existing vegetation and soil will be removed from the site,
Sediment Control measures will be in place before earthworks begin
Earthworks will keep to a minimum.

Stockpiles will be delivered as late as possible, located within the sediment control zone, and protected from runoff and covered where necessary.

Trenching will where possible be done at one time for all services. Contractors will be requested to set out, dig, and backfill trenches in a such as way as to minimise erosion and runoff.

Hard wastes will be placed in the bins provided by the Company.

Clients will be encouraged to landscape and cover exposed soil on their site as soon as possible.

Sediment and Run-off Control

Upslope water will be diverted from the site where possible.

Sediment controls will be placed at the bottom of the site to minimise runoff leaving the site. These may involve sediment fencing, supplemented with straw bales on steep areas.

Existing vegetation will be used where possible to minimise runoff

Sump inlets will be protected from sediment runoff.

Storm water down pipes will be connected as soon as practicable to the permanent Storm water system once the roof is laid.

Contractors will be required to comply with these control measures

Wash down and wet trade runoff will be trapped and controlled on site

Sediment control measures will be regularly inspected and maintained.

Site Access

Stabilised access from the road to the platform will be provided.

A runoff diversion bund will be included in the site access way if required.

Sediment on footpaths and roads will be removed as soon as practicable

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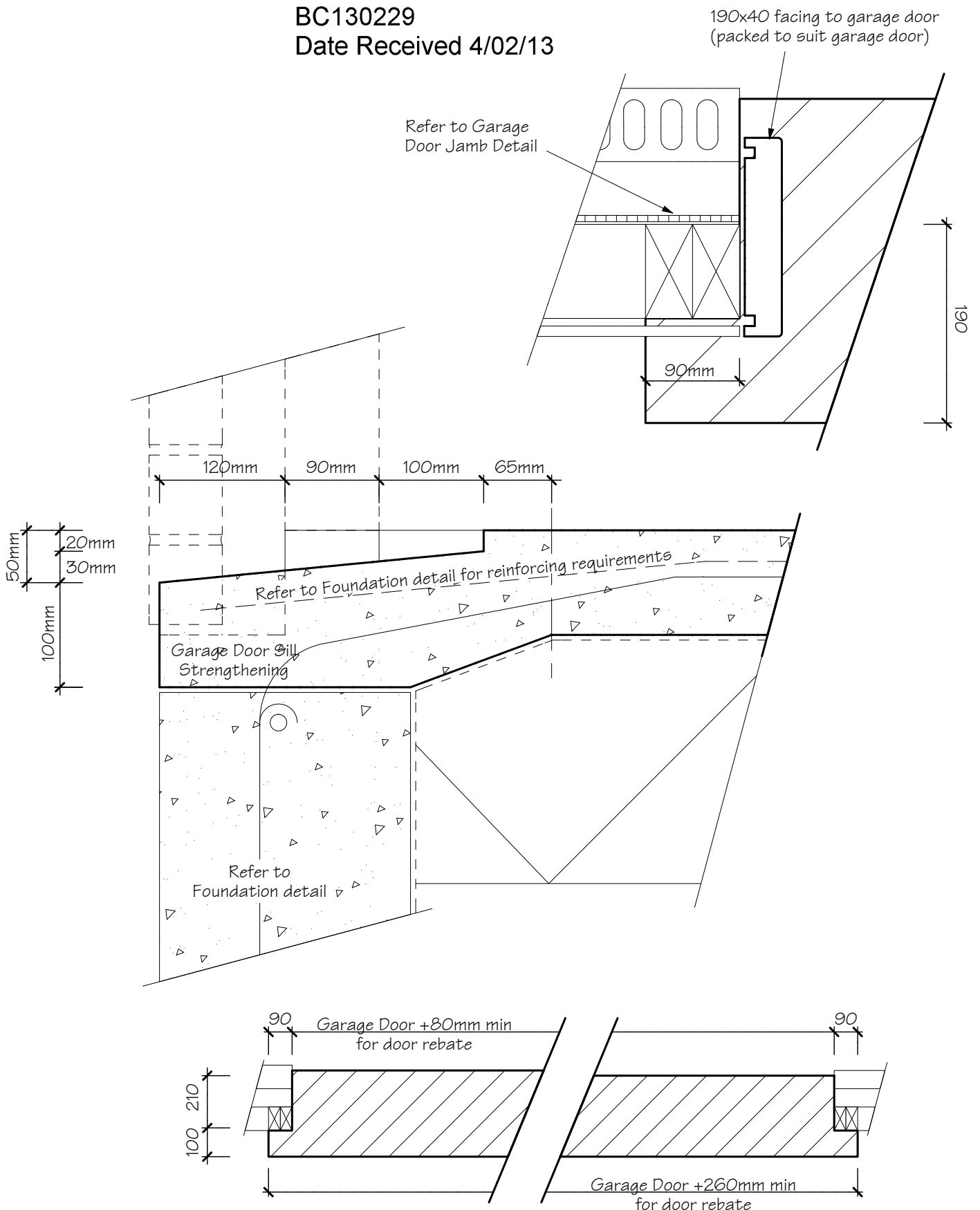
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190x40 facing to garage door
(packed to suit garage door)

Refer to Garage
Door Jamb Detail



PLAN VIEW (NTS)

The contractor shall verify all measurements prior to setout and commencement of work. Use figured dimensions in preference to scaling.



This plan is developed for the purchaser and is
copyright to Stonewood Homes NZ Ltd.

Brick Veneer (Ecoply Barrier)

Scale:

1:5

Drawn By:

Jody

Garage Door Sill
(70 Series Brick)

Issue Date:

April 2012

Product:

BRE

Detail Number:

005

Rev:

A

Detail Type:

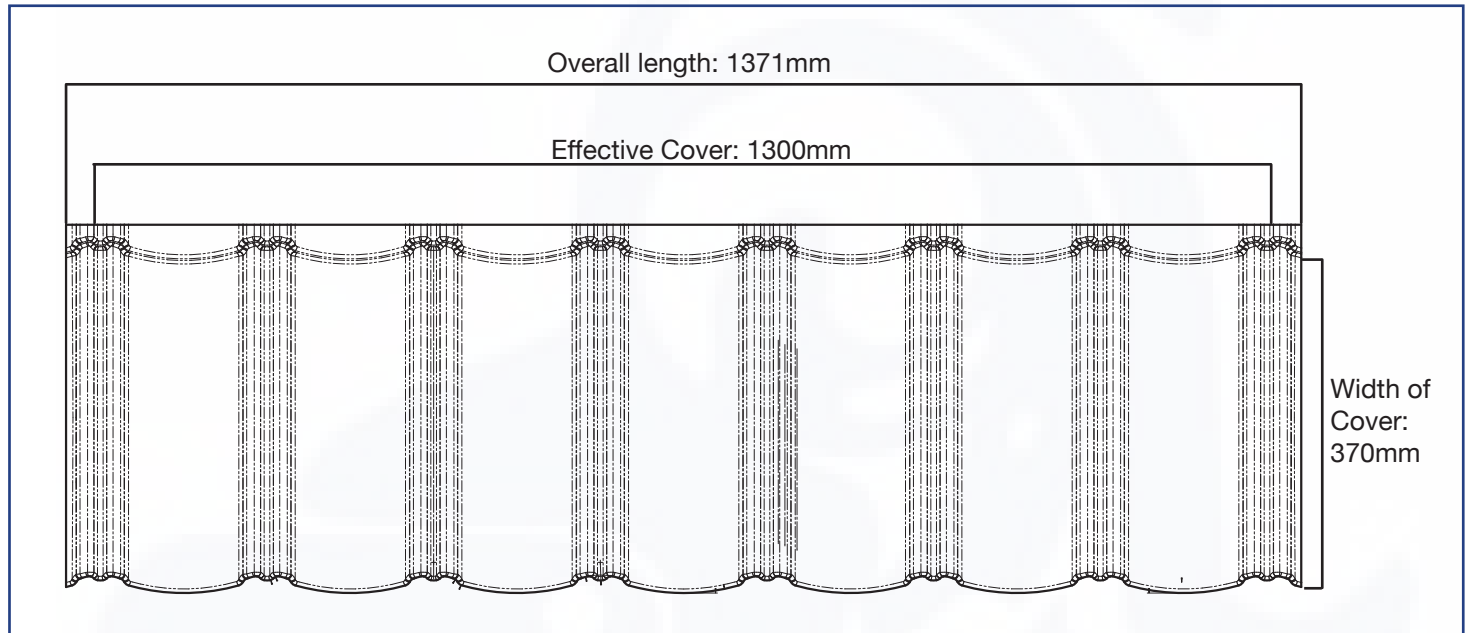
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T:\SWH Draughting\Detail Library\BRE Brick Veneer (Ecoply Barrier) Detail book\BRE Brick Veneer (Ecoply Barrier) LAYOUT layout

Chateau Tile

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Metalcraft Lightweight Chateau Metal Tiles provide an economical and durable roofing option. Metal Tiles provide a quality finish to any dwelling and offer a cost saving solution in comparison with heavier alternative roof tiles, as they require less reinforcing timber in the roof bracing. The Metalcraft Chateau Tile has a scalloped finish, which affords a timeless look to any style home.

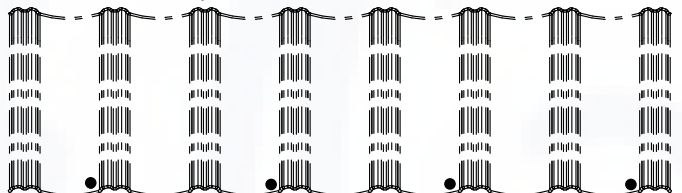


Minimum Pitch: 12.5 degrees Cover: 1300mm

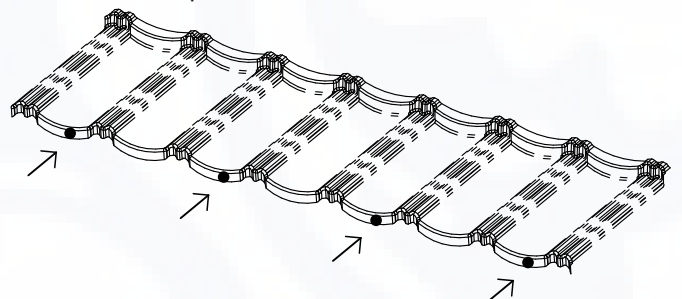


Chateau Tile Fixing Details

Bottom Course pattern - 50 x 2.8 coloured with washer seal



Main roof area pattern - 50 x 2.8 Black or Galv nails



- ★ Gauge: 0.39 G300
- ★ Tiles /m2: 2.1
- ★ Available in pre-painted Color Steel or Chip Coat Finish
- ★ Weight (painted): 2.1kg (chip coated): 3.0kg

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1.0 ECOPLY® BARRIER

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Ecoply® Barrier provides a weather tight rigid air barrier for drained and vented cavity systems outside the building frame effectively replacing traditional building wrap in the cavity while providing superior structural bracing and forming a strong secondary line of defence against moisture penetration into the building envelope.

Ecoply Barrier is suitable for use in both residential and commercial buildings and consists of a 7 mm thick structural plywood panel which is sealed on the face and edges using an advanced polyester powder coating process for increased sheet durability and protection from moisture penetration.

Ecoply Barrier meets the NZ Building Code rigid sheathing performance requirements as outlined in Section 9.1.4 and Table 23 of E2/ AS1 and has been tested to 4.5kPa ultimate limit and 3.3kPa serviceability limit using a 12 mm sheet cladding in accordance with AS/NZS 4284:2008 Testing of Building Facades.

1.1 ECOPLY BARRIER ADVANTAGES

- Fully tested code compliant rigid air barrier system
- Special water repellent face coating
- High structural bracing when installed as per bracing specifications
- Temporary weather protection to the building envelope for up to 6 months prior to cladding installation
- Fast building close in for an earlier interior start and a quicker overall build time
- Low formaldehyde emission level (E0)
- Manufactured from sustainable plantation pine
- Available FSC certified (SCS-COC-001316) upon request

2.0 ECOPLY® BRAND

Ecoply is New Zealand's leading brand of structural plywood and is manufactured by CHH Woodproducts under a third party audited quality control programme to monitor compliance with AS/NZS 2269 - Plywood Structural.

