GIB® EzyBrace® Systems

Specification and installation manual



CBI 5113
AUGUST 2016



NATIONAL SUPPORT

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GIB® HELPLINE

0800 100 442

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication at any time. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded.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

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

PATENTS

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

Beware of substitution

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

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

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

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

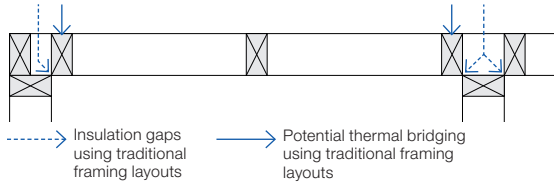
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

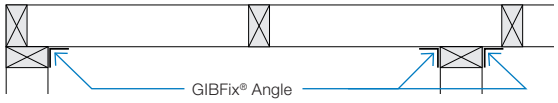
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

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

NZBC CLAUSE B2 — DURABILITY

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

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

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 — ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

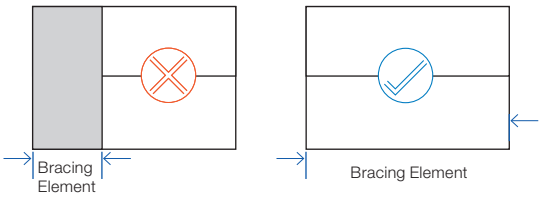
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

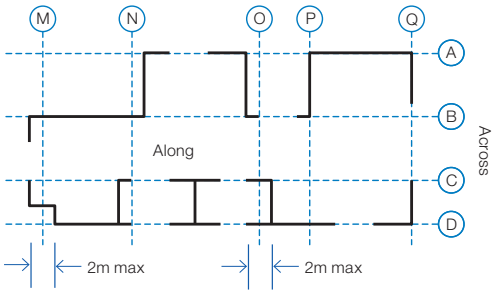
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

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

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

Bracing demand

GIB EZYBRACE® CALCULATOR

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

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

DEMAND

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

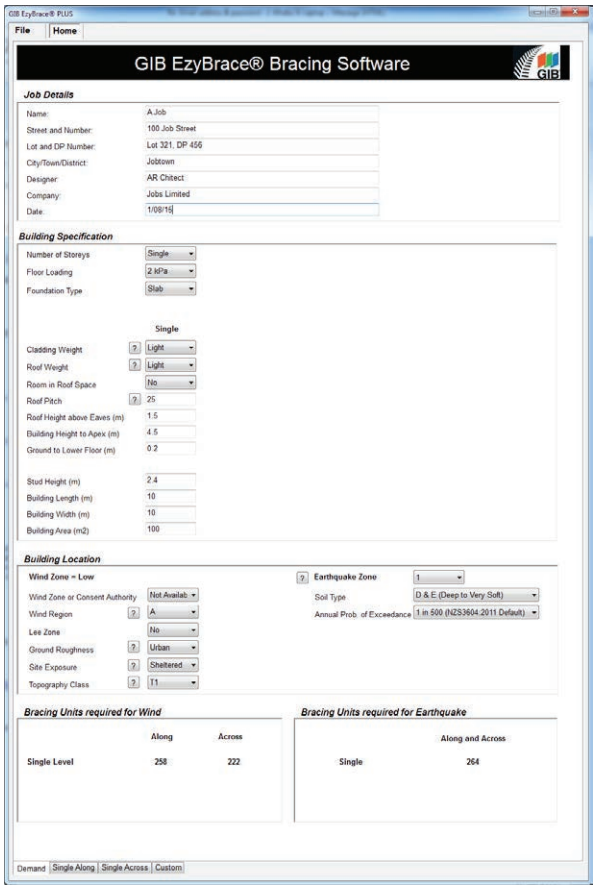
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

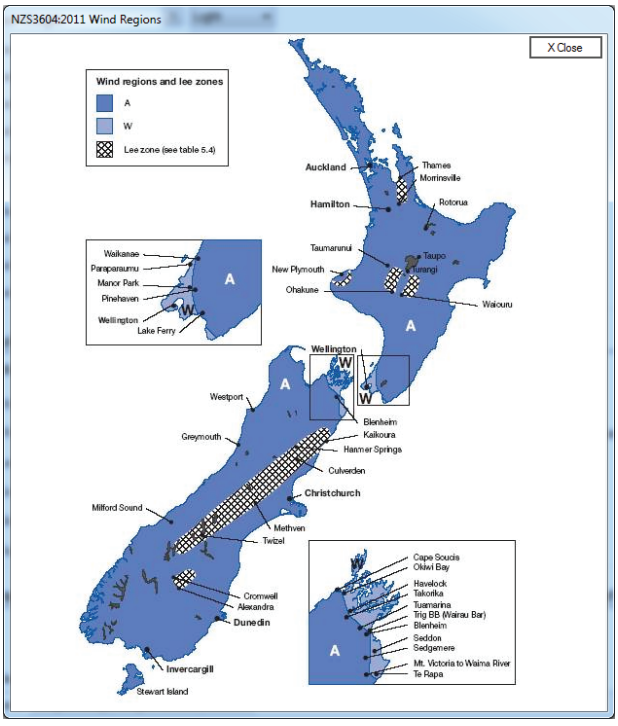
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design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

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

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

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





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

Software functionality

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

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

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

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

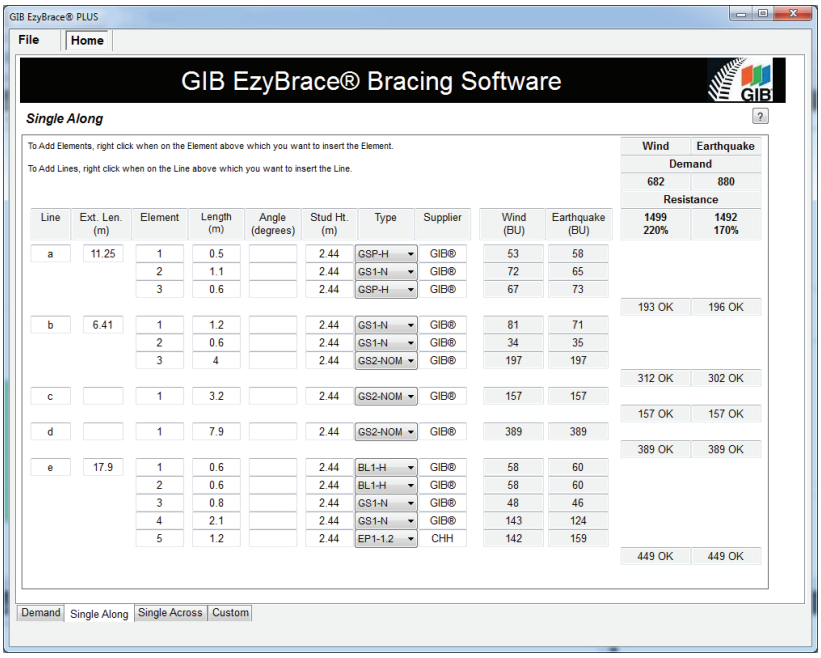
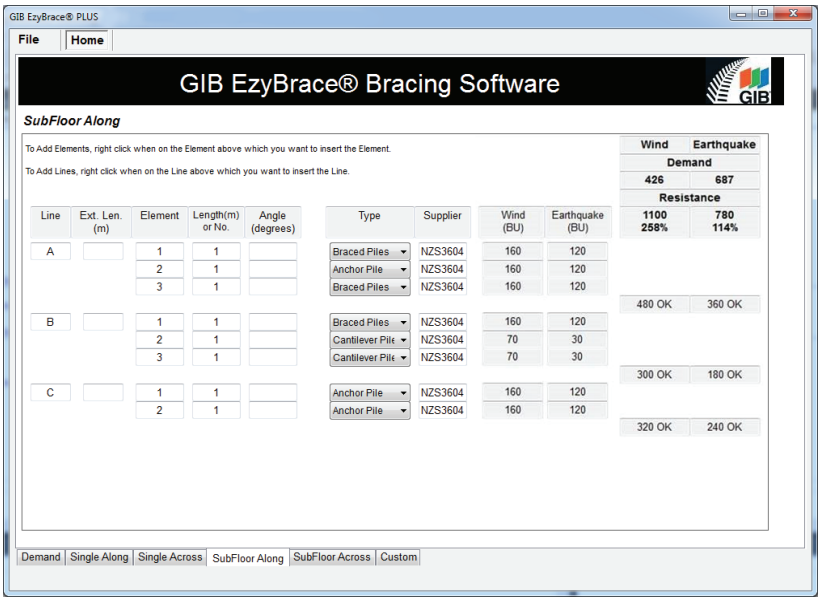


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

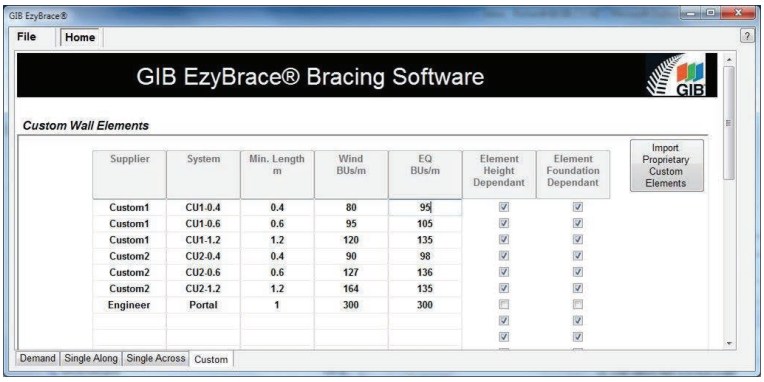


Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



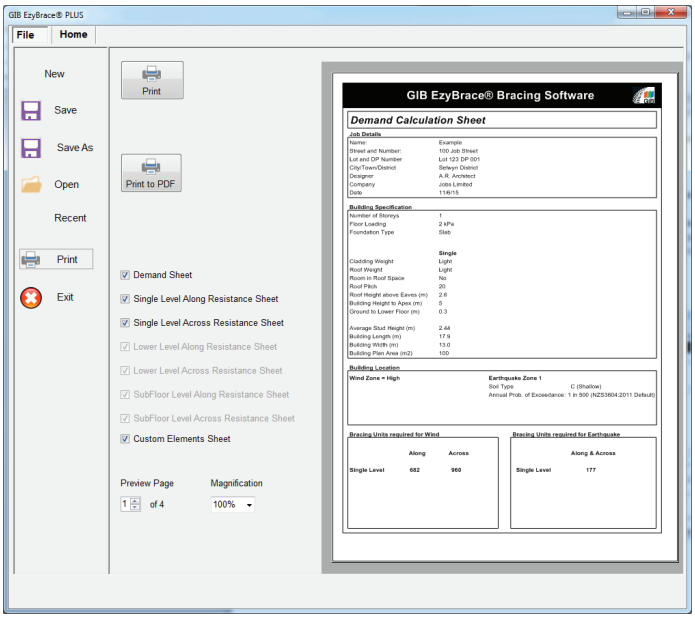
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

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

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

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

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



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

GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

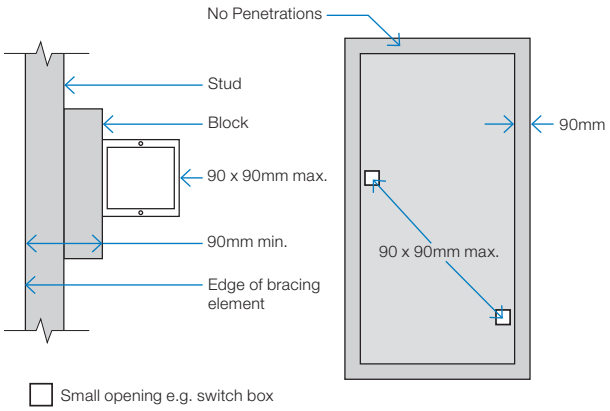
SMALL OPENINGS

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

LARGE OPENINGS

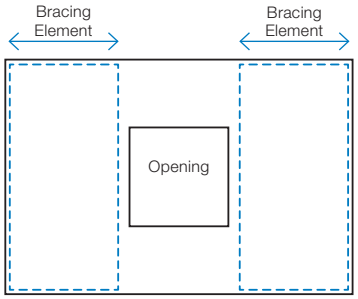
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

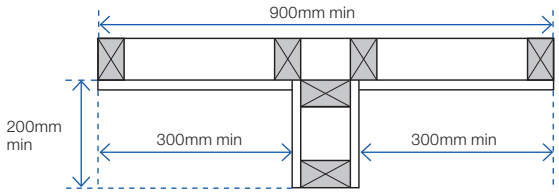
Guidelines for intersection walls

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

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

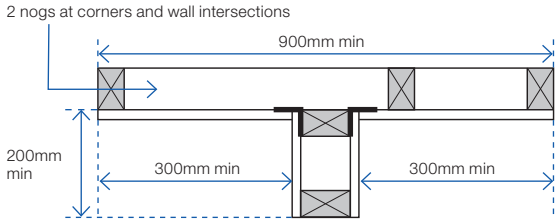
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



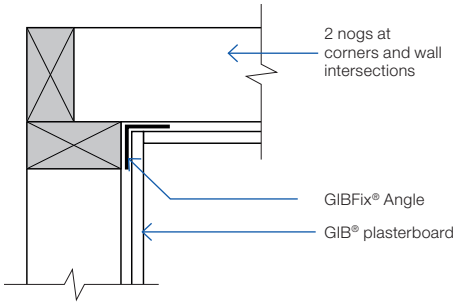
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



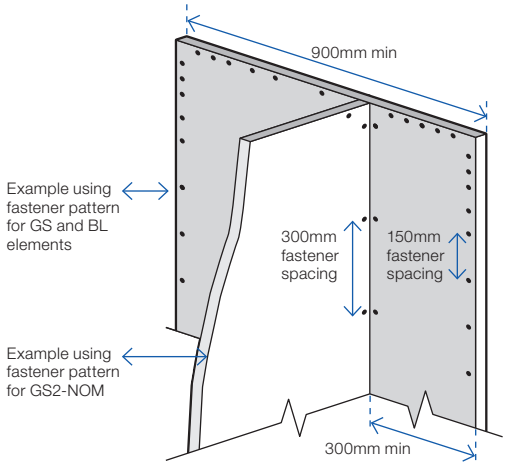
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

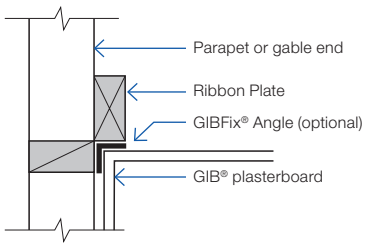
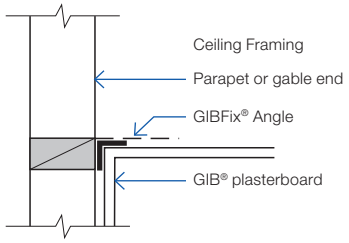


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



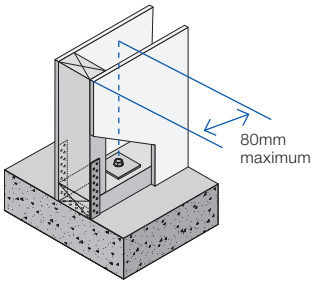
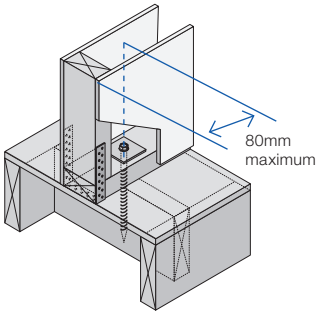
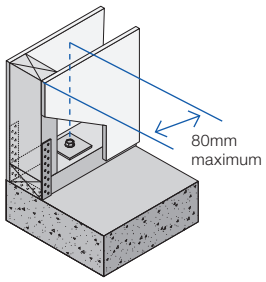
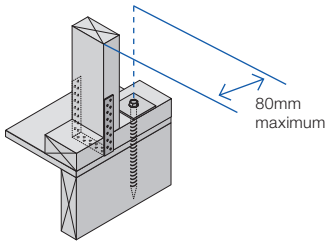
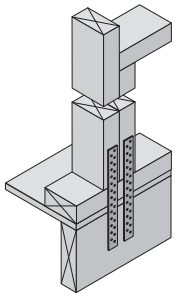
GFS003

BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

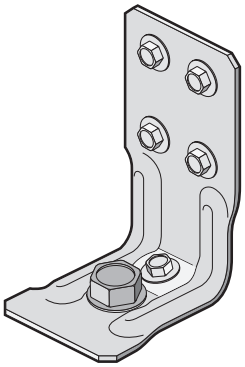
Bracing strap installation

Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

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 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	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.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

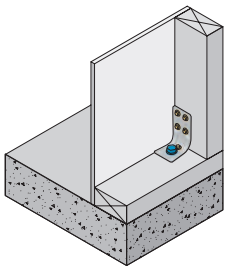
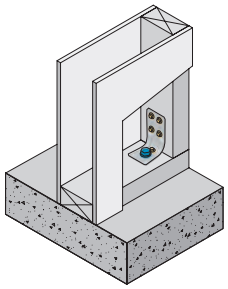
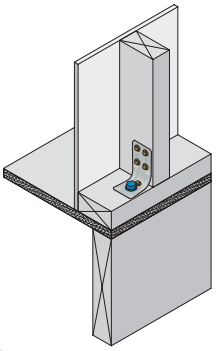
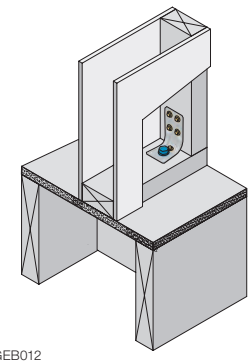
GIB HandiBrac® installation



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

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

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

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

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

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

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

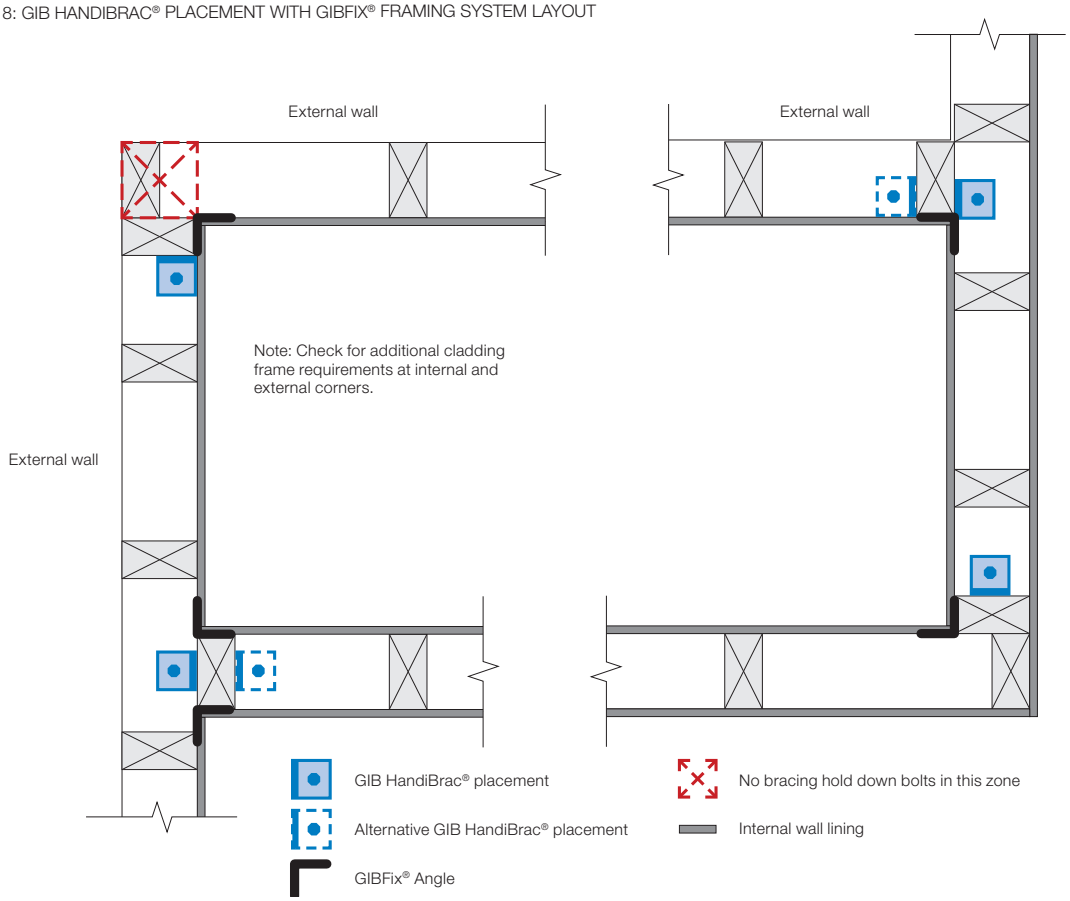
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

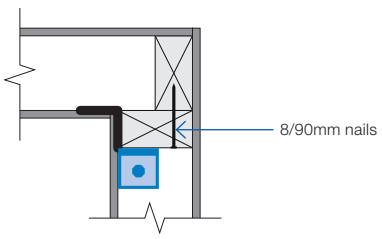
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

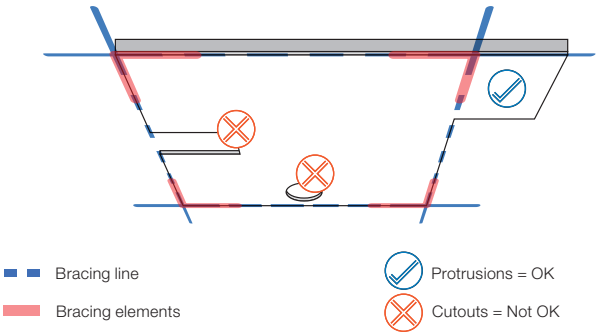


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

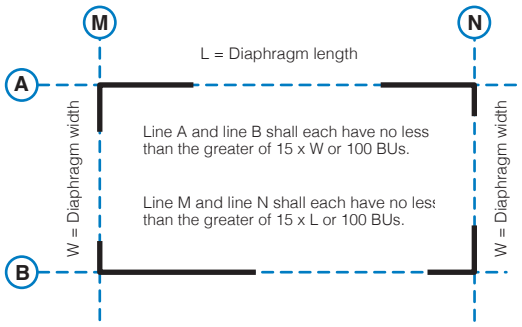
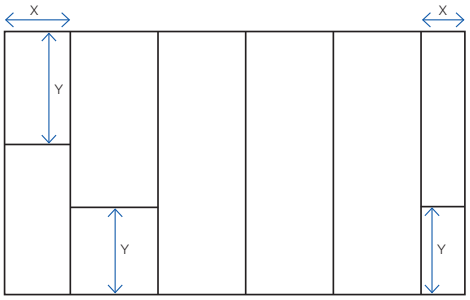
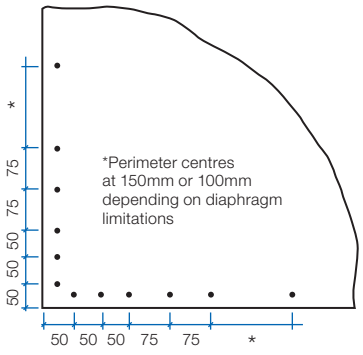


FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.
Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

Ceiling battens in ceiling diaphragms

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.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

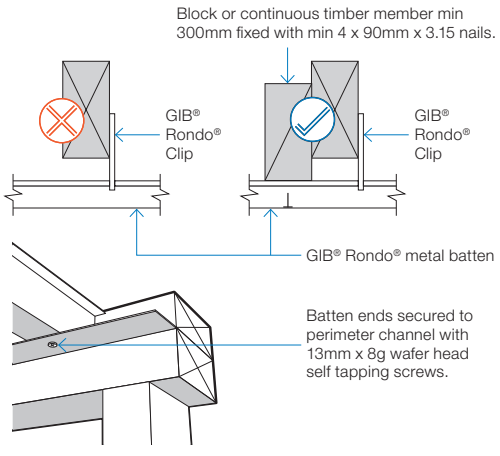
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal 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 or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

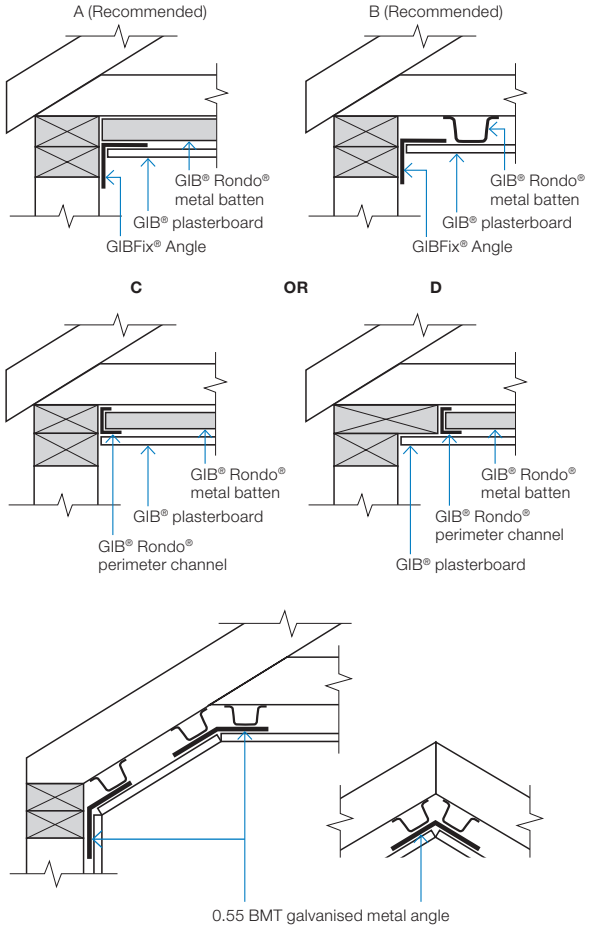
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
— Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
— Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



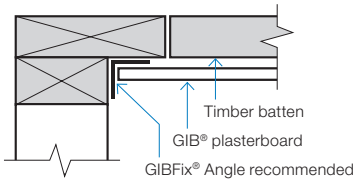
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed withing the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvansed metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

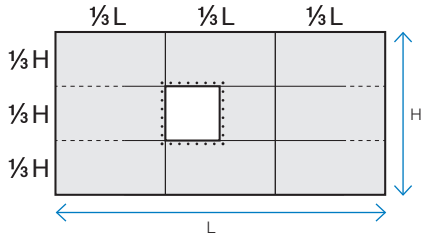
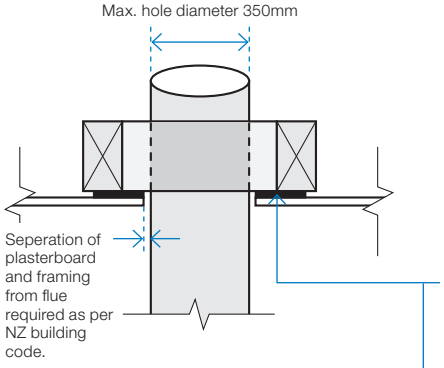
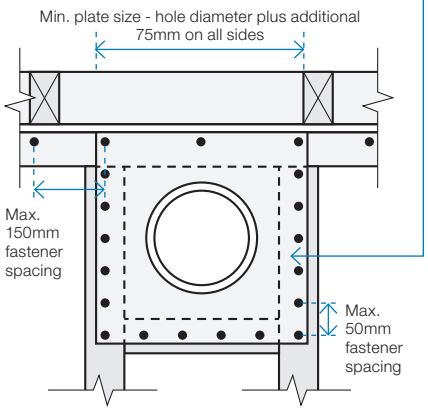


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Steel plate
0.55 BMT Galvanised sheet Max. opening 350mm diameter. Installed prior to GIB® plasterboard.

Framing
90 x 45mm framing trimmed to provide extra fixing.

GIB® plasterboard ceiling
Installed over the steel plate and into framing using a minimum of 32mm x 6g GIB® Grabber High Thread or 32mm x 7g GIB® Grabber Dual Thread screws at 50mm max centre spacing.

Plasterboard ceiling not shown in plan view

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

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

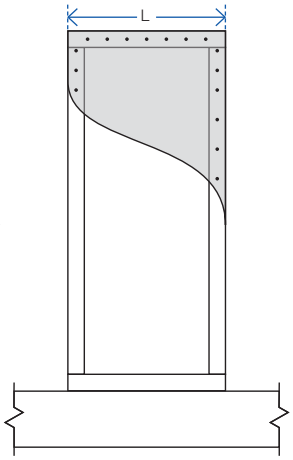
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

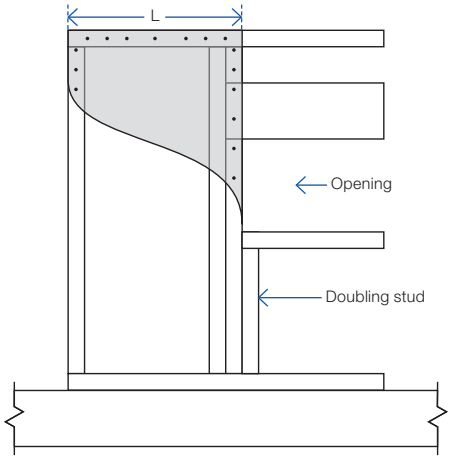
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



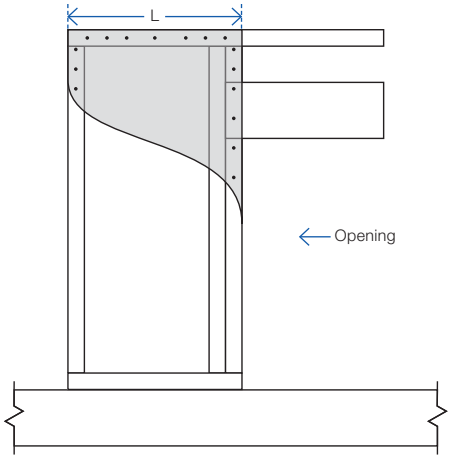
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



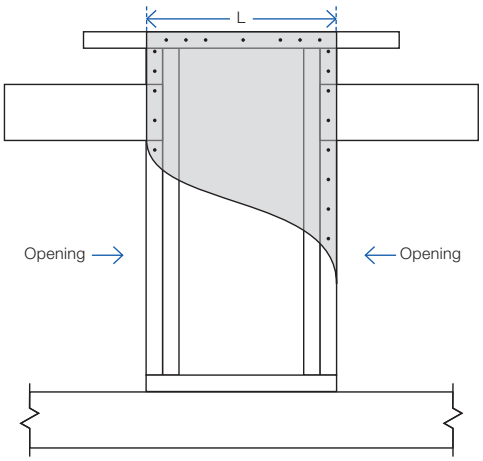
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

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

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

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

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

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

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

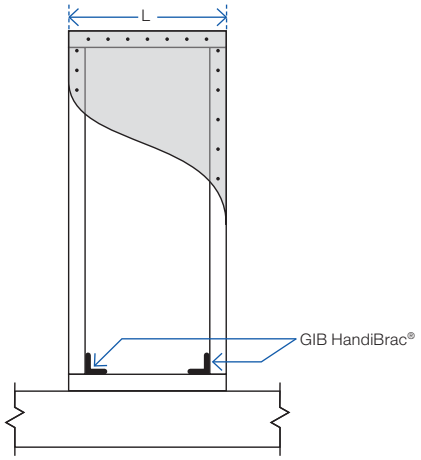
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

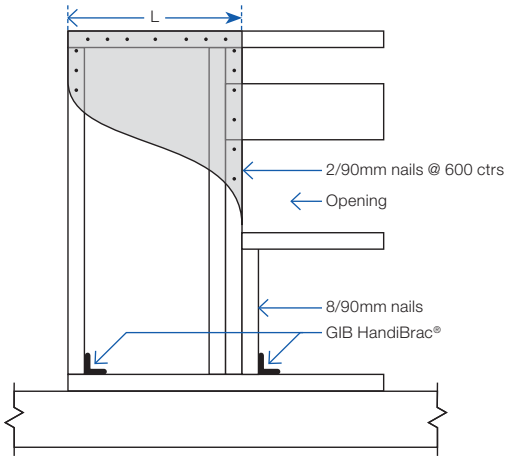
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



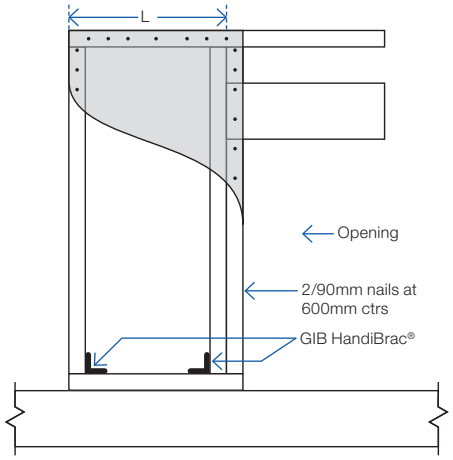
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



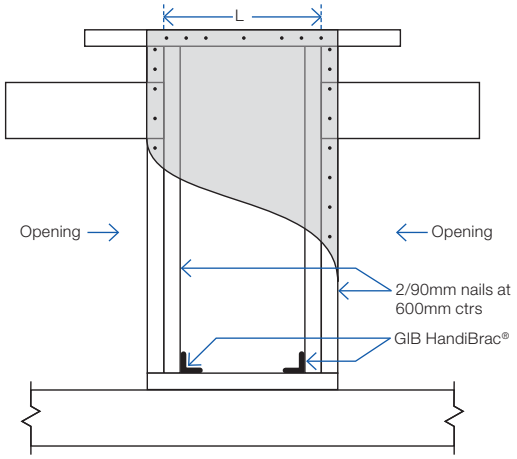
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

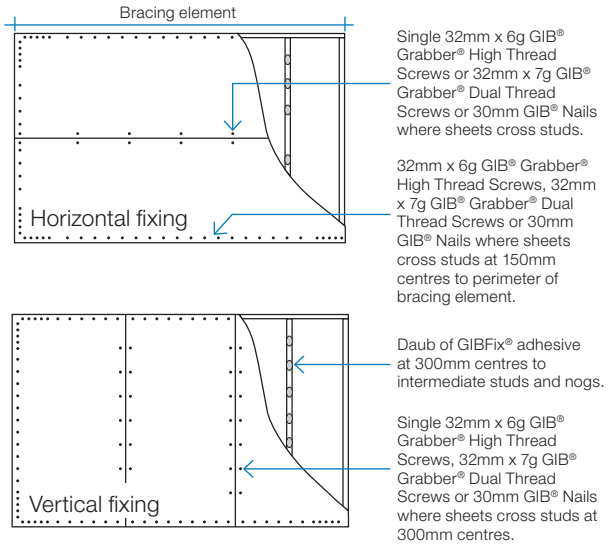
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

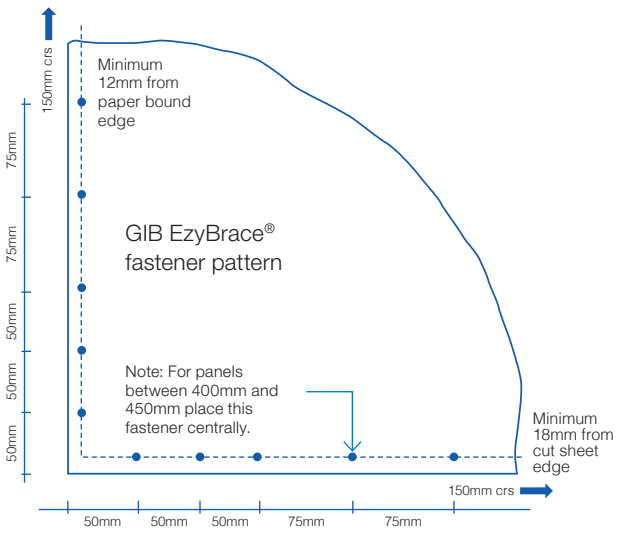
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

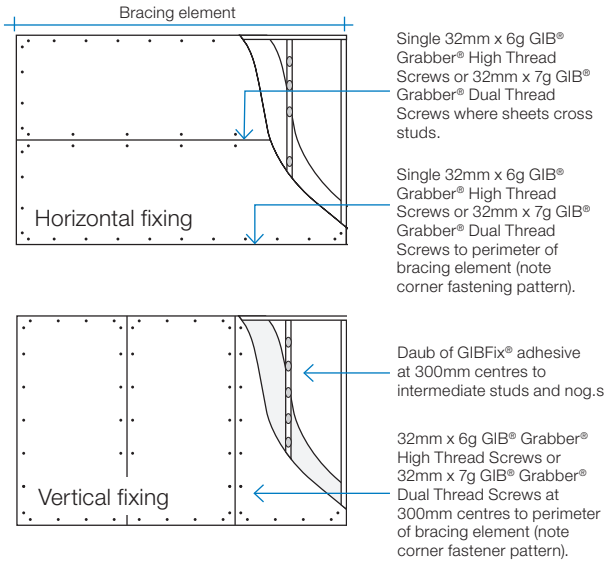
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

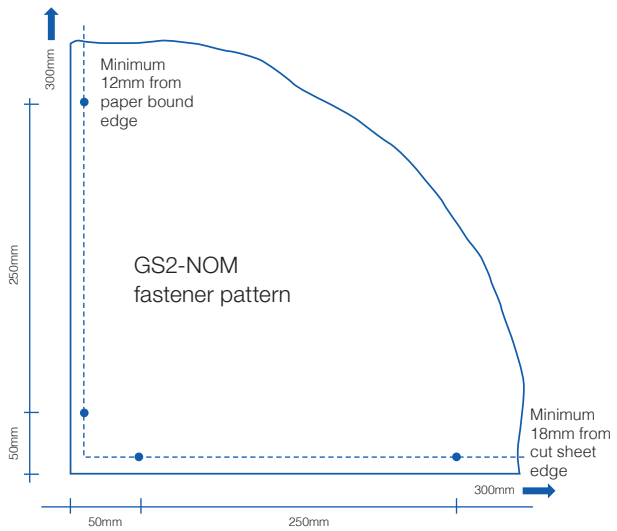
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

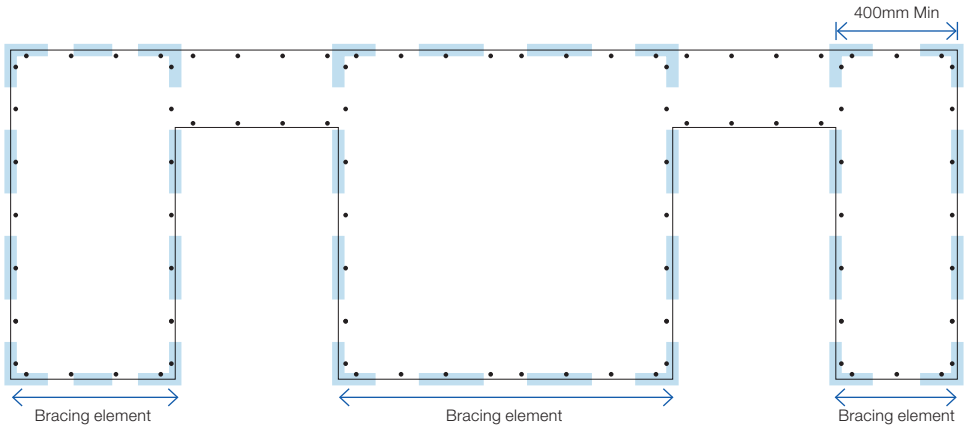
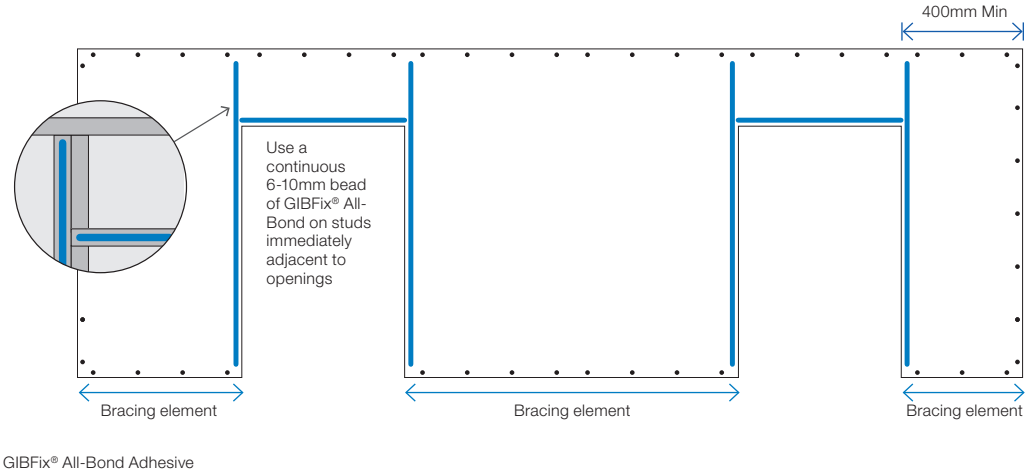
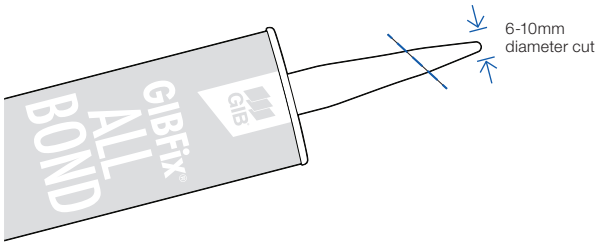


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber Floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

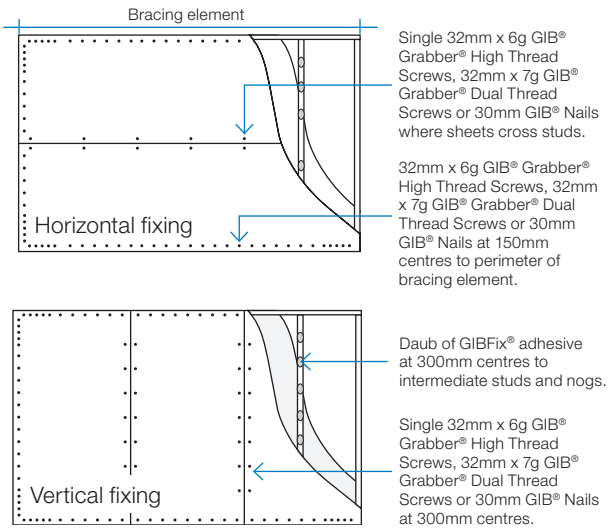
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

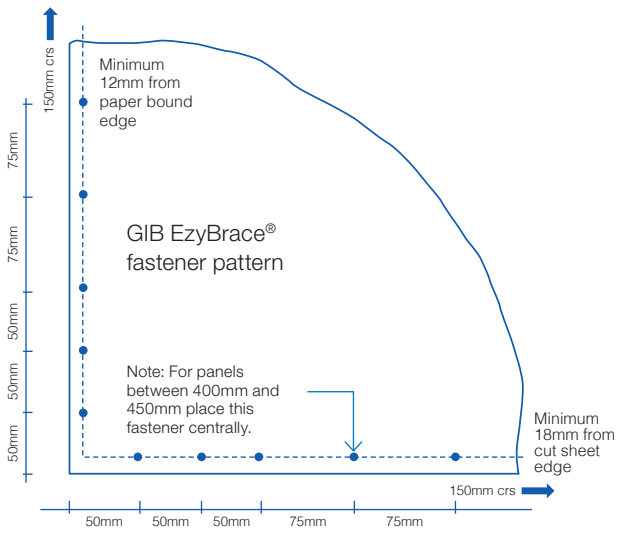
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

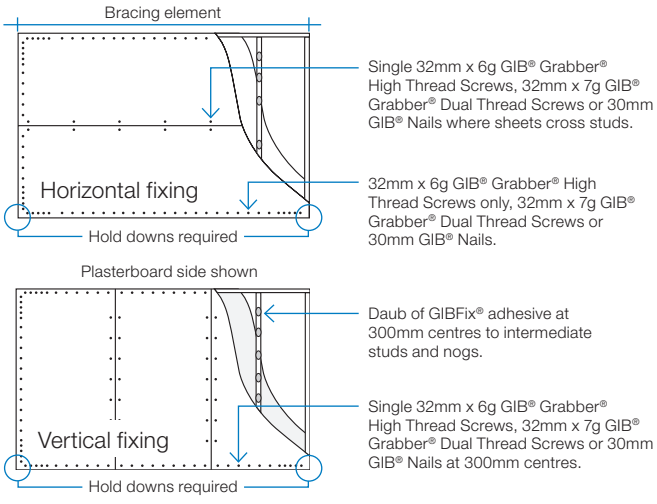
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

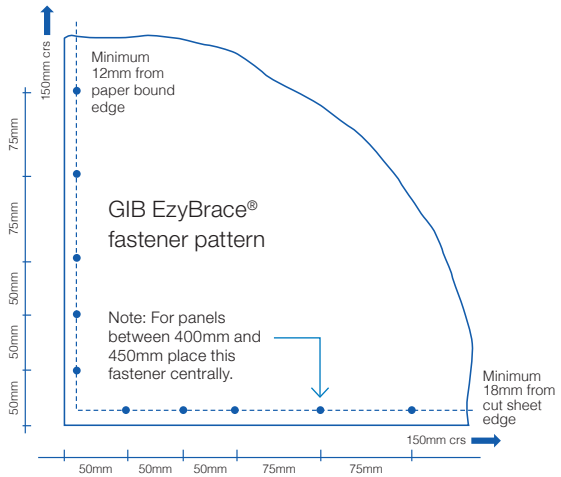
Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification BL1-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

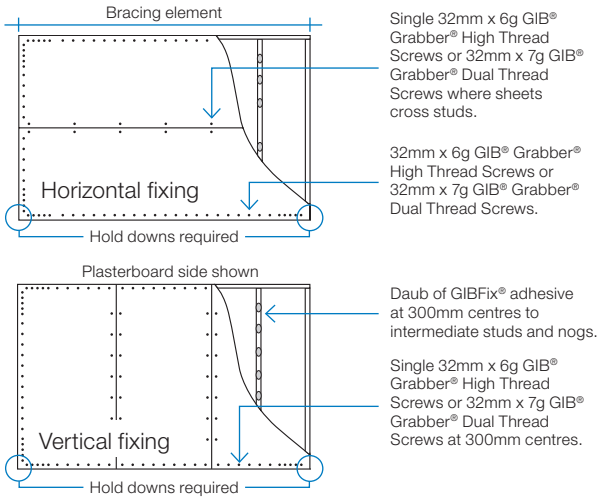
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

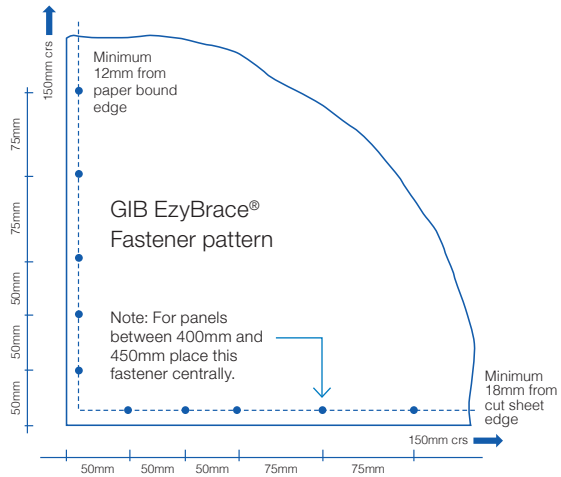
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws.Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

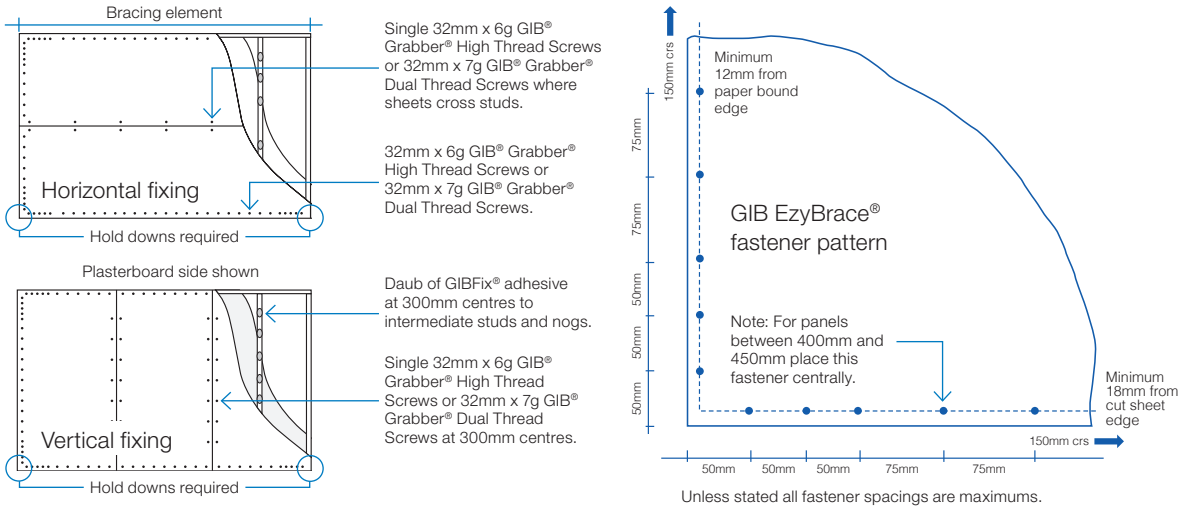
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

Fastener centres

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

JOINTING

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



Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

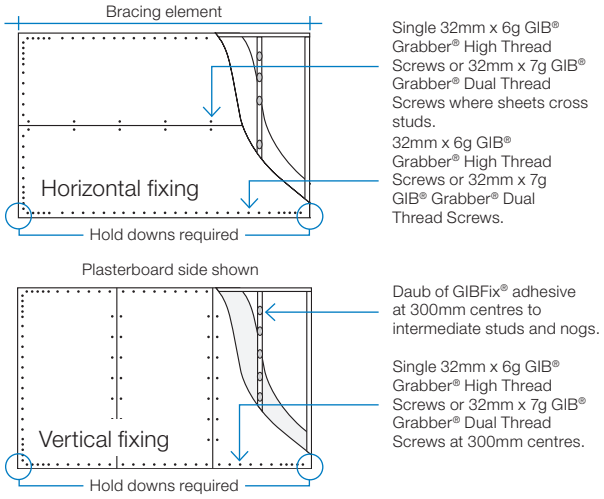
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

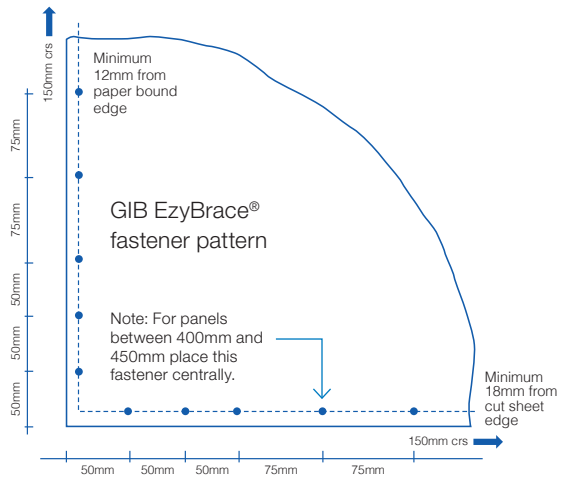
Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the 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. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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

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

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

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

GLOBAL GREENTAG^{CERTTM}

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

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

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

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

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

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

TRADEMARKS

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

PATENTS

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

GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

GIB®

Wet Area Systems

Specification and installation manual



CBI 5113

FEBRUARY 2021

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RESIDENTIAL AND NON-RESIDENTIAL APPLICATIONS. BATHROOMS, LAUNDRIES, TOILETS AND KITCHENS.

Protection from internal moisture is an important consideration when designing interior lining systems for homes, multi-unit apartments, educational, healthcare and commercial applications.

The New Zealand Building Code sets out minimum standards for wet area spaces in residential dwellings. However, often higher levels of performance and protection from internal moisture is demanded.

The GIB® Wet Areas System specification and installation manual provides internal lining options and details for specifiers, builders and building owners.

USE ONLY THE CURRENT SPECIFICATION

This manual supersedes the publication GIB Aqualine® Wet Area Systems March 2007. Winstone Wallboards Ltd accepts no liability for reliance upon publications that have been superseded.

If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442 or go to gib.co.nz

BEWARE OF SUBSTITUTION

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

BRANZ Appraised
Appraisal No.427 [2021]

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This publication

This publication is a best practice guide to the design and construction of wall and ceiling linings in wet areas with intermittent water exposure within residential and non-residential buildings, as covered by NZ Building Code Clause E3 Internal Moisture.

The information is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZ Building Code and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

To form a complete wet area system it is important to specify compatible materials and systems, designed to cope with conditions that are common in wet areas, and to ensure correct installation using best practice.

WET AREAS

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Within wet areas the following requirements apply;

1. NZBC Clause E3.3.4 states that wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
2. NZBC Clause E3.3.6 states that surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

NZ Building Code Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management. Ongoing maintenance of wet areas is also important to maximise service life.

GIB AQUALINE®, GIB TOUGHLINE® AQUA AND GIB WEATHERLINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

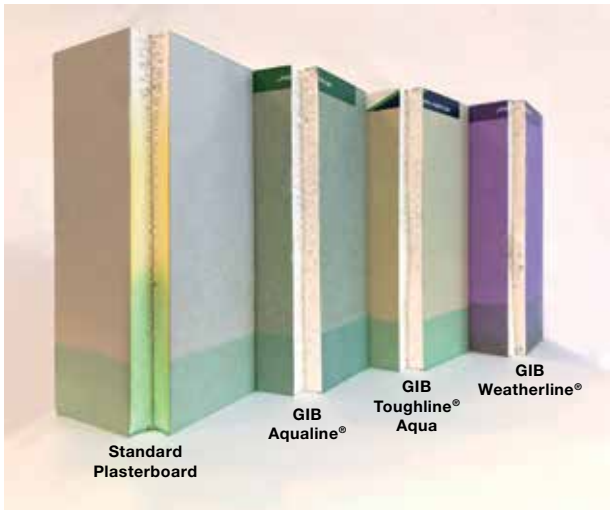
The NZ Building Code does not call for water resistant linings in wet areas but it is desirable to specify lining materials which will maintain their integrity longer when exposed more frequently to moisture, and to one-off events such as leaks or flooding.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® feature a water-resistant polymer impregnated core, designed for wet area applications. These core formulations not only resist penetration of moisture through the lining into the framing behind, but also resist water “wicking” up the core, a common cause of long-term damage where a water-resistant lining has not been used.

WATER ABSORPTION TEST

The illustrations below show how GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® compare with standard plasterboard after soaking for two-hours in green dye.





WHERE TO USE GIB® WET AREA LININGS

In order to prolong the life expectancy of the space it is highly desirable to include wet area linings in situations where there is an increased risk of water or moisture damage. Applications include walls and ceilings in bath and shower rooms, and walls in laundries, toilets and kitchens.

BENEFITS

- Water resistant and durable linings help protect against water damage
- Proven substrate for paint, wallpaper, waterproofing membranes, tiles, sheet vinyl and rigid sheet shower linings
- Suitable for both residential and non-residential applications
- Dimensionally stable and an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains glass fibres and other additives to increase strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB Noise Control® Systems (see Compliance with the NZ Building Code, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details

HANDLING AND STORAGE

- GIB® plasterboard must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB® plasterboard must be handled as a finishing material

LIMITATIONS

- GIB® wet area linings must not be used for bracing purposes in shower cubicles or above baths. For more information refer to page 9 of this manual
- Do not use GIB® wet area linings where exposed for extended periods to humidity levels above 90% RH, such as in group shower or steam rooms, or where exposed to moisture and chlorine rich environments such as in indoor swimming pools
- GIB® wet area linings used in a bathroom or other high humidity environment must not be directly applied to solid plaster (gypsum or cement), wood-based sheet linings or similar materials, masonry or concrete, without strapping or steel furring channels
- GIB® wet area linings must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® or GIB Toughline® Aqua must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details

Table 1: GIB® Wet Area linings sheet dimensions and weights

Product	Sheet face colour	Thickness (mm)	Sheet width (mm)	Edge Type	Sheet length (mm)						Max. Weight (kg/m²)
					2400	2450	2700	3000	3600	4800	
GIB Aqualine®	Green	10	1200	TE/TE	■		■	■	■		8.0
			1200	TE/SE	■					■	
			1350	TE/SE	■				■		
		13	1200	TE/TE	■		■	■	■		11.0
GIB Toughline® Aqua	Mauve	13	1200	TE/TE	■		■	■			11.4
GIB Weatherline®	Purple	10	1200	SE/SE		■	■	■			9.0
		13	1200	SE/SE			■	■			11.5

BOARD SUBSTITUTION OPTIONS

Acceptable GIB Aqualine® alternatives	
10mm GIB Aqualine® can be replaced with:	10mm GIB Weatherline® 13mm GIB Toughline® Aqua
13mm GIB Aqualine® can be replaced with:	13mm GIB Weatherline® 13mm GIB Toughline® Aqua

GIB® Wet Area System construction details in this manual refer to the use of GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® sheets may also be used in place of GIB Aqualine®.

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® are suitable substrates for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures are presented in this literature, except that the lining gap at the floor is no more than 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles behind internal lining corners is recommended for sheet vinyl applications in showers or shower over bath situations
- The lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph even through a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/ manufacturers of the vinyl

RIGID SHEET SHOWER LININGS

- The wall surface must be free of dust before installation of the lining
- Avoid lining joints as much as possible and where necessary flush with plaster to achieve a level surface
- Do not preseal or paint areas which are to be covered by the rigid shower linings
- The suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Care must be taken to ensure that rooms are adequately ventilated
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- Consult the supplier of the shower lining for full installation details
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service

WATERPROOF MEMBRANE SYSTEMS AND TILING

- A waterproof membrane system must be applied to lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane system over the lining and once penetrations for shower mixers, taps and associated fittings are sealed
- The installation of galvanised steel reinforcing angles behind internal lining corners is required for tiled wall applications in showers or shower over bath situations
- In-situ waterproofing membrane materials manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and must be applied to manufacturer’s recommendations. Typically, these types of membrane systems are not suitable for paint and wallpaper finishes
- Waterproof membrane systems must be fully cured and dry prior to application of tiling adhesives
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this manual are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane system

For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Ensure shower mixer and tap penetrations are sealed with a proprietary flange system to prevent the passage of moisture into the wall cavity
- Sealants should be of a mould inhibiting type and be paintable. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Apply a bead of sealant to the full depth of the lining in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the wet area lining
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable always use tested and approved proprietary penetration seals

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture.

When renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them. This allows for a new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation, water-resistant linings, and propriety plumbing penetration flange systems where appropriate
- Make the job easier

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often expensive failure of components and building elements within wet areas.

It is important to regularly inspect and repair any potential problem before it becomes expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and re-coated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out

Compliance with the NZ Building Code

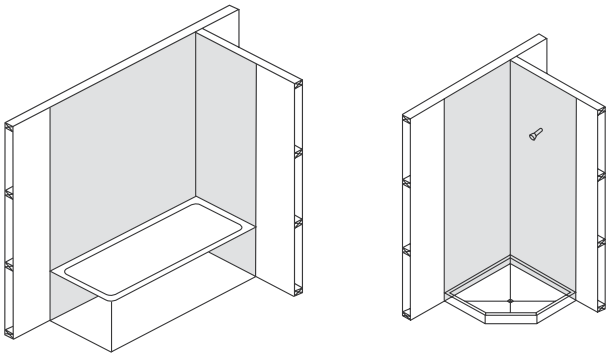
STRUCTURE – CLAUSE B1

The design and material specification for steel and timber framing used in GIB® Wet Area systems must be in accordance with the performance requirements of NZ Building Code Clause B1 (Structure).

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members, such as at bath and shower tray locations.

Otherwise, GIB® Bracing Systems can be used in water-splash areas, provided these are maintained impervious for the life of the building.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. They can also be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB® Grabber 32mm x 6g screws at 100mm centres, using the GIB Braceline® corner fixing pattern. Refer to the GIB® Bracing System literature.



No bracing in the shaded areas.

DURABILITY – CLAUSE B2

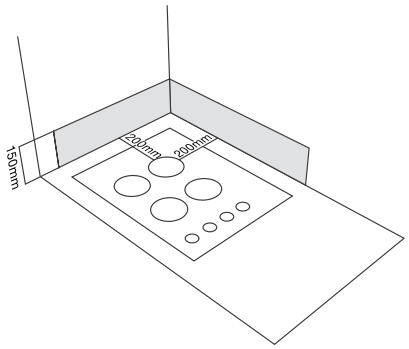
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB® Wet Area Systems have a serviceable life of at least 50 years and comply with NZ Building Code Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

FIRE AFFECTING AREAS BEYOND THE SOURCE – CLAUSE C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZ Building Code Clause C3. When GIB Aqualine® or GIB Toughline® Aqua is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

The protection of combustible surfaces surrounding gas cooking appliances is covered by the latest version of AS/NZS 5601.1.



As a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the specific requirements of AS/NZS 5601.1

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. It would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

INTERNAL MOISTURE – CLAUSE E3

The New Zealand Building Code Clauses that relate to wall surfaces are;

E3.3.4 - Wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.

E3.3.5 - Surfaces of the building elements likely to be splashed or become contaminated in the course of the intended use of the building, must be impervious and easily cleaned.

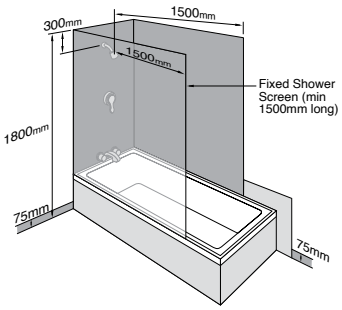
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

New Zealand Building Code Acceptable Solution E3/AS2 substantially refers to the Waterproof Membrane Association Incorporated (WMAI) Code of Practice for Internal Wet Area Membrane Systems (IWAM), August 2020.

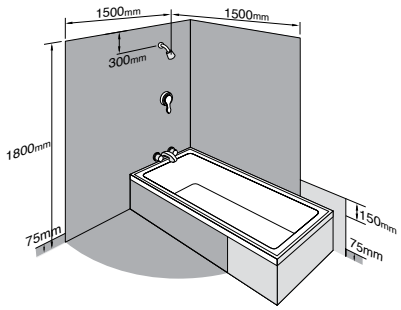
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

Shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

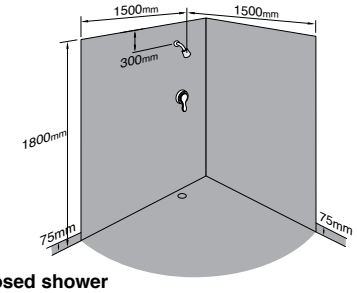
Enclosed shower over bath



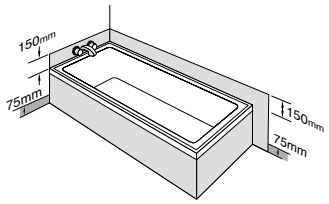
Unenclosed shower over bath



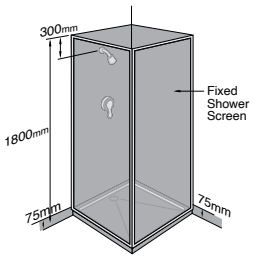
Unenclosed shower



Bath



Enclosed shower



HAZARDOUS BUILDING MATERIALS – CLAUSE F2

At no stage during its serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZ Building Code Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

VENTILATION – CLAUSE G4

NZ Building Code Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating, thermal insulation and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

AIRBORNE AND IMPACT SOUND – CLAUSE G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZ Building Code Clause G6 (Airborne and Impact Sound). When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information refer to the GIB Noise Control® Systems literature or contact the GIB® Helpline 0800 100 442.

TIMBER WALL FRAMING

Framing dimensions must comply with the requirements of NZS 3604:2011.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread screws.

FASTENER CENTRES

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

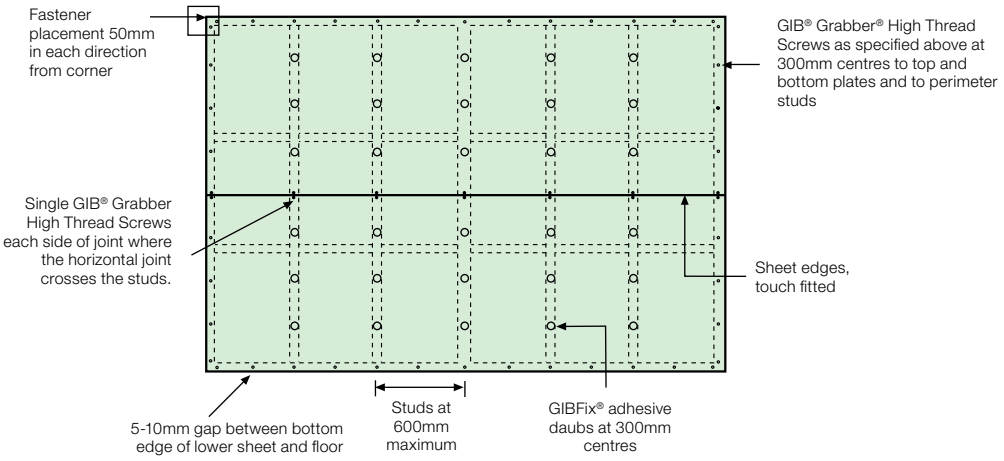
LINING

- Use minimum 10mm GIB® plasterboard
- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

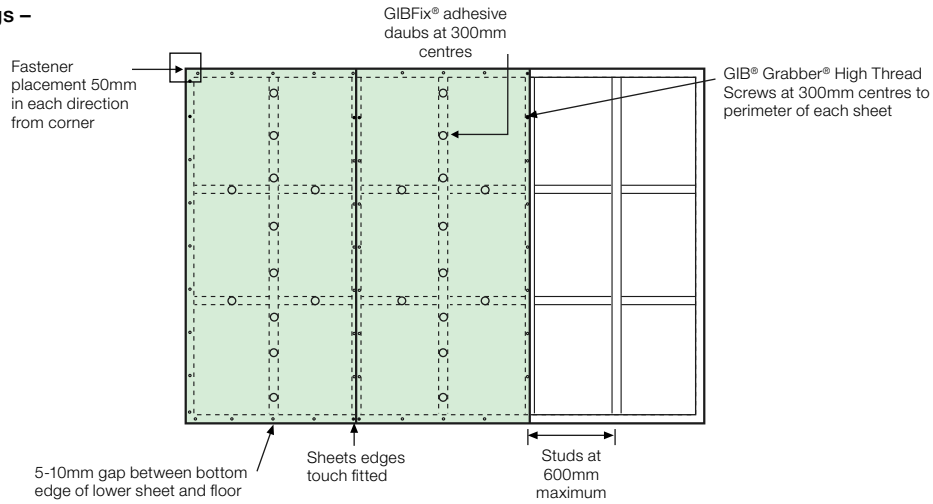
JOINTING

- Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



STEEL WALL FRAMING

The minimum sheet thickness for fixing on light gauge 0.55mm base metal thickness (BMT) steel framing is 13mm GIB® plasterboard. For bracing, noise control or fire rating applications consult the relevant GIB® technical publication.

Steel frame for residential construction is in accordance with NZBC B1/AS1 9.1 NASH Standard Part 2 Light Steel Framed Buildings, or by specific design. 10mm GIB plasterboard is commonly used on minimum 0.75mm BMT residential steel framing.

FASTENERS

— Minimum 25mm x 6g GIB® Grabber® Self Tapping Screws.

FASTENER CENTRES

— 300mm centres to top and bottom channels and to end studs

— Single screws to each stud where the horizontal joint crosses the studs

— Place fasteners 12mm from sheet edges and 18mm from sheet ends

— Daubs of GIBFix® All-Bond adhesive or screws at 300mm centres to intermediate studs

— Do not place adhesive at sheet edges or under fasteners.

— Sheet edges at door or window openings can be adhesive fixed.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

LINING

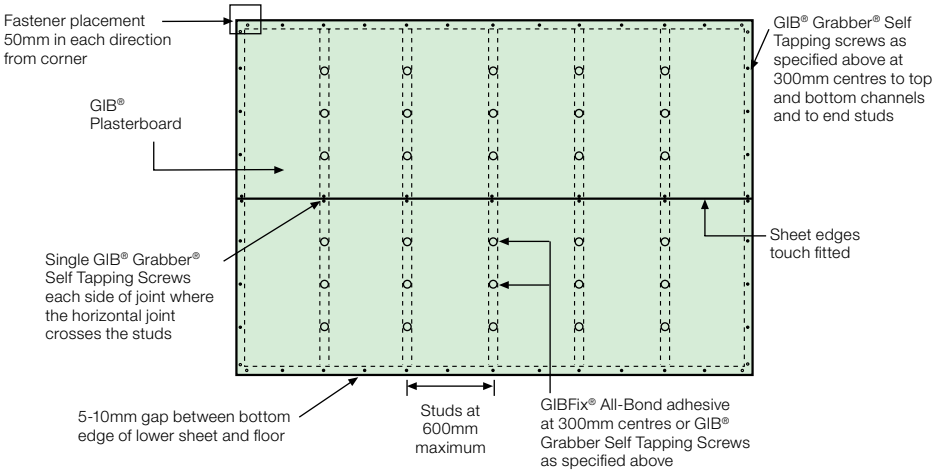
— Lay the sheets, leaving a 5-10mm gap at the floor line. Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry

— Sheets to be touch fitted.

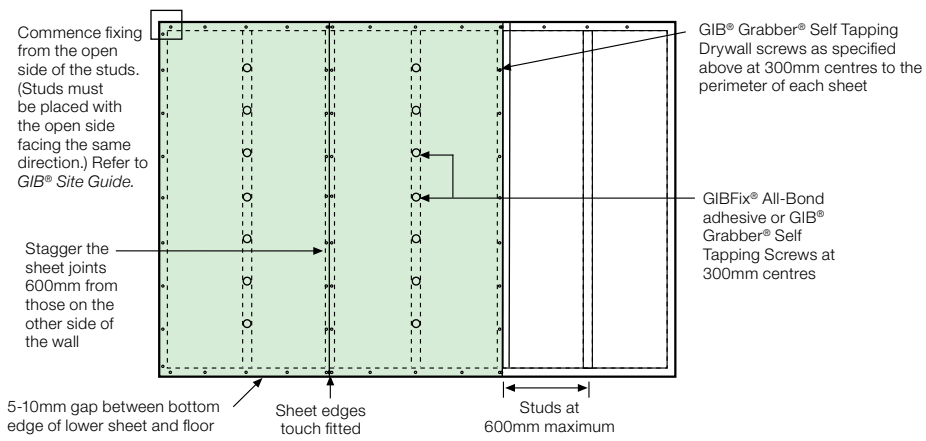
JOINTING

— Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



TIMBER WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NZS 3604:2011 Timber Framed Buildings, or relevant specific design Standard.

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings.

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread Screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Single fasteners to each stud where the horizontal joint crosses the studs
- Where relevant, fastener lengths must comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

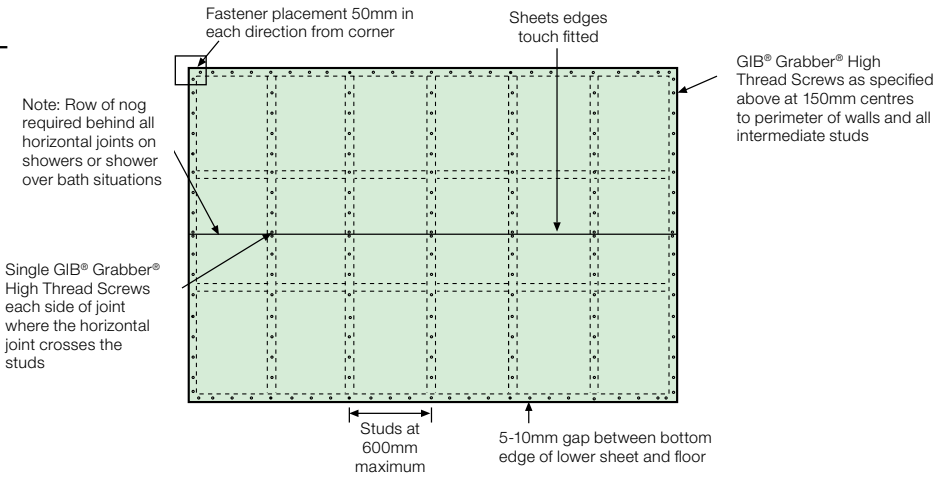
LINING AND TILE WEIGHTS

- Use minimum 10mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

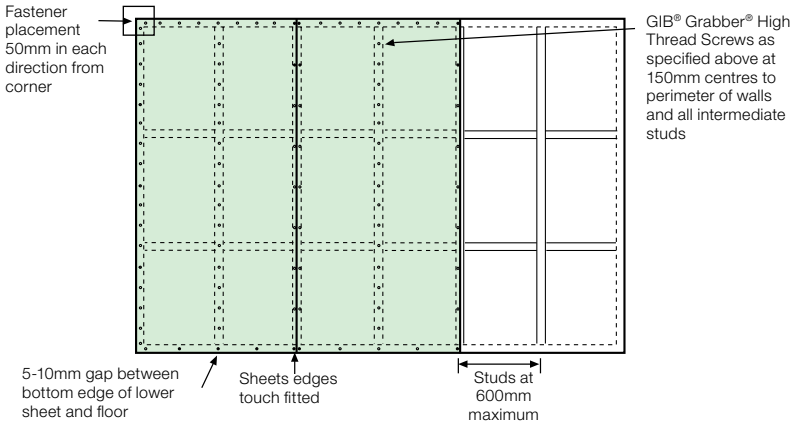
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



STEEL WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NASH Standard Part 2:2019 Light Steel Framed Buildings, or relevant specific design Standard.

- Linings are placed hard to floor, bedded into a sealant bead
- Steel framing for tiling to have a minimum base metal thickness (BMT) of 0.75mm

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® Self Tapper screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

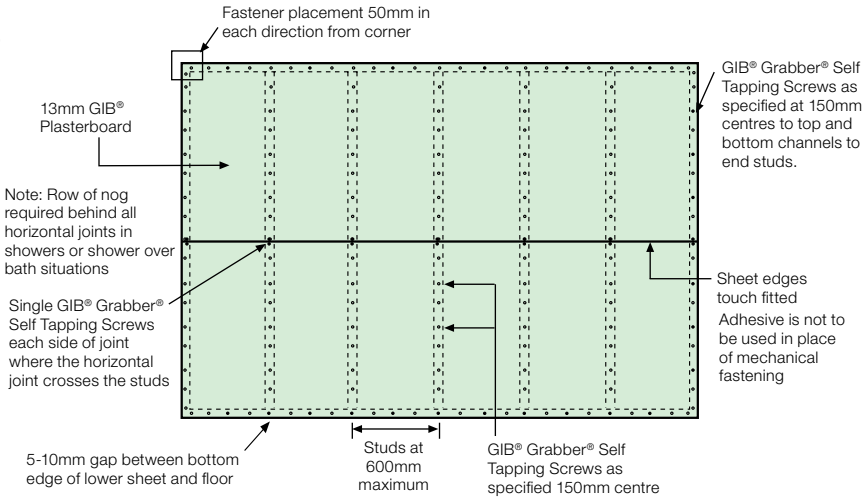
LINING AND TILE WEIGHTS

- Use minimum 13mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

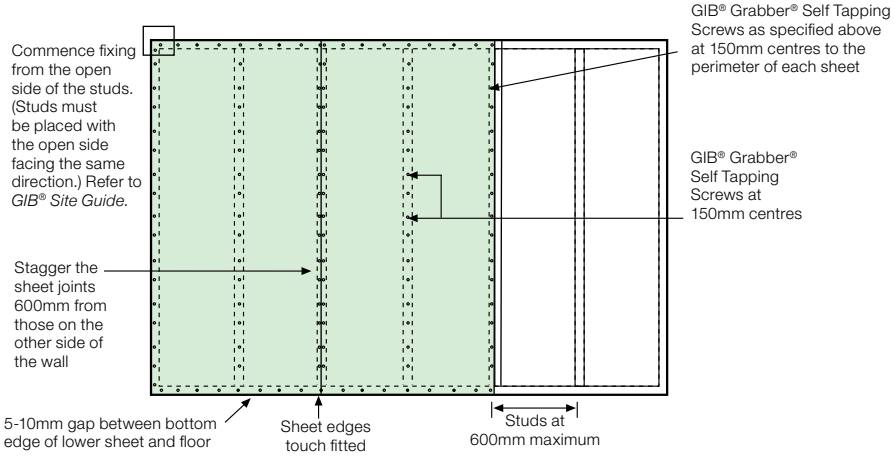
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only

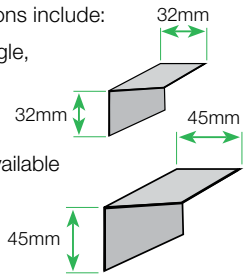


Fastening the Linings – Vertical Fixing Only

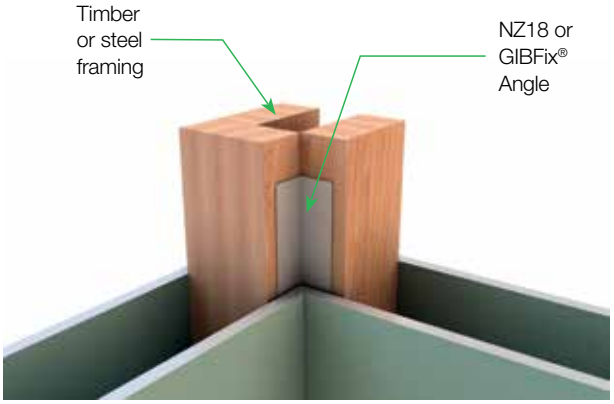


METAL ANGLES FOR TILED INTERNAL CORNERS

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle.
- Suitable GIB® metal angle options include:
  - GIB® Rondo® NZ18 metal angle, available length: 3.0m
  - GIBFix® Angle metal angle, available lengths: 2.4m and 2.7m



- Angles need to be temporarily held in place until secured by the lining fixings
- Minimum height of the metal angle is 1800mm



WATERPROOF MEMBRANE SYSTEMS

A waterproof membrane system must be applied to all lining materials used as a substrate for ceramic tiles in a shower or shower over a bath application, or any other tiled application exposed to frequent water splash.

For further information see p10.

TILES AND TILE WEIGHTS

In areas likely to be directly exposed to water, tiles may be ceramic, porcelain or stone must comply with the over-surface finish requirements of the IWAM Code of Practice and be bedded with a suitable tile adhesive on the waterproof membrane system. See page 10 for the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

Smaller mosaic tiles are often lighter, but the integrity of grout joints might be more prone to impact, whilst heavier tiles are larger and have less and deeper grout and sealant joints. For more information also see AS 3958:2007 Ceramic tiles – Guide to the installation of ceramic tiles.

Table 2: Recommended maximum tile weights

Maximum Tile Weights for GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline®			
Stud Centre (maximum)	**Fasteners Centre (maximum)**	**Lining Thickness**	**Tile Weight**
600mm maximum	150mm maximum	10mm	26kg/m^2
		13mm	40kg/m^2

ADHESIVE AND GROUT WEIGHTS

The weight of adhesive and grout can vary depending on the type of tile and the installation process used. The maximum tile weights stated in table 2 are conservative and refer to the tile weight excluding grout and adhesive used. An additional 3kg/m^2 has been factored into tile adhesion testing on top of the above stated tile weights to account for adhesive and grout weight used during the installation of the tile.

CEILING FRAMING

Framing dimensions and spacing must comply with the requirements of NZS 3604:2011, NASH for steel or relevant NZ Standard.

For noise control or fire rating applications consult the relevant GIB® technical publication.

FASTENERS

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber® High Thread screws

ADHESIVES

- Steel battens - GIBFix® All-Bond
- Timber battens - GIBFix® All-Bond or GIBFix® One

FASTENERS CENTRES

- Single screws to the edges and centre of the sheets across each batten
- Single screw at 600mm maximum to the perimeter of the ceiling
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw pops

LINING

- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards.
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints.
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements

BATTEN SPACINGS

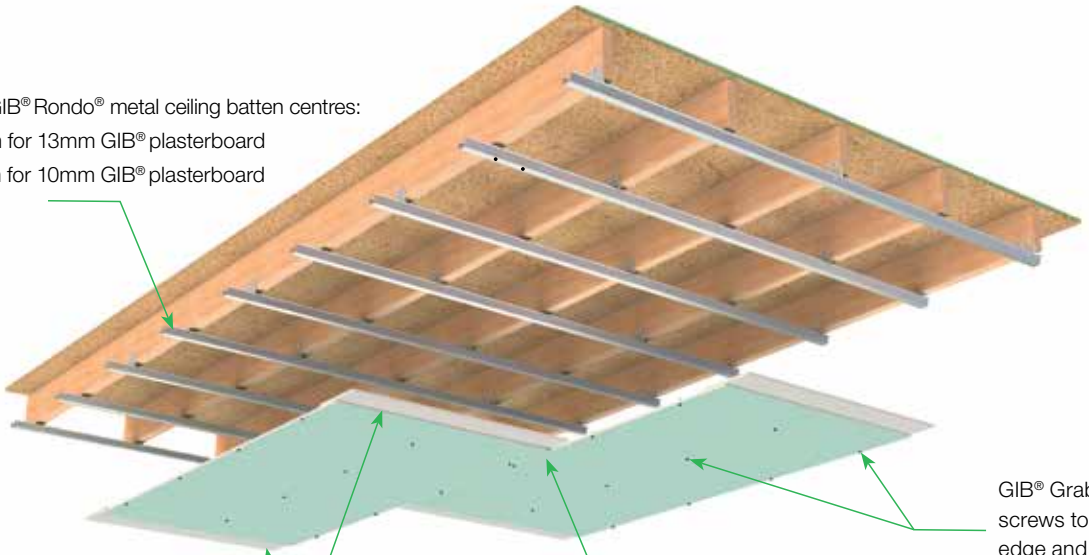
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

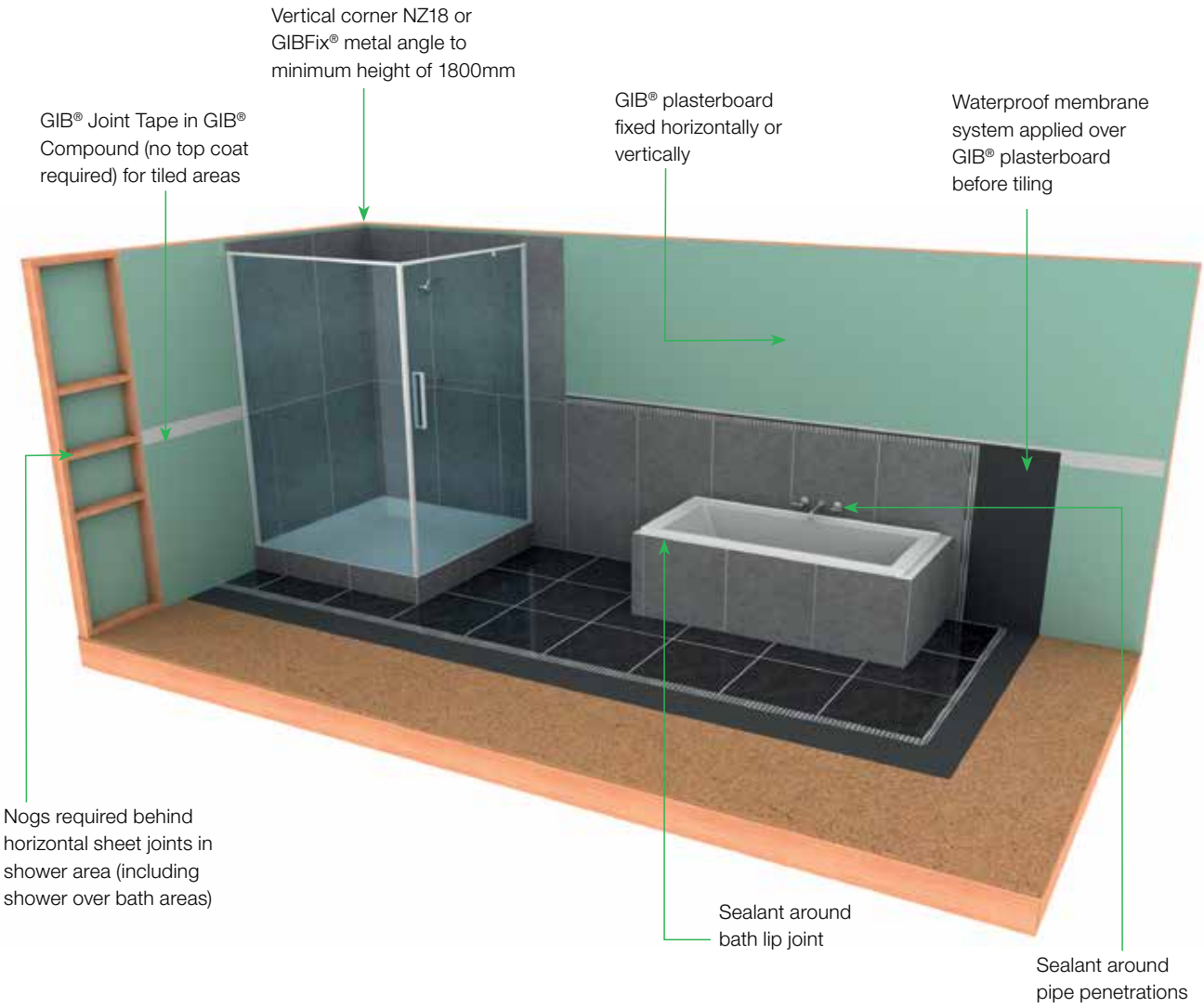
JOINTING

- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the GIB® Site Guide
- Do not fix tiles to GIB® plasterboard ceilings

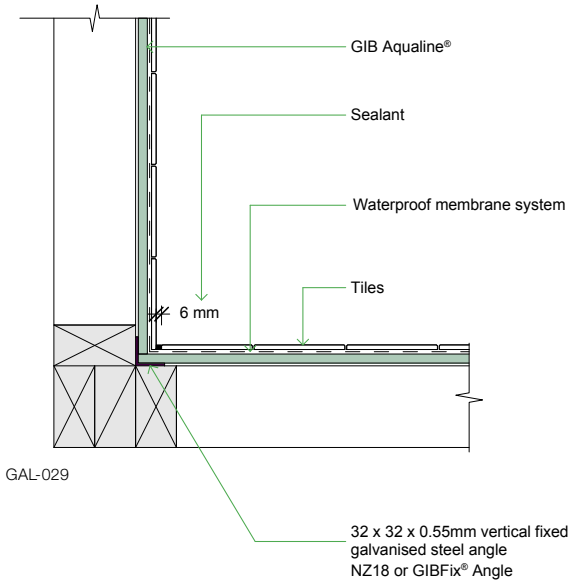
Maximum GIB® Rondo® metal ceiling batten centres:

- 600mm for 13mm GIB® plasterboard
- 450mm for 10mm GIB® plasterboard



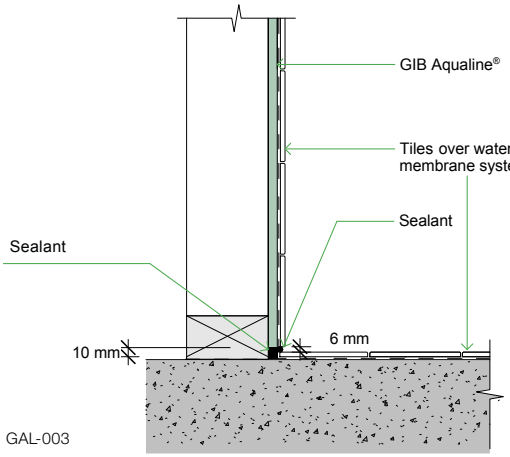

Vertical corner NZ18 or GIBFix® metal angle to minimum height of 1800mm
GIB® Joint Tape in GIB® Compound (no top coat required) for tiled areas
GIB® plasterboard fixed horizontally or vertically
Waterproof membrane system applied over GIB® plasterboard before tiling
Nogs required behind horizontal sheet joints in shower area (including shower over bath areas)
Sealant around bath lip joint
Sealant around pipe penetrations

A: TILED INTERNAL CORNER



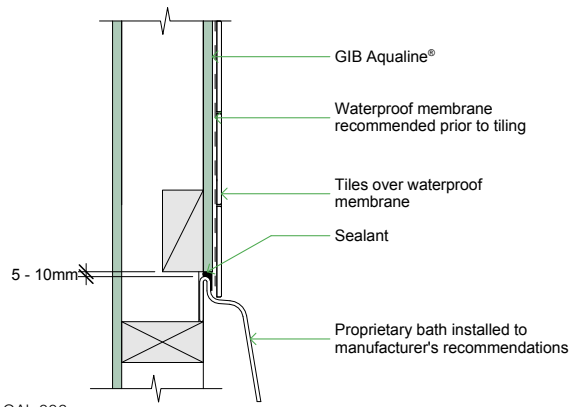
GAL-029

B: CERAMIC FLOOR LINING JUNCTION



GAL-003

C: BATH LINING JUNCTION

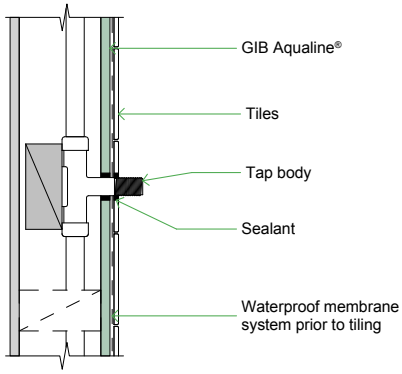


GAL-006

G: SHOWER MIXER PENETRATION IN WET WALL LININGS

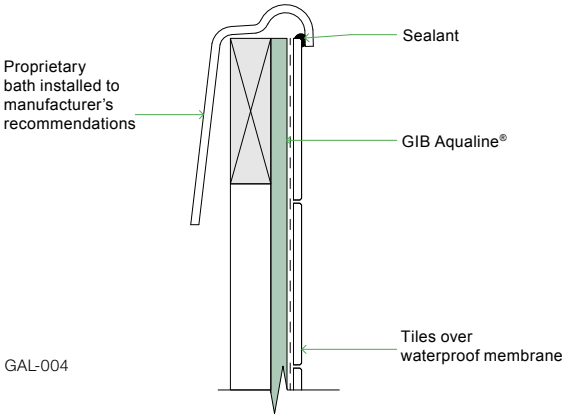
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

D: SEALING WET AREA PENETRATION



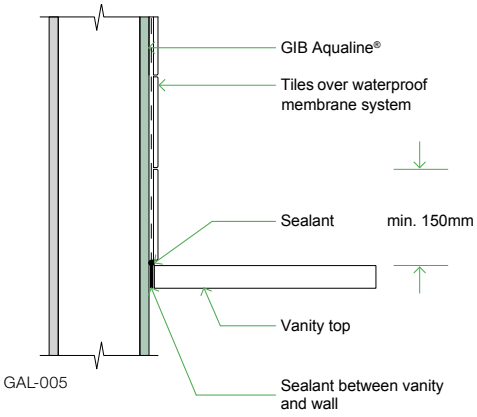
GAL-002

E: BATH CRADLE LINING DETAIL

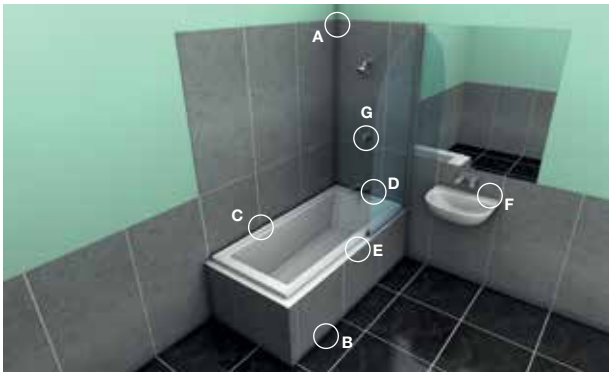


GAL-004

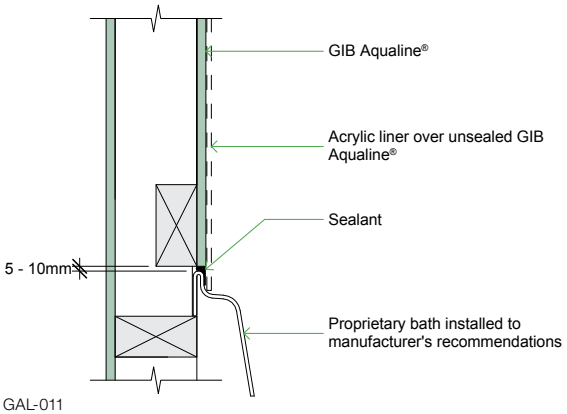
F: VANITY TOP LINING JUNCTION



GAL-005

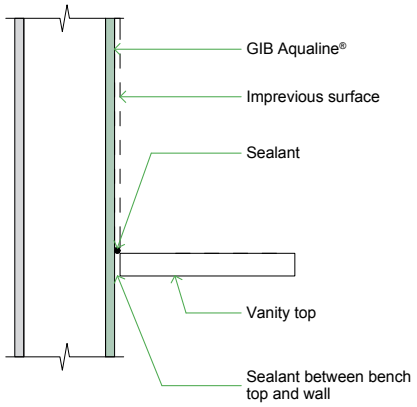


A: BATH LINING JUNCTION



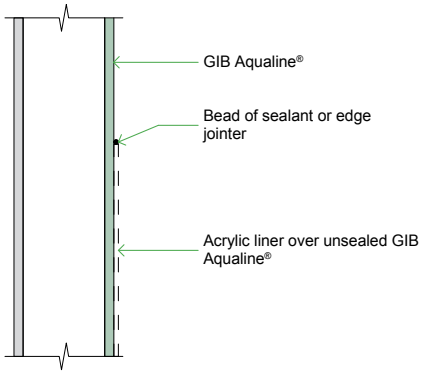
GAL-011

B: VANITY TOP LINING JUNCTION



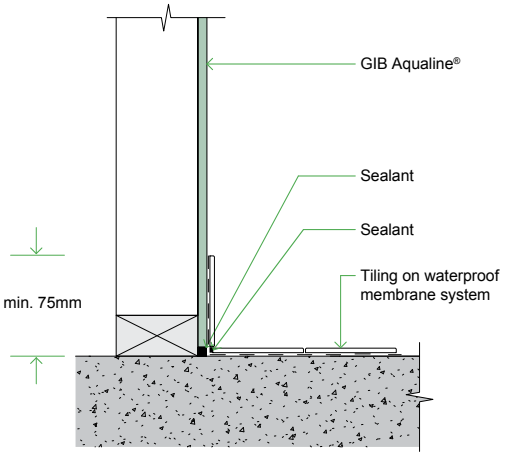
GAL-023A

C: UNSEALED PLASTERBOARD LINING



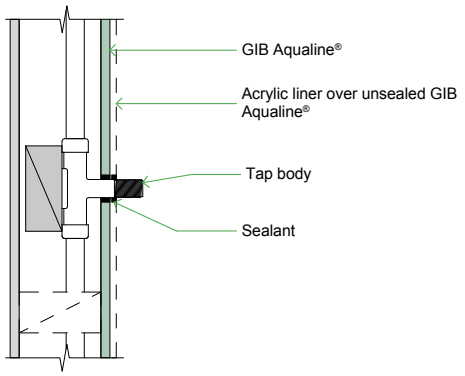
GAL-028

D: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

E: SEALING SEMI WET AREA PENETRATION



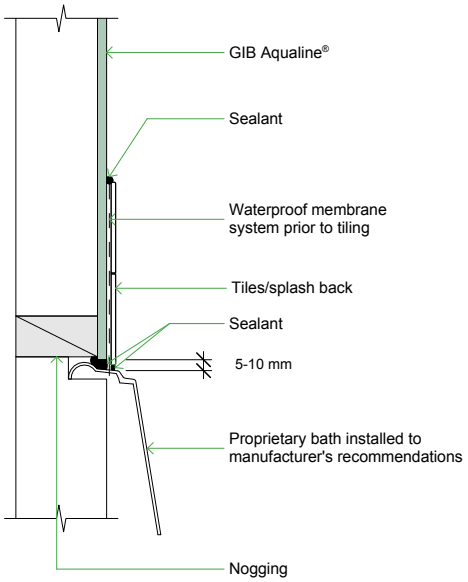
GAL-019

F: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

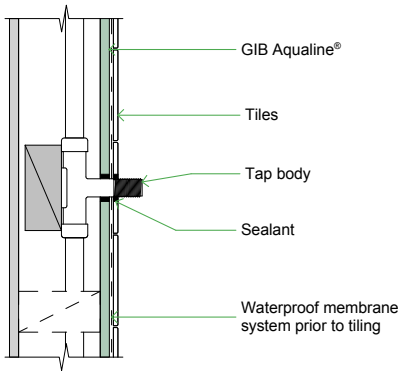


A: BATH LINING JUNCTION



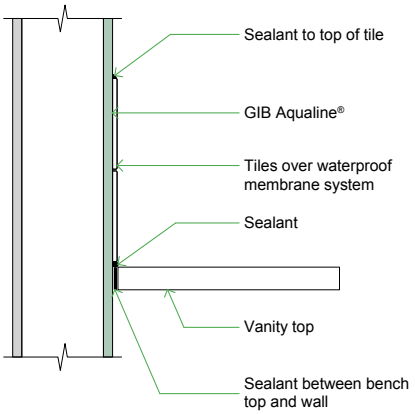
GAL-009

B: SEALING SEMI WET AREA PENETRATION



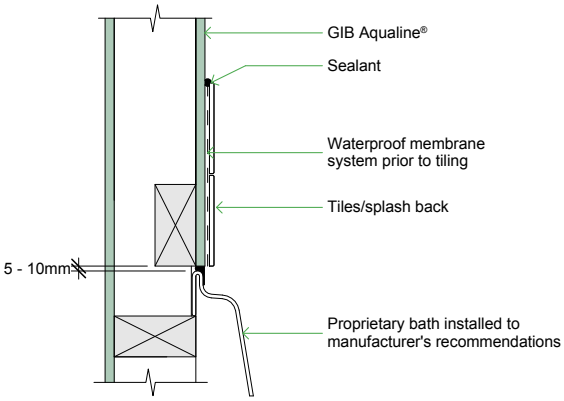
GAL-020

C: VANITY TOP LINING JUNCTION



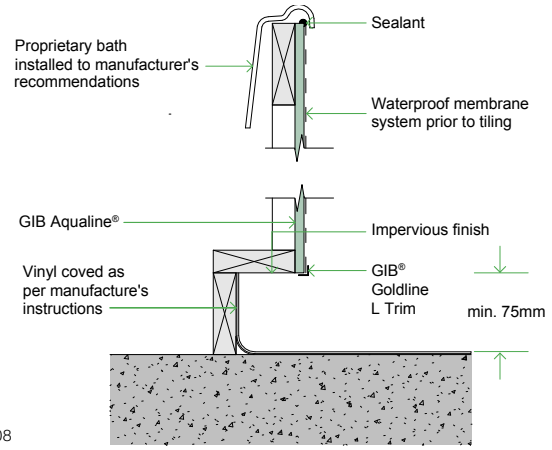
GAL-024

D: BATH LINING JUNCTION

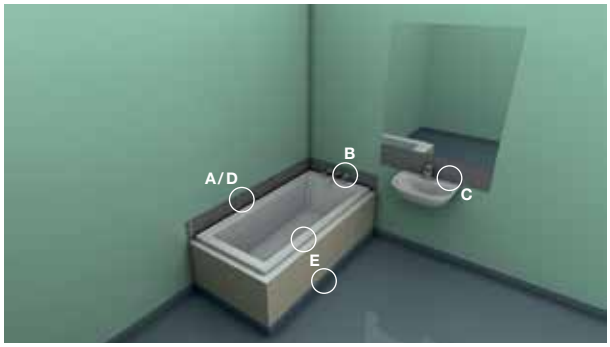


GAL-010

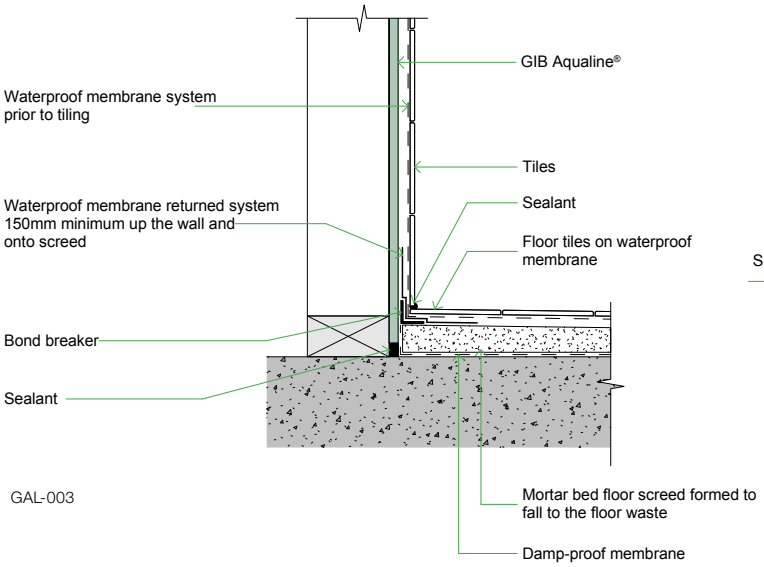
E: CRADLE VINYL LINING JUNCTION



GAL-008

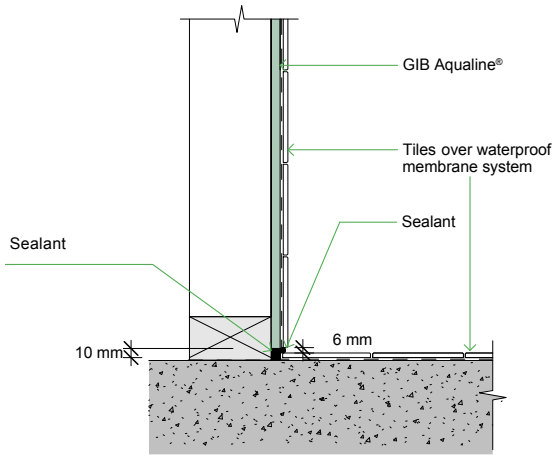


A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



GAL-003

C: CERAMIC FLOOR LINING JUNCTION

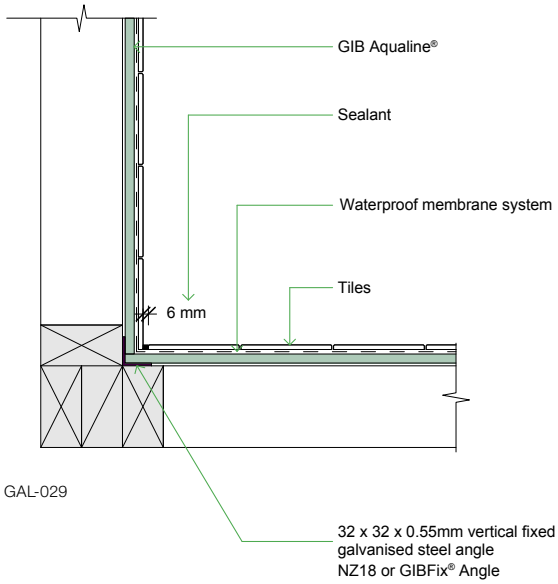


GAL-002A

PREFORMED SHOWER BASE JUNCTIONS

Refer to the shower base manufacturer for proprietary shower tray installation detailing including wet wall lining junction detailing.

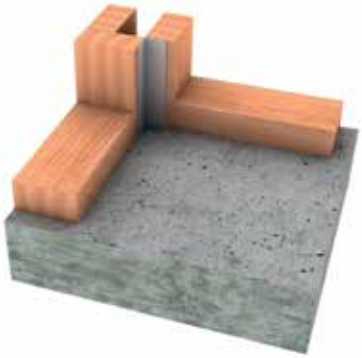
B: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.