3.0 TECHNICAL INFORMATION AND CAD DETAILS

Product test reports, technical data sheets and CAD drawings referenced in this guide are downloadable at www.chhwoodproducts.co.nz

When specifying or installing any Ecoply product visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material.

The information contained in this manual relates specifically to Ecoply Barrier branded structural plywood manufactured by Carter Holt Harvey Woodproducts and cannot be used with any other plywood manufacturers product however similar they may appear.

Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply products is not appropriate and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the New Zealand Building Code.

4.0 ECOPLY® BARRIER PRODUCTS

TABLE 1: PRODUCT RANGE

Description	Weight (kg/m ²)	Thickness (mm)	Width (mm)	Length (mm)
Ecoply® Barrier Structural Plywood with factory applied proprietary coating to sheet surface and edges	4.0	7 mm	1200	2440
				2745

4.1 BUILDING MATERIALS FOR USE WITH ECOPLY® BARRIER

Materials Available from CHH Woodproducts

- Ecoply® Sealing Tape 60 mm x 30 m for vertical, internal and external sheet joints
- Cavity Batten - 47 x 21 mm Merch Grade

Materials Not Available from CHH Woodproducts

- PVC horizontal flashing. Use Ecoply Horizontal Jointer (Product code RDZF7) supplied by E2 Flashing Solutions
- PVC cavity closure flashing or acceptable flashing with Tables 20 and 21 of E2/AS1
- Fasteners - refer to Section 6.2: Fasteners
- Window and penetration flexible flashing tapes

Recommended Window and Penetration flexible flashing tape suppliers

Flexible flashing tapes must comply with Parts 3.2 and 4 of ICBO Acceptable Criteria AC148.

- Protecto Wrap - 0800 776 9727, www.protectowrap.co.nz
- Thermakraft - 0800 806 595, www.thermakraft.co.nz

5.0 DESIGN CONSIDERATIONS

Responsibility

The Specifier for the project must ensure that the details in the specification are appropriate for the intended application and that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

Preservative Treatment

Ecoply® Barrier is treated in accordance with AS/NZS 1604.3 with H3.2 CCA (Copper Chrome Arsenate) water borne treatment.

H3.2 CCA treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, suitable to periodic moderate wetting and leaching."

Cut Sheets

Ecoply Barrier is envelope preservative treated. If a sheet end is cut place the cut end to the top. Always have a sealed sheet end at the bottom to avoid potential moisture ingress into the panel.

All other cuts and penetrations must be covered by a suitable flexible flashing tape and installed as per Ecoply Barrier literature.

When installed as per the above requirements, cut edges and penetrations are not required to be resealed with a brush on preservative treatment however if desired CHH® Woodproducts recommends the use of Holdfast Metalex End Seal.

Dimensional Sheet Change

Detailing and construction using Ecoply Barrier must allow for natural movement in line with normal cycles of moisture change occurring in the external environment.

The total expansion both along and across a 2440 x 1200 mm panel can be in the order of 1.5 mm to 3 mm dependent upon the natural environment. Detailing and construction practise should take the potential for natural movement into consideration.

Ecoply Barrier sheets may exhibit slight sheet bowing across the sheet resulting from the preservative treatment and surface coating processes. This is to be expected and will not affect the products structural performance or weather tightness when installed as per specifications.

Formaldehyde

Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply Barrier meets the lowest formaldehyde emission classification (E₀ - less than 0.5 mg/ litre).

Wind Loadings

Ecoply Barrier is suitable for use in all wind zones up to and including extra high (up to 55 m/s) in New Zealand as defined by NZS 3604 and has been tested to 4.5kPa ultimate limit and 3.3kPa serviceability limit in accordance with the AS/NZS 4248:2008 Testing of Building Facades in conjunction with a 12 mm sheet cladding (ie: Shadowclad® exterior cladding) on a drained cavity system.

For Ecoply Barrier section properties refer to Section 1.5: Section Properties in the Ecoply Specification and Installation Guide.

Sustainability

Ecoply Barrier is manufactured from radiata pine, a plantation grown medium density softwood. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees.

Ecoply Barrier is available Forestry Stewardship Council (SCS-COC-001316) certified upon request.

Health & Safety

Ecoply Barrier should be handled in accordance with the Material Safety Data Sheet (MSDS) for H3.2 CCA treated Ecoply.

Always wear safety glasses or non fogging goggles when working with Ecoply Barrier.

If wood dust exposure is not controlled when machining (sawing, drilling etc) a P1 or P2 replaceable filter or disposable face piece respirator should be worn.

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

Storage & Handling

Ecoply Barrier requires care in storage and handling. The following suggestions will help keep the plywood in good condition prior to installation:

- The storage area should be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity
- Support for the sheets should be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in sheets)
- The stack should be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage
- The sheets should be stacked flat, NOT on edge

Limitations

The information contained in this document is current as at June 2011 and is based on data available to CHH Woodproducts at the time of going to print.

It is important that you call 0800 326 759 to confirm that you have the most up to date information available or refer to www.chhwoodproducts.co.nz to download current specification literature.

CHH Woodproducts has used reasonable endeavours to ensure the accuracy and reliability of the information contained in this document and, to the extent permitted by law, will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

6.0 INSTALLATION

6.1 FRAMING

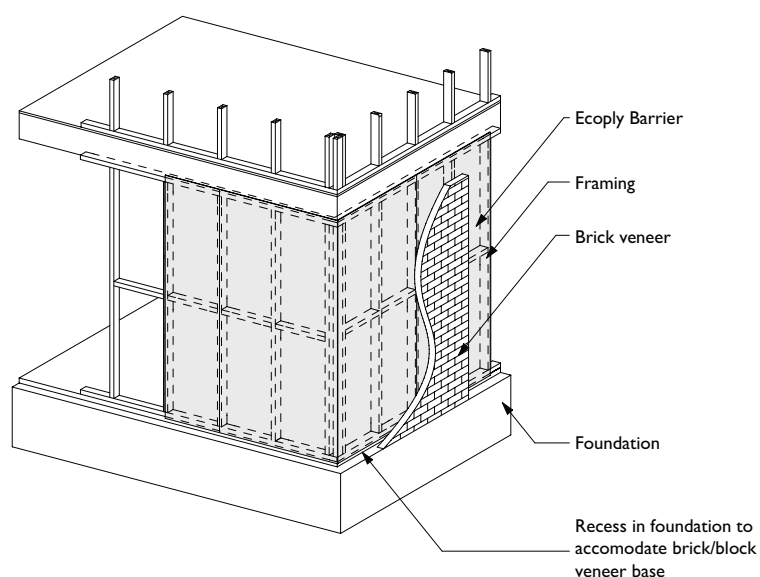
Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specification and treated in accordance with NZS 3602.

All timber framing sizes and set outs must comply with NZS 3604 (or be specifically designed to NZS 3603:1993 "Timber Structures Standard" and with stud and nog centres and timber widths required by this specification.

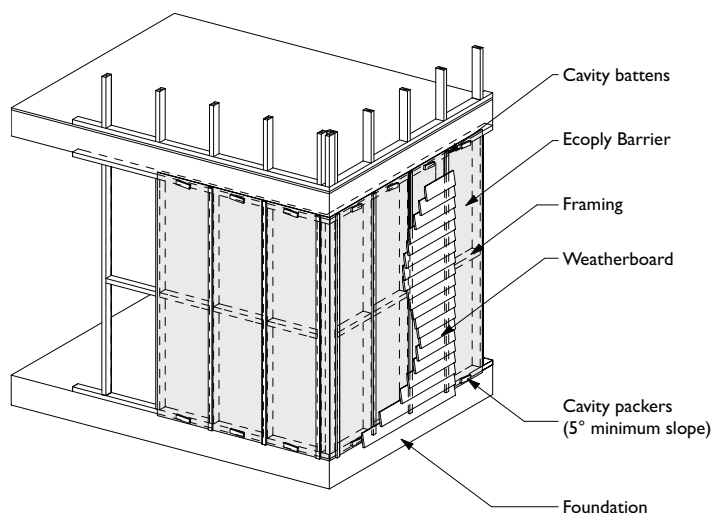
All Ecoply® Barrier sheet edges must be fully supported by framing.

- Studs must not exceed 600 mm centres
- Nogs must be provided at 1200 mm centres maximum
- The minimum framing width for fixing Ecoply Barrier is 45 mm at sheet joints
- Framing must be kept as dry as possible at all times

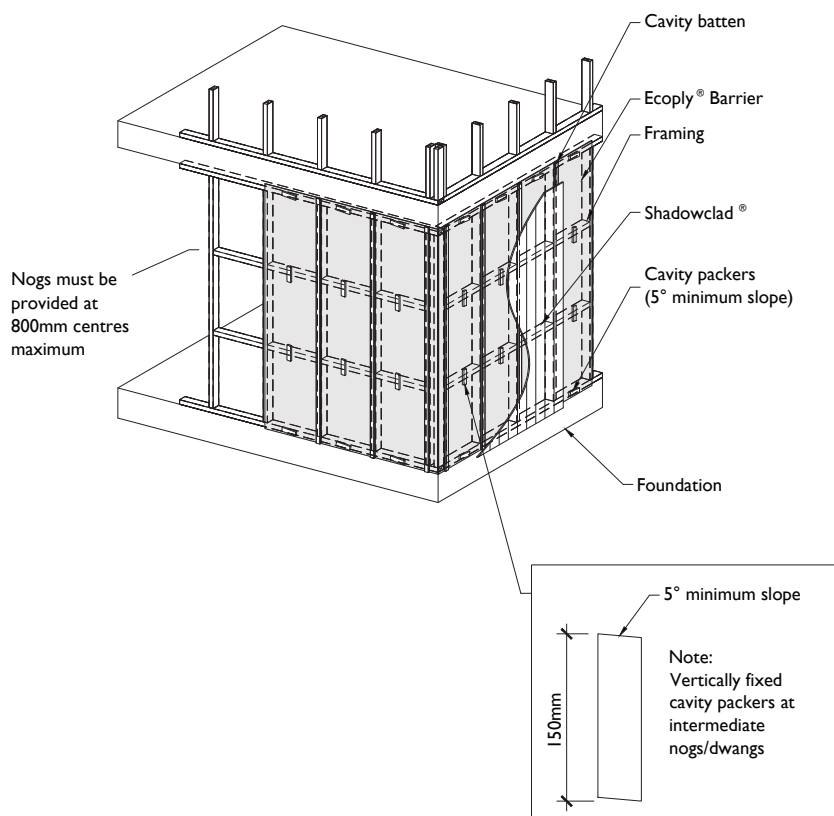
BAR001: Ecoply® Barrier with brick



BAR002: Ecoply® Barrier with weatherboard



BAR003: Ecoply® Barrier with Shadowclad®



6.2 FASTENERS

- Unless otherwise specified nail length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is greater
- Fasteners must be at least 3 fastener diameters or 7 mm from the edge of the sheet
- Unless otherwise specified use a minimum of hot dipped galvanised fasteners or better
- Where using stainless steel nails, nails must be annular grooved
- Cladding fasteners must be increased by a minimum of 7 mm to achieve the required fastener pull out loadings

TABLE 2: FASTENER SIZE

Fixing Type	Minimum Nail Length
Hand Driven	40 x 2.5 mm clouts (flat head), hot dipped galvanised or better
Power Driven	Paslode Impulse 50 x 2.8 mm hot dipped galvanised or better, ring round head drive

Where Ecoply® Barrier is used as structural bracing refer to the specifications detailed in Section 3.0: Structural Bracing in the Ecoply Specification and Installation Guide.

6.3 FASTENER DURABILITY

Ecoply Barrier is designed for use in sheltered conditions such as cavity construction and not as an external cladding. Fasteners shall be a minimum of hot dip galvanised for all zones excluding sea

spray zones where stainless steel fasteners are required. Where stainless steel is required, annular groove nails must be used.

6.4 SHEET LAYOUT

- All sheet edges must be supported by the framing
- Fastener pattern unless otherwise specified:
 - 150 mm centres at sheet edges
 - 300 mm centres within sheet body
- Sheets must overhang the bottom plate by a minimum of 25 mm over timber and concrete foundations

Cut Sheets

Ecoply® Barrier is envelope preservative treated. If a sheet end is cut place the cut end to the top. Always have a sealed sheet end at the bottom to avoid potential moisture ingress into the panel.