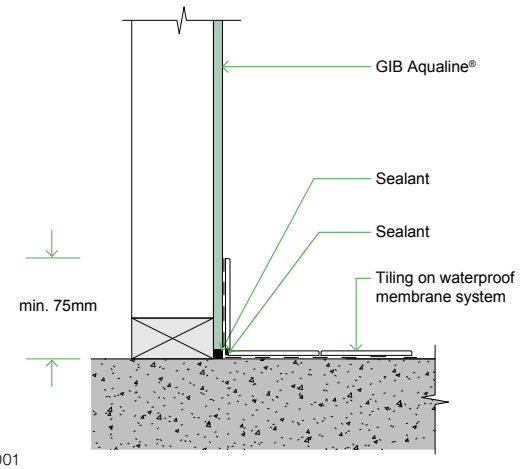


E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

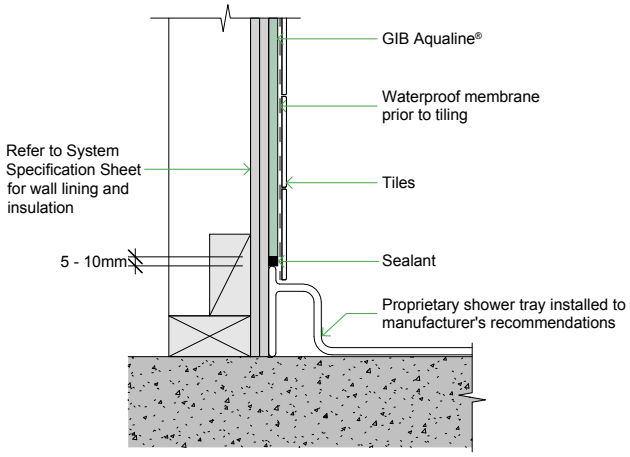


A: CERAMIC FLOOR SKIRTING LINING JUNCTION



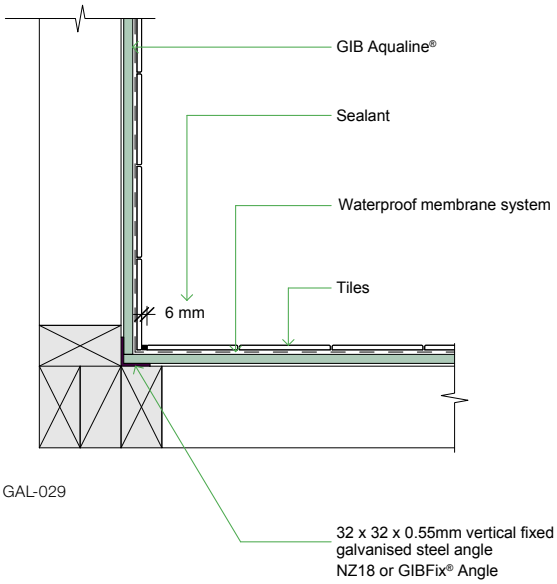
GAL-001

B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



GAL-016

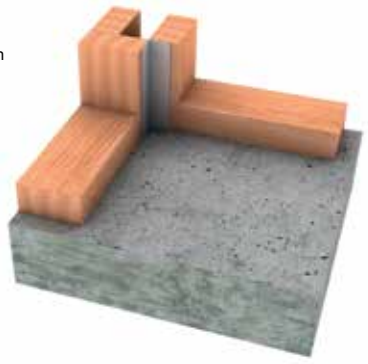
C: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.

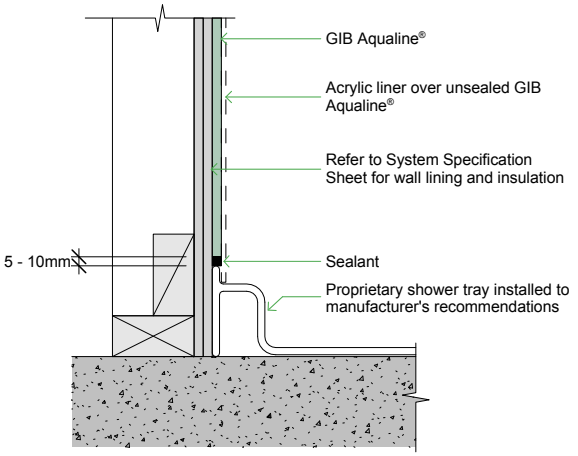


E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

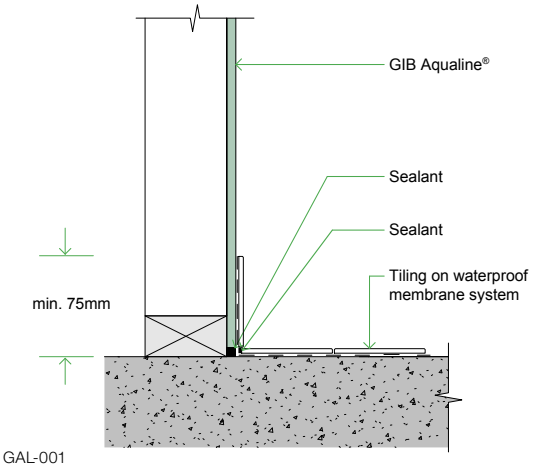


A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



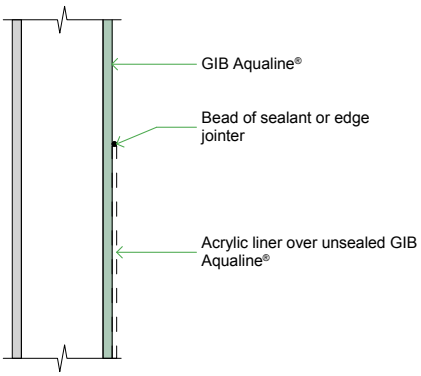
GAL-015

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

C: UNSEALED PLASTERBOARD LINING



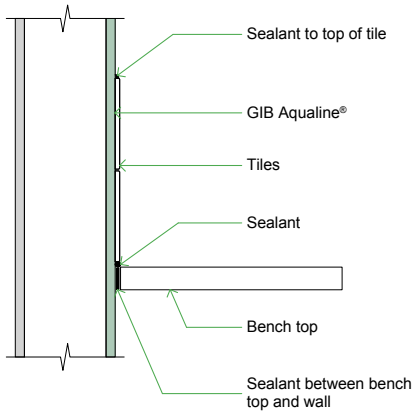
GAL-028

D: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

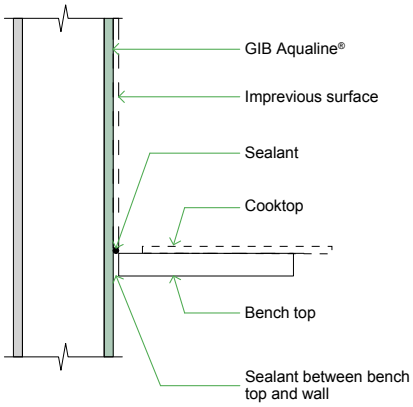


A: BENCH TOP LINING JUNCTION



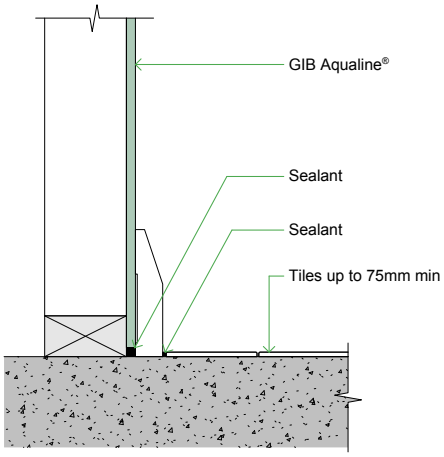
GAL-024

B: COOKTOP LINING JUNCTION



GAL-023B

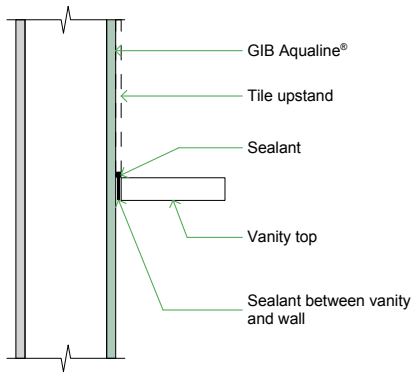
CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001A

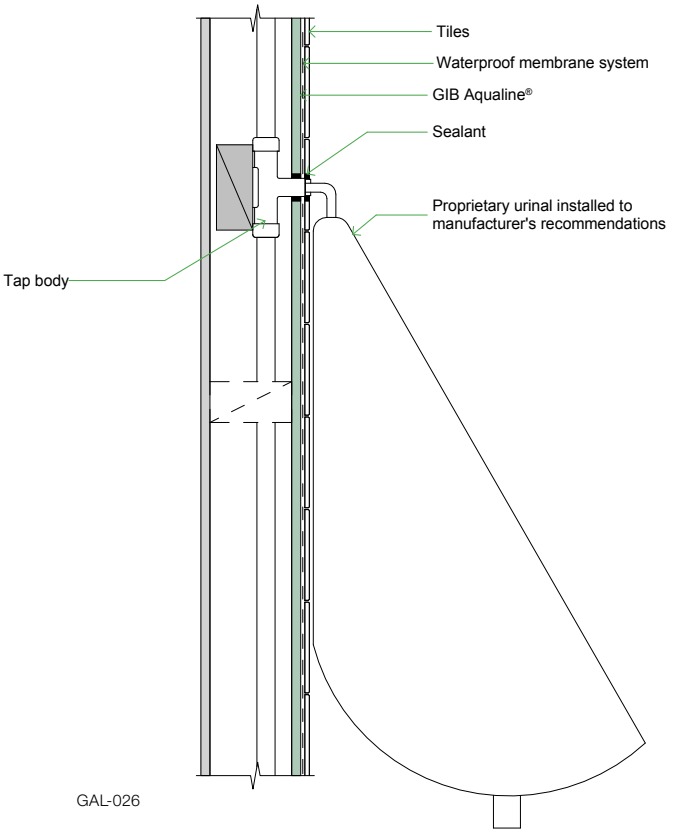


A: VANITY TOP LINING JUNCTION



GAL-022

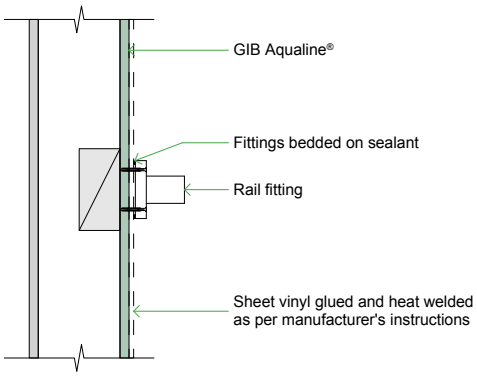
B: SEALING WET AREA PENETRATION LINING JUNCTION



GAL-026

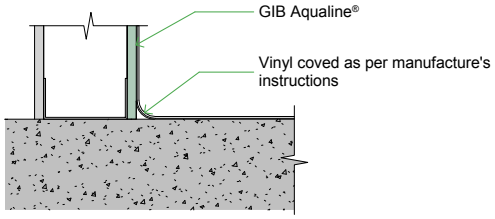


A: SURFACE MOUNTED WITH NOG



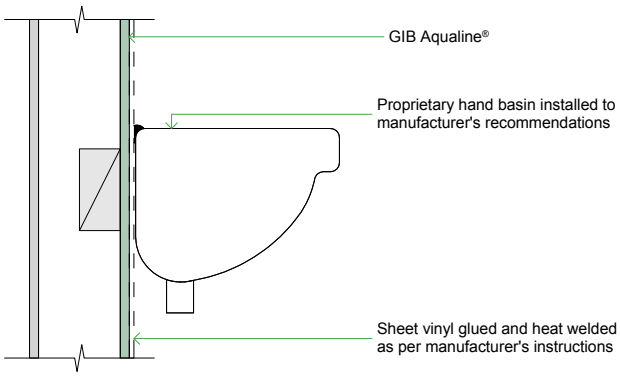
GAL-027

B: VINYL FLOOR LINING JUNCTION



GAL-006A

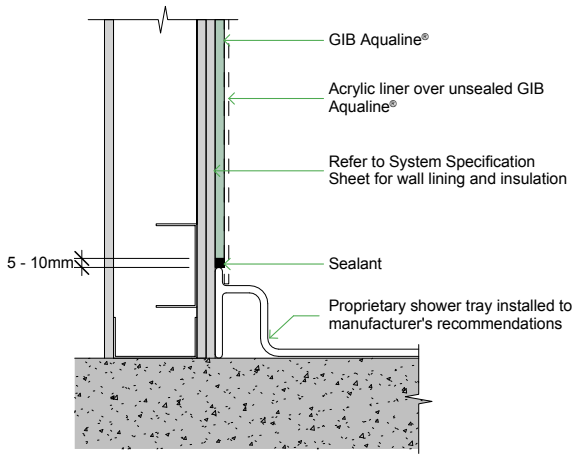
C: BASIN LINING JUNCTION



GAL-025

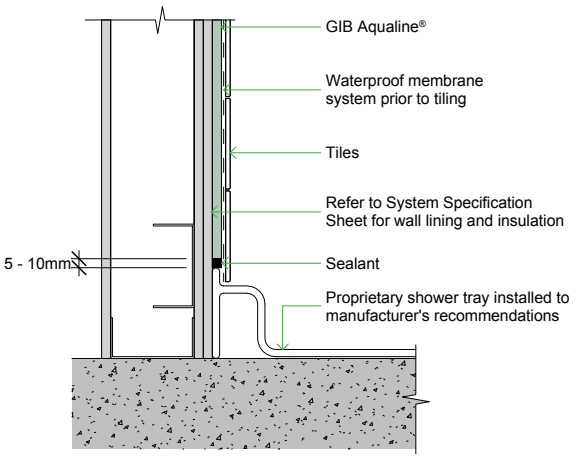


A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



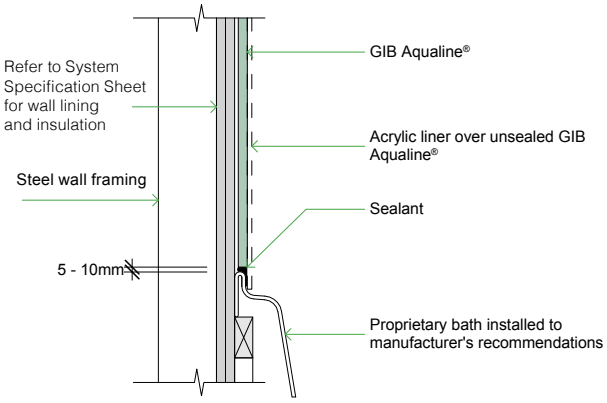
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



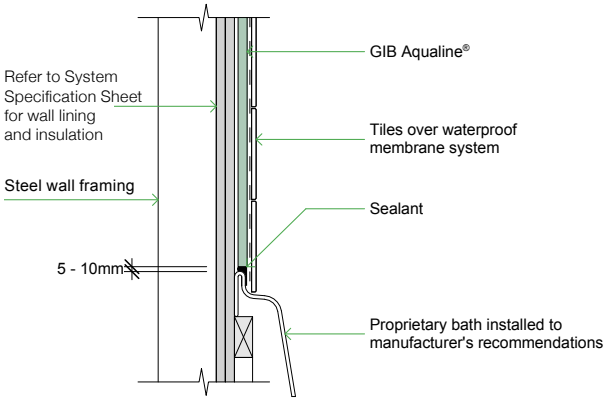
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



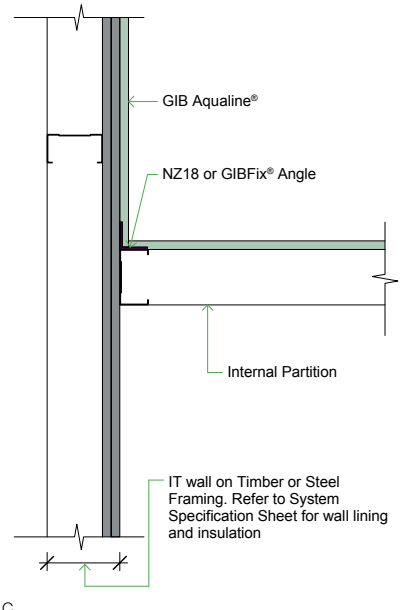
GAL-014

GIB® WET AREA SYSTEMS FIRE RESISTANCE AND NOISE CONTROL PERFORMANCE

Given recesses required for shower trays, bath upstands, etc., and the likelihood of renovations during the service life of the building, it is recommended that GIB® Wet Area linings in water splash areas are installed in addition to and over required fire and noise control systems in commercial or multi-residential applications.

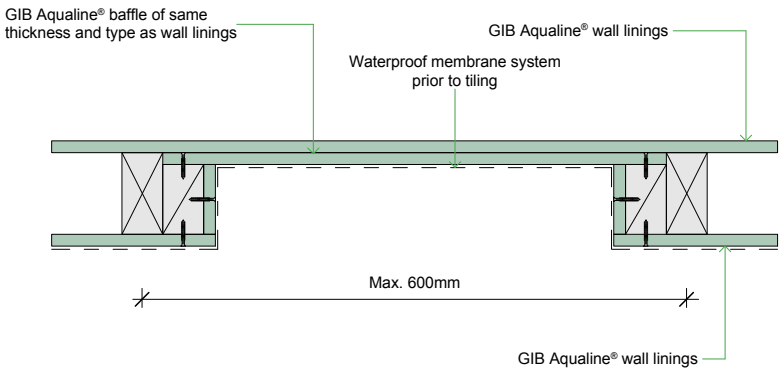
Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

E: INTERTENANCY WALL AND WET AREA WALL JUNCTION

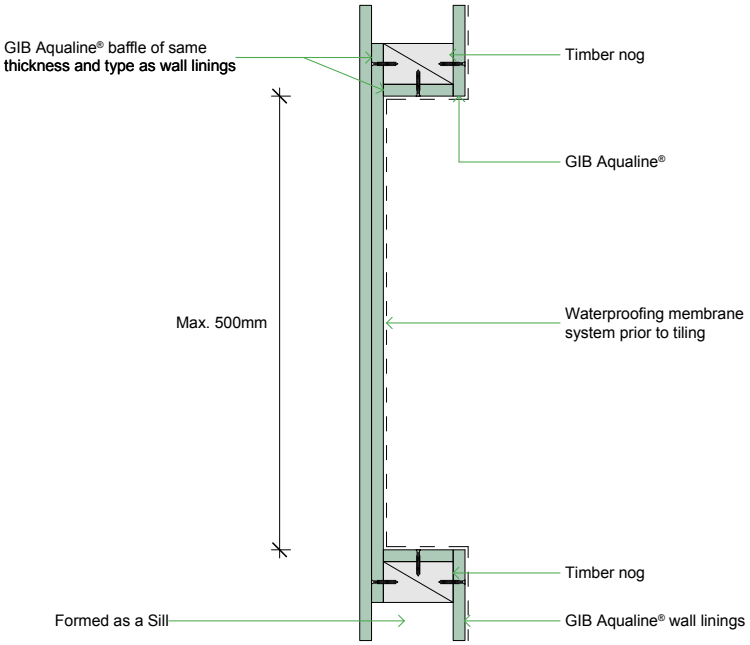


GAL-031C

TIMBER FRAME TILE RECESS

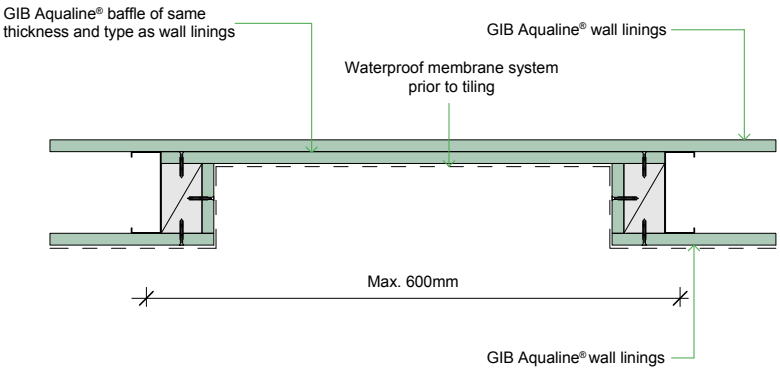


Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.

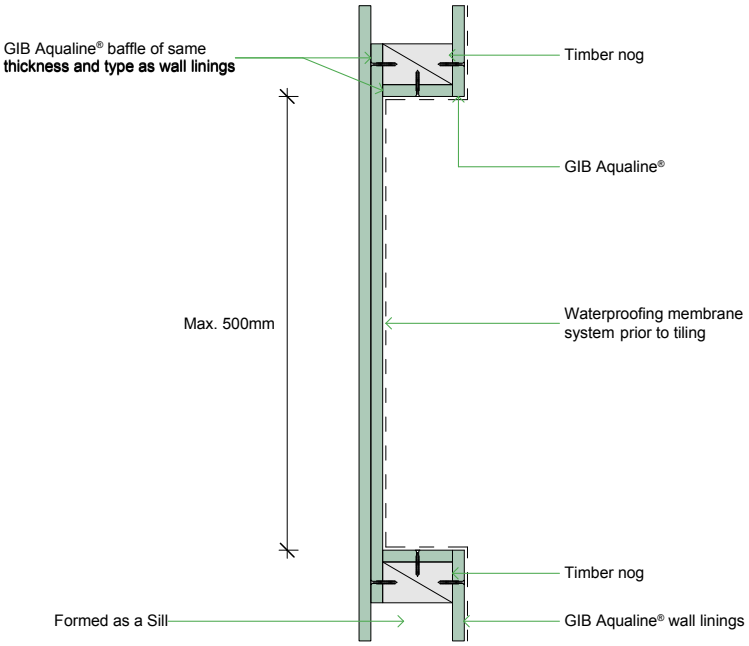


GAL-029B

STEEL FRAME TILE RECESS



Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.



GAL-030

GIB® Wet Area Systems, February 2021

LIMITATIONS

Winstone Wallboards Ltd accepts no liability if the GIB® Wet Area Systems and junction details are not installed in strict accordance with instructions contained within this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. You should check the GIB® website to ensure you are using the current publication. If you are unsure whether this is the current publication, simply call the GIB® Helpline on 0800 100 442.

SUBSTITUTION

GIB® Wet Area Systems have been specifically designed and tested to achieve the stated performance levels. To maintain the GIB® Product and System Warranty, all system components detailed in this publication must be used when specifying and installing GIB® Wet Area Systems.

TRADEMARKS

The names GIB®, GIB Fyreline®, GIB Ultraline®, GIB Toughline®, GIB Braceline® GIB Noiseline®, GIB Aqualine®, GIB Weatherline®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, GIB® Quiet Stud®, GIB Rail®, GIB Barrierline®, GIB X-Block®, GIB Fire Soundseal®, GIB Clip®, the colour mauve for GIB Toughline®, the colour blue for GIB Braceline® GIB Noiseline®, the colour pink for GIB Fyreline®, the colour green for GIB Aqualine®, the colour purple for GIB Weatherline® and the shield device are registered trademarks of Fletcher Building Holdings Limited.

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gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

February 2021

BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	UWC ltd
Project name	
Address	52 Benn St , Amberley
Designer	JKH
Date	12/5/25

Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

Proposed Building

Element		Area (m²)	Proposed Building Heat Loss (W/K)
Slab Floors		177.0	80.8
Other Floors		0.0	0.0
Roof		177.0	31.4
Skylights		0.0	0.0
Walls		153.1	69.6
Glazing (walls & doors)	(19.0% of total wall area)	36.2	72.4
Doors (opaque)		1.6	4.7
		544.9	**Total** **258.9**

Reference Building

Element	Area (m²)		Reference Building Heat Loss (W/K)
Slab Floors	177.0	1.6	**110.6**
Other Floors	0.0	3.0	**0.0**
Total Roof (includes skylight area)	177.0	6.6	**26.8**
Walls (70% of total wall area)	133.6	2.0	**66.8**
Glazing allowance (30% of total wall area)	57.3	0.50	**114.5**
	544.9	**Total**	**318.8**

Comparison of proposed building against the reference building **PASS**

	Element type	Description	Embed heating?	Area (m²)	Construction R-value (m².K/W)	Heat Loss (W/K)	Errors
1	Slab Floors	Floor Slab	No	177.0	2.2	80.8	
2	Roof	Colorsteel Roof R6.6	No	138.0	7.0	19.8	
3	Roof	Colorsteel Roof R3.6	No	39.0	3.4	11.6	
4	Walls	Brick Veneer Exterior	No	93.0	2.2	42.3	
5	Walls	BGC Cladding	No	34.5	2.2	15.7	
6	Walls	Internal Wall	No	25.6	2.2	11.6	
7	Glazing (walls & doors)	W1		2.7	0.50	5.4	
8	Glazing (walls & doors)	W2		0.9	0.50	1.8	
9	Glazing (walls & doors)	W3		3.8	0.50	7.7	
10	Glazing (walls & doors)	W4		1.9	0.50	3.8	
11	Glazing (walls & doors)	W5		1.9	0.50	3.8	
12	Glazing (walls & doors)	W6		5.8	0.50	11.5	
13	Glazing (walls & doors)	W7		3.8	0.50	7.7	
14	Glazing (walls & doors)	W8		2.1	0.50	4.2	
15	Glazing (walls & doors)	W9		2.1	0.50	4.2	
16	Glazing (walls & doors)	W10		1.0	0.50	2.1	
17	Glazing (walls & doors)	W11		0.7	0.50	1.3	
18	Glazing (walls & doors)	W12		2.1	0.50	4.2	
19	Glazing (walls & doors)	W13		0.7	0.50	1.3	
20	Glazing (walls & doors)	W14		1.5	0.50	3.1	
21	Glazing (walls & doors)	W15		2.1	0.50	4.2	
22	Glazing (walls & doors)	W16		1.1	0.50	2.2	
23	Glazing (walls & doors)	W17		2.1	0.50	4.2	
24	Doors (opaque)	Internal Garage Door		1.6	0.34	4.7	
25							
26							

BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

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Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

INSTALLATION GUIDE

Thermakraft™
ALUBAND
Window Flashing Tape



Thermakraft™ ALUBAND

Bituminous adhesive flexible window flashing tape.

Kingspan Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Product usage

Aluband Window Flashing Tape is installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.

BRANZ Appraised
Appraisal No.878 [2019]

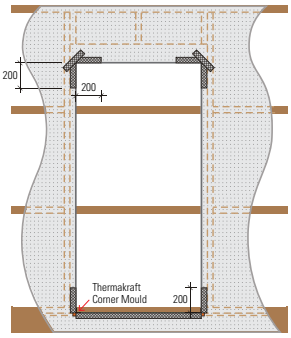
Kingspan®

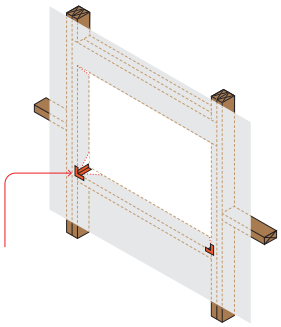
Aluband

Bituminous adhesive flexible window flashing tape

Application Method

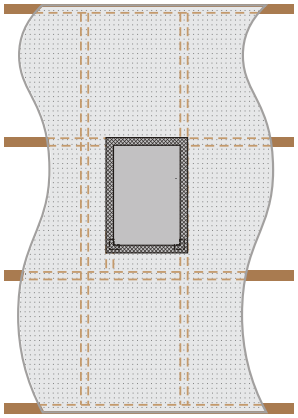
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes. Note the following: 150mm wide tape is used for 100mm wide window or door framing, and the 200mm wide tape is used for 140mm to 150mm wide reveals. (With steel framed houses use Double Sided Tape to attach the Corner Moulded Piece to metal framing).
- Measure 200mm up both jambs, add 400mm to the length of the window sill and cut to suit that measurement.
- First remove the release film from the tape; align the back edge of the tape with the inside edge of the sill.
- Using an appropriate tool, firmly press the tape onto the wall underlay to ensure good adhesion and ensure the tape is fitted tightly into the jamb to sill corners.
- At the sill/jamb corners cut the tape from the external edge of the frame outwards. Fold flaps back onto the wall underlay/air barrier and press tape firmly for good adhesion.
- Proceed to fit the Window Flashing Tape to the top corners of the frame (200mm across lintel x 200mm down jamb).
- For window or door lintel to jamb junction, apply a butterfly using the 75mm wide x 100mm long Aluband. Fix at a 45° angle to the jamb with an overlap at the corner of 3mm.
- Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.
- Window Flashing Tape is used to seal the up stand of the window head flashing to the building underlay. (Refer to the cladding manufacturer's details).
- Aluband must NOT be left exposed to the weather or UV for more than 42 days.

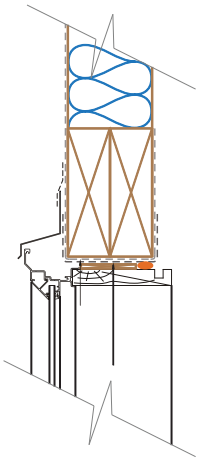




Window and door frames

- Staple orange corner piece to the bottom corner sill. Place tape 200mm up the jambs and across the full width of the sill opening. Align tape with the back of the frame opening.
- At the top corner place tape 200mm down the jamb and 200mm across the lintel. Place a strip of 75mm tape across the top corner.





Application Tips

- Always use an appropriate tool to apply firm pressure onto the tape during installation. This will ensure proper adhesion of the tape to the building underlay or other substrates.
- Install the Aluband Window Flashing above 5°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Aluband

Bituminous adhesive flexible window flashing tape



Important Information

To assist the adhesion of Aluband window flashing tape, Kingspan suggests the following two options. This is particularly relevant in the following conditions:

- In temperatures below 5°C.
- When adhering to difficult to bond substrates such as rough/uneven surfaces.
- When the tape has been lifted or moved after initial application.

Application of Heat:

- Press the window sill tape into position in the usual manner.
- Apply a gentle heat, using a heat gun on low heat to the top of the window sill tape.
- Once the adhesive starts to soften use an appropriate tool or a roller to firmly press the tape into the wall underlay ensuring good adhesion.
- Take care not to damage the foil face lining.

Difficult to Bond Substrates Surface Preparation:

- Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes.
- Application of Scotch® Super 77™ Spray Adhesive: When installing Aluband Flashing Tapes on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

Adhesives and Sealants:

- After the installation of Aluband window flashing tape, ensure that the edges do NOT come into contact with solvent based sealants or adhesives. Solvents in these products can adversely affect the adhesion or dissolve the bituminous adhesive and cause it to run.
- If the application of solvent based adhesives or sealants are necessary, cover the edges with Thermakraft joining tape or a true aluminium foil tape to form a barrier. With a true aluminium foil tape, the installer must test the bonding strength.
- The installer must check the compatibility of the Aluband window flashing tape with the sealant or adhesive product to ensure the components are fully compatible.

Handling and Storage

Aluband window flashing tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

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

BRANZ Appraised
Appraisal No.878 [2019]

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Issue 5.0, September 2022



INSTALLATION GUIDE

Thermakraft™
THERMAKRAFT 215

Thermakraft™

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as 'Building Paper' Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Kingspan®

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof Pitch	Span	Underlay Support Required	
		Horizontally Installed	Vertically Installed
≥ 10°	> 1200mm	Yes	Yes
	≤ 1200mm	No	No
< 10° (Min 3°)	> 1200mm	Yes	Yes
	≤ 1200mm	No	Yes

- Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.
  Note: Thermakraft 215 can move downwards. To prevent this, it must be 'Captured' by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Kingspan recommend using Ausmesh Roof Safety Mesh, Ausnet hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.
- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft 215 may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with E2/AS1 8.2.5.
- Do NOT Run Thermakraft 215 longer than 10m in length.

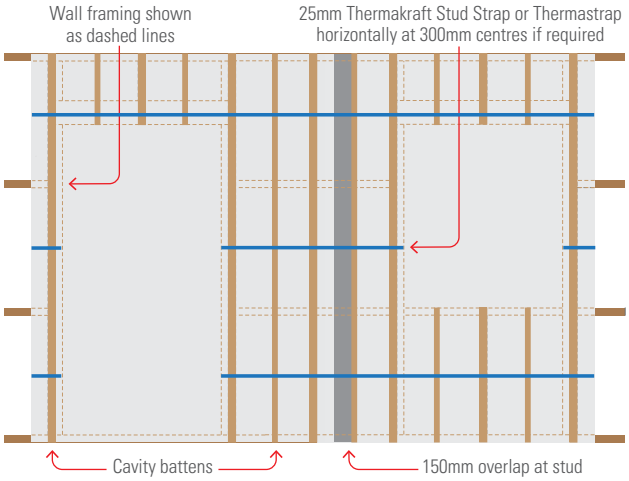
Application Method (Wall)

- Fix Thermakraft 215 underlay with the lap line printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.

Thermakraft 215

Self-supporting bituminous wall and roof underlay

- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215 underlay is not cut and prepared for window installation until the arrival of the windows. Minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft Stud Strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 7 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

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

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

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

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Issue 2.0, September 2022



INSTALLATION GUIDE

Thermakraft™ WATERGATE Plus

Thermakraft ONE WRAP SYSTEM

10 Products - One system
One warranty

Thermakraft™ WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay for use behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

CodeMark BRANZ-CM-1002-Rev 2

BRANZ Appraised Appraisal No.695 [2017]

Kingspan®

Watergate Plus

Premium Synthetic Wall Wrap

Application Method

- Fix Watergate Plus underlay with printed side facing the exterior and run horizontally.
- Fix to all exterior walls from below bearers to the top plate. Watergate Plus underlay is available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to cover from below the bottom plate to the top plate.
- **Timber Framing:** Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically.
- **Steel Framing:** Ensure frame is free from oil, dust and dirt. Fix securely using construction grade double-sided tape or adhesive or galvanized flat head screws that are appropriate for external framing and roofing use, at 300mm centres.

  Note: Check adhesive compatibility with Watergate Plus and the steel framing materials before use.

  If using a tape: Apply double-sided tape onto steel frame studs and only peel off the forward-facing liner once Watergate Plus is ready to be installed. When ready, peel off approximately 2m of tape liner at a time and press Watergate Plus firmly onto tape, ensuring it is taut.

  Note: The double-sided tape is to temporarily hold the Watergate Plus in place until the batten and/or cladding is installed. The screws used to fix these are the permanent fixings for Watergate Plus.
- Minimum of 150mm lap is required at joins. All vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of Watergate Plus.
- Cover all windows and door openings with Watergate Plus underlay. It is recommended that the Watergate Plus underlay is not cut and prepared for window installation until the arrival of the windows.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should be cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.

  Note: In accordance with NZBC Acceptable Solution E2/AS1 and NASH Building Envelope Solutions: 2019 (E2/AS4), wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm, Thermakraft Stud Strap or Thermastrap run horizontally at 300 centres is an acceptable means of prevention.
- Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 90 days. Watergate Plus underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZBC B2 Durability.
- Repair small damaged areas with any Thermakraft window flashing tape or Thermakraft Premium Joining Tape. Any large areas which require repair may be covered with a second layer of underlay with a lap of 150mm and then taping.
- Watergate Plus underlay must be installed by, or under the guidance of a licensed building practitioner.



Fix Watergate Plus securely to the frame.

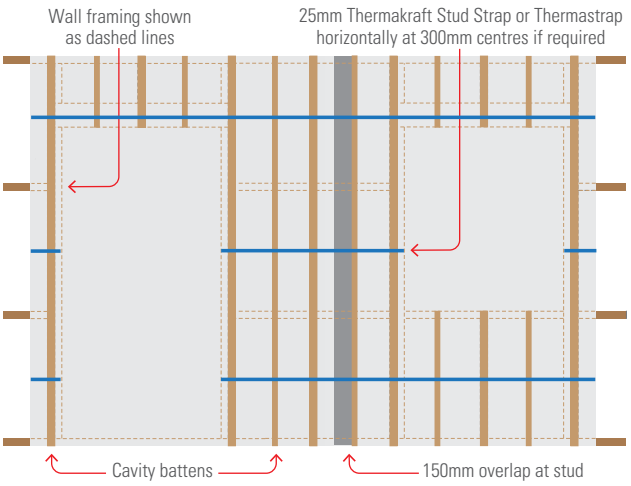




On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

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



Watergate Plus

Premium Synthetic Wall Wrap

Handling and Storage

Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

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

CODEMARK BRANZ-CM-1002-Rev 2

BRANZ Appraised Appraisal No.695 [2017]

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Issue 5.0, September 2022

Form 2A

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 SITE

52 Benn St
Amberley

THE OWNER

UWC Ltd Earl Hope	
Mailing address:	
Suburb:	PO Box/Private Bag:
Town/City: Amberley	Postcode:
0275073118	Email address: ehopepearson@propertygroup.co.nz

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (√)	
( )	**sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design 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 memoranda 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 restricted building work	***Description***	***Carried out/ supervised***	***Reference to plans and specifications***
Tick(√)if included *Cross (X) if excluded*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*

Primary structure

All RBW Design work relating to B1 (√)		( ) Carried out (√) Supervised	
Foundations and subfloor framing (√)		( ) Carried out (√) Supervised	
Walls (√)		( ) Carried out (√) Supervised	
Roof (√)		( ) Carried out (√) Supervised	
Columns and beams (√)		( ) Carried out (√) Supervised	
Bracing (√)		( ) Carried out (√) Supervised	
Other ( )	*N/A*	( ) Carried out ( ) Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2 (√)		( ) Carried out (√) Supervised	
Damp proofing (√)		( ) Carried out (√) Supervised	
Roof cladding or roof cladding system (√)		( ) Carried out (√) Supervised	
Ventilation system (for example, subfloor or cavity) (√)		( ) Carried out (√) Supervised	
Wall cladding or wall cladding system (√)		( ) Carried out (√) Supervised	
Waterproofing (√)		( ) Carried out (√) Supervised	
Other ( )	*N/A*	( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or 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.

Note: continue on another page if necessary.

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]*
	N/A

Note: continue on another page if necessary.

ISSUED BY

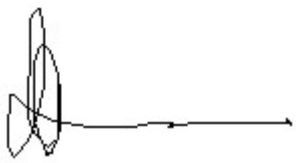
Name: **Jeremy Harrison**	LBP or Registration number: **105491**
The practitioner is a: (√) Design LBP ( ) Registered architect ( ) Chartered professional engineer	
Design Entity or Company (optional):	
Mailing address (if different from below):	
Street address / Registered office: **12 Murfitt St**	
Suburb:	Town/City: **Pegasus**
PO Box/Private Bag:	Postcode: **7612**
Phone number:	Mobile: **0277715816**
After Hours:	Fax:
Email address: **harrisonjerm@gmail.com**	Website:

DECLARATION

I **Jeremy Harrison** [*name of practitioner*] , 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: **12/04/2025**

Management Plan for Stormwater Disposal System

1. This management plan applies to the building consent and property stated below and this Management Plan will be remained applicable even if the property ownership changes. Any future changes to this management plan will require a new Stormwater Discharge application.

2. During construction of a dwelling or earthworks on the site, the sump should be inspected once every month and cleaned of any accumulated sediments. This should be covered in the Erosion and Sediment Plan.

3. Thereafter, the sump and soak pit shall be inspected and maintained throughout the year, by the property owner, with particular attention given to maintenance before the wet season.

4. Maintenance shall include, but is not limited to, the removal of any litter, debris, and accumulated sediment.

5. The sump grate shall remain in place at all times, except when inspections and maintenance are undertaken.

6. The sump shall not be used for the disposal of any other liquids or waste apart from onsite stormwater.

7. The top outlet pipe cap shall remain in place at all times as a watertight seal, except when inspections and maintenance are undertaken.

8. At the time of inspections, should the silt depth in the bottom of the sump exceed 50mm, it shall be removed immediately and disposed of appropriately.

9. In swales inspect and ensure adequate vegetation cover with grass maintained at 50-100mm. Remove undesirable weeds/vegetation any litter, debris, and accumulated sediment. Remediate any areas of standing water.

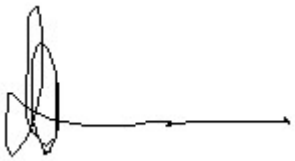
10. The owner shall take all practical steps to avoid spills of fuel, oil, or any other contaminant into the swale, sump, or soak hole. If a spill does occur, this shall be removed immediately, and the contents disposed of appropriately.

11. If a storm is recognised as having a 2% (1 in 50 year) or less Annual Exceedance Probability (AEP) and there is surface runoff or water pooling, then the owner shall take immediate measures to replace/extend the soak hole and associated connecting pipework to Council's satisfaction.

Note: Conditions 1, 2 and 3 are mandatory. The maintenance and monitoring plan will not be accepted if that information is removed.

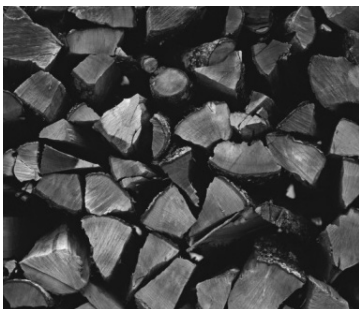
Street Address:52 Benn St
Amberley

Owners Name:UWC Ltd

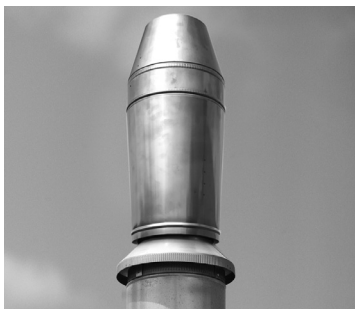
Owners Signature: 

ECO Flue Kits Installation Manual









metrofires

ECO Flue Kits

Freestanding Flue Systems

ECO Flue Kit Installation Options 2
ECO Flue Kit / ECO Option Kit 3
ECO Flue Kit Installation 4-5
ECO Option Kit Installation..... 5-6

Insert Flue Systems

ECO Insert Kit Installation 7
ECO Flue Kit Minimum Heights 8

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NZHHA
New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER
MANUFACTURING LIMITED

19 Oropuriri Road // New Plymouth 4312
info@metrofires.co.nz // www.metrofires.co.nz

⚠ WARNING! Important Information

- Metro ECO Flue Systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue & ECO Option Kits are both installed. Please read these instructions and familiarise yourself with the installation options and various components of the ECO Flue Systems
- Metro ECO Flue Systems have been tested to and complies with AS/NZS 2918 Appendix 'B' and 'F'. Metro ECO Flue Systems shall be installed in accordance with AS/NZS 2918 and the appropriate requirements of the relevant building codes
- The ECO Flue Kit must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted

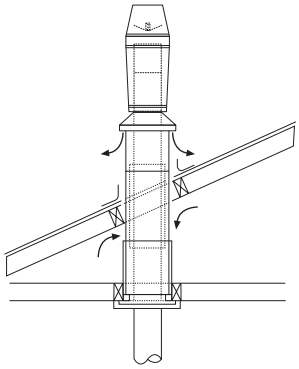
⚠ CAUTION! Important Information

- Mixing of flue system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted
- Prior to installing the assembled flue pipe into a masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

ECO Flue Systems Installation Options

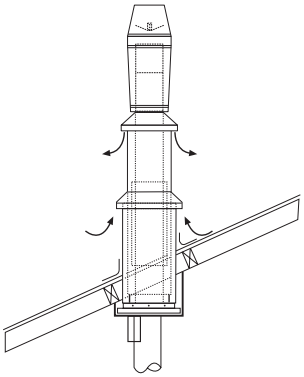
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



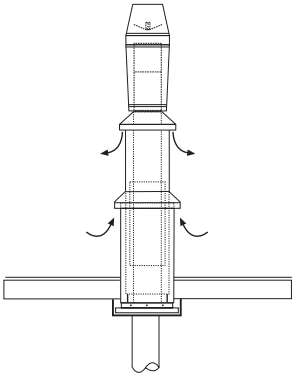
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

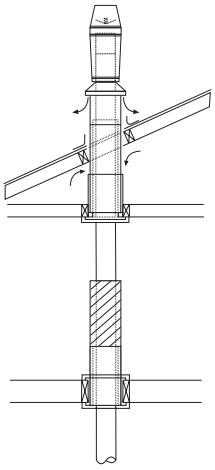
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



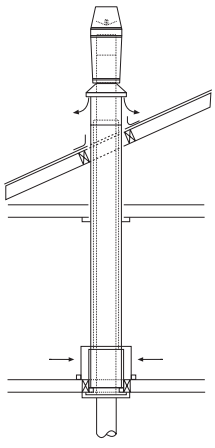
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS 2918



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS 2918

ECO Flue Kit & ECO Option Kit Component Checklist

ECO Flue Kit

The ECO Flue Kit is designed for installation into a building that has a 'ceiling cavity' with unrestricted air supply as is the case with conventional homes. A vented ceiling cavity is required as the ECO Flue Kit draws its cooling air from within the ceiling cavity.

Metro offers both the ECO Flue Kit, which is designed to be installed on its own and the ECO Option Kit which is designed to be installed in conjunction with the ECO Flue Kit. The specific application for each of these two options is detailed below with installation instructions overleaf.

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

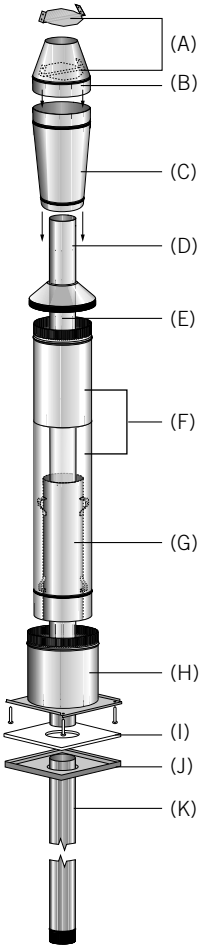
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

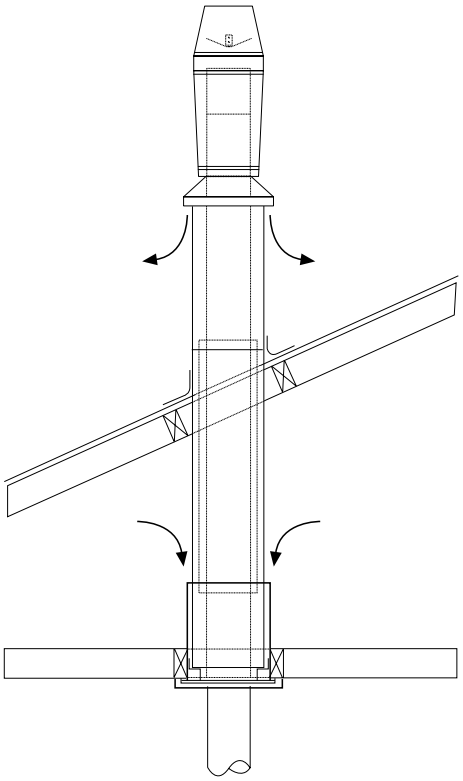
(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



ECO Flue Kit assembled



ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).

ECO Option Kit components

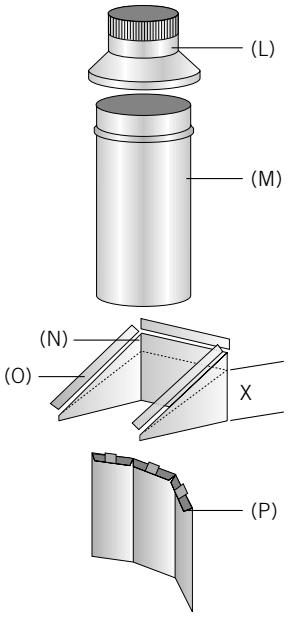
(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

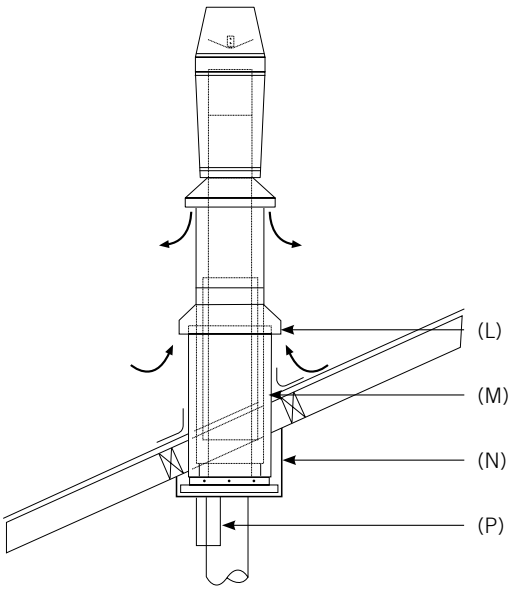
(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield



ECO Flue Kit & ECO Option Kit assembled



ECO Flue Kit Installation Instructions

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

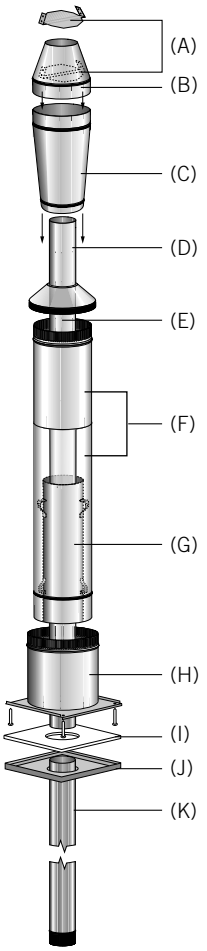
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



Having positioned the wood fire in the desired location, check to ensure the wood fire and floor protector have adequate clearances/projections, and that the flue system is clear of ceiling joists, trusses etc. (refer to the Wood Fire Installation and Operation Manual).

Note: ECO Flue Systems use stainless steel brackets enabling movement due to expansion, while centralising flue pipes and casings. These brackets may require resetting after transport, if they are too loose or tight during assembly;

1. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 250mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 250mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

2. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

3. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets.

   Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

4. Return back onto the roof and using a suitable flashing, weather proof the joint where the 250mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to. Prior to fitting the flashing, by fitting stays securing the outer casing (F) to the roof material will further improve rigidity of the installation.

5. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

   Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ **WARNING!** Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

6. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

7. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

ECO Flue Kit Installation Instructions - continued

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

8. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

9. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

10. Making your way back onto the roof, slide the 750mm long slip section of the outer casing (F) until the top of this slip section is level with the top of the 150mm stainless steel flue pipe, then secure this slip section of the outer casing with rivets.

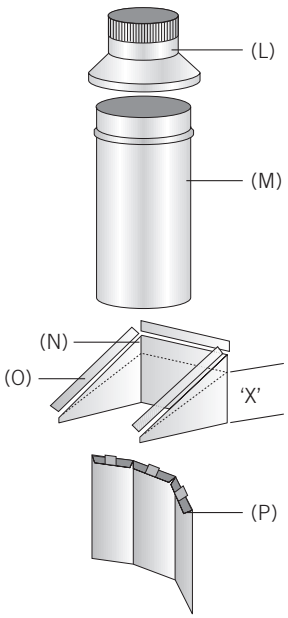
11. Fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom, fit its short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

12. Taking the removable section of the ECO Cowl, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and enables easy removal for future flue cleaning.

Installation Instructions with the ECO Option Kit

ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).



ECO Option Kit components

(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield

Dependent on whether you are installing into a flat roof/ ceiling or sloping ceiling situation as detailed on page 2, will determine if you require all the components of the ECO Option Kit. If installing into a flat ceiling/roof you will not require the drop box or drop box edge covers.

1. Slip the 300mm outer extension liner supplied with the ECO Option Kit over the 300mm outer liner 'stub' attached to the mounting plate (H) supplied with the ECO Flue Kit. Permanently secure these two components together by drilling four evenly spaced holes around the circumference and rivet with stainless steel rivets.

2. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 300mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 300mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

3. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

- **If the ceiling is angled**, it is critical that the mounting plate is correctly positioned so the drop box in-fill panel can be fitted. Ensure the two 'upturned folds' on the mounting plate are aligned parallel to the roof joists, i.e pointing towards the apex.

  You will only be able to use two of the securing holes provided in the mounting plate. To give additional support to the installation nail through the 300mm diameter outer liner into the timber framing, access is through the 200mm hole in the base of the mounting plate.

4. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely

bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets. Return back onto the roof and using a suitable flashing, weather proof the joint where the 300mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to.

Prior to fitting the flashing, by fitting brackets securing the outer casing (F) to the roof material will further improve rigidity of the installation.

Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

5. Fit the external 'intake' flashing cone supplied with the Option Kit as illustrated, and secure it to the top of the 300mm diameter extension liner through the 4 x brackets which protrude below the base of the external 'intake' flashing cone.

6. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ WARNING! Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

7. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

8. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

9. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

10. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

The removable section of the ECO Cowl is now fully assembled.

11. Measure dimension 'X' as shown on page 3 and transfer this measurement to the drop box in-fill panel as shown.

- Cut the in-fill panel to the correct size and fit the 3 x edge covers.

Note: The side edge covers will require trimming on the ends to suit the angle of the ceiling.

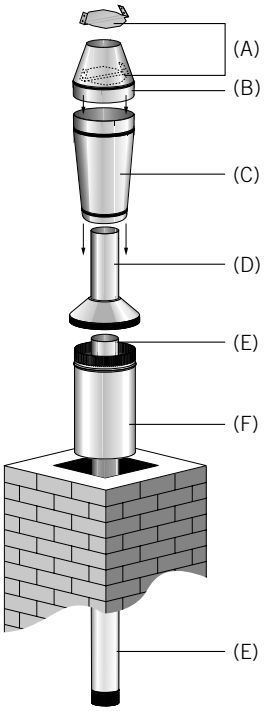
- Secure the in-fill panel in position by fitting three rivets to each side through the holes provided.

12. Back in the room, lift the ceiling plate then attach the 'ceiling plate mounted heat shield' to the lower face of the ceiling plate so that it acts as a deflector shield between the flue pipe and the lower side of the ceiling (refer assembled diagram on page 3). This heat shield has three tabs on its top face enabling it to be 'clipped' into the 160mm diameter hole in the ceiling plate. Attach the ceiling plate by clipping it onto the mount plate and the installation is now complete.

ECO Insert Kit Installation Instructions & Component Checklist

Please read these instructions fully prior to installation of the ECO Insert Kit and familiarise yourself with all the various components illustrated right and listed below.

Note: Rivets, fire cement and chimney cap or flashing plate are not included as they are supplied by the installer.



ECO Insert Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 3 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 600mm x 250mm diameter galvanised outer casing

This flue kit has been manufactured and complies with AS/NZS 2918. To ensure a safe and efficient installation, this flue kit must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

1. Check the masonry chimney for structural soundness and make any repairs that are necessary.

   Note: Most councils require the masonry chimney to be inspected prior to installation. The masonry chimney cavity must also be swept prior to installation.

2. Once the fireplace insert has been installed correctly as per the manufacturers instructions, look directly down the chimney to ensure the wood fire flue spigot is in line with the masonry chimney. (A torch will be required).

3. If you cannot see the flue spigot, a flue pipe offset will be required. If so, install the flue pipe offset so the top of it can be clearly seen from the top of the masonry chimney.

4. If an offset is required, an adjustable telescopic type is recommended. Measure the amount of offset required and adjust the telescopic offset to suit, after smearing an adequate amount of Pioneer fire cement onto the slip section of the offset to ensure a good seal, then rivet the offset in three locations around its circumference. (If the offset is used in its fully compressed form, it will be necessary to modify the end of the female slip section otherwise it will restrict the internal diameter) Apply a liberal amount of Pioneer fire cement into the flue outlet of the fireplace insert, and fit the lower crimped end of the offset into position inside the flue outlet, and bolt into position.

   Note: In some installations where it is not possible to fit offsets or rigid flue pipe due to the shape of the masonry chimney cavity, 'Flexi flue' may be used.

5. Secure the flue pipes together and ensure the flue seams are in line. Flue pipe joints must be fully compressed with a considerable amount of fire cement to ensure a good seal, and then riveted together at three even points around the flue join. Prior to installing the assembled flue pipe into the masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

6. Lower the flue pipe into the masonry chimney, with the crimped end fitting into the fireplace insert flue outlet/offset, and securely attach with three rivets (offset/bend must be riveted to the flue pipe). For installations where extra lengths of flue pipe are required, or when the weather is poor, it will be easier to assemble the flue pipe lengths as they are lowered into the masonry chimney.

7. Secure the outer casing to the masonry chimney with suitable fasteners. A masonry chimney flashing plate will be required to weatherproof/seal the masonry chimney top. Note: The top of the outer casing must be finished level with the top of the 150mm stainless steel flue pipe.

8. Assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

9. Making your way back onto the roof, fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom. Fit the short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

10. Taking the 'removable section of the ECO Cowl' assembled in section (8) above, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and therefore enables easy removal for future flue cleaning.

Minimum Heights for all Metro Flue Systems In compliance with AS/NZS 2918

The Metro ECO Flue Systems comply with AS/NZS 2918 and its 4.6 metre height requirement (4.6 metre minimum from the top of the floor protector to the top of the flue pipe). However as external structures and the proximity of other buildings will differ for every installation, some situations will require additional flue height to comply with the standard. Refer to Diagrams 3 and 4 below. (All measurements in mm).

Note: AS/NZS 2918 Section 4, details flue system installation requirements in full.

Diagram 3

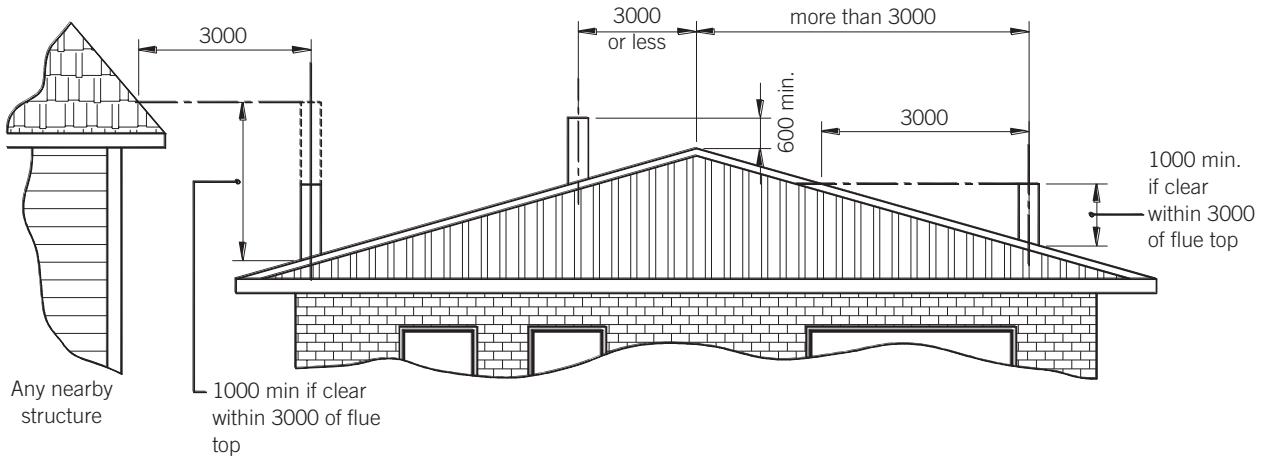
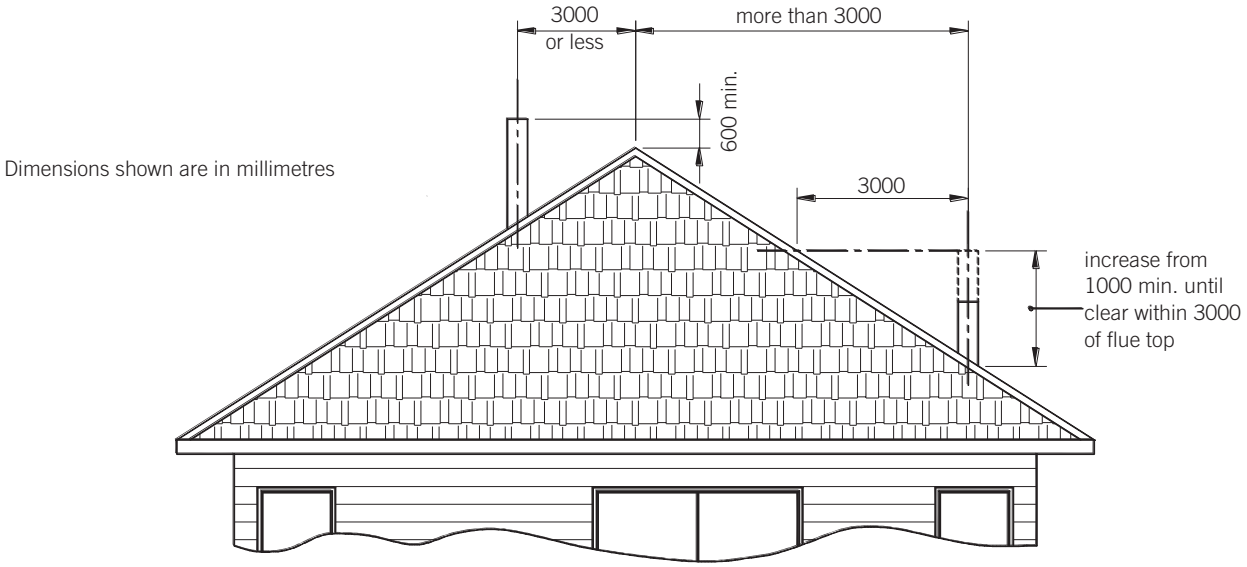
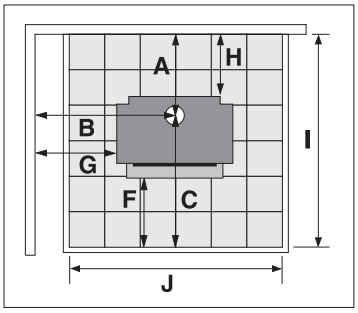


Diagram 4

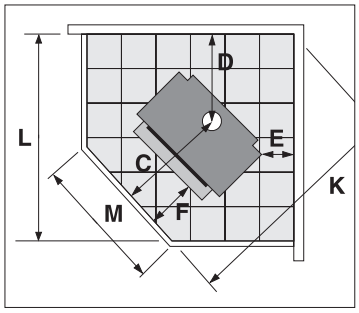


Wood Fire Installation & Owner's Operation Manual









metrofires

Freestanding Wood Fires

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NEW ZEALAND MADE

PIONEER MANUFACTURING LIMITED

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⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- The appliance and flue-system shall be installed in accordance with AS/NZS2918 and the appropriate requirements of the relevant building code or codes
- Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for compliance with AS/NZS4013 and will void the warranty
- The appliance must be installed correctly. We recommend a competent and suitably qualified NZHHA installer

⚠ CAUTION! Important Information

- Mixing of appliance or flue-system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance
- Do not install a Metro fire if there is any sign of visible damage to the product
- This appliance must be regularly maintained.
- Use authorised Metro replacement parts only. The use of unauthorised parts may void the warranty
- This manual MUST be left with the home owner

All Metro wood fires comply with AS/NZS2918:2001 when installed in accordance with this manual. Please ensure you are fully conversant with the relevant standard and the contents of this manual. Correct installation is critical to the safe operation and performance of this wood fire.

Please take particular note of the following:

- It is recommended that Metro fires be installed with a Metro ECO flue system which has been developed to enhance the performance of Metro wood fires. Any alternative flue system must have a minimum flue pipe length of 4.2 metres of 150mm diameter flue pipe and have been tested to AS/NZS2918:2001 with a 12mm spaced ceiling plate of no less than 345mm square
- The 150mm active flue pipe must be fully encased from the ceiling to the underside of the flashing cone at the top of the flue system, (i.e. there must not be any 150mm flue pipe exposed)
- All flue pipe joints must be sealed and riveted. The bottom of the flue pipe in particular MUST be fully sealed into the flue outlet of the Metro fire
- In New Zealand, the Metro fire must be bolted through the floor protector into the floor to comply with the seismic restraint provisions of AS/NZS2918:2001
- All Metro's are extremely heavy, varying in weight from 75kgs up to 185kgs. During the installation process do not lift the appliance by yourself, and take care not to damage the panel coating
- Please take care when lifting the Metro fire into place onto the hearth or floor protector as point loading may break tiles and/or scratch surfaces.

Assembling your Metro wood fire

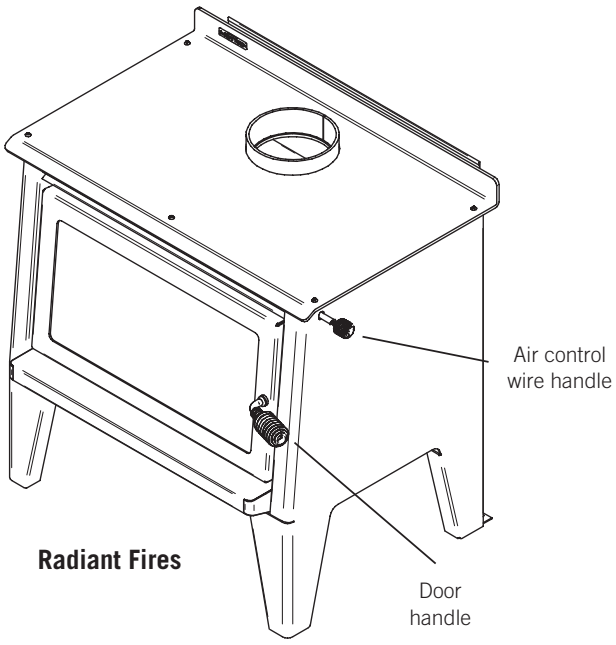
Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation. The Metro carton shows the model Metro you are about to install, enabling you to select the appropriate model's assembly instructions.

All Metro wood fires are packed in a single heavy-duty carton, and tek screwed to a wooden pallet. Having removed the packaging and located this manual, familiarise yourself with the illustrations on pages 2 & 3, and proceed as follows.

Metro radiant fires

These Metro's are supplied virtually fully assembled. Packed inside the firebox you will find bricks in a cardboard wrapper, a wire door handle and the air control wire handle.

- Remove the two tek screws located at the base of each rear leg which secure the Metro to the wooden pallet, and carefully 'walk' the Metro off the pallet
- Open the door fully and fit the side bricks to each side of the firebox. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2
- Attach the door handle to the door latch assembly by screwing it on clockwise
- Attach the air control wire handle by screwing it on clockwise.



Radiant Fires

Assembling your Metro wood fire

Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation.

Metro pedestal and base model fires

To eliminate freight damage, the pedestal base has been packaged inside the firebox. To safely assemble your Metro, please proceed as follows:

- Lift off the top grill (convection models only) and place somewhere safe. Be careful not to chip the enamel coating or damage paint
- Open the door 45 degrees and lift the door off the hinge and place somewhere safe. Be careful not to damage the finish
- Remove the pedestal packed in a cardboard wrap
- Remove, rotate and re-fix the mount plate to the pedestal.

  Note: The pedestal mount plate is fixed to the back of the pedestal base with 4x screws. This mounting plate must be removed, rotated and re-fixed to the pedestal as detailed on page 4 in diagrams 3 and 3A. The return fold must face back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.
- Remove the pedestal heat shield

  Note: For some models the pedestal heat shield may be taped to the rear heat shield. The ECO Tiny Ped's pedestal heat shield is pre-fitted.
- Remove the side bricks, door handle and the bolt bag
- Remove the 2 tek screws at the base of the inside of the firebox that fix the wood fire to the pallet.

It is recommended that 2 people work together with the next step:

- Grab the underneath top of the firebox door opening with one hand, holding the flue spigot with the other, slowly lift the front of the wood fire all the way back and rest the wood fire on its rear heat shield on the floor. Remove the packaging pallet.
- Fit the pedestal heat shield over the 4 bolts as shown in Diagram 1, with the open edge facing the front of the Metro (up)
- Position the pedestal with its front facing over the 4 bolts and fit the washers and nuts supplied, check to ensure the pedestal is correctly aligned and securely tighten the nuts.

It is recommended that 2 people work together with the next step:

- Grab the flue spigot with one hand and the other hand underneath the top of the firebox door opening, lift upwards standing the wood fire onto its pedestal
- Fit the side bricks to each side of the fire box. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2. (Classic Rad also features two side rear bricks).
- Re-fit the door and top grill (Convection models only)

All Metro models

Check to ensure the top baffle is in its correct position in the top chamber of the firebox. It should be resting on four support lugs (two on each side of the firebox). The baffle must be hard back against the rear of the firebox with the "promet extension" (white board) or return front steel edge of the baffle facing forward as illustrated in Diagram 2.

Note: Some models feature a two-piece top baffle.

Diagram 1

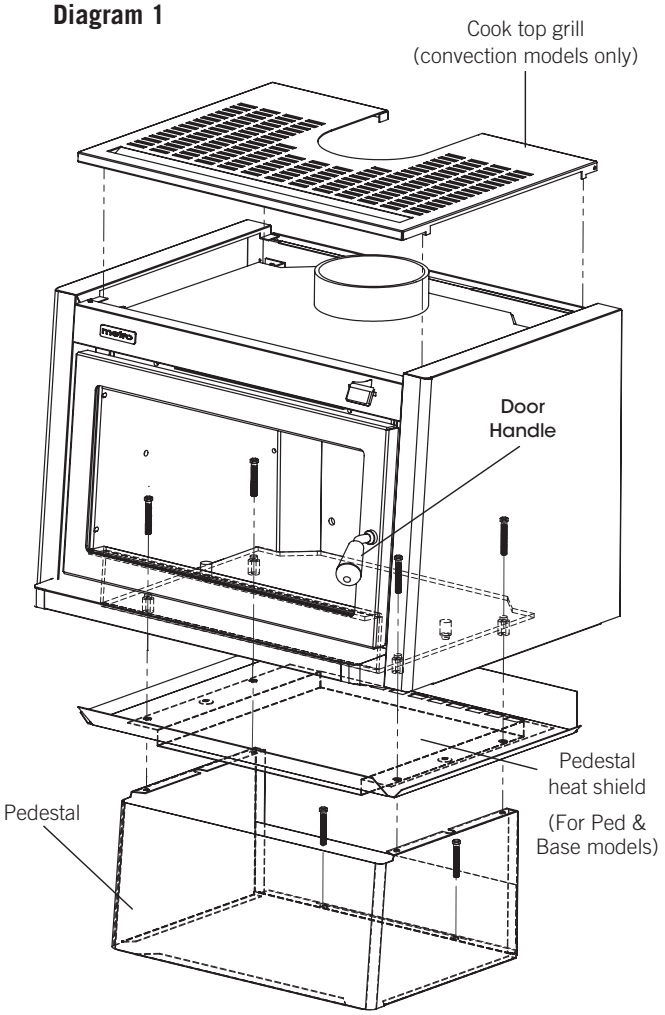
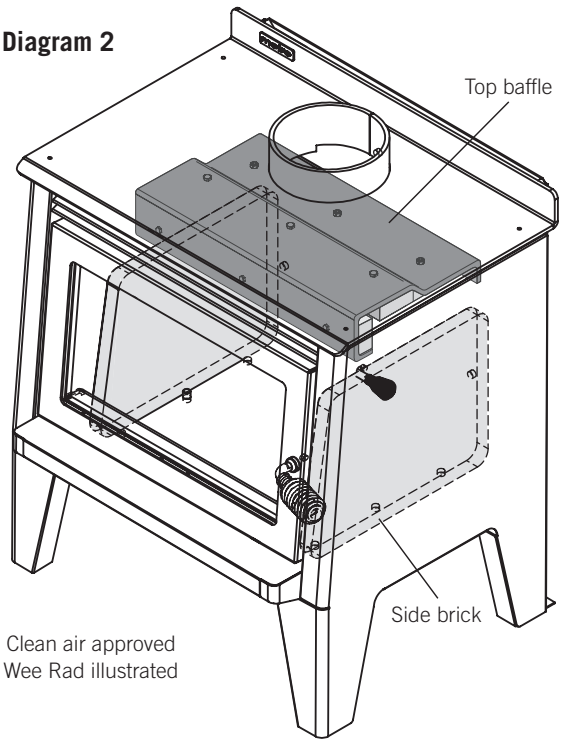


Diagram 2



Floor protector size, construction and fitting

Pioneer manufacture an extensive range of Pioneer 'Ash Floor Protectors' which comply with the minimum floor protector requirements of AS/NZS2918:2001, and can be installed with any freestanding Metro wood fire. Metro freestanding wood fires do not require an insulated floor protector as they comply with the minimum floor protector requirements of AS/NZS2918:2001. These minimum floor protector requirements are;

- They must be of adequate size to give appropriate wall, rear and front clearances/projections as detailed below and in the chart illustrated on page 7. Note;
- The floor protector must extend 200mm horizontally to the rear and each side directly below the door opening, and 300mm forward of the door opening
- The upper surface of the floor protector must be made of non-combustible material.

A suitable floor protector for a Metro freestanding wood fire is therefore any non-combustible material which could include;

- Ceramic tiles with grouted joints fixed directly to a hard base over timber flooring
- A sheet of toughened glass, panel steel etc. laid directly onto a wooden or other combustible floor.

Metro radiant fires

Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded. Once the Metro's location on the floor protector is established and if the installation is within New Zealand, seismic restraint is required.

Using masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor, secure through the holes provided at the base, behind both rear legs.

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

Metro pedestal and base model fires

Prior to lifting the Metro fire onto the floor protector, ensure you have removed, rotated and re-assembled the mount plate from the back of the pedestal base as detailed in diagrams 3 & 3A above. This rear panel must be rotated with the return fold facing back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.

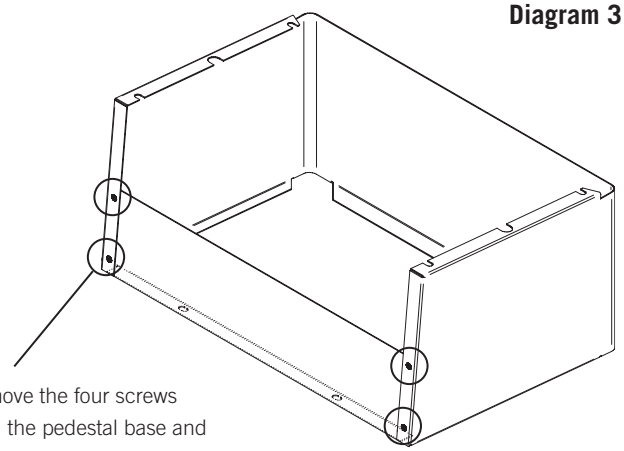
Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded.

Once the location of the fire is established, you can then secure the Metro through the floor protector into the floor using the two seismic restraint holes in the rear edge of the mount plate. Use masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

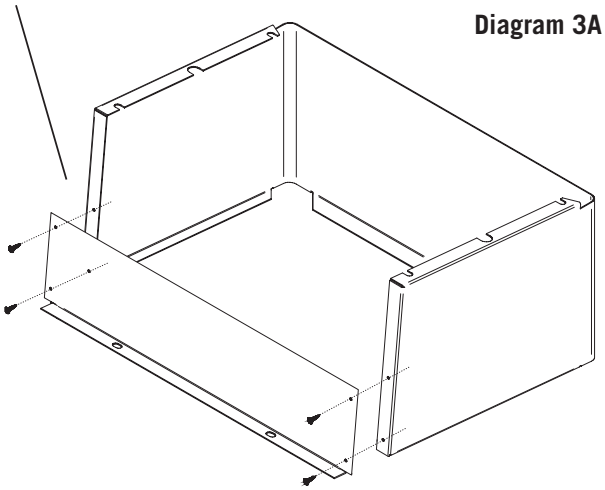
Preparing the mount plate

Diagram 3

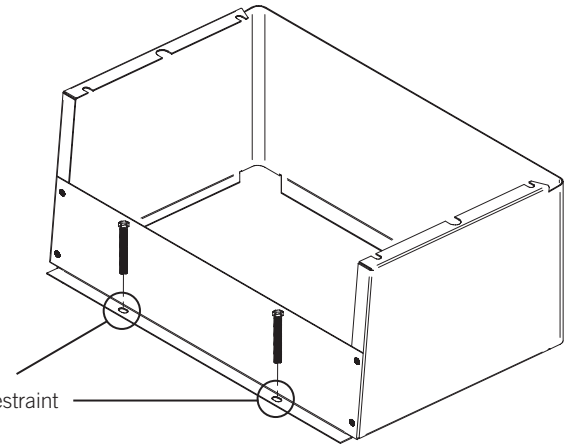


Remove the four screws from the pedestal base and rotate the mount plate so the return fold faces back the other way. Refix in place.

Diagram 3A



Correct mount plate position



Flue installation

It is recommended that all Metro freestanding wood fires be installed with the energy efficient ECO Flue System which comes complete with a detailed installation manual. This installation manual must be presented with your application to gain consent with your local council.

A copy of the ECO Flue System installation manual can be downloaded from metrofires.co.nz, or a copy can be obtained from your Metro retailer. Any alternative flue system must comply with and be installed as detailed in AS/NZS2918:2001, and a copy of the installation manual must also be presented with your application to gain consent with your local council.

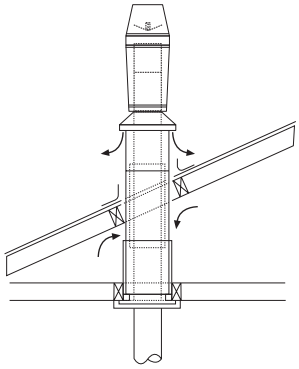
All Metro fires require a 150mm diameter flue. Please note:

- Metro ECO flue systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue Kit and ECO Option Kits are both installed
- The ECO Flue system must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- ECO Flue systems shall be installed in accordance with AS/NZS2918:2001 and the appropriate requirements of the relevant building codes
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted
- The flue systems 150mm diameter flue pipe must terminate a minimum of 4.6 metres above the top surface of the floor protector
- All joints in the flue pipe must be sealed with Pioneer fire cement (or similar) and riveted. The base of the flue pipe must also be sealed into the Metro fires flue outlet. This is critical for optimum operation.

All Metro fires have been tested with a Pioneer double flue shield. For the Metro fire to be installed with minimal clearances as the clearance table on page 7 states, only the Pioneer double flue shield can be used. All other flue shields will invalidate the installation.

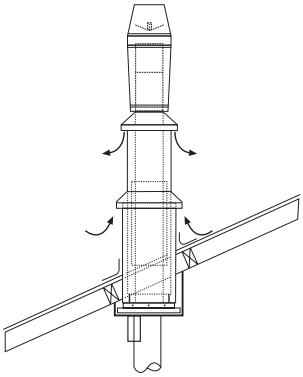
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



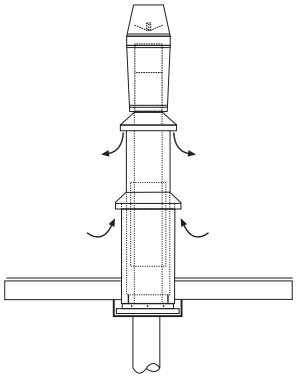
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

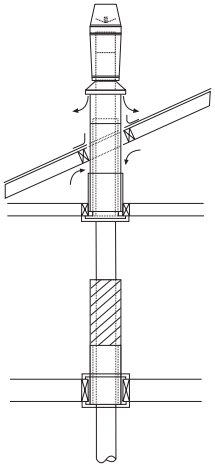
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



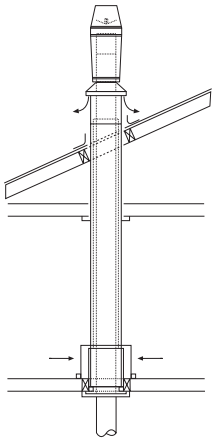
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS2918:2001



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS2918:2001

Wetback installation

⚠ WARNING! Important Information

- DO NOT connect to an unvented hot water system
- Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building code or codes.

⚠ CAUTION! Important Information

- Wetbacks must be connected with water before operating the fire and available to the wetback while the fire is in operation
- Wetback systems are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail
- Rainwater collection tanks installed lower than the wetback that use a water pump to supply the home, can cause problems if the pump is not operational. In these situations either the type of wetback or a roof header tank should be considered

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Wetback connections are as follows, taken facing the Metro/wall; the return pipe connection is directly above the inlet connection. Heights for all models are illustrated and detailed opposite on page 7.

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

All wetbacks are fitted to the inside rear wall of the firebox, with the exception of the Tiny Rad Woody, clean air Wee Series models and the Classic Rad model. Side wetback position for these models is to the outside left hand firebox wall. Please see the specific installation instructions in the 'Side Wetback' box for installation of a wetback into these appliances.

It is recommended the return pipe has a minimum rise of 1 in 12; performance will reduce as the distance to the storage cylinder increases.

To fit the wetback proceed as follows

1. Remove the rear panel of the Metro by removing the four pozi drive screws. Remove the two pre-punched knockouts from this panel.
2. Two further knockouts will be visible on the inner rear heatshield, remove these also. Once these are removed 6mm nuts will be visible through the knockout holes.
3. Open the Metro's door and locate two bolts securing the pressed washers which are visible on the left hand side of the firebox for both inlet and outlet connection points.
4. A further three bolt heads will also be visible on the inside rear wall of the firebox; these are threaded into the 6mm thick firebox. Remove all three.
5. Using the tube of sealant supplied with the wetback, apply a liberal bead of sealant around both the two connection pipes and also the outer circumference of the wetback which will face and press against the inside rear wall of the firebox. This will completely seal the wetback to the inside rear wall of the fire on installation.

Ensure there is no gap between pipe and rear wall access holes. This cement must fully cure before appliance use.

6. Fit the wetback into the firebox and carefully pass the connection pipes through the holes in the rear of the firebox. Securely attach the wetback using the three bolts previously removed from the rear face of the firebox, fitting them through the slots provided in the wetback's jacket.
7. The wetback is now ready for connection to the storage cylinder by a registered plumber.

Metro clearances and specifications (Minimum clearances shown are in mm, with a Pioneer double flue shield fitted)

Minimum clearances

All Metro wood fires comply with AS/NZS2918:2001. Minimum clearances shown below are detailed in millimetres, with a Pioneer double flue shield fitted to the appliance. Measurements are taken from the following reference points as illustrated:

- From the nearest combustible wall or surface (A, B, D, E, G, H)
- From the Metro's flue centre (A, B, C, D)
- From the Metro's cabinet/heatshield outermost point (E, F, G, H)
- To the edge of the ash floor protectors non-combustible surface (C, F, I, J, K, L, M)

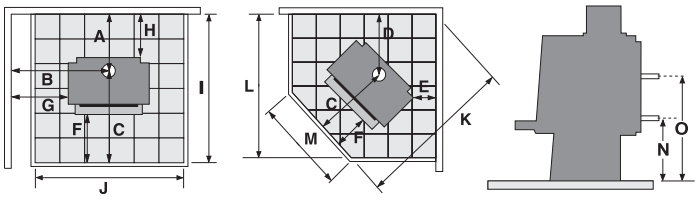
AS/NZS2918:2001 allows for a reduction in minimum clearances as detailed in Section 3, tables 3.1 and 3.2 of the standard.

Some Metro models have undergone additional testing which allows for reduced clearances. Please see the footnotes below the clearance table for the applicable models.

Wetback connections (taken facing the Metro/wall)

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

Specifications were correct at the time of printing, but may alter and those detailed within should be used only as a guide. If in doubt, please consult your Metro retailer or metrofires.co.nz.



	Minimum installation clearances with a Pioneer double flueshield fitted (mm)													Wetback		Dimensions		
Clean air models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
ECO Tiny Ped	211	433	580	290	25	235	185	60	791	650	990	780	250	280	470	496	492	659
ECO Tiny Rad	230	553	585	419	150	232	300	75	815	650	1180	910	250	280	470	505	508	667
Tiny Rad Woody	251	568	580	382	110	232	310	100	831	650	1120	870	250	365	555	515	498	758
Wee Rad - Leg [1]	251	568	580	456	150	232	260	100	831	825	1225	1016	425	295	485	615	501	688
Wee Rad - Base	271	678	580	486	180	232	370	120	851	825	1270	1048	425	295	485	615	501	691
Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
Wee Rad V2 - Base	318	768	580	586	250	232	460	150	898	825	1410	1147	425	N/A	N/A	615	518	691
Wee Ped [2]	263	651	580	473	170	230	350	110	843	825	1250	1034	425	295	485	602	503	665
Classic Rad [3]	257	695	780	500	220	229	430	100	1037	728	1490	1170	328	393	583	530	708	680
Xtreme Ped	251	624	630	442	110	226	280	100	881	907	1260	1070	507	312	502	688	554	707
Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	382	572	740	554	813
Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744
LTD rural models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
LTD Wee Rad - Leg	251	548	580	426	120	232	240	100	831	825	1185	989	425	295	485	615	501	688
LTD Wee Rad - Base	251	658	580	486	180	232	350	100	831	825	1270	1048	425	300	490	615	501	691
LTD Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
LTD Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	420	610	740	554	813
LTD Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744

The Wee Rad installed with a Pioneer double flue shield with the Wee Rad corner wing shields fitted allows for reduced clearances as follows:

[1] Wee Rad - Leg corner clearance (E) can be reduced to 120mm. This in turn also reduces clearances (D) to 426mm, (K) to 1185mm and (L) to 987mm. When fitting the corner wing shields, the Wee Rad - Leg itself must be installed to a corner clearance (E) of 120mm. The corner wing shields are then fitted which gives a wall to shield corner clearance of 100mm.

The following models installed with a Pioneer double flue shield with the side extensions fitted allows for reduced clearances as follows:

[2] Wee Ped corner clearance (E) can be reduced to 115mm. This in turn also reduces clearances (D) to 418mm, (K) to 1170mm and (L) to 978mm.

[3] Classic Rad corner clearance (E) can be reduced to 180mm. This in turn also reduces clearances (D) to 460mm, (K) to 1435mm and (L) to 1131mm.

⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- Any modification of the appliance that has not been approved in writing by the testing authority is considered as breaching AS/NZS 4013 and will void the warranty
- Do not use flammable liquids or aerosols in the vicinity of this appliance when it is operating
- Never operate your Metro with the top grill removed
- Do not dry clothes on or near this appliance
- Do not use flammable liquids or aerosols to start or rekindle the fire OR store fuel within the Metro's specified installation clearances
- Never operate your Metro with the door ajar, except on initial start up
- Open the air control fully before opening the Metro's door.

⚠ CAUTION! Important Information

- This appliance should be maintained & operated at all times in accordance with this instruction manual
- This appliance should not be operated with cracked door glass, over worn, faulty or missing door seals
- Do not use driftwood, treated or unseasoned (wet) fuel, the use of most types of preservative treated wood as fuel can be hazardous and will damage your appliance
- Burning unseasoned (wet) fuel or incorrect operation on extended low burn cycles will cause excessive creosote to form. Creosote is very corrosive and excessive buildups will result in the flue pipe, flue spigot and upper burn chamber failing. Failure of the applicance and/or flue system due to creosote damage is not covered under warranty. The formation of such is not an appliance issue it is a fuel and operational issue
- This appliance must be regularly maintained and replacement parts must be authorised Metro parts only
- Do not empty ash into a combustible container.

Congratulations on the purchase of your Metro wood fire

This slow combustion appliance is designed to give you many years of warmth and service, subject to the following key factors. These key factors, if not adhered to are the major causes of unsafe installation, poor performance and flue blockages and potential product failure.

1. Your Metro wood fire must be installed correctly. Metro recommend a competent and suitably qualified NZHHA installer.
2. The only fuel to be used in this appliance shall be wood that meets the following criteria.
   - Less than 25% moisture content
   - Has not been treated with preservatives or impregnated with chemicals or glue,
   - Is not chipboard, particle board, or laminated board,
   - Is not painted, stained or oiled
   - Is not driftwood or other salt impregnated wood
3. The appliance shall be operated at all times in accordance with the "Installation and Operating Instructions" supplied with each appliance.
4. It is preferable that Metro wood fires should be installed with a Metro ECO Flue System.
5. Coal must not be used as a fuel.

Please also note the following important points:

- In New Zealand a building consent is required from your local building authority. The homeowner is responsible for obtaining this consent
- As correct installation is critical to the performance and safe operation of your Metro, it is recommended your Metro be installed by a NZHHA registered installer or a person suitably qualified in the installation of wood fires. Your Metro retailer will be able to arrange professional installation for you
- During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed; open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time
- Properly seasoned (dry) timber is necessary for the Metro to operate efficiently; firewood that contains a high moisture content will result in flue pipe blockages, reduce heat output and create other issues.

Note: Once split, Softwood usually takes 12 months to season - Hardwood can take up to 24 months to season - Wood must be stored in a location that enables air circulation. Unseasoned wood stored in a closed woodshed without air circulation will still be unseasoned 12 months later.

- It is critical that the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) this will cause air to leak into the fire, causing the appliance to 'over fire'
- It is critical that the fire not be operated with over worn, faulty or missing bricks, baffle plate, promet extension (white board on the baffle plate)
- It is critical that the fire not be operated with cracked or broken door glass.

Please note, the above 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. A glowing firebox or lower fluepipe is just one sign you are over firing your appliance. Please ensure you keep your proof of purchase/receipt on any parts you purchase.

- For optimum performance fuel must be loaded so the logs lay "front to rear" in preference to laying across the width of the firebox. Spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- A small hot fire loaded frequently is more efficient than a large fire burning on a low setting
- Your Metro is covered by a full unconditional 12 month warranty on replacement parts, and a 10 year firebox warranty.

Where to install a Metro wood fire in your home

Wood fires are usually installed in the main living area, which is the section of the home that is usually kept the warmest, being the area in the home most frequently occupied. However, before deciding on the best location for your Metro wood fire you may wish to consider:

- Water heating. If you are intending to have a wetback it is important that the wood fire is as close as practically possible to the water storage cylinder
- Split level homes are best heated when the wood fire is installed on the lower level, as the heated air will rise to the higher levels
- Building construction is another consideration. Specified clearances from walls, curtains etc must be maintained and you need to ensure no structural beams or internal gutters etc are directly above your preferred site. If you have a two storey dwelling you need to consider the second storey to ensure you don't have the flue directly outside a second storey window.

Generally, you can install your Metro in your home anywhere that suits you; Pioneer offer various fan systems to transfer heat to other sections of the home that are not heated sufficiently. It is necessary if using a fan system that the Metro you have purchased has sufficient output to heat the total area you wish to heat. Your Metro retailer or installer will be able to advise if you are uncertain.

Optional wetbacks

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Other considerations are:

- Distance from your Metro to the storage cylinder will affect the amount of hot water produced
- Your climate & the manner in which you will 'fire' your Metro will determine the amount of hot water produced.

Note: Wetbacks are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail.

Cost Savings

Wetbacks can enable substantial power savings, dependent on the climate in the area in which you live. If you live in a cold climate you are likely to use your Metro for many months of the year, in which case a Pioneer wetback will reduce or even eliminate your water heating costs over those months. If however you live in a warmer climate and use your Metro for only a few hours a day over the colder months, electricity savings will be considerably less.

Water Pressure

A common misconception is that you must have a low-pressure system to have a wetback; this is not true. You must have a 'vented' system and high-pressure cylinders are usually not vented. However you can install an 'indirect' cylinder which contains a secondary coil inside the storage cylinder, enabling you to have a wetback while retaining a high-pressure system.

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

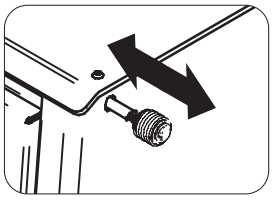
The Wee Rad V2 Base model cannot be fitted with a wetback.

Getting to know your Metro wood fire

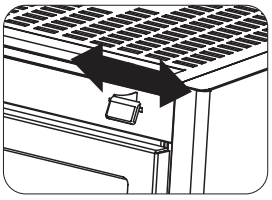
Operating your Metro fire is simple and you will quickly learn how to get the best from it. First take a minute to familiarise yourself with your new Metro.

- Raise the door handle anti-clockwise until the latch releases, and then slowly pull the door open. You will note that if you let the door go before it is at 90° to the appliance, it will fall closed. This is a safety feature that ensures the door cannot fall open if it is not latched securely. For the door to remain open, you must open it fully
- There is a single air control making your Metro fire easy to adjust. This control moves from left to right, which is 'low to high'.

All Metro radiant fires have a wire air control handle located at the upper right hand side of the appliance. Simply pull out to increase burn rate or push in to reduce burn rate.



Radiant fires air control



All other fires air control

All other Metro fires have an air control knob located on the upper front panel of the appliance.

Slide this control knob gently from right to left until you reach a stop. This is a pre-set 'low' position. Your Metro fire must not be operated at a lower burn rate than this pre-set low allows.

Operating your Metro wood fire

If your Metro has only been installed within the past few days, the fire cement seal at the base of the flue will not be fully cured. To ensure the cement sets without blistering it is recommended you burn 2-3 sheets of loosely crumpled newspaper at a time, approximately once every hour over a 6-8 hour period.

During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed. Open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time.

Start up

Place a quantity of loosely crumpled newspaper on the base of the firebox until it is approximately half full of paper, or place firelighters on the base of the firebox. Add dry kindling and move the air control knob fully to the right, being the 'full open' position.

Light the paper at two or three locations across the front of the door opening and leave the door slightly ajar resting on the latch pin if necessary for a few minutes while the fire establishes. Once the kindling is burning well, open the door and add 2-3 small logs at a time until you have a well-established fire. Usually this will take approximately 30 minutes, during which time the air control should be set on "high" and the door should be closed, except for the initial few minutes and when fuel is being added.

Normal operation

Once the fire is well established, regulate the air control to achieve the desired burn rate and heat output. As you move the air control to the right, burn rate, firebox temperature and heat output will increase, if you move the control to the left they will decrease. Please note:

- Always open the air control fully prior to opening the door, then open the door slowly. Every time you refuel, leave the air control on 'high' for a minimum of 20-25 minutes
- When loading logs, place them end-on, 'front to back'; air spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- Never use the door to force wood into the firebox, as this is likely to break the glass.

Extended burning (rural models only)

It is most important if your Metro is to be refuelled and turned down for an extended period, such as an overnight burn that you operate it correctly:

- The wood used as fuel for extended burning MUST BE FULLY SEASONED (DRY). Once the fuel is loaded, the appliance must be operated on high for a period of at least 20 minutes to drive out residual moisture from the fuel (dry wood is usually 20% water content) and ensure surface area combustion.
- Do not turn the air control down lower than you need to, if you want the Metro to burn overnight, endeavour to obtain an 8 hour burn time, not 12 hours. It will take a few burns to find the correct location of your Metro's air control setting to achieve the length of burn cycle you desire as this setting is affected by several variables including fuel density, flue length and outside wind velocity.
- A smouldering fire over a long time frame is likely to deposit corrosive elements into your system which could be detrimental to your Metro.

⚠ CAUTION! Important Information

- If not operated correctly on extended burn cycles, your Metro is likely to incur flue blockages, corrosion of the upper baffle, lower flue pipe and firebox flue spigot. As these are not covered under warranty if they fail through improper use, it is important you operate your Metro correctly.

Cooking

All Metro's are designed to enable cooking of soups, stews and casseroles etc, and your Metro will easily boil a flat bottom stainless steel kettle. The Radiant Series have a dedicated cooking top enabling large pots to be placed on the cook top, while all other models have a lift-off grill.

Note: Metro's supplied with a lift-off top grill have this feature to enable the grill to be removed for cleaning if you have a spill. The lift-off top grill must be left on when cooking, because if removed the wall temperatures next to the appliance may become excessive and the top of the firebox is generally too hot to cook on directly.

Cleaning and maintenance for your Metro wood fire

Your Metro fire will give you many years of efficient service with minimal maintenance if operated correctly using seasoned fuel. Your Metro fire must be regularly maintained and replacement parts must be authorised Metro fires parts only.

The Metro radiant fires are painted wood fires and coated with 'Pioneer Metallic Black' high temperature paint and will require periodic repainting to keep them looking their best.

All other Metro fires are coated with vitreous enamel. Vitreous enamel is extremely durable and designed to last the life of the appliance. As vitreous enamel is glass, a solid or heavy object dropped or banged against a panel could chip the enamel surface.

All model Metro fires can be cleaned with a soft cloth when the appliance is not in operation.

Door glass

Providing your fuel is properly seasoned, under normal operating conditions the air-wash design of the Metro's firebox will keep the door glass clear. If the glass requires cleaning you may use either a razor blade scraper or crumpled wetted newspaper dipped in wood ash rubbed over the glass.

If your door glass breaks it must be replaced with 5mm thick ceramic glass which is available from your local Metro retailer.

Door seals

Over time, usually 3-4 years, the door and glass seals will become hard and cause air to leak into the firebox, causing the appliance to 'over fire'. Your Metro retailer stocks replacement woven fibreglass door and glass seals, which need replacing when they become hard and over worn.

The door of your Metro is easily removed. Hold it in both hands and lift the hinge end of the door up and over the top hinge pin, then lower the door from the bottom hinge pin.

Side bricks

Hair-line cracks are not uncommon and are a result of the intense heat within the Metro's firebox, coupled with mechanical damage caused by accidental impact when fuel is being loaded. However if the side bricks become cracked to the extent that they start to break up, they must be replaced.

Door adjustment

Provision is available on both sides of the door for adjustment.

To adjust the hinge end of the door, open the door fully, loosen the top hinge nut and slightly lift the latch end of the door; you will see the hinge assembly move back 1-2mm which will usually be sufficient. Retighten, then repeat by loosening the lower hinge nut, this time applying a slight downwards pressure onto the door to move the lower hinge assembly back a similar distance, then retighten.

The door latch is also adjustable, as the latch pin on the right side of the firebox is fitted through a slot which enables the latch pin to be loosened, moved back and re-tightened.

Ash removal

Over a period of time ash will build up in the base of the Metro's firebox and require removal. The time this build-up takes depends on the density and cleanliness of your fuel.

To remove the excess ash your Metro should not be operating.

- Open the door, and using a hearth shovel or similar, empty the excess ash directly into a steel or non-combustible container.
- If the ash is not disposed of immediately, be careful where you store it, as the ash can retain heat for many days and become a fire hazard.
- You must leave a bed of ash in the base of the firebox approximately 10mm deep; this insulates the base of the firebox and improves combustion.

Top baffle

This is a 'sacrificial' wear part of the firebox and should be checked monthly. Usually only the promet (white board) front/underneath section needs to be replaced when it starts to disintegrate.

Note: Cracks in the promet are not uncommon and have no adverse effect on the operation of your Metro. These cracks are the result of intense heat coupled with expansion and contraction. Burning wood which is not properly seasoned, i.e. 25% moisture content or more, will over time cause the promet to disintegrate and require replacement.

Flue systems

Should be checked annually, particularly the bottom end of the lower flue section at its rear lock formed joint. If deterioration is noticed contact your Metro retailer or installer.

The flue pipe should also be swept a minimum of once a year, or as required during the winter season. If smoke enters the room when you open the Metro's door this usually indicates the flue pipe is becoming restricted and needs cleaning. The frequency of flue pipe cleans depends on many factors, with the main variables being:

- The seasoning of the wood. If not properly seasoned you will require frequent flue pipe cleans.
- The density of the wood. Softwoods generally result in more deposits building up in the flue pipe.

To clean the flue pipe of your Metro, proceed as follows:-

- Open the Metro's door fully, reach inside with the palm of your hand face-up and extended, lift the top baffle approximately 20mm, then lift it forward out through the door opening, placing it on a sheet of newspaper you have placed on the front of the floor protector. To prevent jamming, removal and replacement of the top baffle is best performed using both hands.

Note: Some appliances have a two piece top baffle.

- Close the door and slide the air control to the left.
- Once on the roof, remove the cowl from the top of flue system and sweep the flue pipe using a 150mm-diameter flue pipe brush as detailed in the instructions provided with the fluebrush.
- Once the flue pipe is clear, clean and refit the cowl. Remove the excess soot which has fallen into the firebox, leaving a layer of ash 10mm deep on the base of the firebox, then refit the top baffle.

Note: The baffle must be fitted so its rear is touching the back of the firebox; if uncertain refer to page 3 in the installation section at the front of this manual, which shows illustrations of the baffle location.

Troubleshooting your Metro wood fire

If your Metro is installed correctly, your fuel is dry and you operate your fire correctly, you will find it to be a pleasure to use. Metro's many years of experience within the wood heating industry has shown that dissatisfaction is mainly due to:

- unseasoned fuel
- faulty installation
- operational error
- or a combination of the above 3 points.

Correct operation

Modern day wood fires need to be operated hard and fast, more so than low and lazy to ensure the firebox and flue pipe runs hot and efficiently. If the fire and flue pipe is up to temperature it will perform extremely well, the smoke will draw up the flue pipe with ease, and the fire will produce good amounts of heat.

If the fire is operated on low a lot of the time, the door glass will run black, the flue pipe will tend to block up more frequently and the fire will end up smoking into the room when reloading. It's better to have a small fire running hard and fast, rather than a big fire running low and lazy.

The following may be of assistance if you are experiencing any problems with the operation of your Metro Fire.

Smoke enters the room when the Metro's door is ajar

(possible reasons and solutions)

Check flue pipe joins

If the flue pipe joins are not sealed correctly, the flue pipe will not draw as well as it should. The flue pipe join connecting into the flue spigot on top of the Metro is most critical, if this is not sealed correctly, smoke will enter the room when the door is ajar. To check this join is sealed correctly, run a match or lighter flame around the join. If the flame is sucked into the spigot then it is not sealed correctly. This check needs to be done when the fire is not going. Ensure you check the rear of the flue pipe/spigot join, as due to the seam in the flue pipe, this is the most common area for not being sealed correctly.

Ensure the fuel you are using is correctly seasoned

If you are burning unseasoned fuel (wet), the fire will cause nothing but problems. The Metro won't deliver much heat, it will be lazy, smoke will enter the room when the door is ajar, and the door glass will run black. Unseasoned fuel is the main contributor to excessive creosote deposits which can be corrosive to your appliance and flue system.

Flue pipe length is too short

Add more flue pipe as the longer the flue system, the better the draw of the flue pipe. Please note, if you did not purchase the Metro ECO Flue System, you will not have the ECO Cowl which increases draw. We highly recommend the Metro ECO Cowl is fitted as this will increase the draw. If you already have an ECO Cowl and smoke is still entering the room, please add another 600mm length of flue pipe.

Downdraft/Turbulence blockage

If you have checked all of the previous factors and the fire is still smoking into the room, it's possible there may be a down draft issue. Down draft is environmental and can be caused by many variables, and it is purely trial and error to ascertain the cause.

Air turbulence and/or negative air pressure influences around the flue termination can be caused by too close or overhanging trees or natural/ artificial ridges etc. Address these where possible or look to extend the flue above the roofline.

Other options may be:

- 'H' Cowl, designed purely for downdraft issues, but if you have an ECO Cowl fitted as standard, you will also need to add another 600mm of flue pipe to compensate as the H Cowl is shorter in length
- Directional Cowl, designed for high wind areas.

Air control setting

Ensure the air control setting is on high before opening the door to reload, as this increases the draw up the flue pipe. Open the door slowly.

If your Metro did not smoke, but its starting too and is getting worse:

The flue pipe is in need of a clean. It is recommended that the flue pipe be cleaned every season, however if you are burning the fire on low a lot, or are using unseasoned fuel, flue pipe cleans will be required more frequently.

Other issues you may experience

I can smell smoke in the room after a low burn cycle

The smell is creosote that will be seeping through the flue pipe join or out of the flue spigot onto an external surface, thus creating the smell in your room. The cause will be either unseasoned fuel, fuel mass too large, incorrect operation on low burn cycles or a combination. Creosote is very corrosive and excessive buildups will result in the flue pipe and potentially the flue spigot and upper burn chamber failing. The formation of excessive creosote is not an appliance issue, it is a fuel and operational issue. Failure of flue pipe or firebox due to creosote build up is not covered under warranty as excessive creosote build up is only possible from either unseasoned fuel or incorrect operation.

The Metro is noisy as it heats up and cools down

There will always be some expansion and contraction noise as the Metro heats and cools. This can usually be reduced by loosening three nuts at the rear of the appliance. To remedy, locate the 25mm deep cavity at the rear of your Metro between the 'rear panel' and the 'inner rear heat shield'. You will see a 6mm nut and two 6mm bolt heads in this cavity. Using a 10mm ring or open ended spanner, loosen all three so they are finger tight only.

On all Metro freestanding fires the air channel that allows the combustion air to enter the fire is fitted to the top underneath of the door opening. It is fitted with two M6 bolts. Slightly loosen both of these bolts.

The Metro won't turn down as much as it did

The door itself may need readjusting, the hinge and latch is slotted and allows for movement. Loosening the hinge and moving it back a few mm will make the door seal tighter and stop air leaking into the fire. The door and glass seals may be in need of replacing, which is generally required every 3-4 years.

Familiarise yourself with the instructions on page 10 before proceeding with this maintenance.

Warranty details for your Metro wood fire

Metro wood fires are manufactured in New Zealand, using the highest quality of materials, workmanship and the latest manufacturing techniques, which is why we offer a full 10 year firebox warranty and a 1 year parts warranty for your peace of mind.

Metro Warranty

(NZ Consumer laws apply to this warranty)

Pioneer Manufacturing Limited (Pioneer) warrants the steel firebox against defective materials and workmanship which would render it unfit for normal domestic use, from the date of purchase by the original consumer, for a period of 10 years.

Components including panel coating, door retainers, door seals, glass, trim, baffle & bricks are warranted for a period of 1 year from the date of original purchase for normal domestic use against defective materials and workmanship.

All associated accessories including, but not limited to, fans, flue systems, flue shields, wetbacks, tool sets, ash pots etc, are covered by a 1 year warranty against defective materials and workmanship.

It is recommended, but not a condition of this warranty, that a full service/ inspection of the Metro fire be carried out at the end of each winter season.

Warranty Conditions

- The Metro fire must be installed, operated and maintained strictly in accordance with the building code and this installation and operation manual
- The Metro fire must be installed and used in a domestic application
- This warranty covers appliance like for like replacement or repair at the manufacturer's discretion but excludes freight, travel, installation, labour and/or any other associated costs
- Pioneer or their agents are not liable for any loss or expense direct or indirect arising from the failure of any part or operation of the appliance
- Operation of this appliance in violation of the warnings in this operation and installation manual will void this warranty
- Your Metro fire must be regularly maintained and we recommended it is also serviced annually. Proof of servicing may be required. If a wood fire is not regularly maintained and serviced, the life span will be reduced. If your Metro wood fire has been neglected, by not being regularly maintained and serviced, warranty may be declined

⚠ **CAUTION!** Important Information

Note: The following 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. Please ensure you keep your proof of purchase/receipt on any parts you buy.

- It is critical the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) and will cause air to leak into the fire, causing the appliance to 'over fire'. Do not operate the fire with cracked, or broken door glass
- It is critical the fire not be operated with over worn, faulty or missing bricks, baffle plate or baffle extension (white board on or under the baffle plate)
- A claim under this warranty should be directed to the retailer who supplied the Metro fire. If this is not possible write directly to the manufacturer stating details of fault, model, serial number of your Metro, dated proof of purchase and name of retailer purchased from.

Warranty Exclusions

(This manufacturer's warranty does not cover)

- Service calls which are not related to any defect in the product (i.e. operational, installation or fuel issues). The cost of a service call will be charged if the problem is not found to be a product fault
- Defects caused by factors other than normal domestic use or use in accordance with the product's operation manual
- Defects caused through the product being operated in an 'over-fired' manner resulting in sections of the firebox operating excessively hot to the point that sections glow red. (Note – This will result in distortion of the firebox)
- Defects to the product caused by accident, neglect, misuse or act of God
- The cost of repairs carried out by non-authorised repairers or the cost of correcting such unauthorised repairs
- Required maintenance as set out in this manual.

Service under this manufacturer's warranty must be provided by a repairer authorised by Pioneer Manufacturing Ltd. Such service shall be provided during normal business hours.

⚠ **IMPORTANT!** Complete and retain these details at time of purchase:

Purchase Date	
Serial Number	
Model	
Colour	
Retailer	



Parts guide for your Metro – Promet, baffles and wetback options

Your Metro wood fire must be regularly maintained and we recommended it is also serviced annually. If a wood fire is not regularly maintained and serviced, the life span will be reduced.

If your Metro wood fire has been neglected, by not being regularly maintained and serviced, with authorised Metro parts replaced as required, your warranty may be declined.

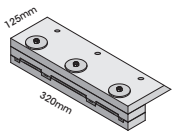
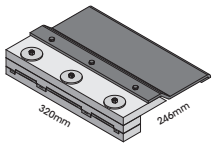
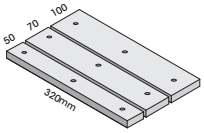
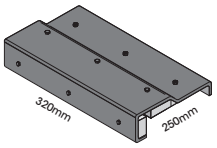
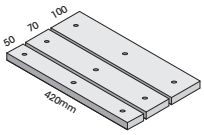
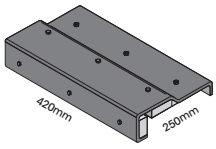
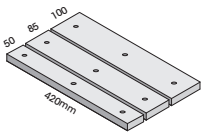
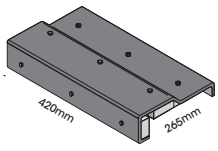
Listed below are the parts and product codes for your Metro wood fire. The promet/baffle should be regularly checked and must always be in place during the operation of your fire.

The baffle should be resting on four support lugs (two on each side of the firebox). It must be hard back against the rear of the firebox with the 'promet extension' (white board) or return front steel edge of the baffle facing forward.

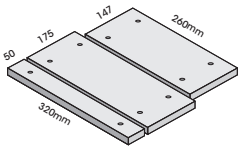
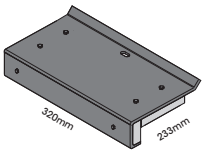
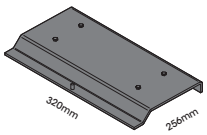
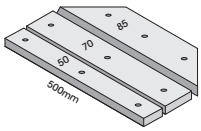
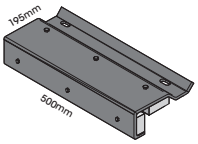
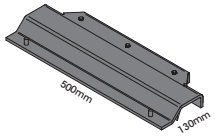
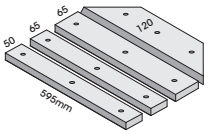
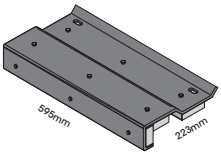
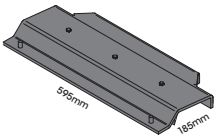
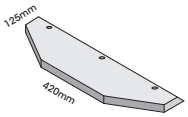
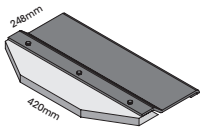
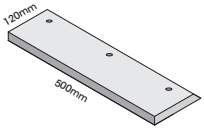
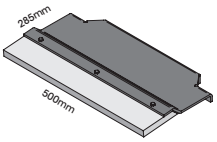
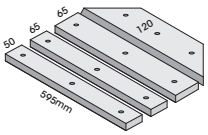
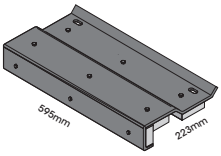
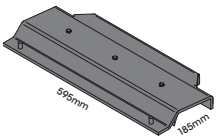
Hairline cracks in the promet extension are not uncommon and will have no adverse effect on the operation and performance of your Metro wood fire. These cracks are the result of intense heat coupled with expansion and contraction and is normal wear and tear.

If the promet extension starts to break up and pieces fall into the firebox it must be replaced.

Note: Impact damage when loading wood and burning wood which is not properly seasoned, i.e. 25% moisture content or more, will cause the promet to disintegrate and require replacement. Always burn dry well seasoned wood and take care when loading wood into the firebox.

Model	Type of promet required / Type of steel baffle(s) required		Wetback options
• Tiny Ped • Tiny Rad	Tiny Promet 500-1550 	Tiny Baffle 500-2050 	2kW Wetback 450-0050 
• Tiny Rad Woody	Tiny Woody Promet Set 500-2004 	Tiny Woody Baffle 500-2504 	Side Wetback 450-0275 
• Wee Rad Base • Wee Rad Leg • Wee Rad Woody • Wee Ped	Wee/R1 Promet Set 500-2005 	Wee/R1 Baffle 500-2505 	Side Wetback 450-0275 
• Wee Rad V2 Base	Wee V2 Promet Set 500-2006 	Wee V2 Baffle 500-2506 	No wetback can be fitted to this appliance

Parts guide for your Metro – Promet, baffles and wetback options

Model	Type of promet required / Type of steel baffle(s) required			Wetback options
• Classic Rad	Classic Rad Promet Set 500-2015 	Classic Rad Front Baffle 500-2520 	Classic Rad Rear Baffle 500-2525 	Side Wetback 450-0275 
• Xtreme Rad Base • Xtreme Rad Leg • Xtreme Rad Woody • Xtreme Ped	Xtreme/R2 Promet Set 500-2010 	Xtreme/R2 Front Baffle 500-2510 	Xtreme/R2 Rear Baffle 500-2515 	3kW Wetback 450-0100 
• Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 
• LTD Wee Rad Base • LTD Wee Rad Leg • LTD Wee Rad Woody		LTD Small Promet 500-1700 	LTD Small Baffle 500-2600 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Xtreme Rad Base • LTD Xtreme Rad Leg • LTD Xtreme Rad Woody		LTD Large Promet 500-1850 	LTD Large Baffle 500-2650 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 

Metro - Visit us online today www.metrofires.co.nz

Metro wood fire specifications

Metro have a Specifications Brochure available which details relevant compliance data for every model. This brochure is updated annually and details the minimum clearances and specifications for all models, which is generally required when applying for a building consent. See your Metro retailer to obtain a copy, or visit www.metrofires.co.nz

metrofires.co.nz

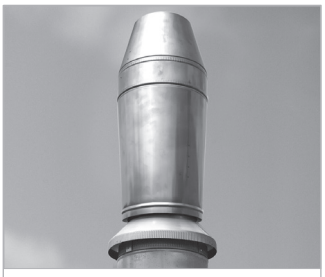
Visit the Metro website: metrofires.co.nz to view Metro's 'video demos' showing the latest in wood fire technology energy saving options. You can view the entire Metro product range, find out where your nearest Metro retailer is located or simply check out the latest specifications, installation requirements and emission and efficiency data for the Metro of your choice.



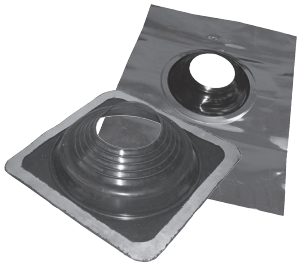
Pioneer heating accessories

Pioneer/Metro Fires offer a wide range of heating accessories designed to complement your Metro wood fire. The range includes ECO flue systems, floor protectors, wetbacks, heat transfer systems, baffles, bricks and more.

For further details talk to your Metro agency or visit www.metrofires.co.nz



ECO Flue Systems



Flashrites and Versatiles



Wetbacks



High Temperature Paint



Corner and Wall Floor Protectors



Heat Transfer Systems



Universal Door Seal Kits



Fire Cement And Silicone



Glass Tape



Door Seal Rope



Chubb Smoke Detectors

BRANZ Appraised

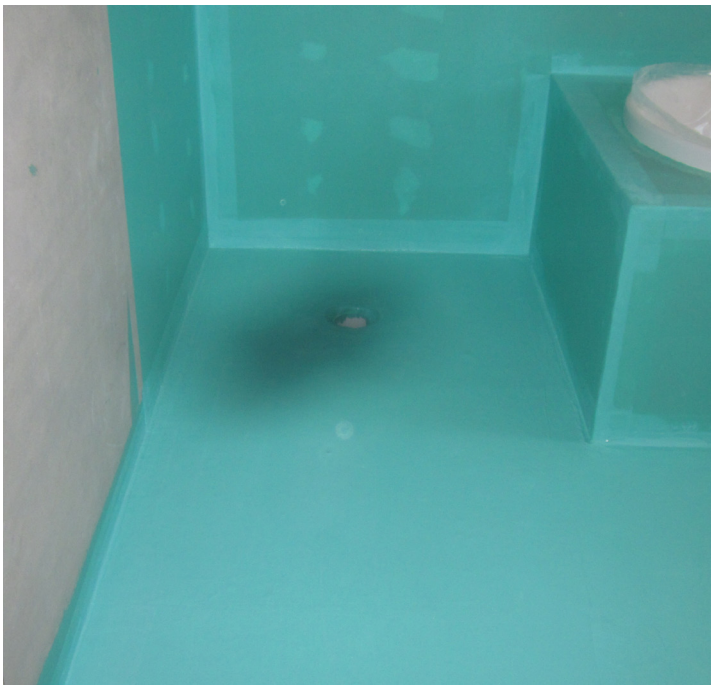
Appraisal No. 1123 [2020]

WET-SEAL ENVIRO-COAT IS 520 INTERNAL WATERPROOFING MEMBRANE

Appraisal No. 1123 (2020)

This Appraisal replaces BRANZ Appraisal No. 655 (2019)

Amended 07 June 2024



BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is a liquid-applied waterproofing membrane for use under ceramic or stone tile finishes in internal wet areas.

Scope

2.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane has been appraised for use as a waterproofing membrane for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particleboard, plywood, fibre cement compressed sheet, fibre cement sheet tile underlay and Strandfloor H3.1® or Strandboard™, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360th of the span.

2.2 The use of Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Building structural movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints are specific to each building, and therefore the responsibility of the building designer and building contractor and are outside the scope of this Appraisal.

2.4 Ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membrane must be installed by Wet-seal New Zealand Ltd trained and approved applicators.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meets this requirement. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meet this requirement. See Paragraphs 11.1-11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meets this requirement.

Technical Specification

4.1 Materials supplied by Wet-seal New Zealand Ltd are as follows:

- **Wet-seal Enviro-coat™ IS 520** - a one-component, elastic, water-based, moisture-curing, co-polymer waterproofing membrane. It is coloured jade and is supplied in 18 kg pails.
- **Polyspun Enviro Fabric** - a high strength, spun-bonded polyester reinforcement for reinforcing any changes of plane and the body of membrane. It is supplied as a 142 mm wide lineal strip x 100 m roll and 1 m wide x 150 m long roll, and is coloured white.
- **Wet-seal Hydroseal** - a two-part, water-based primer for moist or damp concrete or timber substrates. It is a grey colour and is supplied as 'A' and 'B' in 10 L containers
- **Wet-seal Enviro-prime EP 20 + Primer** - a ready-to-use, water-based, spray-applied primer for use on porous substrates. It is coloured bright violet and is supplied in 15 L containers.
- **Wet-seal Ultra-grip Non-porous Primer** – a one-component, flexible, water-based non-porous grip primer for use on non-porous substrates. It is a grey liquid and is supplied in 15 L pails.
- **Wet-seal Top-coat 300** - a two-component, water-based primer for moist or damp concrete or timber substrates. It is a jade green colour and is supplied as 'A' and 'B' in 10 L containers.
- **Superseal 50FC™** - a high strength, one-component, MS-polymer adhesive sealant. It is used as a gap sealant and is supplied in 600 ml sausages.
- **Tape** - a masking and detail tape, supplied as a 48 mm wide silicone release bond breaker tape and coloured light brown.

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 12 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Enviro-coat IS 520 Internal Installation Procedures Manual, Controlled Copy: 0, 01 July 2020.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Design Information

General

7.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 The membrane must be protected from physical damage by the application of ceramic or stone tile finishes.

7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Good Practice Guide: Tiling.

7.4 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases, framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). LOSP treated plywood must not be used. The plywood must be supported with framing with a maximum span of 400 mm, with all sheet edges supported, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges, and 200 mm through the body of the sheets.

8.2 When F11/F8 19 mm thick Ecoply plywood is used, the plywood must be supported with framing with a maximum span of 450 mm in one direction only, with all sheet edges supported, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges and 200 mm through the body of the sheets.

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

8.3 Fibre cement compressed sheet and tiling underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Installation must be in accordance with the instructions of the manufacturer.

Particleboard

8.4 Particleboard must be specified for the end use in accordance with NZS 3602 for wet areas.

Concrete and Concrete Masonry

8.5 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604, and concrete slab-on-ground floors and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

8.6 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal for use in internal wet areas.

8.7 Fibre cement sheet must comply with the requirements of AS/NZS 2908.2.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Strandfloor H3.1®

8.8 The installation of Strandfloor H3.1® in wet areas must be undertaken in conjunction with the Technical Literature, NZS 3604, Paragraph 4.3.4 and NZS 3602, Table 1. Strandfloor H3.1® must be installed with centres no greater than 450 mm. Refer to the Technical Literature and BRANZ Appraisal No. 677 for more information.

Strandboard™

8.9 The installation of Strandboard™ in wet areas must be undertaken in conjunction with the Technical Literature, NZS 3604, Paragraph 4.3.4 and NZS 3602, Table 1. Strandboard™ must be installed with centres no greater than 450 mm. Refer to the Technical Literature and BRANZ Appraisal No. 664 for more information.

Durability

Serviceable Life

9.1 The Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

Maintenance

10.1 No maintenance of the membrane will be required provided significant substrate movement does not occur, and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound, and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membrane, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively, and ceramic or stone tile finishes must be kept clean.

Internal Moisture

11.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is impervious to water, and when appropriately designed and installed, will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of code compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of code compliance to NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1, Paragraphs 3.1.1 b), 3.1.2 b) and 3.3.1 b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1,500 mm out from the shower rose. Floor wastes must be provided, and the floor must fall to the outlet.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1,500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions, can be obtained from AS 3740, the BRANZ Good Practice Guide: Tiling, and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber, plywood or particleboard floors are used. This is also a requirement of particleboard manufacturers.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Installation Information

Installation Skill Level Requirement

12.1 All design and building work must be carried out in accordance with the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane Technical Literature and this Appraisal. All building work must be undertaken by Wet-seal New Zealand trained and approved applicators. Where the work involves Restricted Building Work, this must also be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License class.

Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 The relative humidity of the concrete must be 75% or less before membrane application. Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have reinforcement installed as set out in the Technical Literature.

13.4 Substrates when required must be primed with primer as detailed in the Technical Literature and allowed to cure before the membrane is installed.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.

14.2 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane must be thoroughly stirred before application.

14.3 The membrane must be applied in a minimum two-coat at the rates set out in the Technical Literature to give a total finished dry film thickness of between 0.5-1 mm.

14.4 Reinforcement fabric (Polyspun Enviro Fabric) is to be used as the carrier mechanism for the liquid membrane when detailing floor areas, vertical and horizontal joints, over bond breakers, around penetrations and all critical areas as set out in the Technical Literature.

14.5 Application can be made by special roller (supplied by Wet-seal New Zealand Ltd) or brush (long bristle).

14.6 Polyspun Enviro Fabric reinforcement is laid into the first coat of membrane to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

14.7 Clean up may be undertaken with water.

Tiling

15.1 The membrane must be fully cured before tiling. The cured membrane must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide: Tiling. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Wet-seal New Zealand Ltd.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Inspections

16.1 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles, including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

Basis of Appraisal

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

Tests

18.1 The following testing of Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane has been undertaken:

- AS/NZS 4858 Appendix A, including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission, cyclic movement resistance requirements of AS/NZS 4858 Appendix B, water absorption, peel adhesion, dry pull-off/tensile adhesive test on plywood, dry pull-off/tensile adhesive test on fibre cement, puncture resistance and low temperature flexibility.

18.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

19.1 An assessment was made of the durability of the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane by BRANZ technical experts.

19.2 Site inspections have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of the membrane has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of the membrane's manufacturer has been assessed and found to be satisfactory.

20.3 The quality of supply of the membrane system materials to the market is the responsibility of Wet-seal New Zealand Ltd.

20.4 Quality on-site is the responsibility of the Wet-seal New Zealand Ltd trained and approved applicators.

20.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems, in accordance with the instructions of the substrate manufacturer, Wet-seal New Zealand Ltd and this Appraisal.

20.6 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Wet-seal New Zealand Ltd.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Sources of Information

- AS 3740:2021 Waterproofing of domestic wet areas.
- AS 3958.1:2007 Guide to the installation of ceramic tiles.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2269:2012 Plywood – Structural.
- AS/NZS 2908.2:2000 Cellulose-cement products – flat sheet.
- AS/NZS 4858:2004 Wet area membranes.
- BRANZ Appraisal No. 664 Strandboard™ Flooring.
- BRANZ Appraisal No. 677 Strandfloor® H3.1 Flooring.
- BRANZ Good Practice Guide: Tiling, (Third Edition) April 2015.
- NZS 3101:2006 The design of concrete structures.
- NZS 3602:2003 Timber and wood-based products for use in buildings.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4229:2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230:2004 Code of practice for the design of masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 10 December 2021

This Appraisal has been amended to update finalised finished film thicknesses.

Amendment No. 2, dated 11 January 2023

This Appraisal has been amended to add a new primer and update installation information.

Amendment No. 3, dated 07 June 2024

This Appraisal has been amended to update the tape description from fibreglass to fabric in the technical specification.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

BRANZ

In the opinion of BRANZ, Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

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

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
01 October 2020

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Wet-seal Project Specification

Internal Waterproofing



Author EB| Reviewer AZ, JA| Approver RC
Version control: 11.11.2020
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Wet–seal™

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1 Waterproofing

1.1 Scope

This specification applies to the installation of Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System ("the Enviro-coat Waterproofing System"). The Enviro-coat Waterproofing System is to be applied in internal areas defined in the contract, quotation, technical drawing and or plans and in accordance with all Wet-seal NZ Ltd. (Wet-seal) Technical literature and in accordance and compliance with all relevant standards and codes.

1.2 Compliance information

System installation must comply with all relevant provisions of the following documents/codes:

NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
3101.1&2:2006 NZS	Concrete Structures Standard
3602:2003 NZS	Timber and wood-based products for building
3604:2011 NZS	Timber-framed buildings
AS/NZS 2908.2	Cellulose cement products - Flat sheets
AS/NZS 2588	Gypsum plasterboard
AS 3740	Waterproofing of domestic wet areas
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4858	Wet area membranes
AS/NZS 2269.0.2012	Plywood – Structural – Part 0 Specifications
BRANZ	Good practice guide: Tiling

1.3 Manufacturer/Supplier documentation

Wet-seal is the supplier and manufacturer of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System. The documents related to this specification are collectively referred to as the Wet-seal technical literature and include:

Scope of Works Enviro-coat IS 520 Internal Waterproofing
BRANZ Appraisal No. 1123 [2020]
Enviro-coat Internal IS 520 Safety Data Sheet
Tile adhesive technical bulletins (check wet-seal.co.nz or email technical@wet-seal.com)
Wet-seal Technical Bulletins
Wet-seal Installation Manuals

Up to date Wet-seal Technical literature and recommendations are available through the supplier/manufacturer.
Contact details:

Company: **Wet-seal NZ Ltd.**
Web: wet-seal.co.nz
Email technical@wet-seal.com
Phone: 0800 436 000

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1.4 Qualifications

Wet-seal Independent Franchisees and their employees are the only approved Applicators of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System. Approved Applicators install in compliance with Wet-seal Technical literature.

All Residential Building Work (RBW) must be carried out, or supervised by, an LBP. They must work within the scope of their licence class.

1.5 Producer statements

Approved Applicators will provide producer statements – PS3's at time of installation for code compliance where required.

1.6 Warranty

Wet-seal NZ Ltd. Material and Installation Warranty – are provided according to the warranty terms and conditions – 15 years' product & 7 Year's Installation Warranty.

1.7 Substitution

Substitution is not permitted to any specified Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System, or associated components or products with an alternative product.

1.8 Quality Assurance

Maintain the quality necessary to assure that all work is performed in accordance with this specification and the qualifying requirements of Wet-seal to ensure that all work is of the highest standard.

1.9 Tests

Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System is tested to and complies with AS/NZS 4858 Wet Area Membranes.

2 Enviro-coat Waterproofing System Materials

The Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System as appraised by BRANZ is comprised of the following:

2.1 Waterproofing Membrane

Wet-seal Enviro-coat IS 520 is a one component, elastic, water-based, co-polymer waterproofing membrane. Wet-seal Enviro-coat IS 520 is fibre reinforced, liquid applied and designed for internal applications. Wet-seal Enviro-coat IS 520 is coloured jade green and supplied in 18 kg pails.

2.2 Reinforcing fabric

Wet-seal Enviro-fabric is a high strength reinforcement fabric that provides added durability and structural stability. Wet-seal Enviro-fabric is used and installed in all critical areas, according to Wet-seal Technical Literature by approved Applicators.

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2.3 Primers

Wet-seal system primers are selected according to substrate type and condition and used in compliance with Wet-seal Technical literature.

Enviro-prime EP 20+: is a ready to use water-based primer for use on porous and dry substrates. It is coloured violet and supplied in 15 L containers.

Wet-seal Top-coat 300: is a two-component water-based epoxy primer for green (7 day old hardened), or damp concrete, or timber substrates. It is aqua green in colour and supplied as part A and B in 10 L containers.

Wet-seal Epoxy-MVP: is a two-component water-based epoxy primer for green (7 day old hardened), or damp concrete, or timber substrates. It is light green in colour and supplied as part A and B in 10 L containers.

2.4 Sealants and Tapes

Wet-seal approved high performance MS polymer, moisture cure, construction adhesive sealants are used and applied in accordance with the manufacturer's instructions and the Wet-seal Technical Literature.

Wet-seal approved foam tapes are used in accordance with the Wet-seal Technical literature.

2.5 Delivery, storage and handling

Wet-seal approved applicators provide the Enviro-coat Waterproofing System and will handle all Wet-seal products and components according to the relevant Technical Literature and in accordance with WorkSafe NZ Guidelines and Codes of practice.

3 Pre-Install Checks

3.1 Preliminary works

Ensure that the substrate is in a suitable condition prior to installation and is in compliance with NZBC E3/AS1 and AS 3740 for the relevant substrate and Wet-seal requirements. Ensure that all preliminary works are completed to the specification provided on quotes, technical drawings, and site plans, etc. Approved Applicators must not commence work until all necessary preliminary work has been completed by other trades and to the required standard.

3.2 Falls

Interior falls must be in accordance with BRANZ Good Practice Guide – Tiling clause 6.5 Falls in Floors, unless other-wise specified to ensure that there is no ponding of water on the surface. Falls must be corrected, if necessary, before installation of the Enviro-coat Waterproofing System. Falls must be built into the substrate with membrane applied over the top. Falls are not to be created on top of the membrane. All falls must slope to a floor waste.

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Table 1 Required falls as per BRANZ Good Practice Guide – Tiling clause 6.5 Falls in Floors

Fall (minimum)	Site
1:50	Unenclosed shower bases (to NZBC E3/AS1, 3.3.5)
1:60	Enclosed shower bases
1:50	Shower bases for people with disabilities (to NZS 4121, 10.5.11.3 (b))

3.3 Substrate requirements

3.3.1 Preliminary substrate check

Prior to any Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System installation, on all approved substrates, all necessary checks of substrate condition in accordance with Wet-seal Technical literature, all drawings, specifications and plans and manufacturer's requirements must occur.

Substrate temperature must be between 5℃ and 35℃ for installation of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System.

Substrates must be structurally sound and dimensionally stable, clean, dry, free from any dust, dirt, debris, oils, or any other contaminants likely to damage the membrane or interfere with adhesion to substrate or performance. The surface must be smooth and free from any projections or sharp materials. Substrates must be free of voids or depressions, and have the minimum falls required.

Ensure sheet materials are screw fixed to specifications and screw heads are flush. Ensure that any surface damage is appropriately treated and that substrates are installed as per the manufacturer's requirements. Check the layout, correct fixings and thicknesses are as per the manufacturer's requirements.

Ensure all movement control joints are in the correct location and are appropriately treated. Check that all joints are flush, and substrates are even. Check that all apertures, openings, edges and expansion and movement control joints are completed as detailed in the plans and drawings.

3.3.2 Concrete Slabs

Concrete slab substrates must have a smooth steel trowel finish. The surface must be smooth and free from laitance, dust, debris, depressions, and protrusions. Any voids must be filled prior to Enviro-coat Waterproofing System application. All curing compounds and formwork release agents must be removed.

New concrete must be at least 7 days old and hardened, before application of Enviro-coat primers and Enviro-coat IS 520 Waterproofing Membrane. When new hardened concrete is between 7 and 28 days old it must first be treated with Enviro-coat epoxy primers as per Wet-seal Technical Literature. Old concrete must be thoroughly clean, washed and allowed to dry.

For 28-day old concrete where not using Wet-seal epoxy primers the moisture content of the concrete must be measured using a hydrometer and readings must be 75% relative humidity (rh) or less. If readings are higher than 75% rh, the substrate must be allowed to dry until readings are compliant with Wet-seal Technical Literature.

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3.3.3 Fibre Cement Compressed Sheet Floors

Ensure that fibre cement compressed sheet is wet area grade, and suitable for internal wet areas and complies with AS/NZS 2908.2. Ensure that the fibre cement sheet is correctly installed as per manufacturer's requirements. Refer to sheet manufacturer's details for correct fixing, thicknesses and sheet layout.

3.3.4 Fibre Cement Sheet Wet Area Tile Underlay

Fibre cement sheet tile underlay must be manufactured to AS/NZS 2908.2, and be suitable for internal wet areas. The tile underlay must be installed as per the manufacturer's requirements.

3.3.5 Concrete/Masonry Walls

Concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZ Building code, NZS 4229 and NZS 4230. Old or soiled block work must be thoroughly cleaned and allowed to dry.

3.3.6 Plasterboard

Plasterboard must be wet area grade and suitable for internal wet areas and must be manufactured to AS/NZS 2588 and installed to manufacturer's requirements.

3.3.7 Plywood floors

Plywood sheet material must comply with AS/NZS 2269, and be a minimum of 17 mm thick, minimum CD structural grade, with the sanded C face upwards. Plywood must be hazard classification of H3.2 with CCA treatment. Timber framing support must comply with NZS 3604. Supporting framing must be installed so that the substrate maximum span is in accordance with the manufacturer's requirements. All edges of the sheet should be fully supported.

Plywood sheets must be fixed with 10-gauge x 50 mm stainless steel countersunk screws, at 150 mm centers on edges and 200 mm in the body of the sheet. Fixings must be to manufacturer's specifications.

Plywood moisture readings must be taken, and waterproofing must not occur if moisture content is greater than 20% relative humidity.

LOSP treated plywood must not be used

3.3.8 Strandfloor ® H3.1

The installation of Strandfloor® must be to the manufacturer's requirements and in accordance with BRANZ Appraisal 677 - Strandfloor H3.1®. The Strandfloor® H3.1 must be installed with no greater than 450 mm unless otherwise specified by the manufacturer.

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4 Waterproofing System Installation

4.1 Installation Compliance

The Wet-seal Approved Applicator will provide a complete waterproofing system. The Wet-seal Approved Applicator will install the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System using the required Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System materials, primers and components, in accordance with the stringent Wet-seal Installation requirements, following design guidance from AS 3740, BRANZ Good Practice Guide – Tiling, and flooring and wallboard manufacturer's specifications, and the Wet-seal Technical Literature to provide a professionally waterproof install.

4.2 Completion

The Wet-seal Approved Applicator will complete the professional installation of the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane System and will ensure the site is left in a clean and tidy state. The Wet-seal Approved Applicator will provide an Installation Warranty Certificate upon completion and all other required documentation, in a timely manner.

4.3 Protection and duty of care

Adequate drying and curing time must be allowed before tiling. The Wet-seal Enviro-coat IS 520 Waterproofing Membrane System is tile ready after 48 hours at 25 °C and 50% relative humidity. Allow longer dry times if temperatures are lower or humidity higher. After installation the wet waterproofing membrane must be protected from any pedestrian traffic until it is dry. Once dry, physical damage and rain wetting must be avoided by use of suitable temporary protection covers until tiled finishes are complete. Such requirements should be discussed before commencement of waterproofing works. The dry membrane is not trafficable or weatherproof and must be protected appropriately. Further information regarding the Customer's duty of care can be found in Wet-seal's Terms and Conditions for Internal Waterproofing.

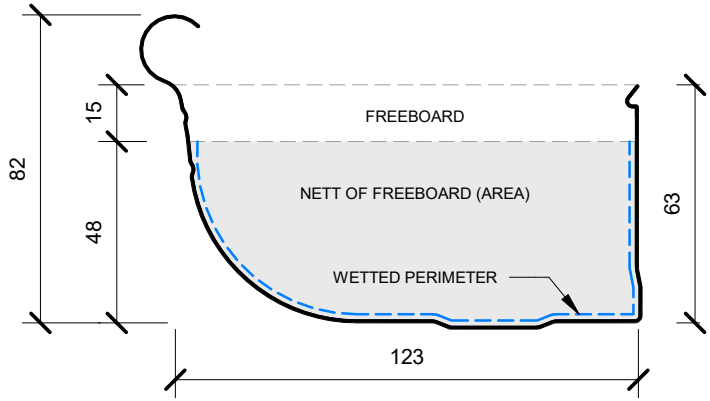
4.4 Flood testing

If a flood test is required, conduct a flood test of the installed waterproofing membrane prior to tiling. Conduct flood test no **less than 7 days after installation.** Carry out any additional works as a result of the flood testing.

4.5 Tiled Surfaces

Tile adhesives used over Wet-seal Enviro-coat IS 520 Waterproofing Membrane System must meet the requirements of AS 4992.2 and be carried out in accordance with AS 3958.1 and BRANZ Good Tiling Practice.

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TOTAL CROSS SECTIONAL AREA	6967mm²
NETT OF FREEBOARD	5186mm²
WETTED PERIMETER	191mm

TOTAL CROSS SECTIONAL AREA OF GUTTER ONLY TO BE USED WHEN INSTALLED WITH OVERFLOW (SEE TABLE)

MANUFACTURED IN PALMERSTON NORTH, HAMILTON, CROMWELL, CHRISTCHURCH, NEW PLYMOUTH

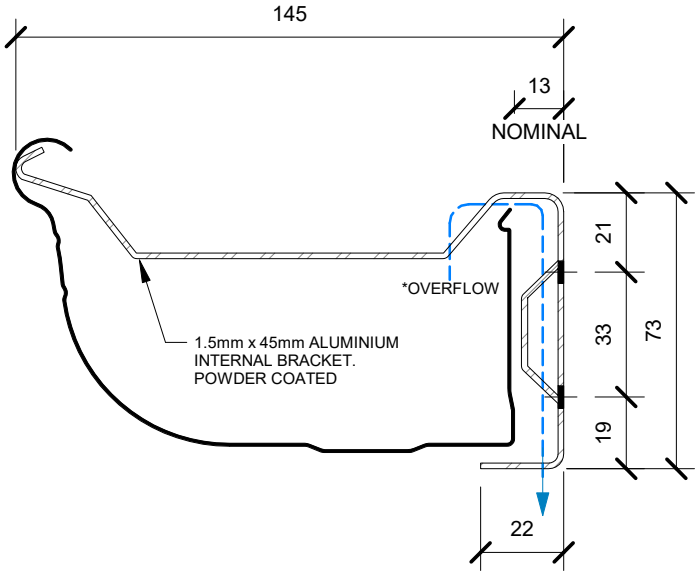
OVERFLOW WITH SOFFIT =

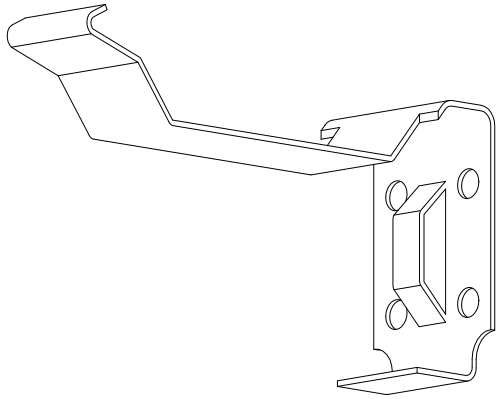
BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 3mm.

OVERFLOW WITH NO SOFFIT OVERHANG =

BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 10mm.

AS PER SECTION 5.3.2.3B OF THE NZ MRM COP.





3D GUTTER BRACKET

BRACKET SPACINGS 750MM MAX EXCEPT FOR SNOW LOAD AREAS = 600MM MAX.

NOTES:
- ALL DIMENSIONS ARE NOMINAL AND MAY VARY WITH MATERIAL
- *THE OVERFLOW SHOULD HAVE ADEQUATE CAPACITY. THE OVERFLOW OF THE GUTTER NEEDS TO BE CONSIDERED WHEN DESIGNING AND INSTALLING THE METALCRAFT ROOFING GUTTER*

Metalcraft Roofing
www.metalcraftgroup.co.nz

DISCLAIMER:
All details are to be used for indicative purposes only and the designer should consult both the MRM code of practice version 3.0 / 2022, E2 and all other relevant building codes
Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary for wall cladding. 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.

Colonial Quad Gutter

Reference MC Gutters Date MAY 2024 Scale 1 : 2 @ A4 Sheet **02**

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 24/07/2024

Element Name (optional)

2.2 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Weatherboard Rusticated or Shiplap
R-value: 0.16

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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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 ○

Date: 11/10/2023

Element Name (optional) **2.20** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Brick 70mm
R-value: 0.06

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Construction R-value Calculator

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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.

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 ( )

Date: 12/04/2025

Element Name (optional) **2.09** m²°C/W

Type: Floor: Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Table F Slab Insulation (H1 Edition 5) - H1 Acceptable Solutions and Verification Methods

Slab floor area [m²]: 163.3

Area Perimeter Ratio: 2.56

Underslab insulation: Full Insulation : 2.37

Perimeter:

	*Length**	*Masonry Veneer Wall*	*External Wall Thickness**	*Edge Insulation*
-	63.8 m	☑	90 mm	☐
+				

* required data. If empty the perimeter type will be ignored.

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 03/08/2024

Element Name (optional) **2.27** m²°C/W

Type: Wall: Timber Framed intertenancy Wall

Timber Framed intertenancy Wall [view detail]

internal surface 0.09

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4% *Cavity Area: 85.6%*

Framing :
R-value: 0.75

Insulation : 2.8

still Airgap: none
R-value: 0.00

Cladding : generic - None (Cladding is part of the insulation system)
R-value: 0.00

Timber Frame & Cavity : no framing (for example SIP Panels)

Wall Frame Area: 0.0% *Cavity Area: 100.0%*

Framing :
R-value: 0.00

Insulation :

still Airgap: none
R-value: 0.00

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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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 ◉

Date: 18/08/2023

Element Name (optional) **3.35** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

Non-IC-rated recessed downlights

Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

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Construction R-value Calculator

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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.

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 ◉

Date: 04/03/2024

Element Name (optional) **6.98** m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation : 6.6

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, blocking @ 600mm

Roof Frame Area: 12.1%	*Cavity Area: 87.9%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : notched to cover bottom chord ☐

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

[Print Page]

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innova™ INNOVATIVE BUILDING SYSTEMS

BGC FIBRE CEMENT - NZ

1 - IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME	BGC Fibre Cement Sheets
OTHER NAMES	Duraliner Plus / Durasheet / Duratex / Duralattice / Duralux Plus / Duraplank / Ultraform / Compressed / Ceramic & Tile Underlay / Vinyl and Cork Underlay / Nuline Plus / Duracom / Duragrid / Durascape / Duragroove / Stonesheet / Stratum / Stratum Duo / Stratum Duo Offset / Stratum Trio / Stratum Contour / Durafloor / Durabarrier / Intergroove / Duracom Greystone Charcoal / Duracom Greystone Natural / Duracom Greystone Basalt / Durascape Greystone / Durapanel / Duracom Earthstone Quartzite / Duracom Earthstone Anthracite / Duracom Eartstone Ochre
UN NUMBER	None Allocated
DANGEROUS GOODS CLASS & SUBSIDARY RISK	None Allocated
HAZCHEM CODE	None Allocated
POISONS SCHEDULE NUMBER	None Scheduled
USE(S)	Fibre cement sheets for use on internal/external wall linings and soffits and internal/external flooring. Refer to product manual for installation.
COMPANY	BGC (Australia) Pty Ltd T/A BGC Fibre Cement
ADDRESS	77 Cryers Rd, East Tamaki, Auckland 2013
WEBSITE	www.bgcinnovadesign.co.nz
TELEPHONE	09 273 1457
FAX	09 273 1461
EMERGENCY PHONE NUMBER	111 Fire Brigade, Police and Ambulance
POISON INFORMATION CENTRE	0800 764 766

2 - HAZARDS IDENTIFICATION

The potential health hazards are related to dust generated from these materials during cutting, sanding and the use of power tools.

The intact BGC Fibre cement products do not give off dust or fume during installation or when installed. However, cutting, breaking, drilling, sanding, rebating or sawing the boards may generate dust. Inhaling dust liberated from BGC Fibre cement may aggravate pre-existing respiratory conditions and may cause cancer.

Smoking and inhalation of airborne particulates from other sources may increase the risk of lung disease.

Work areas and storage areas should be deemed smoke-free zones.

GHS CATEGORY	PICTOGRAM	SIGNAL WORD	HAZARD CODE	HAZARD STATEMENTS
Carcinogenicity, Cat 1A		Danger	H350	May cause cancer through inhalation of dust
Specific target organ toxicity (repeated exposure), Cat 1		Danger	H372	Causes damage to respiratory system through prolonged or repeated exposure

OTHER CLASSIFICATIONS	Contact with dust and fibres from this product may cause skin and eye irritation due to physical reaction (e.g. rubbing or scratching).
PRECAUTIONARY STATEMENTS	Observe the following precautionary measures when handling, installing or processing the product.

BGC FIBRE CEMENT - NZ

Prevention Precautionary Statement Codes

CODE	PRECAUTIONARY STATEMENT
P201	Obtain special instruction before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe in dust.
P264	Wash hands and face thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P281	Use personal protective equipment as required.

Response

P308+P313	If exposed or concerned: get medical advice.
P314	Get medical advise if you feel unwell.

Disposal

P501	Dispose products in accordance with local/region/national/international regulations.

3 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	PROPORTION	EXPOSURE LIMITS
Calcium silicate hydrate	66997-15-1	40%-60%	10.0 mg/m³ measured as inspirable dust
Crystalline silica	14808-60-7	20%-60%	0.05 mg/m³ measured as inspirable dust
Paper pulp (cellulose)	9004-34-6	< 10%	10 mg/m³ measured as inspirable dust
Calcium silicate aluminate	21645-51-2	< 5%	10 mg/m3 measured as inspirable dust
Water		< 15%	
Other non-hazardous ingredients (pigments, sealers, coatings)		< 5%	

4 - FIRST AID MEASURES

SWALLOWED	Give copious amounts of water to drink to dilute stomach contents. Wash mouth and lips with water. Do not induce vomiting. If symptoms persist, seek medical attention.
EYE	Remove contact lens or eyeglasses. Flush thoroughly with flowing water for at least 10 minutes. If redness persists, seek medical attention.
SKIN	Wash thoroughly with soap and water. Contact physician if irritation persists or later develops.
INHALED	Remove to fresh air.
ADVICE TO DOCTOR	Treat symptomatically.

5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS	BGC Fibre Cement products are non-flammable and non-combustible.
SUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
UNSUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
PRODUCT OF COMBUSTION	BGC Fibre Cement products are non-combustible and non-flammable.

BGC FIBRE CEMENT - NZ

6 - ACCIDENTAL RELEASE MEASURES

SPILL AND DISPOSAL	Use wet sweeping and/or vacuuming to clean up dust and waste. Dry sweeping should not be attempted. Vacuuming with an M or H class industrial vacuum is recommended. Do not wash material down storm water drains. Bagged waste should be placed in containers and disposed of with other construction waste in accordance with local authority guidelines.

7 - STORAGE AND HANDLING

STORAGE	Fibre cement sheets should be stored flat and level in a covered dry area. Avoid contact with strong acids and strong oxidizing agents.
HANDLING	Crystalline silica dust may be generated during processing and handling. Use appropriate personal protective equipment to reduce exposure to respirable silica dust. Keep dust generation to a minimum using proper tools. Wear protective equipment to prevent skin and eye contamination. Manual handling should be in accordance with Manual Handling Regulations and Codes. Maintain the work area clean by using wet sweeping or vacuuming with an M or H class filter. Keep fibre cement from incompatible materials. Read and understand all safety precautions before handling fibre cement.

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE STANDARDS	BGC Fibre Cement has adopted the following maximum exposure limits, corresponding to the limits set out by the CoA, NOHSC; Exposure Standards for Atmospheric Contaminants in the Occupational Environment:- • Calcium silicates: 10 mg/m³ time-weighted average (TWA) as inspirable dust • Cellulose: 10 mg/ m³ TWA as respirable dust • Crystalline silica (quartz): 0.05 mg/ m³ TWA as respirable dust BGC Fibre Cement recommends keeping exposures to dust as low as practicable and work in a well-ventilated space.
ENGINEERING CONTROLS	Keep exposures to dust as low as practicable, preferably below 5 mg/m3 TWA (time-weighted average) of inspirable dust, to prevent respiratory discomfort. Cutting, sanding, rebating, drilling, grinding and other machining activities will generate dust. Power tools should be fitted with a local dust extraction device with a HEPA M or H class filter. Hand tools (unpowered) generate less dust when cutting or sanding. If generated dust cannot be avoided, follow recommendations for protective equipment. Work in the open air or near external openings in the building, for adequate ventilation. Where dust is generated, in confined spaces, local mechanical ventilation should be used, to direct the dust away from the work areas. Personal protective equipment should be used in confined spaces and where dust levels exceed the maximum levels. Use safe work practices to minimize dust release and exposure. Clean work areas regularly by wet sweeping or vacuuming with a HEPA class M or H filtered vacuum. Never attempt dry sweeping as it excites silica dust into the workers' breathing zone.
VENTILATION	Where safe work practices, adequate engineering and material handling controls are in place, ventilation is not normally required. Use local mechanical ventilation and or dust extraction in confined areas and where dust could escape into the working environment.

TOOLS AND EQUIPMENT-

REPAIR AND MAINTENANCE	Vacuum and or wipe down all tools and equipment prior to maintenance and repair work. Avoid compressed air cleaning where possible, follow recommended exposure controls and protective equipment as listed below.
SKIN PROTECTION	Avoid direct skin contact with fibre cement products. Wear loose appropriate clothing, such as long sleeved shirts and long trousers, head protection and standard duty leather or equivalent gloves, which comply with Australian Standard AS 2161: Industrial Safety Gloves and Mittens. Wash work clothes regularly and do not shake out dust.
EYE PROTECTION	Wear dust resistant non-fogging safety goggles or glasses, which comply with Australian and New Zealand Standard AS/NZS 1336: Recommended Practices for Eye Protection.

BGC FIBRE CEMENT - NZ

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION cont.

RESPIRATORY PROTECTION	BGC Fibre Cement recommends particulate respirator , which comply with Australian and New Zealand Standard AS/NZS 1715: Selection, Use and Maintenance of Respiratory Protective Devices, and Australian and New Zealand Standard AS/NZS 1716: Respiratory Protective Devices when Exposed to Dust), be used at all times. The type of respirator to be used will depend on the level of exposure determined through sampling. If in doubt about the exposure level, use a respirator that offers the highest protection from respirable silica.
PERSONAL HYGEINE	Do not eat, drink, or smoke whilst handling and working with fibre cement. Wash dust from skin with mild soap and water after working with fibre cement.
FLAMMABILITY	Fibre cement products are non-combustible and non-flammable.

9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Factory applied blue tint on face of the Duratex™, and a white tint to the face of 4.5, 6.0, 9.0 and 12mm Compressed while all other products are cement grey finish.	BOILING POINT (°C)	Not Applicable
VAPOUR PRESSURE	Not Applicable	SPECIFIC GRAVITY (H_2O = 1)	Not Relevant
FLASH POINT	Not Applicable	FLAMMABILITY LIMITS	Not Flammable
SOLUBILITY IN WATER	Not Relevant	REACTIVITY (I.E. WITH WATER OR AIR)	Not Reactive
AUTO-IGNITION TEMPERATURE (°C)	-	ODOUR THRESHOLD	Slight cement odour
LOWER EXPLOSION LIMIT	-	UPPER EXPLOSION LIMIT	-
SELF ACCELERATING DECOMPOSITION	-		

10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY	Stable and non-reactive.
HAZARDOUS REACTIONS	None
CONDITIONS TO AVOID	Dust generation during handling, processing and inhalation.
INCOMPATIBLE MATERIALS	Strong acids and strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS	None

11 - TOXICOLOGICAL INFORMATION

Health Effects: Acute (short term)

SWALLOWED	Unlikely to occur, however may result in symptoms of acute indigestion.
EYES	Excessive dust may cause eye irritation.
SKIN	The dust, particularly in association with heat and sweat, can cause irritation, but it is not absorbed through skin.
INHALED	Inhaled dust may cause nasal, throat and lung irritation, symptomatic through excess mucus and coughing.

Health Effects: Chronic (long term)

INHALED	If respirable crystalline silica levels are not controlled, repeated exposure to excessive dusts of fibre cement products could result in chronic lung disease silicosis. However, if the practices noted in this SDS are followed during cutting and sanding, exposure to airborne dusts should be within recommended occupational exposure standards and no long-term effects are expected.

BGC FIBRE CEMENT - NZ

12 - ECOLOGICAL INFORMATION

ECO-TOXICITY	BGC Fibre Cement products are not toxic to aquatic and terrestrial organisms.
PERSISTENCE AND DEGRADABILITY	No data
BIOACCUMULATIVE POTENTIAL	No data
MOBILITY IN SOIL	A low mobility would be expected in a landfill situation.

13 - DISPOSAL CONSIDERATION

DISPOSAL	BGC Fibre Cement products must be disposed into a landfill site in accordance with local authority guidelines. Measures should be taken to prevent dust generation during disposal, and exposure and personal precautions should be observed (see above).

14 - TRANSPORT INFORMATION

TRANSPORT	No special transport requirements are necessary.

15 - REGULATORY INFORMATION

Not scheduled.

16 - OTHER INFORMATION

For further information on this product, please contact:
BGC (Australia) Pty Ltd (ABN 6200 5736 005 008) T/A BGC Fibre Cement
77 Cryers Rd, East Tamaki, Auckland 2013
Phone: 09 273 1457
Fax: 09 273 1461

ADDITIONAL INFORMATION

Australian Standards References

AS/NZ 1336	Recommend Practices for Occupational Eye Protection
AS/NZ 1715	Selection, Use and Maintenance of Respiratory Protective Devices
AS/NZ 1716	Respiratory Protection Devices
AS 2161	Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)

Other References

NOHSC:1008 (2004)	Approved Criteria for Classifying Hazardous Substances
MODEL CODE OF PRACTICE	Preparation of Safety

AUTHORISATION

REASON FOR ISSUE	Add new product names in Section 1. Updated Section 2, 3 and 8.
DATE OF ISSUE	May 2023

Whilst the information contained in this document is based on data which, to the best of our knowledge, was accurate and reliable at the time of preparation, no responsibility can be accepted by us for errors and omissions. The provision of this information should not be construed as a recommendation to use any of our products in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Since the information contained in this document may be applied under conditions beyond our control, no responsibility can be accepted by us or any loss or damage cause by any person acting or refraining from action as a result of this information.

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

1.0 - Product Overview

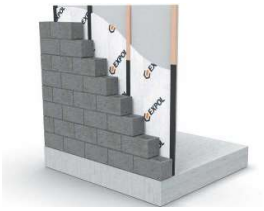
EXPOL ThermaSlab (Expanded Polystyrene / EPS) provides excellent compressive strength, moisture resistance, and thermal protection.

Ideally suited for residential applications**, EXPOL ThermaSlab** is a cost effective, easy to install insulation solution that achieves R-values above building regulations.

EXPOL ThermaSlab is available in grades S, M, H, VH and SL, and can be used in:

- Retaining Walls (S Grade)
- Skillion Roof Insulation (S, M H Grades)
- Concrete Floor Insulation (S, H, VH Grades
- Wall Insulation (SL Grade)
- Cladding Insulation (S and H Grades)





2.0 - Installation

2.1 There are no special requirements for PPE when handling or installing EPS. It is an inert, non-toxic material.

2.2 When transporting, storing or installing, ensure the EPS is not exposed to:

- Petroleum based solvents, or
- Fire, or
- Sustained direct sunlight.

2.3 PVC sheathed electrical cables should not be allowed direct contact with EPS.

2.4 EPS is compatible with all common construction products.

3.0 - Maintenance

3.1 No maintenance required

4.0 - Warranty

We believe we manufacture and supply the highest quality UnderFloor, EPS and XPS Foam Insulation products and that is why we stand behind them with some of the best warranties in the industry.

4.1 We provide a 20-year warranty on our EPS Foam Insulation Products – for full warranty details visit www.expol.co.nz/expol-eps-warranty/

5.0 - Compliance with the New Zealand Building Code

EPS, when installed and maintained in accordance with the requirements outlined in this technical data sheet, will meet or contribute to meeting the following provisions of the New Zealand Building Code:

5.1 Clause B2 Durability, performance B2.3.1 (a), B2.3.1(b)

5.2 Clause E3 Internal moisture performance E3.3.1

5.3 Clause F2 Hazardous building materials performance F2.3.1(a)

EXPOL EPS is not subject to a warning or ban under the Building Act 2004.

6.0 - Quality Assurance

6.1 BRANZ, H1 Energy efficiency performance H1.3.1(a), H1.3.2(e)

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

7.0 - Technical Data

Properties	Test / Method / Standard	Test Results
Material	Expanded Polystyrene	
Density	16 kg / m3	
Sheet Size	2400 mm x 1200 mm	
Thickness / R Value	10mm	-
	20mm	R 0.53
	25mm	R 0.66
	30mm	R 0.79
	35mm	R 0.92
	40mm	R 1.05
	45mm	R 1.18
	50mm	R 1.32
	55mm	R 1.45
	60mm	R 1.58
	65mm	R 1.71
	70mm	R 1.84
	75mm	R 1.97
	80mm	R 2.11
	85mm	R 2.24
	90mm	R 2.37
	95mm	R 2.50
	100mm	R 2.63
	110mm	R 2.89
	120mm	R 3.16
Thermal Conductivity	ATSM 168	K – Value 0.038
Rate of water vapour transmission (max) measured parallel to rise at 23 deg C	AS 2498.5	520 mg/m2s
Permeability m/s	-	
Compressive Resistance KPA at 1% Compressive Resistance KPA at 2% Compressive Resistance KPA at 5% Compressive Resistance KPA at 10%	AS 2498.3	34 KPA 59 KPA 74 KPA 84 KPA
Youngs Modulus	-	3.8 MPA
Cross breaking strength KPA	AS 2498.4	165 KPA
Dimensional stability of length, width & thickness (max) at 70 deg C for 7 days	AS2498.6	1%
Long term water absorption by immersion	ASTM C72	- %v / v
Determination of flame propagation surface ignition Medium flame duration (max) Eighth vale	AS2122.1-1993	 2 sec 3 sec
Fire behavior Spread of flame index (0 – 10) Smoke developed index (0 – 10)	AS/NZS 1530.3:1999	 0 5
Recycled Content	5%	
Recyclability	EPS is 100% recyclable	
Environmental Statement	EPS is inert and non-toxic. There are no chemicals or gases harmful to the environment emitted from EPS either during manufacture or within use.	
Ozone Depleting Potential	EPS does not contain ozone-depleting CFC or HCFC gases, nor use them in its manufacture. As a result, EPS has zero ozone depletion potential.	
Vermin Resistance	EPS does not offer any nutritive value.	

Date: **16 April 2025**

Fabricator: **VIP Frames & Trusses**

Job Name: **Brendon Esler Builders**
New House
Lot 79 52 Benn Street
Amberley

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

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

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

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

Wind Zone	**Altitude**	**100m**
	Snow (Open Ground Load)	**0.900kPa**
Roof Material	**Snow (Basic Roof Load)**	**0.441kPa**

Treatment Definition:

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

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

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

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

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

Council Contacts:

Consents Officer: _____
Email #: _____
Phone: _____

Please forward to:

VIP Frames & Trusses
65-67 Wickham Street
Ph (03) 389-8200

Pre-consent Truss Design Agreement

By accepting this truss design from VIP Frames and Trusses you agree to the following

1) Truss designs are null and void if production is being completed by parties other than VIP Frame and Trusses

2) Truss design must be reviewed by the Architect and Engineer engaged on the project to ensure any crucial details are translated to the architectural and structural plans

3) Architect and Engineer review should also confirm plans have been interpreted correctly and the design is fit for purpose

4) Any bracing specified is indicative of location only and must be installed as per the manufacturers guidelines

MiTek New Zealand Limited

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

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

www.miteknz.co.nz

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **VIP Frames & Trusses**

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

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **400623** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited, **Date: Wednesday, 16 April 2025**



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

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	~MSGx45 H1.2	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron .5mm	Material:	Gib Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
GE1	1D	3370	25.000	900	J12	1	2331	25.000	900	*R2	4	913	25.000	900	S2	2	7385	25.000	900	J21	1	2267	25.000	900
*H1	2	7942	18.249	900	J14	1	1431	25.000	900	*R3	4	913	25.000	900	S5	1	3370	25.000	900	J26	1	2267	25.000	900
*H2	1	3635	18.249	900	J15	1	1431	25.000	900	*R4	1	1144	25.000	900	S6	1	3370	25.000	900	T3	1	7385	25.000	900
*H3	1	3242	18.249	900	J16	1	3231	25.000	900	*R5	1	913	25.000	900	S7	1	5060	25.000	900	J6	1	3231	25.000	900
*H4	2	5306	18.249	900	J17	1	3231	25.000	900	*R6	1	1080	25.000	900	S8	2	5060	25.000	900	J11	1	3231	25.000	900
J1	1	3231	25.000	900	J18	1	3167	25.000	900	*R7	1	1080	25.000	900	T2	1	10108	25.000	900	J19	1	3167	25.000	900
J2	2	3231	25.000	900	J20	1	2267	25.000	900	*R8	1	6260	25.000	900	T4	1	7385	25.000	900	J24	1	3167	25.000	900
J3	1	3231	25.000	900	J22	1	1367	25.000	900	*R9	5	1305	0.000	760	V1	1	2275	25.000	900	S4	1	6380	25.000	553
J4	1	3231	25.000	900	J23	1	1367	25.000	900	*R10	2	1305	0.000	760	V2	1	1375	25.000	900	S3	1	6380	25.000	900
J5	1	3231	25.000	900	J25	1	2267	25.000	900	*R11	1D	1305	0.000	900	V3	1	1402	25.000	900	T1	1	10108	25.000	900
J7	1	2331	25.000	900	J27	1	1367	25.000	900	*R12	1	2350	25.000	900	V4	1	2302	25.000	900					
J9	1	1431	25.000	900	J28	1	1367	25.000	900	*R13	1D	2350	25.000	900	J8	1	2331	25.000	900					
J10	1	1431	25.000	900	*R1	1	1144	25.000	900	S1	11	10108	25.000	900	J13	1	2331	25.000	900					

Total quantity : 88

The computer design input has been carried out by:

Signed: ..... Date: ...Wednesday, 16 April 2025....

Name of Detailer: Anton Musson Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

TRUSS FIXING SELECTION REPORT - Characteristic Loads

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

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
GE1	1D	3370	K	0.995	0.572	Wide		No fixing selected
			A	0.645	0.153	Wide		No fixing selected
			I	1.057	0.847	Wide		No fixing selected
			H	0.865	0.671	Wide		No fixing selected
			G	1.438	0.983	Wide		No fixing selected
			J	1.131	0.000	Wide		No fixing selected
*H1	2	7942						Refer NZS3604:2011 Tables 15.6
*H2	1	3635						Refer NZS3604:2011 Tables 15.6
*H3	1	3242						Refer NZS3604:2011 Tables 15.6
*H4	2	5306						Refer NZS3604:2011 Tables 15.6
J1	1	3231	B	4.322	0.739	Cross	1	Pair of Wire Dog Staples
			G	0.607	0.416	Butt	1	Pair of 3.15d Nails
			D	3.662	2.462	Cross	1	Pair of Wire Dog Staples
			I	0.760	0.266	Cross	1	Pair of Wire Dog Staples
			E	1.527	1.100	Cross	1	Pair of Wire Dog Staples
J2	2	3231	B	4.452	1.267	Cross	2	Pair of Wire Dog Staples
			F	2.225	1.357	Butt	2	JH 47x90
			D	1.003	0.664	Butt	2	JH 47x90
J3	1	3231	B	4.253	0.944	Cross	1	Pair of Wire Dog Staples
			E	0.447	0.341	Butt	1	Pair of 3.15d Nails
			D	4.017	2.628	Cross	1	Pair of Wire Dog Staples
			G	0.460	0.201	Cross	1	Pair of Wire Dog Staples
J4	1	3231	B	4.397	1.244	Cross	1	Pair of Wire Dog Staples
			D	2.598	1.745	Butt	1	JH 47x90
			F	0.787	0.299	Cross	1	Pair of Wire Dog Staples
J5	1	3231	B	4.318	0.973	Cross	1	Pair of Wire Dog Staples
			E	0.446	0.342	Butt	1	Pair of 3.15d Nails
			D	3.757	2.526	Cross	1	Pair of Wire Dog Staples
			G	0.756	0.274	Cross	1	Pair of Wire Dog Staples
J7	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J9	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J10	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J12	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J14	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J15	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J16	1	3231	A	2.914	0.599	Cross	1	Pair of Wire Dog Staples
			E	0.599	0.416	Butt	1	Pair of 3.15d Nails
			C	4.235	2.688	Cross	1	Pair of Wire Dog Staples
			F	0.548	0.122	Cross	1	Pair of Wire Dog Staples
			D	1.571	1.103	Cross	1	Pair of Wire Dog Staples
J17	1	3231	B	4.369	0.995	Cross	1	Pair of Wire Dog Staples
			E	0.444	0.344	Butt	1	Pair of 3.15d Nails
			D	4.364	2.779	Cross	1	Pair of Wire Dog Staples
J18	1	3167	B	4.388	1.244	Cross	1	Pair of Wire Dog Staples
			D	3.160	1.980	Butt	1	JH 47x90
J20	1	2267	A	2.323	0.846	Cross	1	Pair of Wire Dog Staples
			E	1.701	0.988	Butt	1	JH 47x90
			C	0.591	0.403	Butt	1	Pair of 3.15d Nails
J22	1	1367	B	2.639	0.575	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.916	0.777	Butt	1	JH 47x90
J23	1	1367	B	3.056	0.240	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.148	0.964	Cross	1	Pair of Wire Dog Staples
J25	1	2267	B	3.491	0.914	Cross	1	Pair of Wire Dog Staples
			F	1.588	0.967	Butt	1	JH 47x90
			D	0.670	0.411	Butt	1	Pair of 3.15d Nails
J27	1	1367	B	2.650	0.585	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.464	Butt	1	JH 47x90
			D	0.583	0.343	Butt	1	Pair of 3.15d Nails
J28	1	1367	B	3.092	0.245	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.144	1.000	Cross	1	Pair of Wire Dog Staples
*R1	1	1144						Refer NZS3604:2011 Tables 15.6
*R2	4	913						Refer NZS3604:2011 Tables 15.6
*R3	4	913						Refer NZS3604:2011 Tables 15.6
*R4	1	1144						Refer NZS3604:2011 Tables 15.6
*R5	1	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1080						Refer NZS3604:2011 Tables 15.6
*R7	1	1080						Refer NZS3604:2011 Tables 15.6
*R8	1	6260						Refer NZS3604:2011 Tables 15.6
*R9	5	1305						Refer NZS3604:2011 Tables 15.6
*R10	2	1305						Refer NZS3604:2011 Tables 15.6
*R11	1D	1305						Refer NZS3604:2011 Tables 15.6
*R12	1	2350						Refer NZS3604:2011 Tables 15.6
*R13	1D	2350						Refer NZS3604:2011 Tables 15.6
S1	11	10108	B	9.159	5.111	Cross	11	CT400
			J	9.159	5.111	Cross	11	CT400
S2	2	7385	B	4.523	1.775	Cross	2	Pair of Wire Dog Staples
			N	0.925	0.970	Butt	2	JH 47x90
			K	8.575	5.861	Cross	2	CT400
S5	1	3370	B	3.699	1.904	Cross	1	Pair of Wire Dog Staples
			J	4.068	2.028	Cross	1	Pair of Wire Dog Staples
			F	2.250	0.956	Cross	1	Pair of Wire Dog Staples
S6	1	3370	B	3.665	1.870	Cross	1	Pair of Wire Dog Staples
			I	4.324	2.159	Cross	1	Pair of Wire Dog Staples
			F	1.064	0.818	Cross	1	Pair of Wire Dog Staples
S7	1	5060	B	3.498	1.534	Cross	1	Pair of Wire Dog Staples
			F	1.122	0.492	Wide		No fixing selected
			H	4.757	3.090	Wide		No fixing selected
S8	2	5060	B	5.039	2.592	Cross	2	Pair of Wire Dog Staples
			F	4.133	2.525	Cross	2	Pair of Wire Dog Staples
T2	1	10108	B	9.035	5.136	Cross	1	CT400
			I	9.035	5.136	Cross	1	CT400
T4	1	7385	B	4.986	2.271	Cross	1	Pair of Wire Dog Staples
			N	2.297	0.899	Butt	1	JH 47x90
			K	6.526	4.324	Cross	1	CT400
V1	1	2275	A			Wide		No fixing selected
V2	1	1375	A			Wide		No fixing selected
V3	1	1402	A			Wide		No fixing selected
V4	1	2302	A			Wide		No fixing selected
J8	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J13	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J21	1	2267	A	2.480	1.183	Cross	1	Pair of Wire Dog Staples
			E	1.725	1.054	Butt	1	JH 47x90
J26	1	2267	B	3.652	1.245	Cross	1	Pair of Wire Dog Staples
			F	1.597	1.037	Butt	1	JH 47x90
T3	1	7385	B	4.403	1.916	Cross	1	Pair of Wire Dog Staples
			M	13.702	8.722	Cross	1	CT400
			Q	3.704	2.686	Butt	1	JH 47x90
J6	1	3231	B	5.668	2.358	Cross	1	Pair of Wire Dog Staples
			H	4.122	2.637	Butt	1	JH 47x90

VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J11	1	3231	B	4.017	2.220	Cross	1	Pair of Wire Dog Staples
			F	3.910	2.915	Cross	1	Pair of Wire Dog Staples
J19	1	3167	B	5.652	2.278	Cross	1	Pair of Wire Dog Staples
			F	4.084	2.503	Butt	1	JH 47x90
J24	1	3167	B	5.541	2.265	Cross	1	Pair of Wire Dog Staples
			F	3.926	2.487	Butt	1	JH 47x90
S4	1	6380	A	5.659	5.127	Cross	1	CT400
			E	5.979	3.859	Cross	1	CT400
S3	1	6380	A	10.408	6.430	Cross	1	CT400
			E	11.250	6.490	Cross	1	CT400
T1	1	10108	B	17.770	10.733	Cross	1	CT400
			G	14.701	8.763	Cross	1	CT400

Fixing List

Qty	Selected Fixing
59	Pair of Wire Dog Staples
19	Pair of 3.15d Nails
23	JH 47x90
34	CT400
12	No fixing selected

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

Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

Design Certificate

PROJECT

Project Name	**Brendon Esler Builders**
Project Address	Lot 79 52 Benn Street , Amberley

CALCULATION SUMMARY

Calculation Name	Product Code	Description	Product Length*
Garage Door	PL12H1-350100	Prolam 315x90 Non-Visual PL12 H1.2	5.0 m
VERANDA	PL10H1-200100	Prolam 190x90 Non-Visual PL10 H1.2	3.2 m

*Confirm required length with architectural drawings and/or on site prior to ordering. Non-bracing post lengths noted exclude footing embedment (if any).

1) GARAGE DOOR

Product Code	**PL12H1-350100**	Calculator	Lintel Supporting Multiple Girder Trusses
Product Description	Prolam 315x90 Non-Visual PL12 H1.2	Product Length	5.0 m

Lintel Span	**4.8 m**
Loaded Dimension	**3.2 m**
Supported Roof Width	**6.2 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Wet in Service	**No**

Snow Zone	**N4**
Site Elevation	**100**
Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**315 mm**
Member Width	**90 mm**
Max. Movement	**10.8 mm**
Deflection	**5.1 mm**
Capacity Ratio	**1.1**
Rigidity Ratio	**1.1**
Support Reaction	**12.3 kN**
Uplift Restraint Required	**6.5 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

2) VERANDA

Product Code	**PL10H1-200100**	Calculator	Lintel Roof and Ceiling
Product Description	Prolam 190x90 Non-Visual PL10 H1.2	Product Length	3.2 m

Lintel Span	**3.0 m**
Loaded Dimension	**2.4 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Snow Zone	**N4**
Site Elevation	**100**
Wet in Service	**No**

Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**190 mm**
Member Width	**90 mm**
Max. Movement	**4.9 mm**
Deflection	**2.7 mm**
Capacity Ratio	**1.8**
Rigidity Ratio	**2.4**
Support Reaction	**5.4 kN**
Uplift Restraint Required	**2.9 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

PRODUCER STATEMENT

Tasman Consulting Engineers Limited has been engaged by Prowood Limited to provide the design services that are as used for the Prolam on-line calculator (the Prolam Specifier). The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS 1170, NZS AS 1720.1:2022 and with reference to NZS 3604:2011. This producer statement covers that design work.

Provided that the Prolam Specifier has been used correctly and that all entered values are correct I believe, on reasonable grounds, that the resulting design will meet the requirements of NZBC clause B1 (structure) as an alternative means of verification.

Substitution of the Prowood products listed is not provided for and if substitution occurs then this statement is nullified.

28 March 2025 (3.1.0)

David King
ME(civil) CMEngNZ CPEng(no 145511) IntPE(NZ)
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050

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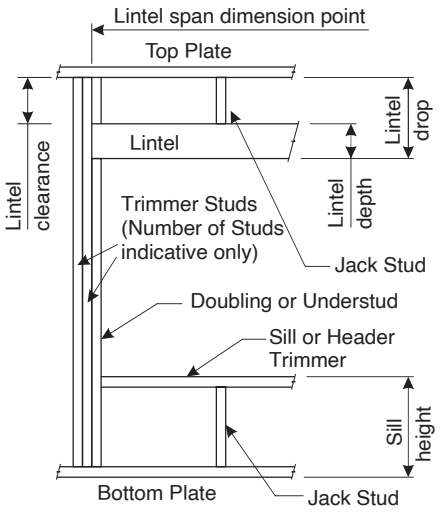
LINTEL FIXING SCHEDULE

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 0.20kPa
- 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
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	H	-	-

NOTES:

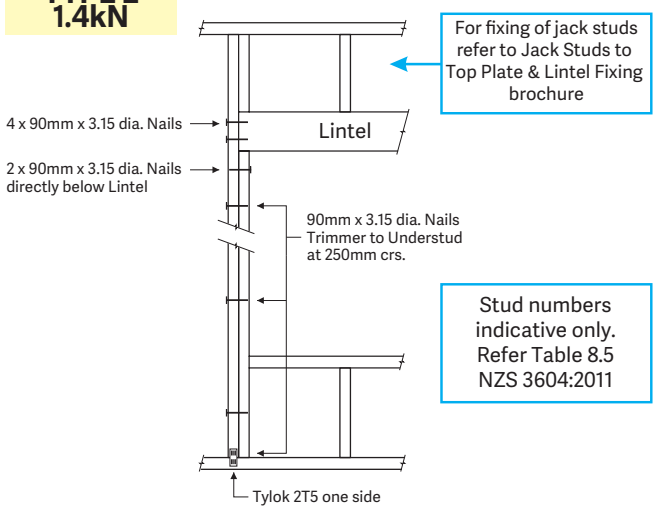
1. Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
2. Assumed girder truss is at mid-span or middle third span of lintel
3. Use similar fixings for both ends of lintel
4. All other cases require specific engineering design

Selection Chart for Lintel Fixing											
Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	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	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	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	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	F	G	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-
5.4	2.0	F	F	G	H	H	E	F	G	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-

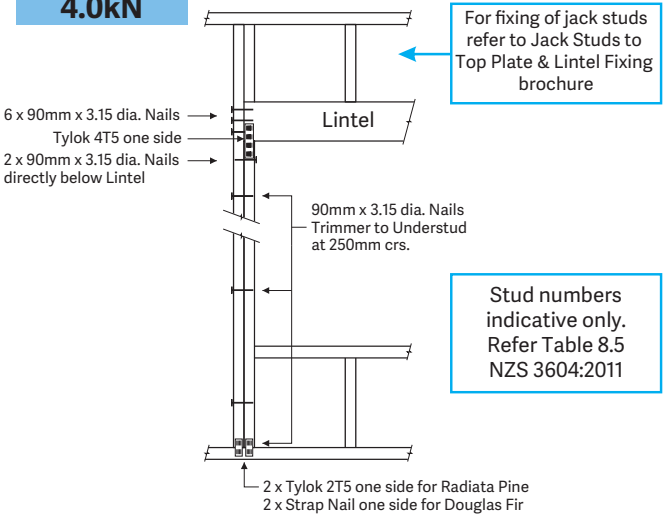
LINTEL FIXING OPTIONS

(Characteristic Uplift)

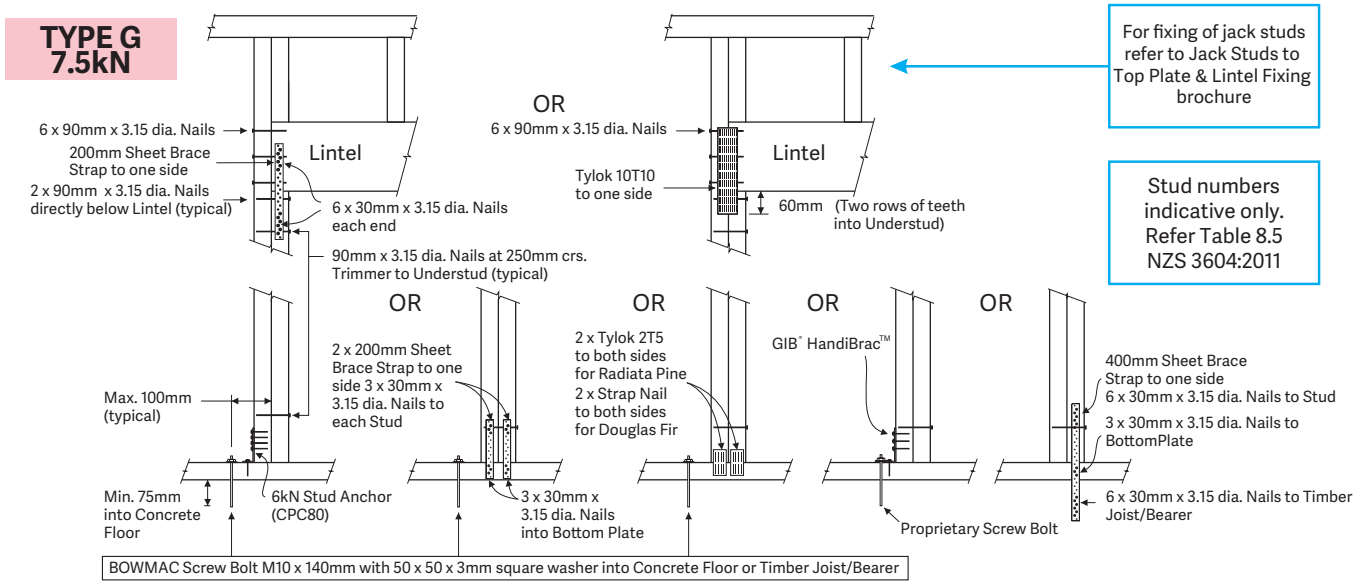
TYPE E 1.4kN



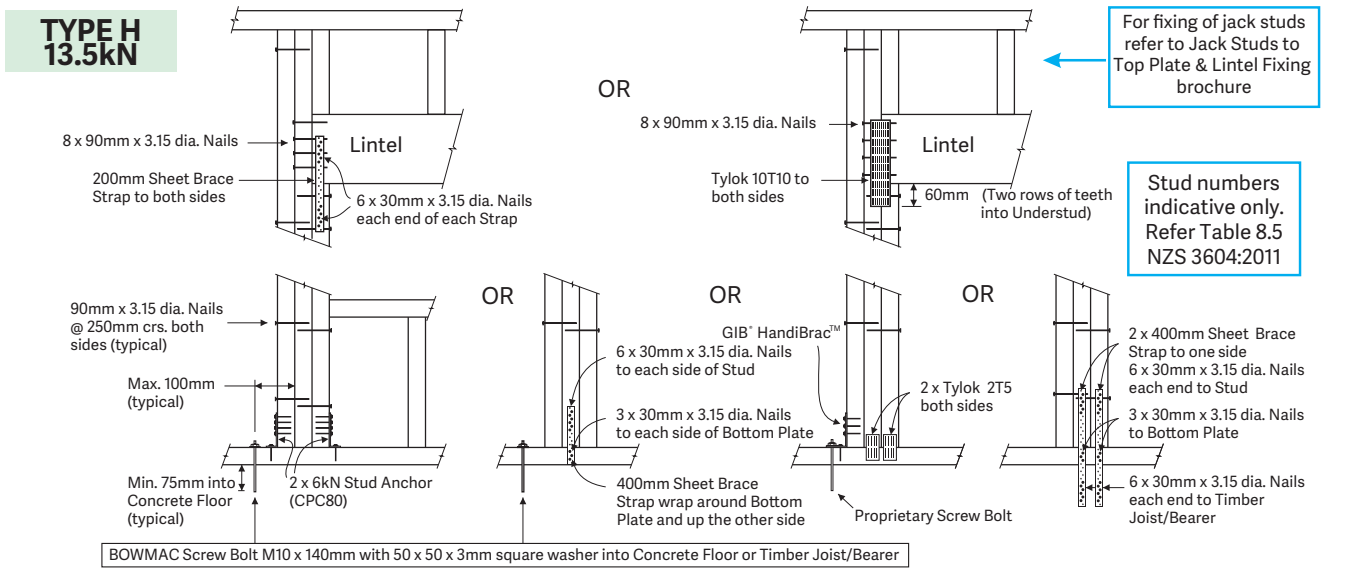
TYPE F 4.0kN



TYPE G 7.5kN



TYPE H 13.5kN



MiTek® Truss: S1

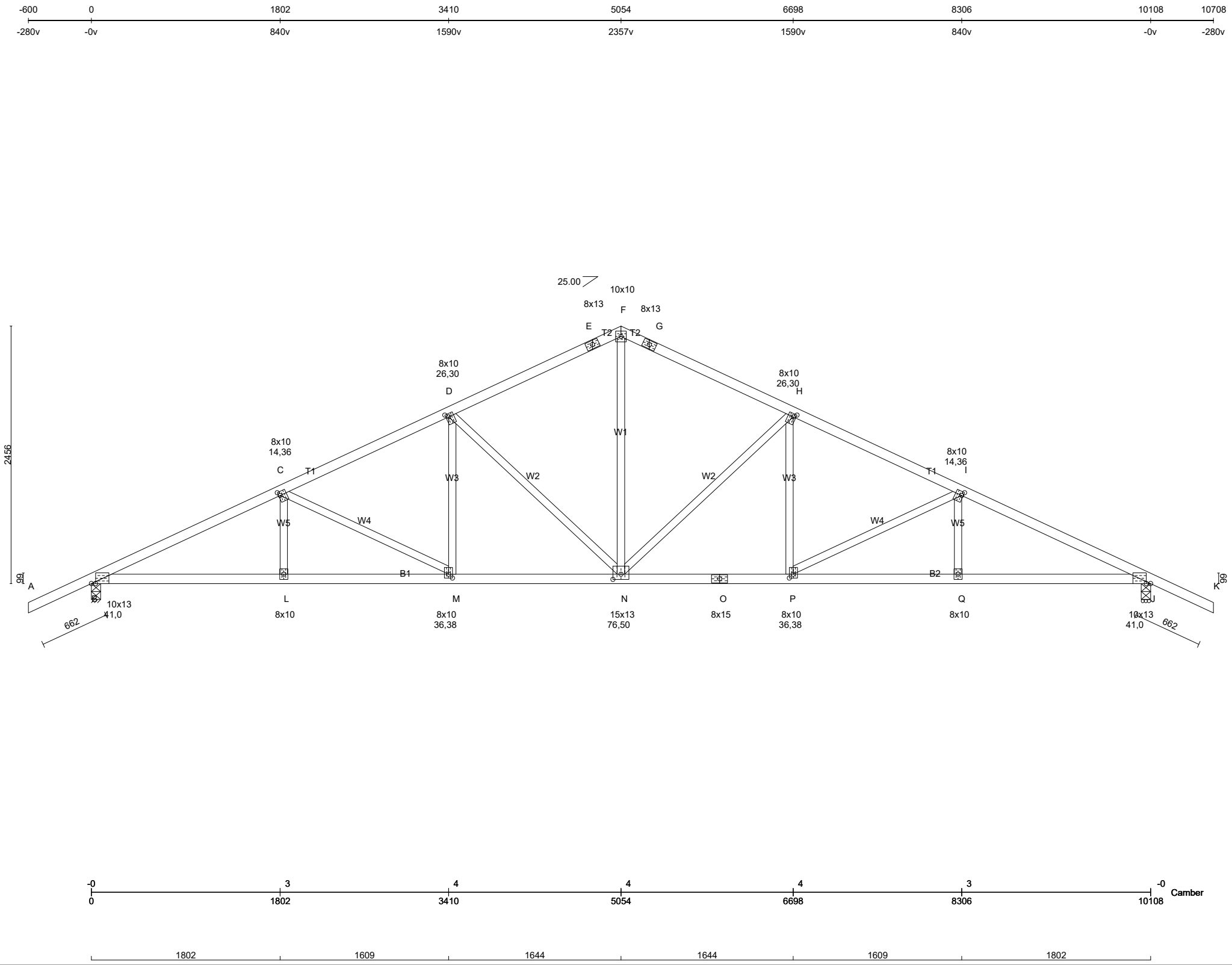
VIP Frames & Trusses

Qty: 11 of 11 **Ply: 1** **Bundle: None**
Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

Client: Brendon Esler Builders
Phone:

Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:



*** Designed with warnings ***

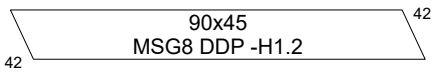
Uplift at joint(s) B and J exceeds the capacity of two wire dogs. Please ensure that adequate fixing is provided
All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2736 mm

CHORDS
All: 90x45 DDP MSG8 H1.2

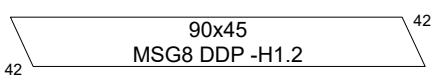
WEBS
All: 70x45 DDP MSG6 H1.2

CONNECTORS
176 of 176/GNQ-8x10
22 of 22/GNQ-10x10
44 of 44/GNQ-8x13
22 of 22/GNQ-8x15
44 of 44/GNQ-10x13
22 of 22/GNQ-15x13

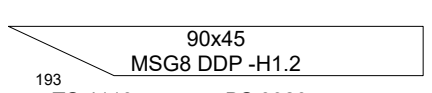
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Piece: T2 — 22/22 Off


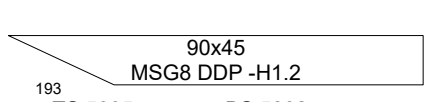
OL:342 TS:300 BS:300

Piece: T1 — 22/22 Off


OL:5980 TS:5939 BS:5939

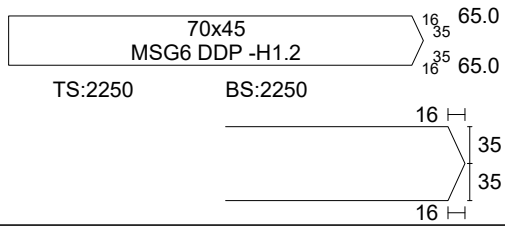
Piece: B2 — 11/11 Off


OL:4113 TS:4113 BS:3920

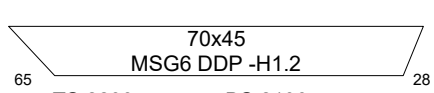
Piece: B1 — 11/11 Off


OL:5995 TS:5995 BS:5802

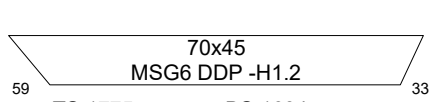
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Piece: W1 — 11/11 Off


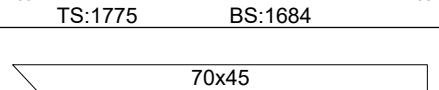
OL:2267 TS:2250 BS:2250

Piece: W2 — 22/22 Off


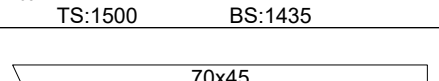
OL:2200 TS:2200 BS:2106

Piece: W4 — 22/22 Off


OL:1775 TS:1775 BS:1684

Piece: W3 — 22/22 Off


OL:1500 TS:1500 BS:1435

Piece: W5 — 22/22 Off


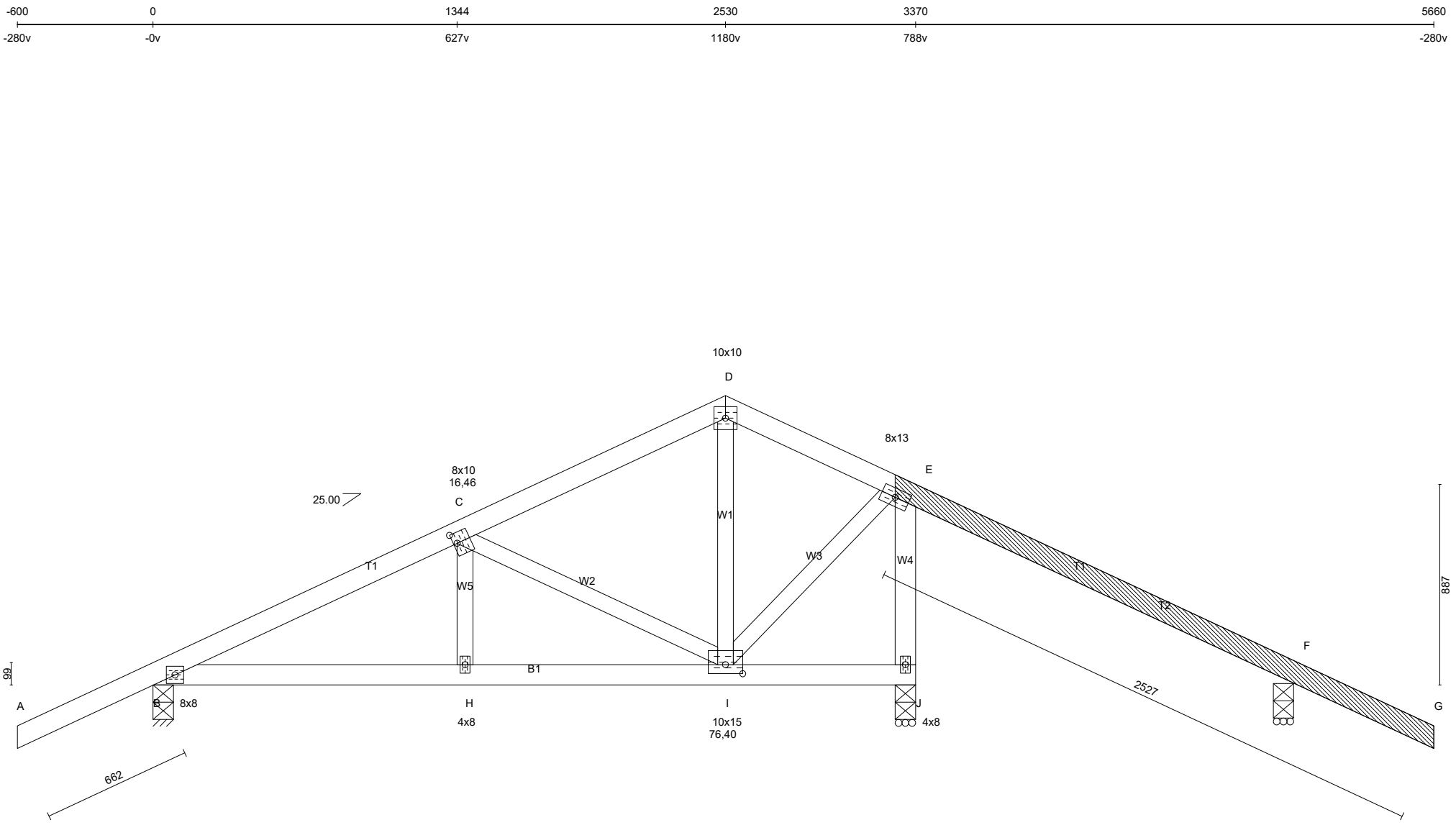
OL:750 TS:750 BS:717

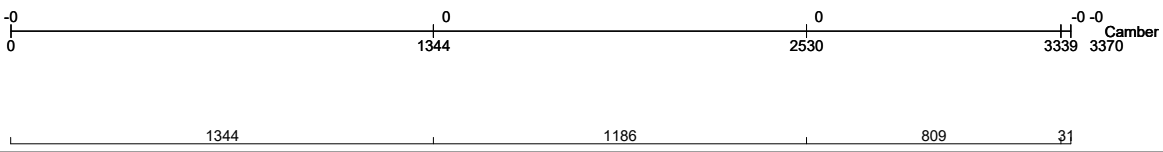
Qty: 1 of 1 **Ply: 1** **Bundle: None**
Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

Client: Brendon Esler Builders
Phone:

Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:





Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1559 mm

CHORDS		**WEBS**	
All:	90x45 DDP MSG8 H1.2	**All:**	70x45 DDP MSG6 H1.2
CONNECTORS			
4 of 4/GNQ-4x8	2 of 2/GNQ-8x8	2 of 2/GNQ-8x10	2 of 2/GNQ-8x13
2 of 2/GNQ-10x10	2 of 2/GNQ-10x15		
SCAB NAILING			
T2	2 rows of 90 x 2.8 dia. nails at 80 mm		

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 1/1 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:2668 TS:2626 BS:2626

Piece: T1 — 2/2 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:3495 TS:3453 BS:3453

Piece: B1 — 1/1 Off
90x45 MSG8 DDP -H1.2
25.0 | 193 | 90.0
OL:3370 TS:3370 BS:3177

===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 1/1 Off
70x45 MSG6 DDP -H1.2
50.0 | 59 | 33 | 65.0
OL:1270 TS:1270 BS:1178

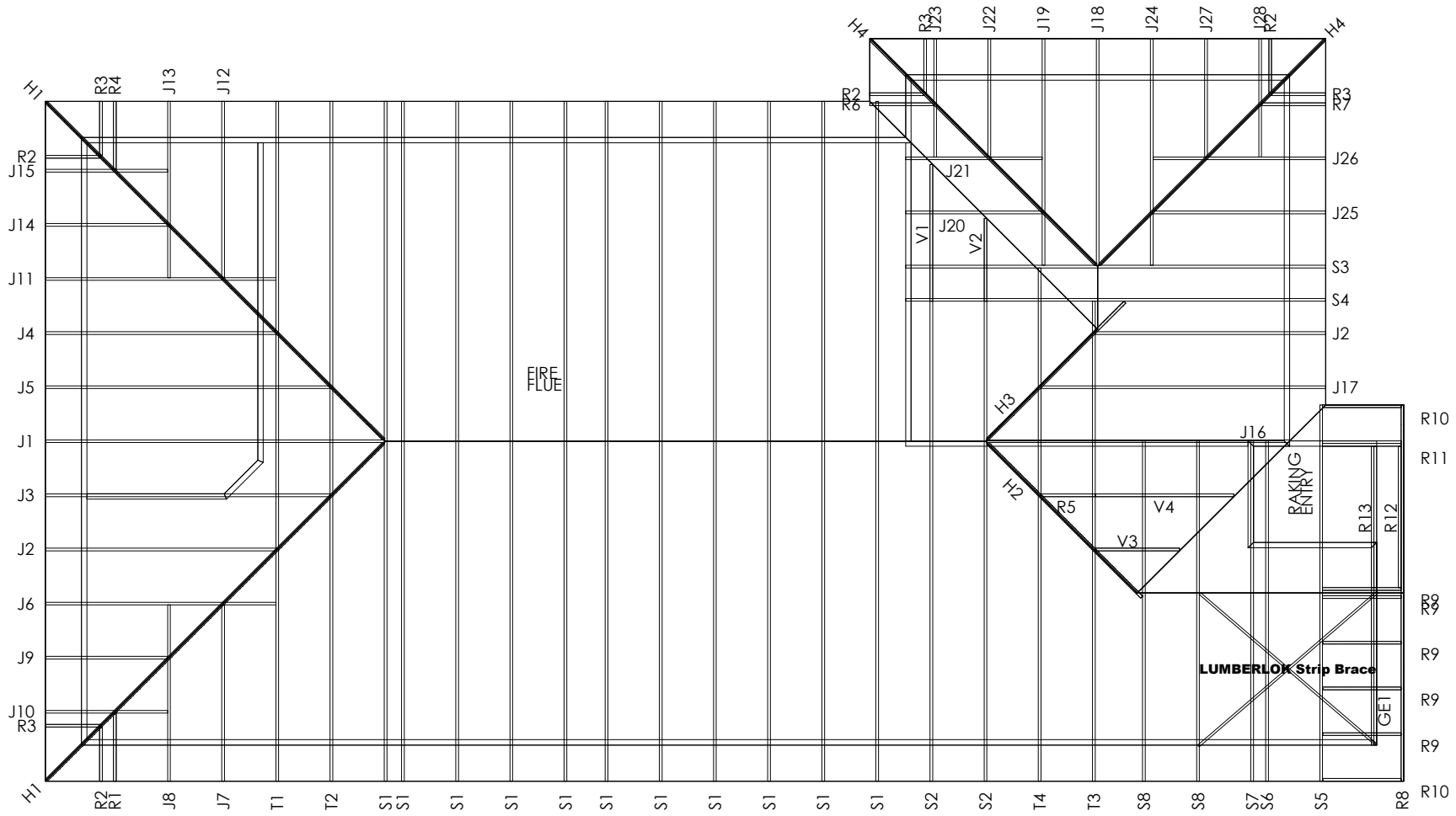
Piece: W1 — 1/1 Off
90.0
70x45 MSG6 DDP -H1.2
16 | 35 | 65.0
16 | 35 | 65.0
OL:1090 TS:1073 BS:1073
16
35
35
16

Piece: W3 — 1/1 Off
70x45 MSG6 DDP -H1.2
44.0 | 72 | 24 | 71.0
OL:1029 TS:1029 BS:932

Piece: W5 — 1/1 Off
70x45 MSG6 DDP -H1.2
65.0 | 33 | 90.0
OL:537 TS:537 BS:504

Piece: W4 — 1/1 Off
90.0
90x45 MSG8 DDP -H1.2
42 | 65.0
OL:740 TS:698 BS:740

Roof Bracing



VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

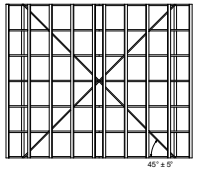
Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

Pitch: 25.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.441

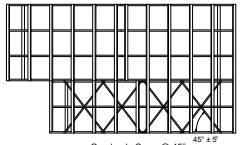
Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson
DATE 16 Apr,2025 PAGE 1 of

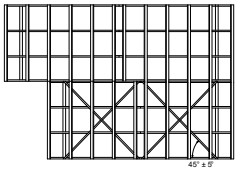
Roof Bracing Details



Single Cross @ 45°



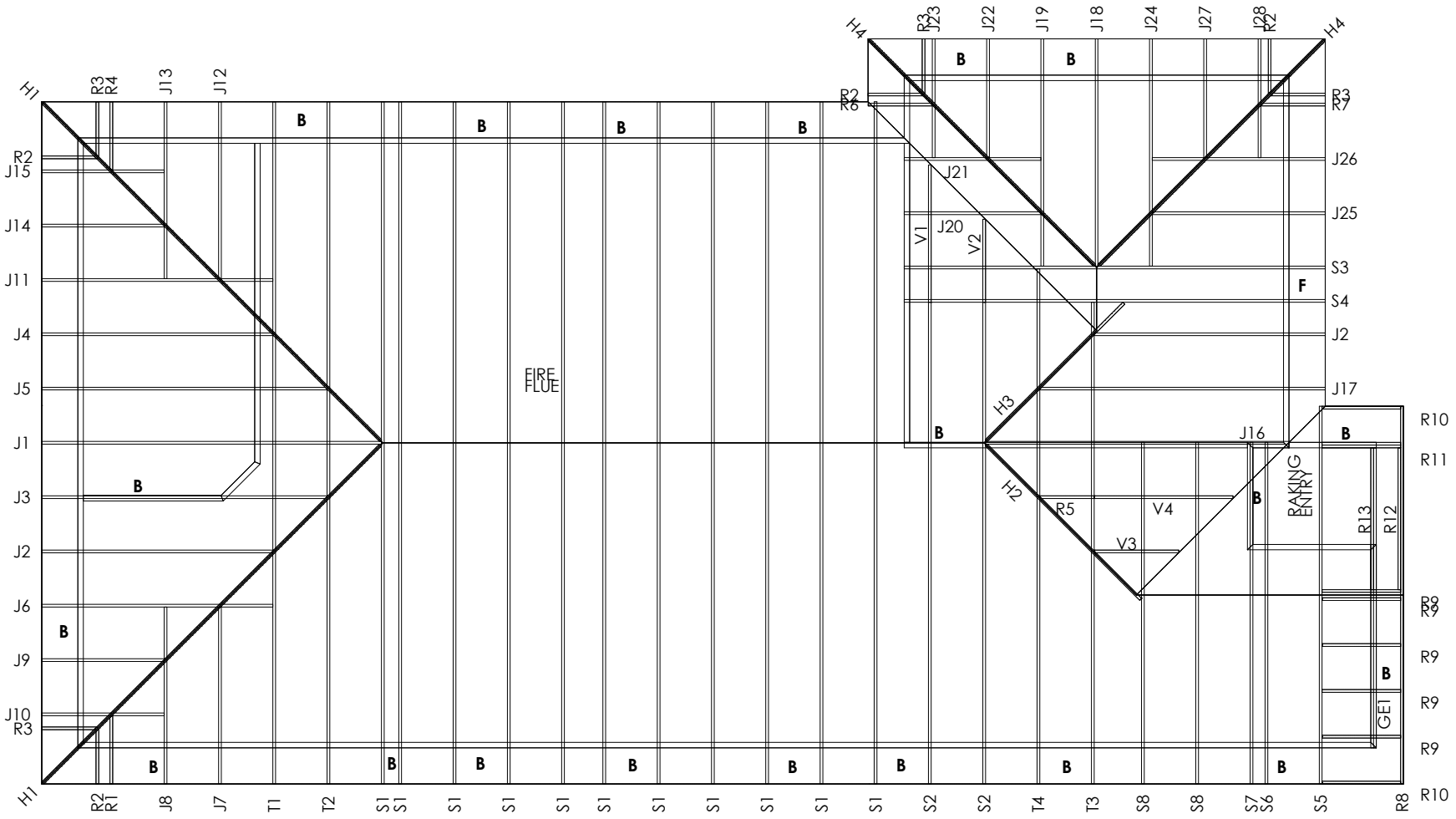
Quadruple Cross @ 45°



Double Cross @ 45°
(as diagram above)

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

All internal wall shown on this layout are considered to be Load Bearing(loads not exceeding 10 kN)
No slab thickening required



VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

Pitch:	25.000
Roof Material:	Galv Iron .5mm
Soffit Overhang:	600
Wind Area:	High
Snow Load:	0.441

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson

DATE 16 Apr,2025 PAGE 1 of

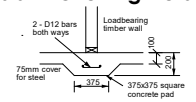
These lintels have been sized as per the GANGLAM and FLITCH BEAM selection manuals as provided by MiTek NZ Ltd.

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

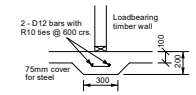
Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	SG8
B	140x90	PL10
C	190x90	PL10
D	240x90	PL10
E	290x90	PL10
F	315x90	PL12

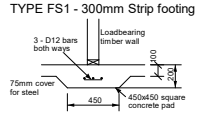
Slab Thickening Details



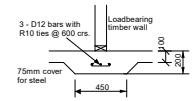
TYPE FP1 - 375x375mm Pad



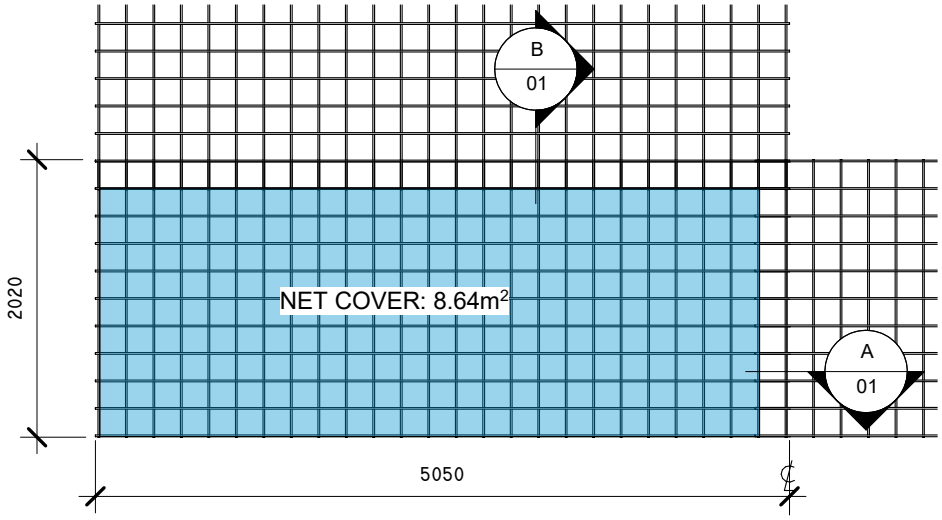
TYPE FS1 - 300mm Strip footing

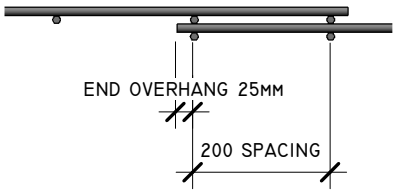


TYPE FP2 - 450x450mm Pad

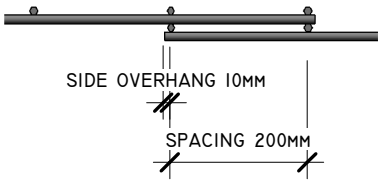


TYPE FS2 - 450mm Strip footing





A Section A
1 : 10



B Section B
1 : 10

MAIN WIRE DIAMETER	6.10mm
LONG WIRE LENGTH	5050mm
SHORT WIRE LENGTH	2020mm
SHEET GROSS	10.201m²
SHEET NET	8.64m²
SPACING	200mm
SIDE OVERHANG	10mm
END OVERHANG	25mm
LAP	200mm*

*This lap has been determined by extensive test programme to validate it's physical performance and verified by a certified engineer

STRENGTH (KN/METER WIDTH)	73.0617
WIRE GRADE	500E
TOTAL WEIGHT (KG)	24.78
KG'S PER m²	2.29385m²

YIELD STRENGTH	≥500Mpa & ≤600MPa
CROSS SECTION	146.12
UNIFORM ELONGATION	≥10%

United Steel Ductile SE62 Standard Mesh

M62

Reference Designer

Manufactured in accordance with ASNZS4671:2019 Steel Reinforcing Materials. Batch test certificates available on request. Lap diagrams in accordance with NZS3103:2006 Concrete Structures Standard. Please consult your engineer for your project specific lap splice.

Drawn by. United Steel

United Steel

Date MAR 2023

Scale As indicated

Sheet **01**

BRANZ Appraised
Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY



Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.

Kingspan Insulation NZ Limited
11 Turin Place
Otara
Auckland 2013
Tel: 09 273 3727
Free phone: 0800 806 595
Email: info@kingspaninsulation.co.nz
www.thermakraft.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Building Regulations

New Zealand Building Code (NZBC)

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

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

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

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

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

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

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

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

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

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

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

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

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

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

BRANZ

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

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Water Supply

- Urban Main
- Urban Service Connection
- Urban Sub Main
- Point on main
- Fire Hydrant
- Manifold
- Valve less than or equal to 50mm
- Valve greater than 50mm

Sewer

- Gravity Main
- Service
- Manhole

Stormwater

- Gravity Main
- Service
- Manhole
- Soak Pit
- Sump - Bubble Up
- Sump - Double
- Sump - Entry

Other

- Parcel
- Hurunui Rating Unit
- Settlement Boundary



52 Benn Street, Amberley

Date:	25/07/2025
Scale:	1:564
Print Size:	A4 Landscape
Projection:	NZTM
Produced by:	arcservice

Hurunui District Council does not guarantee that the data in this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequences which may arise from relying on any information depicted. Cadastral and topographic data sourced from LINZ. Crown Copyright Reserved.

HURUNUI District Council

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley | 7441 | 66 Carters Road | Amberley | 7410
Phone 03 314-8816 | Fax 03 314-9181 | Email info@hurunui.govt.nz
Web hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil
Skype hdc_customer_services | twitter.com/hurunuidc

31 July 2025

UWC Limited
C/- J Harrison
12 Murfitt Street
Pegasus 7612

Dear Jeremy

BUILDING CONSENT BC250252 - VEHICLE CROSSING BOND LETTER

In order to promote the safe and efficient use and development of the transportation network, the Hurunui District Plan has rules for vehicle access onto properties. No activity, including the construction of a dwelling, can be commenced unless the property is provided with adequate site access in terms of Rule 8.4.3 of the Hurunui District Plan.

In order to enter into the vehicle crossing bond agreement with the council to allow building work to proceed, you must:

Enter into the attached bond agreement with the Council to secure compliance with the vehicle crossing standards of the District Plan. Once the bond agreement has been entered into, and the Council has issued the building consent, building works may proceed. Please find attached a copy of the bond documents so that you can enter into the bond agreement with the Council. Please complete two copies and return one copy to the Council with **$3,260**. The bond is made up of a refundable $2700 and a non-refundable fee of $560 for administration and inspections.

In order for building inspections to be booked the following 3 items need to be completed to enter into the council's vehicle crossing bond.

1. **Signed bond document**,
2. **Paid bond and inspection fee,**
3. **Completed Temporary Vehicle Crossing**.

A guideline on how to complete your vehicle crossing has been provided with this letter.

The construction of the vehicle crossing must be undertaken within 12 months of the bond being entered into or before the use of the proposed activity commences, whichever is the lesser.