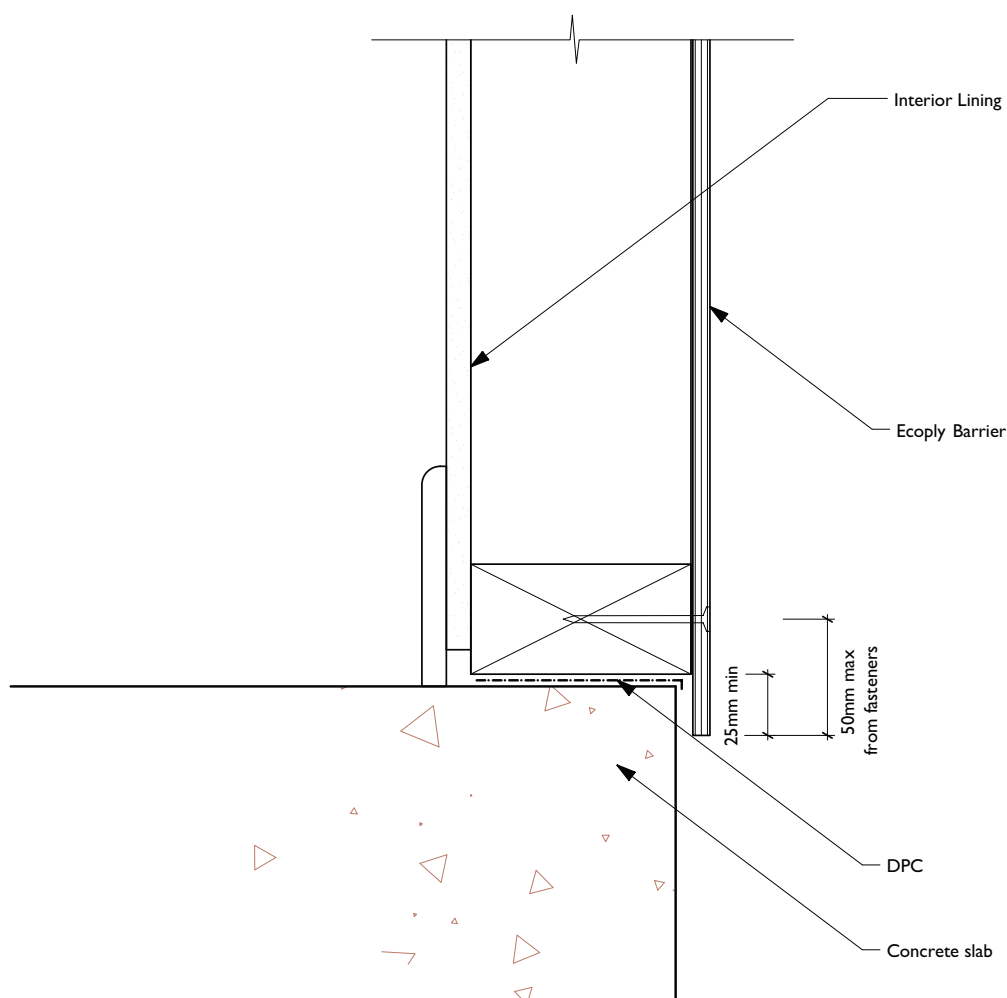
All other cuts and penetrations must be covered by a suitable flexible flashing tape and installed as per Ecoply Barrier literature.

When installed as per the above requirements, cut edges and penetrations are not required to be resealed with a brush on preservative treatment however if desired CHH Woodproducts recommends the use of Holdfast Metalex End Seal.

6.5 GROUND CLEARANCES

- Ground clearance from the bottom of Ecoply Barrier to ground:
 - 100 mm minimum to decks and permanently paved ground
 - 175 mm minimum to unprotected ground
- Ecoply Barrier must not be in contact with non draining water, damp or soil

BAR005: Overhang clearances

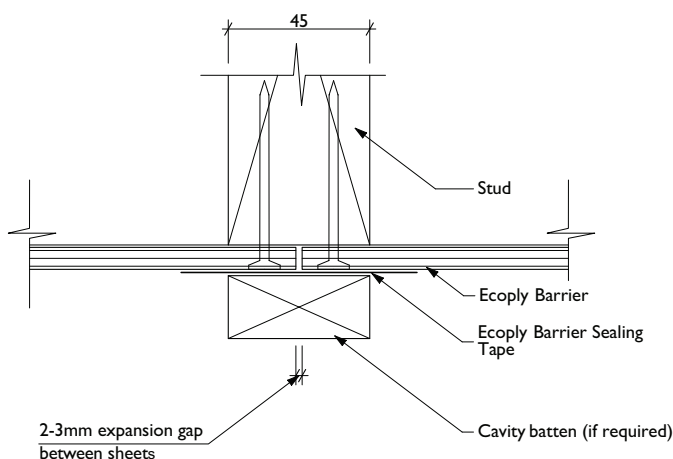


6.6 VERTICAL SHEET JOINTS

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- Sheets must be sealed with a suitable flexible flashing tape over vertical sheet joints to prevent moisture ingress into framing behind the sheets
- Seal vertical joints by running Ecoply® Barrier Sealing tape over the joints
- Installation of cavity battens where applicable prior to cladding installation provides further protection from moisture ingress between sheet edges
- Ensure sheet edges are free of dust prior to tape fixing to ensure adhesion between the sheet surface and tape
- Sheets and Ecoply Barrier Sealing tape must not be exposed to external weathering for more than 6 months prior to installation of the exterior cladding system

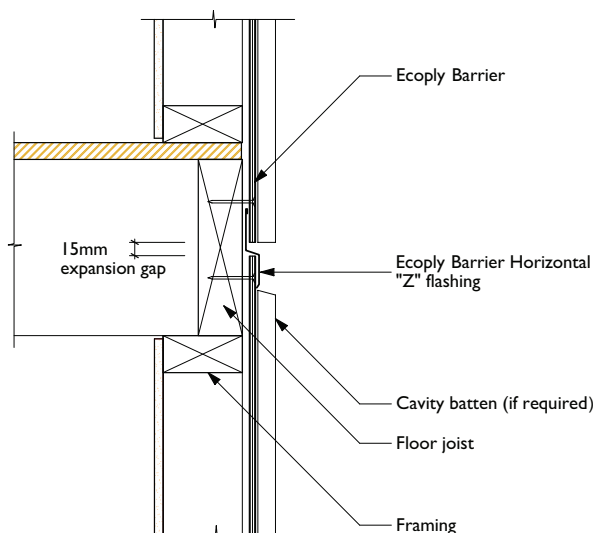
BAR006: Vertical sheet joints



6.7 HORIZONTAL SHEET JOINTS

- Use Ecoply Barrier PVC horizontal 'Z' flashing (Product code RDZF7) for horizontal sheet joints
- The Ecoply Barrier PVC horizontal 'Z' flashing is manufactured by E2 Flashing Solutions. Contact E2 Flashing Solutions on (03) 358 5775 or visit www.e2flashingolutions.co.nz for further information

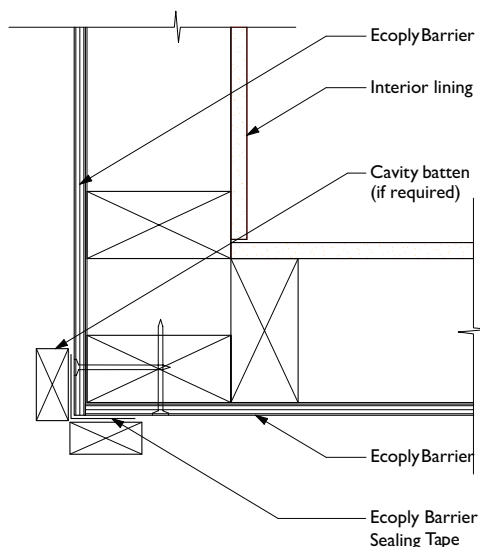
BAR007: Horizontal joint



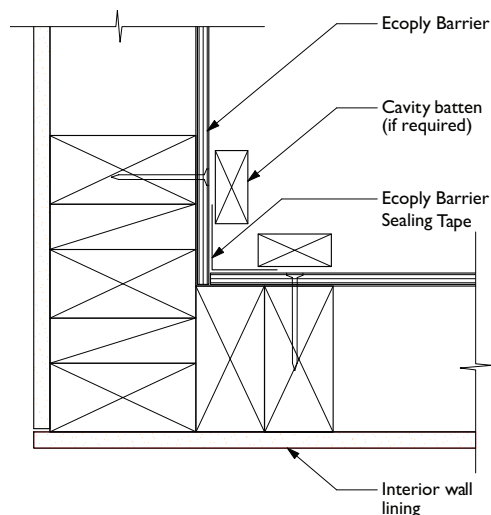
6.8 INTERNAL & EXTERNAL CORNERS

- Corners must be sealed with Ecoply® Barrier Sealing tape

BAR008: External corner



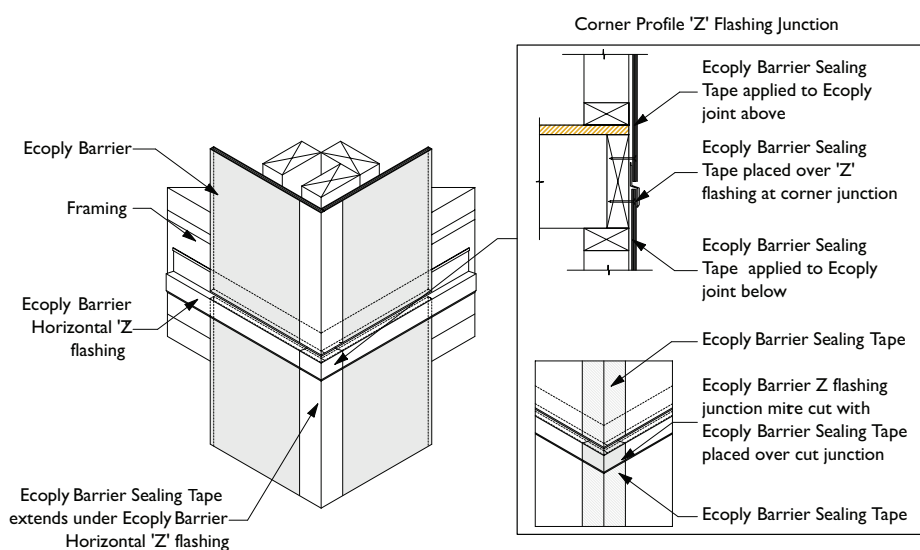
BAR009: Internal corner



6.9 CORNER JUNCTIONS TO HORIZONTAL JOINTS

- Corners must be sealed with Ecoply Barrier Sealing tape
- At horizontal joints sealing tape must extend under horizontal 'Z' flashing
- For internal corner junctions follow BAR010 specifications as detailed for external corner junctions

BAR010: External corner to horizontal joint

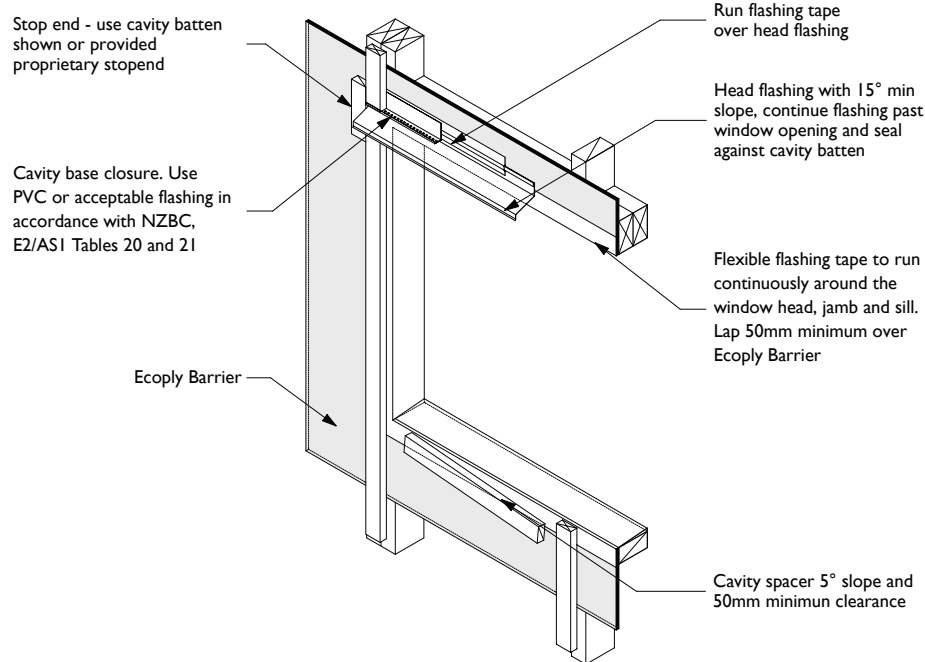


6.10 WINDOW PENETRATIONS

BC130229
Date Received 4/02/13

- Timber framing around window opening must be covered with a 150 mm wide flexible flashing tape
- The entire opening around the window frame must be covered with a flexible flashing tape
- The tape is sealed over the Ecoply® Barrier sheet
- Ecoply Barrier must be free of dust and dry before applying flexible flashing tapes
- The use of primer sprays before fixing tapes may be specified by flexible flashing tape manufacturers