The vehicle crossing bond payment is to be made into the Hurunui District Council's bank account number: **03 0802 0946666 00.** Please ensure the payment details refer to the building consent number noted in this letter and that the payment is for a vehicle crossing bond. **Please also ensure that the bond is only paid once through the building consent invoice or to the provided bank account on the bond documentation as any refunds may take up to 31 days to be returned.**

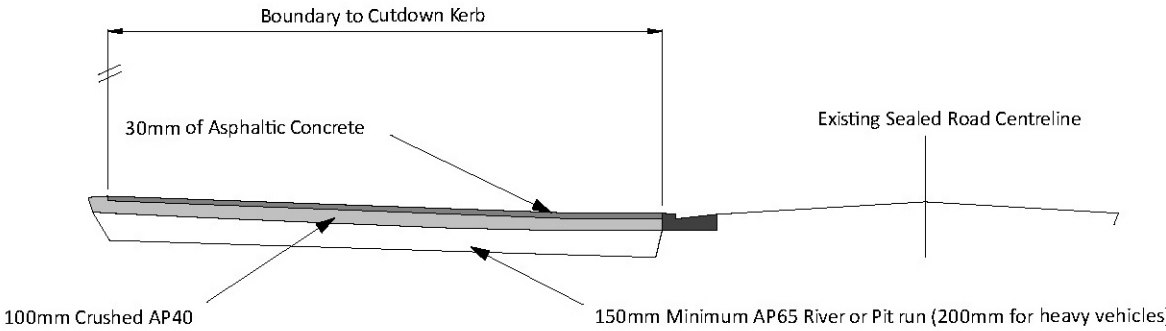
Please do not hesitate to contact the planning team (planning@hurunui.govt.nz) should you wish to discuss the options available to you in further detail.

Yours faithfully

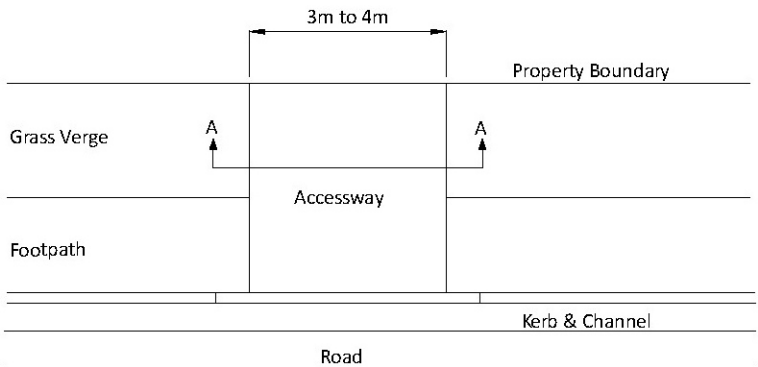


Aidan Chrystal
Planner

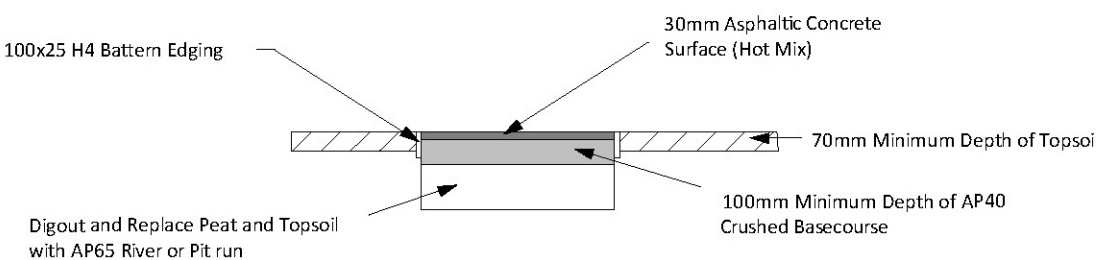
Encl.
Attachment 1: Vehicle crossing design and construction standards.
Attachment 2: Bond documentation
Attachment 3: Bond Guide



Typical Longsection



Typical Plan



Cross Section A-A

Attachment 2: Bond documentation

ACCESSWAY CONSTRUCTION BOND
BUILDING CONSENT BC250252

BY THIS BOND made the _____ day of _____ 2025

BETWEEN the Hurunui District Council (called "the Council") of the one part

AND Ian Bracken Cassels as Director of UWC Limited (the "Owners") 198 Sims Road, Otaki (with his/her/their successors and assigns called "the Owners")

BACKGROUND:

A. The Owners wishes to undertake building works on the property situated at 52 Benn Street, Amberley, legal description – Lot 79 DP 587128 (hereinafter called "the Land").

B. The Council's District Plan for the Land provides that the creation of any new vehicle crossing, or the use of an existing vehicle crossing for a new activity, (including the relocation of such) shall meet the standards of Rule 8.4.2 of the Hurunui District Plan.

C. The Applicant has applied for a building consent (BC250252) under the Building Act 2004. In order for the building consent to comply with Rule 8.4.2 of the District Plan, the Owner agrees to provide a Bond to secure the carrying out of the vehicle crossing construction. The construction of the vehicle crossing shall be undertaken within 12 months of the bond being entered into or before the use of the proposed activity commences, whichever is the lesser.

D. The estimated cost of the construction and formation of the vehicle crossing to the required standard under the District Plan is estimated to be the sum of $2700.

CONDITIONS OF BOND:

Urban Vehicle Crossing
A vehicle crossing shall be provided to the Land in accordance with Figure 8.11 as per the District Plan.

The bond will not be deemed to be given effect to until the following requirements have been completed:

1. The bond has been paid,
2. A completed and signed bond document has been returned to the Council,
3. A Corridor Access permit has been applied for and obtained from Council,
4. A temporary crossing on the site has been approved by the Consents Engineer.

THIS AGREEMENT RECORDS:

1. The Owners has deposited with the Council the sum of **$3,260** as surety for this Bond and agree that the Council may hold the said sum of money until the conditions of this Bond have been fully met or the moneys shall have otherwise been disbursed in accordance with the terms of this Agreement.

2. The Owners acknowledges that the following vehicle crossing inspections are compulsory and the owner is required to give the Councils engineer two working days' notice prior to any inspection.

   - Pre-construction
   - Excavation to sub grade
   - Pre-Seal
   - Final

3. The Owners shall complete the Work to the reasonable satisfaction of the Council within 12 months of the date of this bond or within such longer period as the Council may approve.

4. The sum deposited with the Council includes a non-refundable fee of $560 for administration and inspection costs incidental to the preparation and release of this Bond.

5. The Owners acknowledges that their liability under this Agreement shall not be released, varied, or affected in any way by any delay, extension of time, or other indulgence suffered or permitted by the Council or by any failure or neglect by the Council to enforce the terms of this Agreement.

   5.1 If the Owners shall be in breach of any of the obligations under this Agreement, it shall be lawful for the Council, at the sole option of the Council to arrange for the satisfactory completion of all of the works and for this purpose the Council may employ its servants or agents or such contractors as the Council may see fit.

   5.2 The Owners shall pay all costs incurred by the Council in arranging for the completion of those works and the Owners shall be liable for any sum so expended by the Council or any expenses incurred by the Council in excess of the sum bonded.

   5.3 The Council may apply the moneys deposited with the Council towards payment of all such costs and expenses and in the event that the sum deposited with the Council is not sufficient to carry out the said works the Council may recover any excess from the Owner as a liquidated debt.

   5.4 In the event that costs and expenses incurred by the Council for the formation of the vehicle crossing are less than that sum deposited with the Council then the Owners shall be entitled to the repayment of the balance in accordance with the provisions in Clause 5.

6. Upon completion of the work to the reasonable satisfaction of the Council in accordance with the District Plan the Owners shall be entitled to repayment to them of the moneys deposited with the Council but without any entitlement to interest and any of the costs payable under clause 5 of this bond.

7. In the event of the Owner not proceeding with the building works then the sum bonded will be refunded to them in accordance with Clause 5.

8. The Owners shall pay any costs and disbursements incurred by the Council for additional inspections and in the enforcement by the Council of any of its rights under this Agreement.

9. If there is dispute between the parties arising out of, or in connection with, this bond, neither of the parties is to commence any proceedings relating to that dispute until the following procedure had been complied with:

    9.1 The party claiming a dispute has arisen must give written notice to the other party specifying the nature of the dispute.

    9.2 The parties will endeavour, in good faith to resolve the dispute referred to in the notice by using informal dispute resolution techniques.

    9.3 If the parties do not agree on a dispute resolution technique within 14 days after the date notice of a dispute was given, the dispute is to be mediated according to the standard Bond of LEADR New Zealand Incorporated (Lawyers Engaged in Alternative Dispute Resolution), and the Chair of LEADR (or the Chair's nominee) will select the mediator and determine the mediator's remuneration.

    9.4 A party seeking urgent interlocutory relief may, by notice to the other party, elect not to comply with the provisions of this clause, but only to the extent of the relief sought, and only for the period required to dispose of the application for interlocutory.

    9.5 Pending resolution of the dispute, this Bond will remain in full effect without prejudicing the parties' respective rights and remedies.

SIGNED by

_____ and

_____

in the presence of:

_____
Name of Witness

_____
Signature of Witness

_____
Address of Witness

_____
Occupation of Witness

VEHICLE CROSSING FORMATION GUIDELINES

ROADING REQUIREMENTS

- **Complete Roading requirements (CAR, TMP, BeforeUDig, WAP)**
    - **Contact roading team to obtain these: Roading@hurunui.govt.nz**

ENTERING INTO THE BOND

- **Sign and return provided bond documentation (planning@hurunui.govt.nz).**
- **Pay bond and inspection fee.**
- **Contact the planning department to organise a discussion with the consent engineer to begin forming your temporary crossing.**
- **Once your temporary crossing is formed and confirmation received by the planning team the bond is regarded as being entered into.**
- **The vehicle crossing RM hold will now be removed.**
- **Building inspections can now be booked if there no other RM requirements on the building consent.**

FINAL CROSSING REQUIREMENTS

- **Construct the final vehicle crossing when ready to the design standards provided within the bond documentation. (This step will require a Pre-Pour Inspection)**
- **Contact the planning team to have the consent engineer organise a final inspection.**
- **If passed the final crossing is formed.**

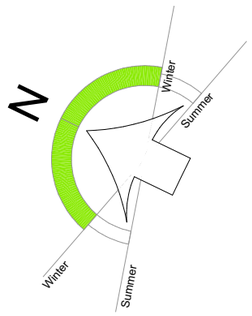
BOND REFUND PROCEDURE

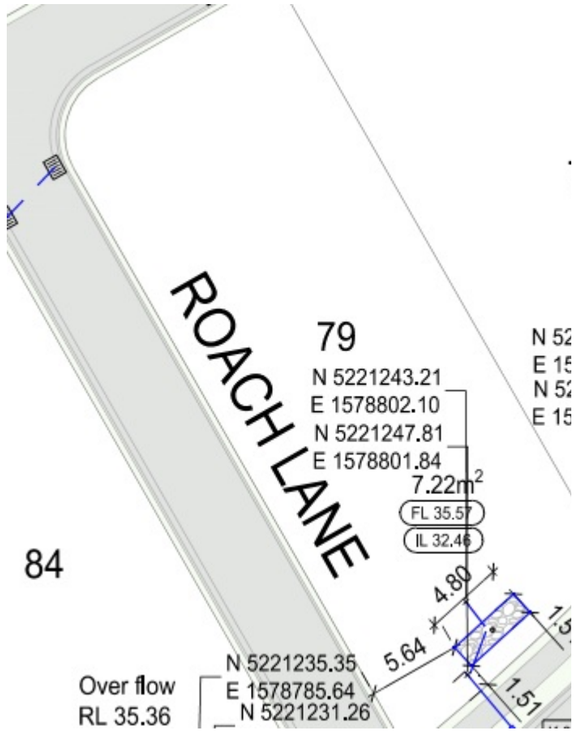
- **In order to have the bond refunded after the final crossing is formed and confirmation is received by the planning team:**
    - How to get the vehicle bond refunded:
        - Ensure that council has received confirmation that the final crossing has passed the final inspection. Send an email to planning@hurunui.govt.nz requesting a bond refund. Include proof of your bank account. (This requires you bank number, name, and bank branch in the image.)
        - We will look to refund the same bank account that paid the bond invoice where possible.
        - Once all the paperwork is complete, the bond is refunded. *

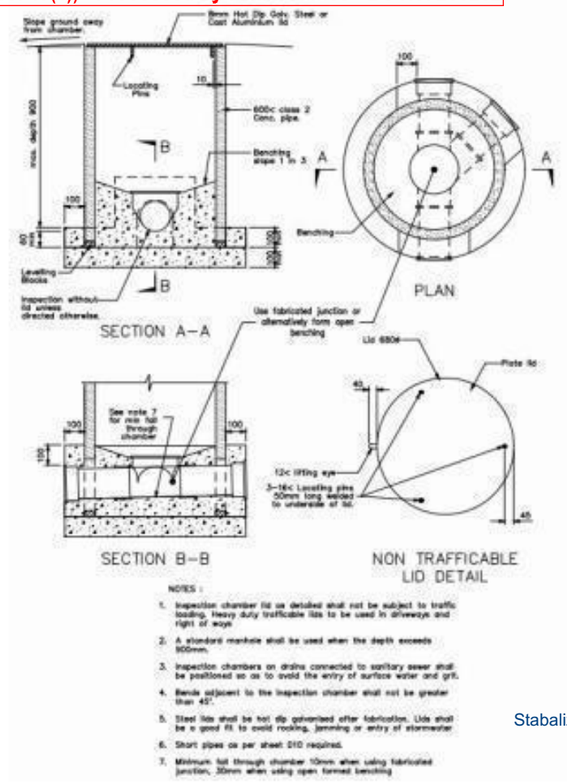
*Note: Payment is on the 20th of each month, or usually on the Monday or day after a public holiday should the 20th fall on a weekend or a public holiday.

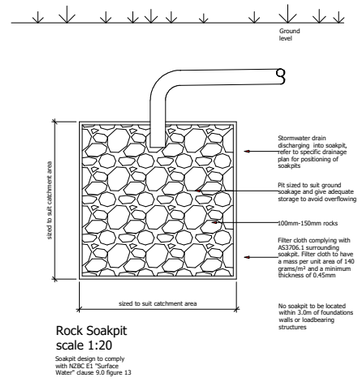
Please ensure only one payment is paid through either the building consent invoice or to the provided bank account on the bond documentation.

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252







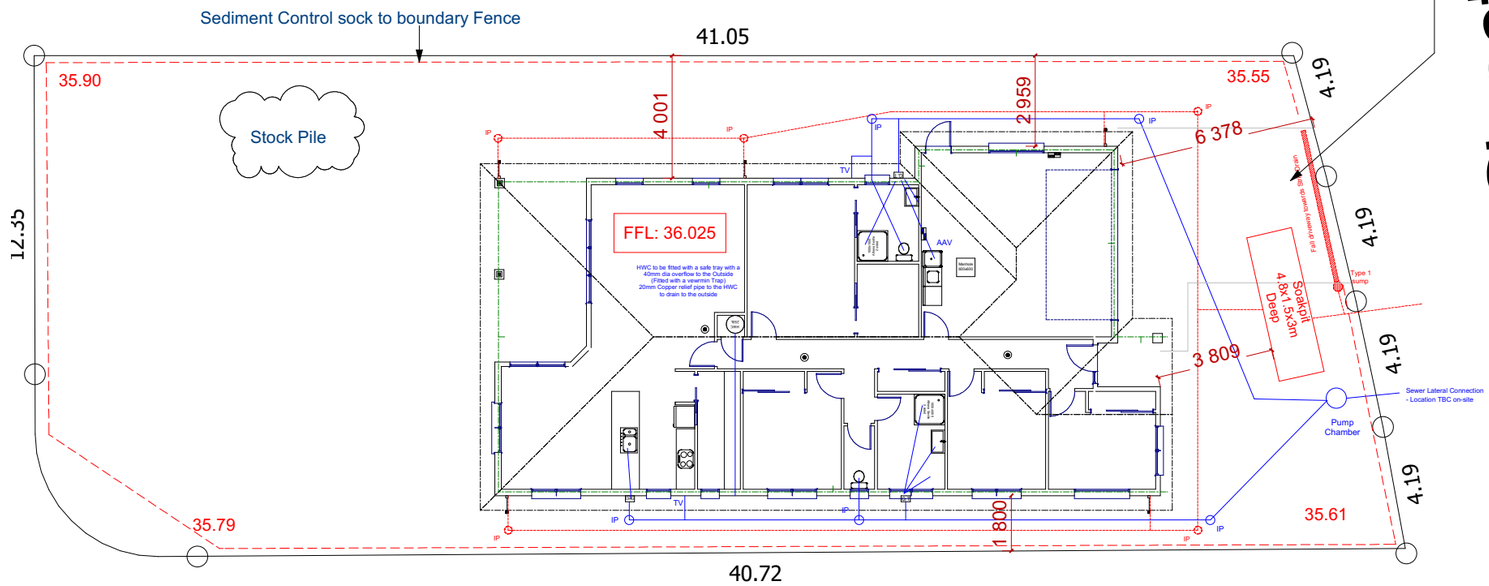


Rock Soakpit
scale 1:20

Soakpit design to comply with NZBC E1 "Surface Water" clause 9.0 figure 13

REVISED During Processing 12/08/2025

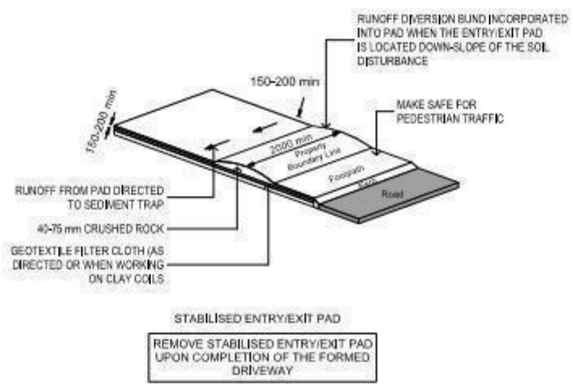
Stabalized entry pad to the site

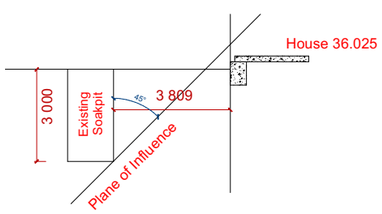


Benn Street

Crown of Road 35.50

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.





FL 35.57
IL 32.46

Roach Lane

LEGEND

LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES

Refer to Drainage Plan for specific drainage information

Refer to sediment control plan in specification and implement where required.

Convey surface water from sealed drive areas to an appropriate approved outfall.

Dimensions are shown to cladding face

SITE INFORMATION

Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE

Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 1
Scale: 1:1000
Date: 7/08/2025
OF: 15

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Key To Elevations

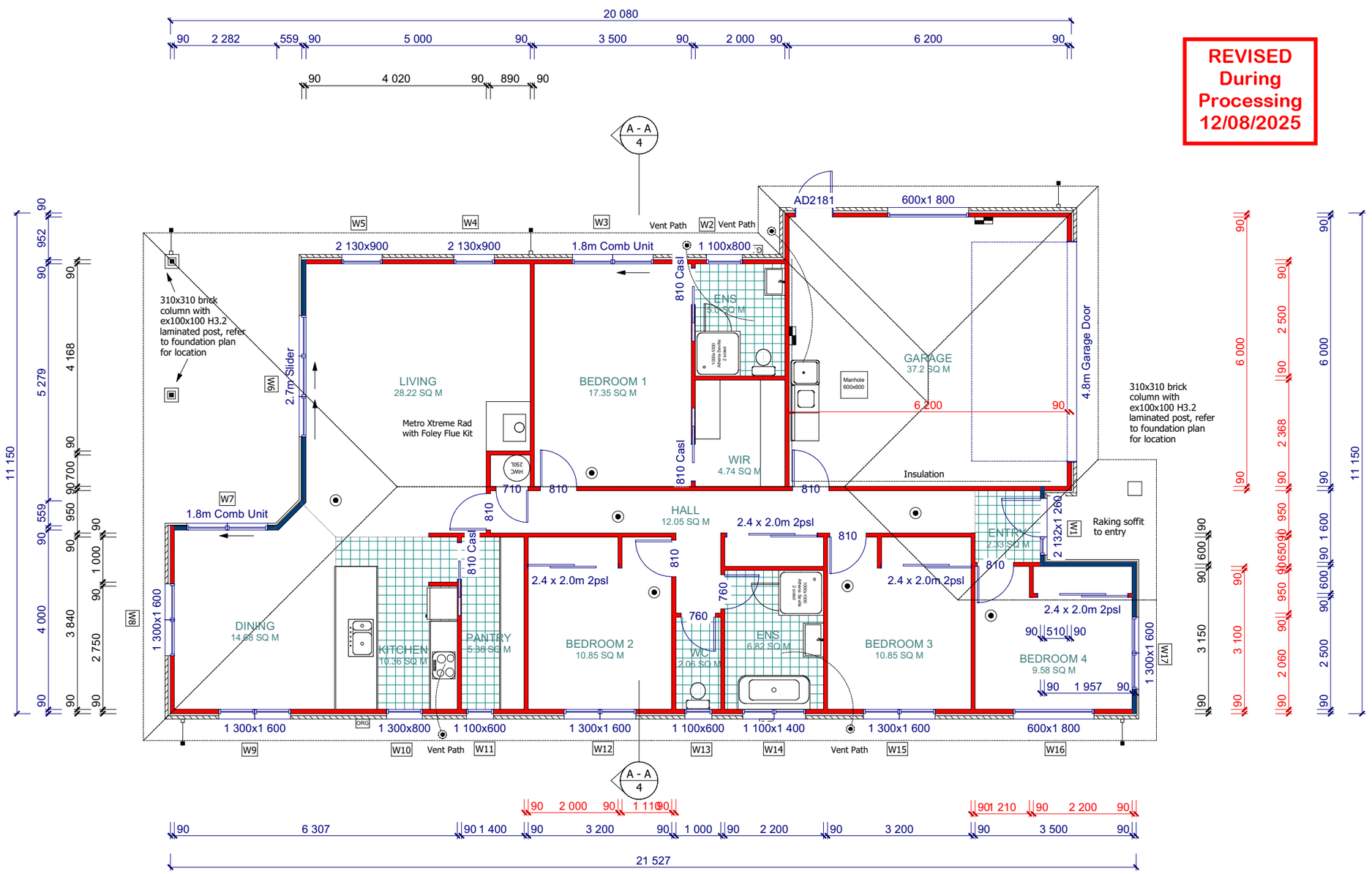
ROOF & WALL CLADDING

Roof -	25° Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame

REVISED During Processing 12/08/2025



GENERAL FLOOR PLAN NOTES

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be Interconnected and Located in each bedroom, Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A) and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

MISCELLANEOUS:
Dimensions shown are to the frame, GIB thickness not shown.
Refer to Construction Schedule (Page 2 & 3 of Specification) for additional construction information.
Entry through external doors
Mechanical ventilation
Air Seals to have PEF rod & low expansion foam
All windows and doors centered in room unless shown otherwise

FOUNDATION SYSTEM
Ribraft Foundation Design

WALL FRAMING -designed to high wind zone

Stud Height:	2420 mm
Exterior Walls:	90x45mm studs @ 600 mm crs
Interior Loadbearing wall:	90x45mm studs @ 600 mm crs
Dwangs Ext:	90x45 @ 800 crs
Non loadbearing:	90x45mm studs @ 600 mm crs
Dwangs Int:	90x45mm @ 800mm Crs

LINTELS AND BEAMS
Lintels and beams can be found on the Truss Design

BUILDING WRAP
Watergate Building Wrap, refer to manufacturers specifications attached

DOORS
Internal Height: 2000mm

INSULATION

Wall -	Pink Batts R2.6 Wall Batts
Ceiling -	Pink Batts R6.6 Ceiling Batts

WALL AND CEILING LININGS

Wall -	Standard 10mm GIB (unless required for bracing)
Ceiling -	Standard 13mm GIB 13mm GIB Aqualine (bathrooms)
Bathroom -	10mm GIB Aqualine
Corner Finish -	Square

FLOOR FINISHES
Carpet, Vinyl Plank , Tiles

EXTERIOR JOINERY

All Windows to be Thermally broken Aluminium frame
Double glazed with Ug of 1.10
with a thermally improved spacer
as per ISO 10077 Annex G
Glass: Low E4/Clear, argon filled , to achieve R0.5.
Air Seals to have PEF rod and low expansion foam

Interior -	Shelf and rail to wardrobes

Electric Hot water system

KITCHEN COOKTOP
Electric Hobb

ROOF CLADDING AND STRUCTURE
Purlins - 70x45 SG8 H1.2 @ 900crs

GUTTER/FASCIA/DOWNPIPES/SOFFITS

Gutter -	Metalcraft Metalline Quad Gutter
Fascia -	Metalcraft Metalline 185 Fascia
Downpipes -	Marley 80mm Dia PVC
Soffits -	Hardiflex 4.5mm

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UWC Ltd
Proposed Dwelling At:
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52 Benn St , Amberley

Floor Plan

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	2500	2
Scale: 1:100	Date: 7/08/2025	OF: 15

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ROOF & WALL CLADDING	
Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

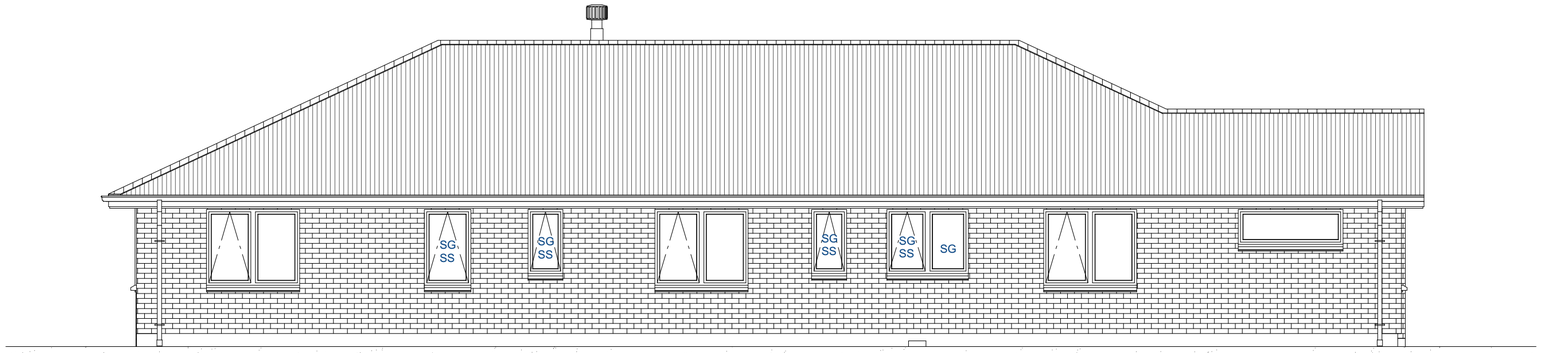
GENERAL ELEVATION NOTES

Air Barrier to unlined wall and gables, refer to the Construction Schedule in the Specification for type.

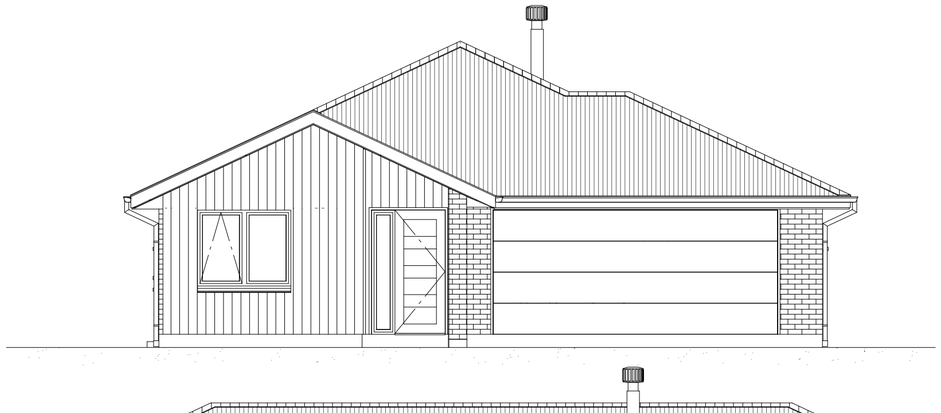
This sheet to be read in conjunction with the Risk Matrix in specification.

Driveway to fall from 20mm max below garage rebates (By Others).

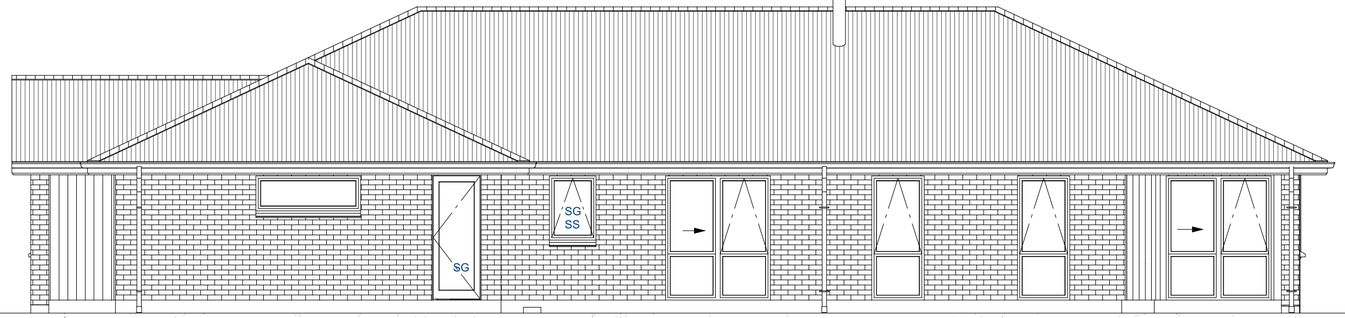
Key
SS: Security Stay
SG: Safety Glass



Elevation A



Elevation B



Elevation C



Elevation D

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Elevations

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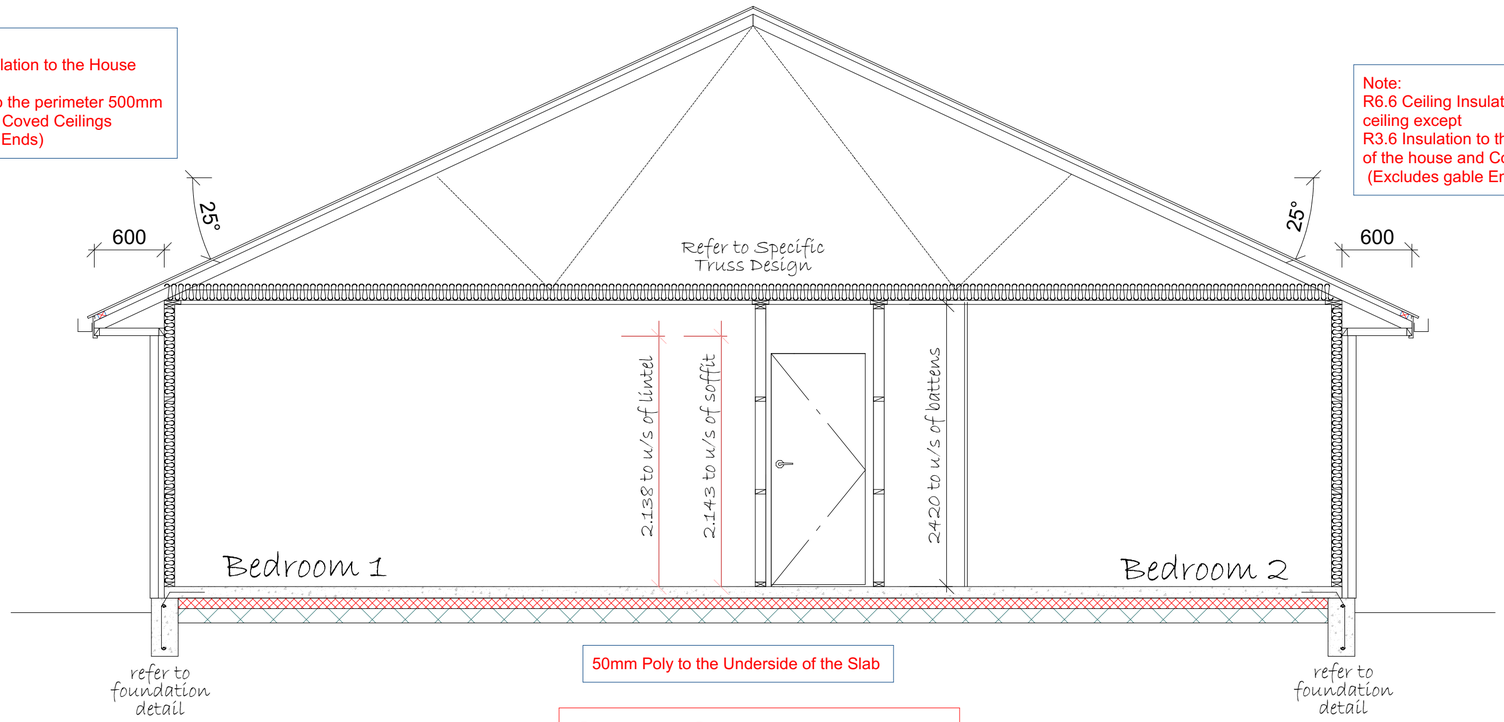
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Jeremy Harrison LBP # 105491	**2500**	**3**
Scale: 1:100	Date: 24/07/2025	OF: **15**

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Note:
Min 35mm cover from the underside of the roof underlay to the top of the Insulation.

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)



50mm Poly to the Underside of the Slab

Cross Section A - A

LEGEND

Refer to the Construction Schedule (Page 2 & 3) in the Specification for sizing of Building Elements.
General Notes:

1 - Corrugated Colorsteel roofing by Metalcraft on self supporting ThermaKraft 215 roof underlay on 70x45mm SG8 H1.2 Purlins @ 900crs fixings 1/10g self-drilling screw, 80mm long

2 - Metalcraft fascia & quad gutter system with 4.5mm Hardies soffit lining on 70x35mm H1.2 eaves bearers on edge fixed to ribbon board.

3 - 4.5mm Hardies Soffit lining

4 - 13mm Standard GIB ceiling lining to underside of Rondo metal ceiling battens @ 600 crs with R6.6 Pink Batts insulation.

5 - 70 Series Brick Veneer on a 50mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).

5 - BGC Duo Cladding on a 20mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).
(Dwangs @ 480mm crs)

6 - Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

7 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. (exterior walls) unless otherwise stated

9 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. 2 min. (interior loadbearing & non-loadbearing walls) unless otherwise stated

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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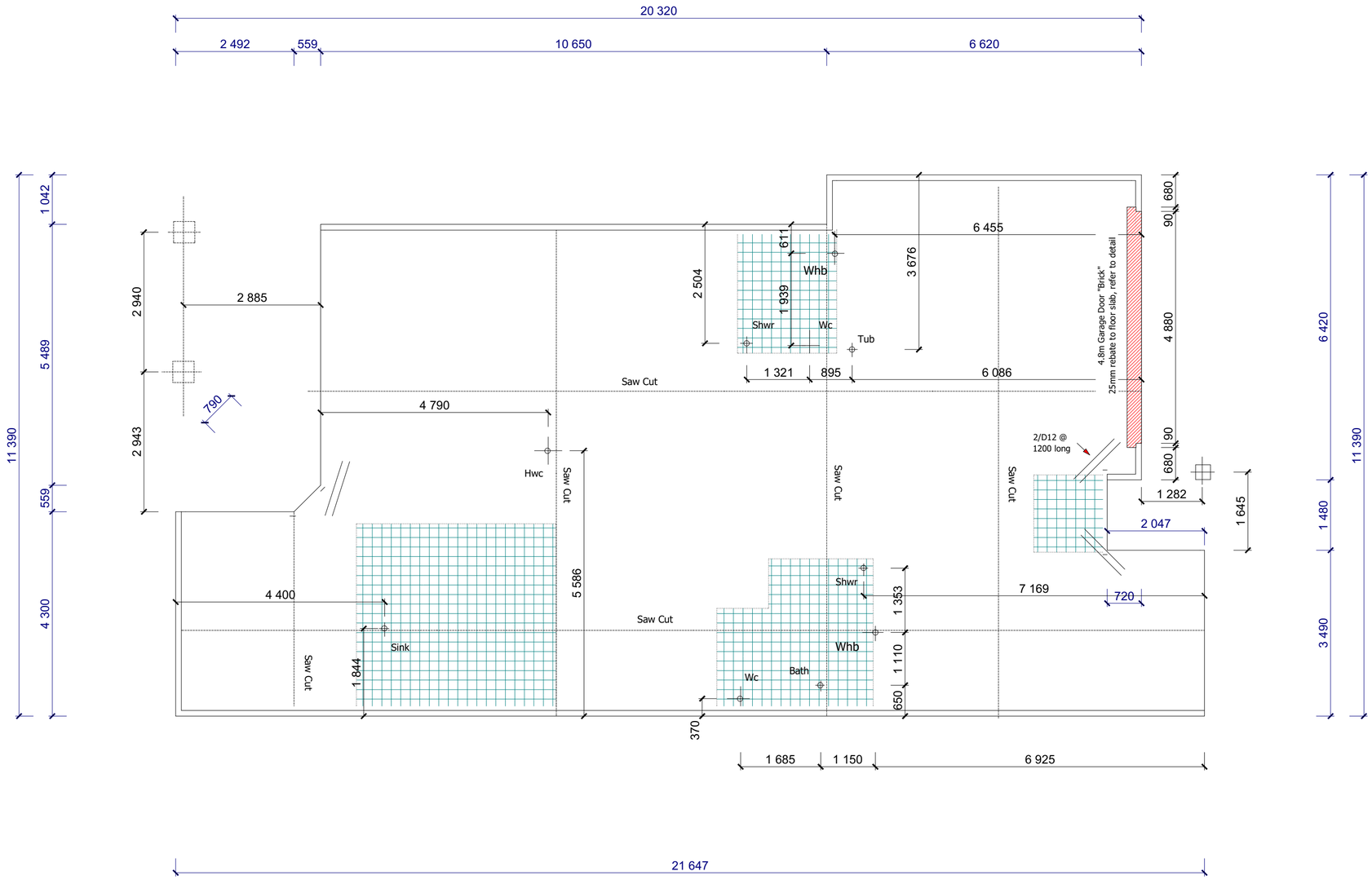
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Cross Section

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: 1:50
Job Number: 2500
Date: 24/07/2025
SHEET: 4
OF: 15

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GENERAL FOUNDATION NOTES

1) All dimensions over foundation face. Allow (120mm rebate) 70mm veneer & 50mm cavity.
2) No construction joints / shrinkage control joints under marked tile areas where possible.
3) The maximum plan dimension of concrete between shrinkage control joints is 6m with mesh to slab. (Standard joint to be formed with 25mm min sawcut & free joint to be at 24m crs max & as per detail CON001AFL).
4) No saw cuts under length of load bearing and bracing walls. (As fixing may not achieve full strength if embedded in sawcuts).
5) Supplementary reinforcing to internal corners to comply with NZS 3604:2011 clause 7.5.8.6.4.
6) W/C location indicated on plan has assumed a 160mm offset from internal frame line, please consult manufacturer's documentation to confirm offset. Contractor to consult manufacturer's documentation to determine the correct location for all wastes positioned through floor slabs.
7) Gully trap positions indicated on ground floor plan.
8) Earth bar to be bonded to the reinforcing mesh
9) Refer to Truss design for exact location of slab thickenings
10) Flexible silicone bondage sealer to fill the saw cuts through vinyl floor areas.

BOTTOM PLATE FIXING

Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

REINFORCING

All reinforcing is to be Ductility Class E, in accordance with NZS 4671

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3

CONCRETE STRENGTH

All concrete to comply with NZS3604:2011 Section 4 Durability Clause 4.5.2

50mm Poly to the Underside of the Slab

Note:
Slab Mesh : SE62-500
320mm Min Cover
Concrete cover to Mesh 30mm min top cover
Against ground 75mm
Against formwork 50mm

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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Foundation Plan

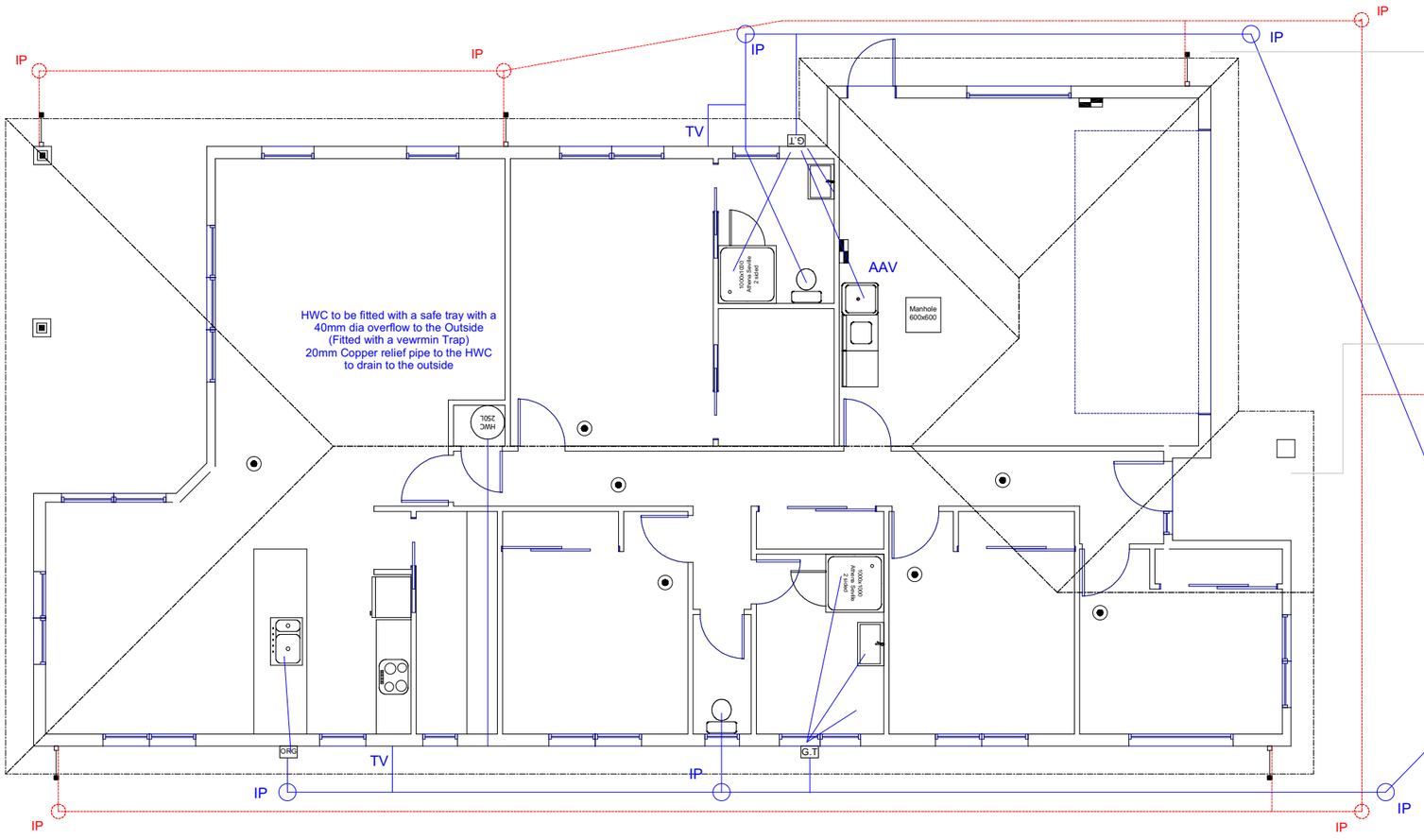
Consent Plans

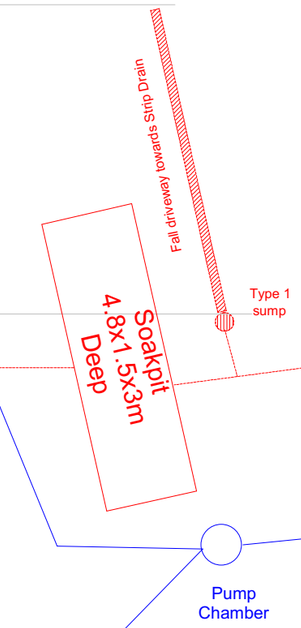
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Job Number: 2500
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Scale: 1:100
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Drainage Schedule	NZBC G13	
(Drainage as per Schedule unless specified otherwise)		
Kitchen		
Sink:	Ø65mm @1:40	(3 discharge units)
Bathrooms		
Vanity:	Ø40mm @ 1:40	(1 discharge units per basin)
Shower:	Ø40mm @1:40	(2 discharge units)
Bath:	Ø40mm @1:40	(4 discharge units)
WC:	Ø100mm @1:40	(4 discharge units)
Laundry		
Sink:	Ø65mm @1:40 min	(5 discharge units)
Main Foulwater Drain	Ø100mm @1:60	
Stormwater Drain	Ø100mm @1:60 (1:120min)	
Terminal Vent	Ø80mm	
Vent	Ø50mm	

LEGEND.	
Sewer Pipe	————
S/W Pipe	– – – – – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV
Vent	V
Inspection Point	IP
Air Admittance Valve	AAV





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Figure 8: Type-one Surface Water Sump
Paragraph 3.6.2

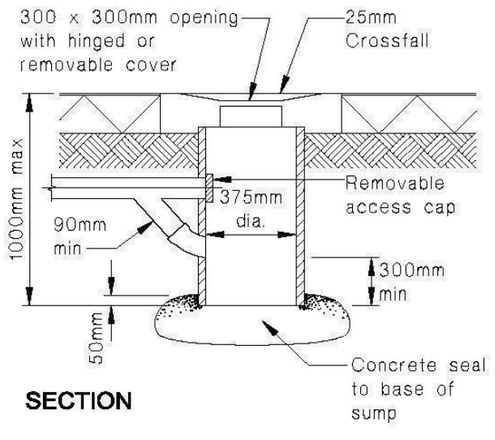
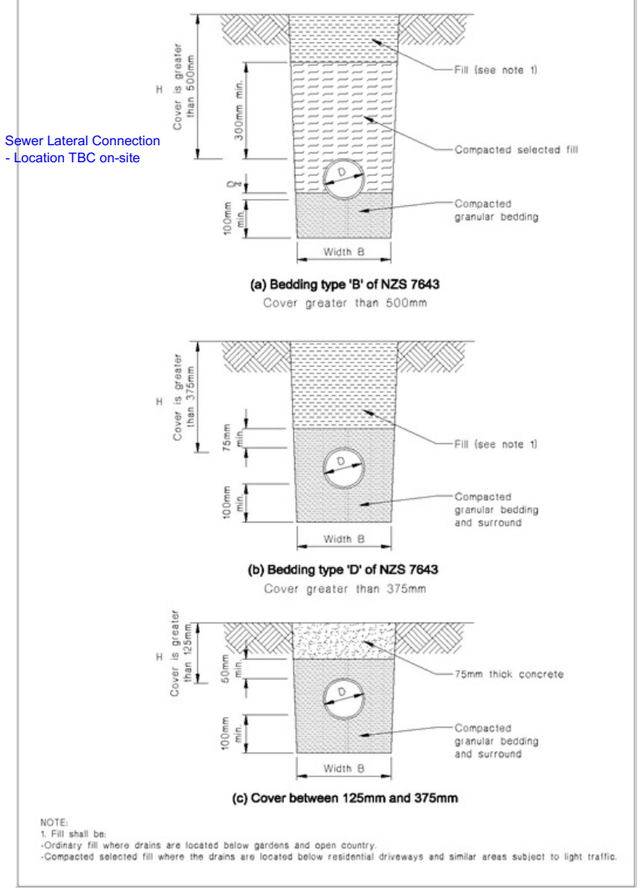


Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



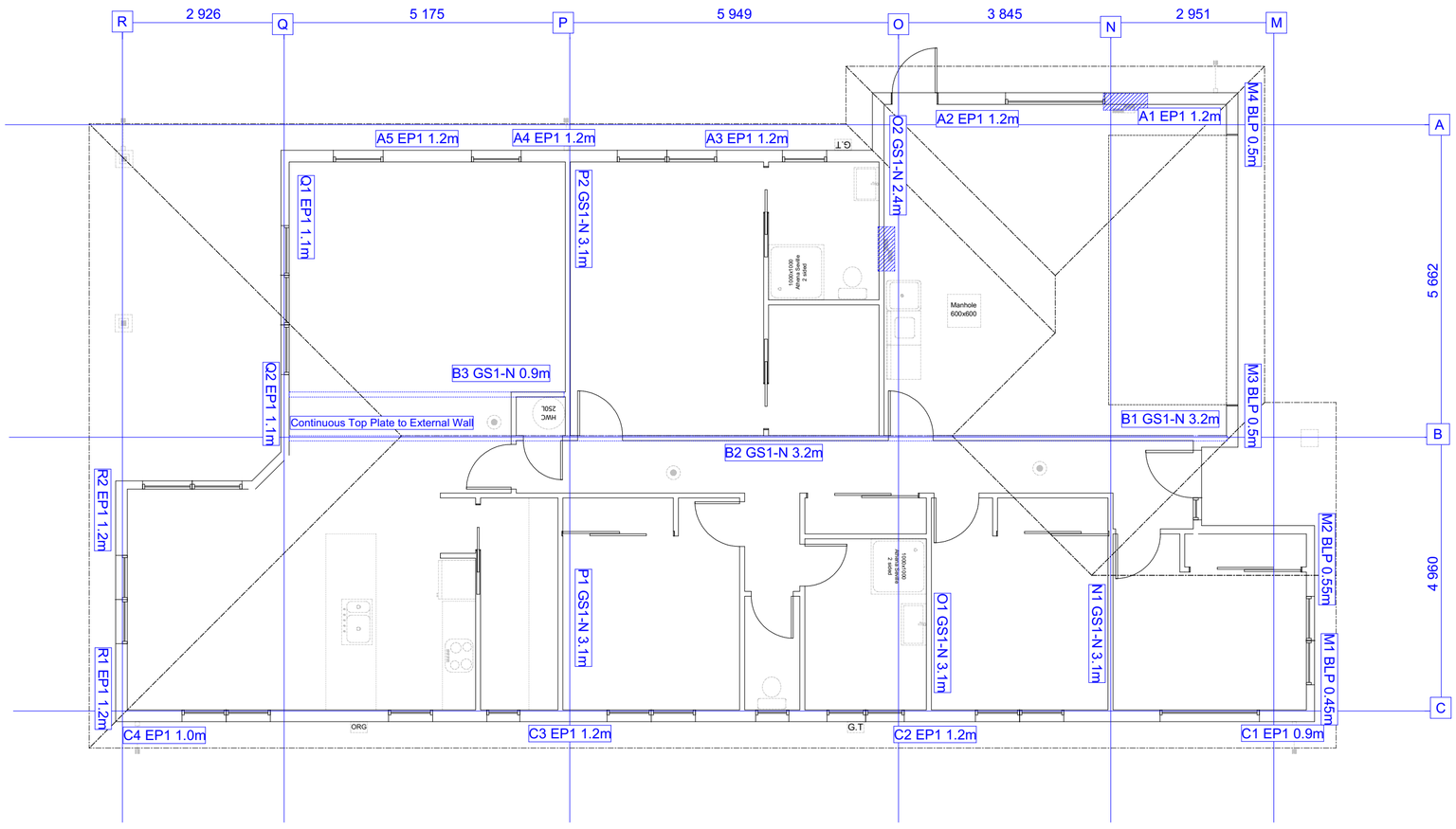
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Drainage Plan
Consent Plans

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GENERAL BRACING NOTES

Bracing plan to be read in conjunction with supplementary bracing calculations

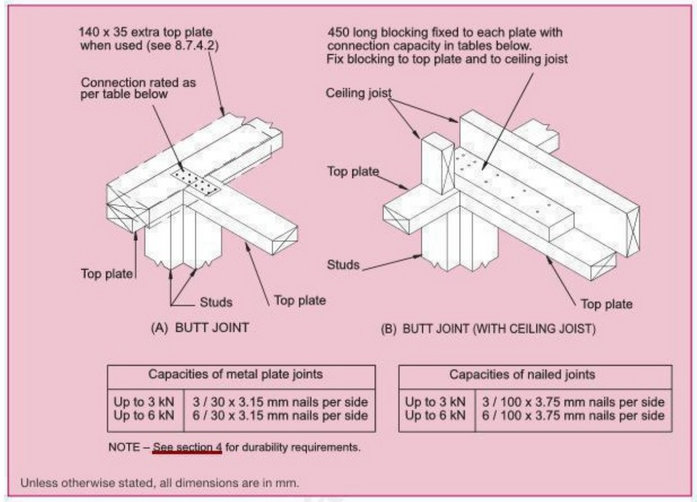
Refer to the supporting documents in the specification for purlin/batten fixing, truss fixing, stud to top plate fixing & lintel fixing schedules.

To be read in conjunction with minimal length bracing detail TAJ002AWA

BRACING SYSTEM

Wall bracing designed in accordance with NZS 3604:2011 & GIB Ezybrace system

Designed to:
Wind: High
Earthquake: 3



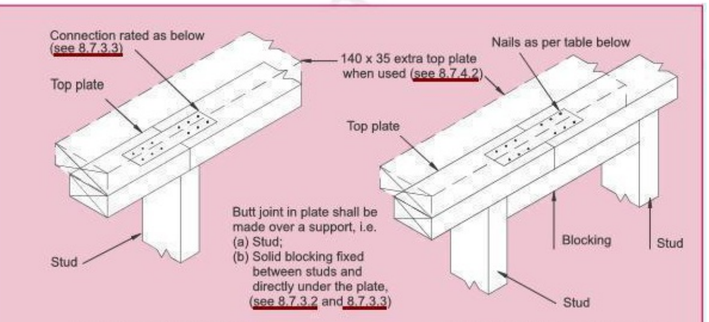
Capacities of metal plate joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

Figure 8.16 – Connecting top plates to external walls at right angles – Walls containing bracing (see 8.7.3.4)



Capacities of metal plate joints(2)	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints(2)	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE –
(1) See section 4 for durability requirements.
(2) Not required when extra top plate is used.

Unless otherwise stated, all dimensions are in mm.

Figure 8.15 – Connecting top plates in line – Walls containing bracing (see 8.7.3.3)

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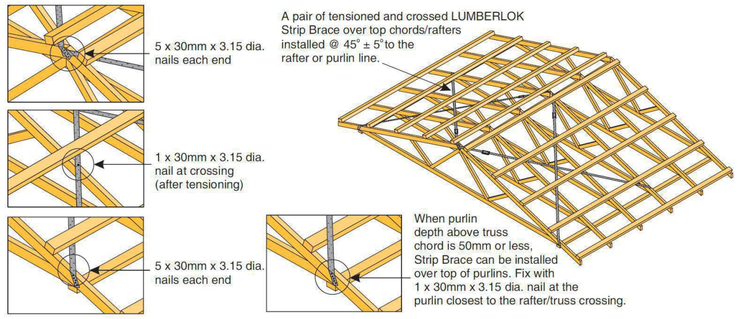
Bracing Plan

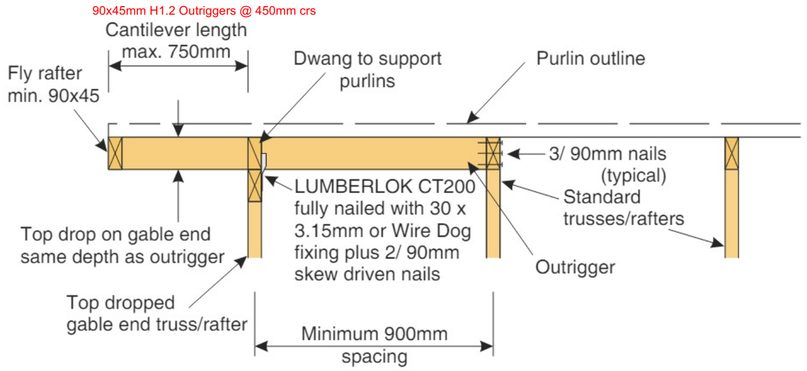
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Scale: 1:100
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- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.





CROSS SECTION

GENERAL ROOF PLAN NOTES

Refer to the Construction Schedule (Page 2 & 3) in the Specification and the manufacturer's specification attached for the gutter and down pipe rainfall catchment area calculations.

RPB - Roof Plane Bracing as per NZS:3604 (Figure: 10.22)

LSB - Lumberlok Strip bracing as per Lumberlok Roof Bracing Specification

ROOF CLADDING

Roof - 25º Corrugated Colorsteel Profile on Thermakraft 215 roof underlay

TRUSS FIXINGS

Refer to the Truss design for truss fixings

PURLINS OR BATTENS

Purlins: 70x45 SG8 H1.2 @ 900crs, fixings 1/10g self-drilling screw, 80mm long
End span of purlins to be 600 crs as per E2 Table 11

TOP PLATE FIXING

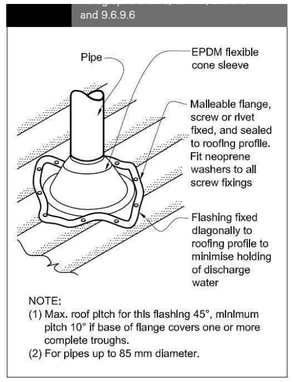
Use Lumberlock top plate fixing chart attached to the main specifications to determine top plate fixings

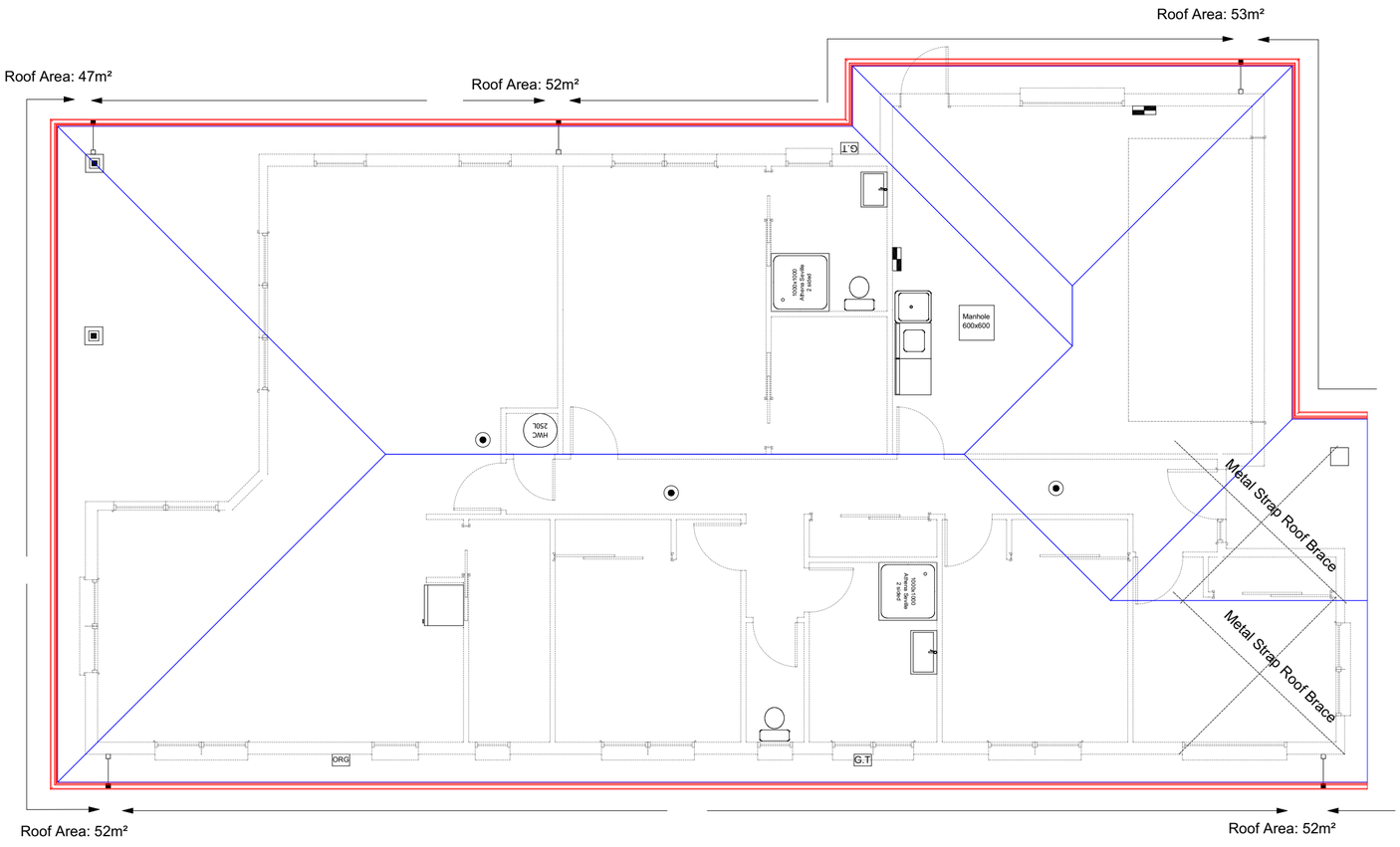
TIMBER GRADE

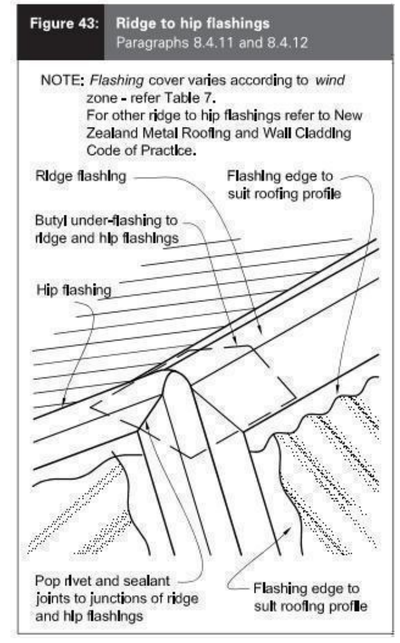
Timber members specified on these drawings are to be a minimum of strength of SG8 graded as per NZS3604:2011

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3







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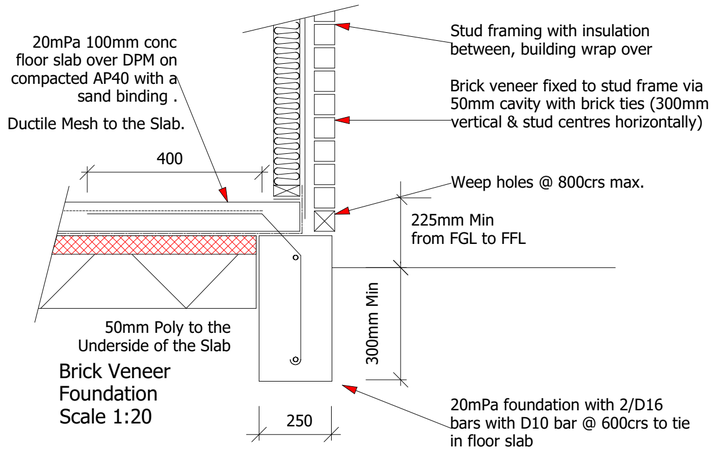
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Roof Plan

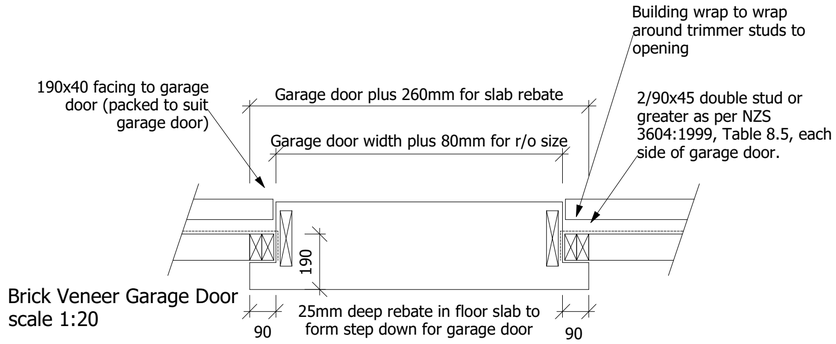
Consent Plans

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SHEET: 8
Scale: 1:100
Date: 24/07/2025
OF: 15

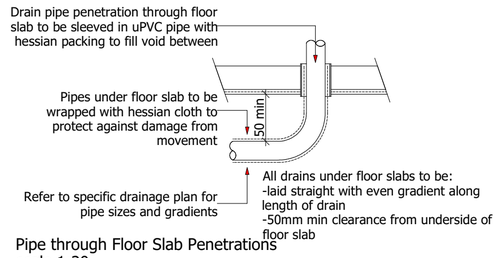
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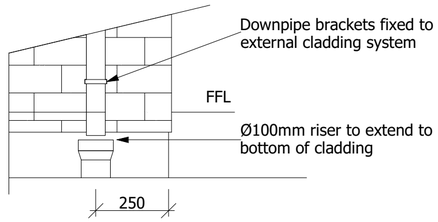
Brick Veneer Foundation
Scale 1:20



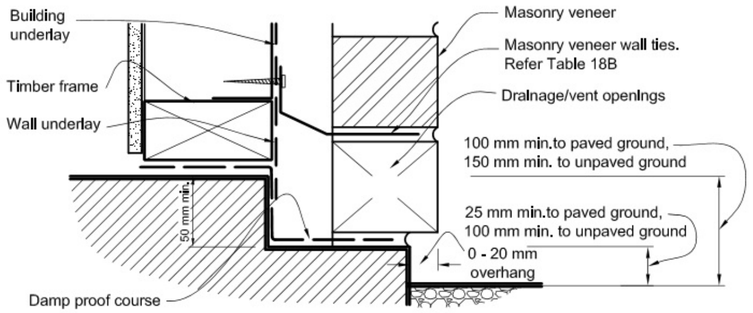
Brick Veneer Garage Door
scale 1:20



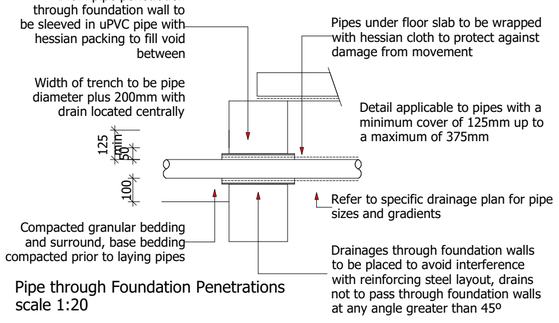
Pipe through Floor Slab Penetrations
scale 1:20



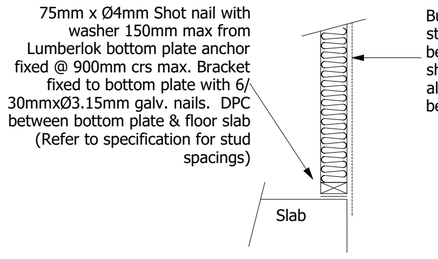
Downpipe Corner Offsets
(Brick)
Scale 1:20



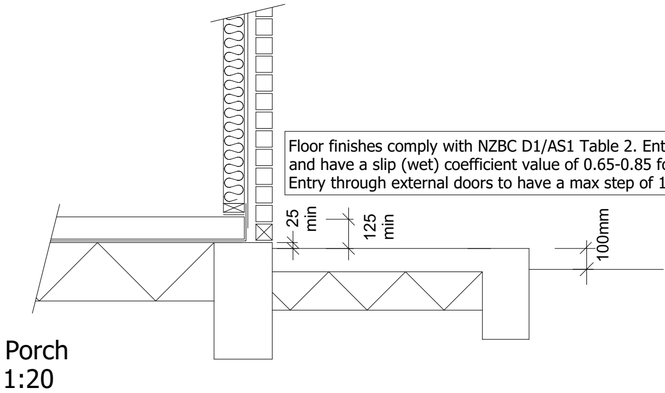
(I) MASONRY VENEER - FLOOR REBATE DETAIL



Pipe through Foundation Penetrations
scale 1:20



Exterior stud framing to slab
Scale 1:20



Entry Porch
scale 1:20

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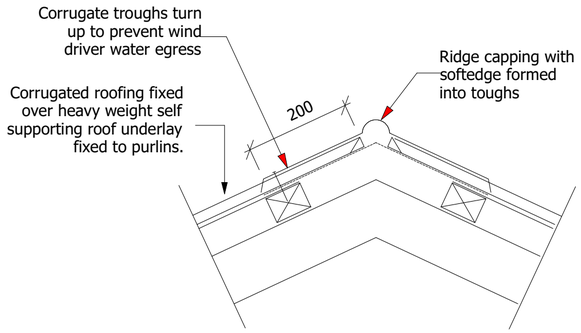
Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Details

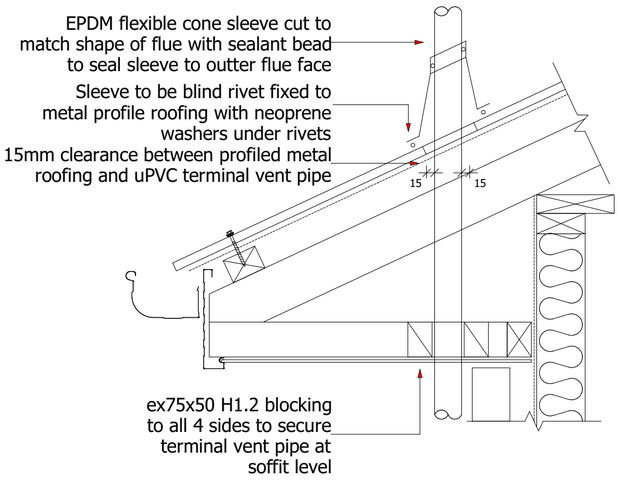
Consent Plans

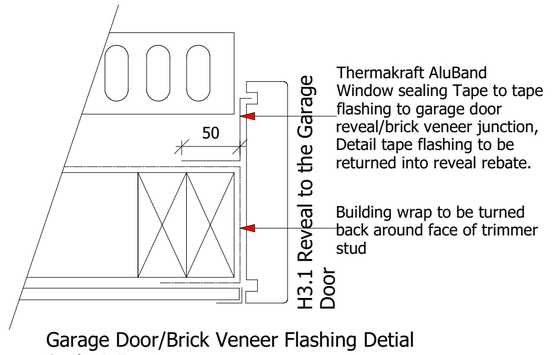
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Job Number: 2500
SHEET: 9
Scale: varies
Date: 24/07/2025
OF: 15

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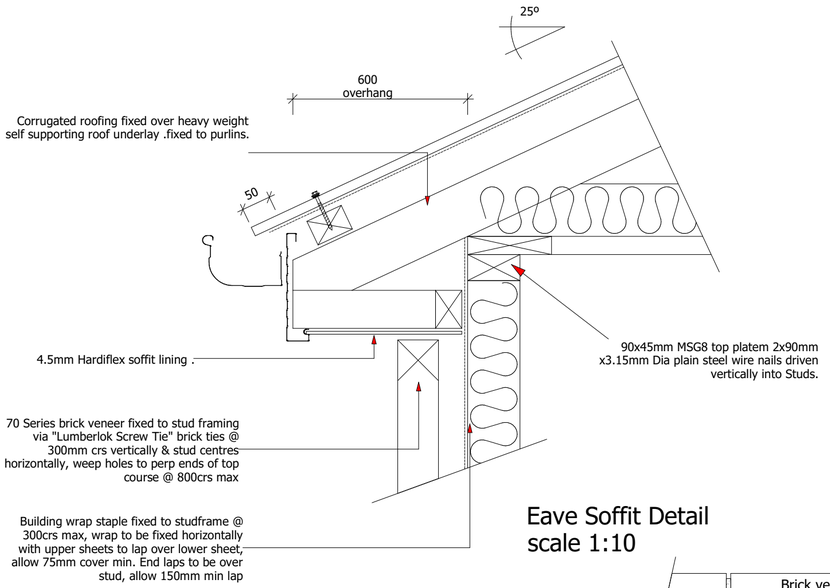


Metal Ridge Capping Detail
scale 1:10





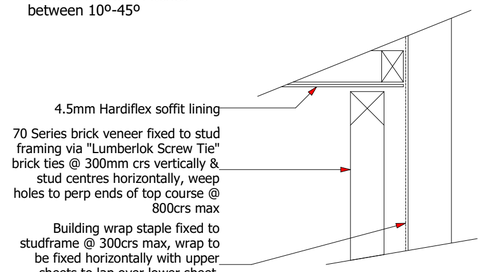
Garage Door/Brick Veneer Flashing Detial
Scale 1:5



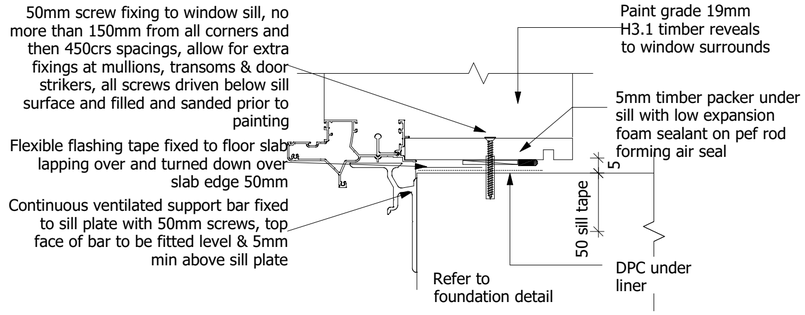
Eave Soffit Detail
scale 1:10

Terminal Vent to Roofing Penetration Detail "Section"
scale 1:10

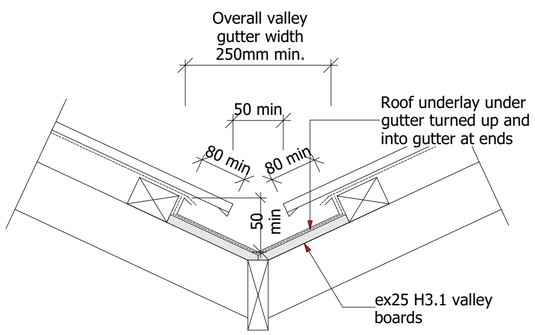
Suitable for Roof Pitches between 10º-45º



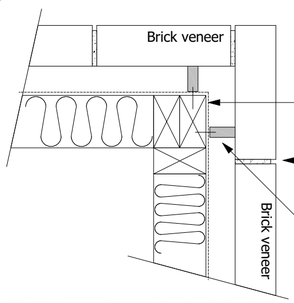
Brick Eave Soffit Detail
Scale 1:10



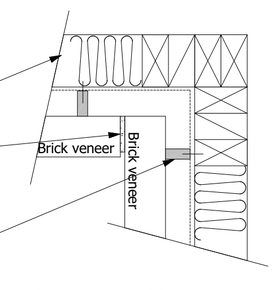
Sliding Door Sill to Slab Detail
scale 1:5



Longrun Valley Gutter Detail
scale 1:10



BRICK EXTERNAL CORNER DETAIL
Scale 1:5



BRICK INTERNAL CORNER DETAIL
Scale 1:5

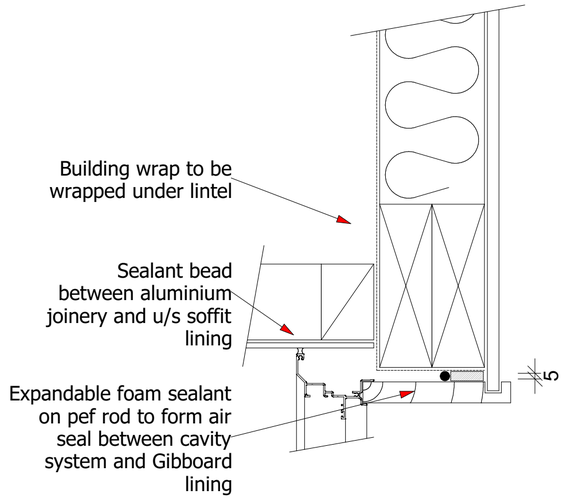
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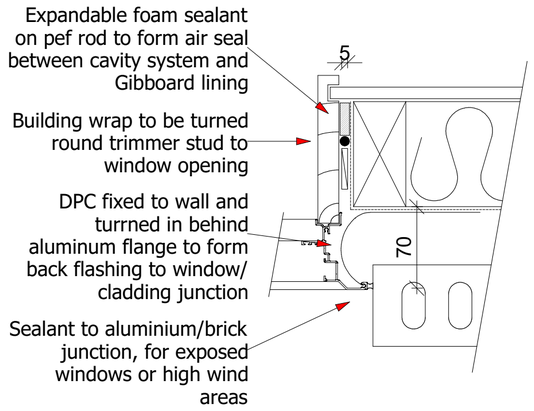
Details
Consent Plans

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Scale: varies
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OF: 15

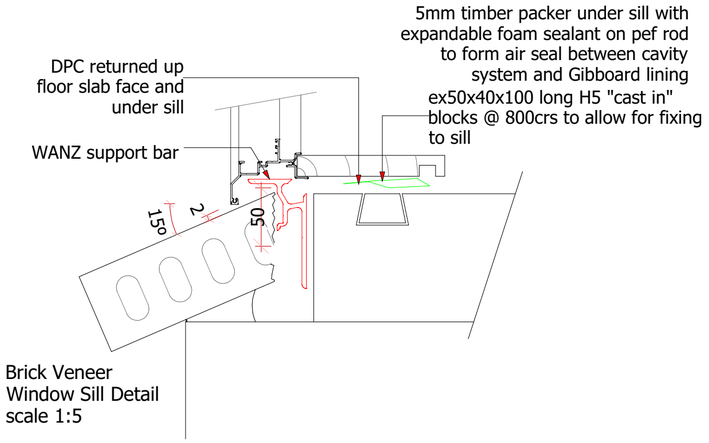
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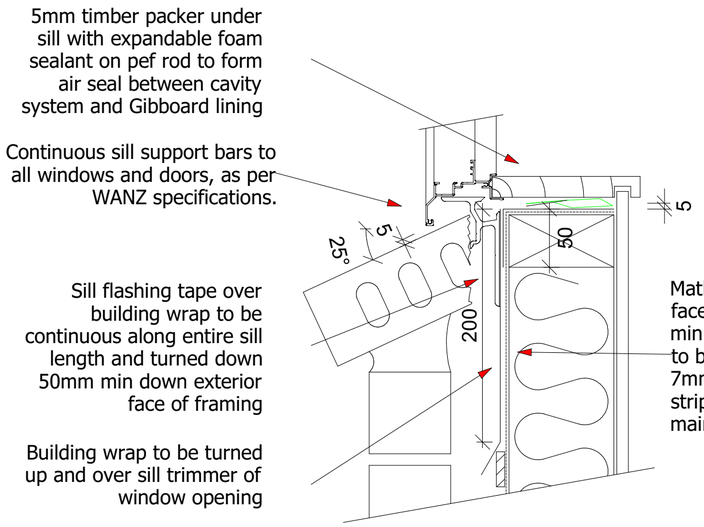
Brick Veneer Window Head to Soffit Detail
scale 1:5



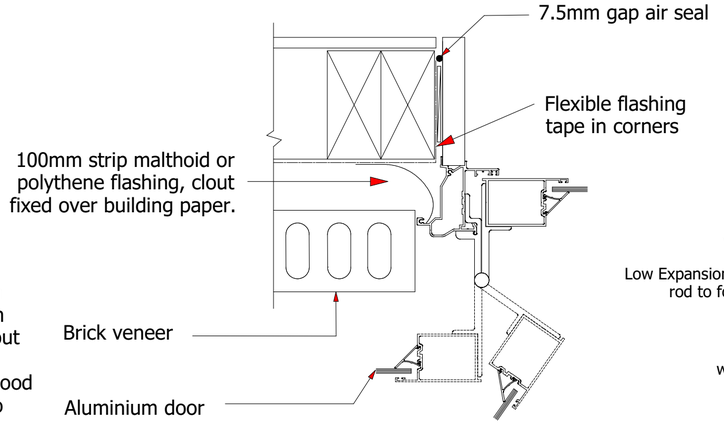
Brick Veneer Window Jamb Detail
scale 1:5



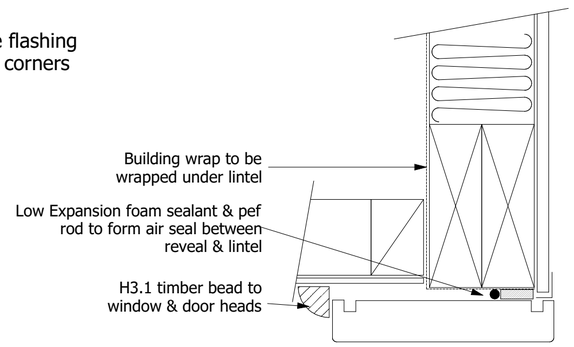
Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Door Jamb Detail (Aluminium)
scale 1:5



Garage Door Head to Soffit Detail
scale 1:5

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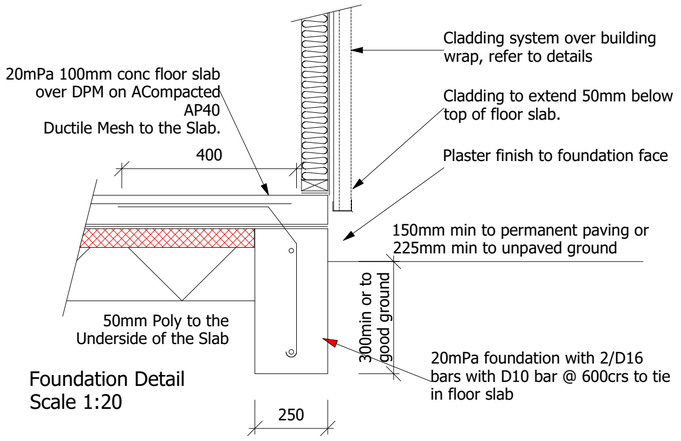
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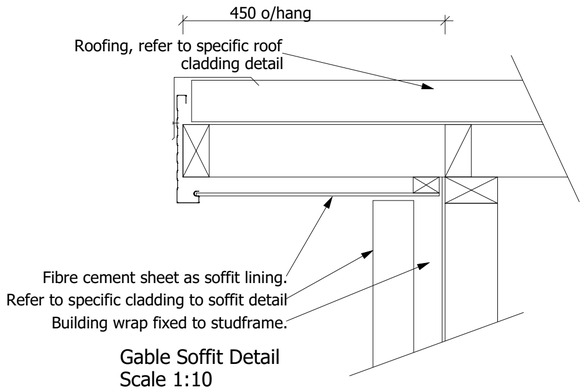
Consent Plans

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Job Number: 2500
SHEET: 11
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Date: 24/07/2025
OF: 15

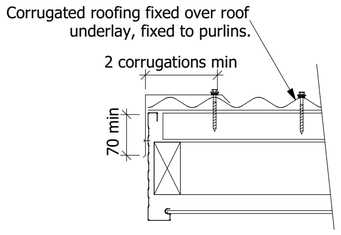
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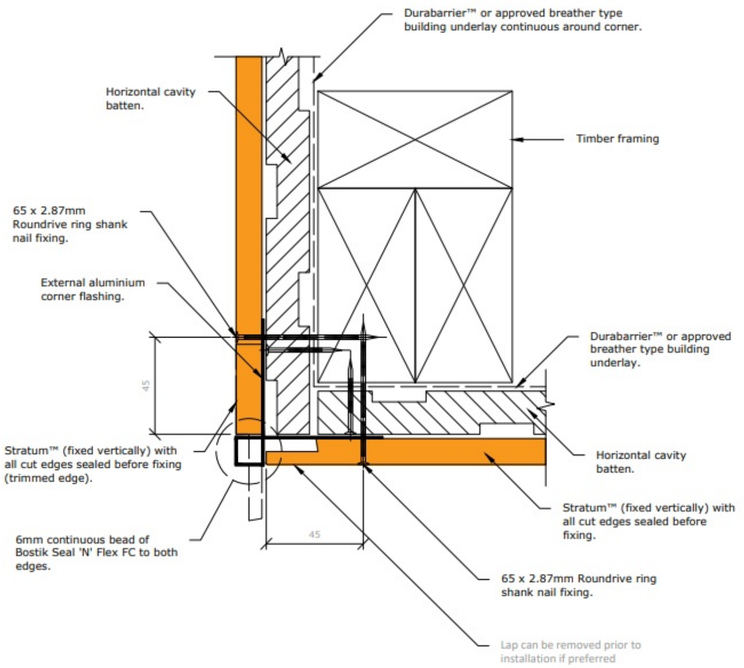
Foundation Detail
Scale 1:20



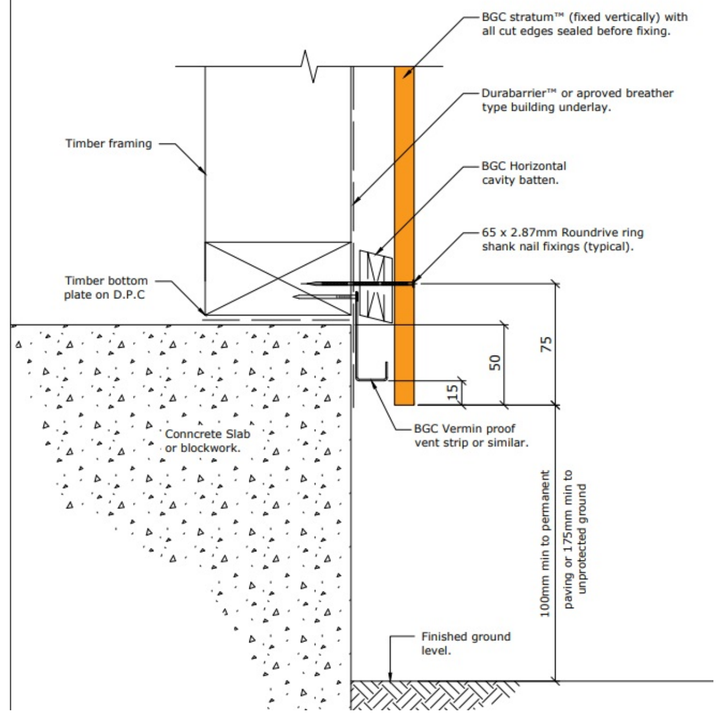
Gable Soffit Detail
Scale 1:10



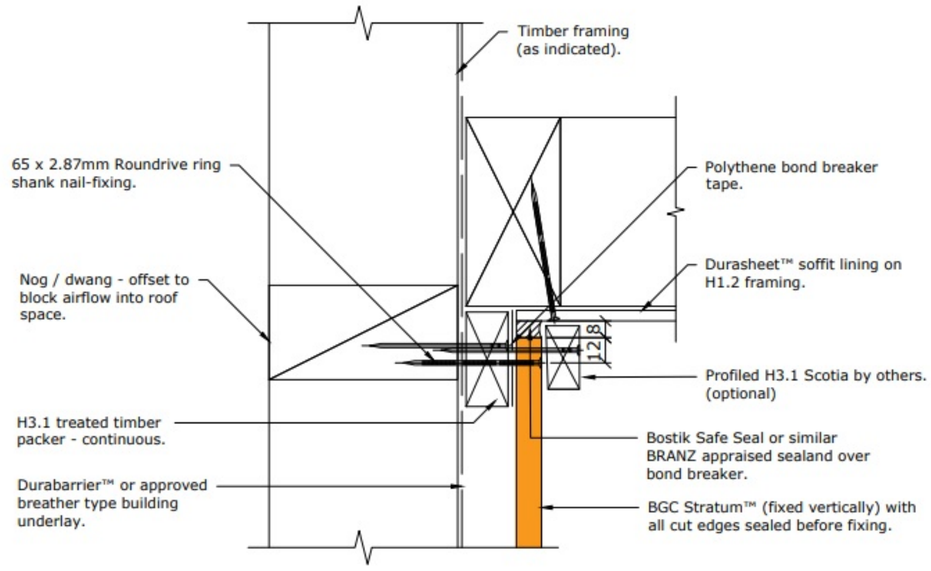
Gable Soffit Detail
Scale 1:10



External Corner Detail



Cladding Base Detail



Soffit Junction Detail

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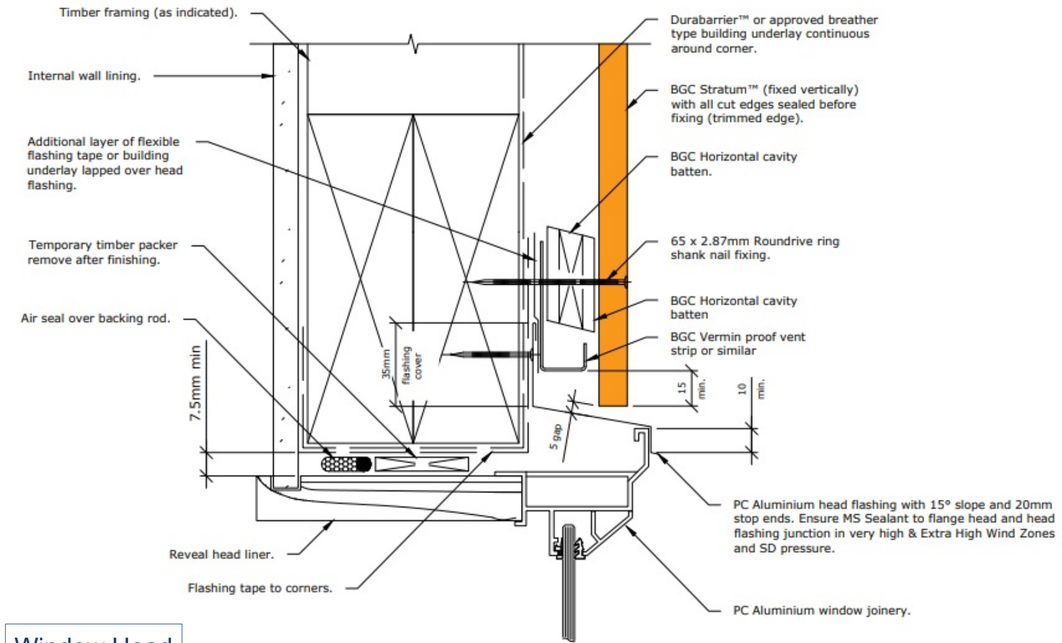
Project:
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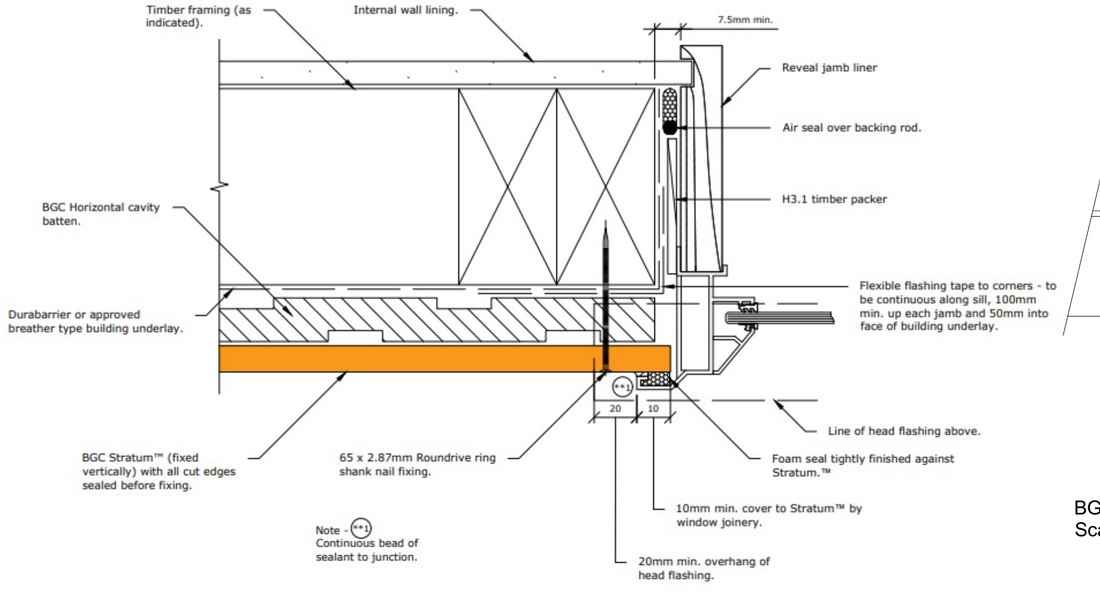
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Drawn: Jeremy Harrison LBP # 105491
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SHEET: 12
OF: 15

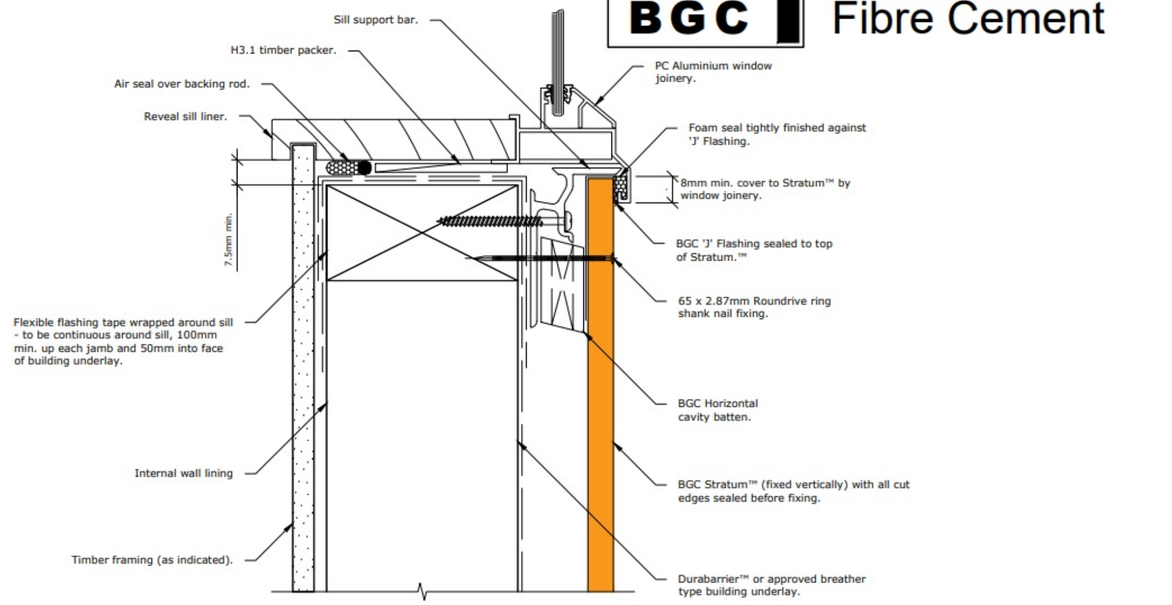
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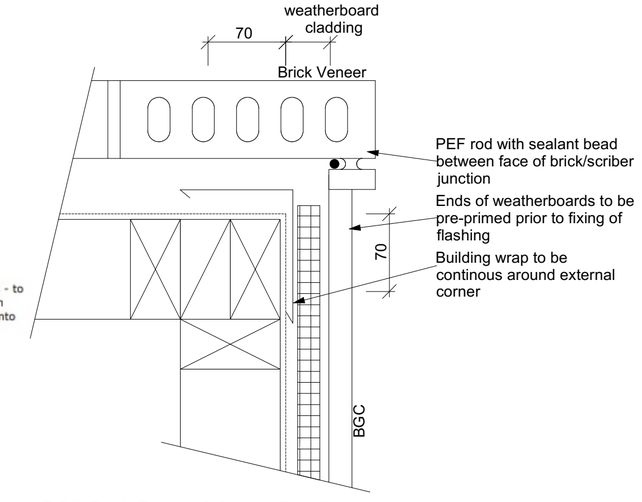
Window Head



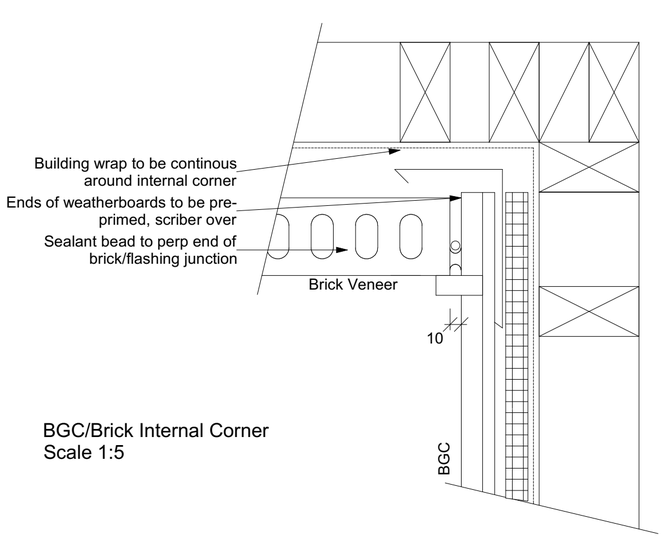
Window Jamb



Window Sill



BGC/Brick External Corner Detail
Scale 1:5



BGC/Brick Internal Corner
Scale 1:5

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Details

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: varies

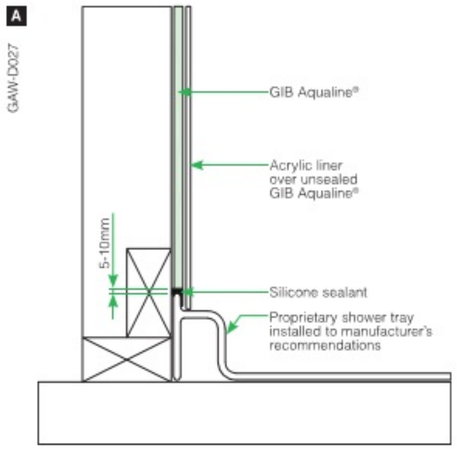
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Date: 24/07/2025

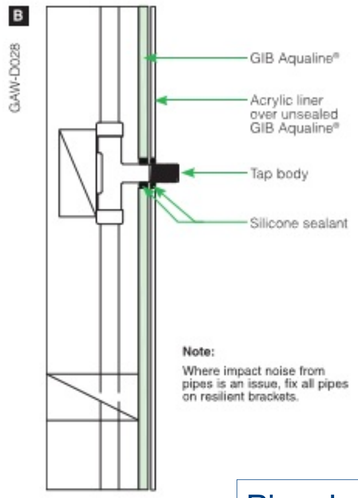
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OF: **15**

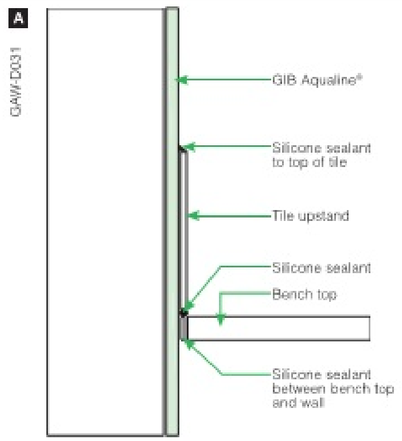
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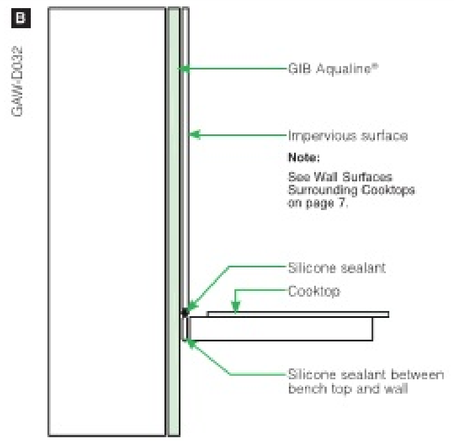
Shower Base



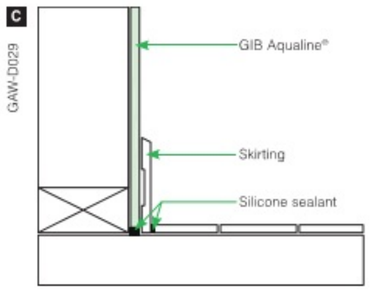
Pipe Junction



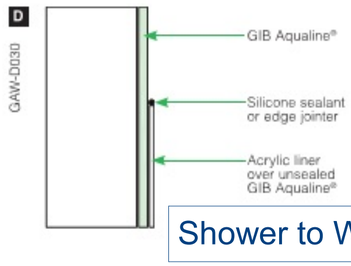
Bench top to wall



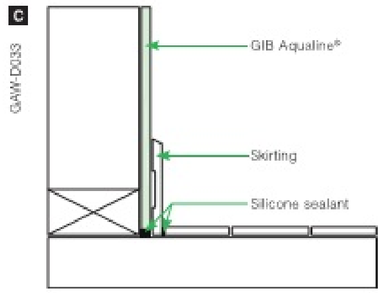
Bench top/ Cooktop to wall



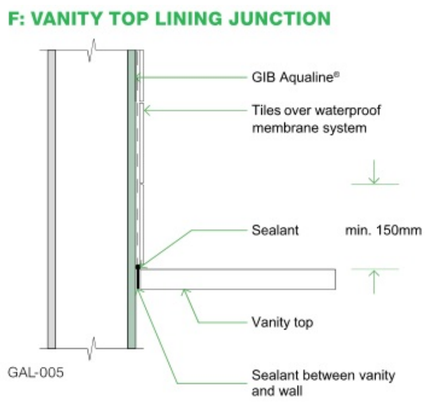
Skirting Detail



Shower to Wall



Skirting Detail









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Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: varies

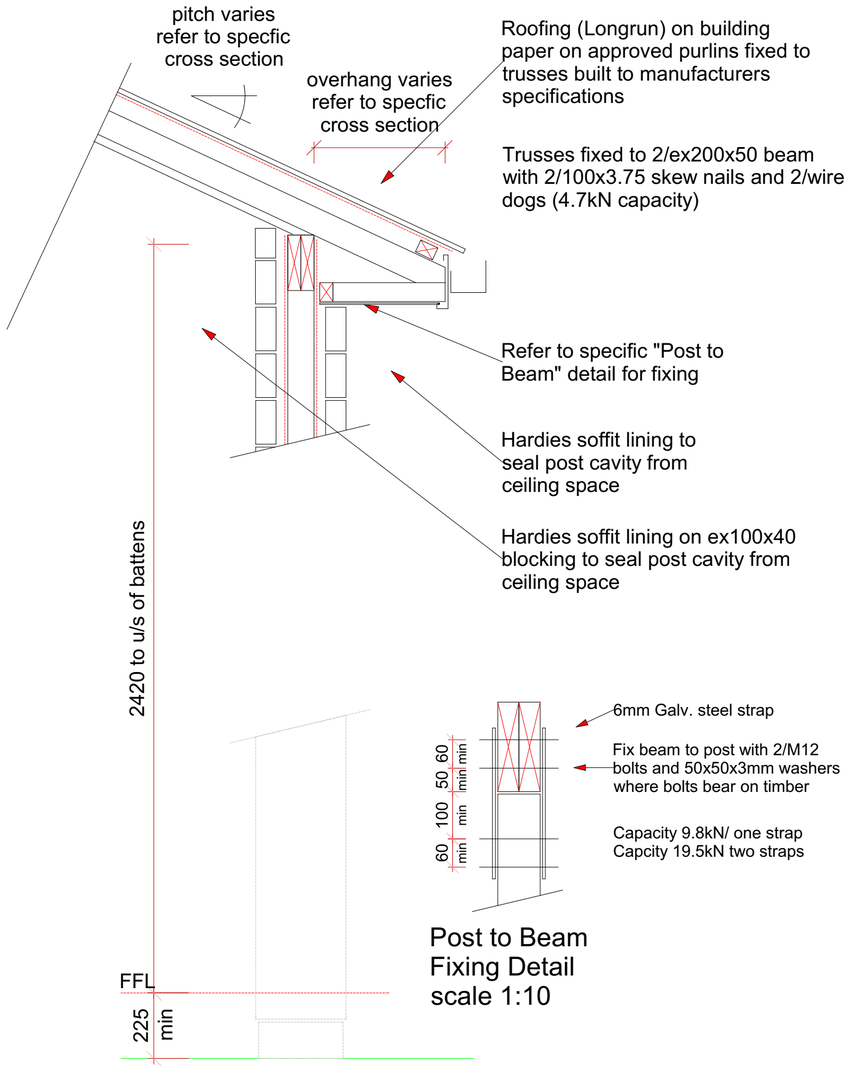
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Date: 24/07/2025

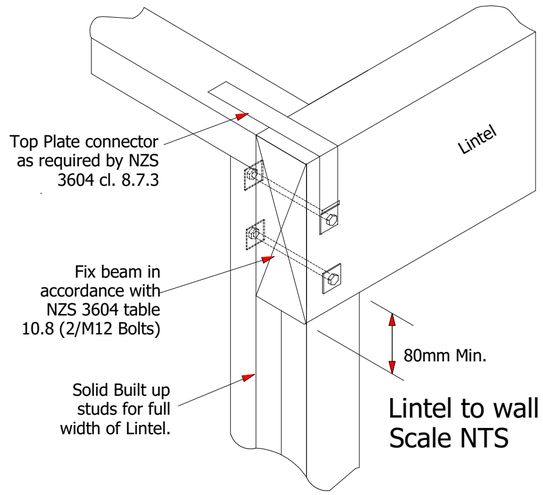
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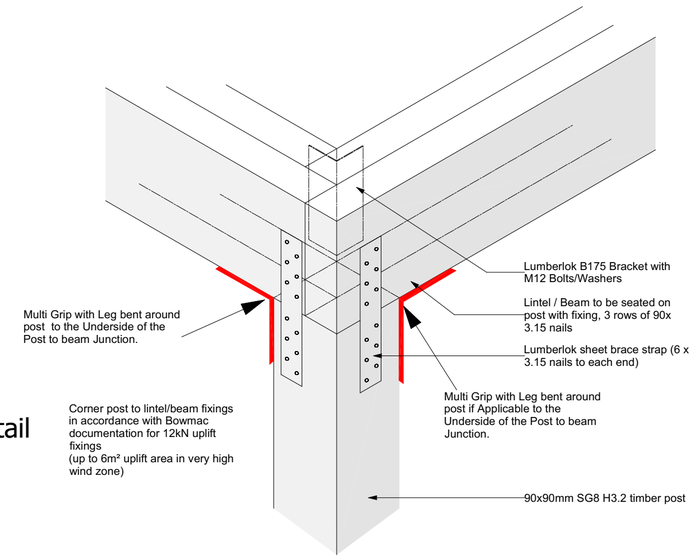
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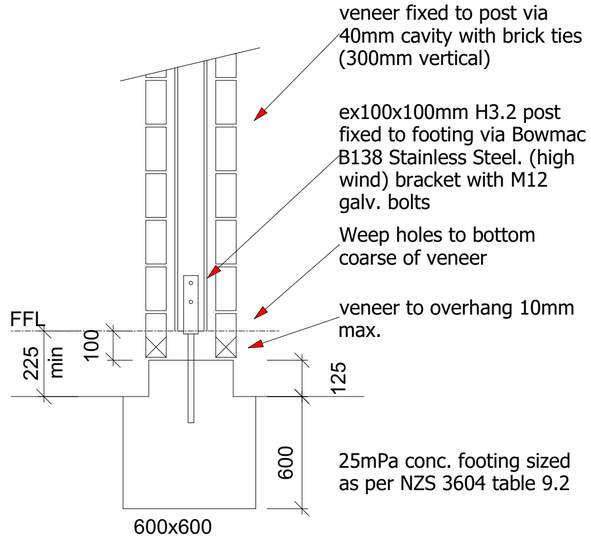


Post to Beam
Fixing Detail
scale 1:10



Lintel to wall detail
Scale NTS





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SPECIFICATION

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

UWC Ltd

52 Benn St
Amberley

Date: 2 April 2025

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CONSTRUCTION SCHEDULE

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:
Waffle Slab Foundation

SG8
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: Lumberlok Bottom Plate Fixing Anchors as per manufacturer’s specifications @ 900mm crs on all external walls and within 150mm of each end of the plate. 75mmx4mmØ shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:
Exterior & Interior Loadbearing wall: 90x45mm studs @ 600 crs
Dwangs Ext: 90x45 @ 800crs
Non loadbearing: 90x45mm studs @ 600 crs
Dwangs Int: 90x45mm @ 800mm crs

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

Building Wrap: Watergate building wrap with Aluband flexible flashing tape
Building wrap to be strapped @ 300crs between dwangs.