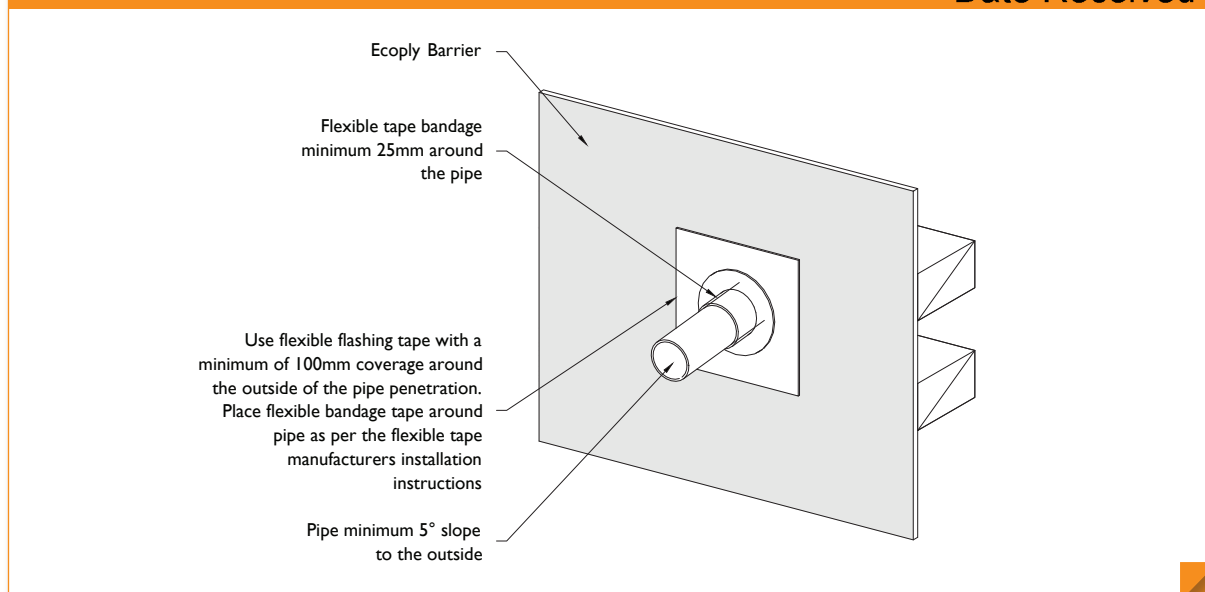
BAR012: Wall openings



6.11 SERVICE PENETRATIONS

- Service penetrations must be sealed using a flexible flashing tape
- A minimum cover of 100 mm over the sheet surrounding the penetration is required
- Use a flexible flashing tape bandage around the pipe (25 mm minimum width)
- Always refer to the flexible flashing manufacturer for further installation advice
- For sheet penetrations where Ecoply Barrier is used as structural bracing refer to Section 3.0: Structural Bracing of the Ecoply Specification and Installation Guide

BAR011: Penetration and services



Note: Refer to Figure 60 E2/AS1 for further information.

6.12 STRUCTURAL BRACING

Where Ecoply® Barrier is used as structural bracing refer to the specifications detailed in Section 3.0: Structural Bracing in the Ecoply Specification and Installation Guide.

Detailing of flexible flashing tapes for Ecoply Barrier used as structural bracing are as per the specifications outlined in this guide.

TABLE 3: SUMMARY P2I RATINGS FOR 2.4 M HIGH ECOPLY® BARRIER WALL ELEMENT

Specification No.	Minimum Wall Length	Lining Requirements	BU's/m Wind	BU's/m Earthquake
EP1	0.6 m	7 mm Ecoply®/Ecoply® Barrier one side	125	130
EP2	0.6 m	7 mm Ecoply®/Ecoply® Barrier each side	140	150
EPG	0.4 m	7 mm Ecoply®/Ecoply® Barrier one side and 10 mm GIB® Standard plasterboard other side	100	115
	1.2 m		150	150
EPGs	0.4 m	7 mm Ecoply®/Ecoply® Barrier one side* and 10 mm GIB® Standard plasterboard other side	100	115
	1.2 m		150	120

* Plywood side of element can be a maximum of 300 mm below top plate

Note: Bracing technical information has been specifically tested using Ecoply branded structural plywood. This information cannot be used with any other plywood brands no matter how similar they may appear

6.13 CLADDING SYSTEM INSTALLATION

- Cladding should be installed within 6 months of Ecoply Barrier installation
- Claddings must comply and be installed in line with NZ Building Code and cladding supplier specifications
- Cladding maintenance advice should be sought from the cladding manufacturer
- Cladding fastener lengths must be increased by a minimum of 7 mm to ensure the required fastener pull out loadings are achieved



FUTURE-PROOF BUILDING



As part of our ongoing commitment to the environment we have printed this brochure on FSC paper stock.



June 2011

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Freefax: 0800 746 400

www.chhwoodproducts.co.nz



Construction R-value Calculator

[H1 compliance calculator](#),
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the new [Design Navigator message board](#)

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☒

Walls ☐

Roofs ☐

Floor: Slab floor

internal surface 0.09

Flooring

R-value: 0

Insulation value of the slabfloor

Slab floor area [m²]:

Perimeter length [m]:

External wall thickness [mm]:

Soil conductivity [W/m ♦C]:

Underslab insulation:

Insulation:

Piles Footings: Number:

Penetration Diameter: mm

Slab edge insulation:

Insulation:

R-value: 1.52

Resulting R-value:

1.61

m♦K/W.

[Print Page](#)

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31



Construction R-value Calculator

[H1 compliance calculator](#),
now with BPI calculation.

BC130229

Date Received 4/02/13

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

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Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☐Walls ☒Roofs ☐

Wall: Timber frame with vented cavity

external surface 0.03

Cladding 70mm brick

R-value: 0.06

Air Barrier Plywood 7.5mm

R-value: 0.06

Timber Frame & Cavity 90mm, studs @ 600mm, dwangs @ 1200mm

Frame Area: 13.2%

Cavity Area: 86.8%

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

Timber Frame
R-value: 0.75

Pink®Batts® R2.4 Wall 2.4

still Airgap none

R-value: 0

Wall Lining Gypsum plasterboard 10mm

R-value: 0.04

internal surface 0.09

Resulting R-value:

2.2

m²K/W.

Print Page

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31



Construction R-value Calculator

[H1 compliance calculator](#),
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the new [Design Navigator message board](#)

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☐

Walls ☒

Roofs ☐

Wall: Timber frame with vented cavity

external surface 0.03

Cladding

R-value: 0.04

Air Barrier

R-value: 0.06

Timber Frame & Cavity

Frame Area: 13.2%

Cavity Area: 86.8%

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

Timber Frame
R-value: 0.75

Pink®Batts® R2.4 Wall

still Airgap

R-value: 0

Wall Lining

R-value: 0.04

internal surface 0.09

Resulting R-value:

2.19

m²K/W.

[Print Page](#)

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid construction)

	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26
Glazing (skylights)	R-0.26	R-0.26	R-0.31



Construction R-value Calculator

[H1 compliance calculator](#),
now with BPI calculation.

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "iso-thermal planes" method, the same method as used in NZS4214:2006.

Some of the possible material combinations may not be suitable for actual constructions, i.e. EPS based claddings directly fixed on timber framing. Please make sure to select only appropriate material combinations.

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it or use the new [Design Navigator message board](#)

Please select the element type. Then choose the construction details and enter the R-value of the insulation either directly in the text box or by choosing a product from the right panel .

Floors ☐

Walls ☐

Roofs ☒

Roof: Timber framed roof, direct fixed or battened flat ceiling

external surface 0.03

Roofing

R-value: 0.01

Insulation

Timber Frame & Cavity

Frame Area: 10%

Cavity Area: 90%

Roof space (still air) 0.11

Roof space (still air) 0.11

Trusses and dwangs

R-value: 0.78

Pink®Batts® R3.6 Ceiling

Ceiling Lining

R-value: 0.06

internal surface 0.09

Recessed downlights

Ceiling area [m²]: Number of downlights: Clearance from lamp holder side [m]:

Resulting R-value:

3.01

m²/K/W.

[Print Page](#)

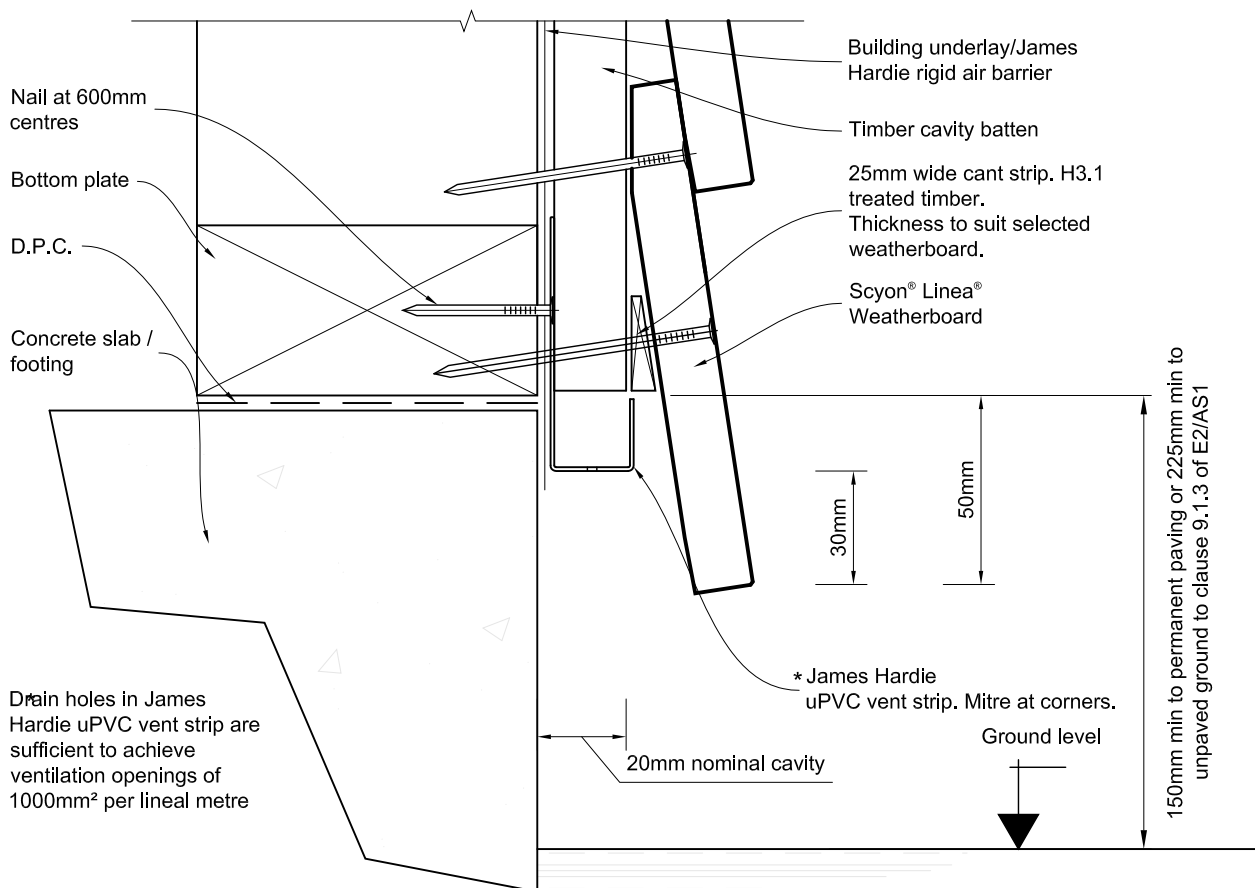
Selwyn District Council
Approved Building Consent Document