INSULATION, ENERGY EFFICIENCY:
Refer to H1 Schedule, Energy Efficiency Calculations
Exterior Walls: Batts – R 2.6 Wall
Ceilings: Batts – R6.6 Ceiling
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)
Purlins: 70x45 SG8 H1.2 @ 900crs (Fixings in specification)

Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated)
Fascia & Gutter system:
Refer to manufacturers specification attached,
Down pipes: 75x55mm Colorsteel
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 of loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.
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
Aqualine Gib with Enamel paint finish, refer to details attached.

KITCHEN JOINERY
Bench top –Melamine (High Pressure laminate), 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, Manrose SF 150)

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be
Interconnected and Located in each bedroom,
Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A)
and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

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
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

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Roof Pitch: As noted in the project information on the plan.
Maximum Catchment Area: 0º-25º =60m² as per NZBC E1/AS1 Table 5

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PRELIMINARIES AND GENERAL

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.

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PREPARATION AND GROUNDWORK

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.

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 (CONCTRETE AS PER ENGINEERS DESIGNS)

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

Bar Diameter	Lap
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.

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.

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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.

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CARPENTRY

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
Battens: Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip).
TIMBER TRUSSES
Moisture content at supply: 18%.

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

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.

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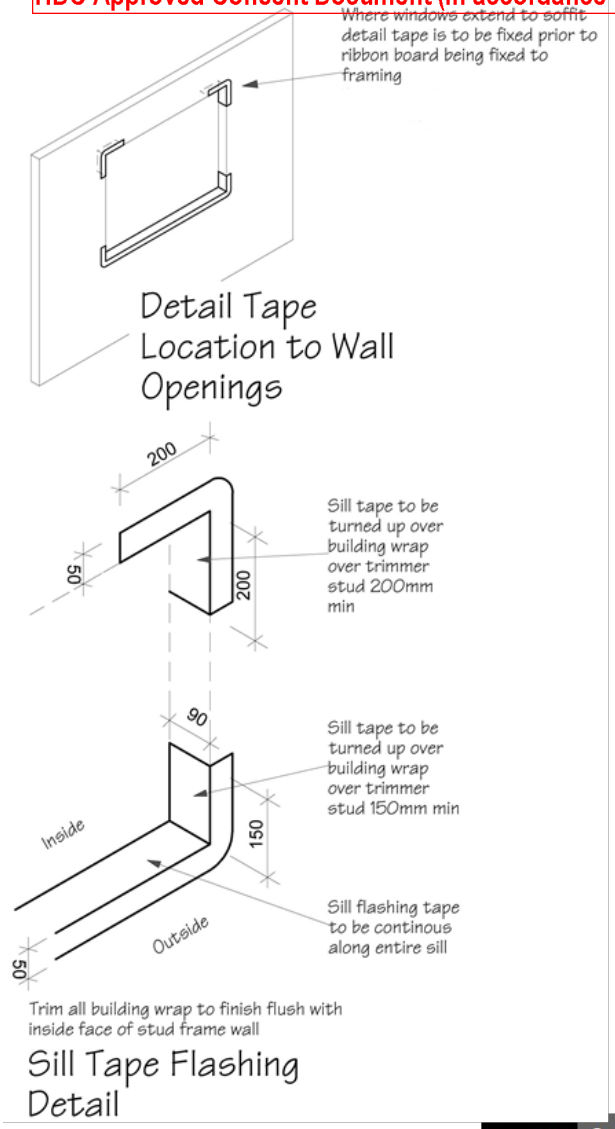
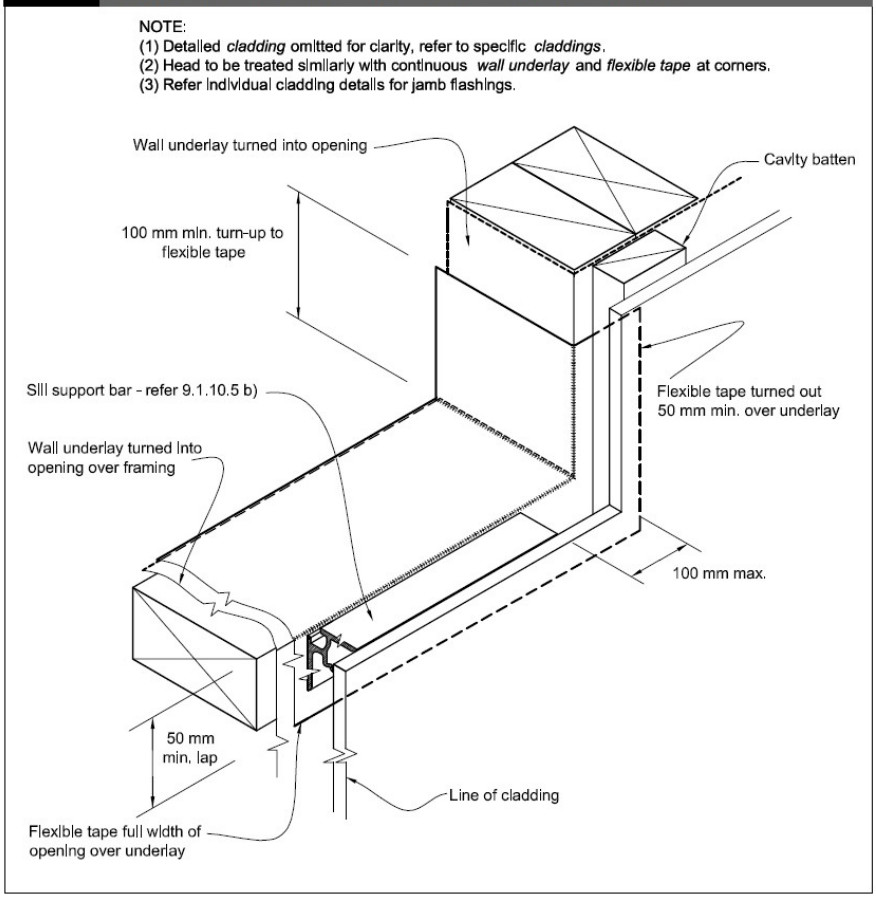


Figure 72B: **General window and door opening with drainage cavity**
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128



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BRICK VENEER CLADDING

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 5º 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 *damp-proof course* Bottom of veneer panel supported on steel angle lintel	Within 300 mm or two courses (whichever is the smaller) from bottom of veneer
Bottom of veneer panel in masonry rebate with *membrane damp-proof course*	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) Horizontal	Vertical	Tie type (4)(5)	Maximum spacings (1) 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.

METAL PROFILED ROOFING

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
NZ Metal Roof and Wall Cladding Code of Practice

QUALIFICATIONS
Roofers to be Approved Installers.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

PERFORMANCE
Install roofing material and associated flashings and accessories to form a weather tight and durable system.

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

MARKING AND CUTTING PROFILED METAL ROOFING
Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

INSTALLING PROFILED METAL ROOFING
Install and fix 0.40 gauge roofing in accordance with NZ Steel's Installers Guide and to the Manufacturer Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.
Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

FLASHINGS GENERALLY
Formable grade 0.55 BMT for galvanised, aluminium/zinc and pre-coated steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to the Manufacturers standard flashing details.

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

NZBC E2/AS1 clause 4.5.2 Metal flashing joints
Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joins of metal flashings shall have the following features:
a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
i) compatible with the flashing material as per NZBC E2 Table 21 and Table 22, and ii) sealed against moisture, or iii) of a sealing type or blind rivet,
b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel, ii) 8 metres for copper, & iii) 8 metres for aluminium.
c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
d) Where necessary, expansion joints shall be formed as shown in Figure 6, with: i) minimum 200 mm laps, and ii) sliding clips at both sides of the lap.

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.

FASTENERS GENERALLY
Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

FIXING SCREWS
Screws appropriate to the roofing material and the supporting member, as recommended by the Manufacturer.

RIVETS
Sealed aluminium, minimum diameter 4 mm.

SEALANT
Neutral curing silicone or polymer sealant as required by the Manufacturer and used as directed.

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

CLOSURE STRIPS
Compressible, profiled, closed cell foam strips to fit the sheet profile.

LAP SEALING TAPE
Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

END LAPS
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

AVOID DAMAGE
Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

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

Remove metal filings from roofing surfaces at least daily.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

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Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting's, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

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ALUMINIUM WINDOWS AND DOORS

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

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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INSULATION

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

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 Aqualine® 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
Battens:Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip
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

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.

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.

MOVEMENT CONTROL JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.

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CARPETING

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

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

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PAINT SYSTEMS TO EXTERIOR AREAS
Undercoat: Resene SpaceCote “Flat white”
Top coat: Resene SpaceCote “Flat white”

RAINWATER SYSTEMS

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/m^2) 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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HOT AND COLD WATER SYSTEM

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 50º) The storage water heater control thermostat shall be set at a temperature of not less than 50º 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.

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.

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 onsite supply 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:
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.

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

ELECTRIC HOT WATER CYLINDER

Brand/model number:	Rheem
Capacity:	250 litres

NZBC G12/AS1

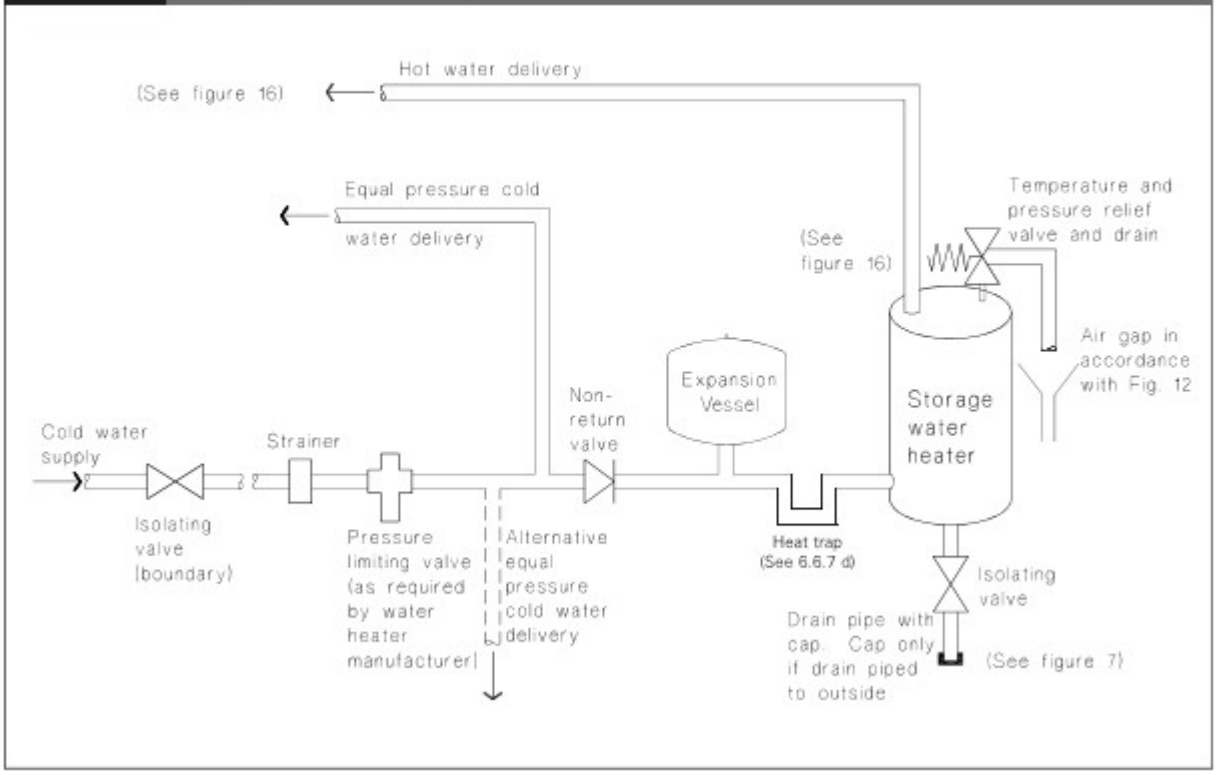
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Table 7: Water Supply Pipework Support Spacing
Paragraph 7.1.3

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

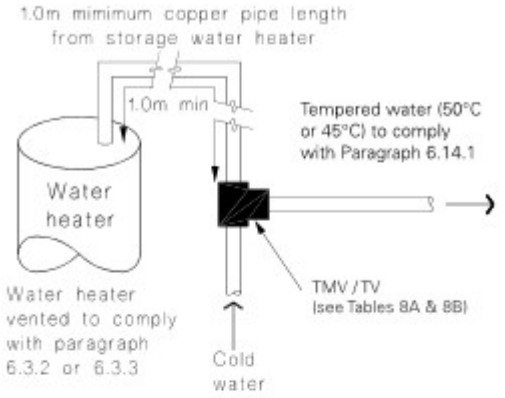
Note:
The spacing for these pipe materials is based on the pipes being located within the *building* structure.

Figure 8(a): Mains Pressure Storage Water Heater System (unvented) - Expansion Vessel
Paragraphs 6.1.2 and 6.2.1 c)

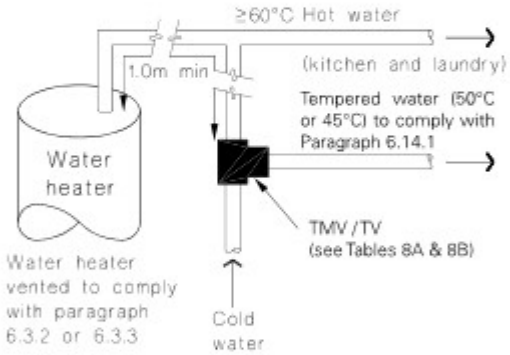


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Figure 16: Tempering Valve or Thermostatic mixing Valve Installation
Tables 8A and 8B



(a) Where all hot water is tempered



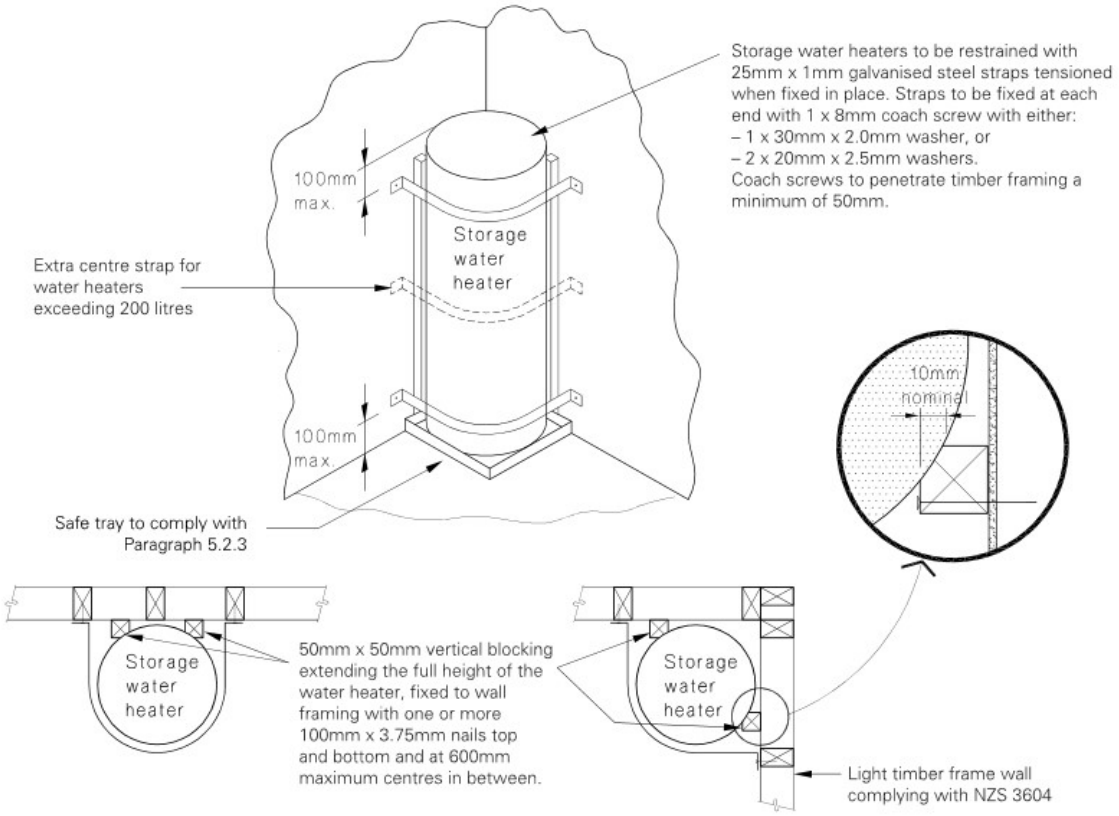
(b) With untempered hot water to laundry and kitchen fixtures and appliances

Notes:

1. For optimum system efficiency the temperature control device, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the temperature control device.
2. 1.0 m minimum copper pipe length from storage water heater to temperature control device.
3. Untempered hot water must not be provided to fixtures or appliances from a storage water heater that is connected to an uncontrolled heat source, such as a wet-back or solar water heater.

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Figure 14: Seismic Restraint of Storage Water Heaters 90 – 360 litres
Paragraph 6.11.4



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SANITARY PLUMBING

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.
Corrugated metal 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

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
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.

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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

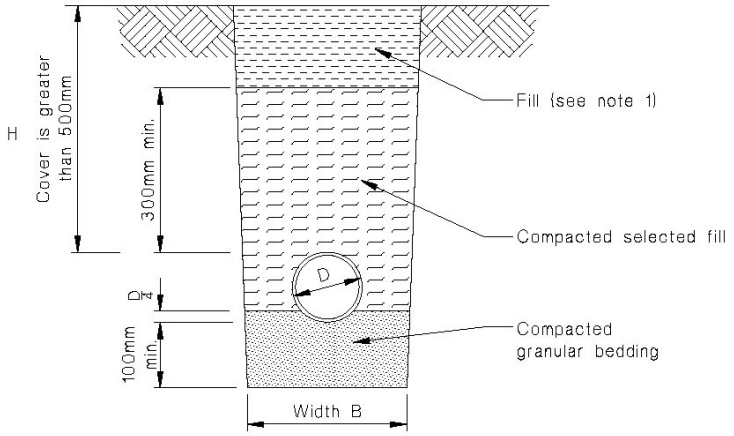
NZS 7643 Section 11 gives an acceptable method for ensuring watertightness of below ground uPVC drainage pipework.

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.

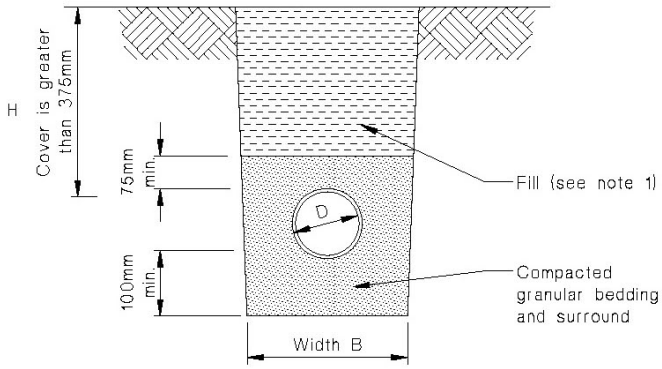
NZBC G13/AS2

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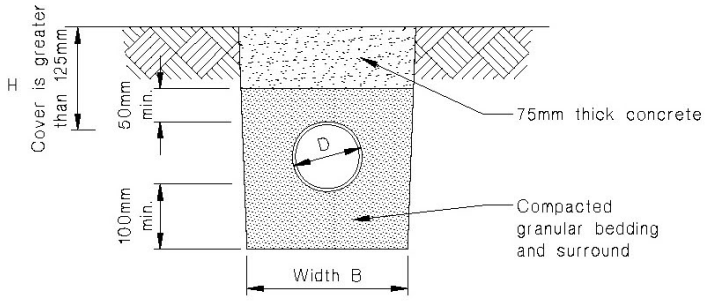
Figure 7: **Bedding and backfilling**
Paragraphs 5.2.1, 5.3.1 and 5.4.1



(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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ELECTRICAL

Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundering – 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
NZECP 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)

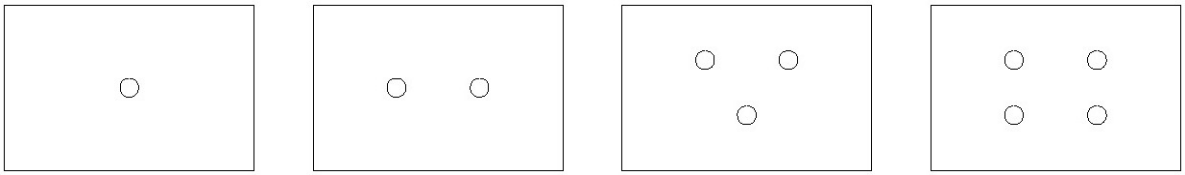
LIGHTING SCHEDULE (Minimum per area/room)

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 10m² 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 5m² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Single (1LF) Double (2 LF) Triple (LF) Quad (4 LF)

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 mm^2, 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.

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 mm^2 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

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 personel. 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

(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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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

Date: **16 April 2025**

Fabricator: **VIP Frames & Trusses**

Job Name: **Brendon Esler Builders**
New House
Lot 79 52 Benn Street
Amberley

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

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

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

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

Wind Zone	**Altitude**	**100m**
	Snow (Open Ground Load)	**0.900kPa**
Roof Material	**Snow (Basic Roof Load)**	**0.441kPa**

Treatment Definition:

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

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

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

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

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

Council Contacts:

Consents Officer: _____
Email #: _____
Phone: _____

Please forward to:

VIP Frames & Trusses
65-67 Wickham Street
Ph (03) 389-8200

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

Pre-consent Truss Design Agreement

By accepting this truss design from VIP Frames and Trusses you agree to the following

1) Truss designs are null and void if production is being completed by parties other than VIP Frame and Trusses

2) Truss design must be reviewed by the Architect and Engineer engaged on the project to ensure any crucial details are translated to the architectural and structural plans

3) Architect and Engineer review should also confirm plans have been interpreted correctly and the design is fit for purpose

4) Any bracing specified is indicative of location only and must be installed as per the manufacturers guidelines

MiTek New Zealand Limited

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

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

www.miteknz.co.nz

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **VIP Frames & Trusses**

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

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **400623** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited, **Date: Wednesday, 16 April 2025**



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

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
Printed: 14:28:32 16 Apr 2025

MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	~MSGx45 H1.2	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron .5mm	Material:	Gib Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
GE1	1D	3370	25.000	900	J12	1	2331	25.000	900	*R2	4	913	25.000	900	S2	2	7385	25.000	900	J21	1	2267	25.000	900
*H1	2	7942	18.249	900	J14	1	1431	25.000	900	*R3	4	913	25.000	900	S5	1	3370	25.000	900	J26	1	2267	25.000	900
*H2	1	3635	18.249	900	J15	1	1431	25.000	900	*R4	1	1144	25.000	900	S6	1	3370	25.000	900	T3	1	7385	25.000	900
*H3	1	3242	18.249	900	J16	1	3231	25.000	900	*R5	1	913	25.000	900	S7	1	5060	25.000	900	J6	1	3231	25.000	900
*H4	2	5306	18.249	900	J17	1	3231	25.000	900	*R6	1	1080	25.000	900	S8	2	5060	25.000	900	J11	1	3231	25.000	900
J1	1	3231	25.000	900	J18	1	3167	25.000	900	*R7	1	1080	25.000	900	T2	1	10108	25.000	900	J19	1	3167	25.000	900
J2	2	3231	25.000	900	J20	1	2267	25.000	900	*R8	1	6260	25.000	900	T4	1	7385	25.000	900	J24	1	3167	25.000	900
J3	1	3231	25.000	900	J22	1	1367	25.000	900	*R9	5	1305	0.000	760	V1	1	2275	25.000	900	S4	1	6380	25.000	553
J4	1	3231	25.000	900	J23	1	1367	25.000	900	*R10	2	1305	0.000	760	V2	1	1375	25.000	900	S3	1	6380	25.000	900
J5	1	3231	25.000	900	J25	1	2267	25.000	900	*R11	1D	1305	0.000	900	V3	1	1402	25.000	900	T1	1	10108	25.000	900
J7	1	2331	25.000	900	J27	1	1367	25.000	900	*R12	1	2350	25.000	900	V4	1	2302	25.000	900					
J9	1	1431	25.000	900	J28	1	1367	25.000	900	*R13	1D	2350	25.000	900	J8	1	2331	25.000	900					
J10	1	1431	25.000	900	*R1	1	1144	25.000	900	S1	11	10108	25.000	900	J13	1	2331	25.000	900					

Total quantity : 88

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The computer design input has been carried out by:

Signed: .....

Date: ...Wednesday, 16 April 2025....

Name of Detailer: Anton Musson

Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
Printed: 14:28:20 16 Apr 2025

TRUSS FIXING SELECTION REPORT - Characteristic Loads

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

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
GE1	1D	3370	K	0.995	0.572	Wide		No fixing selected
			A	0.645	0.153	Wide		No fixing selected
			I	1.057	0.847	Wide		No fixing selected
			H	0.865	0.671	Wide		No fixing selected
			G	1.438	0.983	Wide		No fixing selected
			J	1.131	0.000	Wide		No fixing selected
*H1	2	7942						Refer NZS3604:2011 Tables 15.6
*H2	1	3635						Refer NZS3604:2011 Tables 15.6
*H3	1	3242						Refer NZS3604:2011 Tables 15.6
*H4	2	5306						Refer NZS3604:2011 Tables 15.6
J1	1	3231	B	4.322	0.739	Cross	1	Pair of Wire Dog Staples
			G	0.607	0.416	Butt	1	Pair of 3.15d Nails
			D	3.662	2.462	Cross	1	Pair of Wire Dog Staples
			I	0.760	0.266	Cross	1	Pair of Wire Dog Staples
			E	1.527	1.100	Cross	1	Pair of Wire Dog Staples
J2	2	3231	B	4.452	1.267	Cross	2	Pair of Wire Dog Staples
			F	2.225	1.357	Butt	2	JH 47x90
			D	1.003	0.664	Butt	2	JH 47x90
J3	1	3231	B	4.253	0.944	Cross	1	Pair of Wire Dog Staples
			E	0.447	0.341	Butt	1	Pair of 3.15d Nails
			D	4.017	2.628	Cross	1	Pair of Wire Dog Staples
			G	0.460	0.201	Cross	1	Pair of Wire Dog Staples
J4	1	3231	B	4.397	1.244	Cross	1	Pair of Wire Dog Staples
			D	2.598	1.745	Butt	1	JH 47x90
			F	0.787	0.299	Cross	1	Pair of Wire Dog Staples
J5	1	3231	B	4.318	0.973	Cross	1	Pair of Wire Dog Staples
			E	0.446	0.342	Butt	1	Pair of 3.15d Nails
			D	3.757	2.526	Cross	1	Pair of Wire Dog Staples
			G	0.756	0.274	Cross	1	Pair of Wire Dog Staples
J7	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J9	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J10	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J12	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J14	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J15	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J16	1	3231	A	2.914	0.599	Cross	1	Pair of Wire Dog Staples
			E	0.599	0.416	Butt	1	Pair of 3.15d Nails
			C	4.235	2.688	Cross	1	Pair of Wire Dog Staples
			F	0.548	0.122	Cross	1	Pair of Wire Dog Staples
			D	1.571	1.103	Cross	1	Pair of Wire Dog Staples
J17	1	3231	B	4.369	0.995	Cross	1	Pair of Wire Dog Staples
			E	0.444	0.344	Butt	1	Pair of 3.15d Nails
			D	4.364	2.779	Cross	1	Pair of Wire Dog Staples
J18	1	3167	B	4.388	1.244	Cross	1	Pair of Wire Dog Staples
			D	3.160	1.980	Butt	1	JH 47x90
J20	1	2267	A	2.323	0.846	Cross	1	Pair of Wire Dog Staples
			E	1.701	0.988	Butt	1	JH 47x90
			C	0.591	0.403	Butt	1	Pair of 3.15d Nails
J22	1	1367	B	2.639	0.575	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.916	0.777	Butt	1	JH 47x90
J23	1	1367	B	3.056	0.240	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.148	0.964	Cross	1	Pair of Wire Dog Staples
J25	1	2267	B	3.491	0.914	Cross	1	Pair of Wire Dog Staples
			F	1.588	0.967	Butt	1	JH 47x90
			D	0.670	0.411	Butt	1	Pair of 3.15d Nails
J27	1	1367	B	2.650	0.585	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.464	Butt	1	JH 47x90
			D	0.583	0.343	Butt	1	Pair of 3.15d Nails
J28	1	1367	B	3.092	0.245	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.144	1.000	Cross	1	Pair of Wire Dog Staples
*R1	1	1144						Refer NZS3604:2011 Tables 15.6
*R2	4	913						Refer NZS3604:2011 Tables 15.6
*R3	4	913						Refer NZS3604:2011 Tables 15.6
*R4	1	1144						Refer NZS3604:2011 Tables 15.6
*R5	1	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1080						Refer NZS3604:2011 Tables 15.6
*R7	1	1080						Refer NZS3604:2011 Tables 15.6
*R8	1	6260						Refer NZS3604:2011 Tables 15.6
*R9	5	1305						Refer NZS3604:2011 Tables 15.6
*R10	2	1305						Refer NZS3604:2011 Tables 15.6
*R11	1D	1305						Refer NZS3604:2011 Tables 15.6
*R12	1	2350						Refer NZS3604:2011 Tables 15.6
*R13	1D	2350						Refer NZS3604:2011 Tables 15.6
S1	11	10108	B	9.159	5.111	Cross	11	CT400
			J	9.159	5.111	Cross	11	CT400
S2	2	7385	B	4.523	1.775	Cross	2	Pair of Wire Dog Staples
			N	0.925	0.970	Butt	2	JH 47x90
			K	8.575	5.861	Cross	2	CT400
S5	1	3370	B	3.699	1.904	Cross	1	Pair of Wire Dog Staples
			J	4.068	2.028	Cross	1	Pair of Wire Dog Staples
			F	2.250	0.956	Cross	1	Pair of Wire Dog Staples
S6	1	3370	B	3.665	1.870	Cross	1	Pair of Wire Dog Staples
			I	4.324	2.159	Cross	1	Pair of Wire Dog Staples
			F	1.064	0.818	Cross	1	Pair of Wire Dog Staples
S7	1	5060	B	3.498	1.534	Cross	1	Pair of Wire Dog Staples
			F	1.122	0.492	Wide		No fixing selected
			H	4.757	3.090	Wide		No fixing selected
S8	2	5060	B	5.039	2.592	Cross	2	Pair of Wire Dog Staples
			F	4.133	2.525	Cross	2	Pair of Wire Dog Staples
T2	1	10108	B	9.035	5.136	Cross	1	CT400
			I	9.035	5.136	Cross	1	CT400
T4	1	7385	B	4.986	2.271	Cross	1	Pair of Wire Dog Staples
			N	2.297	0.899	Butt	1	JH 47x90
			K	6.526	4.324	Cross	1	CT400
V1	1	2275	A			Wide		No fixing selected
V2	1	1375	A			Wide		No fixing selected
V3	1	1402	A			Wide		No fixing selected
V4	1	2302	A			Wide		No fixing selected
J8	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J13	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J21	1	2267	A	2.480	1.183	Cross	1	Pair of Wire Dog Staples
			E	1.725	1.054	Butt	1	JH 47x90
J26	1	2267	B	3.652	1.245	Cross	1	Pair of Wire Dog Staples
			F	1.597	1.037	Butt	1	JH 47x90
T3	1	7385	B	4.403	1.916	Cross	1	Pair of Wire Dog Staples
			M	13.702	8.722	Cross	1	CT400
			Q	3.704	2.686	Butt	1	JH 47x90
J6	1	3231	B	5.668	2.358	Cross	1	Pair of Wire Dog Staples
			H	4.122	2.637	Butt	1	JH 47x90

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Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
Printed: 14:28:20 16 Apr 2025

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J11	1	3231	B	4.017	2.220	Cross	1	Pair of Wire Dog Staples
			F	3.910	2.915	Cross	1	Pair of Wire Dog Staples
J19	1	3167	B	5.652	2.278	Cross	1	Pair of Wire Dog Staples
			F	4.084	2.503	Butt	1	JH 47x90
J24	1	3167	B	5.541	2.265	Cross	1	Pair of Wire Dog Staples
			F	3.926	2.487	Butt	1	JH 47x90
S4	1	6380	A	5.659	5.127	Cross	1	CT400
			E	5.979	3.859	Cross	1	CT400
S3	1	6380	A	10.408	6.430	Cross	1	CT400
			E	11.250	6.490	Cross	1	CT400
T1	1	10108	B	17.770	10.733	Cross	1	CT400
			G	14.701	8.763	Cross	1	CT400

Fixing List

Qty	Selected Fixing
59	Pair of Wire Dog Staples
19	Pair of 3.15d Nails
23	JH 47x90
34	CT400
12	No fixing selected

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

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

Design Certificate

PROJECT

Project Name	**Brendon Esler Builders**
Project Address	Lot 79 52 Benn Street , Amberley

CALCULATION SUMMARY

Calculation Name	Product Code	Description	Product Length*
Garage Door	PL12H1-350100	Prolam 315x90 Non-Visual PL12 H1.2	5.0 m
VERANDA	PL10H1-200100	Prolam 190x90 Non-Visual PL10 H1.2	3.2 m

*Confirm required length with architectural drawings and/or on site prior to ordering. Non-bracing post lengths noted exclude footing embedment (if any).

1) GARAGE DOOR

Product Code	**PL12H1-350100**	Calculator	Lintel Supporting Multiple Girder Trusses
Product Description	Prolam 315x90 Non-Visual PL12 H1.2	Product Length	5.0 m

Lintel Span	**4.8 m**
Loaded Dimension	**3.2 m**
Supported Roof Width	**6.2 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Wet in Service	**No**

Snow Zone	**N4**
Site Elevation	**100**
Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**315 mm**
Member Width	**90 mm**
Max. Movement	**10.8 mm**
Deflection	**5.1 mm**
Capacity Ratio	**1.1**
Rigidity Ratio	**1.1**
Support Reaction	**12.3 kN**
Uplift Restraint Required	**6.5 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

2) VERANDA

Product Code	**PL10H1-200100**	Calculator	Lintel Roof and Ceiling
Product Description	Prolam 190x90 Non-Visual PL10 H1.2	Product Length	3.2 m

Lintel Span	**3.0 m**
Loaded Dimension	**2.4 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Snow Zone	**N4**
Site Elevation	**100**
Wet in Service	**No**

Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**190 mm**
Member Width	**90 mm**
Max. Movement	**4.9 mm**
Deflection	**2.7 mm**
Capacity Ratio	**1.8**
Rigidity Ratio	**2.4**
Support Reaction	**5.4 kN**
Uplift Restraint Required	**2.9 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

PRODUCER STATEMENT

Tasman Consulting Engineers Limited has been engaged by Prowood Limited to provide the design services that are as used for the Prolam on-line calculator (the Prolam Specifier). The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS 1170, NZS AS 1720.1:2022 and with reference to NZS 3604:2011. This producer statement covers that design work.

Provided that the Prolam Specifier has been used correctly and that all entered values are correct I believe, on reasonable grounds, that the resulting design will meet the requirements of NZBC clause B1 (structure) as an alternative means of verification.

Substitution of the Prowood products listed is not provided for and if substitution occurs then this statement is nullified.

28 March 2025 (3.1.0)

David King
ME(civil) CMEngNZ CPEng(no 145511) IntPE(NZ)
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050

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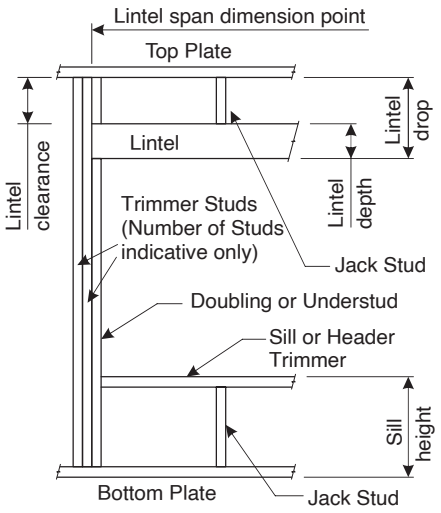
LINTEL FIXING SCHEDULE

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 0.20kPa
- 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
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	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

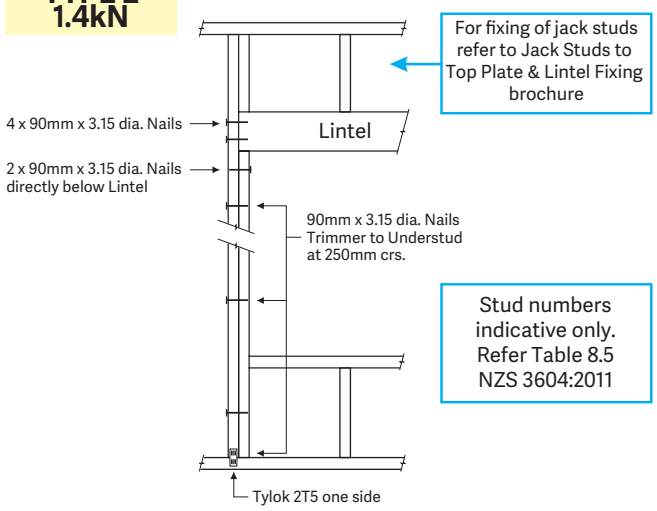
Selection Chart for Lintel Fixing											
Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	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	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	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	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	F	G	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-
5.4	2.0	F	F	G	H	H	E	F	G	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-

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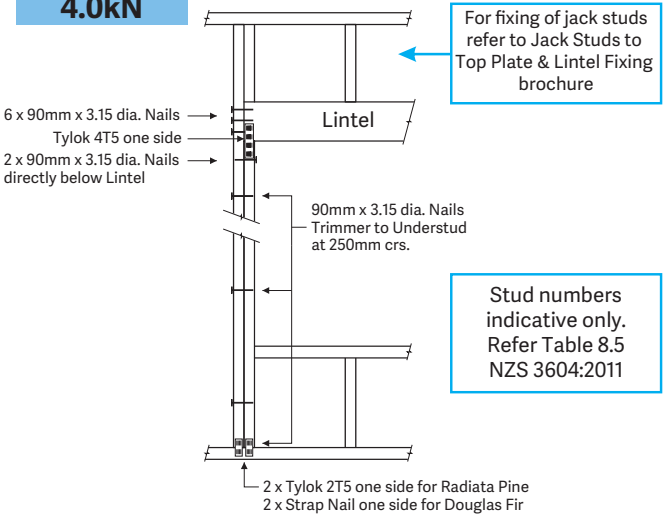
LINTEL FIXING OPTIONS

(Characteristic Uplift)

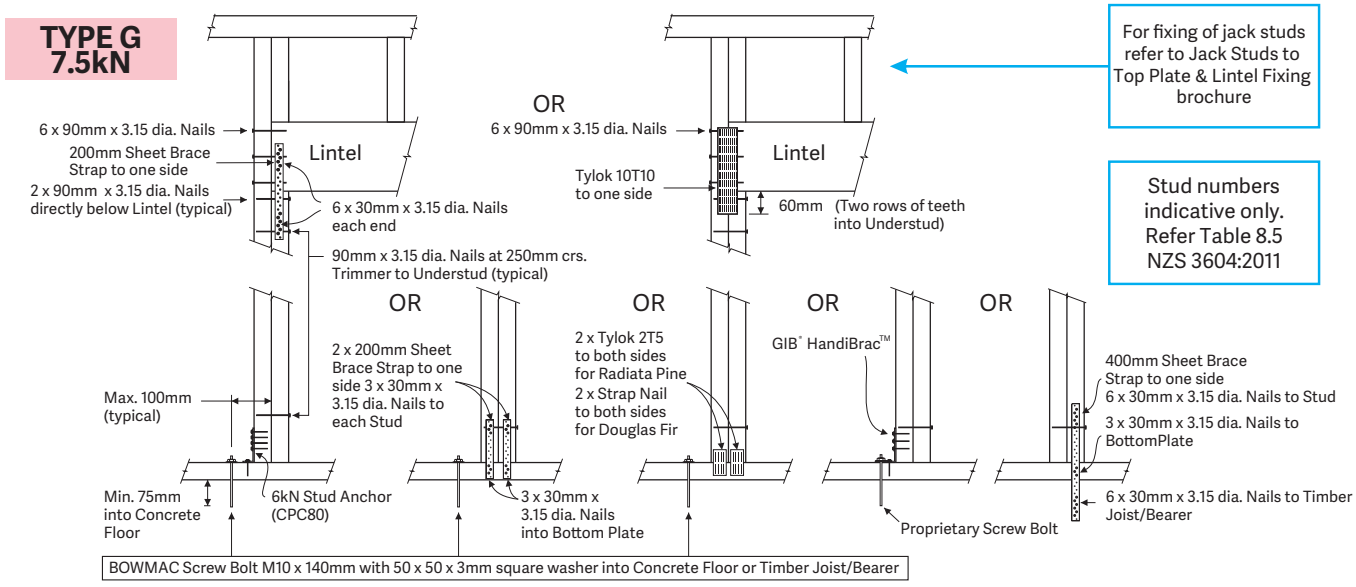
TYPE E 1.4kN



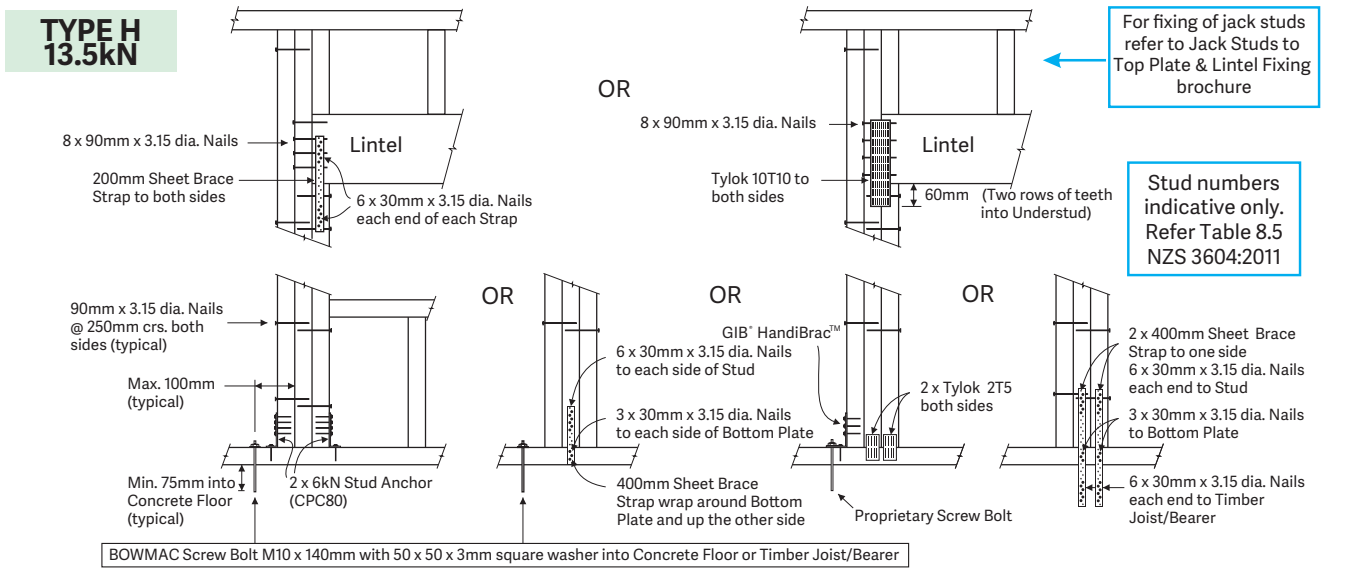
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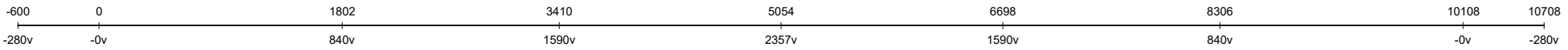


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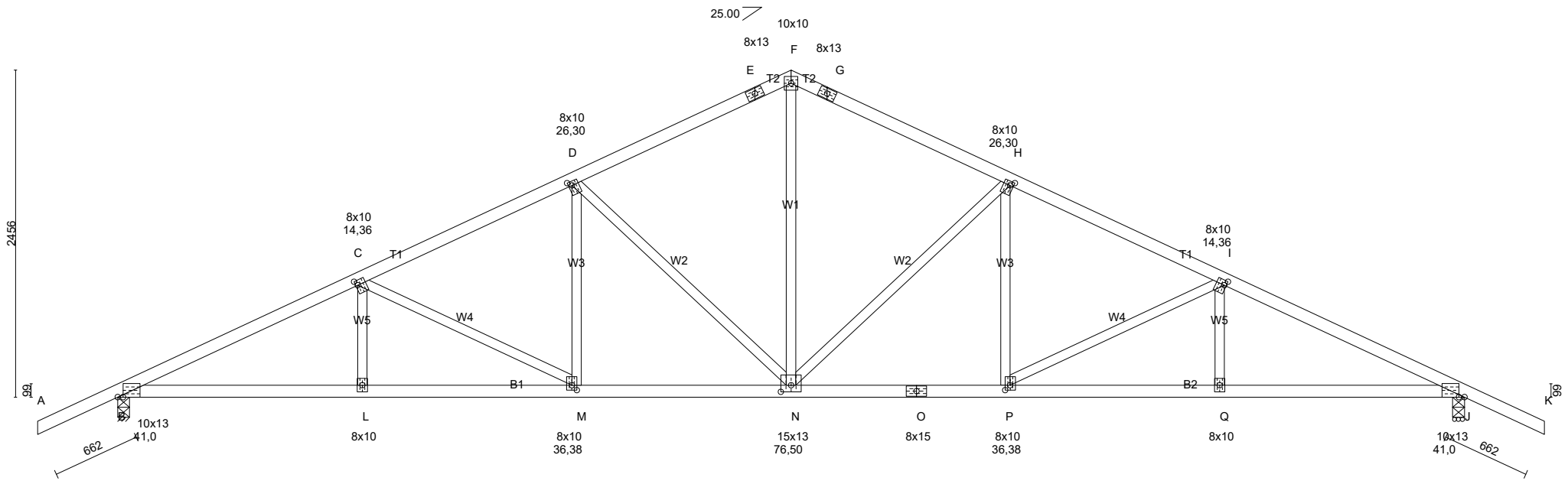


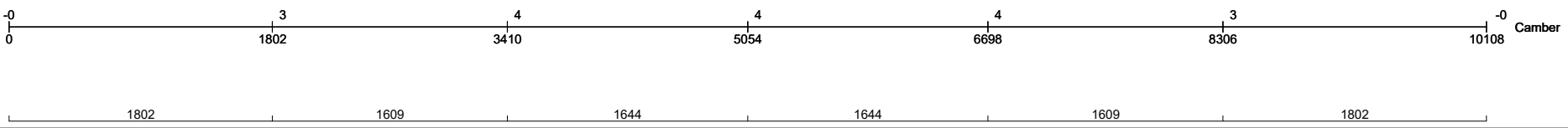
TYPE H 13.5kN





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*** Designed with warnings ***

Uplift at joint(s) B and J exceeds the capacity of two wire dogs. Please ensure that adequate fixing is provided
All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2736 mm

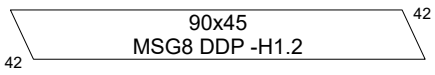
CHORDS
All: 90x45 DDP MSG8 H1.2

WEBS
All: 70x45 DDP MSG6 H1.2

CONNECTORS
176 of 176/GNQ-8x10
22 of 22/GNQ-10x10
44 of 44/GNQ-8x13
22 of 22/GNQ-8x15
44 of 44/GNQ-10x13
22 of 22/GNQ-15x13

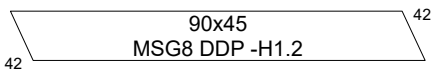
===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 22/22 Off



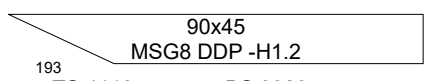
65.0
OL:342 TS:300 BS:300

Piece: T1 — 22/22 Off



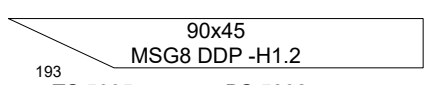
65.0
OL:5980 TS:5939 BS:5939

Piece: B2 — 11/11 Off



OL:4113 TS:4113 BS:3920

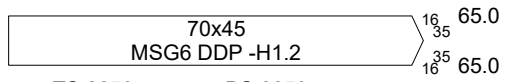
Piece: B1 — 11/11 Off



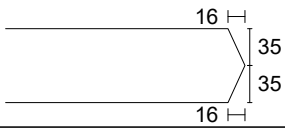
OL:5995 TS:5995 BS:5802

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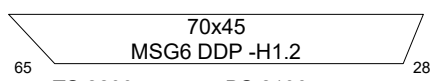
Piece: W1 — 11/11 Off



OL:2267 TS:2250 BS:2250

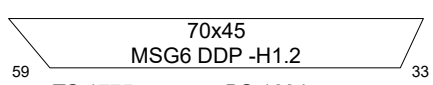


Piece: W2 — 22/22 Off



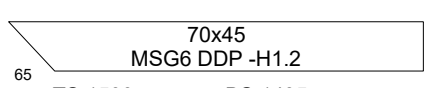
OL:2200 TS:2200 BS:2106

Piece: W4 — 22/22 Off



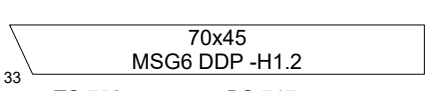
OL:1775 TS:1775 BS:1684

Piece: W3 — 22/22 Off
90.0



OL:1500 TS:1500 BS:1435

Piece: W5 — 22/22 Off
90.0



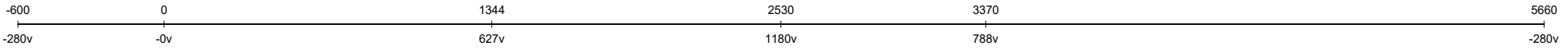
OL:750 TS:750 BS:717

Qty: 1 of 1 **Ply: 1** **Bundle: None** Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

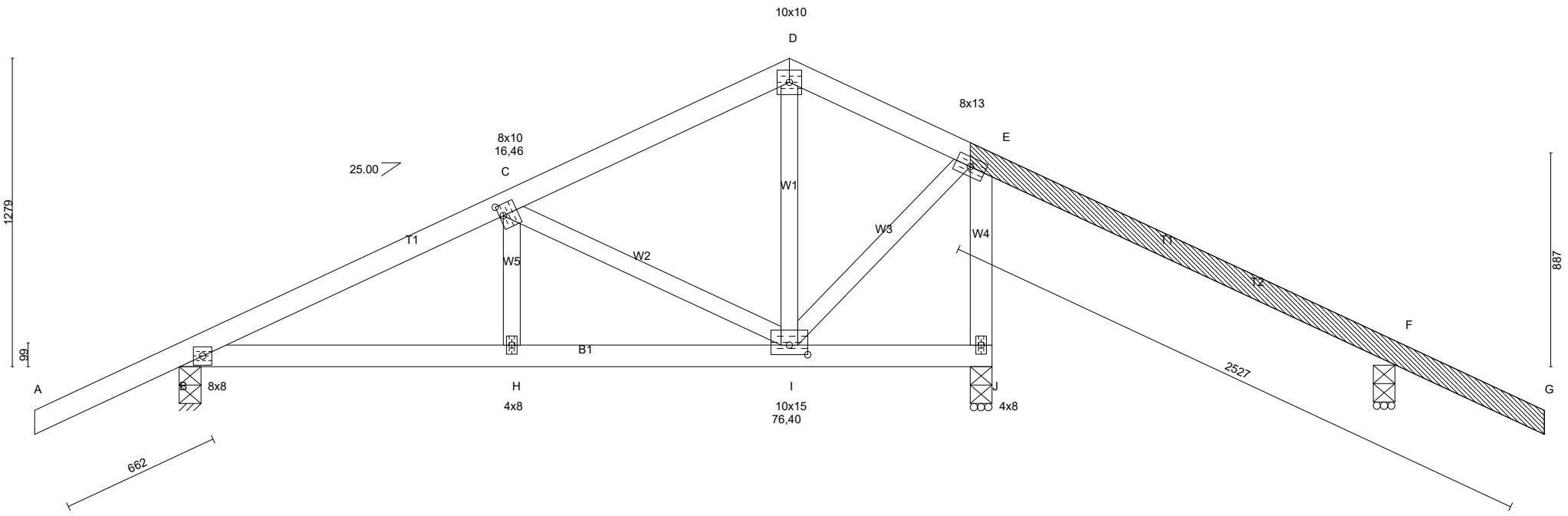
Client: Brendon Esler Builders
Phone:

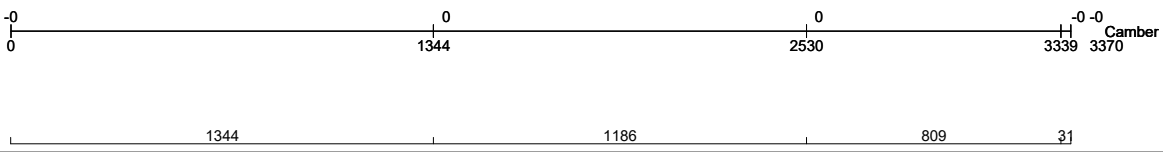
Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:



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Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1559 mm

CHORDS		**WEBS**	
All:	90x45 DDP MSG8 H1.2	**All:**	70x45 DDP MSG6 H1.2
CONNECTORS			
4 of 4/GNQ-4x8	2 of 2/GNQ-8x8	2 of 2/GNQ-8x10	2 of 2/GNQ-8x13
2 of 2/GNQ-10x10	2 of 2/GNQ-10x15		
SCAB NAILING			
T2	2 rows of 90 x 2.8 dia. nails at 80 mm		

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 1/1 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:2668 TS:2626 BS:2626

Piece: T1 — 2/2 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:3495 TS:3453 BS:3453

Piece: B1 — 1/1 Off
90x45 MSG8 DDP -H1.2
25.0 | 193 | 90.0
OL:3370 TS:3370 BS:3177

===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 1/1 Off
70x45 MSG6 DDP -H1.2
50.0 | 59 | 33 | 65.0
OL:1270 TS:1270 BS:1178

Piece: W1 — 1/1 Off
90.0
70x45 MSG6 DDP -H1.2
16 | 35 | 65.0
16 | 35 | 65.0
OL:1090 TS:1073 BS:1073
16 | 35 | 35 | 16

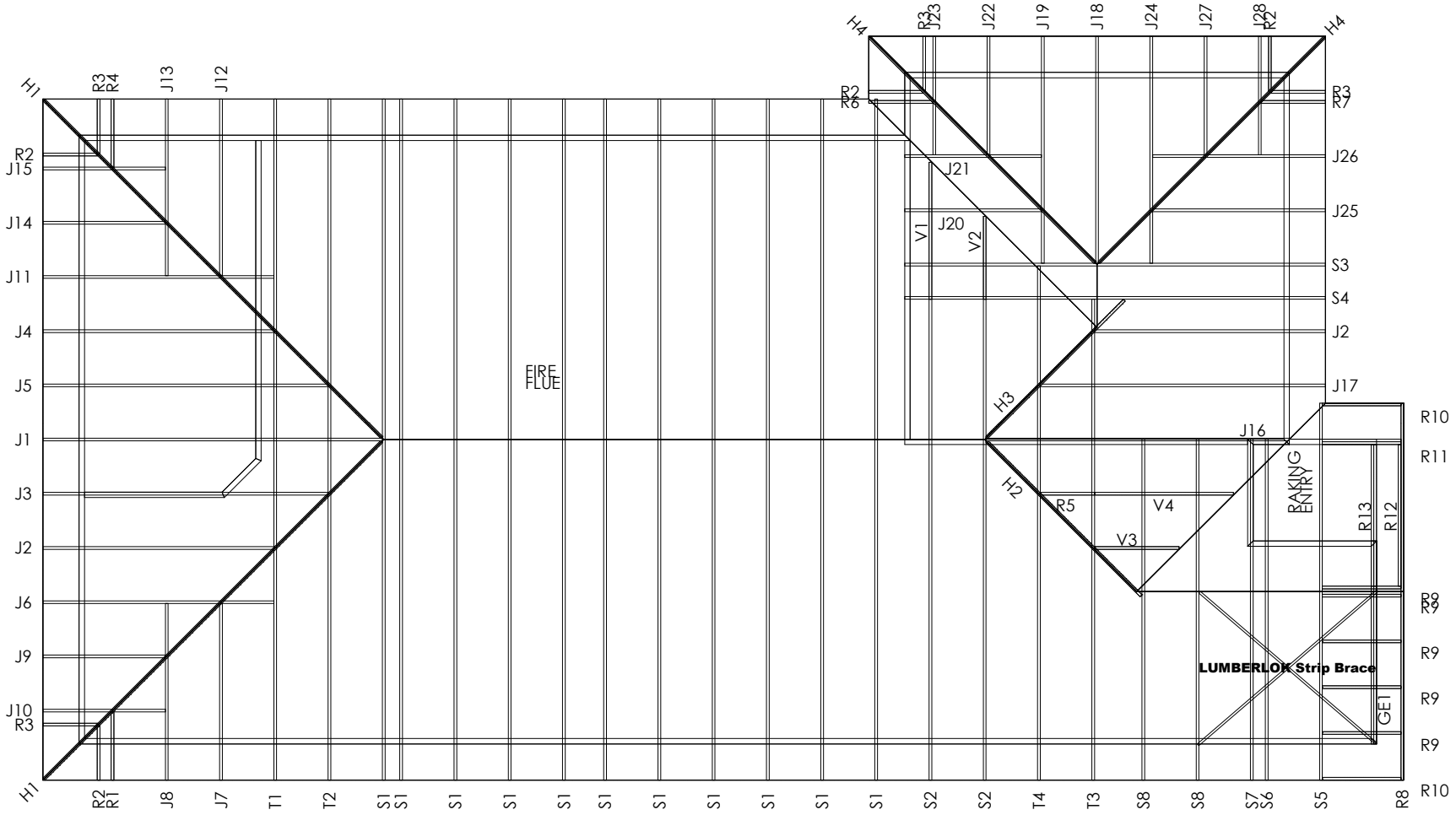
Piece: W3 — 1/1 Off
70x45 MSG6 DDP -H1.2
44.0 | 72 | 24 | 71.0
OL:1029 TS:1029 BS:932

Piece: W5 — 1/1 Off
70x45 MSG6 DDP -H1.2
65.0 | 33 | 90.0
OL:537 TS:537 BS:504

Piece: W4 — 1/1 Off
90.0
90x45 MSG8 DDP -H1.2
42 | 65.0
OL:740 TS:698 BS:740

Roof Bracing

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

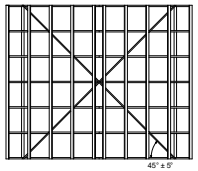
Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

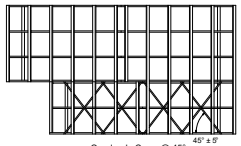
Pitch: 25.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.441

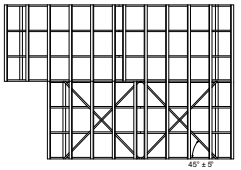
Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson
DATE 16 Apr,2025 PAGE 1 of

Roof Bracing Details


Single Cross @ 45°

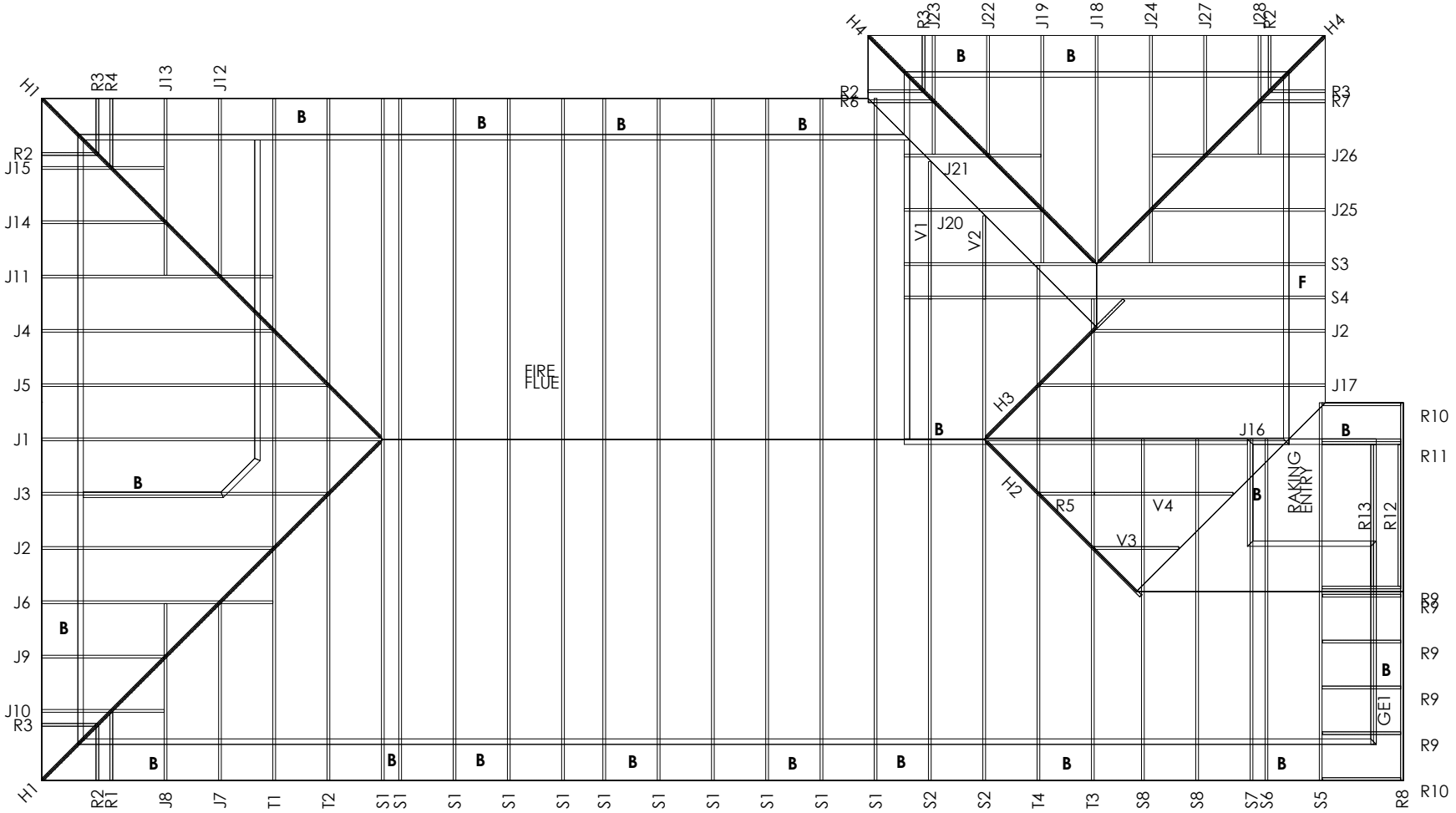

Quadruple Cross @ 45°


Double Cross @ 45°
(as diagram above)

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

All internal wall shown on this layout are considered to be Load Bearing(loads not exceeding 10 kN)
No slab thickening required

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

Pitch:	25.000
Roof Material:	Galv Iron .5mm
Soffit Overhang:	600
Wind Area:	High
Snow Load:	0.441

Trusses And Rafters At 900 Centres Unless Stated Otherwise

DRAWN BY Anton Musson

DATE 16 Apr,2025 PAGE 1 of

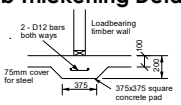
These lintels have been sized as per the GANGLAM and FLITCH BEAM selection manuals as provided by MiTek NZ Ltd.

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

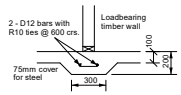
Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	SG8
B	140x90	PL10
C	190x90	PL10
D	240x90	PL10
E	290x90	PL10
F	315x90	PL12

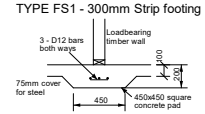
Slab Thickening Details



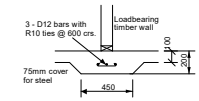
TYPE FP1 - 375x375mm Pad



TYPE FS1 - 300mm Strip footing



TYPE FP2 - 450x450mm Pad



TYPE FS2 - 450mm Strip footing

LUMBERLOK®

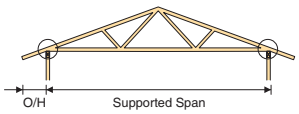
STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

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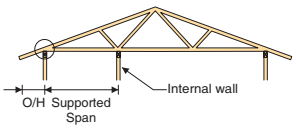
NOTE:

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

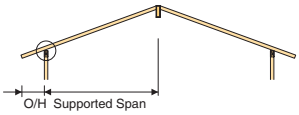
LOADED DIMENSION DEFINITION



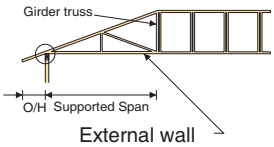
External wall
Standard truss



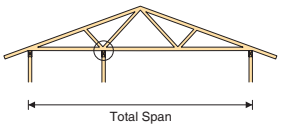
External wall
Internally supported truss



External wall
Rafter roof



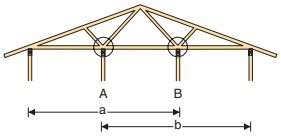
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

FIXING SELECTION CHART

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

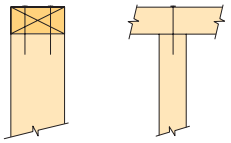
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

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

FIXING OPTIONS

FIXING TYPE A 0.7 kN

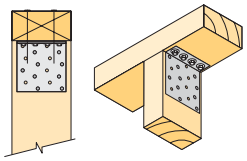
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



FIXING TYPE B 4.7 kN

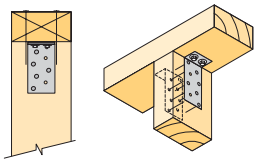
CHOOSE ANY OF THE 3 OPTIONS BELOW

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



Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

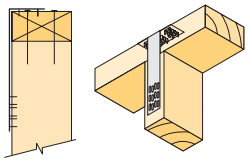
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

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



Plus
LUMBERLOK
Stud Strap
(one face only)

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

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GIB EzyBrace® Bracing Software

Demand Calculation Sheet

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Job Details

Name:	UWC Ltd
Street and Number:	52 Benn St
Lot and DP Number:	Lot 79 Dp 587128
City/Town/District:	Amberley
Designer:	JKH
Company:	
Date:	Saturday, 12 April 2025

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.9
Building Height to Apex (m)	5.2
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	24.6
Building Width (m)	11.2
Building Plan Area (m^2)	196.3

Building Location

Wind Zone = High

Earthquake Zone 2

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**625**	**1500**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1170**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									625	1170
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1687 270%	1771 151%
a	1	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	5	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	External Length =			24.6					720 OK	810 OK
b	1	3.20		2.4	GS1-N	GIB®	221	192		
	2	3.20		2.4	GS1-N	GIB®	221	192		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	External Length =			24.6					498 OK	437 OK
c	1	0.90		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	86	95		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.00		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	95	105		
	External Length =			24.6					469 OK	524 OK

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GIB EzyBrace® Bracing Software

Single Level Across Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									1500	1170
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1773 118%	1721 147%
m	1	0.45		2.4	BLP-H	GIB®	56	62		
	2	0.55		2.4	BLP-H	GIB®	72	77		
	3	0.50		2.4	BLP-H	GIB®	64	69		
	4	0.50		2.4	BLP-H	GIB®	64	69		
	External Length = 11.2								255 OK	278 OK
n	1	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								214 OK	186 OK
o	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	2.40		2.4	GS1-N	GIB®	166	144		
	External Length = 11.2								380 OK	330 OK
p	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								428 OK	372 OK
q	1	1.10		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	105	116		
	2	1.10		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	105	116		
	External Length = 11.2								209 OK	231 OK
r	1	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	External Length = 4								288 OK	324 OK

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Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
EcoPly & EP Barrier	EP1/EPB1-0.4	0.4	80	95
EcoPly & EP Barrier	EP1/EPB1-0.6	0.6	95	105
EcoPly & EP Barrier	EP1/EPB1-1.2	1.2	120	135
OSB	OSB	0.4	90	101
EP Barrier	EPBS-0.4	0.4	60	60
EP Barrier	EPBS-1.2	1.2	65	70
EP Barrier	EPBS-2.4	2.4	80	90
EcoPly & EP Barrier	EPG/EPBG-0.4	0.4	100	115
EcoPly & EP Barrier	EPG/EPBG-1.2	1.2	150	150
EcoPly & EP Barrier	EP2/EPB2-0.6	0.6	105	115
Villa Board	VV	0.6	130	101
GBPF2100S	Gamma Brace	1	20.6	22.8
IBS	S7	0.6	100	100
IBS	S7	0.4	94	104
Home RAB	RAB	0.4	85	91

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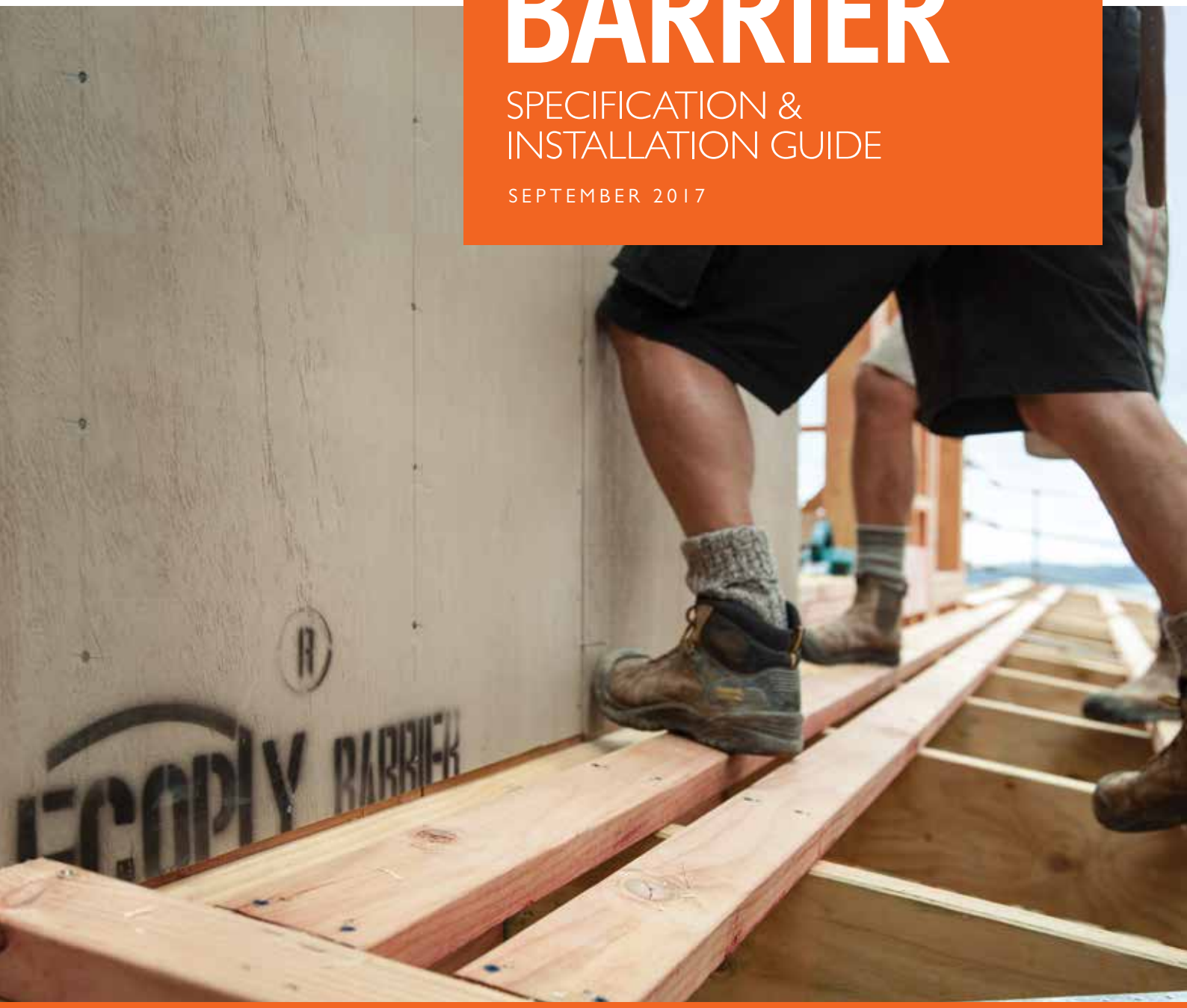
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ECOPLY® STRUCTURAL RIGID AIR BARRIER

BARRIER

SPECIFICATION & INSTALLATION GUIDE

SEPTEMBER 2017



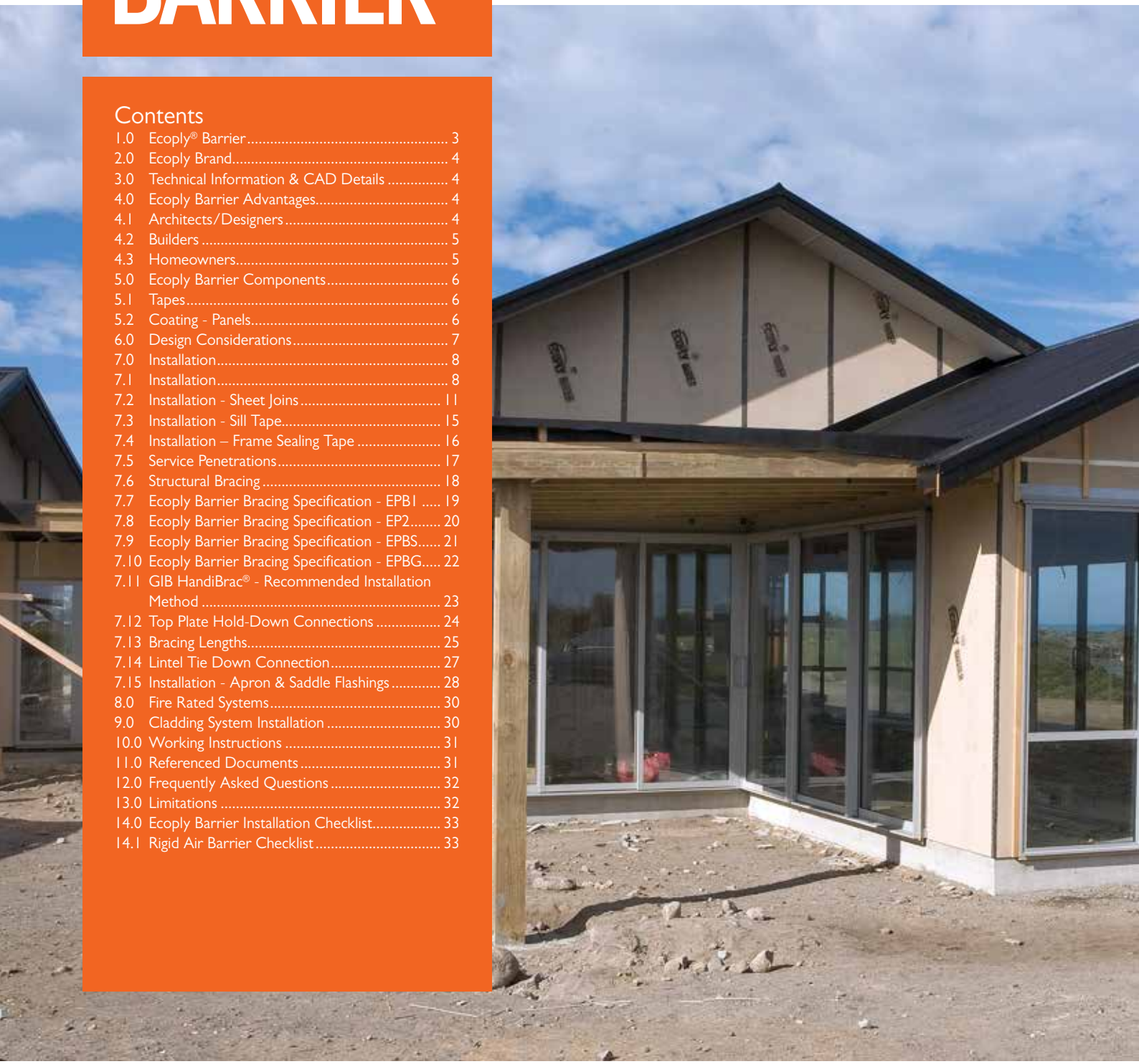
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Information contained within is specific to Ecoply® Barrier structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

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BARRIER



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1.0 ECOPLY® BARRIER

Ecoply® Barrier provides a weathertight rigid air barrier system for drained and vented cavity systems outside the building frame, effectively replacing traditional building wrap in the cavity while providing 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 7mm thick H3.2 CCA (Copper Chrome Arsenate) water borne treated structural plywood panel which is coated on the face and edges using a polyester powder coating process for increased sheet durability and protection from moisture penetration.

Ecoply Barrier meets the New Zealand Building Code (NZBC) requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of NZBC Clause E2 External Moisture, Acceptable Solution (E2/AS1), and has been tested for wind speeds exceeding Extra High wind zone as defined in Standards New Zealand 3604 Timber Framed Buildings (NZS 3604). Testing has been completed to provide solutions for buildings outside the scope of NZS 3604. For details on this, please contact CHH Woodproducts for further information.

Ecoply Barrier is BRANZ appraised for use as a rigid sheathing and temporary weather-protecting sheathing on timber framed buildings.

Ecoply Barrier must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage.

This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply Barrier. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts New Zealand (CHH Woodproducts) assumes no legal liability to you in relation to such information.

Ecoply Barrier panels are engineered to allow the wall system to breathe and dry out, while also preventing the intrusion of exterior moisture. Once the full system has been installed, the system provides a lasting protective barrier.

What is a Rigid Air Barrier?

A rigid air barrier is a barrier against air pressure and water infiltration from the outside to the interior of the building. A rigid air barrier acts as a secondary line of defence against water penetrating into the wall system – the primary defence being the exterior wall cladding.

Definition of an Air Barrier:

- Impermeable to airflow — the system must be continuous (no holes, openings or penetrations) and resistant to air pressure differentials.
- Continuous over the entire building enclosure.
- Able to withstand the forces that may act on them during and after construction.

Ecoply Barrier is a full sheathing system developed to prevent unwanted air movement and replace traditional building wrap.

BRANZ Appraised
Appraisal No.827 [2014]

The information contained in this document is current as at September 2017. It is your responsibility to ensure you have the most up to date information available. The information contained in this publication relates specifically to Ecoply® Barrier manufactured by Carter Holt Harvey Woodproducts New Zealand and must not be used with any other plywood manufacturer's products no matter how similar they may appear. Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply Barrier structural plywood products or Ecoply Barrier Tapes 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 (NZBC).

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2.0 ECOPLY® BRAND

Ecoply® Barrier panels are manufactured in New Zealand by CHH Woodproducts under a third party audited quality control programme to monitor compliance with AS/NZS 2269 – Plywood Structural.

3.0 TECHNICAL INFORMATION & CAD DETAILS

Technical data sheets and CAD drawings referenced in this guide are available for download from www.chhwoodproducts.co.nz.

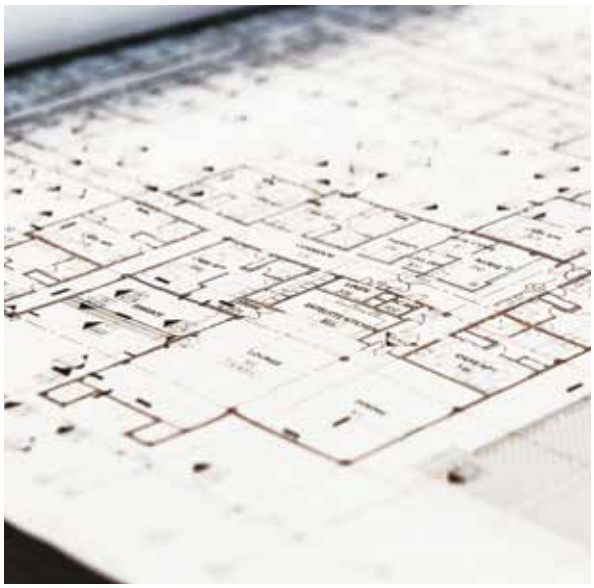
Ecoply Barrier (Rigid Air Barrier) is compliant with NZBC Clause B2.3.1 (a), for not less than 50 years, when used where the cladding durability requirement or serviceable life is not less than 50 years, e.g. structural bracing, and compliant with NZBC Clause B2.3.1 (b), for 15 years where the cladding durability requirement is 15 years when used as a temporary sheathing.

When specifying or installing Ecoply Barrier visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

4.0 ECOPLY® BARRIER ADVANTAGES

4.1 ARCHITECTS / DESIGNERS

Modern construction practices are moving toward providing greater energy efficiency and an airtight building envelope. These principles of high performance building are common in nearly all current green building standards and construction codes. Proper sealing between wall assembly components prevents unwanted air movement in and out of conditioned air spaces.



Advantages:

- Ecoply Barrier can form an integral part of a weathertight system including two of the four 'Ds' of weathertightness; drying and drainage.
- A rigid air barrier provides a more robust cavity and prevents the insulation bulging, which would increase the chance of moisture bridging from the cladding to the framing line.
- Provides both structural support and protection from moisture. Structural bracing is achieved when installed in accordance with the Ecoply Barrier bracing specifications. Bracing benefits may result in cost savings by reducing internal lining bracing elements (Refer to section 7.6 on bracing).
- BRANZ appraised system, fully tested and code compliant rigid air barrier system.
- Manufactured from sustainable plantation pine and available FSC certified (SCS-COC-001316) upon request.
- Low formaldehyde emission level (E0).

BRANZ Appraised
Appraisal No.827 [2014]

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4.2 BUILDERS

Ecoply® Barrier lets you say goodbye to flexible wall underlays forever. Builders no longer have to worry about installing traditional housewrap or building paper on a windy day or having to return for re-work due to rips, tears or wrap that has blown off the home. Ecoply Barrier can typically save up to 2-4* weeks off the total house build time*, by allowing a faster building close in, for an earlier interior start and a quicker overall build time.

Ecoply Barrier installs quickly with two easy steps – fasten the panels and tape the seams. Once completed, the system provides moisture protection both during and after construction.



Advantages:

- Immediate close-in of structure, allowing interior and exterior work to be completed in parallel.
- Reduced builder liability; strong secondary line of defence and solid material for sealing penetrations.
- Schedule your subcontractors sooner.
- No call backs for rips, tears or wrap that has blown off.
- Easy to work light material, simple and easy to install.
- Up to 180 day exposure during construction cycle. No hold-ups while the cladding has to be installed i.e. brick layers etc.

4.3 HOMEOWNERS

An airtight building envelope means less airflow into and out of the home. Since conditioned air is expensive air, homeowners can take comfort in knowing that Ecoply Barrier will provide a strong secondary line of defence against the elements.



Advantages:

- Get possession faster, builders building with Ecoply Barrier can typically reduce up to 2-4* weeks off a typical house build*.
- Structurally rigid home.

* Timeframes and efficiencies are indicative only. Construction production gains will differ with respect to individual builder's abilities and other contributing circumstances outside the control of CHH Woodproducts.

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5.0 ECOPLY® BARRIER COMPONENTS

Table 1: Product Range

Description	Weight (kg/m²)	Thickness	Width	Length
Ecoply® Barrier – structural plywood with factory applied proprietary coating to sheet surface and edges	Approx 4.0	7mm	1197mm	2440mm 2745mm
Sill Tape – one piece stretchable sill tape for window and door sills	-	2 Rolls per Box	150mm, 200mm	20m per roll
Frame Sealing Tape – for a permanent seal of all Ecoply® Barrier openings (Use in conjunction with Sill Tape)	-	2 Rolls per Box 1 Roll per Box	150mm 200mm	30m per roll
Sealing Tape – for a permanent seal of all Ecoply Barrier vertical joints	-	10 Rolls per Box	60mm	30m per roll

COMPONENTS NOT SUPPLIED BY CHH WOODPRODUCTS:

- PVC Horizontal Flashing: use Ecoply® Horizontal Jointer (Product Code RDZF7) supplied by E2 Flashing Solutions.
- Bracing Hold-Down Connectors: GIB HandiBrac® hold-down brackets manufactured by MiTek® complete with mechanical fastener with a minimum 15kN uplift capacity for concrete floors and 150mm x 12mm galvanised coach screw for timber floors.
- Fasteners.

5.1 TAPES

The Ecoply Barrier – Sill Tape, Frame Sealing Tape and Sealing Tape transform our sheathing plywood panels into a seamless protective barrier for your construction project. All tapes are proven to deliver an airtight and watertight seal. The Ecoply Barrier 'rigid air barrier system' tapes save you time and money on the job; and you can leave the site with confidence it will perform.



Table 2: Tapes

Technical Data	Sealing Tape	Sill Tape	Frame Sealing Tape
Description	For a permanent seal of Ecoply Barrier vertical joints	One piece stretchable sill tape, for use on all window / door frame sills	For a permanent seal of all Ecoply Barrier openings (Except window / door frame sill)
Carrier Paper	Special fleece made from PP	Butyl rubber with PE film	Special fleece made from PP
Width / Length	60mm x 30m	150mm x 20m 200mm x 20m	150mm x 30m (box of 2) 200mm x 30m (box of 1)
Release Paper	Siliconized Paper	Siliconized Foil (Split 90mm / 60mm) (Split 140mm / 60mm)	Siliconized Paper (Split 90mm / 60mm) (Split 140mm / 60mm)
Temperature Resistance	Long Term -40°C to +90°C	Long Term -40°C to +90°C	Long Term -40°C to +90°C
Processing Temperature	From -10°C	From -10°C	From -10°C
Colour	Grey	Black	Grey

Storage: All sealing tapes must be stored in clean dry conditions and not in an area with direct sunlight.

5.2 COATING - PANELS

The film formulation provides resistance to the effects of exposure to weathering including sun and moisture, typically experienced during the construction and normal service life of cavity substrate systems. The factory applied powder coat film is specifically formulated for use on Ecoply Barrier plywood panels.

- The film, formed by the powder coating process, helps resist moisture penetration.
- The edges of Ecoply Barrier sheets are coated and sealed.
- High film build (60–80 microns), delivers a smoother and more durable sheet surface allowing easier moisture drainage in cavity construction applications.
- Sealer coating contains low Volatile Organic Compounds (VOC).
- The beige coloured sealer coating can be exposed to the external environment for up to 180 days prior to cladding installation.

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6.0 DESIGN CONSIDERATIONS

Responsibility

Design responsibility lies with the building owner and the professionals that they engage. The Specifier for the project must ensure that the products and 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 applications" and periodic moderate wetting.

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 minimise potential moisture ingress into the panel. All other cuts and penetrations must be covered by Ecoply Barrier Sealing Tape and installed in accordance with the Ecoply Barrier literature. When installed as per the above requirements, cut edges and penetrations are not required to be retreated with a brush on preservative treatment however, if desired, CHH Woodproducts recommends the use of Holdfast® Metalex® Concentrated Timber Preservative Green (Holdfast® Metalex® Green).

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 environment. The total expansion both along and across a 2440 x 1197mm panel can be in the order of 1.5mm to 3mm depending on the environment. Detailing and construction practice 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 product's structural performance or weathertightness when installed as per the 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 0.5mg/ litre).

Wind Loadings

Ecoply Barrier meets the NZBC requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of E2/ AS1, and has been tested for wind speed exceeding Extra High wind zone as defined in NZS 3604. Testing has been completed to assist in providing solutions for buildings outside the scope of NZS 3604. Contact CHH Woodproducts for further information.

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 Safety Data Sheet (SDS) for H3.2 CCA treated Ecoply Barrier. 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 panels and tapes must be stored and handled with care to maintain good condition prior to installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity.
- Support for the sheets must 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 must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage.
- The sheets must be stacked flat, NOT on edge.

Maintenance

Ecoply Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the Ecoply Barrier or to the Ecoply Barrier itself, repairs or replacement should be carried out to ensure the integrity of the rigid air barrier. Small perforations in the panels can be covered by the Frame Sealing Tape or Sealing Tape (200mm, 150mm or 60mm Width, Grey Colour).

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7.0 INSTALLATION

7.1 INSTALLATION

Step 1 Framing:

Install the Ecoply® Barrier sheathing panels positioned with the water resistant powder coat film facing outwards. The panels must be installed with the long side of each panel orientated vertically to the framing members.

All Ecoply Barrier sheet edges must be fully supported by being fastened to framing:

- Studs must not exceed 600mm centres.
- Nogs must be provided at 1350mm centres maximum.
- The minimum framing width for fixing Ecoply Barrier is 45mm at sheet joints.
- Framing must be kept as dry as possible at all times.
- Do NOT glue to frame.

All timber framing sizes and set outs must comply with NZS 3604 (or be specifically designed to NZS 3603:1993 – Timber Structures Standard), with stud and nog centres and timber widths required by this specification. Use kiln dried framing such as Laserframe® in accordance with timber framing manufacturers specification and treated in accordance with NZBC Clause B2 Durability, Acceptable Solution (E2/AS1) or Standards New Zealand 3602:2003 Timber and Wood based products for use in building (NZS 3602).

Step 2 Fastener Durability:

Fasten the panels to the framing members. It is of particular importance in coastal areas, areas subject to salt spray and other corrosive environments that the correct fastener is verified prior to installation.

Fasteners shall be a minimum of hot dip galvanised for all B and C zones excluding sea spray zone D where stainless steel fasteners are required. Where stainless steel is required, annular grooved nails must be used.

Step 3 Fasteners:

Fastener heads should be flush with the panel surface. It is not required to tape over over-driven fasteners unless the fastener head completely penetrates the thickness of the face veneer.

Cladding fasteners must be increased in length by a minimum of 7mm to achieve the required fastener pull out loadings. (Ecoply Barrier is 7mm thicker than building wrap).

Table 3: Fastener Type

Fixing Type	Minimum Nail Length
Hand Driven	50 x 2.8mm nails (flat head or round head), hot dipped galvanised or better
Power Driven – Paslode Pneumatic Cladding Coil Nailer	Paslode Impulse 50 x 2.8mm hot dipped galvanised or better, ring round head drive B20557

NOTE: Please refer to Step 2 Fastener Durability.

Step 4 Sheet Layout:

When using Ecoply Barrier, flexible wall underlay is not required. Ecoply Barrier has been BRANZ appraised and tested to demonstrate product performance against the requirements of Table 23 of Clause E2 / AS1 of NZBC. The sheets are jointed keeping an expansion gap of 2-3mm maximum between the plywood panels. Each plywood panel is 1197mm in width to allow for standard 400mm or 600mm stud spacing.

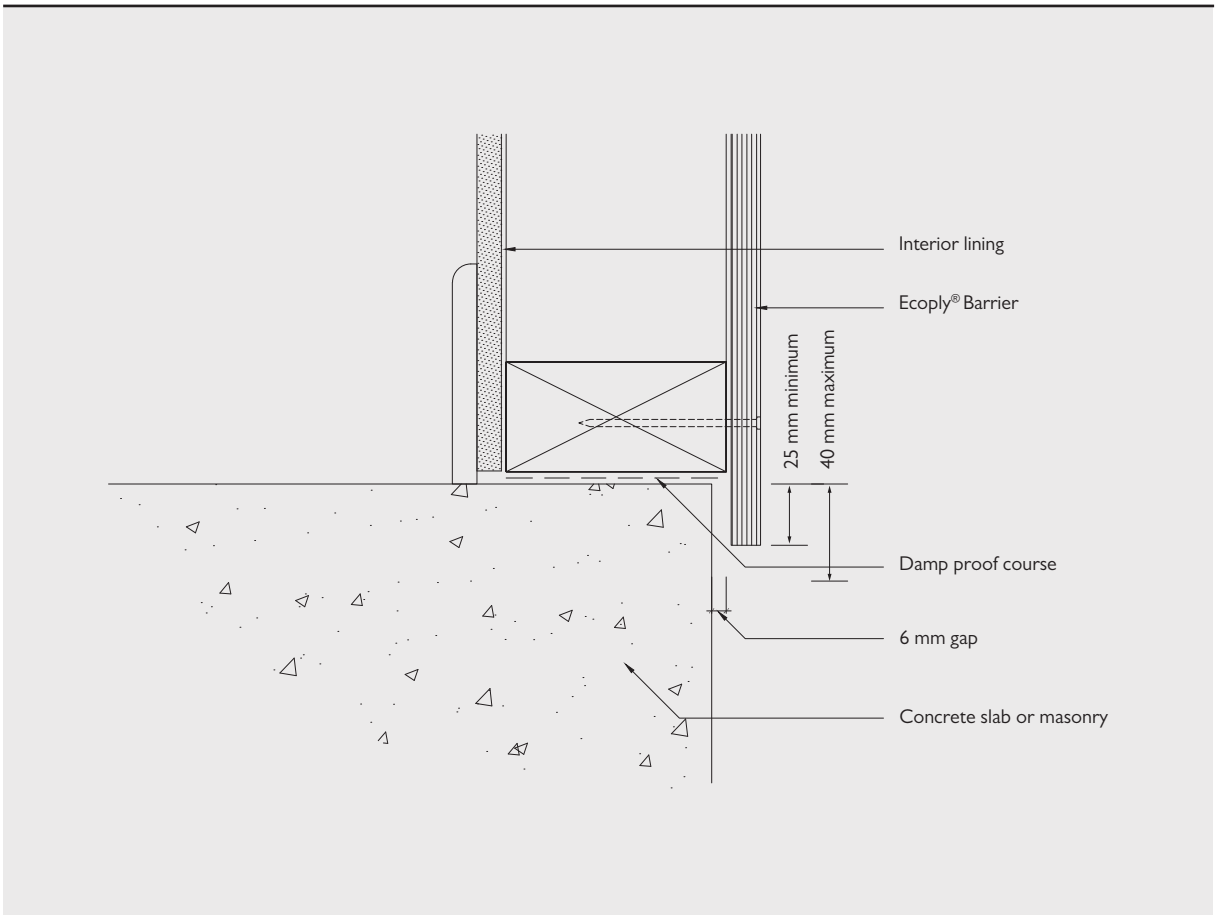
- All sheet edges must be supported by the framing.
- Use fastener pattern unless otherwise specified (refer to the bracing specifications in the Ecoply Specification and Installation Guide).
  - 150mm centres at sheet edges
  - 300mm centres within sheet body up to and including 'Very High' wind zone or;
  - 150mm centres within sheet body in 'Extra High' wind zone
- Sheets must overhang the bottom plate by a minimum of 25mm over timber and concrete foundations (Refer to BAR005: Overhang Clearances For Concrete Slab or Masonry) with a maximum overhang of 40mm.
- For brick cladding rebates, in addition to the 25 – 40mm sheet overhang, 40mm clearance must exist between the face of the Ecoply Barrier sheet and the brick cladding in accordance with E2/AS1 Section 9.2.6 Cavities (Refer to BAR005A: Brick Rebate Overhang Clearance).
- For cantilevered floor joists, sheets must overhang a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005B: Timber Floor Overhang Clearance For Cantilevered Joists).
- For timber sub-floor systems, sheets must overhang the bearer a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005C: Overhang Clearance for Timber Sub-Floors).

Ground Clearances:

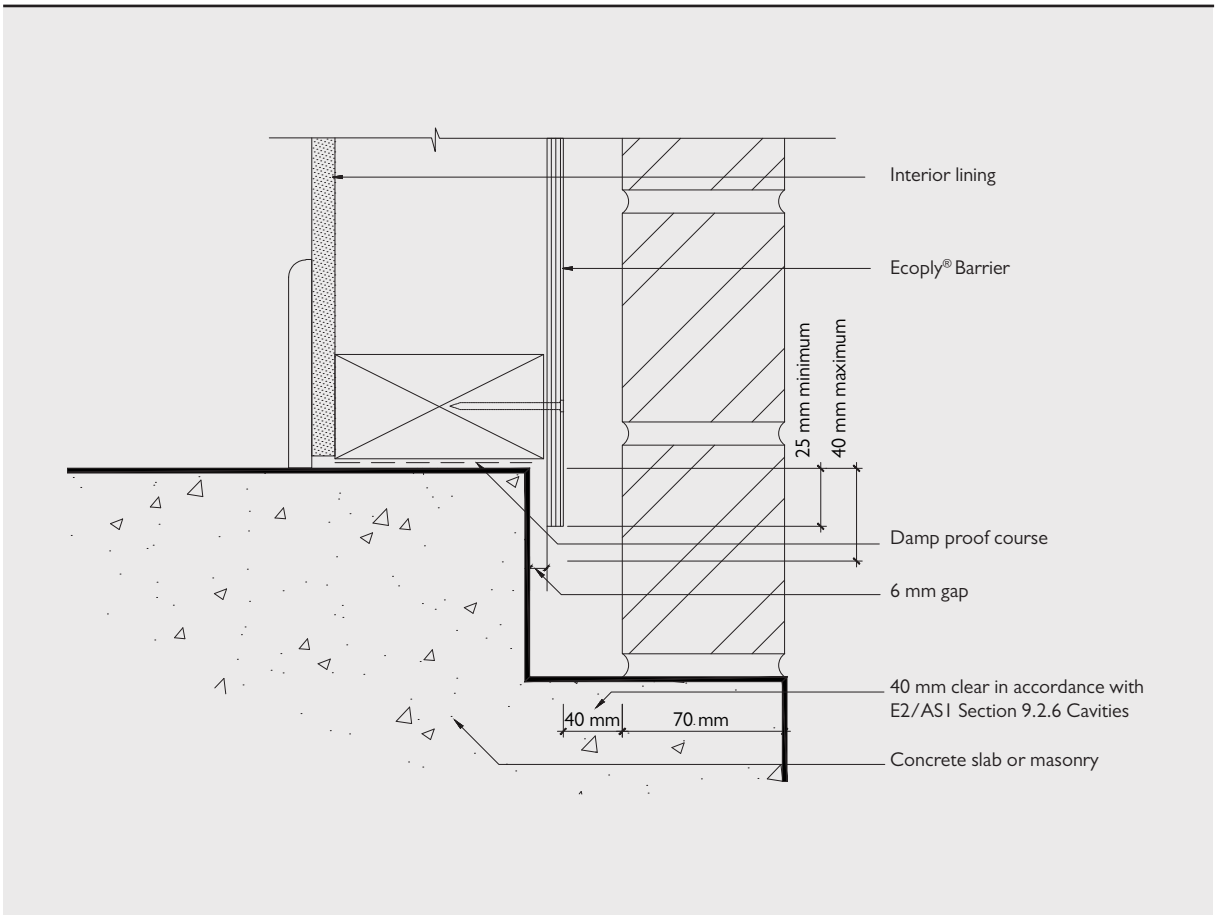
Minimum ground clearances must be maintained for the cladding being installed in accordance with Clause E2/AS1 – Figure 65 and Table 18, and with NZS 3604 for timber floors. The adjacent ground must slope away from the building in accordance with NZBC requirements. Ecoply Barrier must not be installed where product will remain in contact with non-draining water, damp, or soil.