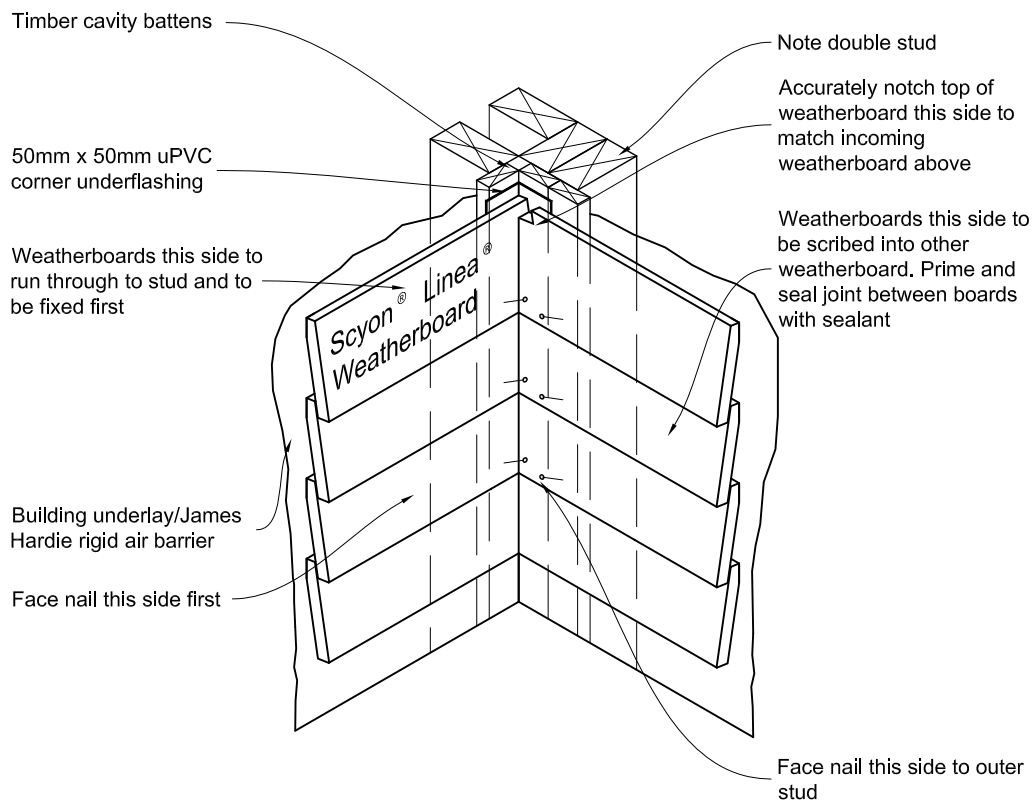
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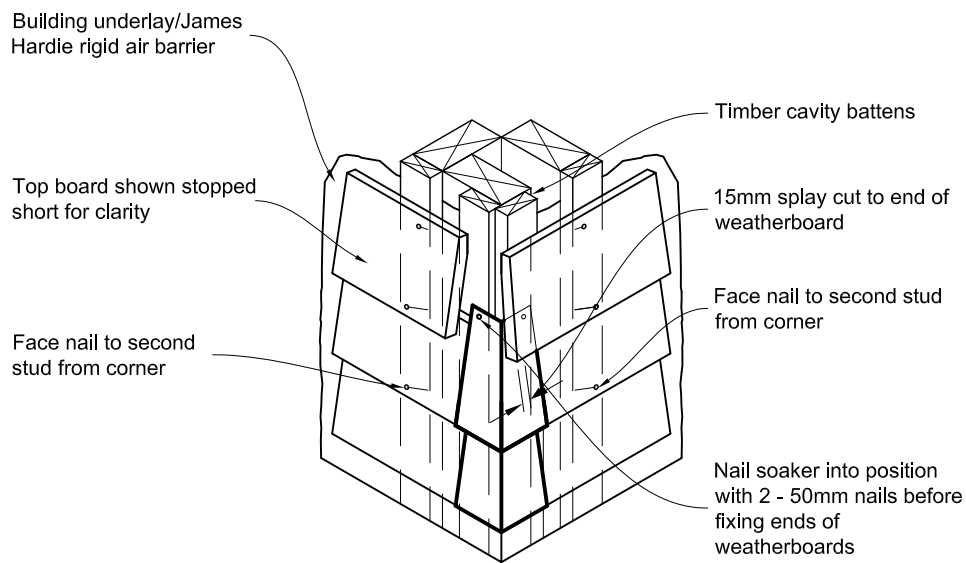
georgr

Current NZS4218/H1 Schedule minimum R-value Targets (non-solid construction)

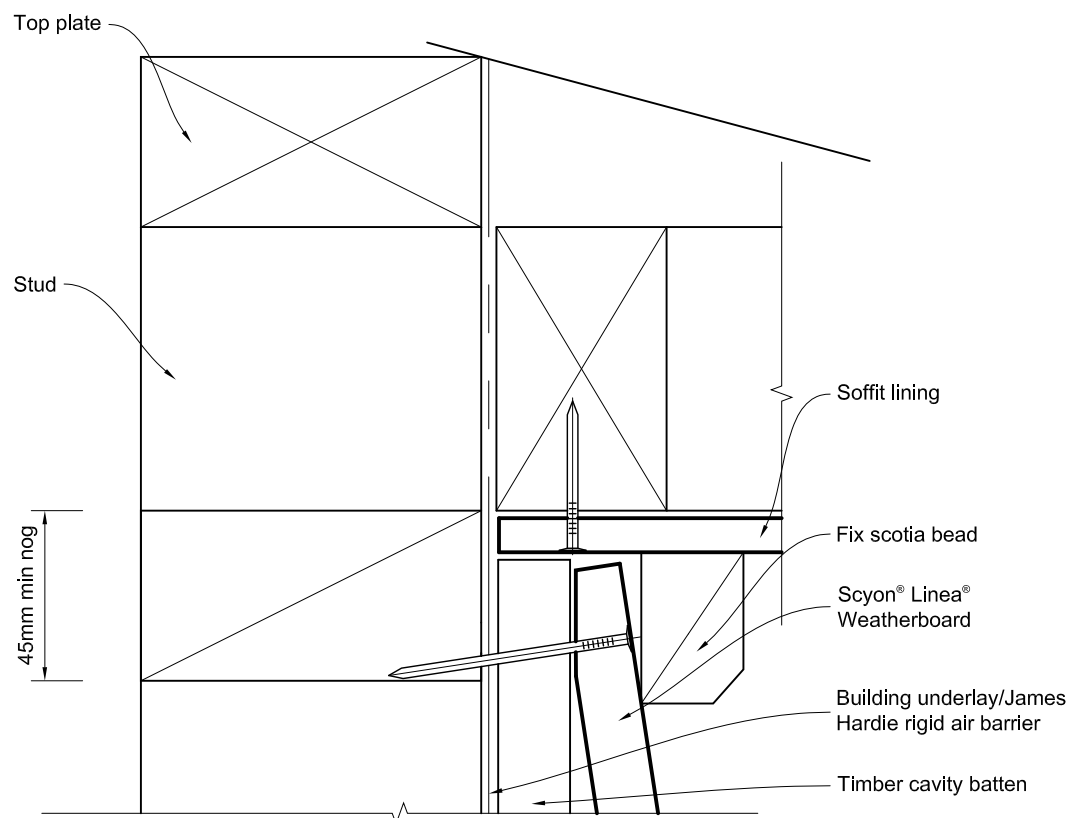
	Zone 1	Zone 2	Zone 3
Roof	R-2.9	R-2.9	R-3.3
Wall	R-1.9	R-1.9	R-2.0
Floor	R-1.3	R-1.3	R-1.3
Glazing (vertical)	R-0.26	R-0.26	R-0.26

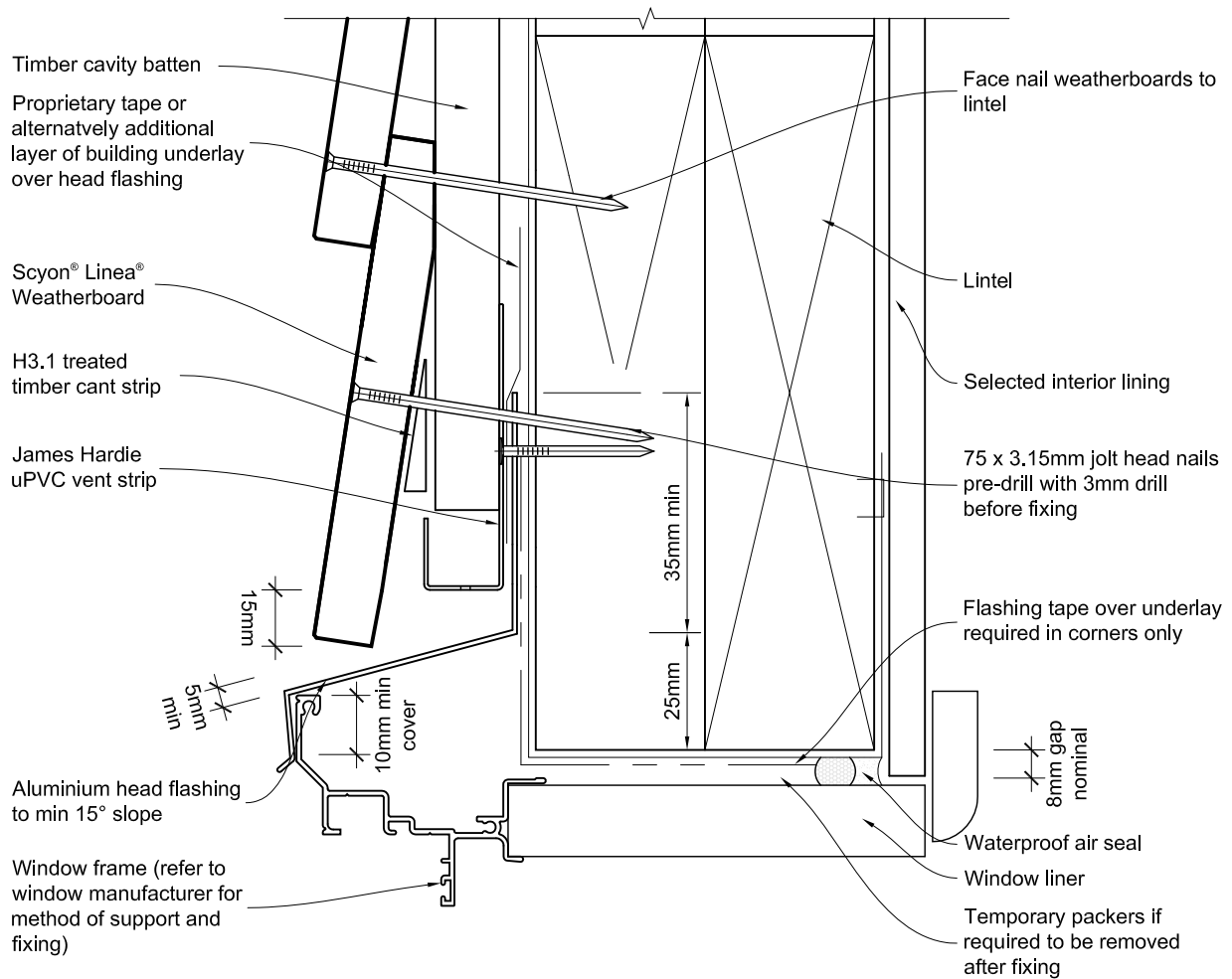






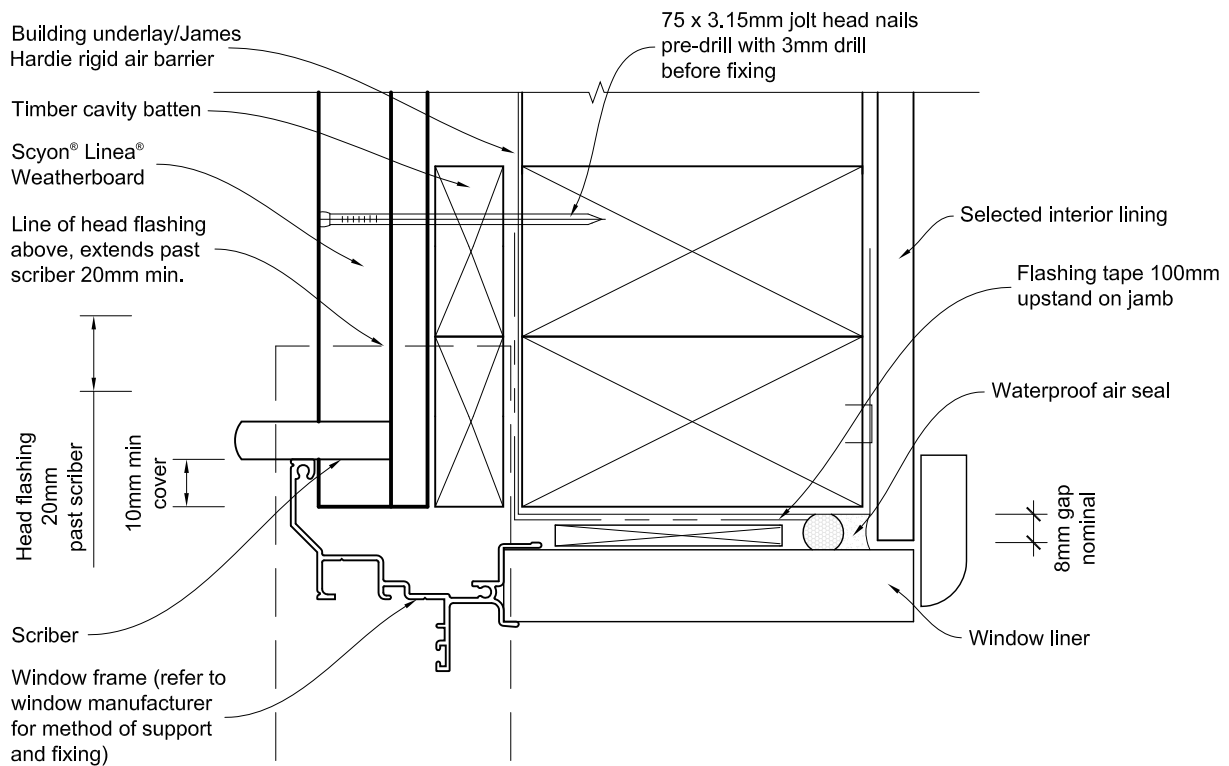
Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel



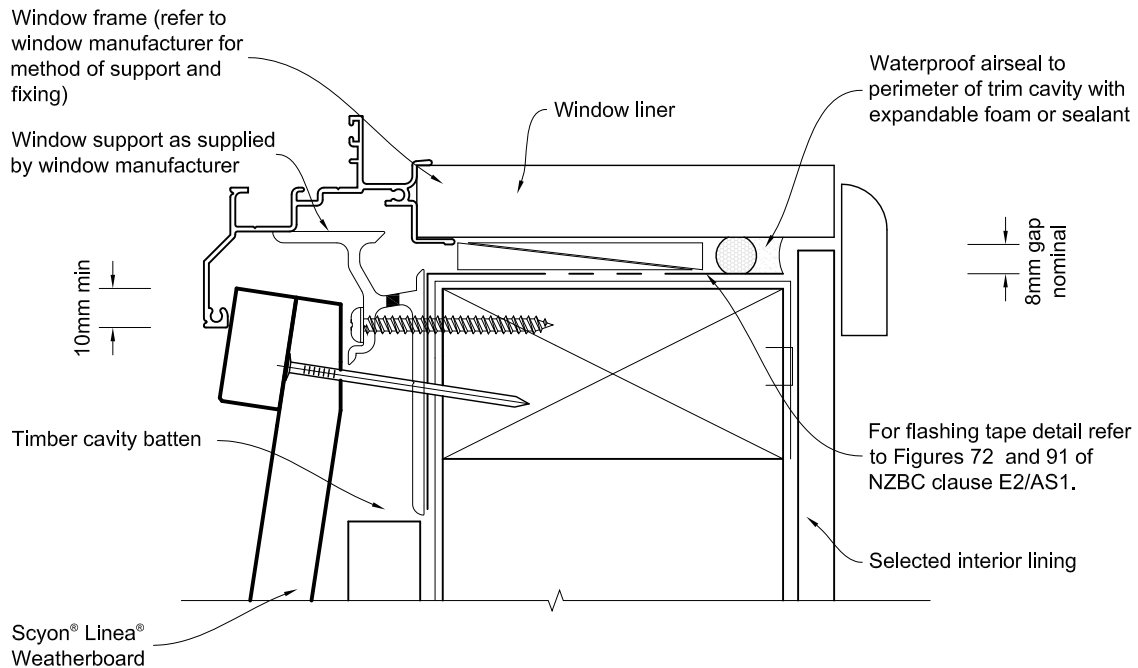


Note:

- When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.
- Sealant must be installed between head flashing and flashing and trim in VH and EH wind zones and SED projects.



Note:
When James Hardie rigid air barrier is used flashing tape to be applied to the entire window opening.



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
2. Building underlay must comply with acceptable solution NZBC clause E2/AS1 and NZS 3604.
3. Flashing tape must have proven compatibility with the selected building underlay / James Hardies rigid air barrier and other materials with which it comes into contact as per Table 21 of NZBC clause E2/AS1.
4. Sill support bars must comply with EM6, E2/VM1 and B2/AS1

Refer to the manufacturer or supplier for technical information for these materials.

INTERNAL LOAD BEARING ON CONCRETE FLOOR SLABS



7. FLOOR

- ★ Covers floor thickening and supporting stud requirements.
- ★ Covers floor slabs on buildings complying with NZS 3604:2011.
- ★ All concrete slabs to be constructed as per NZS 3604:2011.
- ★ Thickening requirements apply to reinforced floor slabs.
- ★ Provides solutions for stud requirements where point loads exceed 10 kN.
- ★ All slabs assumed to be supported on soils that have Ultimate Bearing Capacity of 300 kPa ($\phi_b=0.50$).

Establishing Thickening & Stud Requirements



1. Establish the type of load applied to the floor as being either a UDL (uniformly distributed load) or a concentrated load. Girder trusses will always give concentrated loads and a run of two or more trusses with the same loads will give a UDL.
2. Establish the maximum load value via the MiTek 20/20® Truss Design Software by using the Truss Bearings Exceeding 10 kN Report (see example below). Choose the maximum DOWN value in kN.
3. Go to the Slab Thickening & Stud Requirement Table on page 3 and choose from the appropriate section; either no change for up to 10 kN, FP1 and FS1 for up to 20 kN, or FP2 and FS2 for up to 30 kN.
4. Choose from the selection of stud options (height, centres and grade).
5. Apply the relevant slab and stud requirements as specified and detailed on page 3.
6. Where the maximum positive bearing reaction exceeds 10 kN (uplift), refer to MiTek for Special Design.

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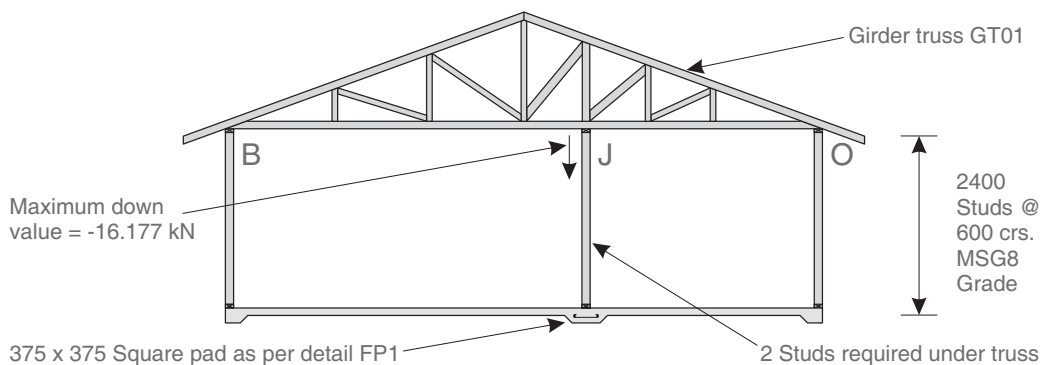
MiTek 20/20® Example Selection

TRUSS BEARINGS EXCEEDING 10 kN REPORT

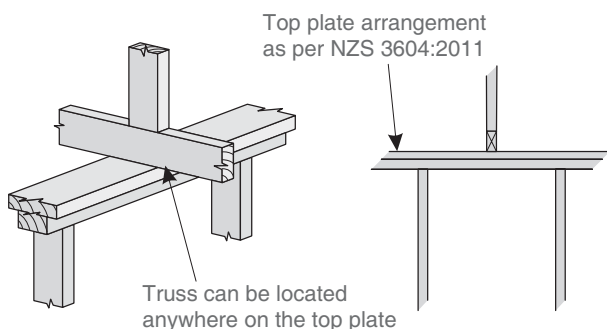
Truss List

Legend: ? = input only, ~~FX~~ = failed design, Unmarked trusses = designed successfully

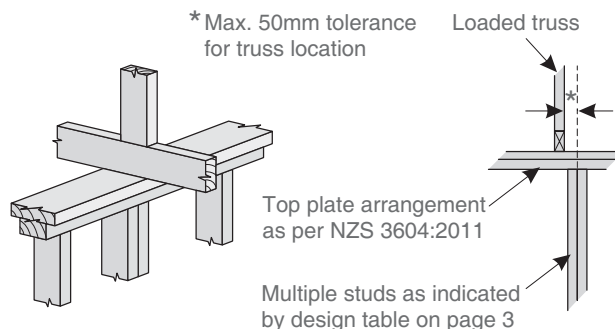
Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN)	
				Down	Uplift
GT01	1	8000	J	16.177	7.292



SINGLE STUD OPTION



MULTIPLE STUD OPTION



Slab Thickening & Stud Requirement Table

CONSTRUCTION SPECIFICATIONS

Max. truss crs. @ 1200mm, Min. truss crs. @ 600mm.

Assume walls are fully lined on at least one face.

Assume full bearing on top plate (i.e. no eccentric loading).

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TRUSS BEARING REACTION	SLAB THICKENING DETAIL		STUD REQUIREMENTS UNIFORM DIST. LOADS OR CONCENTRATED LOADS		
	CONCENTRATED LOAD	UNIFORM DIST. LOAD	STUD HEIGHT	STUD REQUIREMENTS	
Bearing reaction up to & including 10 kN	STANDARD reinforced slab floor as per NZS 3604:2011	STANDARD reinforced slab floor as per NZS 3604:2011	2400	Refer to NZS 3604:2011	
			2700		
			3000		
Bearing reaction up to & including 20 kN	TYPE FP1 375 x 375 PAD	TYPE FS1 300 STRIP THICKENING	STUD HEIGHT	NO. OF STUD UNDER TRUSS	MIN. TIMBER SIZE
			2400	2	90 x 35
			2700	2	90 x 45
Bearing reaction up to & including 30 kN	TYPE FP2 450 x 450 PAD	TYPE FS2 450 STRIP THICKENING	3000	3	90 x 45
			STUD HEIGHT	NO. OF STUD UNDER TRUSS	MIN. TIMBER SIZE
			2400	3	90 x 45
			2700	3	90 x 45
			3000	4	90 x 45

TIMBER SPECIFICATIONS

Timber properties based on NZS 3603:1993 Amendment No.4 March 2005.

Minimum grade specified is SG8 unless otherwise noted.

For SG6 use the studs for the next highest category.

i.e. - For loads up to 10 kN select studs from the 20 kN table.

- For loads up to 20 kN select studs from the 30 kN table.

- For loads above 20 kN Special Design is required.