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BAR005: Overhang Clearances For Concrete Slab or Masonry

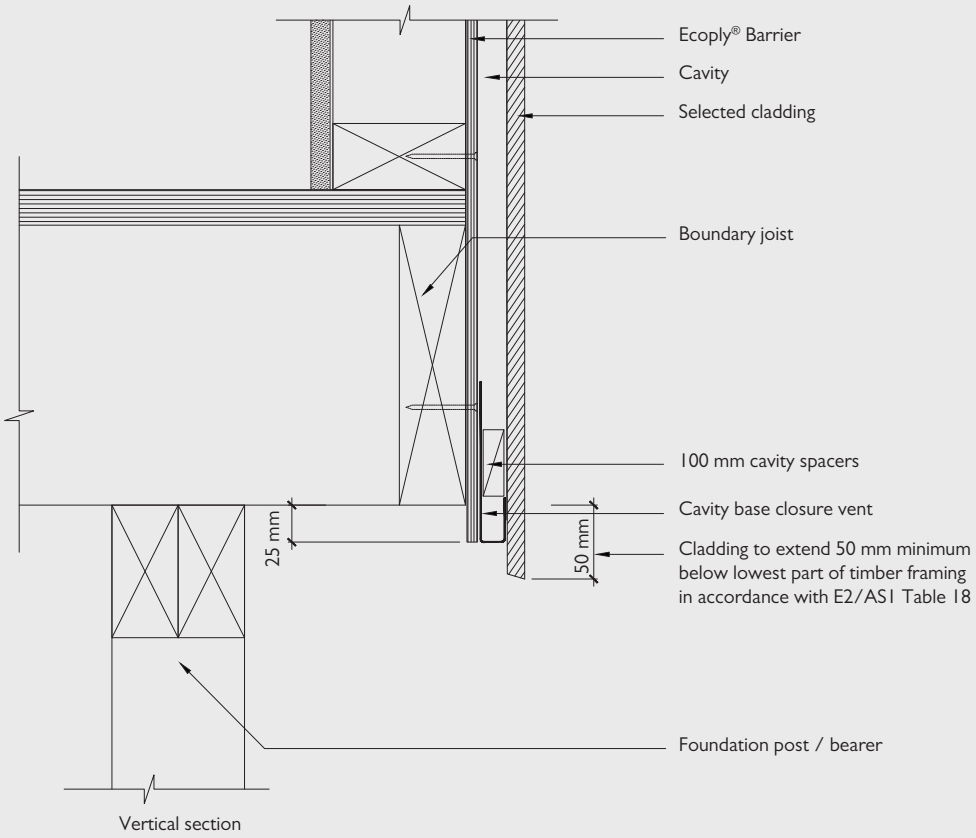


BAR005A: Brick Rebate Overhang Clearance

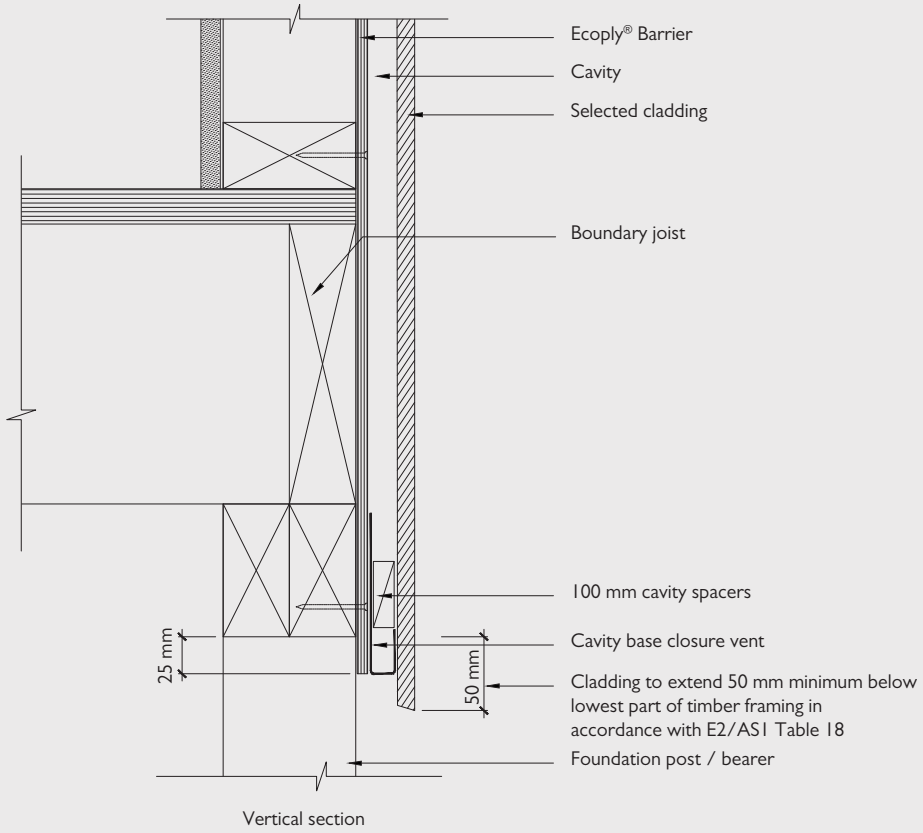


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BAR005B: Timber Floor Overhang Clearance for Cantilevered Joists



BAR005C: Timber Floor Overhang Clearance for Sub Floors

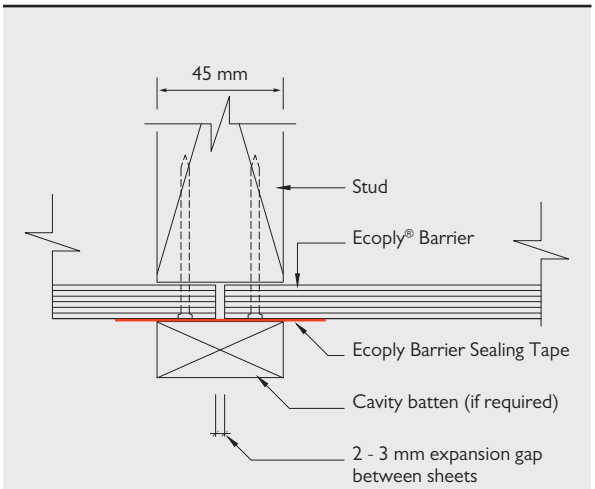


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7.2 INSTALLATION – SHEET JOINS

Apply Ecoply® Barrier Sealing Tape after all sheathing panels are fully fastened to wall framing members. Only designated Ecoply Barrier Sealing Tape should be used. Ensure that each panel is free of sawdust and dirt prior to taping. Ecoply Barrier Sealing Tape requires pressure for a secure seal. Make sure the tape is centred over the seam within +/- 20mm to provide adequate coverage and that wrinkles in tape are minimal.

BAR006: Vertical Sheet Joints



Vertical Sheet Joints:

- Seal vertical joints by running Ecoply Barrier Sealing Tape over the joints (60mm x 30m).
- Ecoply Barrier Sealing Tape must not be exposed to weathering for more than 180 days prior to installation of the exterior cladding system.

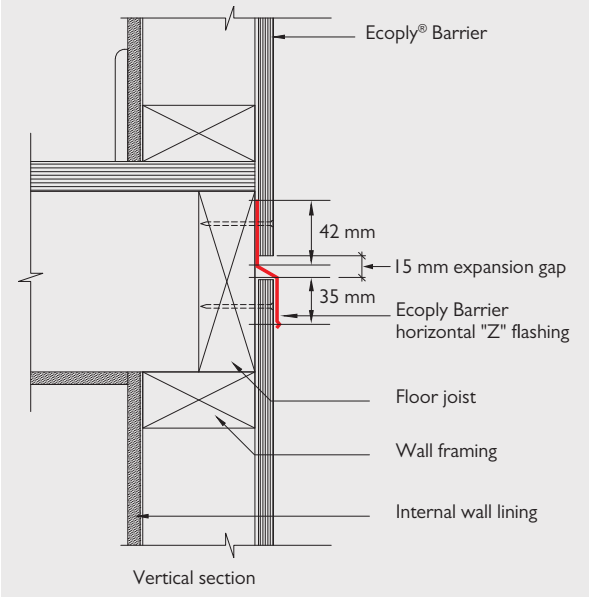
Horizontal Sheet Joins (Three Options):

- Ecoply Barrier PVC horizontal 'Z' Flashing (Product Code RDZF7) for horizontal sheet joints. Refer BAR007: Horizontal Sheet Joints (PVC Z Flashing).
- 'Z' taped joint using Ecoply Barrier 150mm OR 200mm Frame Sealing Tape. Refer BAR007A: Horizontal Sheet Joints (Tape Z Flashing).
- 'Face' seal joint using Ecoply Barrier 150mm OR 200mm Frame Sealing Tape. Refer to BAR007B: Face Sealed Horizontal Sheets Joins at Mid-floor or BAR007C: Face Sealed Horizontal Sheet Joins at Nog.

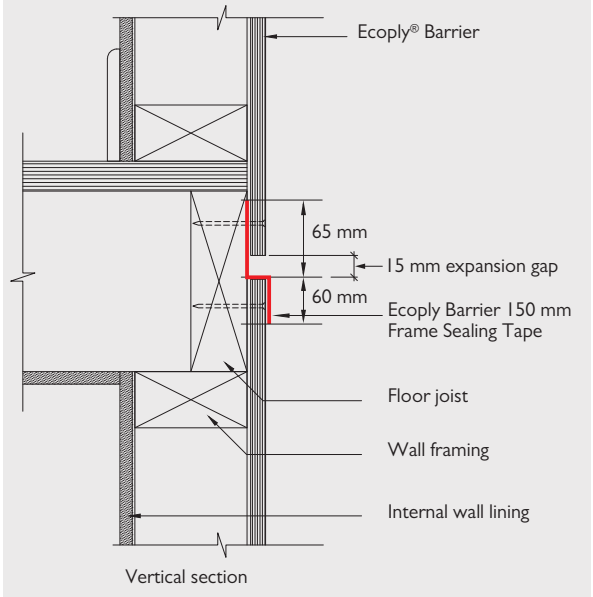
Tape Splices and Joints:

- Whenever tape splices occur at a junction, create an overlapping splice of at least 50mm.
- Make sure to apply adequate pressure for a secure bond between the plywood panel and the tape.
- Take special care to remove any wrinkles or voids at splice areas.

BAR007: Horizontal Sheet Joints (PVC Z Flashing)



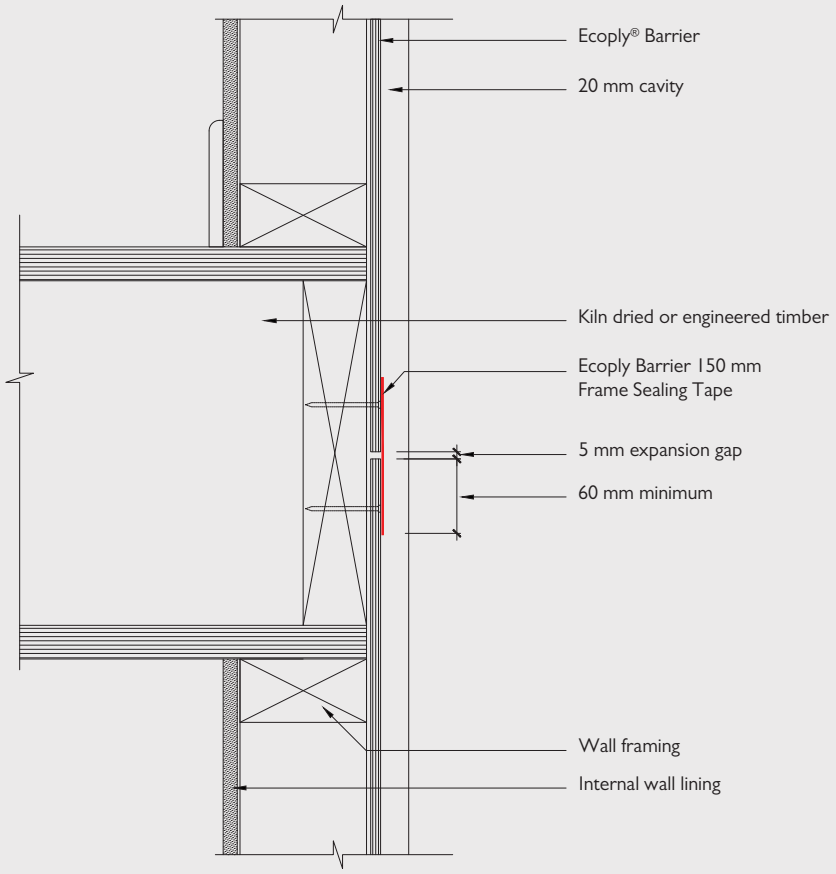
BAR007A: Horizontal Sheet Joints (Tape Z Flashing)



The Ecoply® Barrier PVC Horizontal 'Z' Flashing is manufactured by E2 Flashing Solutions. Contact E2 Flashing Solutions on (03) 358 5775 or visit www.e2flashingsolutions.co.nz for further information.

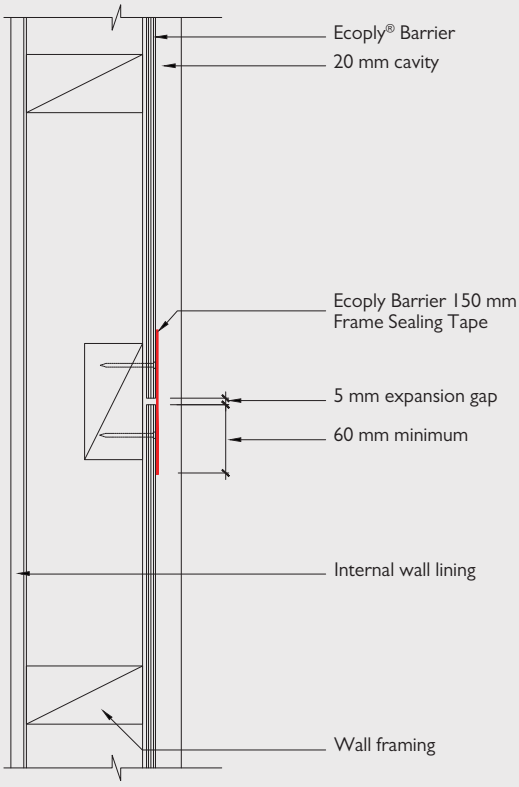
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BAR007B: Face Sealed Horizontal Sheet Joints at Mid-Floor



Vertical section

BAR007C: Face Sealed Horizontal Sheet Joints at Nog



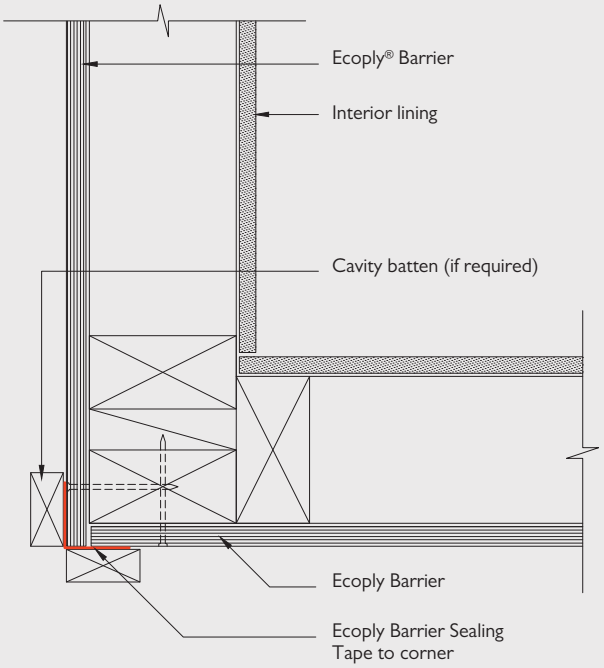
Vertical section

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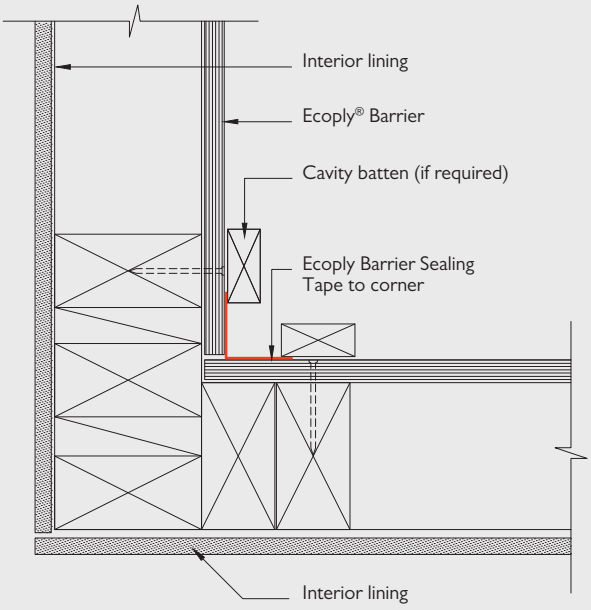
Internal and External Corners:

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour). (Refer to BAR008 and BAR009: External and Internal Corner).

BAR008: External Corner



BAR009: Internal Corner

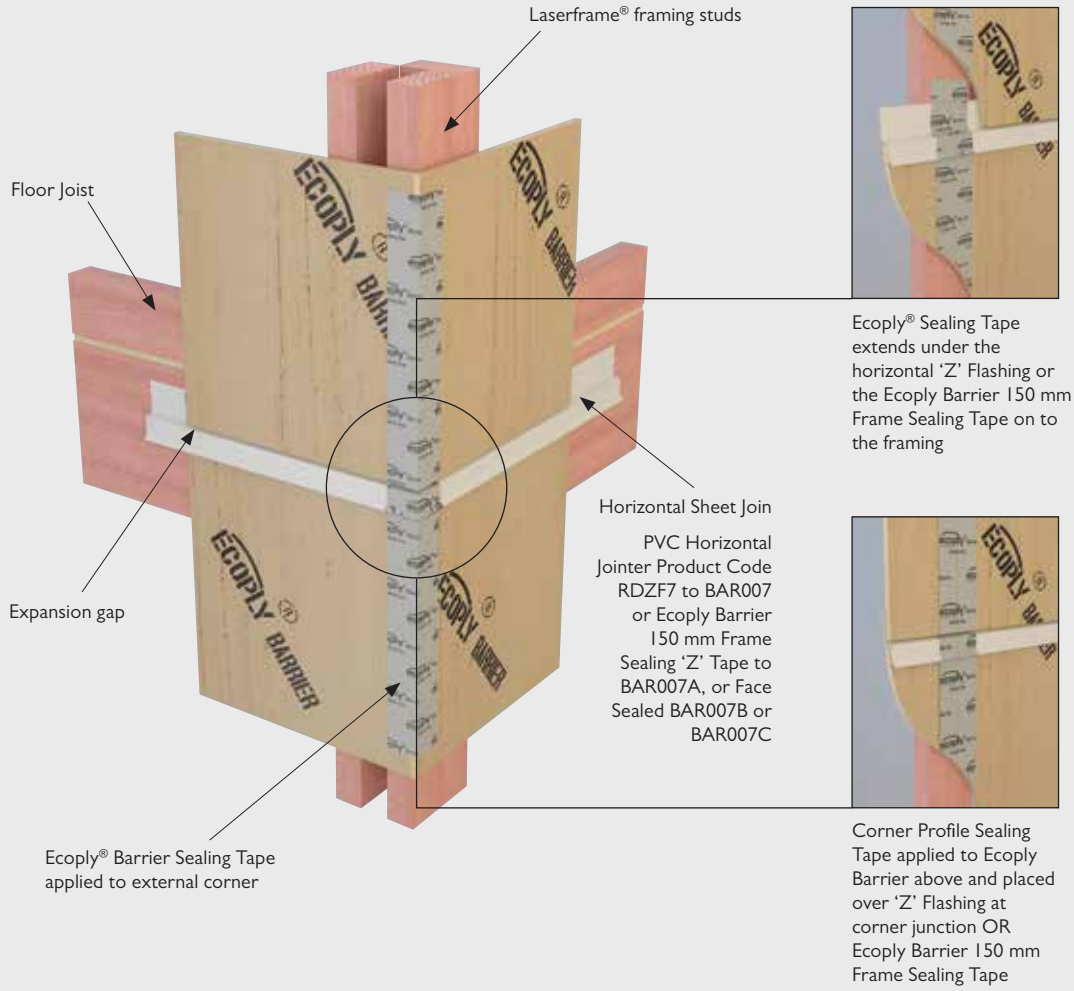


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Corner Junctions to Horizontal Joints

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour).
- PVC Horizontal Z Flashings must be butted together, 60mm Ecoply Barrier Sealing Tape must overlap the PVC butt join entirely over the face and up stand of the PVC Flashing to form a weathertight joint where horizontal Flashings meet.
- Horizontal joins may also be completed using Ecoply Barrier Frame Sealing Tapes.

BAR010: External Corner to Horizontal Joint



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7.3 INSTALLATION - SILL TAPE

Apply Ecoply® Barrier Sill Tape to the horizontal trimmer section of the window or door opening. The exposed timber framing on the sill of the window opening must be totally covered with the Ecoply Barrier Sill Tape (150mm or 200mm Black Colour) – one continuous piece. The tape must be sealed over the face of the Ecoply Barrier.

Take special care to avoid any wrinkles or voids at corner junctions, Ecoply Barrier Sill Tape requires pressure for a secure seal.

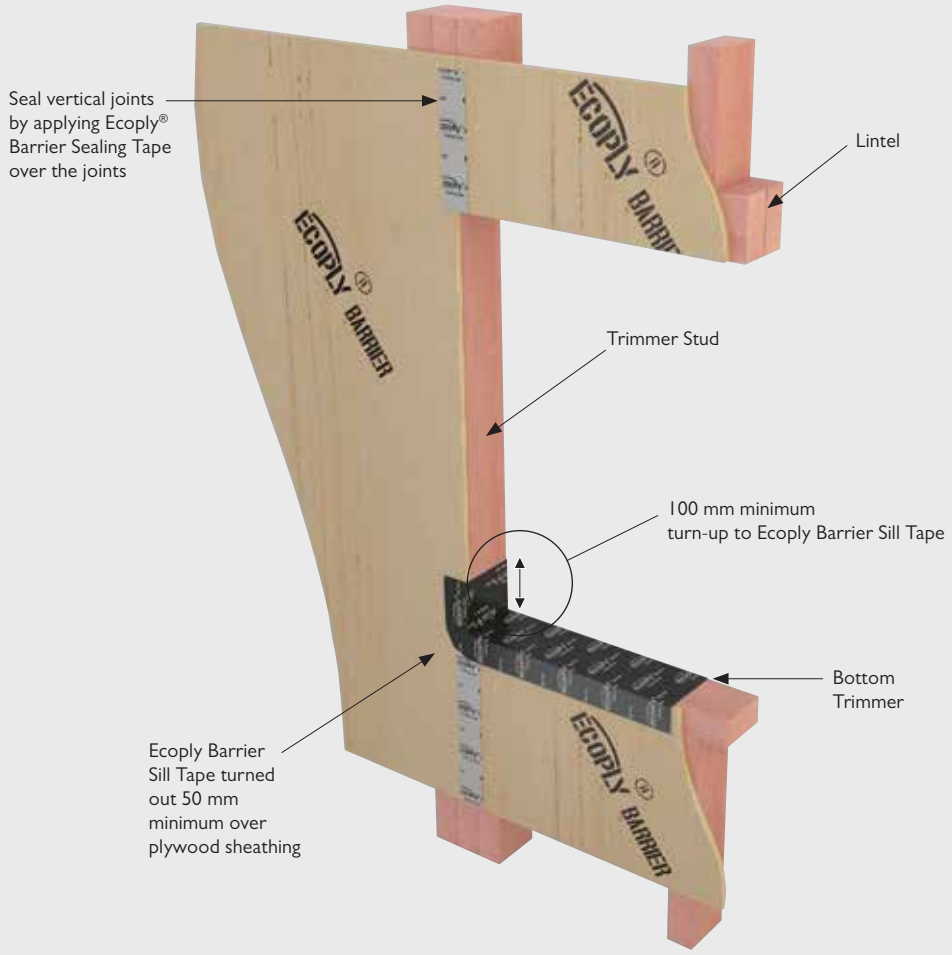
Horizontal Sill Flashing Detail:

- Cut the Ecoply Barrier Sill Tape 200mm longer than the horizontal window/door bottom trimmer.
- Ensure that the framing is free of sawdust and dirt prior to taping.
- Apply the Ecoply Barrier Sill Tape to cover the bottom of the opening, overhanging onto the Ecoply Barrier by at least 50mm and extending 100mm up trimmer stud.
- Carefully bend the Ecoply Barrier Sill Tape to mould into the corners providing a tight seal.



NOTE: Door openings are to be treated similarly to window openings. The bottom trimmer may be either a timber or concrete floor.

BAR012: Window Penetration Sill Tape Installation



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7.4 INSTALLATION - FRAME SEALING TAPE

Apply Ecoply® Barrier Frame Sealing Tape to the vertical trimmer stud and lintel of the window or door opening. The exposed timber framing must be covered with the Ecoply Barrier Frame Sealing Tape (150mm / 200mm Grey Colour). The tape is sealed over the face of the Ecoply Barrier panel.

Take special care to remove any wrinkles or voids at corner junctions, Ecoply Barrier Frame Sealing Tape requires pressure for a secure seal.



Vertical Jamb Detail:

- Cut the Ecoply Barrier Frame Sealing Tape 100mm longer than the vertical opening size.
- Ensure that the trimmer stud is free of sawdust and dirt prior to taping.
- Apply the Frame Sealing Tape to cover the entire trimmers' opening. The tape should extend a minimum of 100mm around the corner at the head of the window framing, and over-lap the Sill Tape on the trimmer stud by a minimum of 50mm.
- Carefully slit the tape from the corner to get a smooth adhesion to the plywood sheathing panel. Bend the Ecoply Barrier Frame Sealing Tape to mould into the corners providing a tight seal.
- Cut and apply a small 100mm strip to reinforce the corner using Ecoply Barrier 150mm Frame Sealing Tape.

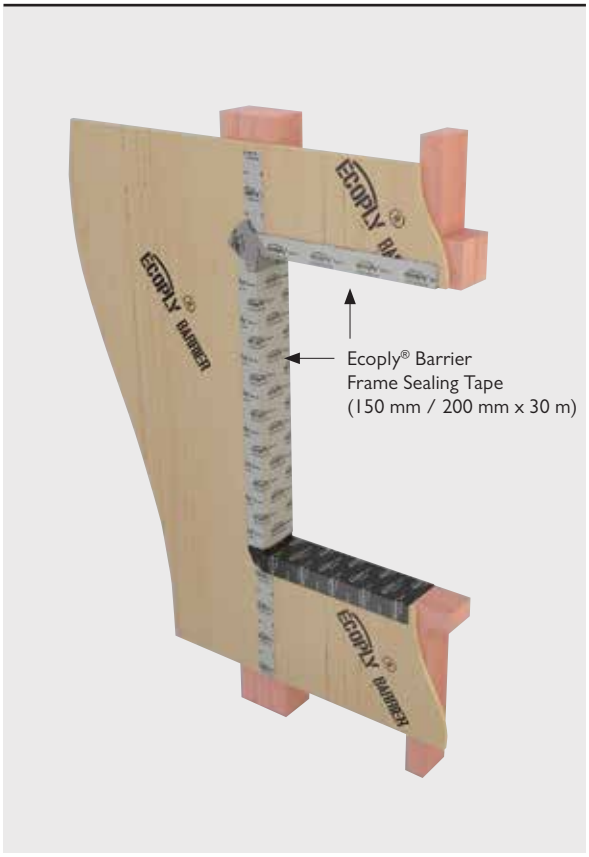
Horizontal Head Detail:

- Once both trimmer studs are installed, cut the Frame Sealing Tape for the horizontal head trimmer and Flashing to suit. Make sure to over-lap the existing tape from the trimmer by at least 50mm (Do not extend tape past the corner).
- Specific installation requirements pertaining to window and door systems should be sought from the joinery manufacturer.

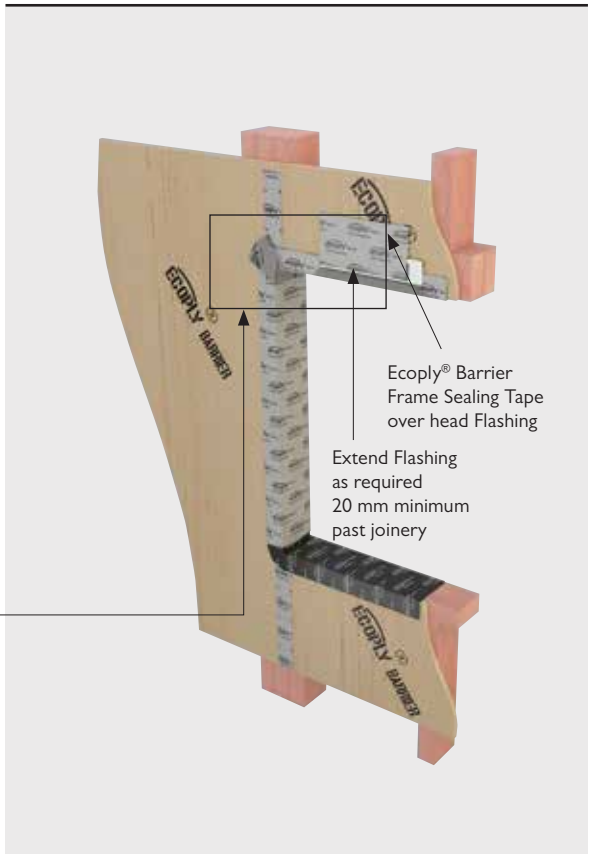
NOTE: Door frames are to be treated similarly to window openings.



BAR013: Window Penetration Sill Tape Installation



BAR014: Window Penetration Frame Sealing Tape Installation with Head Flashing



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7.5 SERVICE PENETRATIONS

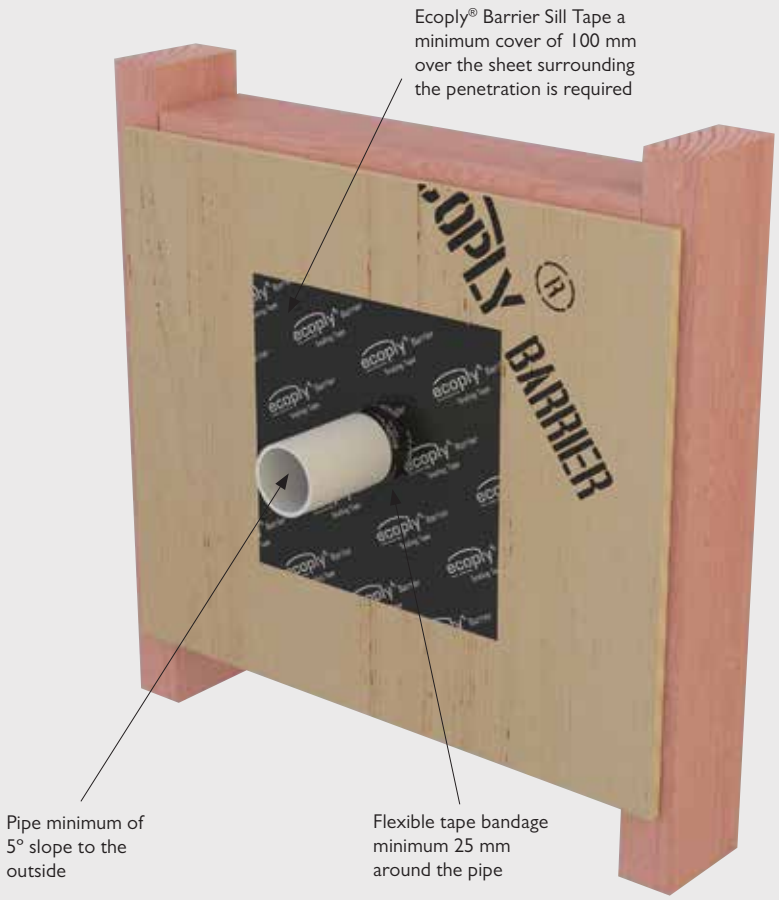
- Service penetrations must be sealed using a flexible Flashing tape. Ecoply® Barrier Sill Tape (150mm or 200mm Black Colour) is recommended for this purpose. (Refer to BAR011: Penetration and Services).
- A minimum cover of 100mm over the sheet surrounding the penetration is required.
- Use Ecoply Barrier Frame Sealing Tape to bandage around the pipe (25mm minimum width).



Service Penetrations in Bracing Elements

Small openings (e.g. power outlets) of 90 x 90mm or less maybe placed no closer than 90mm to the edge of the braced element, or waste pipe outlets of maximum 150mm diameter placed at no closer than 150mm to the edge of the braced element. Maximum one penetration per bracing panel.

BAR011: Penetration & Services



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7.6 STRUCTURAL BRACING

Ecoply Barrier is designed to comply with the New Zealand Building Code (NZBC).

Structure

NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure. CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Demand may be calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz.

EPB bracing systems properties can be easily loaded into the EzyBrace software by way of a software patch downloadable from www.chhwoodproducts.co.nz together with loading instructions.

Specific Design

Ecoply® Barrier structural plywood panels are manufactured to AS/NZS 2269, and is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand timber design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification Method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120BUs/m.

Durability

Ecoply Barrier plywood panels are manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in Buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability requirements of the NZBC.

Adjustments for Wall Height

Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from table below should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4m high shall be rated as if they are 2.4m high.

(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height.

(c) Wall heights <1.5m are to be subject to Specific Engineer Design (SED).

Joining Panels for Walls Higher than Maximum Sheet Length

Ecoply Barrier bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.44m, Ecoply Barrier is available in 2.745m sheet lengths. Alternatively, a part sheet can be installed above a full sheet, in accordance with section 7.2 Installation - Sheet Joins (Three Options for Horizontal Sheet Joins) on a single row of common nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply Barrier bracing specifications (e.g. 2.4m x 1.2m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7m x 1.2m bracing element).

Table 4: Summary P21 Ratings for 2.4m High Ecoply® Barrier Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135
EP2	0.6m	Ecoply Barrier or Ecoply each side	Yes GIB HandiBrac®	105	115
EPBS	0.4m	Ecoply Barrier one side	No additional fastening[1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90
EPBG	0.4m	Ecoply Barrier one side and 10mm GIB® Standard plasterboard other side	Yes GIB HandiBrac®	100	115
	1.2m			150	150

[1] As per NZS 3604: 2011. No specific additional fastening required.

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7.7 ECOPLY® BARRIER BRACING SPECIFICATION – EPB1

Table 5: Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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 of minimum SG8, 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 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening Ecoply® Barrier Panels

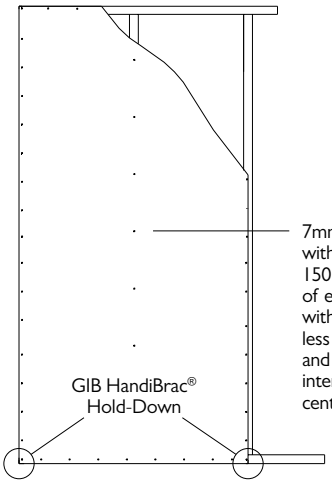
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. 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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

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7.8 ECOPLY® BARRIER BRACING SPECIFICATION – EP2

Table 6: Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EP2_0.6	0.6m	Ecoply® Barrier or Ecoply each side	Yes GIB HandiBrac®	105	115

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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 Each Side

One layer of 7mm, 9mm or 12mm Ecoply® plywood or Ecoply Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening the Ecoply® Barrier

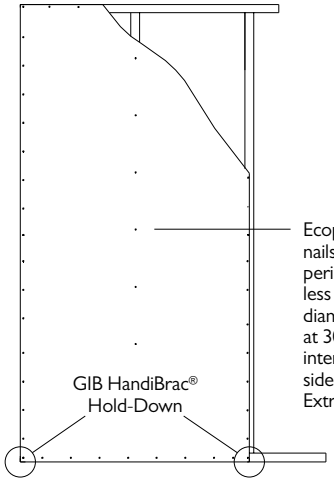
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 of the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. 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 manufactured by CHH Woodproducts and SG8 timber framing, 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.

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7.9 ECOPLY® BARRIER BRACING SPECIFICATION – EPBS

Table 7: Single Sided Structural Plywood Brace No Additional Hold-Down

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPBS	0.4m	Ecoply® Barrier one side	No additional fastening [1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90

[1] As per NZS 3604: 2011. No specific additional fastening required.

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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 of minimum SG8, such as Laserframe®, is recommended.

Bottom Plate Fixing

Bottom plates are fixed in accordance with the requirements of NZS 3604. No specific additional fastening required.

Lining

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

Fastening the Ecoply® Barrier

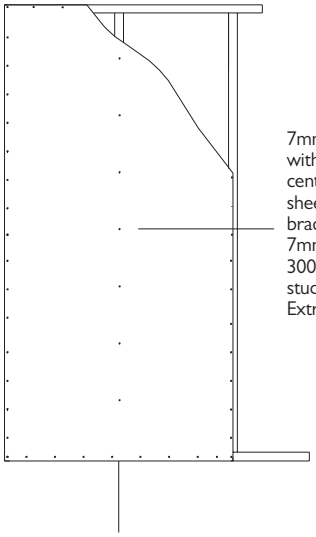
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



7mm Ecoply® Barrier fixed with 50 x 2.8mm nails at 150mm centres to perimeter of each sheet or part sheet within the bracing element at no less than 7mm from sheet edge and at 300mm centres to intermediate studs or 150mm centres in Extra High wind zones.

Bottom plate fixed in accordance with the requirements of NZS 3604.

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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

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7.10 ECOPLY® BARRIER BRACING SPECIFICATION – EPBG

Table 8: Ecoply® Barrier Structural Brace To One Side with 10mm GIB® To The Other

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPBG	0.4m	Ecoply® Barrier one side and 10mm GIB® Standard plasterboard other side	Yes	100	115
	1.2m		GIB HandiBrac®	150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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

Side 1: One layer of 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Side 2: One layer of 10 or 13mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® Barrier

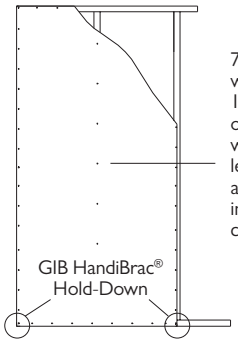
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 of the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



7mm Ecoply® Barrier fixed with 50 x 2.8mm nails at 150mm centres to perimeter of each sheet or part sheet within the bracing element at no less than 7mm from sheet edge and at 300mm centres to intermediate studs or 150mm centres in Extra High wind zones.

Fastening the GIB® Plasterboard

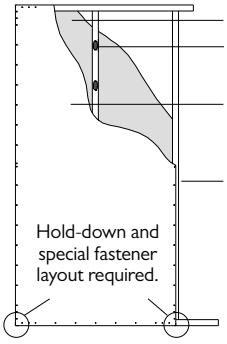
Fasteners

32mm x 6g GIB Grabber® Screws or 35mm GIB® Nails

Fastening centres

Fasten 50, 100, 150, 225 and 300mm from each corner and 150mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12mm from paper bound edges and 18mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.



7mm Ecoply® Barrier.

Daubs of GIBFix® adhesive at 300mm centres to intermediate studs.

GIB® Standard plasterboard.

All four corners of a GIB® plasterboard bracing element must be fastened at 50mm, 100mm, 150mm, 225mm and 300mm from the edge of the sheet.

Bracing element perimeter is then fastened at 150mm centres.

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

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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

SEPTEMBER 2017

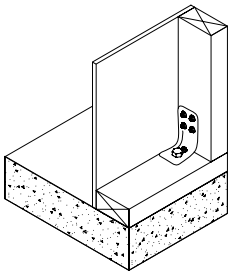
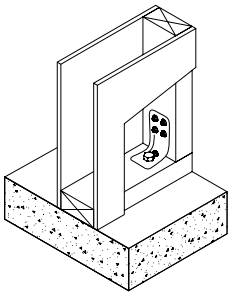
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7.11 GIB HANDIBRAC® - RECOMMENDED INSTALLATION METHOD

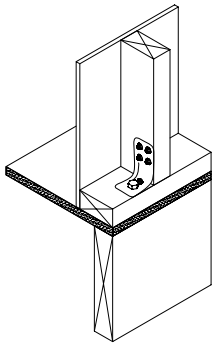
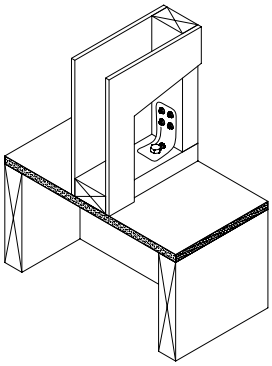
Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as a hold-down in all EPB bracing elements.

- 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

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/ plate junction.
Hold-down Fastener Requirements	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket.	

Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer.	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.
Hold-down Fastener Requirements	
M12 x 150mm galvanised coach screw or screw bolt supplied with the bracket.	

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7.12 TOP PLATE HOLD-DOWN CONNECTIONS

Additional nailing of the Ecoply® Barrier to the top and bottom plates in accordance with the details shown in Figure 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, NZS 3604.

Fastening

Nails must be 50mm x 2.8mm flat head hot dip galvanised or stainless steel as described in the Ecoply Barrier Specification and Installation Guide for Fastener Durability (Section 7.1).

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

The remainder of the sheet perimeter is fastened at 150mm centres no less than 7mm from the sheet edge and 300mm at intermediate studs (or 150mm centres for Extra High wind zones) as with standard nailing for Ecoply Barrier.

Standard nailing of the Ecoply Barrier to the top plate in accordance with the Ecoply Barrier 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, NZS 3604.

Horizontal Sheet Joints and Top Plate Hold-Down

Where horizontal sheet jointing is required and top plate hold-down connections are completed using Ecoply Barrier, nailing to the noggin at 75mm centres and 20mm from the sheet edge is also required at the sheet joins. Refer Figure 1B Top Plate Hold-Downs and Horizontal Sheet Joins.

Figure 1: Top Plate Hold-Downs Connections using Ecoply® Barrier

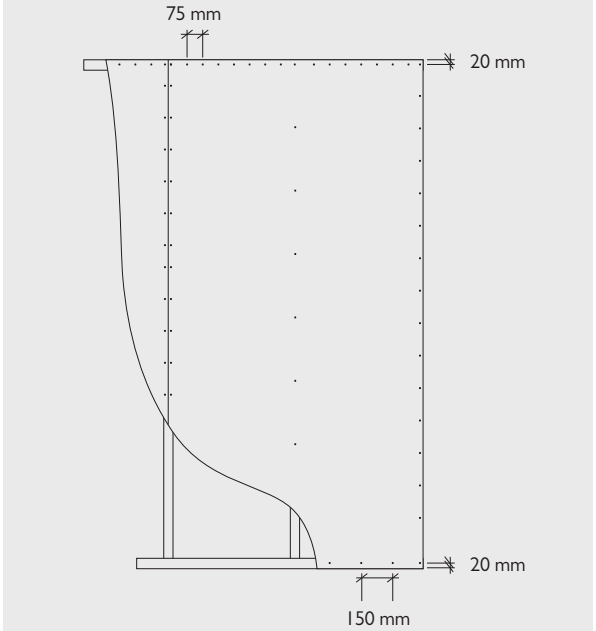
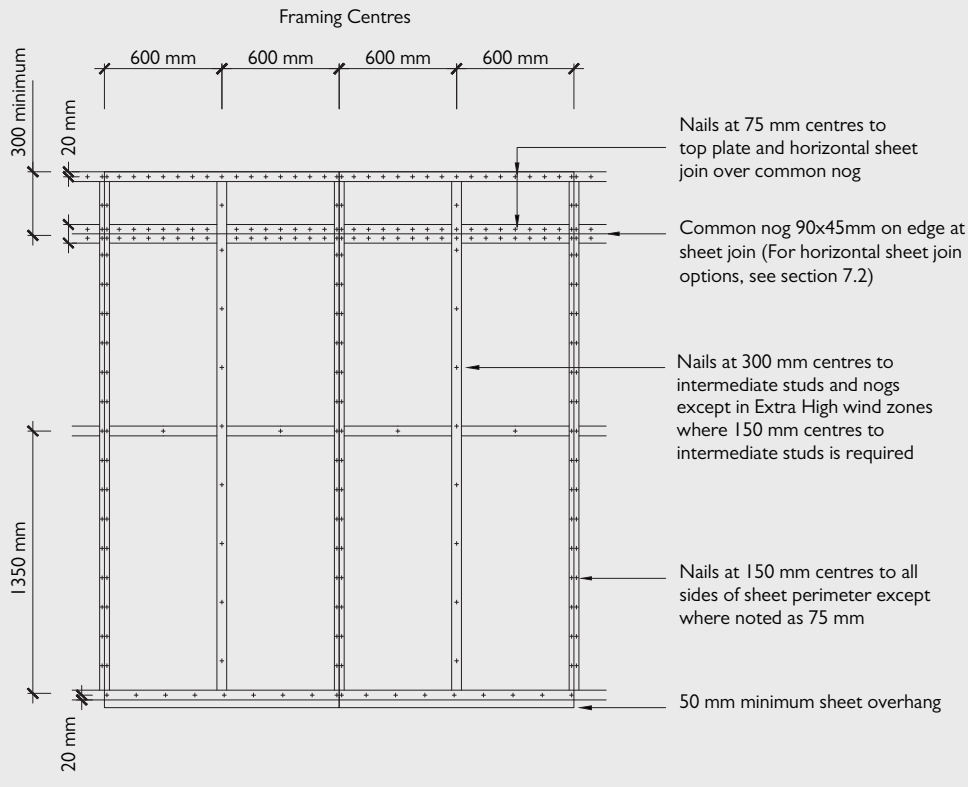


Figure 1B: Top Plate Hold-Downs and Horizontal Sheet Joints



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7.13 BRACING LENGTHS

Length of Ecoply® Barrier Bracing Elements (EPB1, EPBG and EP2).

Ecoply® Barrier bracing elements can be used when the overall bracing element length is >400mm.

The length and capacity of an EPB1, EPBG or an EP2 type element is not only determined by the plywood, but also the placement of the GIB HandiBrac® hold-down fixing. The GIB HandiBrac® must be installed to a continuous stud at the perimeter of the bracing element, refer to Figure 1C: Framing/ Handibrac installation, 1D: Bracing Panel Installation, 1E: Bracing Panel Installation – long and 1F: Bracing Panel Installation at Lintel.

Note: If used for Bracing purposes GIB HandiBrac® should not form part of lintel tie down solution.

Bracing Panel and Hold-down Location at Lintels and 90° Wall Junctions such as Garage Door Openings.

Ecoply Barrier bracing panels can be installed up to lintels and 90° wall junctions such as garage door openings where the element length is > 400mm. See Figure 1E: Bracing Panel Installation at Lintel for bracing element length, and correct GIB Handibrac® location.

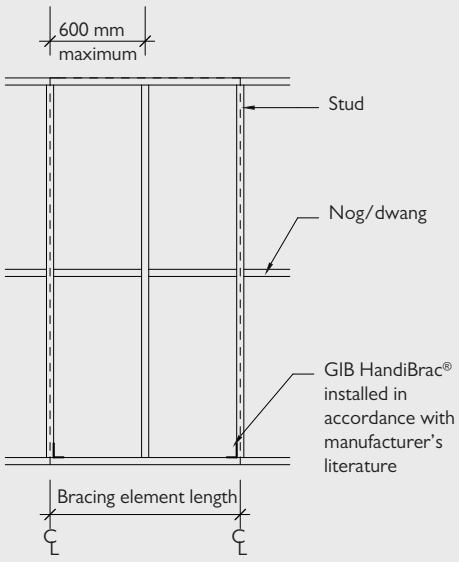
Note: Designers need to be aware of the framing requirements and not try to specify bracing elements based on length only. Framing requirements may mean bracing lengths are not practically achievable as designed and tested and developed due to framing layout.

When lintels share jamb studs with bracing elements, alternate hold-down will be required (the GIB HandiBrac® forming part of the bracing solution must not form part of the lintel hold-down).

Length of EPBS Elements

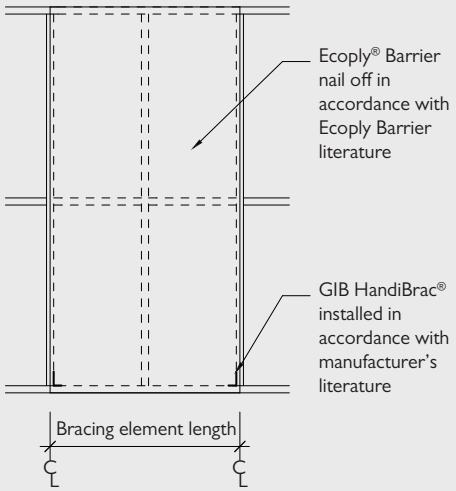
The length of the EPBS element (requiring standard NZS 3604:2011 bottom plate connections) can be taken as full frame length measure from the outside of the end stud to the opening face as illustrated in Figure 1G: EPBS Bracing panel Installation – Long. The length of the bracing element shall be >400mm.

Figure 1C: Framing/HandiBrac Installation



*Note: Bracing panel not shown for clarity

Figure 1D: Bracing Panel Installation



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Figure 1E: Bracing Panel Installation - Long

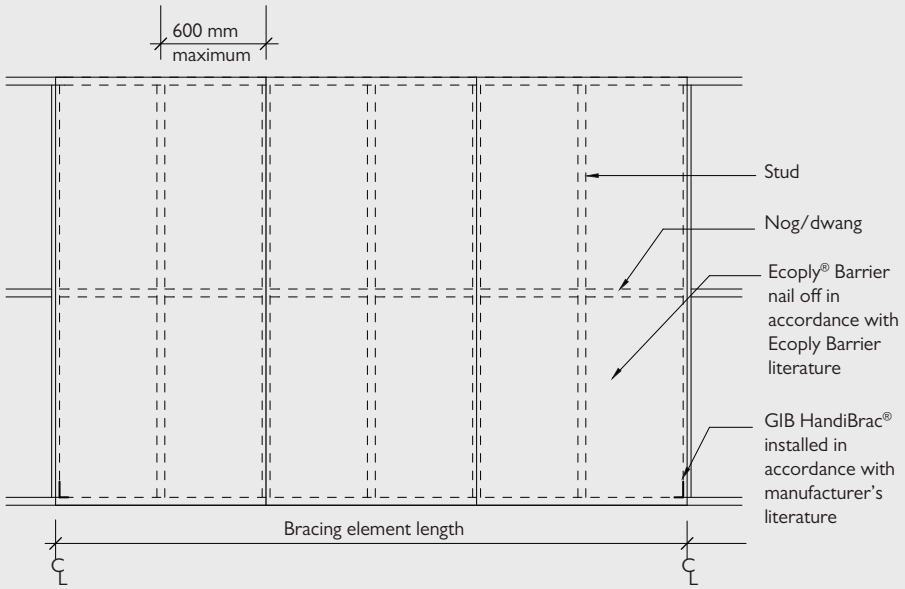
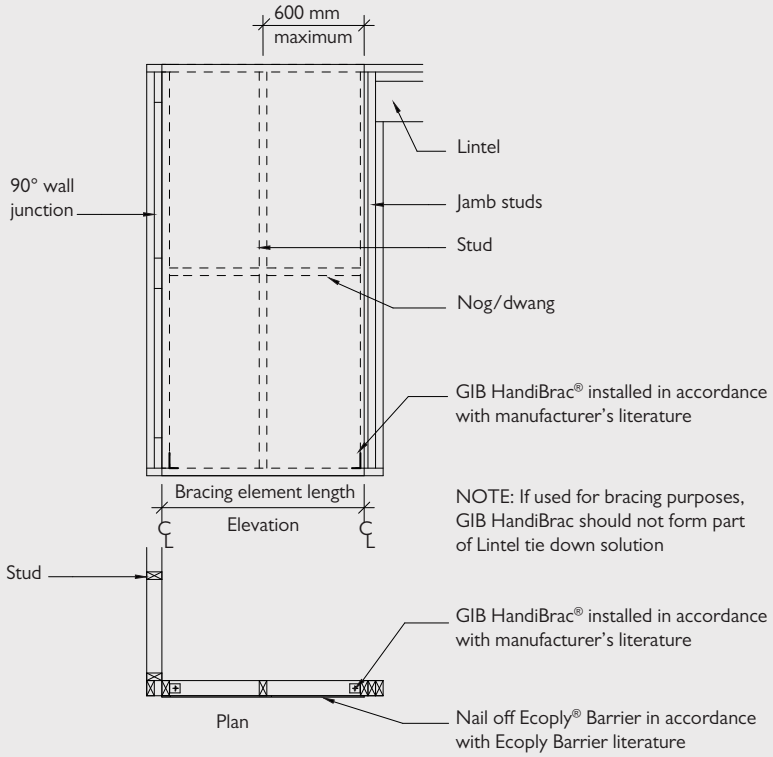
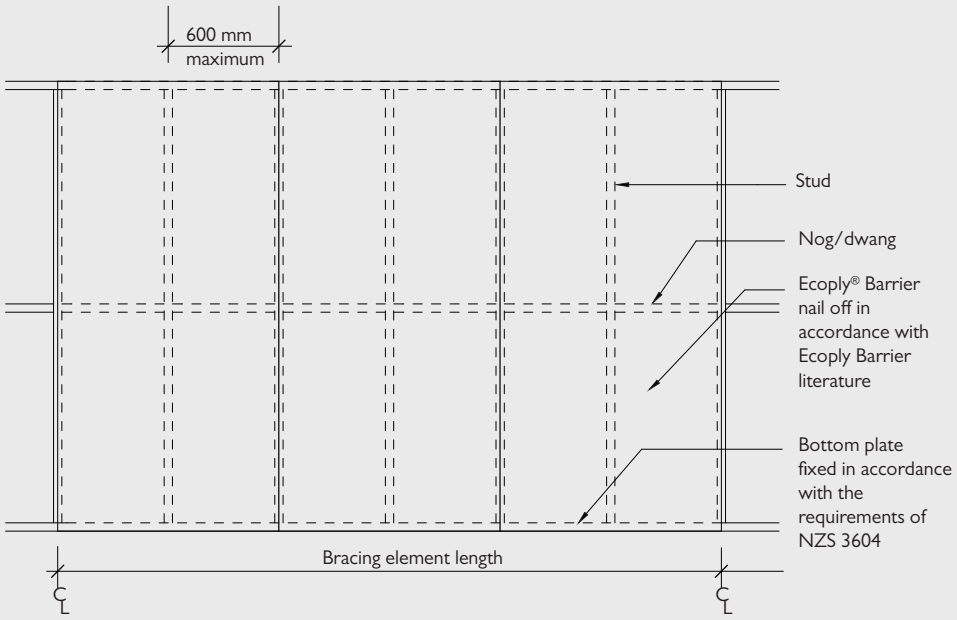


Figure 1F: Bracing Panel Installation at Lintel



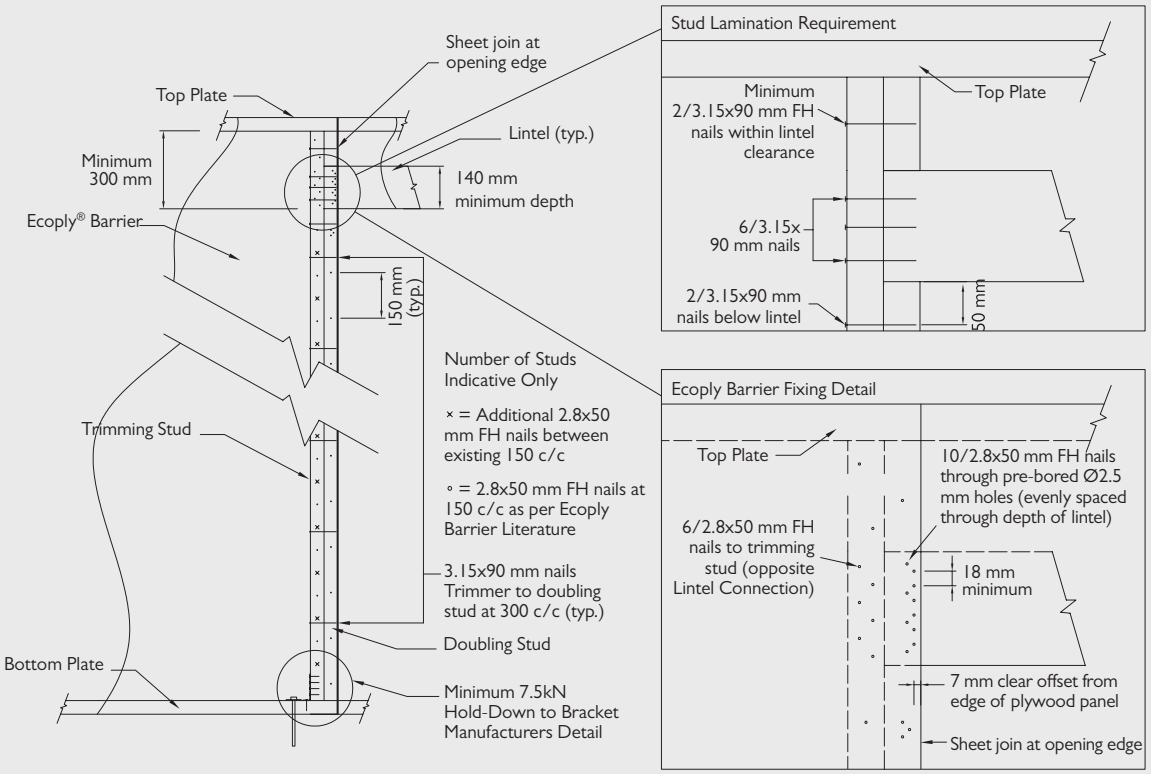
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Figure 1G: EPBS Bracing Panel Installation



7.14 LINTEL TIE DOWN CONNECTION

Figure 2: Lintel Connection Detail (For Uplifts Not Exceeding 7.5kN) as Detailed in Clause 8.6.1.8 of NZS 3604



Notes:

1. Observe minimum end and edge distances for fasteners to NZS3603.
2. Fastener Durability as per the Ecoply Barrier Specification and Installation Guide (Section 7.1).
3. Not suitable for use with trimming studs checked out for lintels.

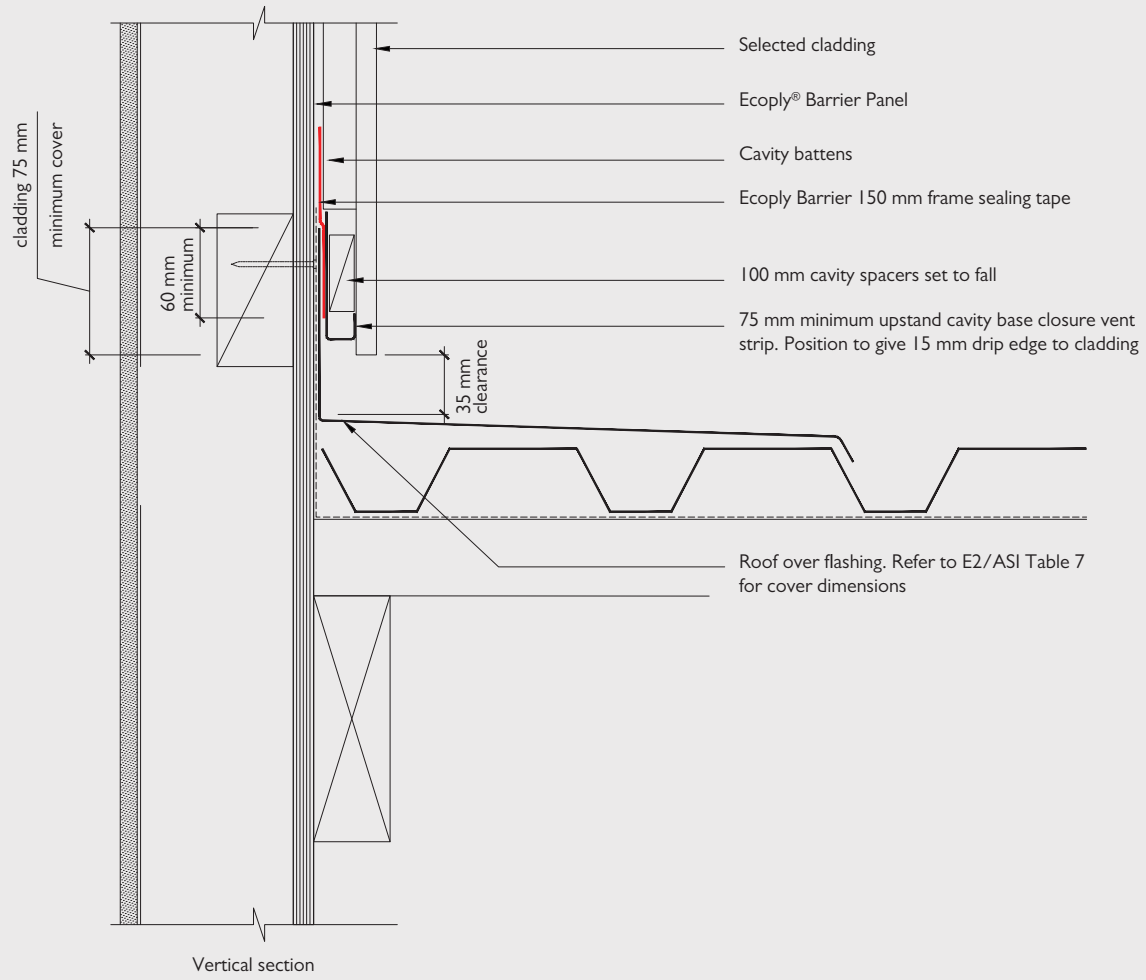
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7.15 INSTALLATION – APRON & SADDLE FLASHINGS

Apron Flashings

Ecoply® Barrier panels must extend past apron Flashing and roofing and have Ecoply Barrier Frame Sealing Tape over an E2/AS1 compliant apron Flashing with minimum 60mm cover as detailed. Refer BAR015 Apron Flashing Junction.

BAR015: Apron Flashing Junction

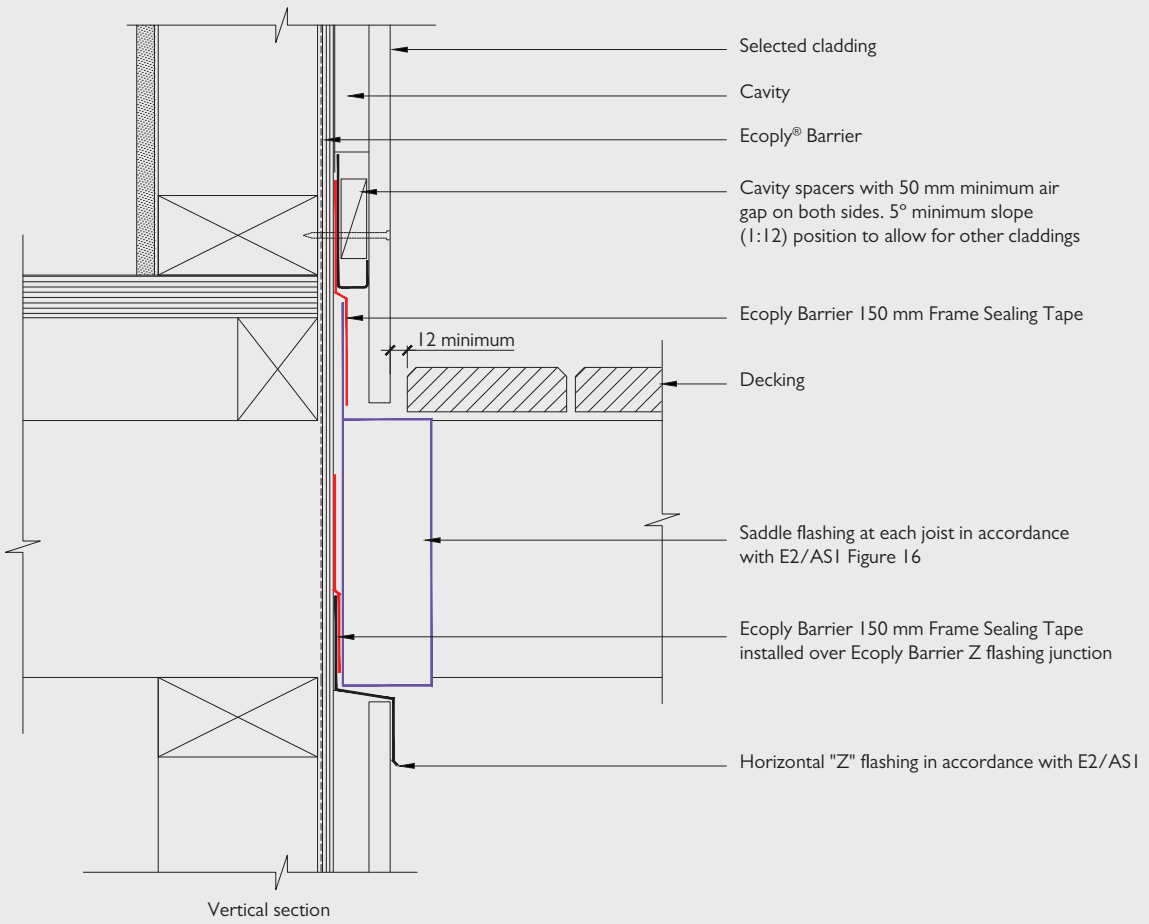


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Saddle Flashings

Apply Ecoply® Barrier Frame Sealing Tape over an E2/AS1 compliant saddle Flashing with minimum 60mm cover as detailed. Where required, Ecoply Barrier Frame Sealing Tape should be applied over the top of horizontal Flashings. Refer BAR016 Ecoply Barrier Saddle Flashing.

BAR016: Ecoply® Barrier Saddle Flashing



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8.0 FIRE RATED SYSTEMS

Where compliance with NZBC Clauses C3 – Spread of Fire and Clause C4 – Structural Stability is required CHH Woodproducts recommends the use of GIB® Fire Rated Systems overlaid directly with the Ecoply® Barrier rigid air barrier system.

Refer to the current GIB® Fire Rated System literature for specifications and installation requirements downloadable from www.gib.co.nz.

Where Ecoply Barrier overlays GIB® fire rated panels fastener lengths for the fixing of Ecoply Barrier panels must be increased by the thickness of the GIB® panel to ensure the required fastener pull out loadings are achieved.

9.0 CLADDING SYSTEM INSTALLATION

- Cladding must be installed as soon as possible.
- Claddings must comply and be installed in line with NZBC and cladding supplier specifications.
- Cladding maintenance advice should be sought from the cladding manufacturer.
- Cladding fastener lengths must be increased by a minimum of 7mm to ensure the required fastener pull out loadings are achieved.

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10.0 WORKING INSTRUCTIONS

Always use safe working practices when handling and installing Ecoply® Barrier plywood Sheathing. For further information refer to Safety Data Sheets available online from www.chhwoodproducts.co.nz.

Hole Forming - Making Penetrations in Ecoply® Barrier Sheets.

- Mark the centre of the hole on the sheet.
- Pre drill a pilot hole.
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a electric drill.
- For irregular rectangle or circular holes a perforation in the sheet can be made by drilling a series of smaller holes around the perimeter of the hole, then tapping out the waste piece from the plywood sheathing or cut using a jig-saw.

Cutting Sheets - Making Cuts to Ecoply Barrier Sheets.

- Ecoply Barrier can be cut using any circular-saw or hand-saw tool.
- When sawing, clamp a straight edge to the sheet as a guide. Run the saw base along the straight edge to make a precise cut.

11.0 REFERENCED DOCUMENTS

NZBC B1/AS1 Structure

NZBC B2/AS1 Durability

NZBC E2/AS1 External Moisture

AS/NZS 1170.2: 2011 Structural design actions – Wind Actions

NZS 1170.5: 2004 Structural design actions – Earthquake actions – New Zealand

AS/NZS 1604.3: 2012 Specification for preservative treatment – Plywood

AS/NZS 2269: 2012 Plywood Structural Specifications

NZS 3602: 2003 Timber and Wood based products for use in Building

NZS 3603: 1993 Timber Structures Standard

NZS 3604: 2011 Timber Framed Buildings

IBC AC148 Acceptance Criteria for Flexible Flashing Materials

CHH Woodproducts Product Technical Statement – Ecoply Barrier: Rigid Air Barrier

CHH Woodproducts Safety Data Sheet - Ecoply Barrier

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12.0 FREQUENTLY ASKED QUESTIONS

Q: Do fastener heads need to be taped over?

A: Fastener heads are not required to be taped over, unless the fastener head completely penetrates the thickness of the face veneer.

Q: Do I need to tape all of the seams between the Ecoply® Barrier plywood panels?

A: Yes. All seams between the panels must be taped with Ecoply® Barrier Sealing Tape (60mm width Grey Colour) to ensure that it functions as a structural rigid air barrier system.

Q: Can Ecoply Barrier Sealing Tape, Sill Tape and Frame Sealing Tape be installed in the rain?

A: Yes. The tapes require pressure for a secure seal, and will require an extra period of time to fully adhere to the surface.

Q: What is permeance, and why is it important?

A: Permeance is a property that defines the ease at which water molecules diffuse through a material, typically measured in "perms." While water resistant barriers are designed to keep liquid water out of the wall system, they are also generally designed to allow moisture vapour to pass through so that the wall system can "breathe" meaning moisture vapour will not accumulate and condense in the wall system.

Q: How long can I leave Ecoply Barrier panels exposed before I install roof and wall coverings?

A: Ecoply Barrier panels can be left exposed for up to 180 days, however it is recommended to install roof and wall coverings as soon as possible.

Q: What is the weight of an Ecoply Barrier panel?

A: 2440mm panel = 11.7kg, 2745mm panel = 13.2kg (guidelines only).

Q: What is the R-value of Ecoply Barrier?

A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (K) of 0.13W/mC so a 7mm panel has a thermal resistance R = 0.007/0.13 = 0.05.

Q: How much space should be left for expansion?

A: Allow 2-3mm expansion gap between square edges of Ecoply Barrier Panels. Ecoply Barrier is provided in 1197mm widths to account for this.

Q: Where can I purchase Ecoply Barrier panels and tapes from?

A: Ecoply Barrier is available from all leading building merchants in New Zealand.

Q: Can I use Ecoply Barrier on steel frame?

A: For use on steel framing please use Ecoply Barrier for Steel and the use the Ecoply Barrier for Steel Specification and Installation Guide.

13.0 LIMITATIONS

The information contained in this document is current as at September 2017 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply Barrier products installed in accordance with this document or the NZBC compliance documents.

This publication replaces all previous CHH Woodproducts' design information and literature relating to Ecoply Barrier structural plywood products and tapes. CHH Woodproducts reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

CHH Woodproducts has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Woodproducts assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

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14.0 ECOPLY® BARRIER INSTALLATION CHECKLIST

14.1 RIGID AIR BARRIER CHECKLIST

The below installation areas are considered critical to the successful installation of Ecoply® Barrier when used as a rigid air barrier.

Using this sheet as a checklist during installation will aid in problem free product installation and long term product durability post construction.

Task	Tick when checked
Prior to Specification and Installation	
Read the Ecoply® Barrier Specification and Installation Guide in its entirety	☐
Install	
Position Ecoply Barrier panels with the water resistant powder coat film facing outwards	☐
Sheet edges fully supported by framing	☐
Sheet Cuts	
Cut sheet ends are placed to the top	☐
Fastener Material Type	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones or other corrosive environments – Zone D)	☐
Sheet Fastener Pattern	
Around sheet edge – maximum 150mm centre spacing	☐
At intermediate framing – maximum 300mm centre spacing or 150mm in Extra High wind zone	☐
Expansion Gap Between Sheets (Vertical sheet joints)	
2-3mm gap between vertical edges of sheets	☐
NOTE: Expansion gaps are required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
Ground Clearances	
Ground clearances maintained for claddings in accordance with E2/AS1 and NZS 3604	☐
Sheets overhang the bottom plate by a minimum of 25mm & maximum 40mm over timber and concrete foundations	☐
Vertical Sheet Joints	
Seal all vertical joints including corners with Ecoply Barrier Sealing Tape (60mm x 30m) or Frame Sealing Tape (150mm / 200mm x 30m)	☐
All vertical window and door frames sealed with Ecoply Barrier Frame Sealing Tape	☐
Horizontal Sill Flashing Detail	
Apply Ecoply Barrier Sill Tape to the horizontal sill section of a window or door opening	☐
Make sure the tape extends 100mm up both window / door studs	☐
Horizontal Sheet Joints	
Use Ecoply Barrier PVC horizontal Z Flashing (Product code RDZF7) OR Ecoply Barrier 150mm OR 200mm Frame Sealing Tape.	☐
Service Penetrations	
Waste pipe outlets of maximum 150mm diameter placed at no closer than 150mm to the edge of braced element	☐
Use a flexible sealing tape to seal the service penetration: minimum cover 100mm, 25mm minimum width around the pipe penetration	☐

Refer to the current Ecoply® Barrier Specification and Installation Guide for full installation specifications and suggested details.

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ecoply®
Proven. Durable. Strong



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September 2017

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BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	UWC ltd
Project name	
Address	52 Benn St , Amberley
Designer	JKH
Date	12/5/25

Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

Proposed Building

Element		Area (m²)	Proposed Building Heat Loss (W/K)	
Slab Floors		177.0	80.8	
Other Floors		0.0	0.0	
Roof		177.0	31.4	
Skylights		0.0	0.0	
Walls		153.1	69.6	
Glazing (walls & doors)	(19.0% of total wall area)	36.2	72.4	
Doors (opaque)		1.6	4.7	
		544.9	**Total**	**258.9**

Reference Building

Element	Area (m²)		Reference Building Heat Loss (W/K)	
Slab Floors	177.0	1.6	**110.6**	
Other Floors	0.0	3.0	**0.0**	
Total Roof (includes skylight area)	177.0	6.6	**26.8**	
Walls (70% of total wall area)	133.6	2.0	**66.8**	
Glazing allowance (30% of total wall area)	57.3	0.50	**114.5**	
	544.9		**Total**	**318.8**

Comparison of proposed building against the reference building — **PASS**

	Element type	Description	Embed heating?	Area (m²)	Construction R-value (m².K/W)	Heat Loss (W/K)	Errors
1	Slab Floors	Floor Slab	No	177.0	2.2	80.8	
2	Roof	Colorsteel Roof R6.6	No	138.0	7.0	19.8	
3	Roof	Colorsteel Roof R3.6	No	39.0	3.4	11.6	
4	Walls	Brick Veneer Exterior	No	93.0	2.2	42.3	
5	Walls	BGC Cladding	No	34.5	2.2	15.7	
6	Walls	Internal Wall	No	25.6	2.2	11.6	
7	Glazing (walls & doors)	W1		2.7	0.50	5.4	
8	Glazing (walls & doors)	W2		0.9	0.50	1.8	
9	Glazing (walls & doors)	W3		3.8	0.50	7.7	
10	Glazing (walls & doors)	W4		1.9	0.50	3.8	
11	Glazing (walls & doors)	W5		1.9	0.50	3.8	
12	Glazing (walls & doors)	W6		5.8	0.50	11.5	
13	Glazing (walls & doors)	W7		3.8	0.50	7.7	
14	Glazing (walls & doors)	W8		2.1	0.50	4.2	
15	Glazing (walls & doors)	W9		2.1	0.50	4.2	
16	Glazing (walls & doors)	W10		1.0	0.50	2.1	
17	Glazing (walls & doors)	W11		0.7	0.50	1.3	
18	Glazing (walls & doors)	W12		2.1	0.50	4.2	
19	Glazing (walls & doors)	W13		0.7	0.50	1.3	
20	Glazing (walls & doors)	W14		1.5	0.50	3.1	
21	Glazing (walls & doors)	W15		2.1	0.50	4.2	
22	Glazing (walls & doors)	W16		1.1	0.50	2.2	
23	Glazing (walls & doors)	W17		2.1	0.50	4.2	
24	Doors (opaque)	Internal Garage Door		1.6	0.34	4.7	
25							
26							

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BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	UWC ltd
Project name	
Address	52 Benn St , Amberley
Designer	JKH
Date	12/5/25

Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

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GIB®

EzyBrace® Systems

Specification and installation manual



CBI 5113

AUGUST 2016

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NATIONAL SUPPORT

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GIB® HELPLINE

0800 100 442

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

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

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

PATENTS

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

Beware of substitution

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

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

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

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

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Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

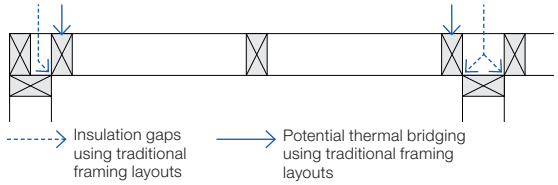
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

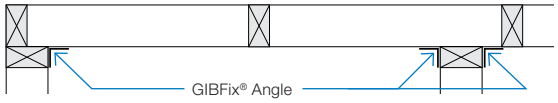
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

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Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

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

NZBC CLAUSE B2 — DURABILITY

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

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

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 — ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

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

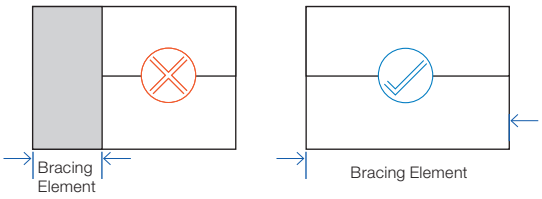
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Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

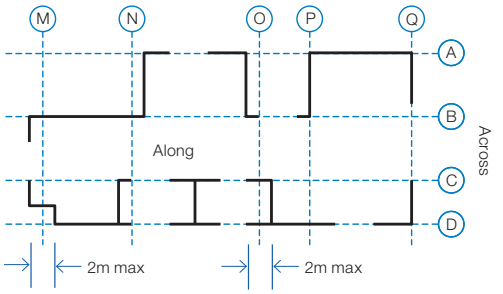
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

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Bracing demand

GIB EZYBRACE® CALCULATOR

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

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

DEMAND

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

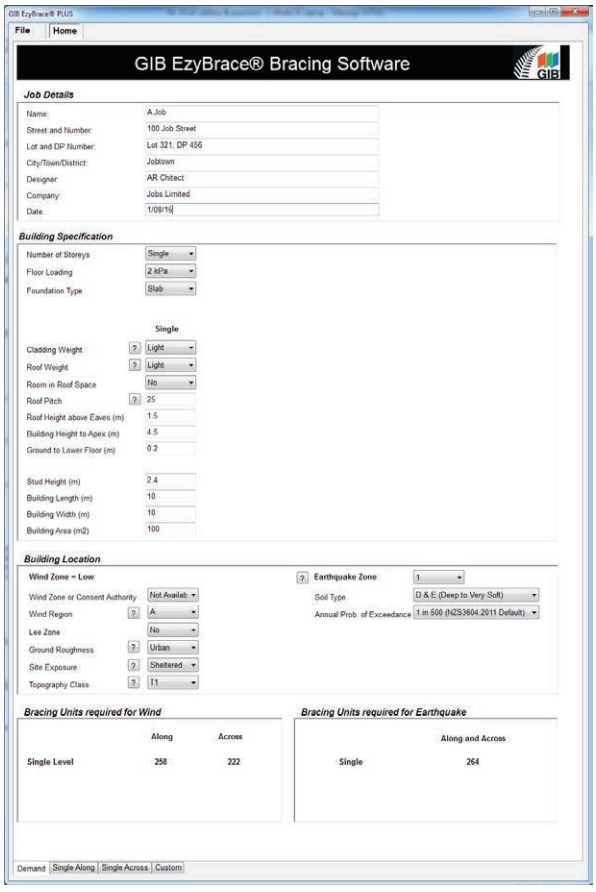
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

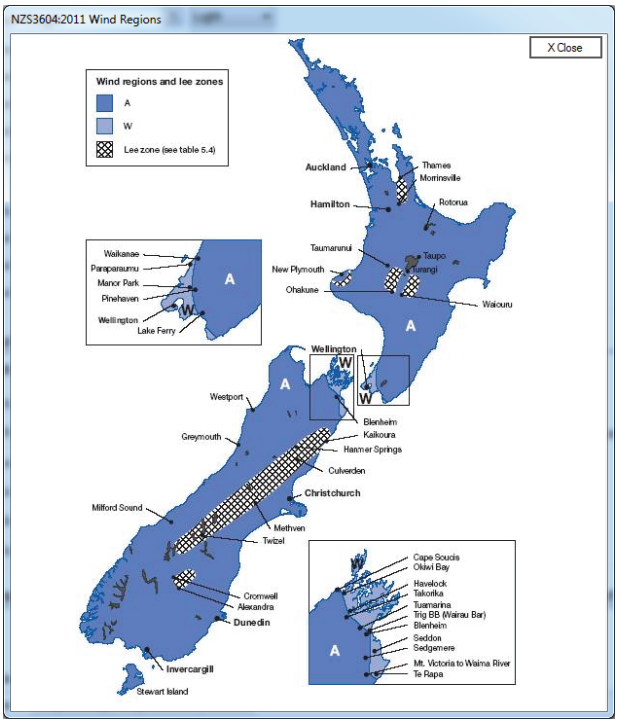
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design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

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

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

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





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

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Software functionality

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

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

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

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

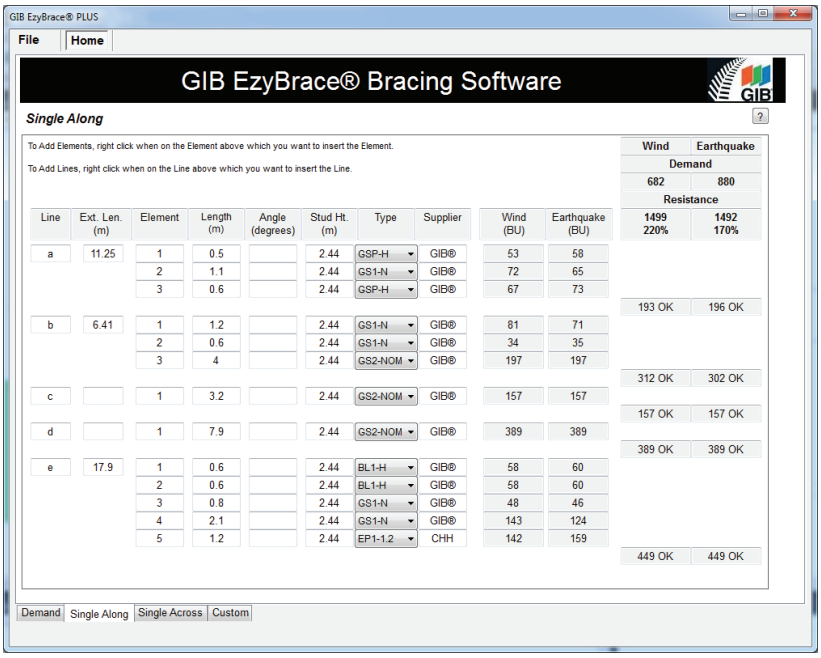
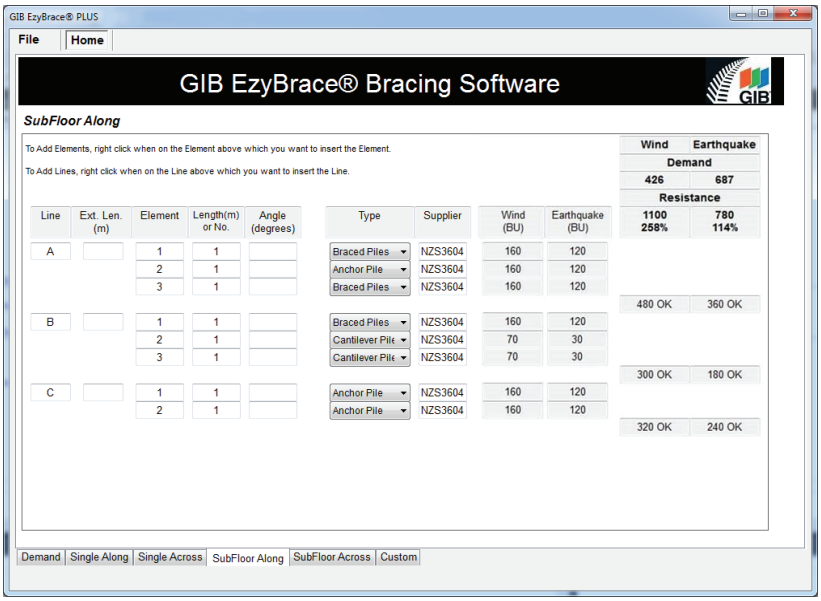


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET



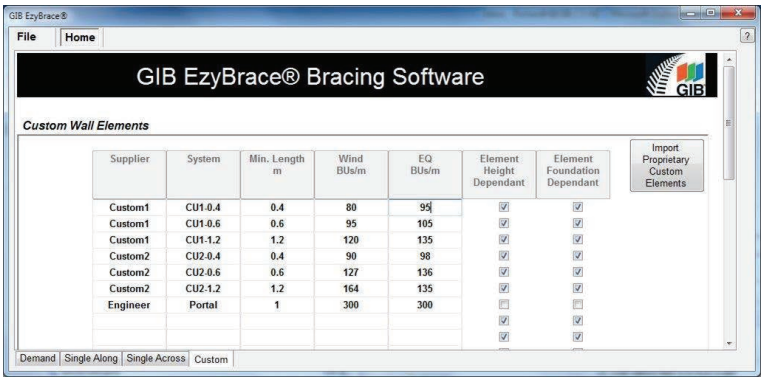
Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

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Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



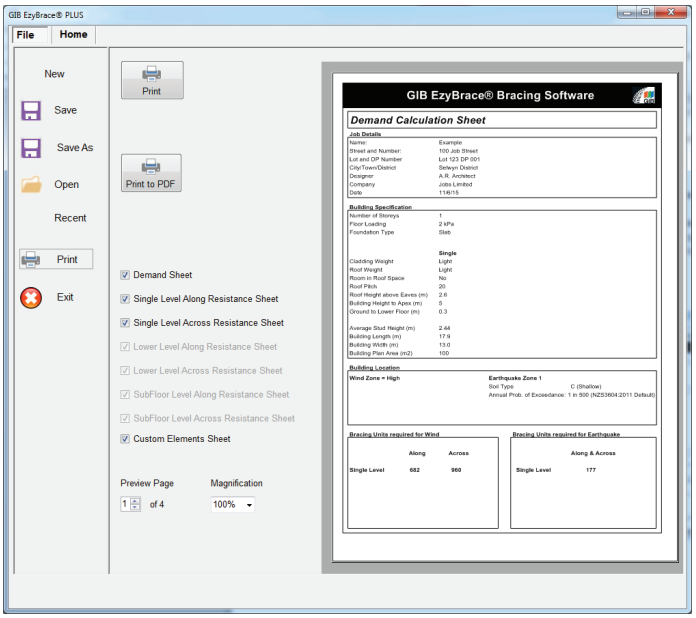
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

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

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

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

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



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

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GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

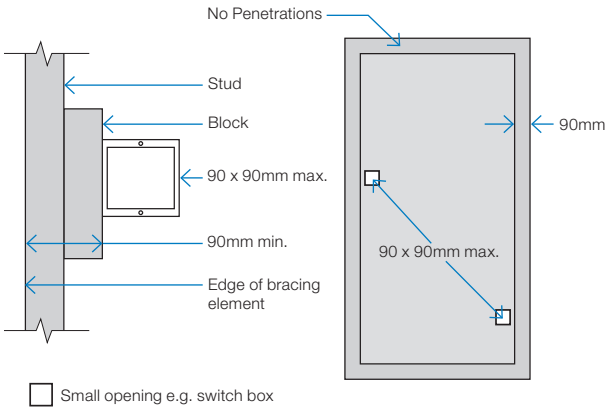
SMALL OPENINGS

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

LARGE OPENINGS

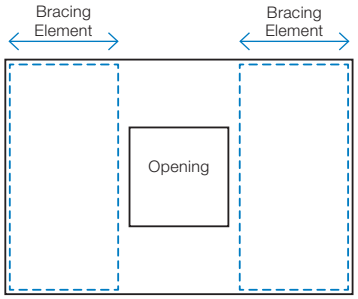
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



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Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

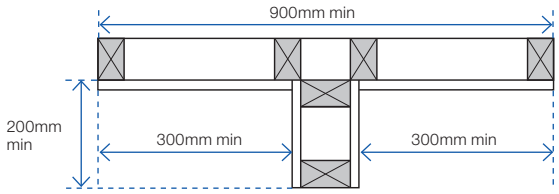
Guidelines for intersection walls

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

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

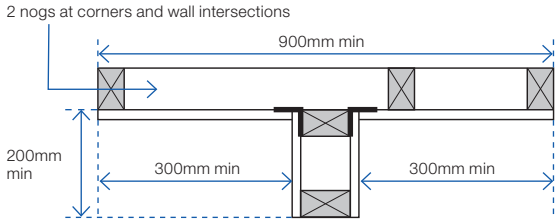
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



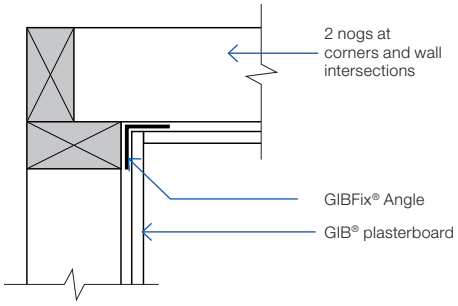
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



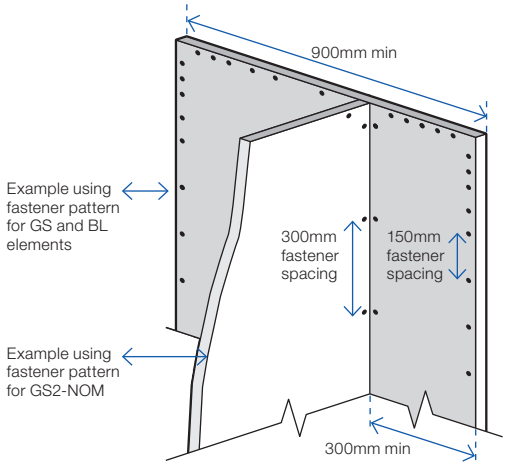
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

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Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

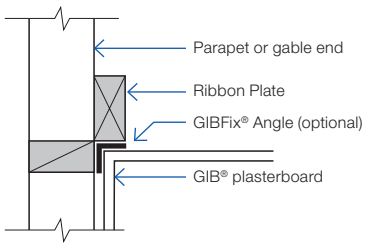
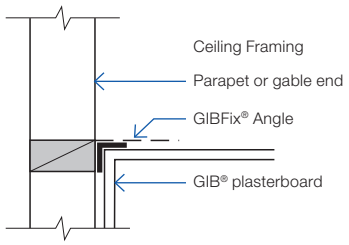


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

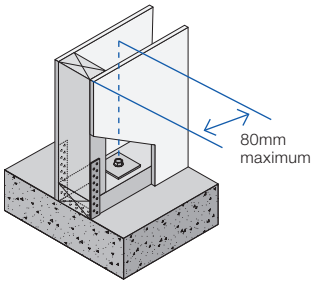
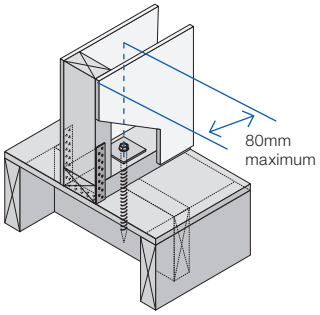
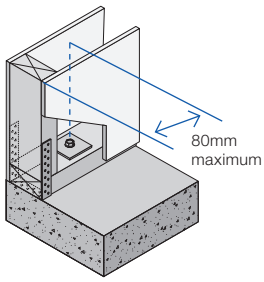
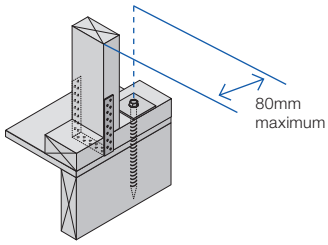
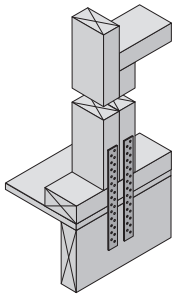
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

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Bracing strap installation

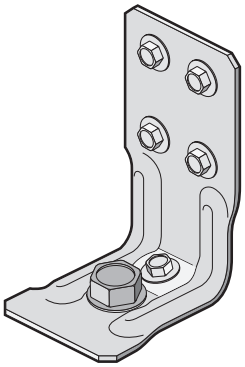
Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

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 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	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.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

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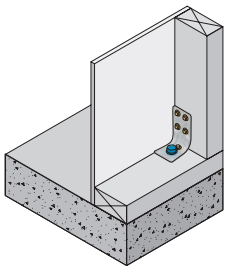
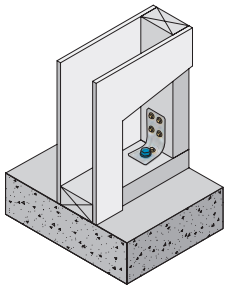
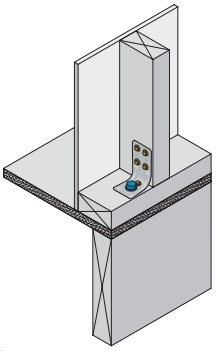
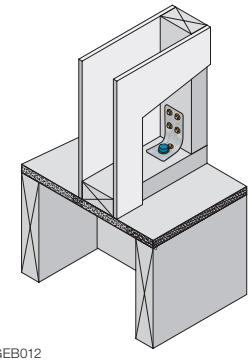
GIB HandiBrac® installation



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

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

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

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

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

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

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

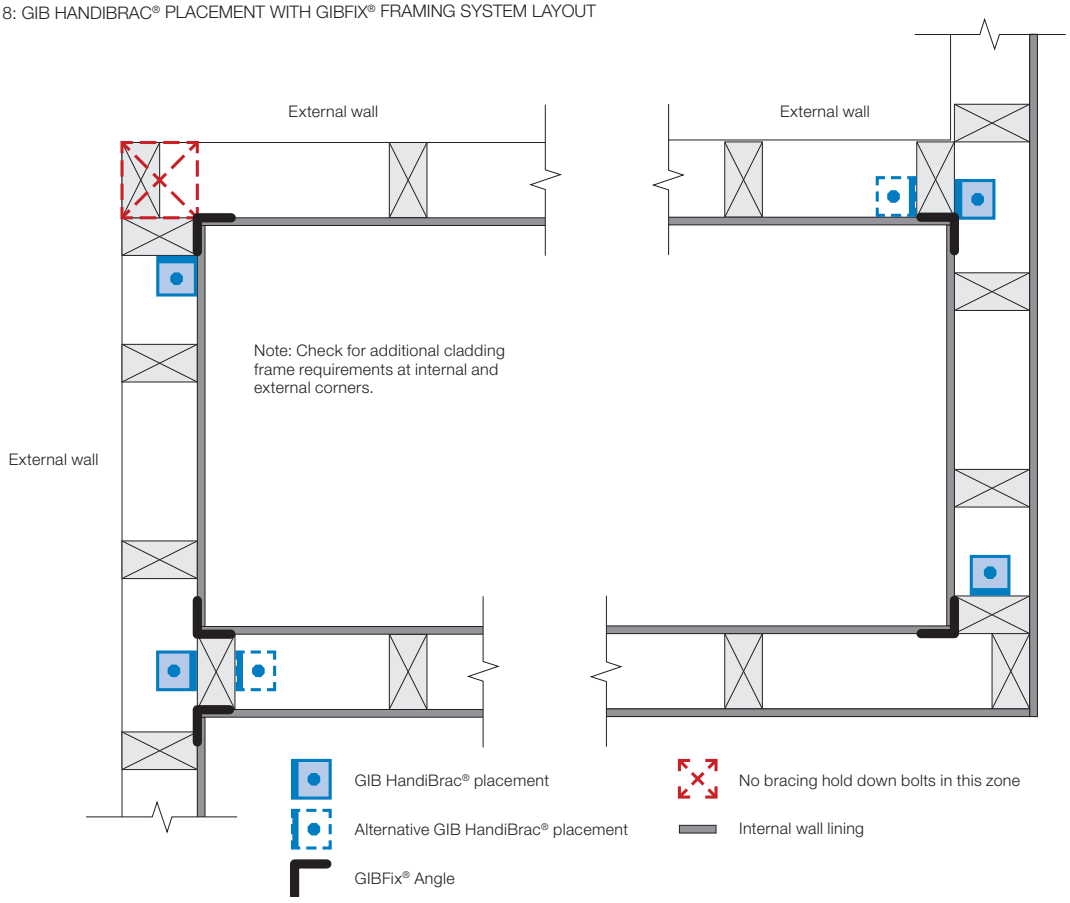
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

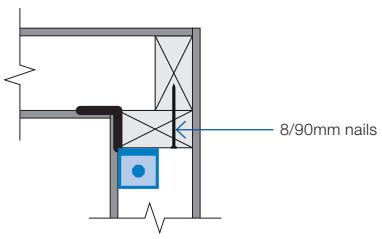
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

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Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

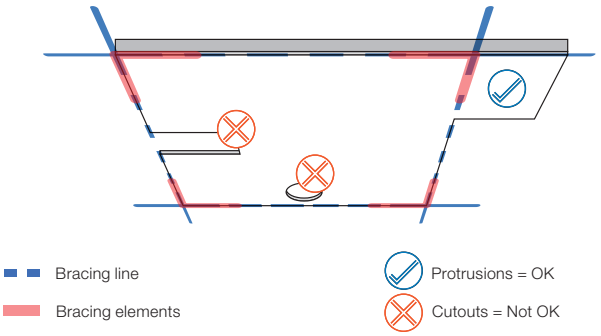


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

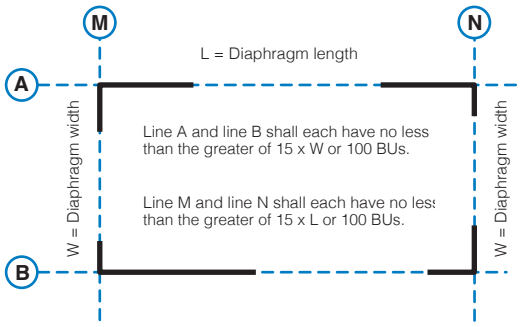
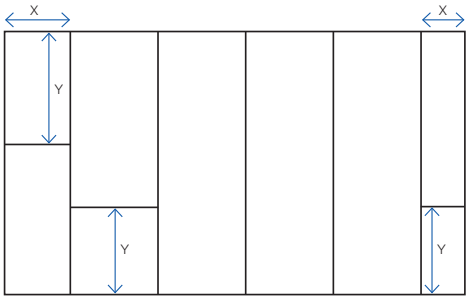


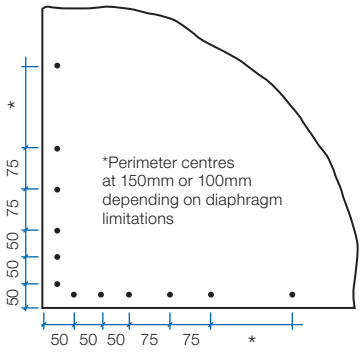
FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.

Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

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Ceiling battens in ceiling diaphragms

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.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

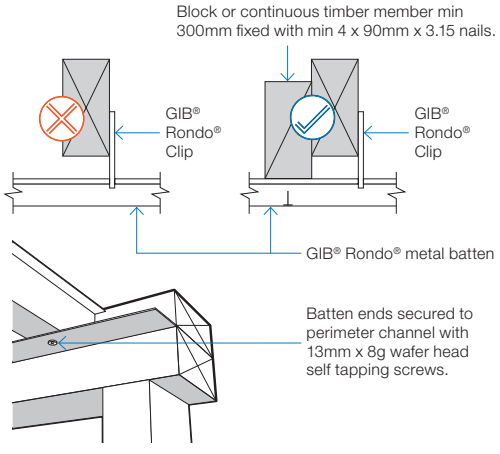
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal 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 or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

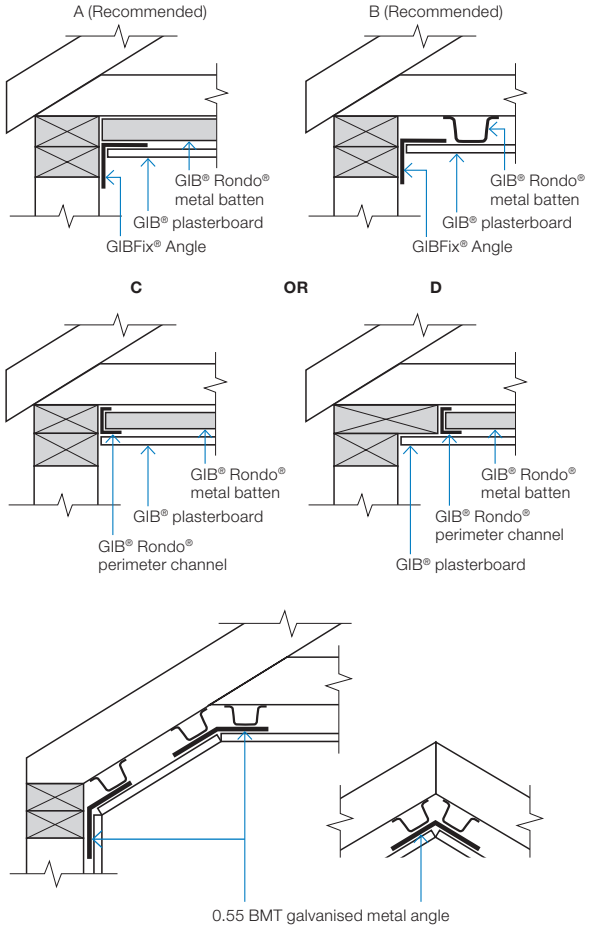
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



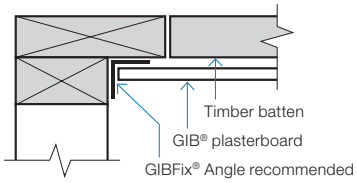
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

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Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed withing the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvansed metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

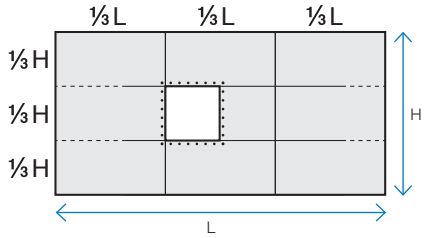
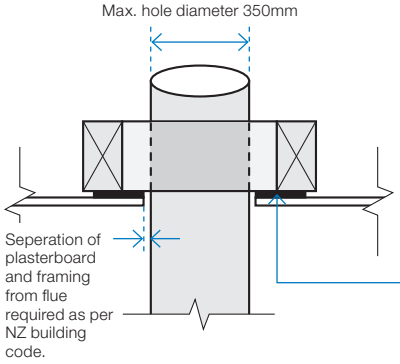
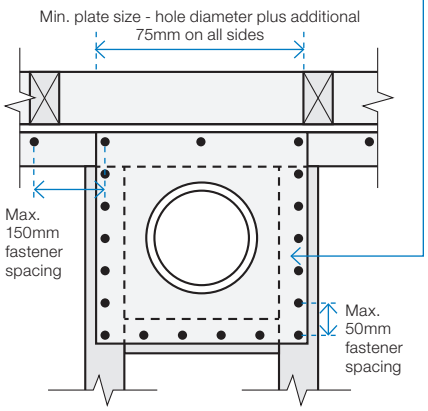


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Steel plate
0.55 BMT Galvanised sheet Max. opening 350mm diameter. Installed prior to GIB® plasterboard.

Framing
90 x 45mm framing trimmed to provide extra fixing.

GIB® plasterboard ceiling
Installed over the steel plate and into framing using a minimum of 32mm x 6g GIB® Grabber High Thread or 32mm x 7g GIB® Grabber Dual Thread screws at 50mm max centre spacing.

Plasterboard ceiling not shown in plan view

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

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

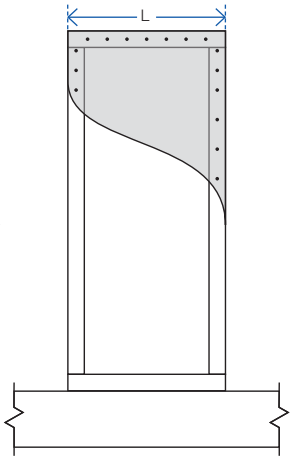
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

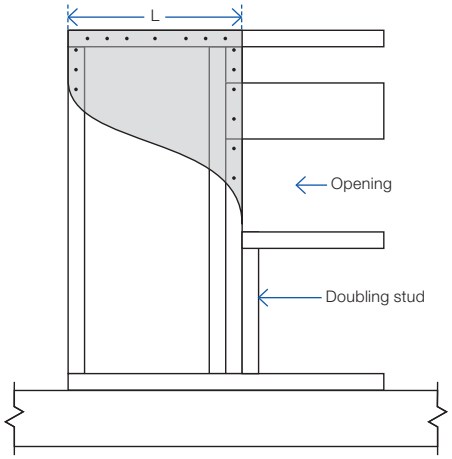
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



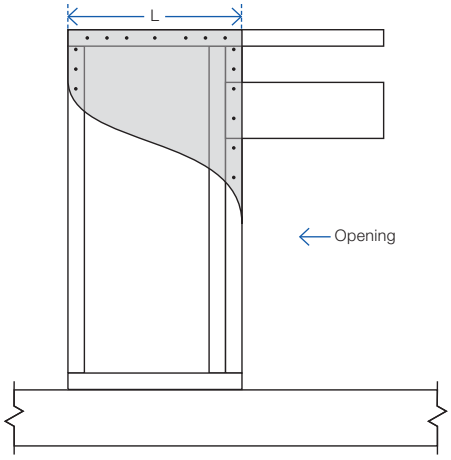
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



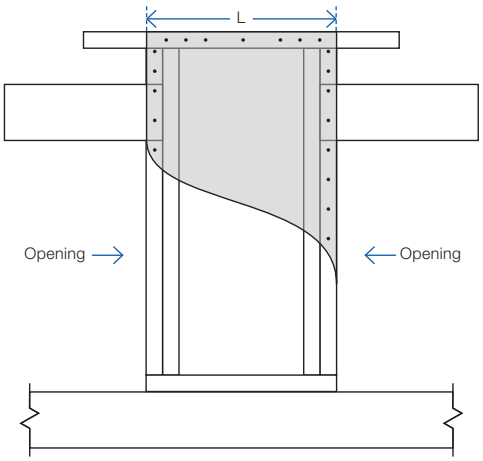
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

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

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

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

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

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

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

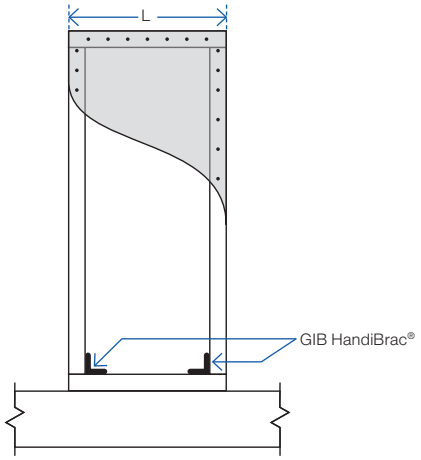
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

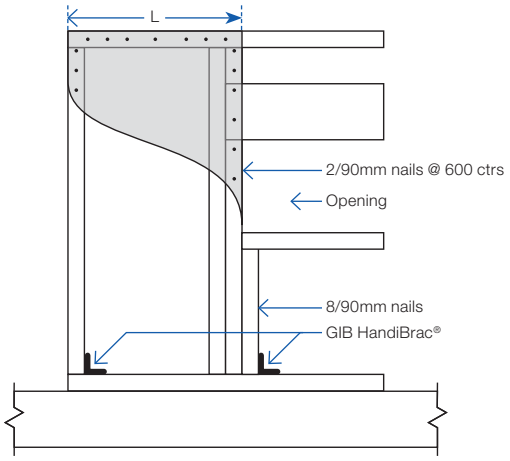
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



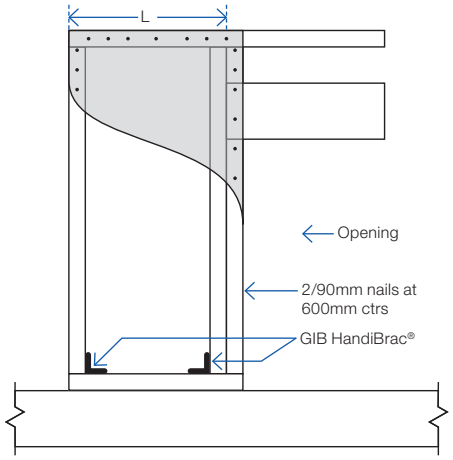
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



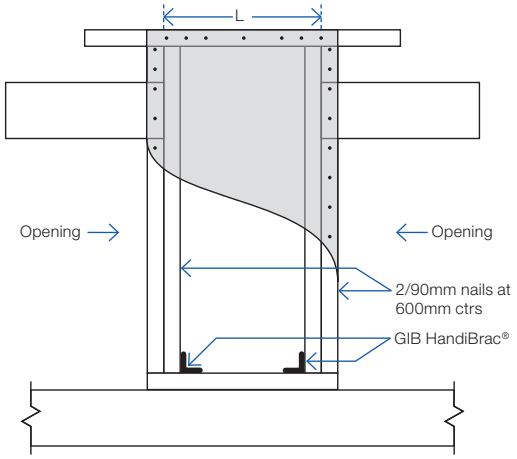
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

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GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

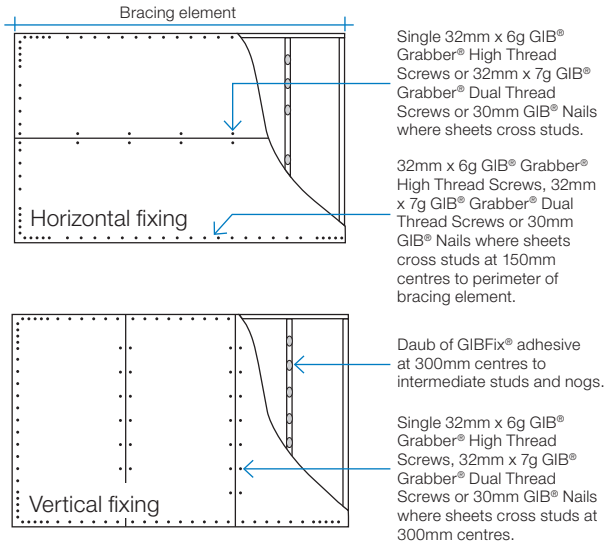
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

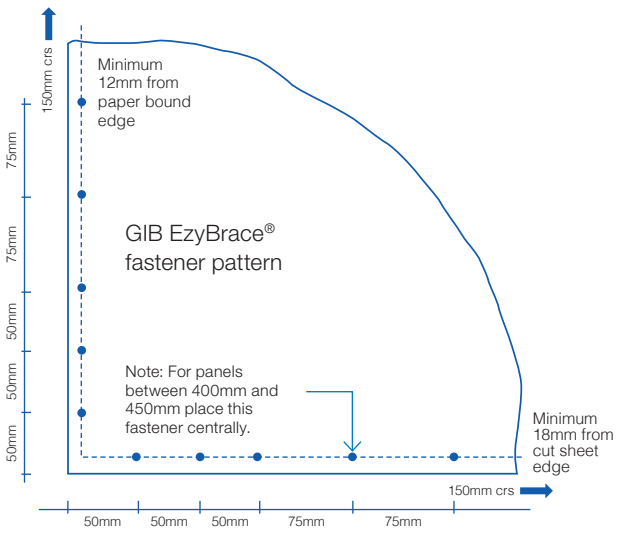
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

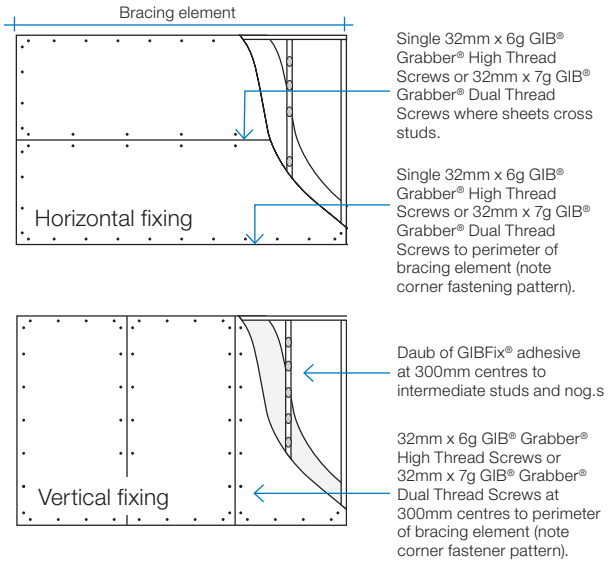
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

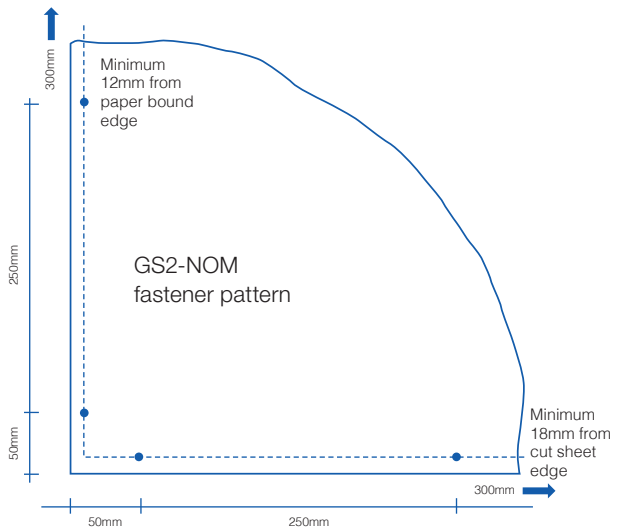
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

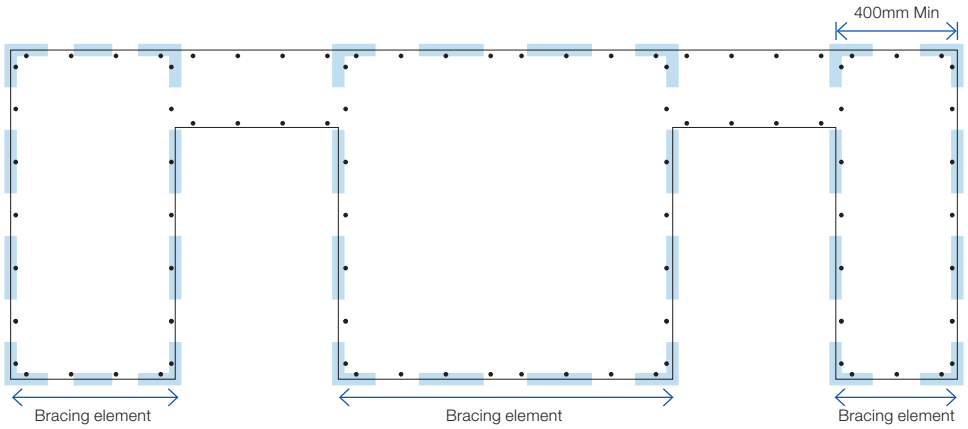
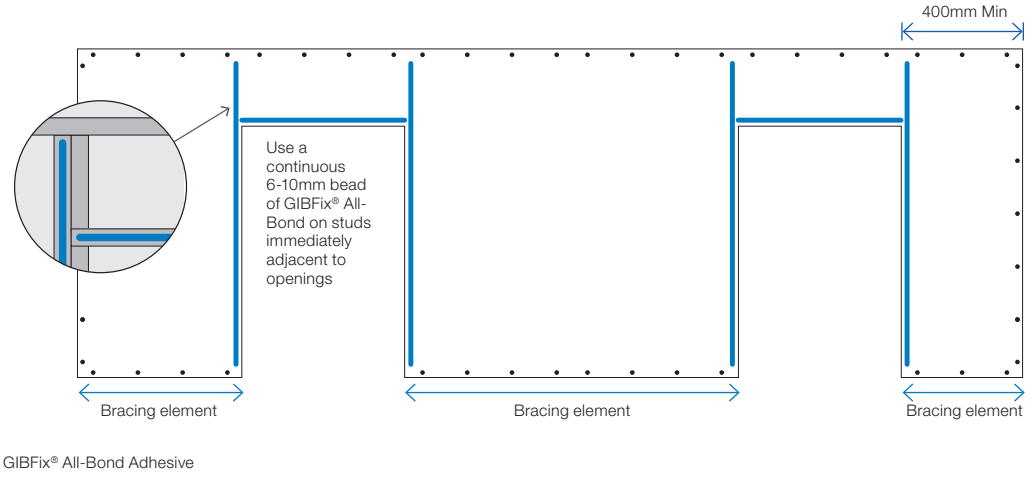
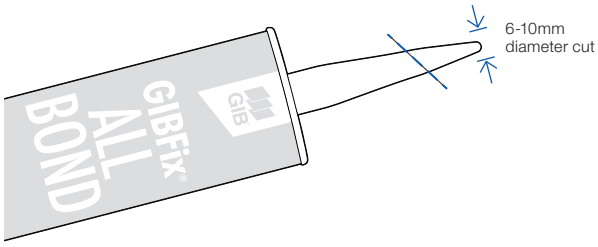


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



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GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber Floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

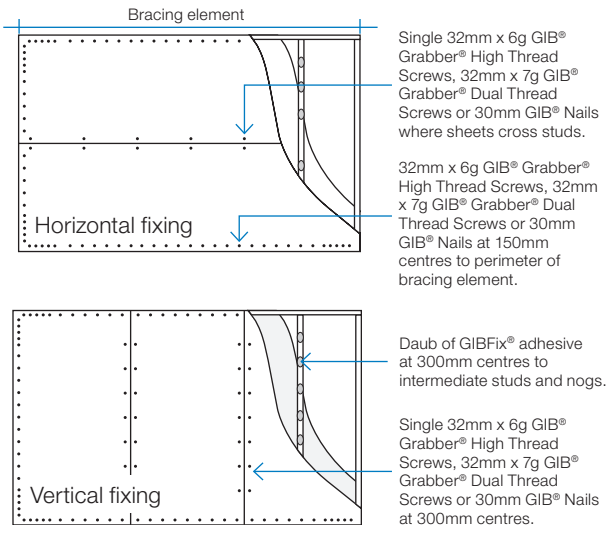
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

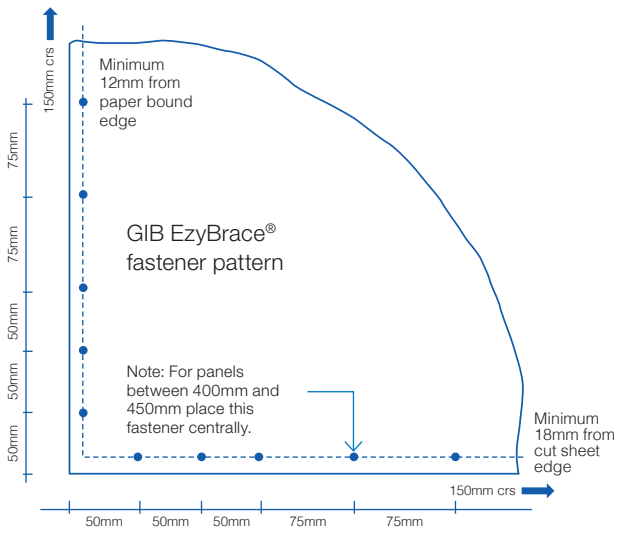
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

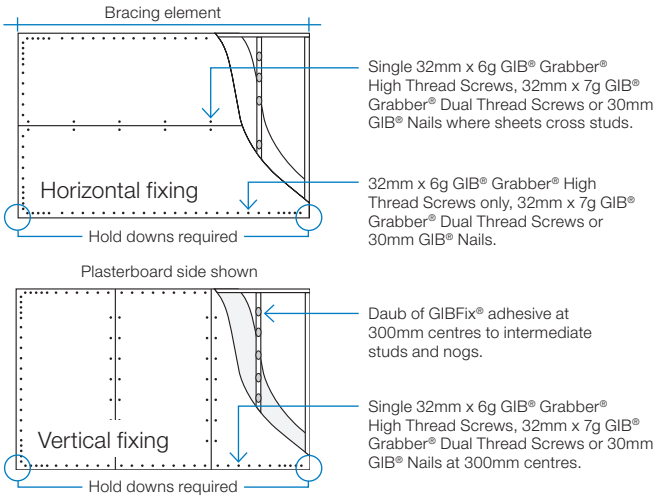
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

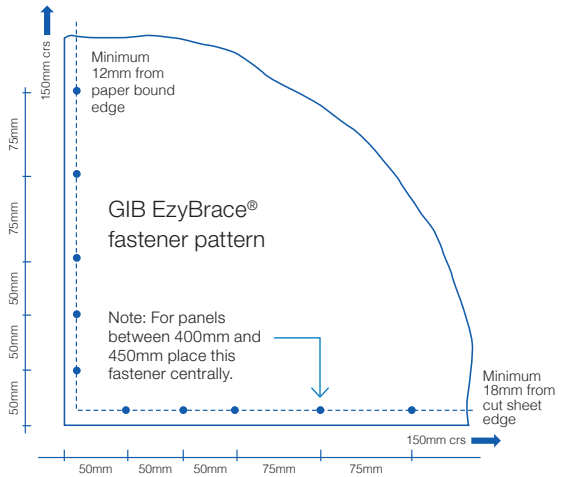
Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BL1-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

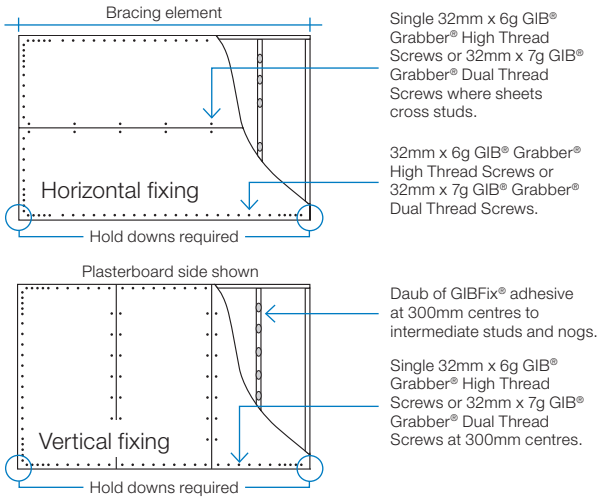
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

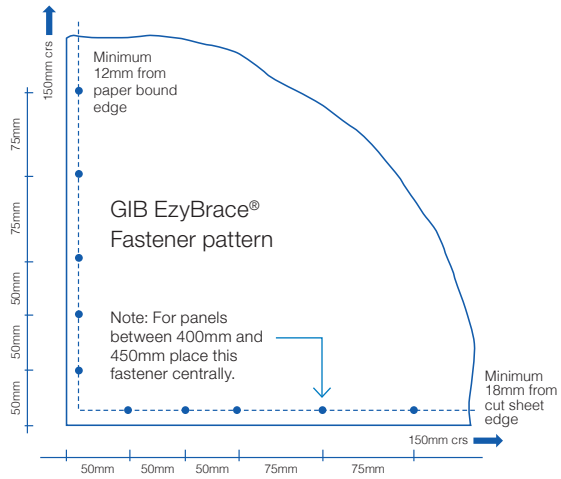
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws.Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

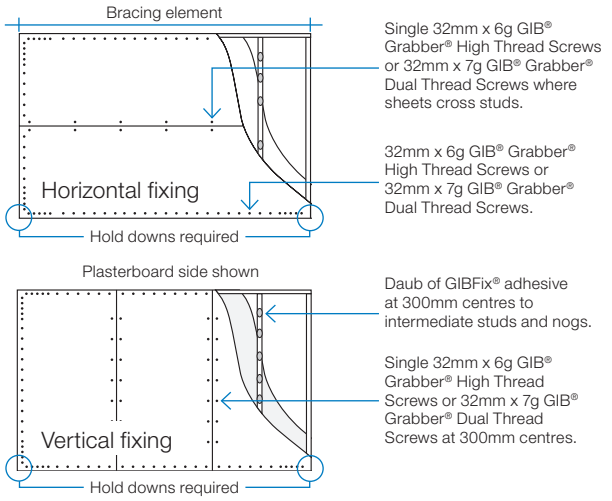
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

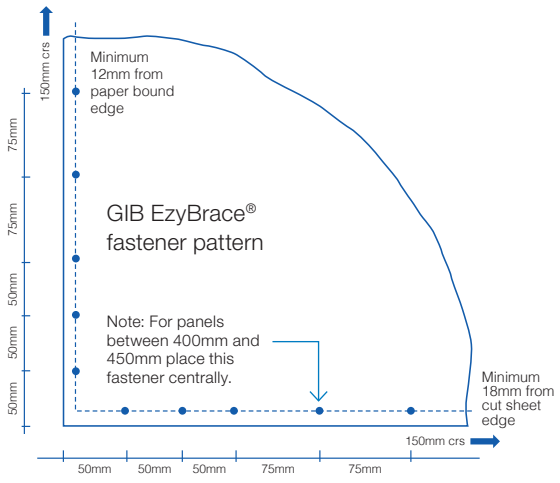
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

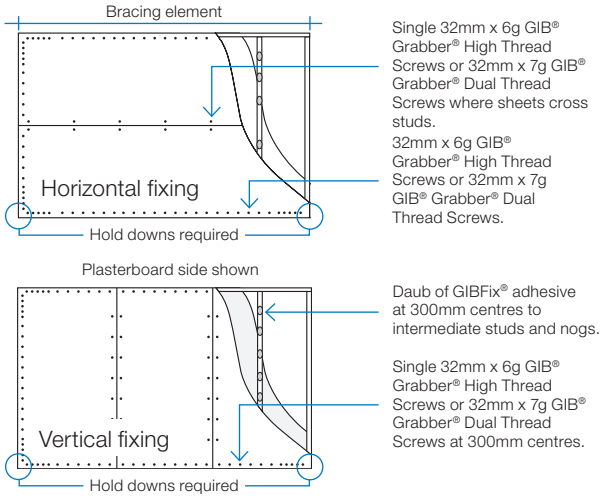
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

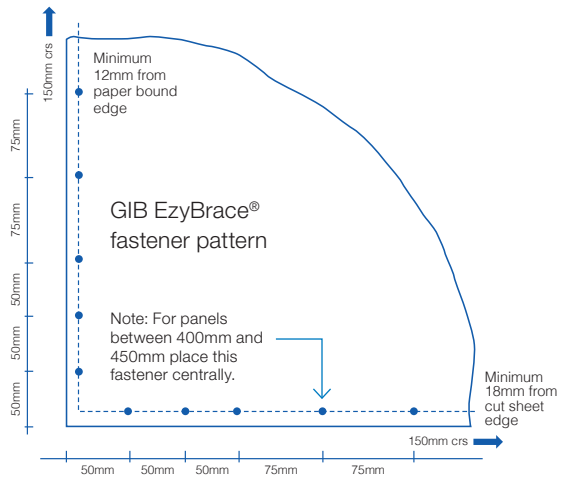
Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the 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. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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

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

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

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

GLOBAL GREENTAG^{CERTTM}

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

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

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

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

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

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

TRADEMARKS

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

PATENTS

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

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GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

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GIB®

Wet Area Systems

Specification and installation manual



CBI 5113

FEBRUARY 2021

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GIB® HELPLINE

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RESIDENTIAL AND NON-RESIDENTIAL APPLICATIONS. BATHROOMS, LAUNDRIES, TOILETS AND KITCHENS.

Protection from internal moisture is an important consideration when designing interior lining systems for homes, multi-unit apartments, educational, healthcare and commercial applications.

The New Zealand Building Code sets out minimum standards for wet area spaces in residential dwellings. However, often higher levels of performance and protection from internal moisture is demanded.

The GIB® Wet Areas System specification and installation manual provides internal lining options and details for specifiers, builders and building owners.

USE ONLY THE CURRENT SPECIFICATION

This manual supersedes the publication GIB Aqualine® Wet Area Systems March 2007. Winstone Wallboards Ltd accepts no liability for reliance upon publications that have been superseded.

If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442 or go to gib.co.nz

BEWARE OF SUBSTITUTION

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

BRANZ Appraised
Appraisal No.427 [2021]

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This publication

This publication is a best practice guide to the design and construction of wall and ceiling linings in wet areas with intermittent water exposure within residential and non-residential buildings, as covered by NZ Building Code Clause E3 Internal Moisture.

The information is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZ Building Code and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

To form a complete wet area system it is important to specify compatible materials and systems, designed to cope with conditions that are common in wet areas, and to ensure correct installation using best practice.

WET AREAS

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Within wet areas the following requirements apply;

1. NZBC Clause E3.3.4 states that wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
2. NZBC Clause E3.3.6 states that surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

NZ Building Code Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management. Ongoing maintenance of wet areas is also important to maximise service life.

GIB AQUALINE®, GIB TOUGHLINE® AQUA AND GIB WEATHERLINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

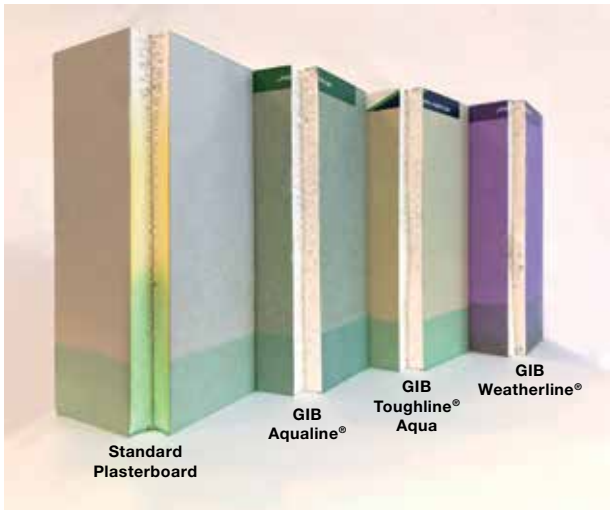
The NZ Building Code does not call for water resistant linings in wet areas but it is desirable to specify lining materials which will maintain their integrity longer when exposed more frequently to moisture, and to one-off events such as leaks or flooding.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® feature a water-resistant polymer impregnated core, designed for wet area applications. These core formulations not only resist penetration of moisture through the lining into the framing behind, but also resist water “wicking” up the core, a common cause of long-term damage where a water-resistant lining has not been used.

WATER ABSORPTION TEST

The illustrations below show how GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® compare with standard plasterboard after soaking for two-hours in green dye.





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WHERE TO USE GIB® WET AREA LININGS

In order to prolong the life expectancy of the space it is highly desirable to include wet area linings in situations where there is an increased risk of water or moisture damage. Applications include walls and ceilings in bath and shower rooms, and walls in laundries, toilets and kitchens.

BENEFITS

- Water resistant and durable linings help protect against water damage
- Proven substrate for paint, wallpaper, waterproofing membranes, tiles, sheet vinyl and rigid sheet shower linings
- Suitable for both residential and non-residential applications
- Dimensionally stable and an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains glass fibres and other additives to increase strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB Noise Control® Systems (see Compliance with the NZ Building Code, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details

HANDLING AND STORAGE

- GIB® plasterboard must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB® plasterboard must be handled as a finishing material

LIMITATIONS

- GIB® wet area linings must not be used for bracing purposes in shower cubicles or above baths. For more information refer to page 9 of this manual
- Do not use GIB® wet area linings where exposed for extended periods to humidity levels above 90% RH, such as in group shower or steam rooms, or where exposed to moisture and chlorine rich environments such as in indoor swimming pools
- GIB® wet area linings used in a bathroom or other high humidity environment must not be directly applied to solid plaster (gypsum or cement), wood-based sheet linings or similar materials, masonry or concrete, without strapping or steel furring channels
- GIB® wet area linings must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® or GIB Toughline® Aqua must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details

Table 1: GIB® Wet Area linings sheet dimensions and weights

Product	Sheet face colour	Thickness (mm)	Sheet width (mm)	Edge Type	Sheet length (mm)						Max. Weight (kg/m²)
					2400	2450	2700	3000	3600	4800	
GIB Aqualine®	Green	10	1200	TE/TE	■		■	■	■		8.0
			1200	TE/SE	■					■	
			1350	TE/SE	■				■		
		13	1200	TE/TE	■		■	■	■		11.0
GIB Toughline® Aqua	Mauve	13	1200	TE/TE	■		■	■			11.4
GIB Weatherline®	Purple	10	1200	SE/SE		■	■	■			9.0
		13	1200	SE/SE			■	■			11.5

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BOARD SUBSTITUTION OPTIONS

Acceptable GIB Aqualine® alternatives	
10mm GIB Aqualine® can be replaced with:	10mm GIB Weatherline® 13mm GIB Toughline® Aqua
13mm GIB Aqualine® can be replaced with:	13mm GIB Weatherline® 13mm GIB Toughline® Aqua

GIB® Wet Area System construction details in this manual refer to the use of GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® sheets may also be used in place of GIB Aqualine®.

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® are suitable substrates for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures are presented in this literature, except that the lining gap at the floor is no more than 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles behind internal lining corners is recommended for sheet vinyl applications in showers or shower over bath situations
- The lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph even through a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/ manufacturers of the vinyl

RIGID SHEET SHOWER LININGS

- The wall surface must be free of dust before installation of the lining
- Avoid lining joints as much as possible and where necessary flush with plaster to achieve a level surface
- Do not preseal or paint areas which are to be covered by the rigid shower linings
- The suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Care must be taken to ensure that rooms are adequately ventilated
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- Consult the supplier of the shower lining for full installation details
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service

WATERPROOF MEMBRANE SYSTEMS AND TILING

- A waterproof membrane system must be applied to lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane system over the lining and once penetrations for shower mixers, taps and associated fittings are sealed
- The installation of galvanised steel reinforcing angles behind internal lining corners is required for tiled wall applications in showers or shower over bath situations
- In-situ waterproofing membrane materials manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and must be applied to manufacturer’s recommendations. Typically, these types of membrane systems are not suitable for paint and wallpaper finishes
- Waterproof membrane systems must be fully cured and dry prior to application of tiling adhesives
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this manual are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane system

For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

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PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Ensure shower mixer and tap penetrations are sealed with a proprietary flange system to prevent the passage of moisture into the wall cavity
- Sealants should be of a mould inhibiting type and be paintable. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Apply a bead of sealant to the full depth of the lining in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the wet area lining
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable always use tested and approved proprietary penetration seals

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture.

When renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them. This allows for a new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation, water-resistant linings, and propriety plumbing penetration flange systems where appropriate
- Make the job easier

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often expensive failure of components and building elements within wet areas.

It is important to regularly inspect and repair any potential problem before it becomes expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and re-coated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out

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Compliance with the NZ Building Code

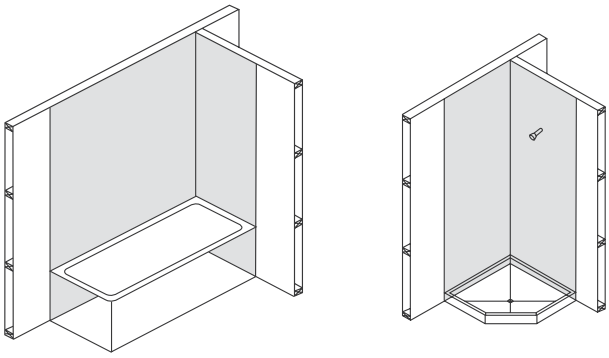
STRUCTURE – CLAUSE B1

The design and material specification for steel and timber framing used in GIB® Wet Area systems must be in accordance with the performance requirements of NZ Building Code Clause B1 (Structure).

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members, such as at bath and shower tray locations.

Otherwise, GIB® Bracing Systems can be used in water-splash areas, provided these are maintained impervious for the life of the building.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. They can also be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB® Grabber 32mm x 6g screws at 100mm centres, using the GIB Braceline® corner fixing pattern. Refer to the GIB® Bracing System literature.



No bracing in the shaded areas.

DURABILITY – CLAUSE B2

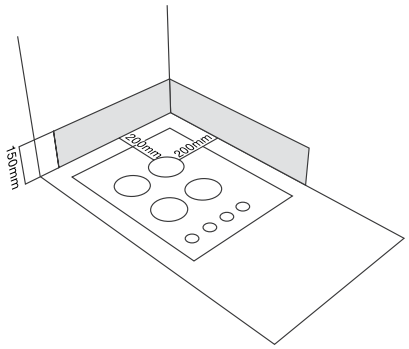
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB® Wet Area Systems have a serviceable life of at least 50 years and comply with NZ Building Code Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

FIRE AFFECTING AREAS BEYOND THE SOURCE – CLAUSE C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZ Building Code Clause C3. When GIB Aqualine® or GIB Toughline® Aqua is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

The protection of combustible surfaces surrounding gas cooking appliances is covered by the latest version of AS/NZS 5601.1.



As a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the specific requirements of AS/NZS 5601.1

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. It would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

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INTERNAL MOISTURE – CLAUSE E3

The New Zealand Building Code Clauses that relate to wall surfaces are;

E3.3.4 - Wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.

E3.3.5 - Surfaces of the building elements likely to be splashed or become contaminated in the course of the intended use of the building, must be impervious and easily cleaned.

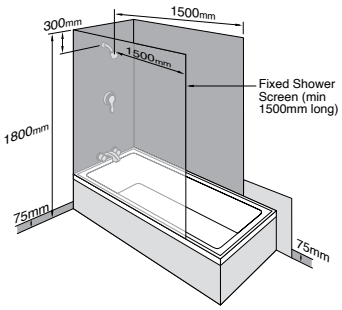
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

New Zealand Building Code Acceptable Solution E3/AS2 substantially refers to the Waterproof Membrane Association Incorporated (WMAI) Code of Practice for Internal Wet Area Membrane Systems (IWAM), August 2020.

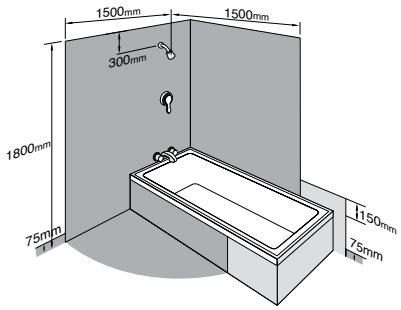
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

Shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

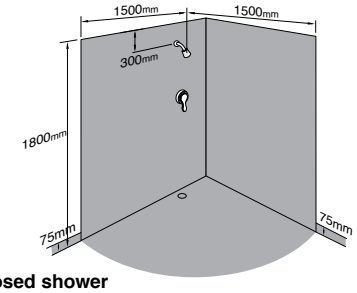
Enclosed shower over bath



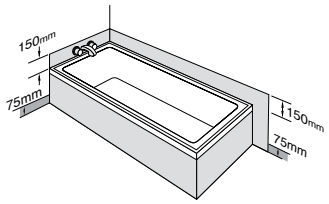
Unenclosed shower over bath



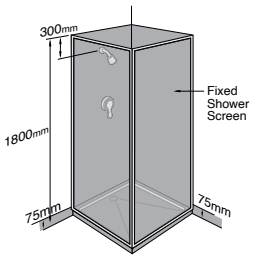
Unenclosed shower



Bath



Enclosed shower



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HAZARDOUS BUILDING MATERIALS – CLAUSE F2

At no stage during its serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZ Building Code Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

VENTILATION – CLAUSE G4

NZ Building Code Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating, thermal insulation and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

AIRBORNE AND IMPACT SOUND – CLAUSE G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZ Building Code Clause G6 (Airborne and Impact Sound). When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information refer to the GIB Noise Control® Systems literature or contact the GIB® Helpline 0800 100 442.

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TIMBER WALL FRAMING

Framing dimensions must comply with the requirements of NZS 3604:2011.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread screws.

FASTENER CENTRES

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

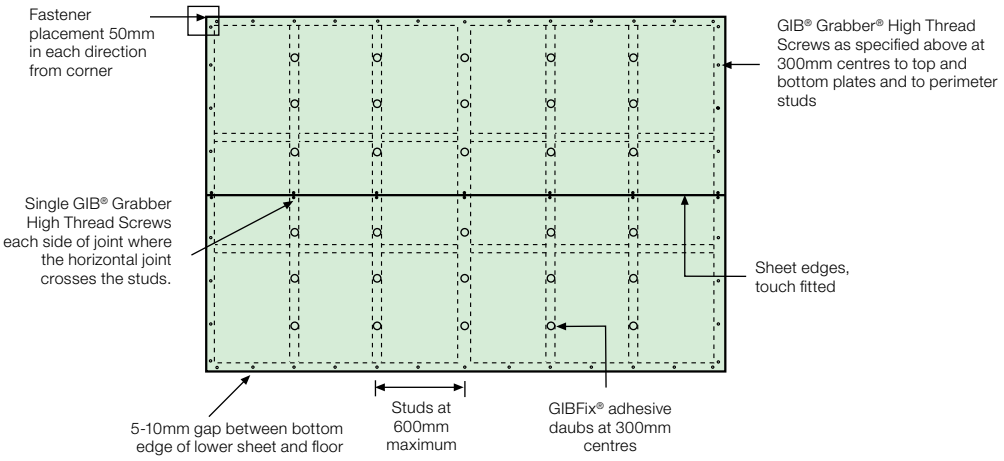
LINING

- Use minimum 10mm GIB® plasterboard
- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

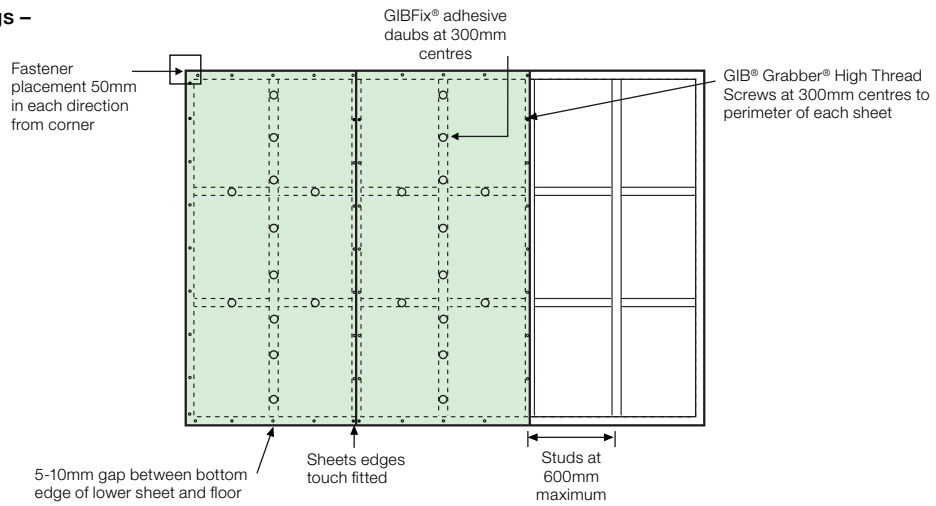
JOINTING

- Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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STEEL WALL FRAMING

The minimum sheet thickness for fixing on light gauge 0.55mm base metal thickness (BMT) steel framing is 13mm GIB® plasterboard. For bracing, noise control or fire rating applications consult the relevant GIB® technical publication.

Steel frame for residential construction is in accordance with NZBC B1/AS1 9.1 NASH Standard Part 2 Light Steel Framed Buildings, or by specific design. 10mm GIB plasterboard is commonly used on minimum 0.75mm BMT residential steel framing.

FASTENERS

— Minimum 25mm x 6g GIB® Grabber® Self Tapping Screws.

FASTENER CENTRES

— 300mm centres to top and bottom channels and to end studs

— Single screws to each stud where the horizontal joint crosses the studs

— Place fasteners 12mm from sheet edges and 18mm from sheet ends

— Daubs of GIBFix® All-Bond adhesive or screws at 300mm centres to intermediate studs

— Do not place adhesive at sheet edges or under fasteners.

— Sheet edges at door or window openings can be adhesive fixed.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

LINING

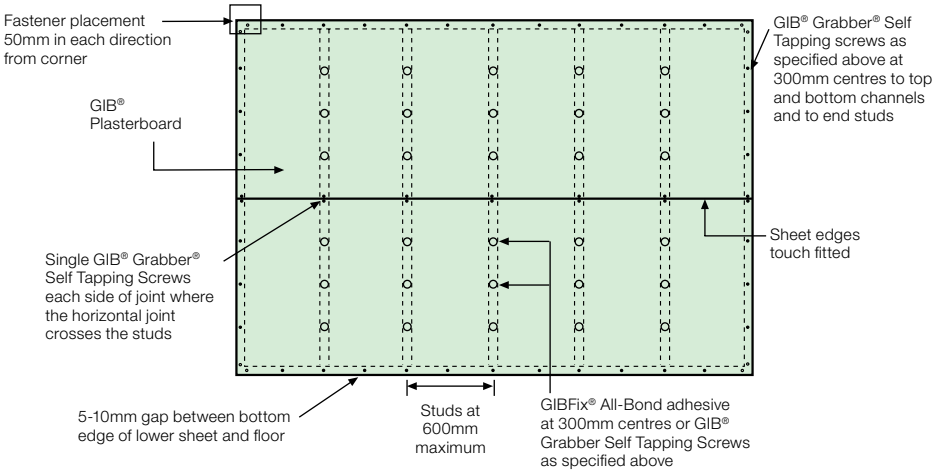
— Lay the sheets, leaving a 5-10mm gap at the floor line. Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry

— Sheets to be touch fitted.

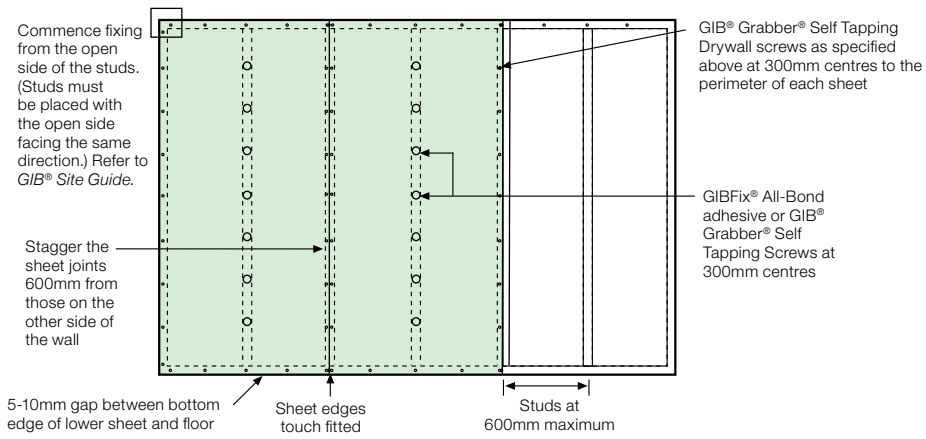
JOINTING

— Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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TIMBER WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NZS 3604:2011 Timber Framed Buildings, or relevant specific design Standard.

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings.

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread Screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Single fasteners to each stud where the horizontal joint crosses the studs
- Where relevant, fastener lengths must comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

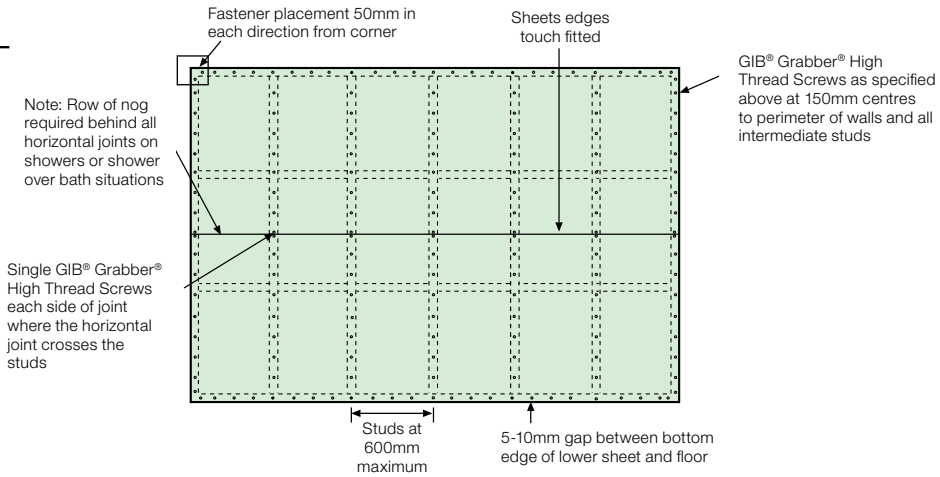
LINING AND TILE WEIGHTS

- Use minimum 10mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

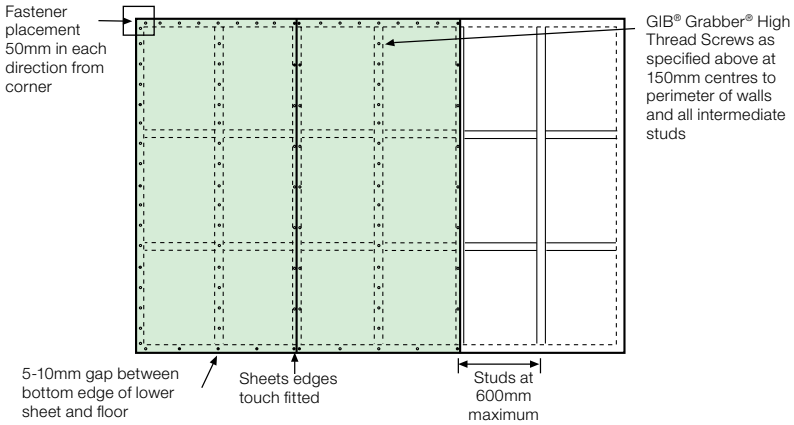
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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STEEL WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NASH Standard Part 2:2019 Light Steel Framed Buildings, or relevant specific design Standard.

- Linings are placed hard to floor, bedded into a sealant bead
- Steel framing for tiling to have a minimum base metal thickness (BMT) of 0.75mm

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® Self Tapper screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

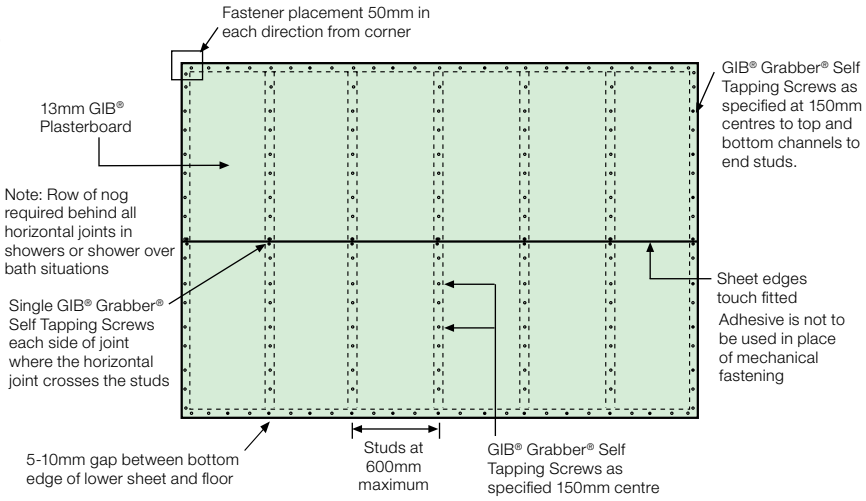
LINING AND TILE WEIGHTS

- Use minimum 13mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

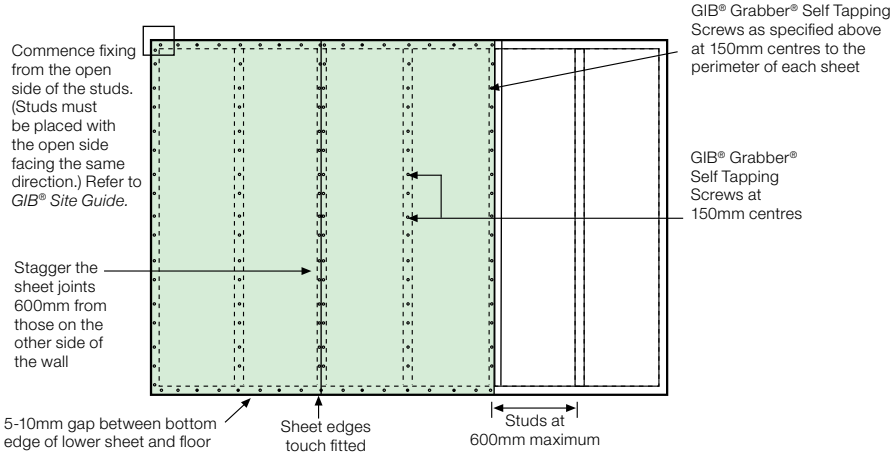
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



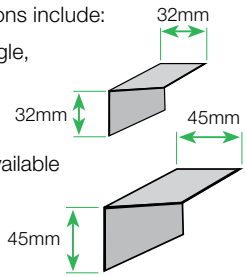
Fastening the Linings – Vertical Fixing Only



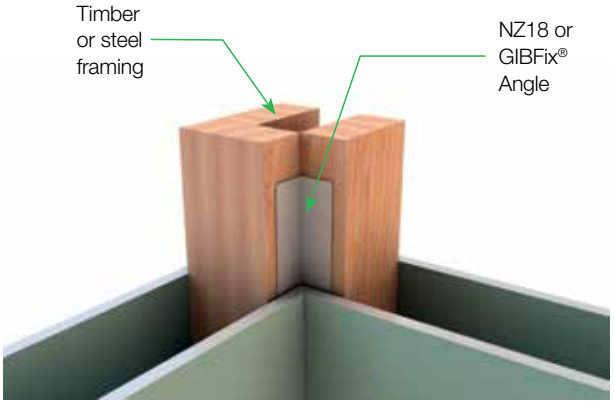
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METAL ANGLES FOR TILED INTERNAL CORNERS

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle.
- Suitable GIB® metal angle options include:
  - GIB® Rondo® NZ18 metal angle, available length: 3.0m
  - GIBFix® Angle metal angle, available lengths: 2.4m and 2.7m



- Angles need to be temporarily held in place until secured by the lining fixings
- Minimum height of the metal angle is 1800mm



WATERPROOF MEMBRANE SYSTEMS

A waterproof membrane system must be applied to all lining materials used as a substrate for ceramic tiles in a shower or shower over a bath application, or any other tiled application exposed to frequent water splash.

For further information see p10.

TILES AND TILE WEIGHTS

In areas likely to be directly exposed to water, tiles may be ceramic, porcelain or stone must comply with the over-surface finish requirements of the IWAM Code of Practice and be bedded with a suitable tile adhesive on the waterproof membrane system. See page 10 for the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

Smaller mosaic tiles are often lighter, but the integrity of grout joints might be more prone to impact, whilst heavier tiles are larger and have less and deeper grout and sealant joints. For more information also see AS 3958:2007 Ceramic tiles – Guide to the installation of ceramic tiles.

Table 2: Recommended maximum tile weights

Maximum Tile Weights for GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline®			
Stud Centre (maximum)	**Fasteners Centre (maximum)**	**Lining Thickness**	**Tile Weight**
600mm maximum	150mm maximum	10mm	26kg/m^2
		13mm	40kg/m^2

ADHESIVE AND GROUT WEIGHTS

The weight of adhesive and grout can vary depending on the type of tile and the installation process used. The maximum tile weights stated in table 2 are conservative and refer to the tile weight excluding grout and adhesive used. An additional 3kg/m^2 has been factored into tile adhesion testing on top of the above stated tile weights to account for adhesive and grout weight used during the installation of the tile.

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CEILING FRAMING

Framing dimensions and spacing must comply with the requirements of NZS 3604:2011, NASH for steel or relevant NZ Standard.

For noise control or fire rating applications consult the relevant GIB® technical publication.

FASTENERS

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber® High Thread screws

ADHESIVES

- Steel battens - GIBFix® All-Bond
- Timber battens - GIBFix® All-Bond or GIBFix® One

FASTENERS CENTRES

- Single screws to the edges and centre of the sheets across each batten
- Single screw at 600mm maximum to the perimeter of the ceiling
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw pops

LINING

- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards.
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints.
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements

BATTEN SPACINGS

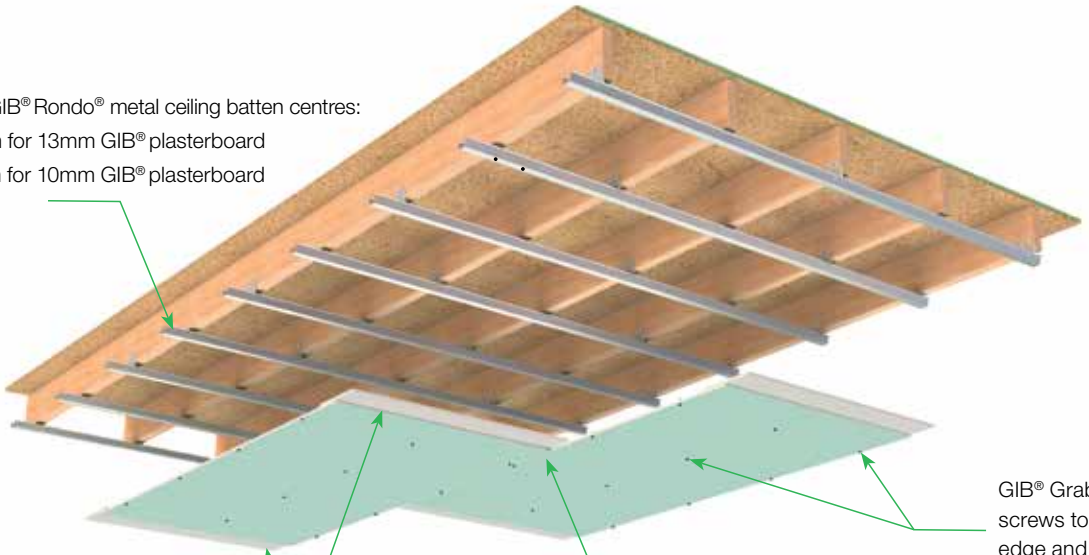
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

JOINTING

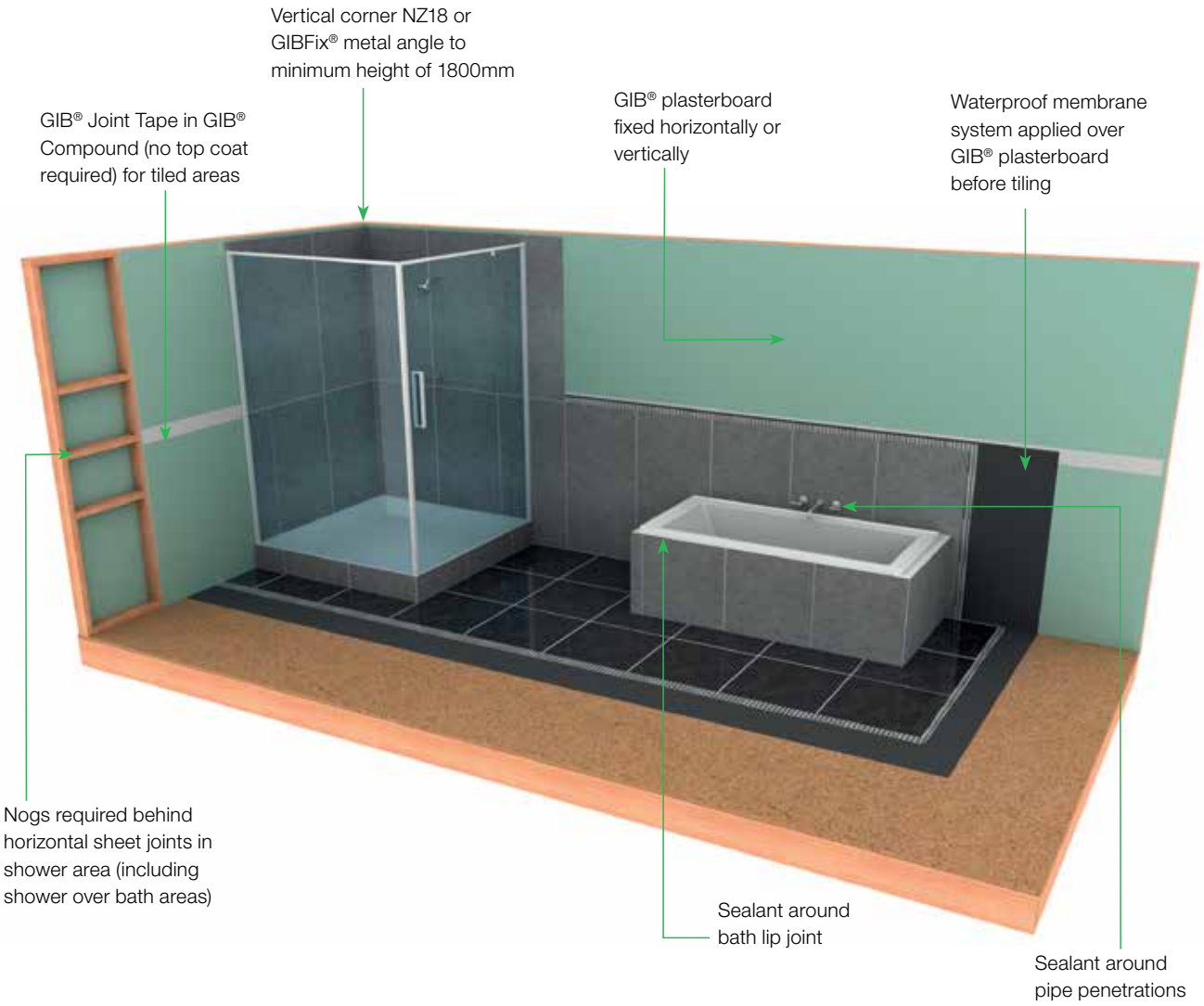
- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the GIB® Site Guide
- Do not fix tiles to GIB® plasterboard ceilings

Maximum GIB® Rondo® metal ceiling batten centres:

- 600mm for 13mm GIB® plasterboard
- 450mm for 10mm GIB® plasterboard

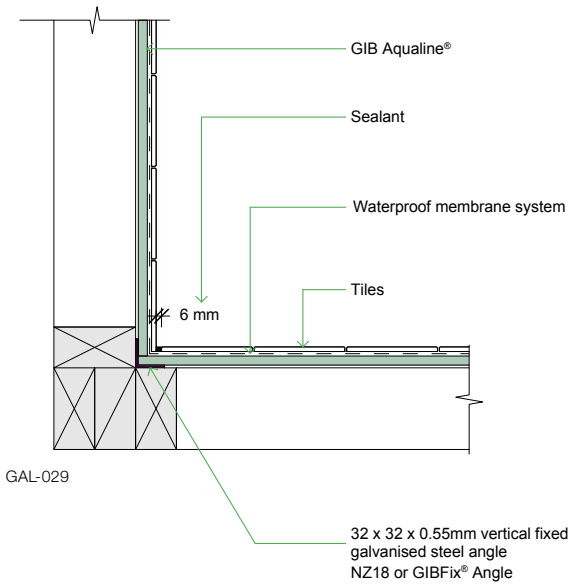


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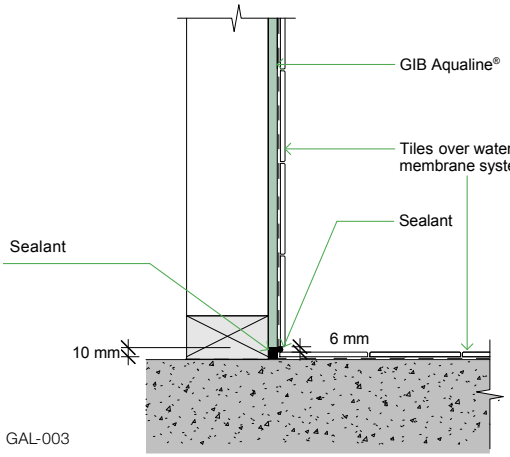
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A: TILED INTERNAL CORNER



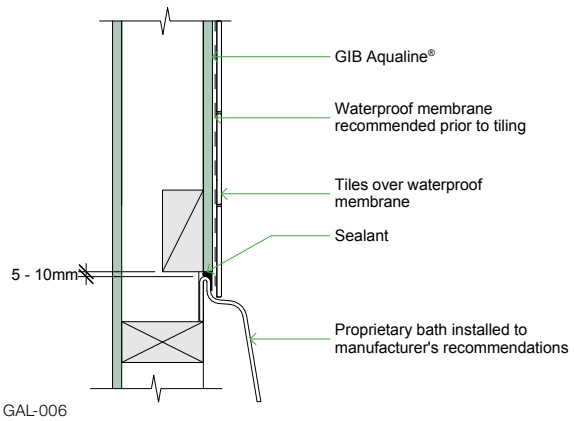
GAL-029

B: CERAMIC FLOOR LINING JUNCTION



GAL-003

C: BATH LINING JUNCTION

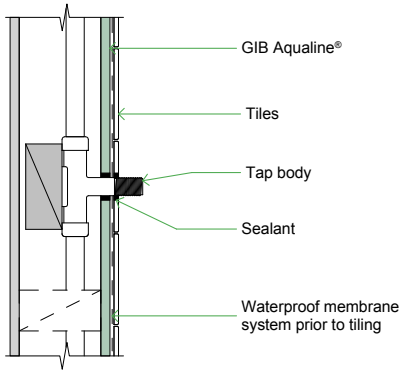


GAL-006

G: SHOWER MIXER PENETRATION IN WET WALL LININGS

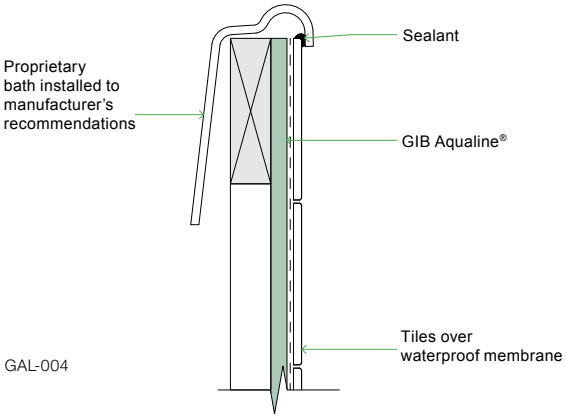
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

D: SEALING WET AREA PENETRATION



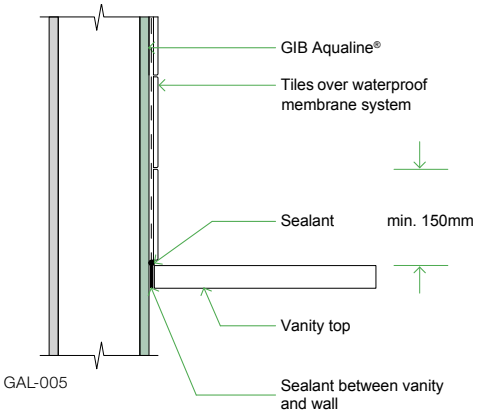
GAL-002

E: BATH CRADLE LINING DETAIL

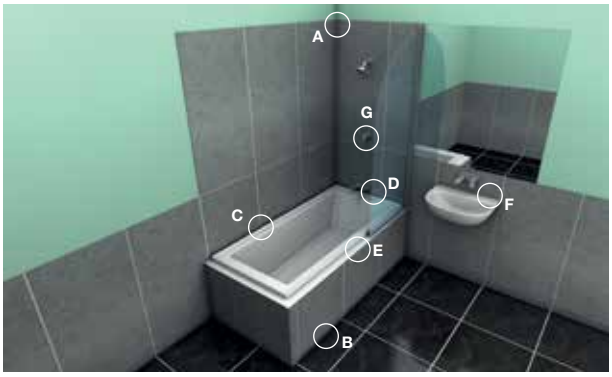


GAL-004

F: VANITY TOP LINING JUNCTION

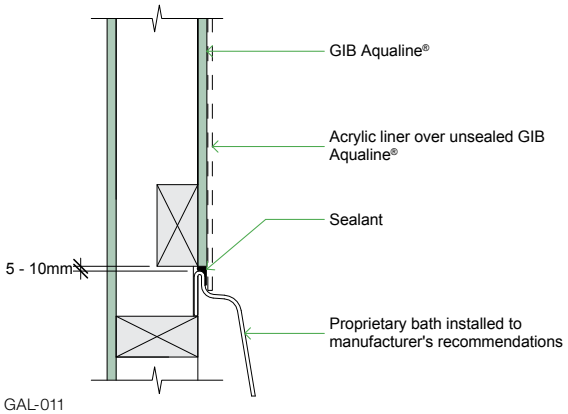


GAL-005



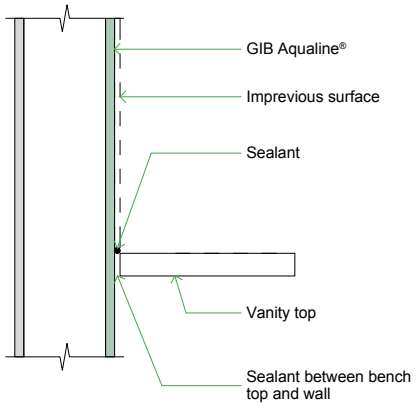
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A: BATH LINING JUNCTION



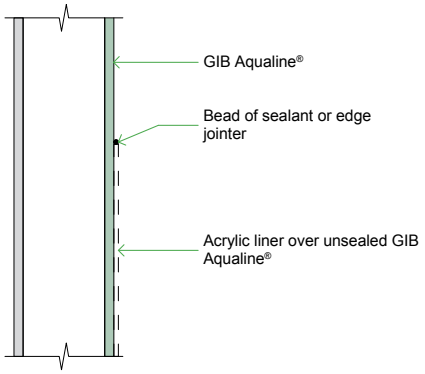
GAL-011

B: VANITY TOP LINING JUNCTION



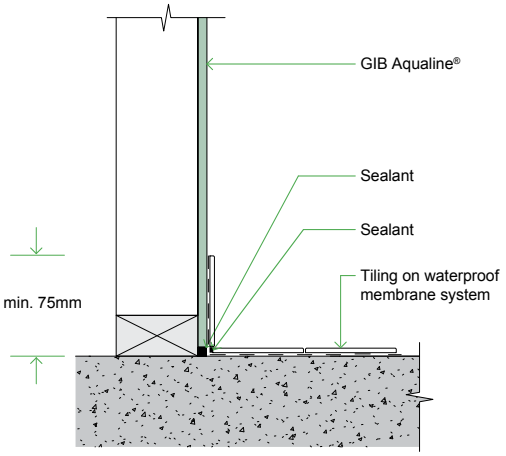
GAL-023A

C: UNSEALED PLASTERBOARD LINING



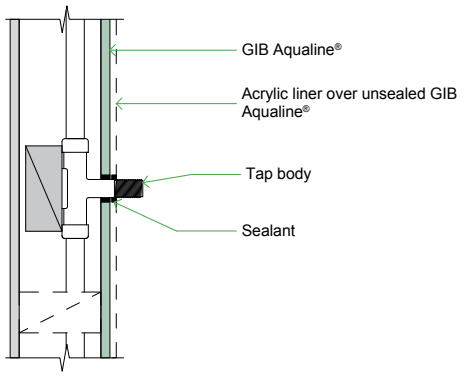
GAL-028

D: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

E: SEALING SEMI WET AREA PENETRATION



GAL-019

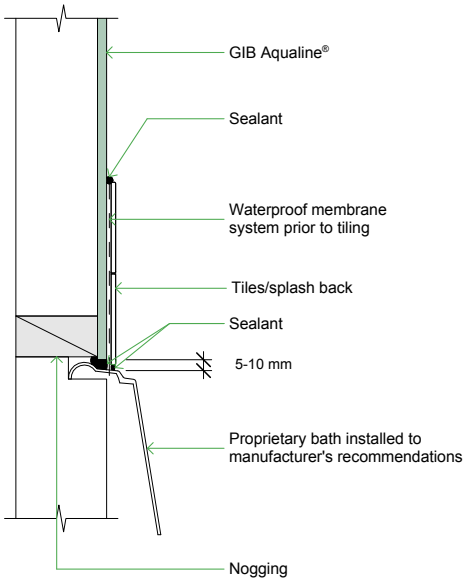
F: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



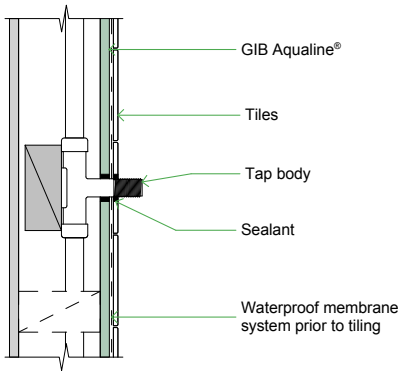
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A: BATH LINING JUNCTION



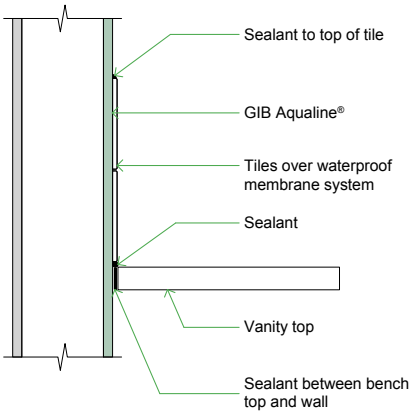
GAL-009

B: SEALING SEMI WET AREA PENETRATION



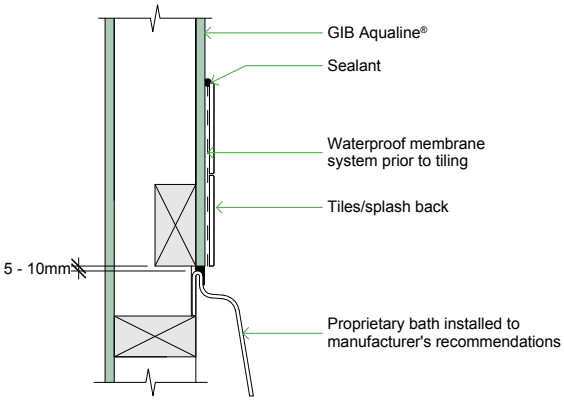
GAL-020

C: VANITY TOP LINING JUNCTION



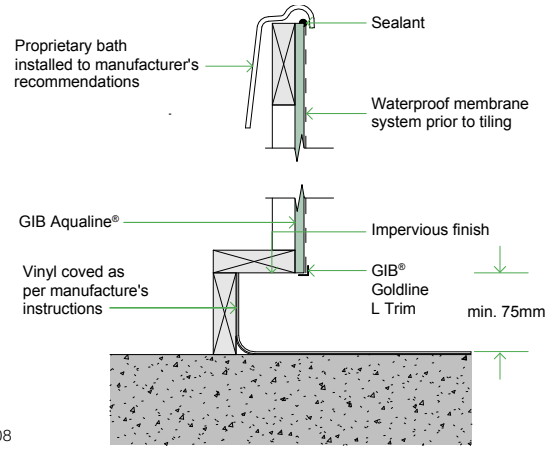
GAL-024

D: BATH LINING JUNCTION

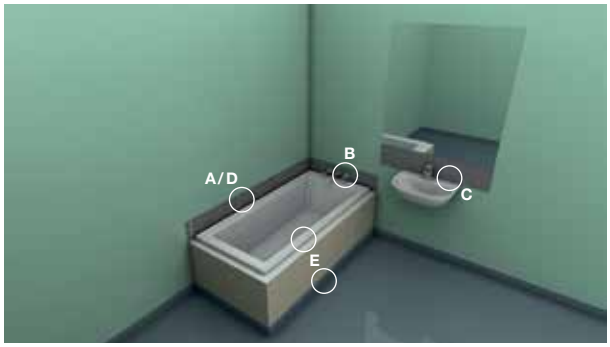


GAL-010

E: CRADLE VINYL LINING JUNCTION

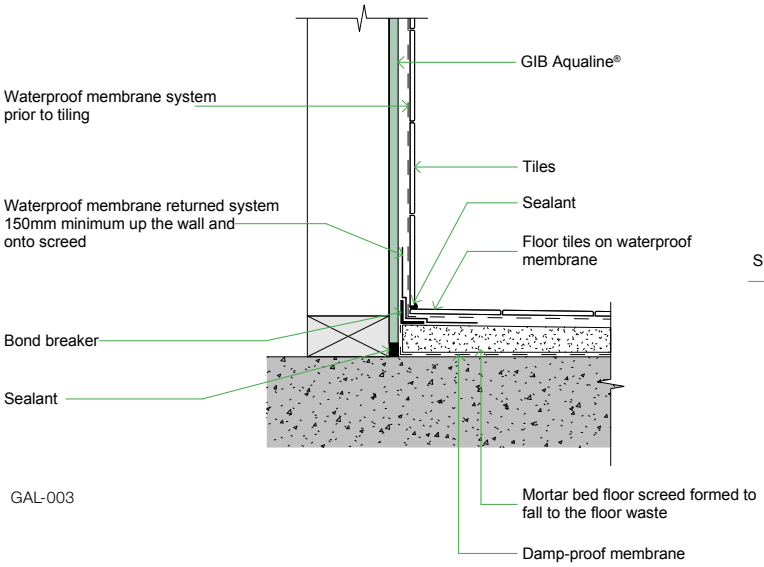


GAL-008



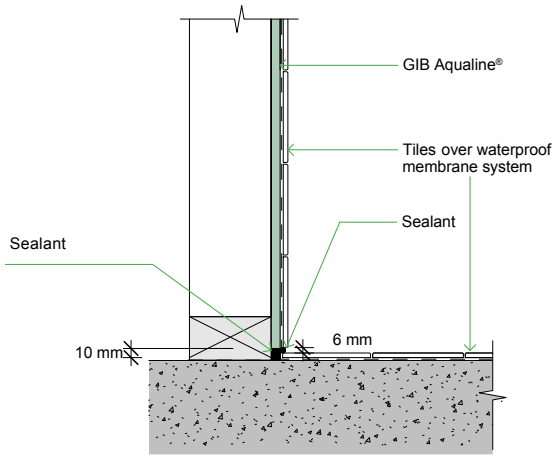
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A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



GAL-003

C: CERAMIC FLOOR LINING JUNCTION

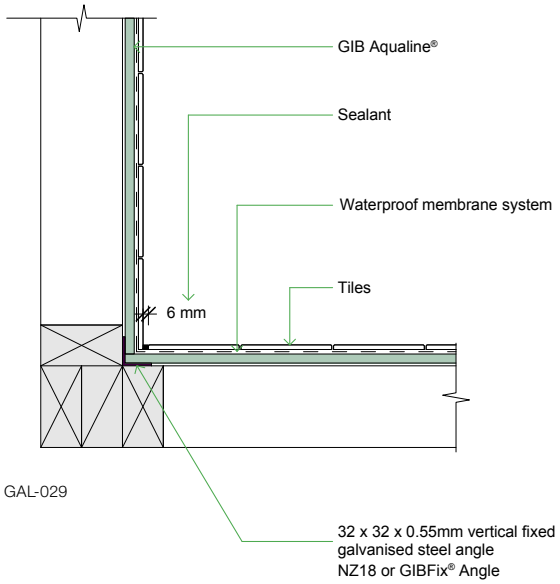


GAL-002A

PREFORMED SHOWER BASE JUNCTIONS

Refer to the shower base manufacturer for proprietary shower tray installation detailing including wet wall lining junction detailing.

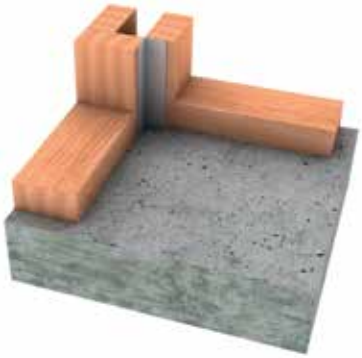
B: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.



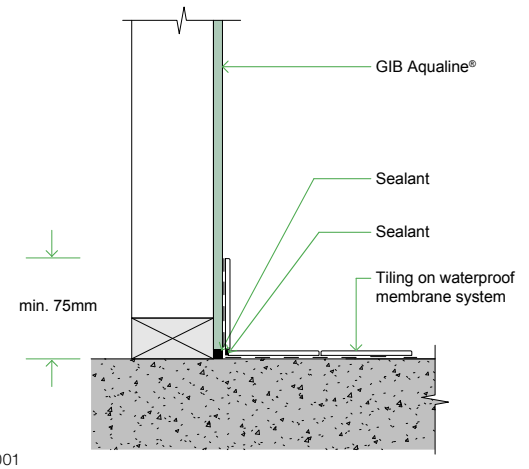
E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



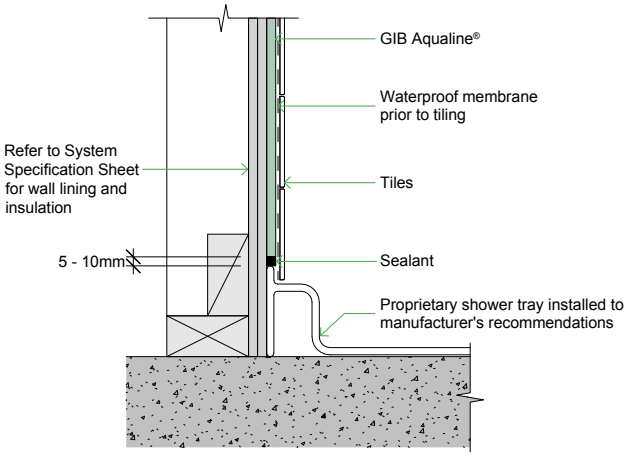
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A: CERAMIC FLOOR SKIRTING LINING JUNCTION



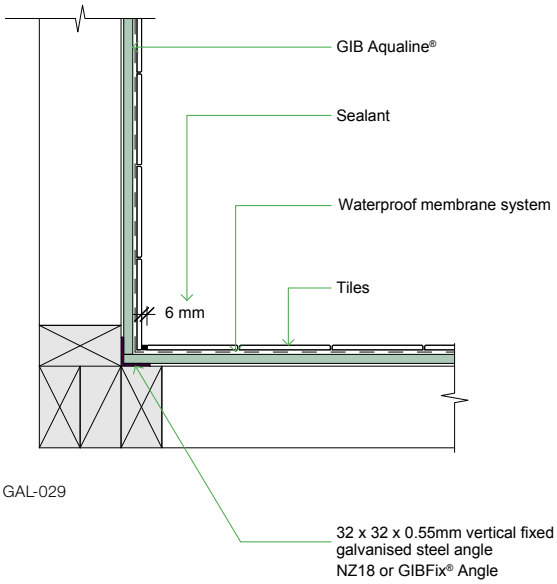
GAL-001

B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



GAL-016

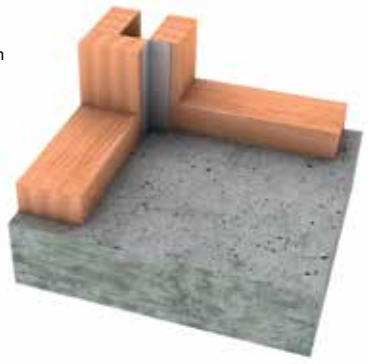
C: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.



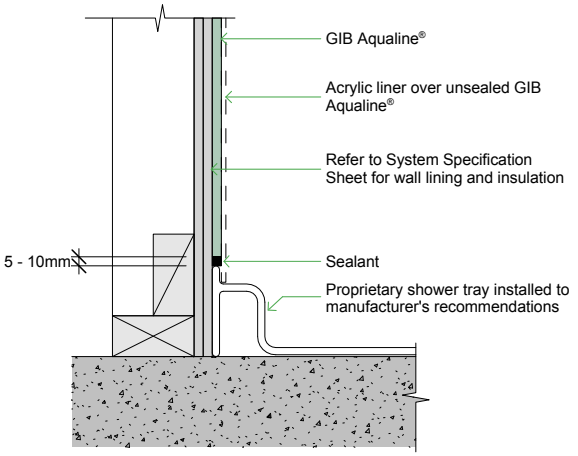
E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



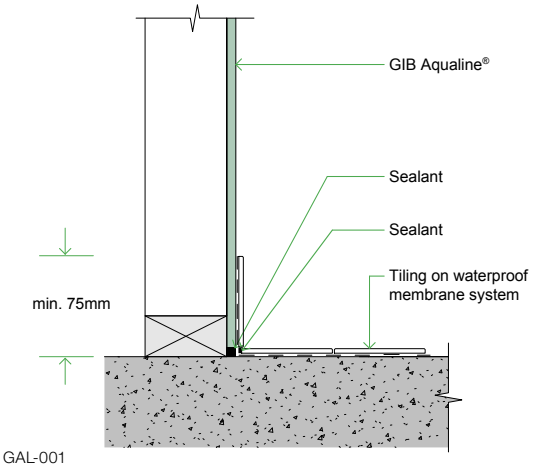
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A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



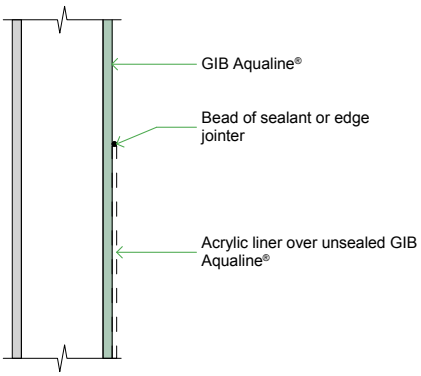
GAL-015

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

C: UNSEALED PLASTERBOARD LINING



GAL-028

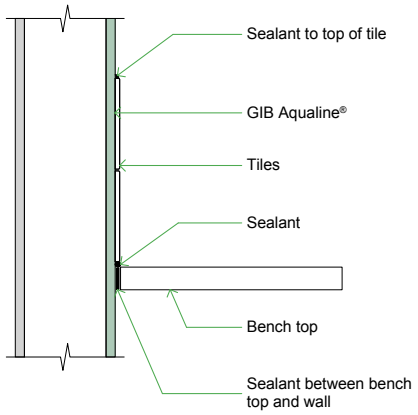
D: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



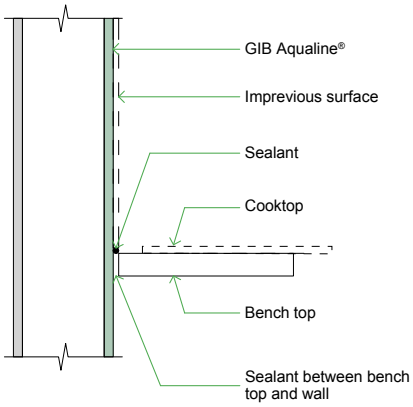
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A: BENCH TOP LINING JUNCTION



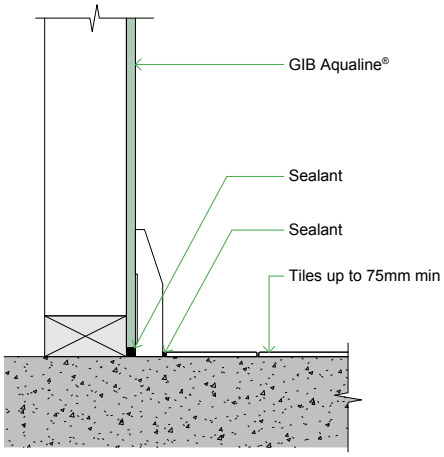
GAL-024

B: COOKTOP LINING JUNCTION



GAL-023B

CERAMIC FLOOR SKIRTING LINING JUNCTION

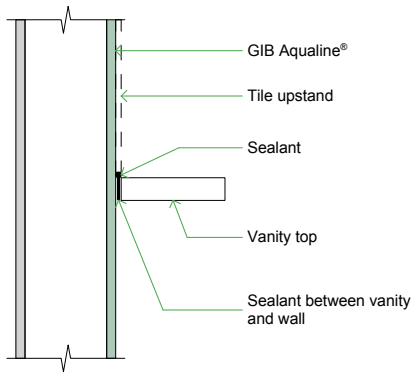


GAL-001A



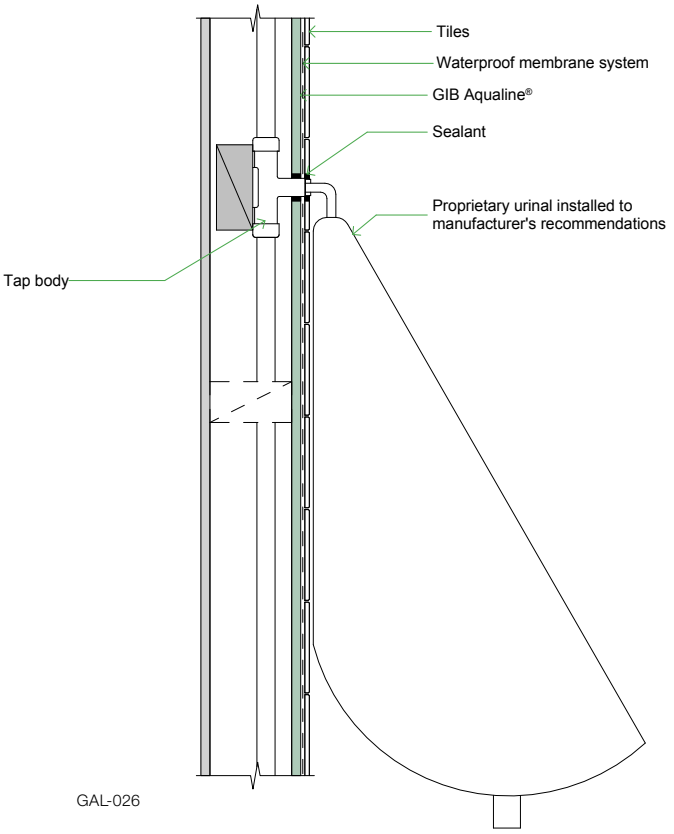
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A: VANITY TOP LINING JUNCTION



GAL-022

B: SEALING WET AREA PENETRATION LINING JUNCTION

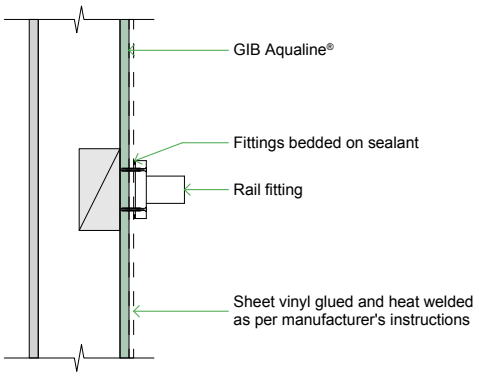


GAL-026



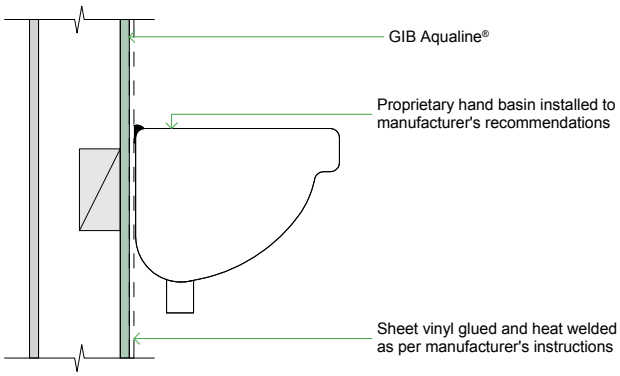
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A: SURFACE MOUNTED WITH NOG



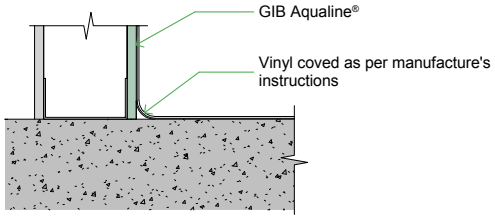
GAL-027

C: BASIN LINING JUNCTION



GAL-025

B: VINYL FLOOR LINING JUNCTION

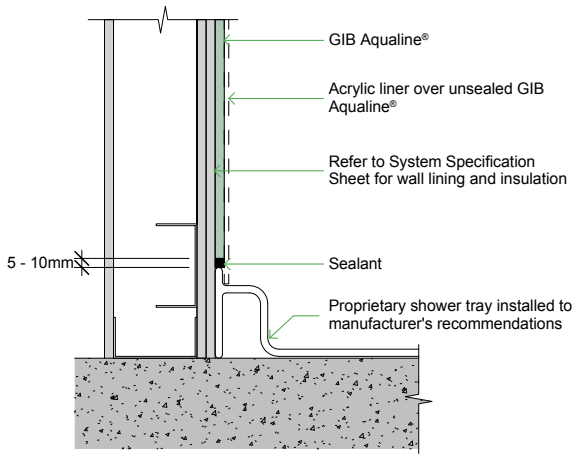


GAL-006A



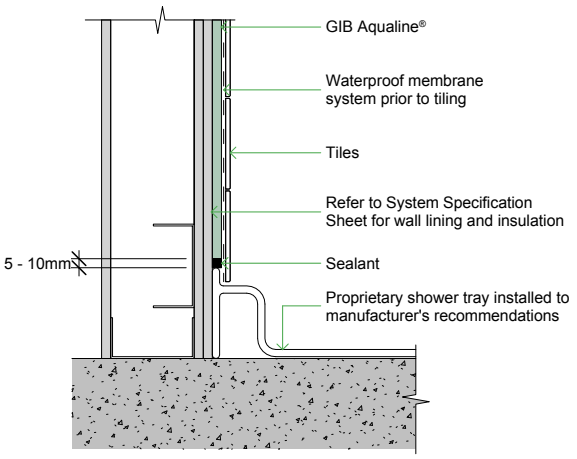
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A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



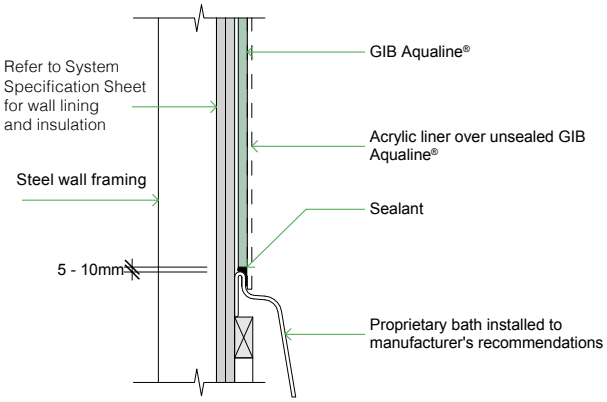
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



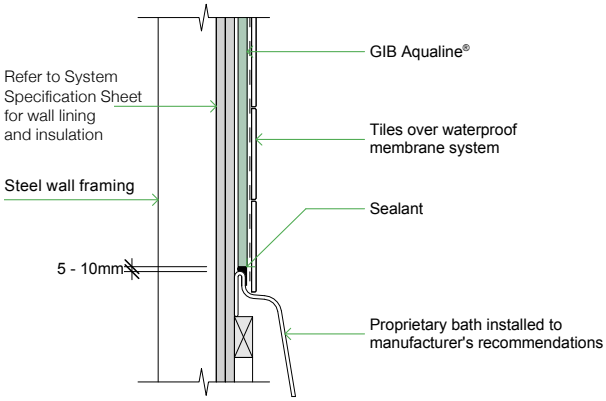
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



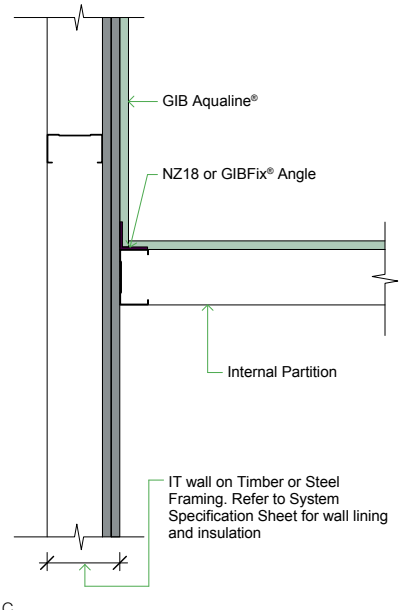
GAL-014

GIB® WET AREA SYSTEMS FIRE RESISTANCE AND NOISE CONTROL PERFORMANCE

Given recesses required for shower trays, bath upstands, etc., and the likelihood of renovations during the service life of the building, it is recommended that GIB® Wet Area linings in water splash areas are installed in addition to and over required fire and noise control systems in commercial or multi-residential applications.

Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

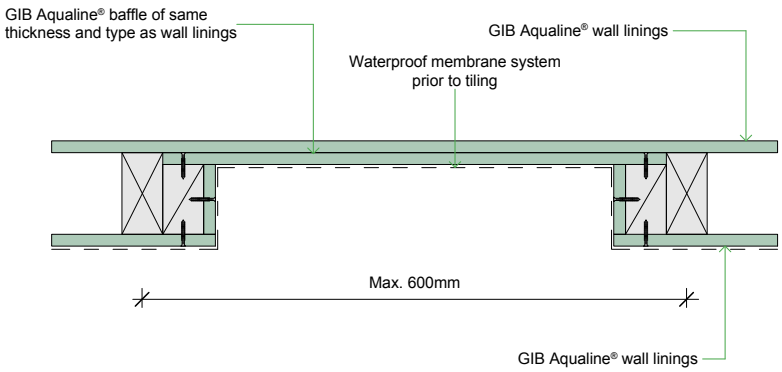
E: INTERTENANCY WALL AND WET AREA WALL JUNCTION



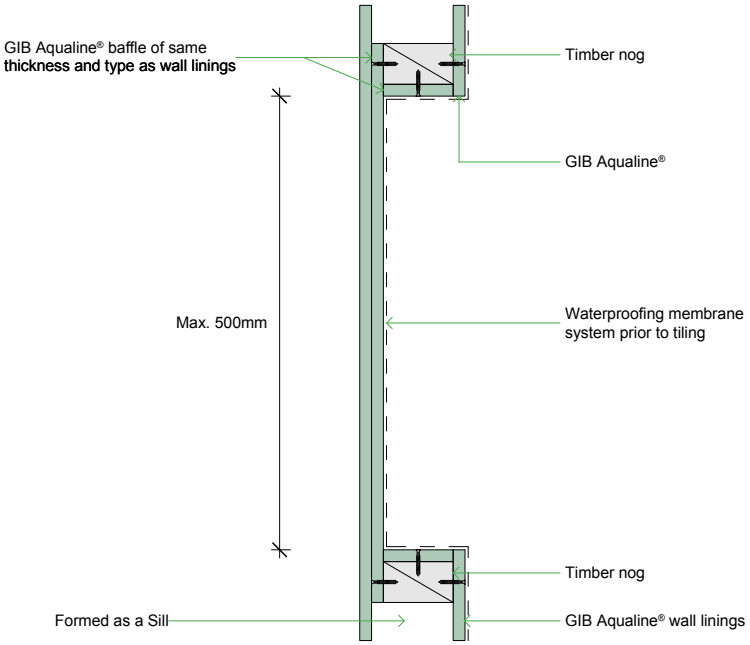
GAL-031C

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TIMBER FRAME TILE RECESS



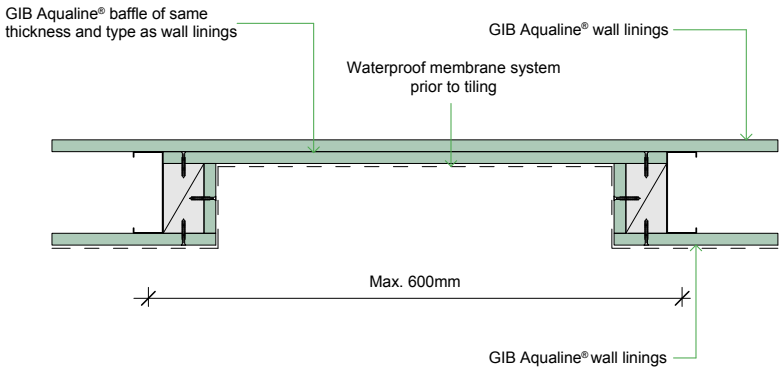
Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.



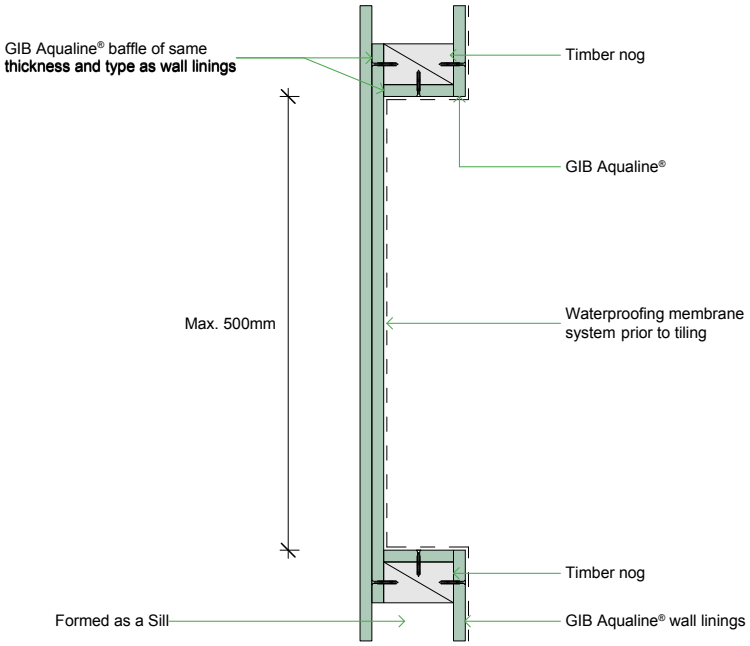
GAL-029B

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STEEL FRAME TILE RECESS



Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.



GAL-030

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GIB® Wet Area Systems, February 2021

LIMITATIONS

Winstone Wallboards Ltd accepts no liability if the GIB® Wet Area Systems and junction details are not installed in strict accordance with instructions contained within this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. You should check the GIB® website to ensure you are using the current publication. If you are unsure whether this is the current publication, simply call the GIB® Helpline on 0800 100 442.

SUBSTITUTION

GIB® Wet Area Systems have been specifically designed and tested to achieve the stated performance levels. To maintain the GIB® Product and System Warranty, all system components detailed in this publication must be used when specifying and installing GIB® Wet Area Systems.

TRADEMARKS

The names GIB®, GIB Fyreline®, GIB Ultraline®, GIB Toughline®, GIB Braceline® GIB Noiseline®, GIB Aqualine®, GIB Weatherline®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, GIB® Quiet Stud®, GIB Rail®, GIB Barrierline®, GIB X-Block®, GIB Fire Soundseal®, GIB Clip®, the colour mauve for GIB Toughline®, the colour blue for GIB Braceline® GIB Noiseline®, the colour pink for GIB Fyreline®, the colour green for GIB Aqualine®, the colour purple for GIB Weatherline® and the shield device are registered trademarks of Fletcher Building Holdings Limited.

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GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

February 2021

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BRANZ Appraised

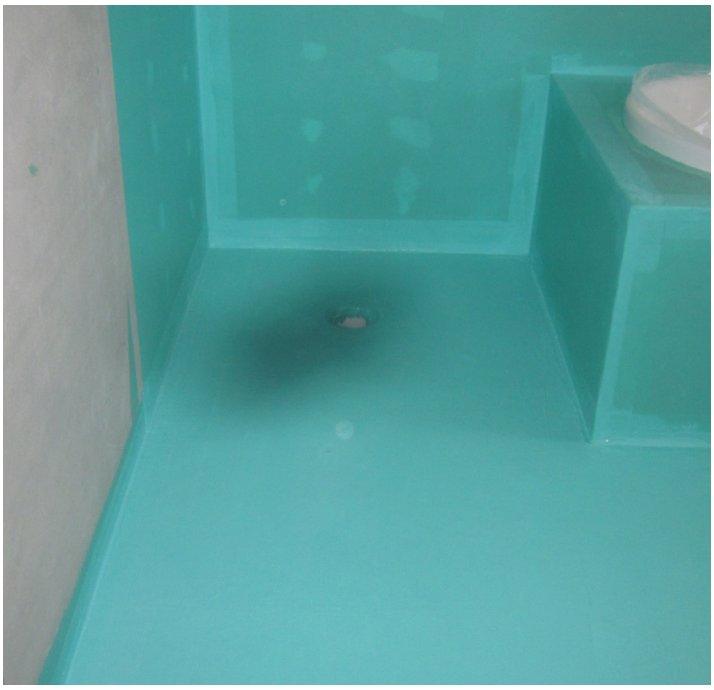
Appraisal No. 1123 [2020]

WET-SEAL ENVIRO-COAT IS 520 INTERNAL WATERPROOFING MEMBRANE

Appraisal No. 1123 (2020)

This Appraisal replaces BRANZ Appraisal No. 655 (2019)

Amended 07 June 2024



BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is a liquid-applied waterproofing membrane for use under ceramic or stone tile finishes in internal wet areas.

Scope

2.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane has been appraised for use as a waterproofing membrane for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particleboard, plywood, fibre cement compressed sheet, fibre cement sheet tile underlay and Strandfloor H3.1® or Strandboard™, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360th of the span.

2.2 The use of Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Building structural movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints are specific to each building, and therefore the responsibility of the building designer and building contractor and are outside the scope of this Appraisal.

2.4 Ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membrane must be installed by Wet-seal New Zealand Ltd trained and approved applicators.

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Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meets this requirement. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meet this requirement. See Paragraphs 11.1-11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane meets this requirement.

Technical Specification

4.1 Materials supplied by Wet-seal New Zealand Ltd are as follows:

- **Wet-seal Enviro-coat™ IS 520** - a one-component, elastic, water-based, moisture-curing, co-polymer waterproofing membrane. It is coloured jade and is supplied in 18 kg pails.
- **Polyspun Enviro Fabric** - a high strength, spun-bonded polyester reinforcement for reinforcing any changes of plane and the body of membrane. It is supplied as a 142 mm wide lineal strip x 100 m roll and 1 m wide x 150 m long roll, and is coloured white.
- **Wet-seal Hydroseal** - a two-part, water-based primer for moist or damp concrete or timber substrates. It is a grey colour and is supplied as 'A' and 'B' in 10 L containers
- **Wet-seal Enviro-prime EP 20 + Primer** - a ready-to-use, water-based, spray-applied primer for use on porous substrates. It is coloured bright violet and is supplied in 15 L containers.
- **Wet-seal Ultra-grip Non-porous Primer** – a one-component, flexible, water-based non-porous grip primer for use on non-porous substrates. It is a grey liquid and is supplied in 15 L pails.
- **Wet-seal Top-coat 300** - a two-component, water-based primer for moist or damp concrete or timber substrates. It is a jade green colour and is supplied as 'A' and 'B' in 10 L containers.
- **Superseal 50FC™** - a high strength, one-component, MS-polymer adhesive sealant. It is used as a gap sealant and is supplied in 600 ml sausages.
- **Tape** - a masking and detail tape, supplied as a 48 mm wide silicone release bond breaker tape and coloured light brown.

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 12 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Enviro-coat IS 520 Internal Installation Procedures Manual, Controlled Copy: 0, 01 July 2020.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

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Design Information

General

7.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

7.2 The membrane must be protected from physical damage by the application of ceramic or stone tile finishes.

7.3 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ Good Practice Guide: Tiling.

7.4 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases, framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). LOSP treated plywood must not be used. The plywood must be supported with framing with a maximum span of 400 mm, with all sheet edges supported, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges, and 200 mm through the body of the sheets.

8.2 When F11/F8 19 mm thick Ecoply plywood is used, the plywood must be supported with framing with a maximum span of 450 mm in one direction only, with all sheet edges supported, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres on the edges and 200 mm through the body of the sheets.

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

8.3 Fibre cement compressed sheet and tiling underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Installation must be in accordance with the instructions of the manufacturer.

Particleboard

8.4 Particleboard must be specified for the end use in accordance with NZS 3602 for wet areas.

Concrete and Concrete Masonry

8.5 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604, and concrete slab-on-ground floors and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

8.6 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal for use in internal wet areas.

8.7 Fibre cement sheet must comply with the requirements of AS/NZS 2908.2.

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Strandfloor H3.1®

8.8 The installation of Strandfloor H3.1® in wet areas must be undertaken in conjunction with the Technical Literature, NZS 3604, Paragraph 4.3.4 and NZS 3602, Table 1. Strandfloor H3.1® must be installed with centres no greater than 450 mm. Refer to the Technical Literature and BRANZ Appraisal No. 677 for more information.

Strandboard™

8.9 The installation of Strandboard™ in wet areas must be undertaken in conjunction with the Technical Literature, NZS 3604, Paragraph 4.3.4 and NZS 3602, Table 1. Strandboard™ must be installed with centres no greater than 450 mm. Refer to the Technical Literature and BRANZ Appraisal No. 664 for more information.

Durability

Serviceable Life

9.1 The Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

Maintenance

10.1 No maintenance of the membrane will be required provided significant substrate movement does not occur, and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound, and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membrane, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively, and ceramic or stone tile finishes must be kept clean.

Internal Moisture

11.1 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is impervious to water, and when appropriately designed and installed, will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of code compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of code compliance to NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1, Paragraphs 3.1.1 b), 3.1.2 b) and 3.3.1 b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1,500 mm out from the shower rose. Floor wastes must be provided, and the floor must fall to the outlet.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1,500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions, can be obtained from AS 3740, the BRANZ Good Practice Guide: Tiling, and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber, plywood or particleboard floors are used. This is also a requirement of particleboard manufacturers.

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Installation Information

Installation Skill Level Requirement

12.1 All design and building work must be carried out in accordance with the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane Technical Literature and this Appraisal. All building work must be undertaken by Wet-seal New Zealand trained and approved applicators. Where the work involves Restricted Building Work, this must also be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License class.

Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 The relative humidity of the concrete must be 75% or less before membrane application. Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have reinforcement installed as set out in the Technical Literature.

13.4 Substrates when required must be primed with primer as detailed in the Technical Literature and allowed to cure before the membrane is installed.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.

14.2 Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane must be thoroughly stirred before application.

14.3 The membrane must be applied in a minimum two-coat at the rates set out in the Technical Literature to give a total finished dry film thickness of between 0.5-1 mm.

14.4 Reinforcement fabric (Polyspun Enviro Fabric) is to be used as the carrier mechanism for the liquid membrane when detailing floor areas, vertical and horizontal joints, over bond breakers, around penetrations and all critical areas as set out in the Technical Literature.

14.5 Application can be made by special roller (supplied by Wet-seal New Zealand Ltd) or brush (long bristle).

14.6 Polyspun Enviro Fabric reinforcement is laid into the first coat of membrane to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

14.7 Clean up may be undertaken with water.

Tiling

15.1 The membrane must be fully cured before tiling. The cured membrane must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide: Tiling. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Wet-seal New Zealand Ltd.

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Inspections

16.1 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles, including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

Basis of Appraisal

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

Tests

18.1 The following testing of Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane has been undertaken:

- AS/NZS 4858 Appendix A, including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission, cyclic movement resistance requirements of AS/NZS 4858 Appendix B, water absorption, peel adhesion, dry pull-off/tensile adhesive test on plywood, dry pull-off/tensile adhesive test on fibre cement, puncture resistance and low temperature flexibility.

18.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

19.1 An assessment was made of the durability of the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane by BRANZ technical experts.

19.2 Site inspections have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of the membrane has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of the membrane's manufacturer has been assessed and found to be satisfactory.

20.3 The quality of supply of the membrane system materials to the market is the responsibility of Wet-seal New Zealand Ltd.

20.4 Quality on-site is the responsibility of the Wet-seal New Zealand Ltd trained and approved applicators.

20.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems, in accordance with the instructions of the substrate manufacturer, Wet-seal New Zealand Ltd and this Appraisal.

20.6 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Wet-seal New Zealand Ltd.

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Sources of Information

- AS 3740:2021 Waterproofing of domestic wet areas.
- AS 3958.1:2007 Guide to the installation of ceramic tiles.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2269:2012 Plywood – Structural.
- AS/NZS 2908.2:2000 Cellulose-cement products – flat sheet.
- AS/NZS 4858:2004 Wet area membranes.
- BRANZ Appraisal No. 664 Strandboard™ Flooring.
- BRANZ Appraisal No. 677 Strandfloor® H3.1 Flooring.
- BRANZ Good Practice Guide: Tiling, (Third Edition) April 2015.
- NZS 3101:2006 The design of concrete structures.
- NZS 3602:2003 Timber and wood-based products for use in buildings.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4229:2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230:2004 Code of practice for the design of masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 10 December 2021

This Appraisal has been amended to update finalised finished film thicknesses.

Amendment No. 2, dated 11 January 2023

This Appraisal has been amended to add a new primer and update installation information.