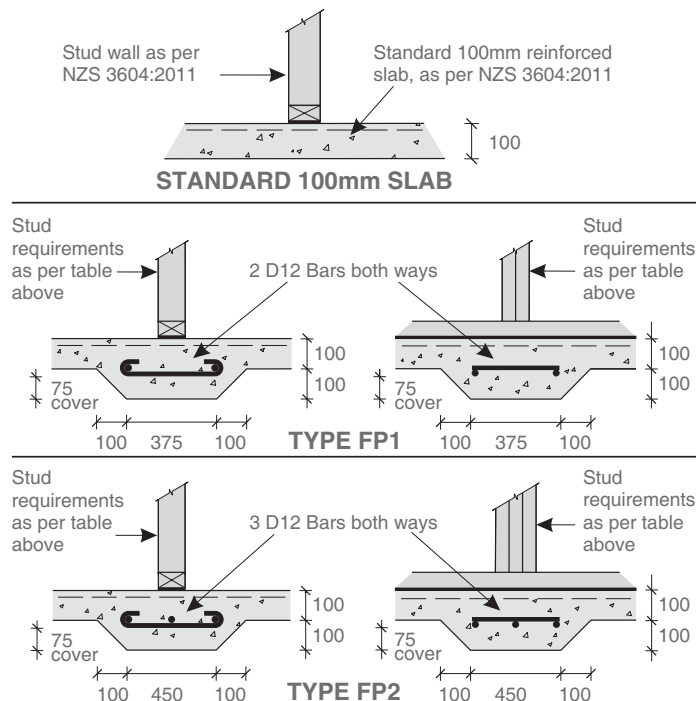
* Note: The stud requirement for 20 kN & 30 kN bearing reactions can be applied to external walls as well.

Slab Thickening Details

CONCRETE PAD

OPTIONS

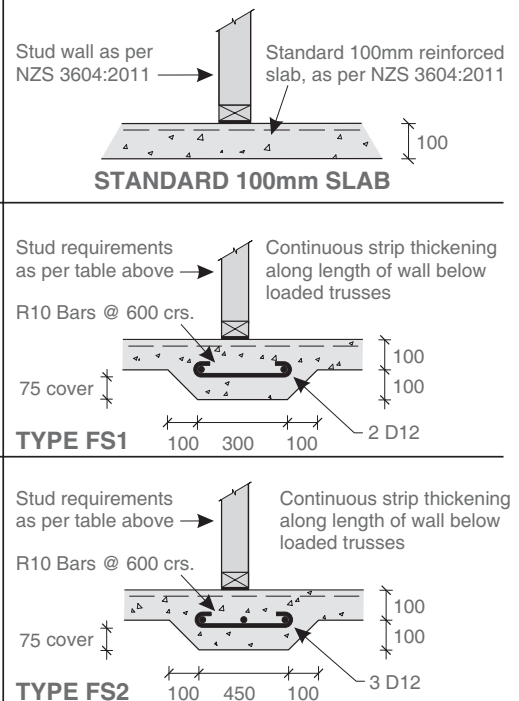
(for concentrated loads)



CONTINUOUS CONCRETE

THICKENING OPTIONS

(for uniformly distributed loads)



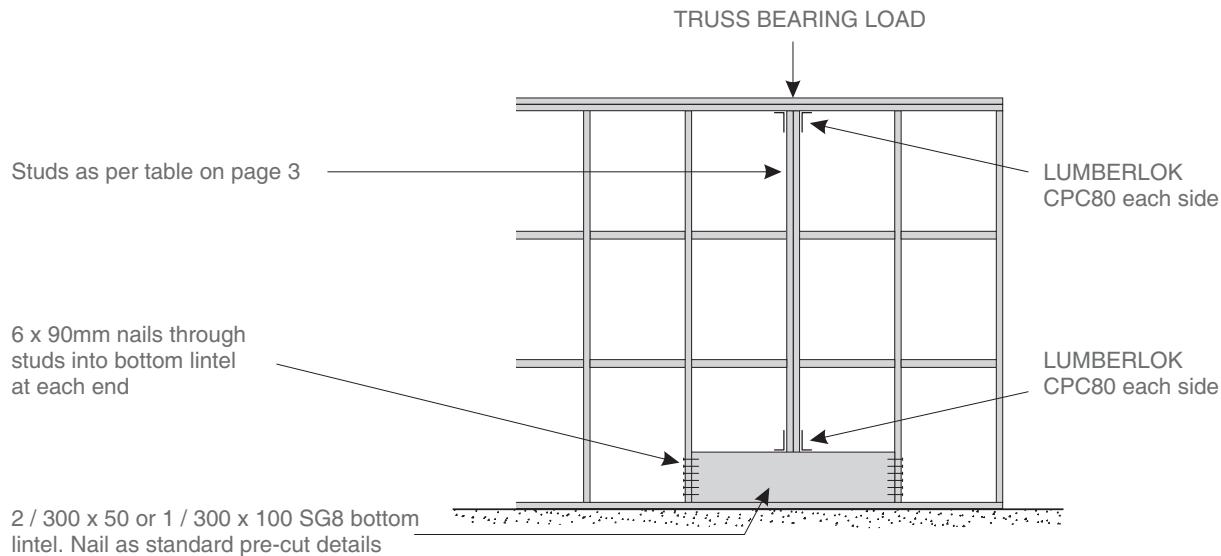
NOTE: FP = Foundation Pad FS = Foundation Strip

Retro Fitted Load Bearing Option

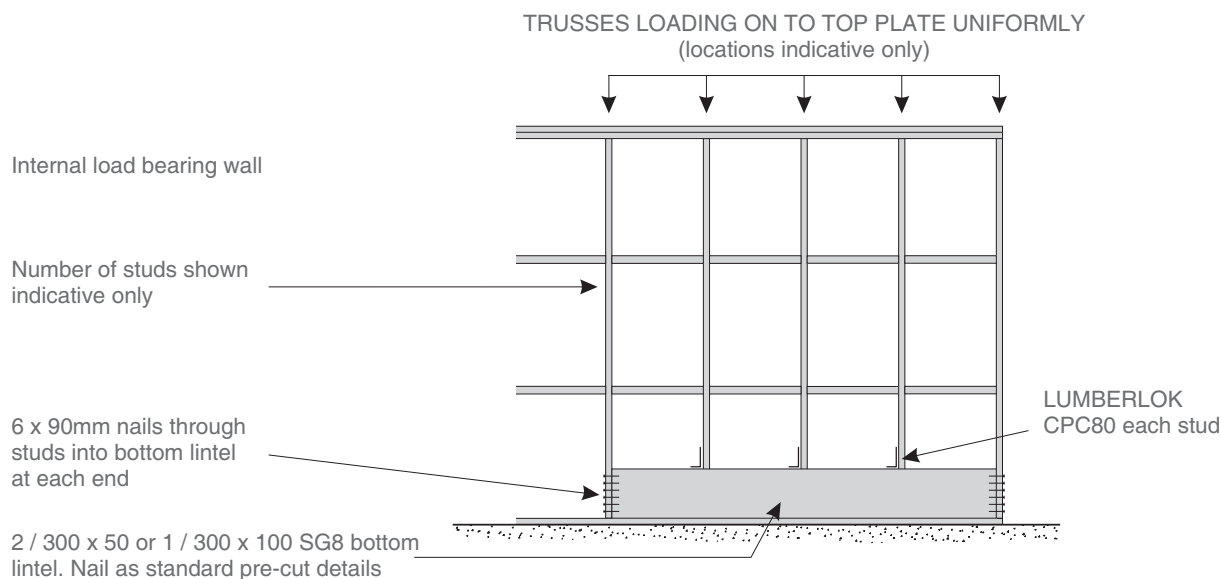
Note:

- Covers slab details where no thickening has been built into the foundation.
- For loads exceeding 10 kN install bottom lintel (300 x 100) between two adjacent studs as detailed below. For loads 30 kN or more, special design is required.
- Ensure the studs comply with requirements on page 3 and are located directly under concentrated loads. This may require on-site installation of these studs.

Concentrated Load



Uniformly Distributed Loads



Memorandum from licensed building practitioner: Certificate of design work

Section 45 and section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING	
Street address:	Lot 84 Faringdon
Suburb:	Rolliston
Town/City:	Christchurch
Postcode:	

THE OWNER(S)	
Name(s):	Michael Bailey & Ting Liu
Mailing address:	84 Chartwell Street
Suburb:	Burnwood
PO Box/Private Bag:	8083
Town/City:	Christchurch
Postcode:	8083
Phone number:	027 4221013
Email address:	

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 Jeremy Harrison 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 ☒ if included. Cross ☐ if excluded	If appropriate, provide details of the RBW	Tick ☒ 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 ☐		☐ Carried out ☐ Supervised	
Foundations and subfloor framing ☒	Concrete slab and foundations - Engineered footing	☐ Carried out ☒ Supervised	Sheet 6 & Sheet 11

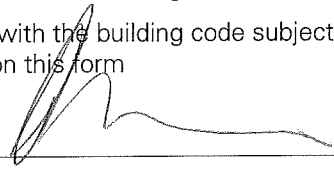
Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ☒ if included. Cross ☒ if excluded	If appropriate, provide details of the RBW	Tick ☒ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Walls ☒	Timber framed	☐ Carried out ☒ Supervised	Sheet 3 Sheet 4 Sheet 11-14
Roof ☒	Truss Manufacturer	☐ Carried out ☒ Supervised	Truss Design Pg 2 & Specs
Columns and beams ☒	Entry / Patio area	☐ Carried out ☒ Supervised	Sheet 3 Sheet 5 Sheet 6, Sheet 14
Bracing ☒	Ezybrace Ecoply	☐ Carried out ☒ Supervised	Sheet 8 Ezybrace Calcs
Other ☐	N/A	☐ Carried out ☐ Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ☒ if included. Cross ☒ if excluded	If appropriate, provide details of the RBW	Tick ☒ 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 ☐		☐ Carried out ☐ Supervised	
Damp proofing ☒	DPM to underside of foundation	☐ Carried out ☒ Supervised	Sheet 11
Roof cladding or roof cladding system ☒	Pressed Metal tile	☐ Carried out ☒ Supervised	Sheet 13 Metalcraft details in Specs pg 16-17 Specs
Ventilation system (for example, subfloor or cavity) ☒	Wall cavity	☐ Carried out ☒ Supervised	Sheet 3, Linear details Sheet 5' Sheet 11-14 Pg 11-15 Specs
Wall cladding or wall cladding system ☒	10 Series brick Linear weatherboard	☐ Carried out ☒ Supervised	Sheet 3, Sheet 5 Sheet 11-14 Sheet 4, Linear details Pg 11-15 Specs
Waterproofing ☒		☐ Carried out ☒ Supervised	
Other ☐	N/A	☐ Carried out ☐ Supervised	

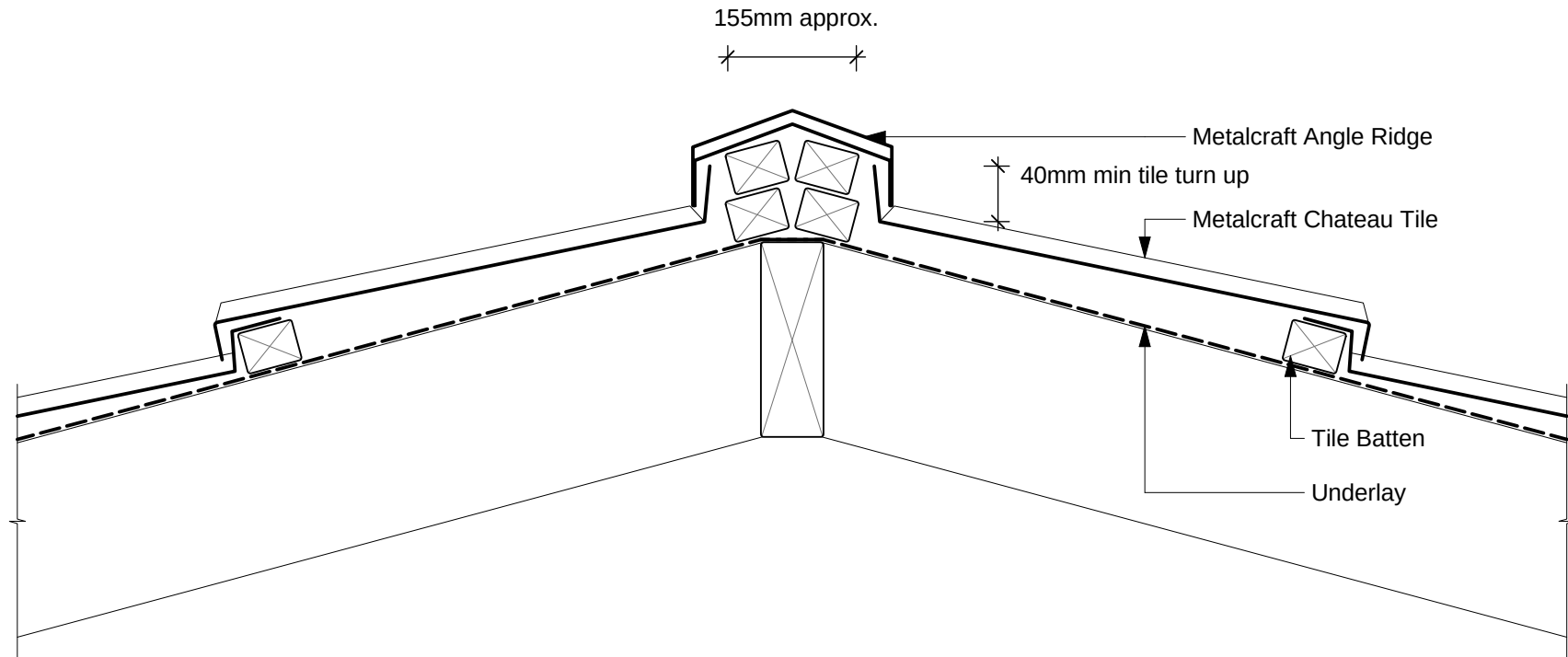
Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ☒ if included. Cross ☐ if excluded	If appropriate, provide details of the RBW	Tick ☒ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
FIRE SAFETY SYSTEMS: C1 - C6			
Emergency warning systems Evacuation and fire service operation systems ☐ Suppression or control systems Other		☐ Carried out ☐ Supervised	
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. ☐ Yes ☒ 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: <u>Jeremy Harrison</u>	LBP or Registration number: <u>105491</u>
The practitioner is a: ☒ Design LBP ☐ Registered architect ☐ Chartered professional engineer	
Design Entity or Company (optional):	
Mailing address (if different from below):	
Street address/Registered office: <u>47 Waterloo Road</u>	
Suburb: <u>Hornby</u>	Town/City: <u>Christchurch</u>
PO Box/Private Bag:	Postcode:
Phone number: <u>03 3491510</u>	Mobile: <u>0277715816</u>
After hours:	Fax:
Email address:	Website:

DECLARATION	
I <u>Jeremy Harrison</u> 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:	<u>29-1-13</u>

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This detail is used for: Chateau Tile Angle Ridge Detail

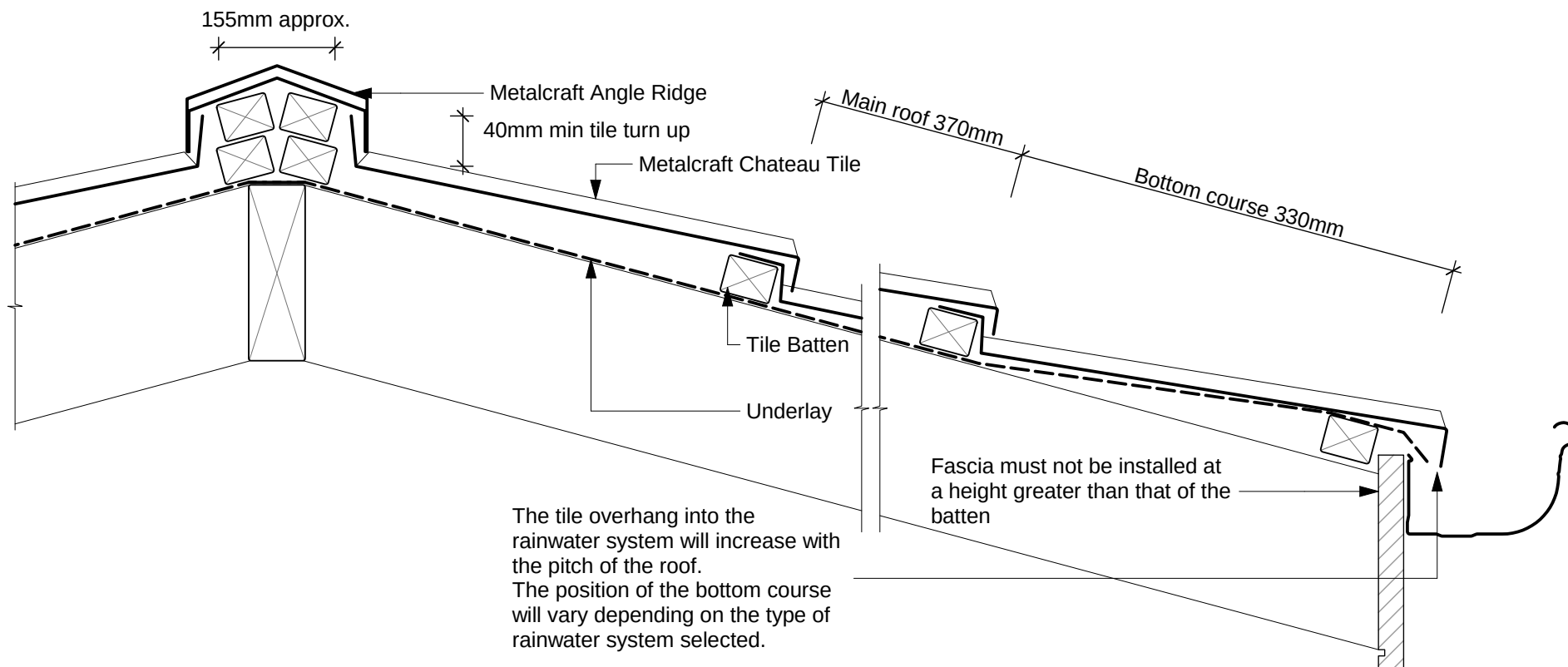
Website Flashing Disclaimer

Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary with roof pitch. The underlay is detailed as a single line for simplicity and is indicative only. Building paper type and method of installation should comply with underlay manufacturers recommendations and NZBC regulations.

Roof Tiles

scale:	1:5	reference
date:	Oct 08	T102B

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This detail is used for: Chateau Tile

Website Flashing Disclaimer

Tile Batten Layout

Angle Ridge

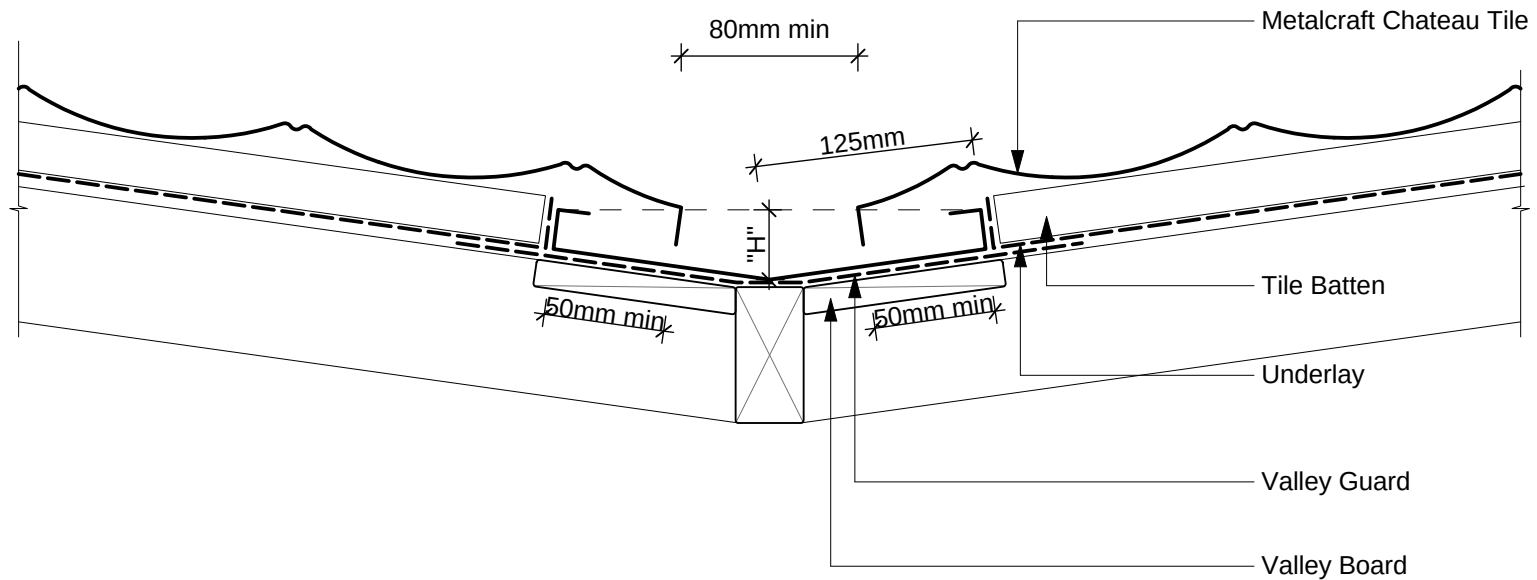
Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary with roof pitch. The underlay is detailed as a single line for simplicity and is indicative only. Building paper type and method of installation should comply with underlay manufacturers recommendations and NZBC regulations.

Roof Tiles

scale:	1:5	reference
date:	Oct 08	T105B

Roof pitch	12.5	15	20	25	30	35	45	60
Valley angle	162	159	152	145	139	132	120	104

H = 75mm 12.5° >



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This detail is used for: Chateau Tile

Website Flashing Disclaimer

Valley Flashing Detail

Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary with roof pitch. The underlay is detailed as a single line for simplicity and is indicative only. Building paper type and method of installation should comply with underlay manufacturers recommendations and NZBC regulations.

Roof Tiles

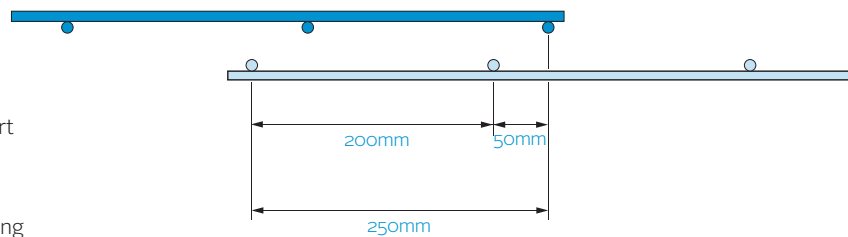
scale:	1:5	reference
date:	Oct 08	T101

DUCTILE PLUS RESIDENTIAL MESH

Designed to meet the Department of Building & Housing (DBH) new B1 Compliance standard, with equivalent mass to 2.27kg/m². Weld strength improved by 22% (for 6.1mm) and 100% (for 7.5mm) compared to the 5.3mm wire used for 665 mesh.

Ductile Plus 62 & 62L Mesh

- SE62 Plus — Easy to transport size 5.03 x 2.02
- SE62L — Larger 6.05 x 2.42 mesh size to maximise handling and lapping



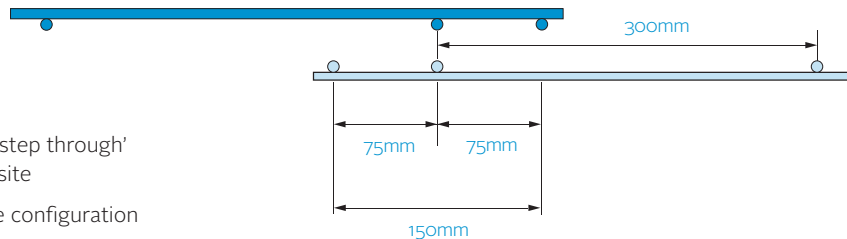
*Diagram not to scale

Ductile Plus 73DE, 73LDE Mesh

- 300mm Bar spacing for easy 'step through' while placing and working on site
- Easy lapping with double edge configuration

Ductile Plus 73LDE only:

- Large 14.49m² nett cover for less wastage in lapping = cheaper per square metre



*Diagram not to scale

MESH PROPERTIES

- All construction meshes have double edge bars to optimise the net cover of the sheets
- The required lap as per AS/NZS 3101:2006 Clause 8.6.2 (square + 50mm: with 150mm lap as min)
- Sheets individually tagged
- Test certificates available
- Independently tested to verify compliance to AS/NZS 4671:2001 Ductility 500E standards
- Grade 500E (seismic) as per AS/NZS4671
- Tensile Ratio (R_m/R_e) 1.15 to 1.40
- Uniform elongation (A_{gt}): min 10%