Amendment No. 3, dated 07 June 2024

This Appraisal has been amended to update the tape description from fibreglass to fabric in the technical specification.

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BRANZ

In the opinion of BRANZ, Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

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

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
01 October 2020

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Wet-seal Project Specification

Internal Waterproofing



Author EB| Reviewer AZ, JA| Approver RC
Version control: 11.11.2020
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1 Waterproofing

1.1 Scope

This specification applies to the installation of Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System ("the Enviro-coat Waterproofing System"). The Enviro-coat Waterproofing System is to be applied in internal areas defined in the contract, quotation, technical drawing and or plans and in accordance with all Wet-seal NZ Ltd. (Wet-seal) Technical literature and in accordance and compliance with all relevant standards and codes.

1.2 Compliance information

System installation must comply with all relevant provisions of the following documents/codes:

NZBC E2/AS1	External moisture
NZBC E3/AS1	Internal moisture
3101.1&2:2006 NZS	Concrete Structures Standard
3602:2003 NZS	Timber and wood-based products for building
3604:2011 NZS	Timber-framed buildings
AS/NZS 2908.2	Cellulose cement products - Flat sheets
AS/NZS 2588	Gypsum plasterboard
AS 3740	Waterproofing of domestic wet areas
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS/NZS 4858	Wet area membranes
AS/NZS 2269.0.2012	Plywood – Structural – Part 0 Specifications
BRANZ	Good practice guide: Tiling

1.3 Manufacturer/Supplier documentation

Wet-seal is the supplier and manufacturer of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System. The documents related to this specification are collectively referred to as the Wet-seal technical literature and include:

Scope of Works Enviro-coat IS 520 Internal Waterproofing
BRANZ Appraisal No. 1123 [2020]
Enviro-coat Internal IS 520 Safety Data Sheet
Tile adhesive technical bulletins (check wet-seal.co.nz or email technical@wet-seal.com)
Wet-seal Technical Bulletins
Wet-seal Installation Manuals

Up to date Wet-seal Technical literature and recommendations are available through the supplier/manufacturer.
Contact details:

Company: **Wet-seal NZ Ltd.**
Web: wet-seal.co.nz
Email technical@wet-seal.com
Phone: 0800 436 000

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1.4 Qualifications

Wet-seal Independent Franchisees and their employees are the only approved Applicators of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System. Approved Applicators install in compliance with Wet-seal Technical literature.

All Residential Building Work (RBW) must be carried out, or supervised by, an LBP. They must work within the scope of their licence class.

1.5 Producer statements

Approved Applicators will provide producer statements – PS3's at time of installation for code compliance where required.

1.6 Warranty

Wet-seal NZ Ltd. Material and Installation Warranty – are provided according to the warranty terms and conditions – 15 years' product & 7 Year's Installation Warranty.

1.7 Substitution

Substitution is not permitted to any specified Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System, or associated components or products with an alternative product.

1.8 Quality Assurance

Maintain the quality necessary to assure that all work is performed in accordance with this specification and the qualifying requirements of Wet-seal to ensure that all work is of the highest standard.

1.9 Tests

Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System is tested to and complies with AS/NZS 4858 Wet Area Membranes.

2 Enviro-coat Waterproofing System Materials

The Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System as appraised by BRANZ is comprised of the following:

2.1 Waterproofing Membrane

Wet-seal Enviro-coat IS 520 is a one component, elastic, water-based, co-polymer waterproofing membrane. Wet-seal Enviro-coat IS 520 is fibre reinforced, liquid applied and designed for internal applications. Wet-seal Enviro-coat IS 520 is coloured jade green and supplied in 18 kg pails.

2.2 Reinforcing fabric

Wet-seal Enviro-fabric is a high strength reinforcement fabric that provides added durability and structural stability. Wet-seal Enviro-fabric is used and installed in all critical areas, according to Wet-seal Technical Literature by approved Applicators.

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2.3 Primers

Wet-seal system primers are selected according to substrate type and condition and used in compliance with Wet-seal Technical literature.

Enviro-prime EP 20+: is a ready to use water-based primer for use on porous and dry substrates. It is coloured violet and supplied in 15 L containers.

Wet-seal Top-coat 300: is a two-component water-based epoxy primer for green (7 day old hardened), or damp concrete, or timber substrates. It is aqua green in colour and supplied as part A and B in 10 L containers.

Wet-seal Epoxy-MVP: is a two-component water-based epoxy primer for green (7 day old hardened), or damp concrete, or timber substrates. It is light green in colour and supplied as part A and B in 10 L containers.

2.4 Sealants and Tapes

Wet-seal approved high performance MS polymer, moisture cure, construction adhesive sealants are used and applied in accordance with the manufacturer's instructions and the Wet-seal Technical Literature.

Wet-seal approved foam tapes are used in accordance with the Wet-seal Technical literature.

2.5 Delivery, storage and handling

Wet-seal approved applicators provide the Enviro-coat Waterproofing System and will handle all Wet-seal products and components according to the relevant Technical Literature and in accordance with WorkSafe NZ Guidelines and Codes of practice.

3 Pre-Install Checks

3.1 Preliminary works

Ensure that the substrate is in a suitable condition prior to installation and is in compliance with NZBC E3/AS1 and AS 3740 for the relevant substrate and Wet-seal requirements. Ensure that all preliminary works are completed to the specification provided on quotes, technical drawings, and site plans, etc. Approved Applicators must not commence work until all necessary preliminary work has been completed by other trades and to the required standard.

3.2 Falls

Interior falls must be in accordance with BRANZ Good Practice Guide – Tiling clause 6.5 Falls in Floors, unless other-wise specified to ensure that there is no ponding of water on the surface. Falls must be corrected, if necessary, before installation of the Enviro-coat Waterproofing System. Falls must be built into the substrate with membrane applied over the top. Falls are not to be created on top of the membrane. All falls must slope to a floor waste.

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Table 1 Required falls as per BRANZ Good Practice Guide – Tiling clause 6.5 Falls in Floors

Fall (minimum)	Site
1:50	Unenclosed shower bases (to NZBC E3/AS1, 3.3.5)
1:60	Enclosed shower bases
1:50	Shower bases for people with disabilities (to NZS 4121, 10.5.11.3 (b))

3.3 Substrate requirements

3.3.1 Preliminary substrate check

Prior to any Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System installation, on all approved substrates, all necessary checks of substrate condition in accordance with Wet-seal Technical literature, all drawings, specifications and plans and manufacturer's requirements must occur.

Substrate temperature must be between 5℃ and 35℃ for installation of the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System.

Substrates must be structurally sound and dimensionally stable, clean, dry, free from any dust, dirt, debris, oils, or any other contaminants likely to damage the membrane or interfere with adhesion to substrate or performance. The surface must be smooth and free from any projections or sharp materials. Substrates must be free of voids or depressions, and have the minimum falls required.

Ensure sheet materials are screw fixed to specifications and screw heads are flush. Ensure that any surface damage is appropriately treated and that substrates are installed as per the manufacturer's requirements. Check the layout, correct fixings and thicknesses are as per the manufacturer's requirements.

Ensure all movement control joints are in the correct location and are appropriately treated. Check that all joints are flush, and substrates are even. Check that all apertures, openings, edges and expansion and movement control joints are completed as detailed in the plans and drawings.

3.3.2 Concrete Slabs

Concrete slab substrates must have a smooth steel trowel finish. The surface must be smooth and free from laitance, dust, debris, depressions, and protrusions. Any voids must be filled prior to Enviro-coat Waterproofing System application. All curing compounds and formwork release agents must be removed.

New concrete must be at least 7 days old and hardened, before application of Enviro-coat primers and Enviro-coat IS 520 Waterproofing Membrane. When new hardened concrete is between 7 and 28 days old it must first be treated with Enviro-coat epoxy primers as per Wet-seal Technical Literature. Old concrete must be thoroughly clean, washed and allowed to dry.

For 28-day old concrete where not using Wet-seal epoxy primers the moisture content of the concrete must be measured using a hydrometer and readings must be 75% relative humidity (rh) or less. If readings are higher than 75% rh, the substrate must be allowed to dry until readings are compliant with Wet-seal Technical Literature.

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3.3.3 Fibre Cement Compressed Sheet Floors

Ensure that fibre cement compressed sheet is wet area grade, and suitable for internal wet areas and complies with AS/NZS 2908.2. Ensure that the fibre cement sheet is correctly installed as per manufacturer's requirements. Refer to sheet manufacturer's details for correct fixing, thicknesses and sheet layout.

3.3.4 Fibre Cement Sheet Wet Area Tile Underlay

Fibre cement sheet tile underlay must be manufactured to AS/NZS 2908.2, and be suitable for internal wet areas. The tile underlay must be installed as per the manufacturer's requirements.

3.3.5 Concrete/Masonry Walls

Concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZ Building code, NZS 4229 and NZS 4230. Old or soiled block work must be thoroughly cleaned and allowed to dry.

3.3.6 Plasterboard

Plasterboard must be wet area grade and suitable for internal wet areas and must be manufactured to AS/NZS 2588 and installed to manufacturer's requirements.

3.3.7 Plywood floors

Plywood sheet material must comply with AS/NZS 2269, and be a minimum of 17 mm thick, minimum CD structural grade, with the sanded C face upwards. Plywood must be hazard classification of H3.2 with CCA treatment. Timber framing support must comply with NZS 3604. Supporting framing must be installed so that the substrate maximum span is in accordance with the manufacturer's requirements. All edges of the sheet should be fully supported.

Plywood sheets must be fixed with 10-gauge x 50 mm stainless steel countersunk screws, at 150 mm centers on edges and 200 mm in the body of the sheet. Fixings must be to manufacturer's specifications.

Plywood moisture readings must be taken, and waterproofing must not occur if moisture content is greater than 20% relative humidity.

LOSP treated plywood must not be used

3.3.8 Strandfloor ® H3.1

The installation of Strandfloor® must be to the manufacturer's requirements and in accordance with BRANZ Appraisal 677 - Strandfloor H3.1®. The Strandfloor® H3.1 must be installed with no greater than 450 mm unless otherwise specified by the manufacturer.

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4 Waterproofing System Installation

4.1 Installation Compliance

The Wet-seal Approved Applicator will provide a complete waterproofing system. The Wet-seal Approved Applicator will install the Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System using the required Wet-seal Enviro-coat Internal IS 520 Waterproofing Membrane System materials, primers and components, in accordance with the stringent Wet-seal Installation requirements, following design guidance from AS 3740, BRANZ Good Practice Guide – Tiling, and flooring and wallboard manufacturer's specifications, and the Wet-seal Technical Literature to provide a professionally waterproof install.

4.2 Completion

The Wet-seal Approved Applicator will complete the professional installation of the Wet-seal Enviro-coat IS 520 Internal Waterproofing Membrane System and will ensure the site is left in a clean and tidy state. The Wet-seal Approved Applicator will provide an Installation Warranty Certificate upon completion and all other required documentation, in a timely manner.

4.3 Protection and duty of care

Adequate drying and curing time must be allowed before tiling. The Wet-seal Enviro-coat IS 520 Waterproofing Membrane System is tile ready after 48 hours at 25 °C and 50% relative humidity. Allow longer dry times if temperatures are lower or humidity higher. After installation the wet waterproofing membrane must be protected from any pedestrian traffic until it is dry. Once dry, physical damage and rain wetting must be avoided by use of suitable temporary protection covers until tiled finishes are complete. Such requirements should be discussed before commencement of waterproofing works. The dry membrane is not trafficable or weatherproof and must be protected appropriately. Further information regarding the Customer's duty of care can be found in Wet-seal's Terms and Conditions for Internal Waterproofing.

4.4 Flood testing

If a flood test is required, conduct a flood test of the installed waterproofing membrane prior to tiling. Conduct flood test no **less than 7 days after installation.** Carry out any additional works as a result of the flood testing.

4.5 Tiled Surfaces

Tile adhesives used over Wet-seal Enviro-coat IS 520 Waterproofing Membrane System must meet the requirements of AS 4992.2 and be carried out in accordance with AS 3958.1 and BRANZ Good Tiling Practice.

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 24/07/2024

Element Name (optional)

2.2 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Weatherboard Rusticated or Shiplap
R-value: 0.16

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

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Date: 11/10/2023

Element Name (optional) 2.20 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Brick 70mm
R-value: 0.06

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

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Construction R-value Calculator

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This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ( )

Date: 12/04/2025

Element Name (optional) — 2.09 m²°C/W

Type: Floor: Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Table F Slab Insulation (H1 Edition 5) - H1 Acceptable Solutions and Verification Methods

Slab floor area [m²]: 163.3

Area Perimeter Ratio: 2.56

Underslab insulation: Full — Insulation : 2.37

Perimeter:

	Length*	Masonry Veneer Wall	External Wall Thickness*	Edge Insulation
-	63.8 m	☑	90 mm	☐
+				

* required data. If empty the perimeter type will be ignored.

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Construction R-value Calculator

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This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 03/08/2024

Element Name (optional) **2.27** m²°C/W

Type: Wall: Timber Framed intertenancy Wall

Timber Framed intertenancy Wall [view detail]

internal surface 0.09

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4% *Cavity Area: 85.6%*

Framing :
R-value: 0.75

Insulation : 2.8

still Airgap: none
R-value: 0.00

Cladding : generic - None (Cladding is part of the insulation system)
R-value: 0.00

Timber Frame & Cavity : no framing (for example SIP Panels)

Wall Frame Area: 0.0% *Cavity Area: 100.0%*

Framing :
R-value: 0.00

Insulation :

still Airgap: none
R-value: 0.00

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ◉

Date: 18/08/2023

Element Name (optional) — 3.35 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ◉

Date: 04/03/2024

Element Name (optional) — 6.98 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation : 6.6

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, blocking @ 600mm

Roof Frame Area: 12.1%	*Cavity Area: 87.9%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : notched to cover bottom chord ☐

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

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EXPOL
Guaranteed Performance

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

1.0 - Product Overview

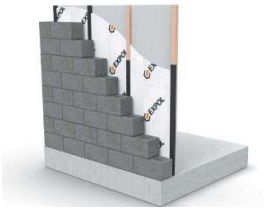
EXPOL ThermaSlab (Expanded Polystyrene / EPS) provides excellent compressive strength, moisture resistance, and thermal protection.

Ideally suited for residential applications**, EXPOL ThermaSlab** is a cost effective, easy to install insulation solution that achieves R-values above building regulations.

EXPOL ThermaSlab is available in grades S, M, H, VH and SL, and can be used in:

- Retaining Walls (S Grade)
- Skillion Roof Insulation (S, M H Grades)
- Concrete Floor Insulation (S, H, VH Grades
- Wall Insulation (SL Grade)
- Cladding Insulation (S and H Grades)





2.0 - Installation

2.1 There are no special requirements for PPE when handling or installing EPS. It is an inert, non-toxic material.

2.2 When transporting, storing or installing, ensure the EPS is not exposed to:

- Petroleum based solvents, or
- Fire, or
- Sustained direct sunlight.

2.3 PVC sheathed electrical cables should not be allowed direct contact with EPS.

2.4 EPS is compatible with all common construction products.

3.0 - Maintenance

3.1 No maintenance required

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4.0 - Warranty

We believe we manufacture and supply the highest quality UnderFloor, EPS and XPS Foam Insulation products and that is why we stand behind them with some of the best warranties in the industry.

4.1 We provide a 20-year warranty on our EPS Foam Insulation Products – for full warranty details visit www.expol.co.nz/expol-eps-warranty/

5.0 - Compliance with the New Zealand Building Code

EPS, when installed and maintained in accordance with the requirements outlined in this technical data sheet, will meet or contribute to meeting the following provisions of the New Zealand Building Code:

5.1 Clause B2 Durability, performance B2.3.1 (a), B2.3.1(b)

5.2 Clause E3 Internal moisture performance E3.3.1

5.3 Clause F2 Hazardous building materials performance F2.3.1(a)

EXPOL EPS is not subject to a warning or ban under the Building Act 2004.

6.0 - Quality Assurance

6.1 BRANZ, H1 Energy efficiency performance H1.3.1(a), H1.3.2(e)

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EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

7.0 - Technical Data

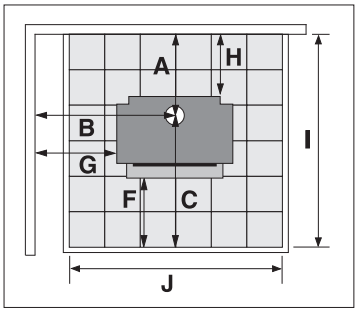
Properties	Test / Method / Standard	Test Results
Material	Expanded Polystyrene	
Density	16 kg / m3	
Sheet Size	2400 mm x 1200 mm	
Thickness / R Value	10mm	-
	20mm	R 0.53
	25mm	R 0.66
	30mm	R 0.79
	35mm	R 0.92
	40mm	R 1.05
	45mm	R 1.18
	50mm	R 1.32
	55mm	R 1.45
	60mm	R 1.58
	65mm	R 1.71
	70mm	R 1.84
	75mm	R 1.97
	80mm	R 2.11
	85mm	R 2.24
	90mm	R 2.37
	95mm	R 2.50
	100mm	R 2.63
	110mm	R 2.89
	120mm	R 3.16
Thermal Conductivity	ATSM 168	K – Value 0.038
Rate of water vapour transmission (max) measured parallel to rise at 23 deg C	AS 2498.5	520 mg/m2s
Permeability m/s	-	
Compressive Resistance KPA at 1% Compressive Resistance KPA at 2% Compressive Resistance KPA at 5% Compressive Resistance KPA at 10%	AS 2498.3	34 KPA 59 KPA 74 KPA 84 KPA
Youngs Modulus	-	3.8 MPA
Cross breaking strength KPA	AS 2498.4	165 KPA
Dimensional stability of length, width & thickness (max) at 70 deg C for 7 days	AS2498.6	1%
Long term water absorption by immersion	ASTM C72	- %v / v
Determination of flame propagation surface ignition Medium flame duration (max) Eighth vale	AS2122.1-1993	 2 sec 3 sec
Fire behavior Spread of flame index (0 – 10) Smoke developed index (0 – 10)	AS/NZS 1530.3:1999	 0 5
Recycled Content	5%	
Recyclability	EPS is 100% recyclable	
Environmental Statement	EPS is inert and non-toxic. There are no chemicals or gases harmful to the environment emitted from EPS either during manufacture or within use.	
Ozone Depleting Potential	EPS does not contain ozone-depleting CFC or HCFC gases, nor use them in its manufacture. As a result, EPS has zero ozone depletion potential.	
Vermin Resistance	EPS does not offer any nutritive value.	

For further technical information please contact us.
P: +64 9 634 3449 **F:** +64 9 634 0756 **T:** 0800 86 33 73 **E:** tech@expol.co.nz **W:** www.expol.co.nz

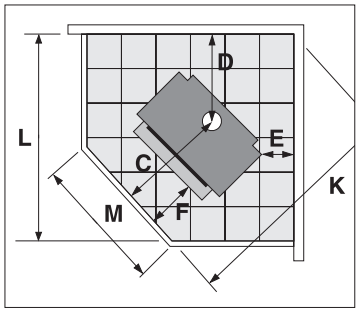
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Wood Fire Installation & Owner's Operation Manual









metrofires

Freestanding Wood Fires

Important information 2
Assembling your Metro fire 2
Floor protector 4
Flue installation 5
Wetback installation 6
Clearances and specifications 7
Important operation information 8
Where to install a Metro fire in your home 9
Optional wetbacks 9
Getting to know your Metro fire 10
Operating your Metro fire 10
Cleaning and maintenance 11
Troubleshooting 12
Metro Fires warranty 13
Replacement parts 14-15
Heating accessories 16

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NZHHA New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER MANUFACTURING LIMITED

19 Oropuriri Road // New Plymouth 4312
info@metrofires.co.nz // www.metrofires.co.nz

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⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- The appliance and flue-system shall be installed in accordance with AS/NZS2918 and the appropriate requirements of the relevant building code or codes
- Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for compliance with AS/NZS4013 and will void the warranty
- The appliance must be installed correctly. We recommend a competent and suitably qualified NZHHA installer

⚠ CAUTION! Important Information

- Mixing of appliance or flue-system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance
- Do not install a Metro fire if there is any sign of visible damage to the product
- This appliance must be regularly maintained.
- Use authorised Metro replacement parts only. The use of unauthorised parts may void the warranty
- This manual MUST be left with the home owner

All Metro wood fires comply with AS/NZS2918:2001 when installed in accordance with this manual. Please ensure you are fully conversant with the relevant standard and the contents of this manual. Correct installation is critical to the safe operation and performance of this wood fire.

Please take particular note of the following:

- It is recommended that Metro fires be installed with a Metro ECO flue system which has been developed to enhance the performance of Metro wood fires. Any alternative flue system must have a minimum flue pipe length of 4.2 metres of 150mm diameter flue pipe and have been tested to AS/NZS2918:2001 with a 12mm spaced ceiling plate of no less than 345mm square
- The 150mm active flue pipe must be fully encased from the ceiling to the underside of the flashing cone at the top of the flue system, (i.e. there must not be any 150mm flue pipe exposed)
- All flue pipe joints must be sealed and riveted. The bottom of the flue pipe in particular MUST be fully sealed into the flue outlet of the Metro fire
- In New Zealand, the Metro fire must be bolted through the floor protector into the floor to comply with the seismic restraint provisions of AS/NZS2918:2001
- All Metro's are extremely heavy, varying in weight from 75kgs up to 185kgs. During the installation process do not lift the appliance by yourself, and take care not to damage the panel coating
- Please take care when lifting the Metro fire into place onto the hearth or floor protector as point loading may break tiles and/or scratch surfaces.

Assembling your Metro wood fire

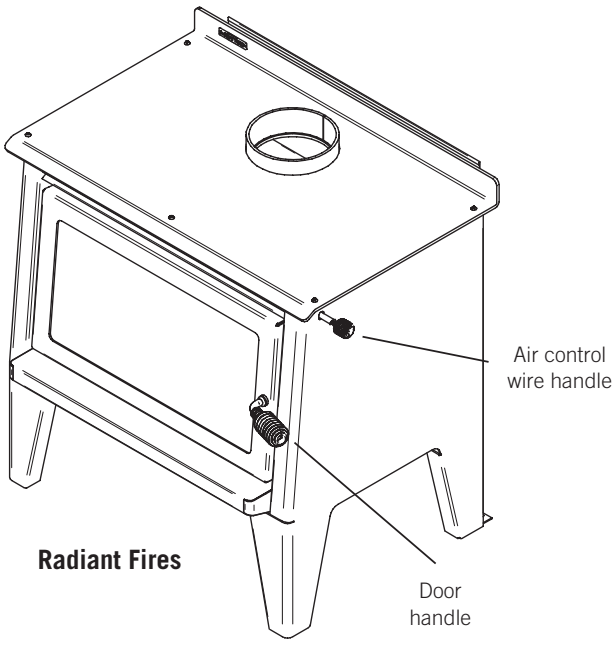
Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation. The Metro carton shows the model Metro you are about to install, enabling you to select the appropriate model's assembly instructions.

All Metro wood fires are packed in a single heavy-duty carton, and tek screwed to a wooden pallet. Having removed the packaging and located this manual, familiarise yourself with the illustrations on pages 2 & 3, and proceed as follows.

Metro radiant fires

These Metro's are supplied virtually fully assembled. Packed inside the firebox you will find bricks in a cardboard wrapper, a wire door handle and the air control wire handle.

- Remove the two tek screws located at the base of each rear leg which secure the Metro to the wooden pallet, and carefully 'walk' the Metro off the pallet
- Open the door fully and fit the side bricks to each side of the firebox. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2
- Attach the door handle to the door latch assembly by screwing it on clockwise
- Attach the air control wire handle by screwing it on clockwise.



Radiant Fires

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Assembling your Metro wood fire

Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation.

Metro pedestal and base model fires

To eliminate freight damage, the pedestal base has been packaged inside the firebox. To safely assemble your Metro, please proceed as follows:

- Lift off the top grill (convection models only) and place somewhere safe. Be careful not to chip the enamel coating or damage paint
- Open the door 45 degrees and lift the door off the hinge and place somewhere safe. Be careful not to damage the finish
- Remove the pedestal packed in a cardboard wrap
- Remove, rotate and re-fix the mount plate to the pedestal.

  Note: The pedestal mount plate is fixed to the back of the pedestal base with 4x screws. This mounting plate must be removed, rotated and re-fixed to the pedestal as detailed on page 4 in diagrams 3 and 3A. The return fold must face back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.
- Remove the pedestal heat shield

  Note: For some models the pedestal heat shield may be taped to the rear heat shield. The ECO Tiny Ped's pedestal heat shield is pre-fitted.
- Remove the side bricks, door handle and the bolt bag
- Remove the 2 tek screws at the base of the inside of the firebox that fix the wood fire to the pallet.

It is recommended that 2 people work together with the next step:

- Grab the underneath top of the firebox door opening with one hand, holding the flue spigot with the other, slowly lift the front of the wood fire all the way back and rest the wood fire on its rear heat shield on the floor. Remove the packaging pallet.
- Fit the pedestal heat shield over the 4 bolts as shown in Diagram 1, with the open edge facing the front of the Metro (up)
- Position the pedestal with its front facing over the 4 bolts and fit the washers and nuts supplied, check to ensure the pedestal is correctly aligned and securely tighten the nuts.

It is recommended that 2 people work together with the next step:

- Grab the flue spigot with one hand and the other hand underneath the top of the firebox door opening, lift upwards standing the wood fire onto its pedestal
- Fit the side bricks to each side of the fire box. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2. (Classic Rad also features two side rear bricks).
- Re-fit the door and top grill (Convection models only)

All Metro models

Check to ensure the top baffle is in its correct position in the top chamber of the firebox. It should be resting on four support lugs (two on each side of the firebox). The baffle must be hard back against the rear of the firebox with the "promet extension" (white board) or return front steel edge of the baffle facing forward as illustrated in Diagram 2.

Note: Some models feature a two-piece top baffle.

Diagram 1

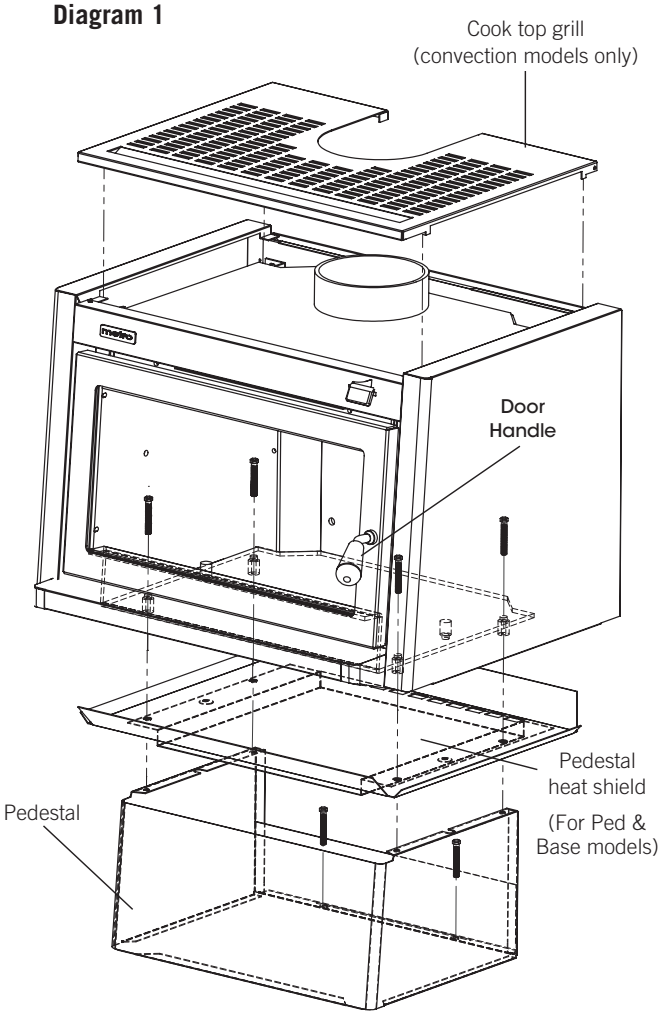
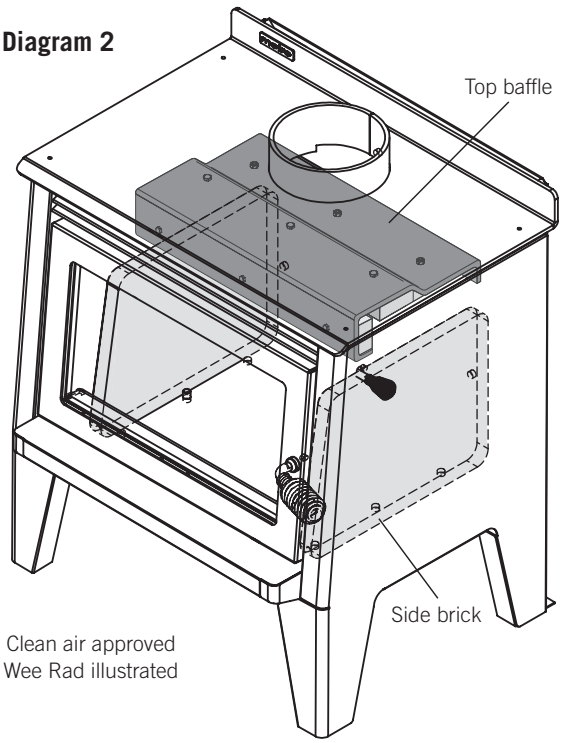


Diagram 2



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Floor protector size, construction and fitting

Pioneer manufacture an extensive range of Pioneer 'Ash Floor Protectors' which comply with the minimum floor protector requirements of AS/NZS2918:2001, and can be installed with any freestanding Metro wood fire. Metro freestanding wood fires do not require an insulated floor protector as they comply with the minimum floor protector requirements of AS/NZS2918:2001. These minimum floor protector requirements are;

- They must be of adequate size to give appropriate wall, rear and front clearances/projections as detailed below and in the chart illustrated on page 7. Note;
- The floor protector must extend 200mm horizontally to the rear and each side directly below the door opening, and 300mm forward of the door opening
- The upper surface of the floor protector must be made of non-combustible material.

A suitable floor protector for a Metro freestanding wood fire is therefore any non-combustible material which could include;

- Ceramic tiles with grouted joints fixed directly to a hard base over timber flooring
- A sheet of toughened glass, panel steel etc. laid directly onto a wooden or other combustible floor.

Metro radiant fires

Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded. Once the Metro's location on the floor protector is established and if the installation is within New Zealand, seismic restraint is required.

Using masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor, secure through the holes provided at the base, behind both rear legs.

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

Metro pedestal and base model fires

Prior to lifting the Metro fire onto the floor protector, ensure you have removed, rotated and re-assembled the mount plate from the back of the pedestal base as detailed in diagrams 3 & 3A above. This rear panel must be rotated with the return fold facing back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.

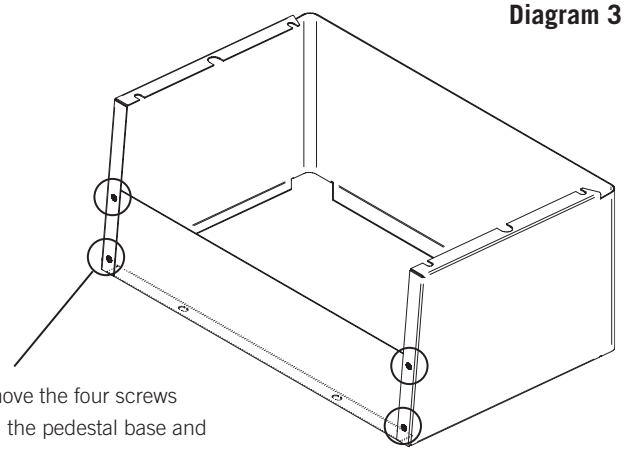
Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded.

Once the location of the fire is established, you can then secure the Metro through the floor protector into the floor using the two seismic restraint holes in the rear edge of the mount plate. Use masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

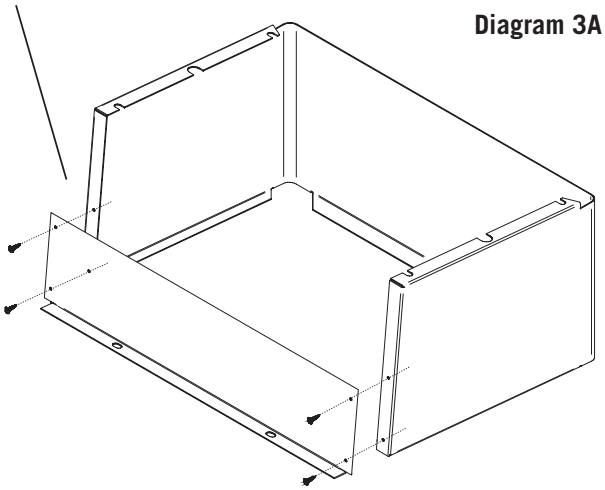
Preparing the mount plate

Diagram 3

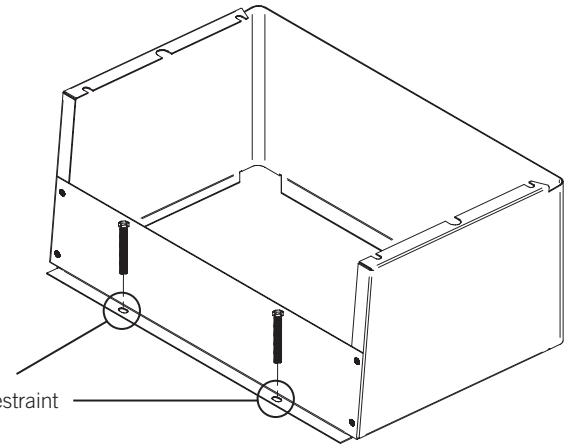


Remove the four screws from the pedestal base and rotate the mount plate so the return fold faces back the other way. Refix in place.

Diagram 3A



Correct mount plate position



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Flue installation

It is recommended that all Metro freestanding wood fires be installed with the energy efficient ECO Flue System which comes complete with a detailed installation manual. This installation manual must be presented with your application to gain consent with your local council.

A copy of the ECO Flue System installation manual can be downloaded from metrofires.co.nz, or a copy can be obtained from your Metro retailer. Any alternative flue system must comply with and be installed as detailed in AS/NZS2918:2001, and a copy of the installation manual must also be presented with your application to gain consent with your local council.

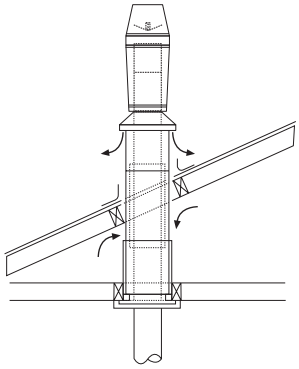
All Metro fires require a 150mm diameter flue. Please note:

- Metro ECO flue systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue Kit and ECO Option Kits are both installed
- The ECO Flue system must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- ECO Flue systems shall be installed in accordance with AS/NZS2918:2001 and the appropriate requirements of the relevant building codes
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted
- The flue systems 150mm diameter flue pipe must terminate a minimum of 4.6 metres above the top surface of the floor protector
- All joints in the flue pipe must be sealed with Pioneer fire cement (or similar) and riveted. The base of the flue pipe must also be sealed into the Metro fires flue outlet. This is critical for optimum operation.

All Metro fires have been tested with a Pioneer double flue shield. For the Metro fire to be installed with minimal clearances as the clearance table on page 7 states, only the Pioneer double flue shield can be used. All other flue shields will invalidate the installation.

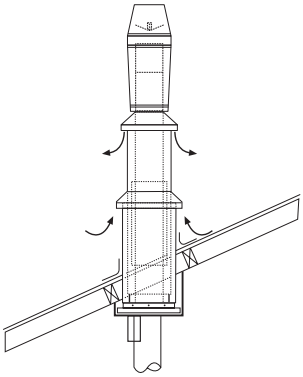
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



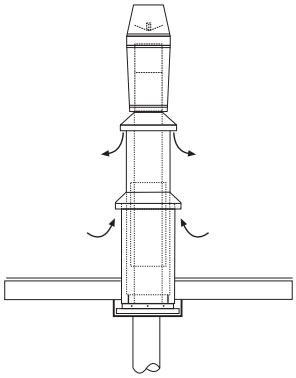
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

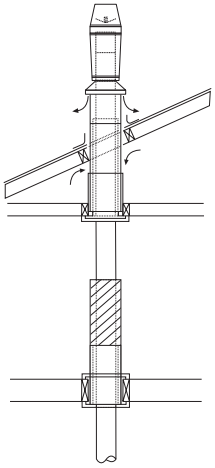
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



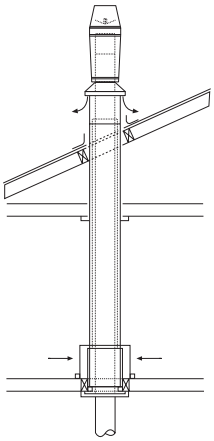
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS2918:2001



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS2918:2001

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Wetback installation

⚠ WARNING! Important Information

- DO NOT connect to an unvented hot water system
- Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building code or codes.

⚠ CAUTION! Important Information

- Wetbacks must be connected with water before operating the fire and available to the wetback while the fire is in operation
- Wetback systems are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail
- Rainwater collection tanks installed lower than the wetback that use a water pump to supply the home, can cause problems if the pump is not operational. In these situations either the type of wetback or a roof header tank should be considered

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Wetback connections are as follows, taken facing the Metro/wall; the return pipe connection is directly above the inlet connection. Heights for all models are illustrated and detailed opposite on page 7.

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

All wetbacks are fitted to the inside rear wall of the firebox, with the exception of the Tiny Rad Woody, clean air Wee Series models and the Classic Rad model. Side wetback position for these models is to the outside left hand firebox wall. Please see the specific installation instructions in the 'Side Wetback' box for installation of a wetback into these appliances.

It is recommended the return pipe has a minimum rise of 1 in 12; performance will reduce as the distance to the storage cylinder increases.

To fit the wetback proceed as follows

1. Remove the rear panel of the Metro by removing the four pozi drive screws. Remove the two pre-punched knockouts from this panel.
2. Two further knockouts will be visible on the inner rear heatshield, remove these also. Once these are removed 6mm nuts will be visible through the knockout holes.
3. Open the Metro's door and locate two bolts securing the pressed washers which are visible on the left hand side of the firebox for both inlet and outlet connection points.
4. A further three bolt heads will also be visible on the inside rear wall of the firebox; these are threaded into the 6mm thick firebox. Remove all three.
5. Using the tube of sealant supplied with the wetback, apply a liberal bead of sealant around both the two connection pipes and also the outer circumference of the wetback which will face and press against the inside rear wall of the firebox. This will completely seal the wetback to the inside rear wall of the fire on installation.

Ensure there is no gap between pipe and rear wall access holes. This cement must fully cure before appliance use.

6. Fit the wetback into the firebox and carefully pass the connection pipes through the holes in the rear of the firebox. Securely attach the wetback using the three bolts previously removed from the rear face of the firebox, fitting them through the slots provided in the wetback's jacket.
7. The wetback is now ready for connection to the storage cylinder by a registered plumber.

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Metro clearances and specifications (Minimum clearances shown are in mm, with a Pioneer double flue shield fitted)

Minimum clearances

All Metro wood fires comply with AS/NZS2918:2001. Minimum clearances shown below are detailed in millimetres, with a Pioneer double flue shield fitted to the appliance. Measurements are taken from the following reference points as illustrated:

- From the nearest combustible wall or surface (A, B, D, E, G, H)
- From the Metro's flue centre (A, B, C, D)
- From the Metro's cabinet/heatshield outermost point (E, F, G, H)
- To the edge of the ash floor protectors non-combustible surface (C, F, I, J, K, L, M)

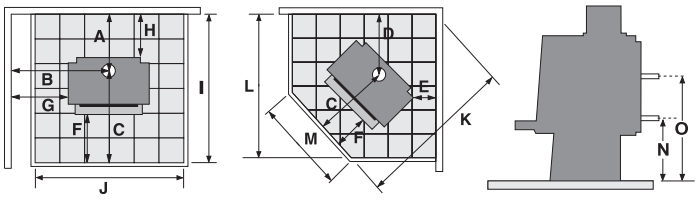
AS/NZS2918:2001 allows for a reduction in minimum clearances as detailed in Section 3, tables 3.1 and 3.2 of the standard.

Some Metro models have undergone additional testing which allows for reduced clearances. Please see the footnotes below the clearance table for the applicable models.

Wetback connections (taken facing the Metro/wall)

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

Specifications were correct at the time of printing, but may alter and those detailed within should be used only as a guide. If in doubt, please consult your Metro retailer or metrofires.co.nz.



	Minimum installation clearances with a Pioneer double flueshield fitted (mm)													Wetback		Dimensions		
Clean air models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
ECO Tiny Ped	211	433	580	290	25	235	185	60	791	650	990	780	250	280	470	496	492	659
ECO Tiny Rad	230	553	585	419	150	232	300	75	815	650	1180	910	250	280	470	505	508	667
Tiny Rad Woody	251	568	580	382	110	232	310	100	831	650	1120	870	250	365	555	515	498	758
Wee Rad - Leg [1]	251	568	580	456	150	232	260	100	831	825	1225	1016	425	295	485	615	501	688
Wee Rad - Base	271	678	580	486	180	232	370	120	851	825	1270	1048	425	295	485	615	501	691
Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
Wee Rad V2 - Base	318	768	580	586	250	232	460	150	898	825	1410	1147	425	N/A	N/A	615	518	691
Wee Ped [2]	263	651	580	473	170	230	350	110	843	825	1250	1034	425	295	485	602	503	665
Classic Rad [3]	257	695	780	500	220	229	430	100	1037	728	1490	1170	328	393	583	530	708	680
Xtreme Ped	251	624	630	442	110	226	280	100	881	907	1260	1070	507	312	502	688	554	707
Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	382	572	740	554	813
Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744
LTD rural models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
LTD Wee Rad - Leg	251	548	580	426	120	232	240	100	831	825	1185	989	425	295	485	615	501	688
LTD Wee Rad - Base	251	658	580	486	180	232	350	100	831	825	1270	1048	425	300	490	615	501	691
LTD Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
LTD Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	420	610	740	554	813
LTD Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744

The Wee Rad installed with a Pioneer double flue shield with the Wee Rad corner wing shields fitted allows for reduced clearances as follows:

[1] Wee Rad - Leg corner clearance (E) can be reduced to 120mm. This in turn also reduces clearances (D) to 426mm, (K) to 1185mm and (L) to 987mm. When fitting the corner wing shields, the Wee Rad - Leg itself must be installed to a corner clearance (E) of 120mm. The corner wing shields are then fitted which gives a wall to shield corner clearance of 100mm.

The following models installed with a Pioneer double flue shield with the side extensions fitted allows for reduced clearances as follows:

[2] Wee Ped corner clearance (E) can be reduced to 115mm. This in turn also reduces clearances (D) to 418mm, (K) to 1170mm and (L) to 978mm.

[3] Classic Rad corner clearance (E) can be reduced to 180mm. This in turn also reduces clearances (D) to 460mm, (K) to 1435mm and (L) to 1131mm.

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⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- Any modification of the appliance that has not been approved in writing by the testing authority is considered as breaching AS/NZS 4013 and will void the warranty
- Do not use flammable liquids or aerosols in the vicinity of this appliance when it is operating
- Never operate your Metro with the top grill removed
- Do not dry clothes on or near this appliance
- Do not use flammable liquids or aerosols to start or rekindle the fire OR store fuel within the Metro's specified installation clearances
- Never operate your Metro with the door ajar, except on initial start up
- Open the air control fully before opening the Metro's door.

⚠ CAUTION! Important Information

- This appliance should be maintained & operated at all times in accordance with this instruction manual
- This appliance should not be operated with cracked door glass, over worn, faulty or missing door seals
- Do not use driftwood, treated or unseasoned (wet) fuel, the use of most types of preservative treated wood as fuel can be hazardous and will damage your appliance
- Burning unseasoned (wet) fuel or incorrect operation on extended low burn cycles will cause excessive creosote to form. Creosote is very corrosive and excessive buildups will result in the flue pipe, flue spigot and upper burn chamber failing. Failure of the applicance and/or flue system due to creosote damage is not covered under warranty. The formation of such is not an appliance issue it is a fuel and operational issue
- This appliance must be regularly maintained and replacement parts must be authorised Metro parts only
- Do not empty ash into a combustible container.

Congratulations on the purchase of your Metro wood fire

This slow combustion appliance is designed to give you many years of warmth and service, subject to the following key factors. These key factors, if not adhered to are the major causes of unsafe installation, poor performance and flue blockages and potential product failure.

1. Your Metro wood fire must be installed correctly. Metro recommend a competent and suitably qualified NZHHA installer.
2. The only fuel to be used in this appliance shall be wood that meets the following criteria.
   - Less than 25% moisture content
   - Has not been treated with preservatives or impregnated with chemicals or glue,
   - Is not chipboard, particle board, or laminated board,
   - Is not painted, stained or oiled
   - Is not driftwood or other salt impregnated wood
3. The appliance shall be operated at all times in accordance with the "Installation and Operating Instructions" supplied with each appliance.
4. It is preferable that Metro wood fires should be installed with a Metro ECO Flue System.
5. Coal must not be used as a fuel.

Please also note the following important points:

- In New Zealand a building consent is required from your local building authority. The homeowner is responsible for obtaining this consent
- As correct installation is critical to the performance and safe operation of your Metro, it is recommended your Metro be installed by a NZHHA registered installer or a person suitably qualified in the installation of wood fires. Your Metro retailer will be able to arrange professional installation for you
- During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed; open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time
- Properly seasoned (dry) timber is necessary for the Metro to operate efficiently; firewood that contains a high moisture content will result in flue pipe blockages, reduce heat output and create other issues.

Note: Once split, Softwood usually takes 12 months to season - Hardwood can take up to 24 months to season - Wood must be stored in a location that enables air circulation. Unseasoned wood stored in a closed woodshed without air circulation will still be unseasoned 12 months later.

- It is critical that the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) this will cause air to leak into the fire, causing the appliance to 'over fire'
- It is critical that the fire not be operated with over worn, faulty or missing bricks, baffle plate, promet extension (white board on the baffle plate)
- It is critical that the fire not be operated with cracked or broken door glass.

Please note, the above 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. A glowing firebox or lower fluepipe is just one sign you are over firing your appliance. Please ensure you keep your proof of purchase/receipt on any parts you purchase.

- For optimum performance fuel must be loaded so the logs lay "front to rear" in preference to laying across the width of the firebox. Spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- A small hot fire loaded frequently is more efficient than a large fire burning on a low setting
- Your Metro is covered by a full unconditional 12 month warranty on replacement parts, and a 10 year firebox warranty.

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Where to install a Metro wood fire in your home

Wood fires are usually installed in the main living area, which is the section of the home that is usually kept the warmest, being the area in the home most frequently occupied. However, before deciding on the best location for your Metro wood fire you may wish to consider:

- Water heating. If you are intending to have a wetback it is important that the wood fire is as close as practically possible to the water storage cylinder
- Split level homes are best heated when the wood fire is installed on the lower level, as the heated air will rise to the higher levels
- Building construction is another consideration. Specified clearances from walls, curtains etc must be maintained and you need to ensure no structural beams or internal gutters etc are directly above your preferred site. If you have a two storey dwelling you need to consider the second storey to ensure you don't have the flue directly outside a second storey window.

Generally, you can install your Metro in your home anywhere that suits you; Pioneer offer various fan systems to transfer heat to other sections of the home that are not heated sufficiently. It is necessary if using a fan system that the Metro you have purchased has sufficient output to heat the total area you wish to heat. Your Metro retailer or installer will be able to advise if you are uncertain.

Optional wetbacks

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Other considerations are:

- Distance from your Metro to the storage cylinder will affect the amount of hot water produced
- Your climate & the manner in which you will 'fire' your Metro will determine the amount of hot water produced.

Note: Wetbacks are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail.

Cost Savings

Wetbacks can enable substantial power savings, dependent on the climate in the area in which you live. If you live in a cold climate you are likely to use your Metro for many months of the year, in which case a Pioneer wetback will reduce or even eliminate your water heating costs over those months. If however you live in a warmer climate and use your Metro for only a few hours a day over the colder months, electricity savings will be considerably less.

Water Pressure

A common misconception is that you must have a low-pressure system to have a wetback; this is not true. You must have a 'vented' system and high-pressure cylinders are usually not vented. However you can install an 'indirect' cylinder which contains a secondary coil inside the storage cylinder, enabling you to have a wetback while retaining a high-pressure system.

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

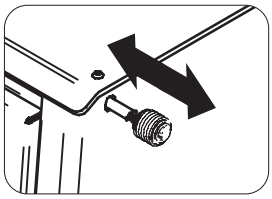
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Getting to know your Metro wood fire

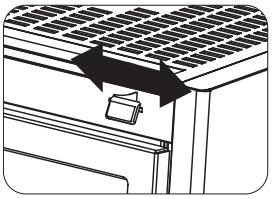
Operating your Metro fire is simple and you will quickly learn how to get the best from it. First take a minute to familiarise yourself with your new Metro.

- Raise the door handle anti-clockwise until the latch releases, and then slowly pull the door open. You will note that if you let the door go before it is at 90° to the appliance, it will fall closed. This is a safety feature that ensures the door cannot fall open if it is not latched securely. For the door to remain open, you must open it fully
- There is a single air control making your Metro fire easy to adjust. This control moves from left to right, which is 'low to high'.

All Metro radiant fires have a wire air control handle located at the upper right hand side of the appliance. Simply pull out to increase burn rate or push in to reduce burn rate.



Radiant fires air control



All other fires air control

All other Metro fires have an air control knob located on the upper front panel of the appliance.

Slide this control knob gently from right to left until you reach a stop. This is a pre-set 'low' position. Your Metro fire must not be operated at a lower burn rate than this pre-set low allows.

Operating your Metro wood fire

If your Metro has only been installed within the past few days, the fire cement seal at the base of the flue will not be fully cured. To ensure the cement sets without blistering it is recommended you burn 2-3 sheets of loosely crumpled newspaper at a time, approximately once every hour over a 6-8 hour period.

During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed. Open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time.

Start up

Place a quantity of loosely crumpled newspaper on the base of the firebox until it is approximately half full of paper, or place firelighters on the base of the firebox. Add dry kindling and move the air control knob fully to the right, being the 'full open' position.

Light the paper at two or three locations across the front of the door opening and leave the door slightly ajar resting on the latch pin if necessary for a few minutes while the fire establishes. Once the kindling is burning well, open the door and add 2-3 small logs at a time until you have a well-established fire. Usually this will take approximately 30 minutes, during which time the air control should be set on "high" and the door should be closed, except for the initial few minutes and when fuel is being added.

Normal operation

Once the fire is well established, regulate the air control to achieve the desired burn rate and heat output. As you move the air control to the right, burn rate, firebox temperature and heat output will increase, if you move the control to the left they will decrease. Please note:

- Always open the air control fully prior to opening the door, then open the door slowly. Every time you refuel, leave the air control on 'high' for a minimum of 20-25 minutes
- When loading logs, place them end-on, 'front to back'; air spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- Never use the door to force wood into the firebox, as this is likely to break the glass.

Extended burning (rural models only)

It is most important if your Metro is to be refuelled and turned down for an extended period, such as an overnight burn that you operate it correctly:

- The wood used as fuel for extended burning MUST BE FULLY SEASONED (DRY). Once the fuel is loaded, the appliance must be operated on high for a period of at least 20 minutes to drive out residual moisture from the fuel (dry wood is usually 20% water content) and ensure surface area combustion.
- Do not turn the air control down lower than you need to, if you want the Metro to burn overnight, endeavour to obtain an 8 hour burn time, not 12 hours. It will take a few burns to find the correct location of your Metro's air control setting to achieve the length of burn cycle you desire as this setting is affected by several variables including fuel density, flue length and outside wind velocity.
- A smouldering fire over a long time frame is likely to deposit corrosive elements into your system which could be detrimental to your Metro.

⚠ CAUTION! Important Information

- If not operated correctly on extended burn cycles, your Metro is likely to incur flue blockages, corrosion of the upper baffle, lower flue pipe and firebox flue spigot. As these are not covered under warranty if they fail through improper use, it is important you operate your Metro correctly.

Cooking

All Metro's are designed to enable cooking of soups, stews and casseroles etc, and your Metro will easily boil a flat bottom stainless steel kettle. The Radiant Series have a dedicated cooking top enabling large pots to be placed on the cook top, while all other models have a lift-off grill.

Note: Metro's supplied with a lift-off top grill have this feature to enable the grill to be removed for cleaning if you have a spill. The lift-off top grill must be left on when cooking, because if removed the wall temperatures next to the appliance may become excessive and the top of the firebox is generally too hot to cook on directly.

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Cleaning and maintenance for your Metro wood fire

Your Metro fire will give you many years of efficient service with minimal maintenance if operated correctly using seasoned fuel. Your Metro fire must be regularly maintained and replacement parts must be authorised Metro fires parts only.

The Metro radiant fires are painted wood fires and coated with 'Pioneer Metallic Black' high temperature paint and will require periodic repainting to keep them looking their best.

All other Metro fires are coated with vitreous enamel. Vitreous enamel is extremely durable and designed to last the life of the appliance. As vitreous enamel is glass, a solid or heavy object dropped or banged against a panel could chip the enamel surface.

All model Metro fires can be cleaned with a soft cloth when the appliance is not in operation.

Door glass

Providing your fuel is properly seasoned, under normal operating conditions the air-wash design of the Metro's firebox will keep the door glass clear. If the glass requires cleaning you may use either a razor blade scraper or crumpled wetted newspaper dipped in wood ash rubbed over the glass.

If your door glass breaks it must be replaced with 5mm thick ceramic glass which is available from your local Metro retailer.

Door seals

Over time, usually 3-4 years, the door and glass seals will become hard and cause air to leak into the firebox, causing the appliance to 'over fire'. Your Metro retailer stocks replacement woven fibreglass door and glass seals, which need replacing when they become hard and over worn.

The door of your Metro is easily removed. Hold it in both hands and lift the hinge end of the door up and over the top hinge pin, then lower the door from the bottom hinge pin.

Side bricks

Hair-line cracks are not uncommon and are a result of the intense heat within the Metro's firebox, coupled with mechanical damage caused by accidental impact when fuel is being loaded. However if the side bricks become cracked to the extent that they start to break up, they must be replaced.

Door adjustment

Provision is available on both sides of the door for adjustment.

To adjust the hinge end of the door, open the door fully, loosen the top hinge nut and slightly lift the latch end of the door; you will see the hinge assembly move back 1-2mm which will usually be sufficient. Retighten, then repeat by loosening the lower hinge nut, this time applying a slight downwards pressure onto the door to move the lower hinge assembly back a similar distance, then retighten.

The door latch is also adjustable, as the latch pin on the right side of the firebox is fitted through a slot which enables the latch pin to be loosened, moved back and re-tightened.

Ash removal

Over a period of time ash will build up in the base of the Metro's firebox and require removal. The time this build-up takes depends on the density and cleanliness of your fuel.

To remove the excess ash your Metro should not be operating.

- Open the door, and using a hearth shovel or similar, empty the excess ash directly into a steel or non-combustible container.
- If the ash is not disposed of immediately, be careful where you store it, as the ash can retain heat for many days and become a fire hazard.
- You must leave a bed of ash in the base of the firebox approximately 10mm deep; this insulates the base of the firebox and improves combustion.

Top baffle

This is a 'sacrificial' wear part of the firebox and should be checked monthly. Usually only the promet (white board) front/underneath section needs to be replaced when it starts to disintegrate.

Note: Cracks in the promet are not uncommon and have no adverse effect on the operation of your Metro. These cracks are the result of intense heat coupled with expansion and contraction. Burning wood which is not properly seasoned, i.e. 25% moisture content or more, will over time cause the promet to disintegrate and require replacement.

Flue systems

Should be checked annually, particularly the bottom end of the lower flue section at its rear lock formed joint. If deterioration is noticed contact your Metro retailer or installer.

The flue pipe should also be swept a minimum of once a year, or as required during the winter season. If smoke enters the room when you open the Metro's door this usually indicates the flue pipe is becoming restricted and needs cleaning. The frequency of flue pipe cleans depends on many factors, with the main variables being:

- The seasoning of the wood. If not properly seasoned you will require frequent flue pipe cleans.
- The density of the wood. Softwoods generally result in more deposits building up in the flue pipe.

To clean the flue pipe of your Metro, proceed as follows:-

- Open the Metro's door fully, reach inside with the palm of your hand face-up and extended, lift the top baffle approximately 20mm, then lift it forward out through the door opening, placing it on a sheet of newspaper you have placed on the front of the floor protector. To prevent jamming, removal and replacement of the top baffle is best performed using both hands.

Note: Some appliances have a two piece top baffle.

- Close the door and slide the air control to the left.
- Once on the roof, remove the cowl from the top of flue system and sweep the flue pipe using a 150mm-diameter flue pipe brush as detailed in the instructions provided with the fluebrush.
- Once the flue pipe is clear, clean and refit the cowl. Remove the excess soot which has fallen into the firebox, leaving a layer of ash 10mm deep on the base of the firebox, then refit the top baffle.

Note: The baffle must be fitted so its rear is touching the back of the firebox; if uncertain refer to page 3 in the installation section at the front of this manual, which shows illustrations of the baffle location.

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Troubleshooting your Metro wood fire

If your Metro is installed correctly, your fuel is dry and you operate your fire correctly, you will find it to be a pleasure to use. Metro's many years of experience within the wood heating industry has shown that dissatisfaction is mainly due to:

- unseasoned fuel
- faulty installation
- operational error
- or a combination of the above 3 points.

Correct operation

Modern day wood fires need to be operated hard and fast, more so than low and lazy to ensure the firebox and flue pipe runs hot and efficiently. If the fire and flue pipe is up to temperature it will perform extremely well, the smoke will draw up the flue pipe with ease, and the fire will produce good amounts of heat.

If the fire is operated on low a lot of the time, the door glass will run black, the flue pipe will tend to block up more frequently and the fire will end up smoking into the room when reloading. It's better to have a small fire running hard and fast, rather than a big fire running low and lazy.

The following may be of assistance if you are experiencing any problems with the operation of your Metro Fire.

Smoke enters the room when the Metro's door is ajar

(possible reasons and solutions)

Check flue pipe joins

If the flue pipe joins are not sealed correctly, the flue pipe will not draw as well as it should. The flue pipe join connecting into the flue spigot on top of the Metro is most critical, if this is not sealed correctly, smoke will enter the room when the door is ajar. To check this join is sealed correctly, run a match or lighter flame around the join. If the flame is sucked into the spigot then it is not sealed correctly. This check needs to be done when the fire is not going. Ensure you check the rear of the flue pipe/spigot join, as due to the seam in the flue pipe, this is the most common area for not being sealed correctly.

Ensure the fuel you are using is correctly seasoned

If you are burning unseasoned fuel (wet), the fire will cause nothing but problems. The Metro won't deliver much heat, it will be lazy, smoke will enter the room when the door is ajar, and the door glass will run black. Unseasoned fuel is the main contributor to excessive creosote deposits which can be corrosive to your appliance and flue system.

Flue pipe length is too short

Add more flue pipe as the longer the flue system, the better the draw of the flue pipe. Please note, if you did not purchase the Metro ECO Flue System, you will not have the ECO Cowl which increases draw. We highly recommend the Metro ECO Cowl is fitted as this will increase the draw. If you already have an ECO Cowl and smoke is still entering the room, please add another 600mm length of flue pipe.

Downdraft/Turbulence blockage

If you have checked all of the previous factors and the fire is still smoking into the room, it's possible there may be a down draft issue. Down draft is environmental and can be caused by many variables, and it is purely trial and error to ascertain the cause.

Air turbulence and/or negative air pressure influences around the flue termination can be caused by too close or overhanging trees or natural/artificial ridges etc. Address these where possible or look to extend the flue above the roofline.

Other options may be:

- 'H' Cowl, designed purely for downdraft issues, but if you have an ECO Cowl fitted as standard, you will also need to add another 600mm of flue pipe to compensate as the H Cowl is shorter in length
- Directional Cowl, designed for high wind areas.

Air control setting

Ensure the air control setting is on high before opening the door to reload, as this increases the draw up the flue pipe. Open the door slowly.

If your Metro did not smoke, but its starting too and is getting worse:

The flue pipe is in need of a clean. It is recommended that the flue pipe be cleaned every season, however if you are burning the fire on low a lot, or are using unseasoned fuel, flue pipe cleans will be required more frequently.

Other issues you may experience

I can smell smoke in the room after a low burn cycle

The smell is creosote that will be seeping through the flue pipe join or out of the flue spigot onto an external surface, thus creating the smell in your room. The cause will be either unseasoned fuel, fuel mass too large, incorrect operation on low burn cycles or a combination. Creosote is very corrosive and excessive buildups will result in the flue pipe and potentially the flue spigot and upper burn chamber failing. The formation of excessive creosote is not an appliance issue, it is a fuel and operational issue. Failure of flue pipe or firebox due to creosote build up is not covered under warranty as excessive creosote build up is only possible from either unseasoned fuel or incorrect operation.

The Metro is noisy as it heats up and cools down

There will always be some expansion and contraction noise as the Metro heats and cools. This can usually be reduced by loosening three nuts at the rear of the appliance. To remedy, locate the 25mm deep cavity at the rear of your Metro between the 'rear panel' and the 'inner rear heat shield'. You will see a 6mm nut and two 6mm bolt heads in this cavity. Using a 10mm ring or open ended spanner, loosen all three so they are finger tight only.

On all Metro freestanding fires the air channel that allows the combustion air to enter the fire is fitted to the top underneath of the door opening. It is fitted with two M6 bolts. Slightly loosen both of these bolts.

The Metro won't turn down as much as it did

The door itself may need readjusting, the hinge and latch is slotted and allows for movement. Loosening the hinge and moving it back a few mm will make the door seal tighter and stop air leaking into the fire. The door and glass seals may be in need of replacing, which is generally required every 3-4 years.

Familiarise yourself with the instructions on page 10 before proceeding with this maintenance.

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Warranty details for your Metro wood fire

Metro wood fires are manufactured in New Zealand, using the highest quality of materials, workmanship and the latest manufacturing techniques, which is why we offer a full 10 year firebox warranty and a 1 year parts warranty for your peace of mind.

Metro Warranty

(NZ Consumer laws apply to this warranty)

Pioneer Manufacturing Limited (Pioneer) warrants the steel firebox against defective materials and workmanship which would render it unfit for normal domestic use, from the date of purchase by the original consumer, for a period of 10 years.

Components including panel coating, door retainers, door seals, glass, trim, baffle & bricks are warranted for a period of 1 year from the date of original purchase for normal domestic use against defective materials and workmanship.

All associated accessories including, but not limited to, fans, flue systems, flue shields, wetbacks, tool sets, ash pots etc, are covered by a 1 year warranty against defective materials and workmanship.

It is recommended, but not a condition of this warranty, that a full service/ inspection of the Metro fire be carried out at the end of each winter season.

Warranty Conditions

- The Metro fire must be installed, operated and maintained strictly in accordance with the building code and this installation and operation manual
- The Metro fire must be installed and used in a domestic application
- This warranty covers appliance like for like replacement or repair at the manufacturer's discretion but excludes freight, travel, installation, labour and/or any other associated costs
- Pioneer or their agents are not liable for any loss or expense direct or indirect arising from the failure of any part or operation of the appliance
- Operation of this appliance in violation of the warnings in this operation and installation manual will void this warranty
- Your Metro fire must be regularly maintained and we recommended it is also serviced annually. Proof of servicing may be required. If a wood fire is not regularly maintained and serviced, the life span will be reduced. If your Metro wood fire has been neglected, by not being regularly maintained and serviced, warranty may be declined

⚠ CAUTION! Important Information

Note: The following 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. Please ensure you keep your proof of purchase/receipt on any parts you buy.

- It is critical the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) and will cause air to leak into the fire, causing the appliance to 'over fire'. Do not operate the fire with cracked, or broken door glass
- It is critical the fire not be operated with over worn, faulty or missing bricks, baffle plate or baffle extension (white board on or under the baffle plate)
- A claim under this warranty should be directed to the retailer who supplied the Metro fire. If this is not possible write directly to the manufacturer stating details of fault, model, serial number of your Metro, dated proof of purchase and name of retailer purchased from.

Warranty Exclusions

(This manufacturer's warranty does not cover)

- Service calls which are not related to any defect in the product (i.e. operational, installation or fuel issues). The cost of a service call will be charged if the problem is not found to be a product fault
- Defects caused by factors other than normal domestic use or use in accordance with the product's operation manual
- Defects caused through the product being operated in an 'over-fired' manner resulting in sections of the firebox operating excessively hot to the point that sections glow red. (Note – This will result in distortion of the firebox)
- Defects to the product caused by accident, neglect, misuse or act of God
- The cost of repairs carried out by non-authorised repairers or the cost of correcting such unauthorised repairs
- Required maintenance as set out in this manual.

Service under this manufacturer's warranty must be provided by a repairer authorised by Pioneer Manufacturing Ltd. Such service shall be provided during normal business hours.

⚠ IMPORTANT! Complete and retain these details at time of purchase:

Purchase Date	
Serial Number	
Model	
Colour	
Retailer	



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Parts guide for your Metro – Promet, baffles and wetback options

Your Metro wood fire must be regularly maintained and we recommended it is also serviced annually. If a wood fire is not regularly maintained and serviced, the life span will be reduced.

If your Metro wood fire has been neglected, by not being regularly maintained and serviced, with authorised Metro parts replaced as required, your warranty may be declined.

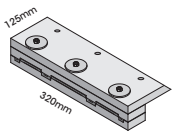
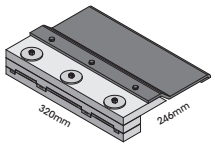
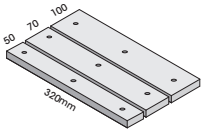
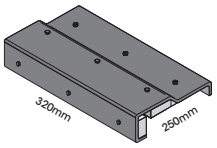
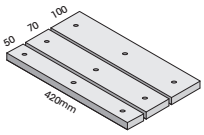
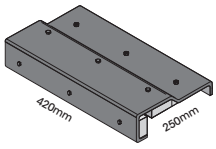
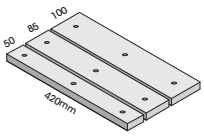
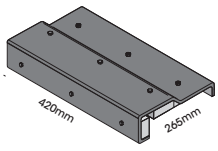
Listed below are the parts and product codes for your Metro wood fire. The promet/baffle should be regularly checked and must always be in place during the operation of your fire.

The baffle should be resting on four support lugs (two on each side of the firebox). It must be hard back against the rear of the firebox with the 'promet extension' (white board) or return front steel edge of the baffle facing forward.

Hairline cracks in the promet extension are not uncommon and will have no adverse effect on the operation and performance of your Metro wood fire. These cracks are the result of intense heat coupled with expansion and contraction and is normal wear and tear.

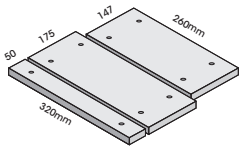
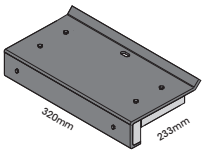
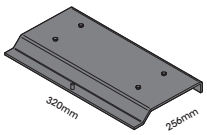
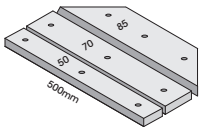
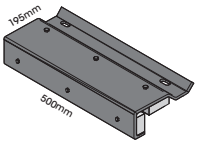
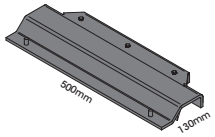
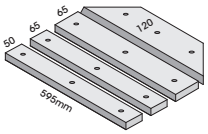
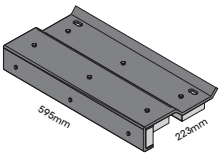
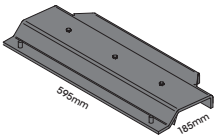
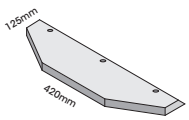
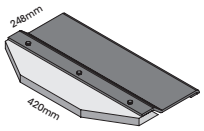
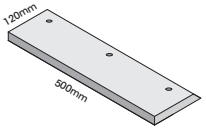
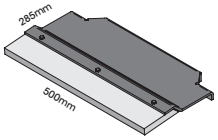
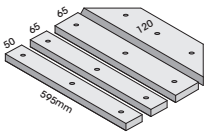
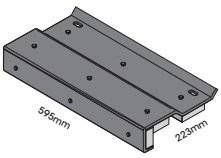
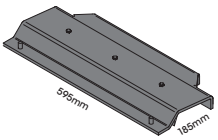
If the promet extension starts to break up and pieces fall into the firebox it must be replaced.

Note: Impact damage when loading wood and burning wood which is not properly seasoned, i.e. 25% moisture content or more, will cause the promet to disintegrate and require replacement. Always burn dry well seasoned wood and take care when loading wood into the firebox.

Model	Type of promet required / Type of steel baffle(s) required		Wetback options
• Tiny Ped • Tiny Rad	Tiny Promet 500-1550 	Tiny Baffle 500-2050 	2kW Wetback 450-0050 
• Tiny Rad Woody	Tiny Woody Promet Set 500-2004 	Tiny Woody Baffle 500-2504 	Side Wetback 450-0275 
• Wee Rad Base • Wee Rad Leg • Wee Rad Woody • Wee Ped	Wee/R1 Promet Set 500-2005 	Wee/R1 Baffle 500-2505 	Side Wetback 450-0275 
• Wee Rad V2 Base	Wee V2 Promet Set 500-2006 	Wee V2 Baffle 500-2506 	No wetback can be fitted to this appliance

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Parts guide for your Metro – Promet, baffles and wetback options

Model	Type of promet required / Type of steel baffle(s) required			Wetback options
• Classic Rad	Classic Rad Promet Set 500-2015 	Classic Rad Front Baffle 500-2520 	Classic Rad Rear Baffle 500-2525 	Side Wetback 450-0275 
• Xtreme Rad Base • Xtreme Rad Leg • Xtreme Rad Woody • Xtreme Ped	Xtreme/R2 Promet Set 500-2010 	Xtreme/R2 Front Baffle 500-2510 	Xtreme/R2 Rear Baffle 500-2515 	3kW Wetback 450-0100 
• Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 
• LTD Wee Rad Base • LTD Wee Rad Leg • LTD Wee Rad Woody		LTD Small Promet 500-1700 	LTD Small Baffle 500-2600 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Xtreme Rad Base • LTD Xtreme Rad Leg • LTD Xtreme Rad Woody		LTD Large Promet 500-1850 	LTD Large Baffle 500-2650 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 

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Metro wood fire specifications

Metro have a Specifications Brochure available which details relevant compliance data for every model. This brochure is updated annually and details the minimum clearances and specifications for all models, which is generally required when applying for a building consent. See your Metro retailer to obtain a copy, or visit www.metrofires.co.nz

metrofires.co.nz

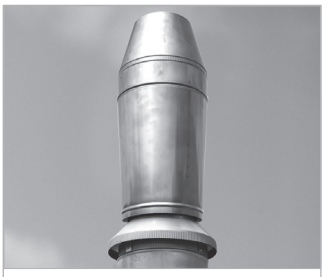
Visit the Metro website: metrofires.co.nz to view Metro's 'video demos' showing the latest in wood fire technology energy saving options. You can view the entire Metro product range, find out where your nearest Metro retailer is located or simply check out the latest specifications, installation requirements and emission and efficiency data for the Metro of your choice.



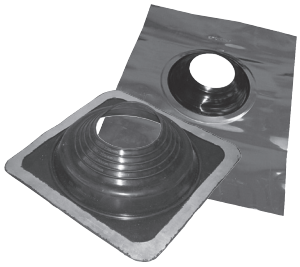
Pioneer heating accessories

Pioneer/Metro Fires offer a wide range of heating accessories designed to complement your Metro wood fire. The range includes ECO flue systems, floor protectors, wetbacks, heat transfer systems, baffles, bricks and more.

For further details talk to your Metro agency or visit www.metrofires.co.nz



ECO Flue Systems



Flashrites and Versatiles



Wetbacks



High Temperature Paint



Corner and Wall Floor Protectors



Heat Transfer Systems



Universal Door Seal Kits



Fire Cement And Silicone



Glass Tape



Door Seal Rope

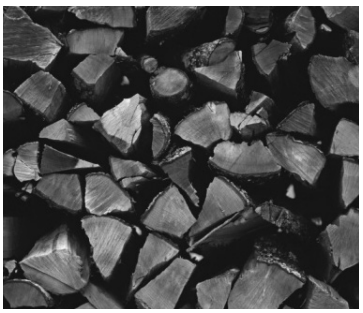


Chubb Smoke Detectors

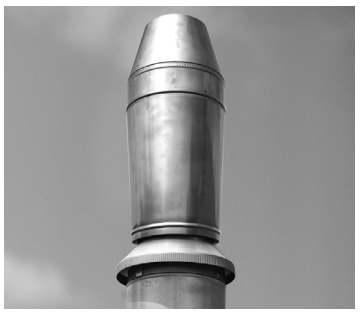
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ECO Flue Kits Installation Manual









metrofires

ECO Flue Kits

Freestanding Flue Systems

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ECO Flue Kit / ECO Option Kit 3
ECO Flue Kit Installation 4-5
ECO Option Kit Installation..... 5-6

Insert Flue Systems

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NZHHA
New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER
MANUFACTURING LIMITED

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⚠ WARNING! Important Information

- Metro ECO Flue Systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue & ECO Option Kits are both installed. Please read these instructions and familiarise yourself with the installation options and various components of the ECO Flue Systems
- Metro ECO Flue Systems have been tested to and complies with AS/NZS 2918 Appendix 'B' and 'F'. Metro ECO Flue Systems shall be installed in accordance with AS/NZS 2918 and the appropriate requirements of the relevant building codes
- The ECO Flue Kit must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted

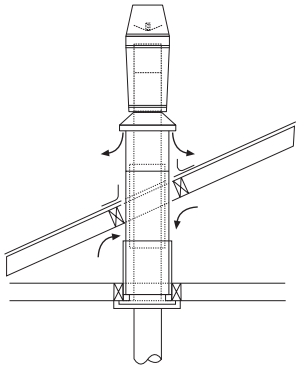
⚠ CAUTION! Important Information

- Mixing of flue system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted
- Prior to installing the assembled flue pipe into a masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

ECO Flue Systems Installation Options

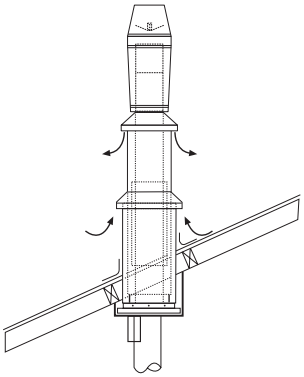
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



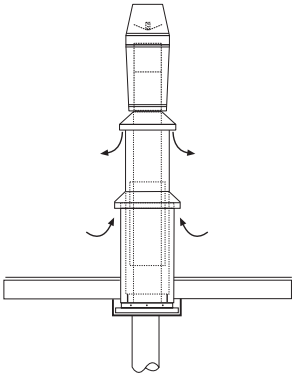
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

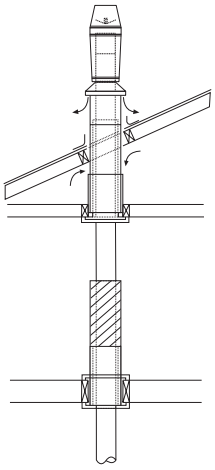
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



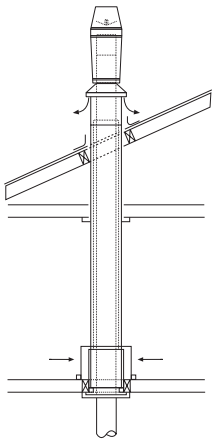
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS 2918



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS 2918

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ECO Flue Kit & ECO Option Kit Component Checklist

ECO Flue Kit

The ECO Flue Kit is designed for installation into a building that has a 'ceiling cavity' with unrestricted air supply as is the case with conventional homes. A vented ceiling cavity is required as the ECO Flue Kit draws its cooling air from within the ceiling cavity.

Metro offers both the ECO Flue Kit, which is designed to be installed on its own and the ECO Option Kit which is designed to be installed in conjunction with the ECO Flue Kit. The specific application for each of these two options is detailed below with installation instructions overleaf.

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

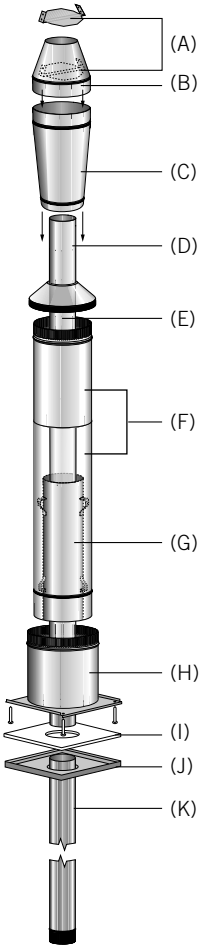
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

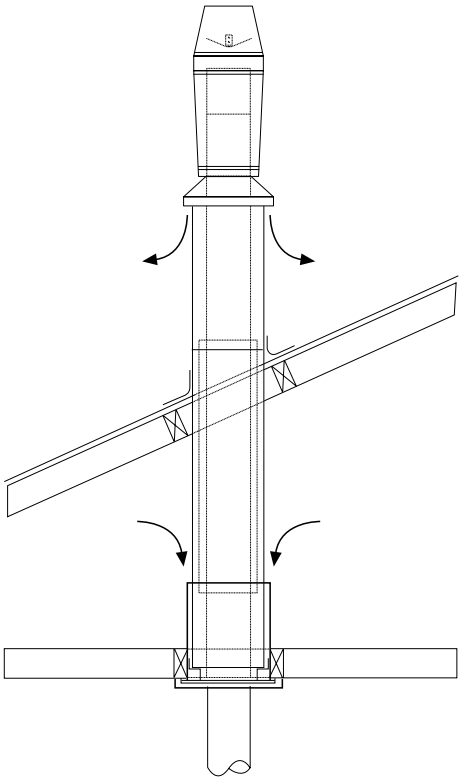
(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



ECO Flue Kit assembled



ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).

ECO Option Kit components

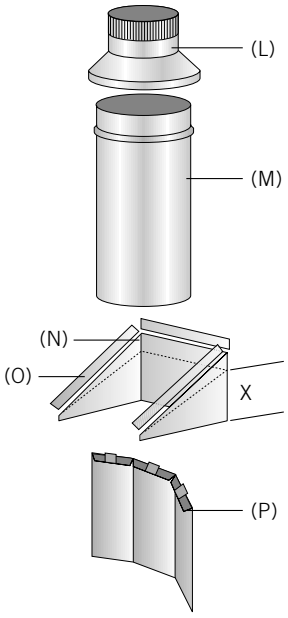
(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

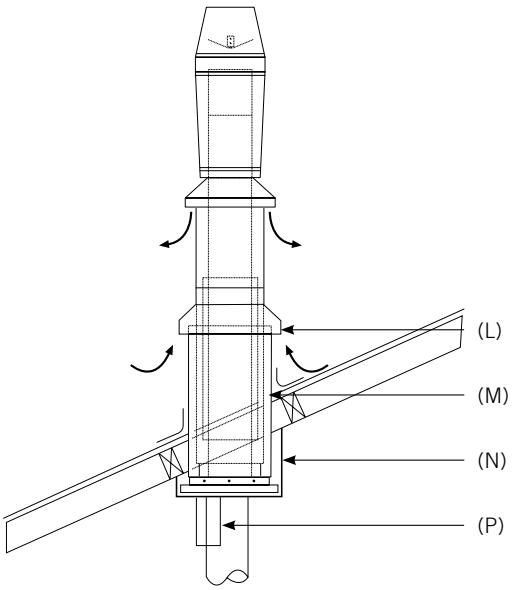
(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield



ECO Flue Kit & ECO Option Kit assembled



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ECO Flue Kit Installation Instructions

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

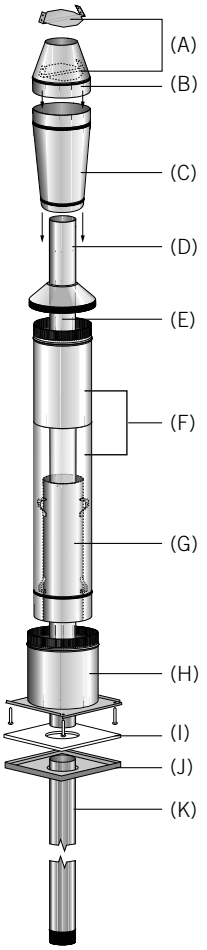
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



Having positioned the wood fire in the desired location, check to ensure the wood fire and floor protector have adequate clearances/projections, and that the flue system is clear of ceiling joists, trusses etc. (refer to the Wood Fire Installation and Operation Manual).

Note: ECO Flue Systems use stainless steel brackets enabling movement due to expansion, while centralising flue pipes and casings. These brackets may require resetting after transport, if they are too loose or tight during assembly;

1. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 250mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 250mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

2. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

3. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets.

   Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

4. Return back onto the roof and using a suitable flashing, weather proof the joint where the 250mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to. Prior to fitting the flashing, by fitting stays securing the outer casing (F) to the roof material will further improve rigidity of the installation.

5. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

   Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ WARNING! Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

6. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

7. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

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ECO Flue Kit Installation Instructions - continued

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

8. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

9. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

10. Making your way back onto the roof, slide the 750mm long slip section of the outer casing (F) until the top of this slip section is level with the top of the 150mm stainless steel flue pipe, then secure this slip section of the outer casing with rivets.

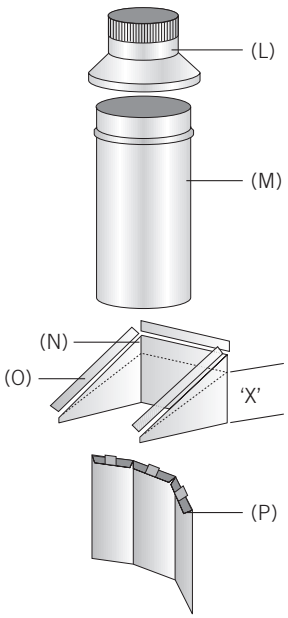
11. Fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom, fit its short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

12. Taking the removable section of the ECO Cowl, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and enables easy removal for future flue cleaning.

Installation Instructions with the ECO Option Kit

ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).



ECO Option Kit components

(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield

Dependent on whether you are installing into a flat roof/ ceiling or sloping ceiling situation as detailed on page 2, will determine if you require all the components of the ECO Option Kit. If installing into a flat ceiling/roof you will not require the drop box or drop box edge covers.

1. Slip the 300mm outer extension liner supplied with the ECO Option Kit over the 300mm outer liner 'stub' attached to the mounting plate (H) supplied with the ECO Flue Kit. Permanently secure these two components together by drilling four evenly spaced holes around the circumference and rivet with stainless steel rivets.

2. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 300mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 300mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

3. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

- **If the ceiling is angled**, it is critical that the mounting plate is correctly positioned so the drop box in-fill panel can be fitted. Ensure the two 'upturned folds' on the mounting plate are aligned parallel to the roof joists, i.e pointing towards the apex.

  You will only be able to use two of the securing holes provided in the mounting plate. To give additional support to the installation nail through the 300mm diameter outer liner into the timber framing, access is through the 200mm hole in the base of the mounting plate.

4. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely

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bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets. Return back onto the roof and using a suitable flashing, weather proof the joint where the 300mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to.

Prior to fitting the flashing, by fitting brackets securing the outer casing (F) to the roof material will further improve rigidity of the installation.

Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

5. Fit the external 'intake' flashing cone supplied with the Option Kit as illustrated, and secure it to the top of the 300mm diameter extension liner through the 4 x brackets which protrude below the base of the external 'intake' flashing cone.

6. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ WARNING! Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

7. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

8. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

9. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

10. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

The removable section of the ECO Cowl is now fully assembled.

11. Measure dimension 'X' as shown on page 3 and transfer this measurement to the drop box in-fill panel as shown.

- Cut the in-fill panel to the correct size and fit the 3 x edge covers.

Note: The side edge covers will require trimming on the ends to suit the angle of the ceiling.

- Secure the in-fill panel in position by fitting three rivets to each side through the holes provided.

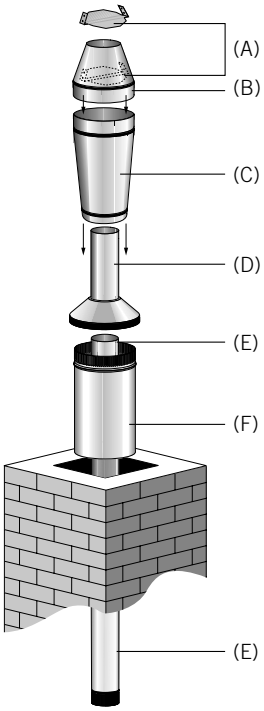
12. Back in the room, lift the ceiling plate then attach the 'ceiling plate mounted heat shield' to the lower face of the ceiling plate so that it acts as a deflector shield between the flue pipe and the lower side of the ceiling (refer assembled diagram on page 3). This heat shield has three tabs on its top face enabling it to be 'clipped' into the 160mm diameter hole in the ceiling plate. Attach the ceiling plate by clipping it onto the mount plate and the installation is now complete.

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ECO Insert Kit Installation Instructions & Component Checklist

Please read these instructions fully prior to installation of the ECO Insert Kit and familiarise yourself with all the various components illustrated right and listed below.

Note: Rivets, fire cement and chimney cap or flashing plate are not included as they are supplied by the installer.



ECO Insert Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 3 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 600mm x 250mm diameter galvanised outer casing

This flue kit has been manufactured and complies with AS/NZS 2918. To ensure a safe and efficient installation, this flue kit must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

1. Check the masonry chimney for structural soundness and make any repairs that are necessary.

   Note: Most councils require the masonry chimney to be inspected prior to installation. The masonry chimney cavity must also be swept prior to installation.

2. Once the fireplace insert has been installed correctly as per the manufacturers instructions, look directly down the chimney to ensure the wood fire flue spigot is in line with the masonry chimney. (A torch will be required).

3. If you cannot see the flue spigot, a flue pipe offset will be required. If so, install the flue pipe offset so the top of it can be clearly seen from the top of the masonry chimney.

4. If an offset is required, an adjustable telescopic type is recommended. Measure the amount of offset required and adjust the telescopic offset to suit, after smearing an adequate amount of Pioneer fire cement onto the slip section of the offset to ensure a good seal, then rivet the offset in three locations around its circumference. (If the offset is used in its fully compressed form, it will be necessary to modify the end of the female slip section otherwise it will restrict the internal diameter) Apply a liberal amount of Pioneer fire cement into the flue outlet of the fireplace insert, and fit the lower crimped end of the offset into position inside the flue outlet, and bolt into position.

   Note: In some installations where it is not possible to fit offsets or rigid flue pipe due to the shape of the masonry chimney cavity, 'Flexi flue' may be used.

5. Secure the flue pipes together and ensure the flue seams are in line. Flue pipe joints must be fully compressed with a considerable amount of fire cement to ensure a good seal, and then riveted together at three even points around the flue join. Prior to installing the assembled flue pipe into the masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

6. Lower the flue pipe into the masonry chimney, with the crimped end fitting into the fireplace insert flue outlet/offset, and securely attach with three rivets (offset/bend must be riveted to the flue pipe). For installations where extra lengths of flue pipe are required, or when the weather is poor, it will be easier to assemble the flue pipe lengths as they are lowered into the masonry chimney.

7. Secure the outer casing to the masonry chimney with suitable fasteners. A masonry chimney flashing plate will be required to weatherproof/seal the masonry chimney top. Note: The top of the outer casing must be finished level with the top of the 150mm stainless steel flue pipe.

8. Assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

9. Making your way back onto the roof, fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom. Fit the short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

10. Taking the 'removable section of the ECO Cowl' assembled in section (8) above, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and therefore enables easy removal for future flue cleaning.

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Minimum Heights for all Metro Flue Systems In compliance with AS/NZS 2918

The Metro ECO Flue Systems comply with AS/NZS 2918 and its 4.6 metre height requirement (4.6 metre minimum from the top of the floor protector to the top of the flue pipe). However as external structures and the proximity of other buildings will differ for every installation, some situations will require additional flue height to comply with the standard. Refer to Diagrams 3 and 4 below. (All measurements in mm).

Note: AS/NZS 2918 Section 4, details flue system installation requirements in full.

Diagram 3

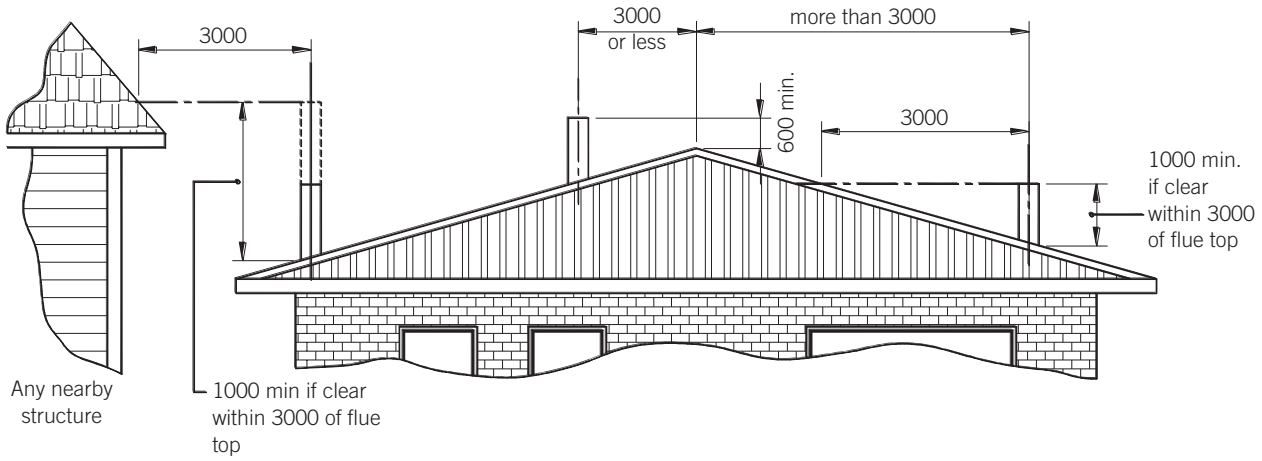
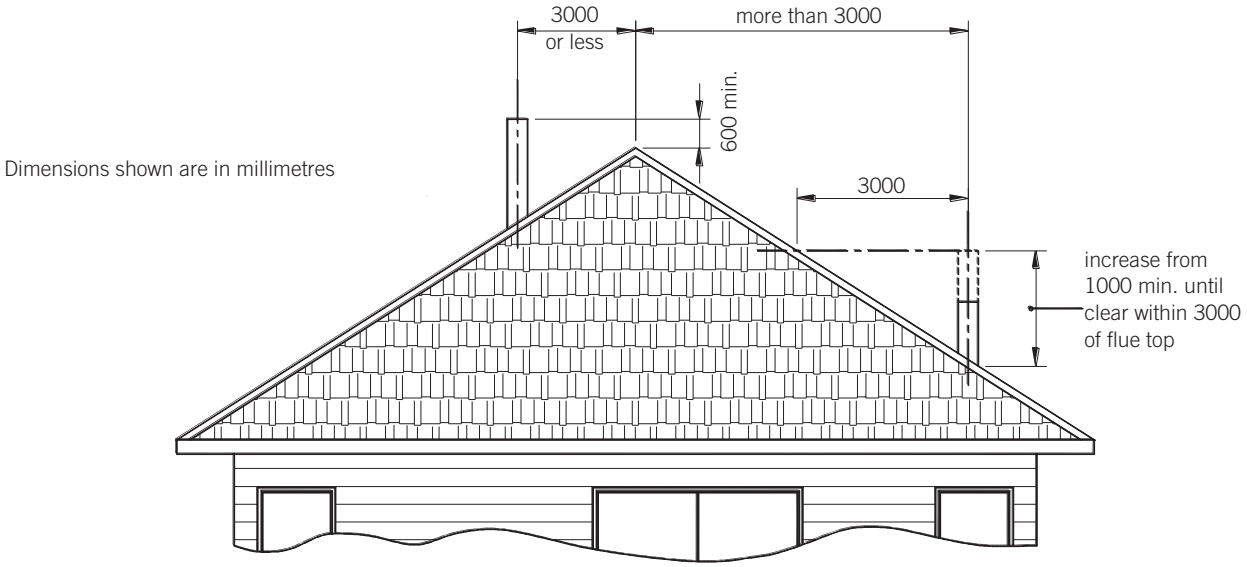


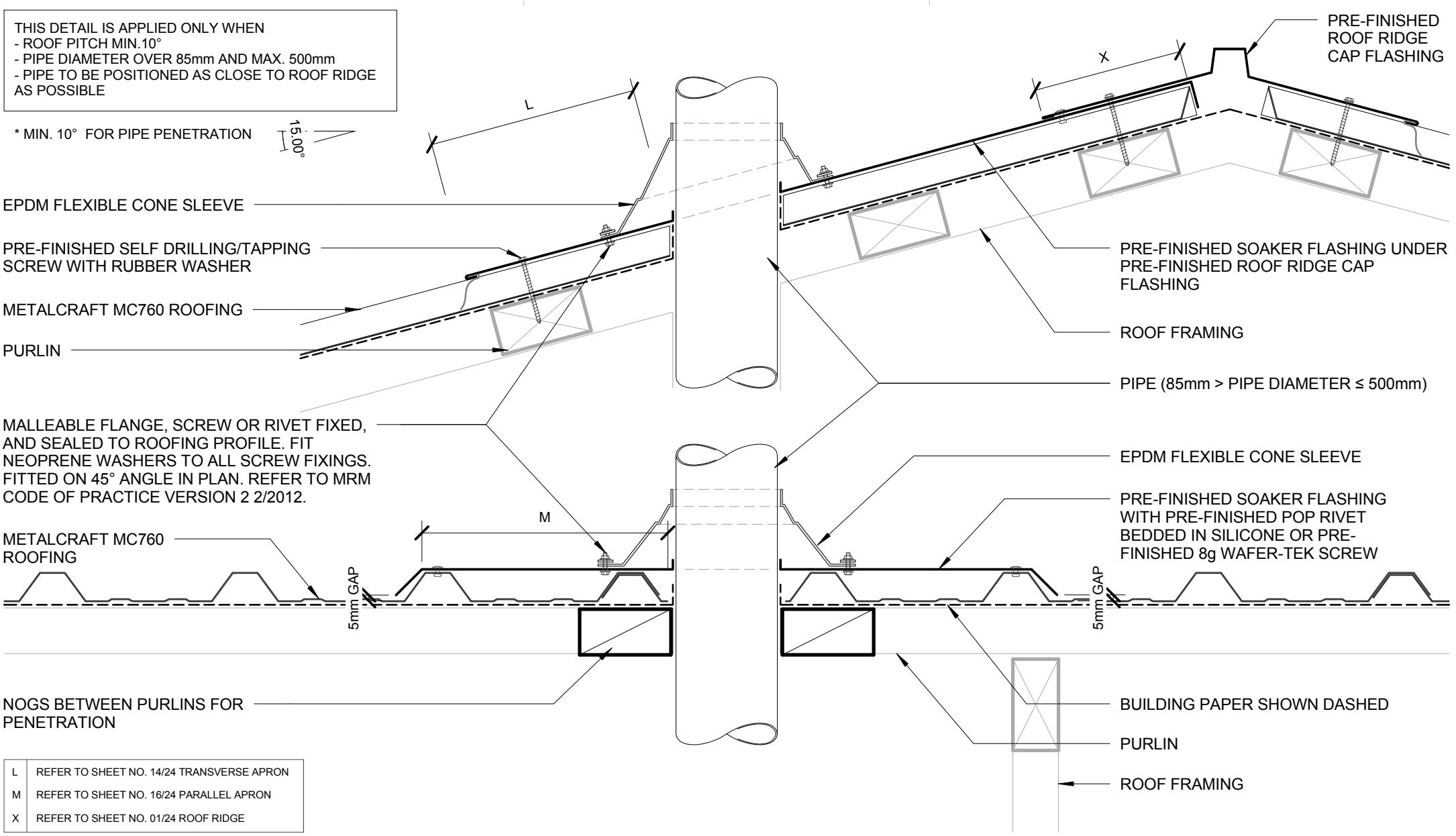
Diagram 4



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THIS DETAIL IS APPLIED ONLY WHEN
- ROOF PITCH MIN.10°
- PIPE DIAMETER OVER 85mm AND MAX. 500mm
- PIPE TO BE POSITIONED AS CLOSE TO ROOF RIDGE AS POSSIBLE

* MIN. 10° FOR PIPE PENETRATION



L	REFER TO SHEET NO. 14/24 TRANSVERSE APRON
M	REFER TO SHEET NO. 16/24 PARALLEL APRON
X	REFER TO SHEET NO. 01/24 ROOF RIDGE

- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

* - PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2 /2012 AS MINIMUM PITCH WILL INCREASE DEPENDING ON SHEET LENGTH.

Metalcraft Roofing

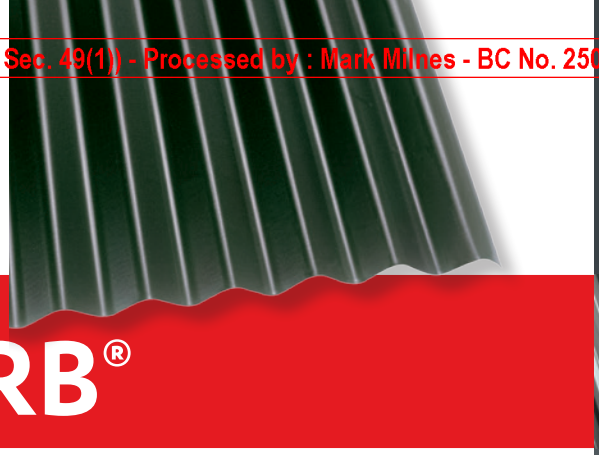
DISCLAIMER:
All details are to be used for indicative purposes only and the designer should consult both the MRM code of practice version 2.2 /2012, E2 and all other relevant building codes
Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary for wall cladding. 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.

OVER 85mm DIAMETER PIPE PENETRATION

MC760 RESIDENTIAL ROOFING

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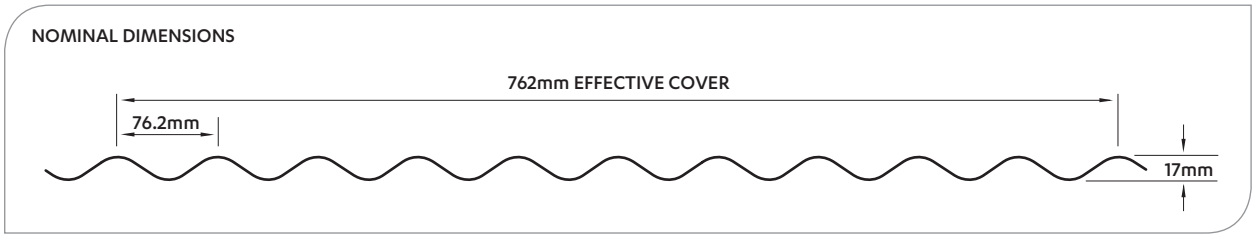
steel&tube
STRONGER IN EVERYWAY



PRODUCT TECHNICAL STATEMENT

CUSTOM ORB®

Profiled Metal Roofing and Cladding



DESCRIPTION

Custom Orb® is a premium quality corrugated profile manufactured under licence to BHP.

APPLICATIONS

- **Residential Roofing & Cladding**
- **Industrial/Commercial Roofing & Cladding**
- **Curving**
- **Specialty Cladding**
- **Ceilings and Linings**

FEATURES

Corrugated steel is a timeless classic. **Custom Orb** is manufactured to controlled tolerances, allowing it to be used with confidence in a great variety of applications.

Custom Orb can be roll curved (bullnosed) to 400mm radius, or spring curved to radii greater than 9 metres depending on grade, thickness and material used (see *Spring Curved Custom Orb Design Guide* for details). It is also popular in perforated patterns for decorative or sound control situations. Matching translucent sheeting is available in G.R.P. (fibreglass) and Polycarbonate.

MATERIALS

Available in metallic coated and pre-painted steel in .40mm and .55mm B.M.T. (base metal thickness), aluminium plain and prepainted in .70mm and .90mm, and other non-ferrous metals.

FASTENERS

Typically: Steelfix 12g x 45mm, Timberfix 12g x 55mm, Class 4 minimum, of material compatible with that being fastened and durability no less than the sheet material. Class 5 or non-ferrous fasteners are recommended for severe or very severe marine environments.

DURABILITY

All material selections must be compatible with prevailing environmental conditions and adjacent materials, see *Roofing Solutions Product Guide* or *Specifiers Guide* for details. Areas not exposed to rain washing will require programmed maintenance.

WARRANTY PLUS

Steel & Tube **Warranty*Plus*** is the most comprehensive warranty available in the industry. **Warranty*Plus*** covers an extended range of performance criteria, is supported back-to back by our suppliers, includes site-specific maintenance requirements and is transferable to subsequent owners.

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PERFORMANCE DATA

MASS (KG/M²)

.40mm B.M.T.	4.08	.55mm B.M.T.	5.54

MAXIMUM SPANS

Base Metal Thickness (mm)	Maximum Spans (mm)	
	Roof	Walls
0.40	1200	1800
0.55	1600	2400

FASTENING REQUIREMENTS

Base Metal Thickness (mm)	Fixings per sheet per support	Roof Span (mm)		
		900	1200	1500
0.40	3	•	•	N/R
	4	•	•	N/R
	5	•	•	N/R
0.55	3	••	•	•
	4	••	•	•
	5	••	•	•

** Suitable for Controlled Traffic ** Suitable for Heavy Traffic N/R Not Recommended*

Wind Zone	High	Very High	Extra High	SED
Design Wind Speed (m/s)	<44m/s	<50 m/s	<55 m/s	<60m/s
Load ULS (kPa)	2.32	3.00	3.63	4.32

Notes:

- *End spans should be not more than 2/3 of maximum internal spans.*
- *Sheet ends should be fastened through every second crest.*
- *To correlate Wind Zone figures to kPa a local pressure factor of 2 has been applied to the entire roof. Specific design is required for roofs designed in accordance with NZS1170 where a local pressure factor of 3 occurs over areas greater than one sheet width or end purlin spacing.*
- *The above tables are governed by seviceability load factors applicable to normal buildings (importance level 2) for all geographic areas.*

MINIMUM PITCH

In accordance with Acceptable Solution E2, the minimum pitch for **Custom Orb** for roofing dwellings is 8˚.
Roof runs in excess of 12 metres should be checked for water runoff capacity.

FOOT TRAFFIC

Foot traffic up the roof must take place with load spread equally across two crests, or over purlin lines. Traffic across the roof must take place along purlin lines.

SPECIFICATIONS

Recommended specifications are available in the branded sections of MasterSpec *BASIC* or MasterSpec *STANDARD*, or from your local Steel & Tube branch or visit www.steeland tube.co.nz.

DESIGN DETAILS

Design details covering many applications are available on our website in CAD and PDF under each product section. Visit www.steelandtube.co.nz.

IMPORTANT PUBLICATIONS

For your installation to perform to its potential, it is essential that it is designed, installed and maintained in accordance with good trade practice. Please refer to:

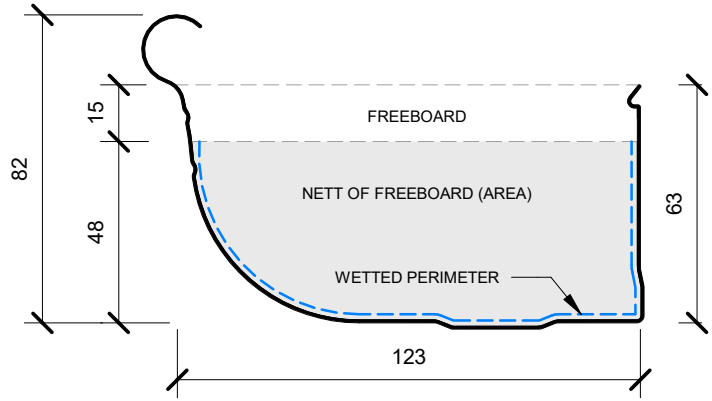
- Steel & Tube: Roofing Solutions Product Guide
- Steel & Tube Roofing Products: Spring Curved Custom Orb Design Guide
- New Zealand Steel: Installation Guide
- New Zealand Steel: Builders and Specifiers Guide
- BRANZ: Good Profiled Metal Roofing Practice
- MRM: New Zealand Metal Roofing and Wall Cladding Code of Practice
- E2/AS1

INSTALLERS

A list of local installers for your area and contract type is available from your local Steel & Tube branch or visit www.steelandtube.co.nz.

Trademark Note:
Masterspec is a registered trademark of Construction Information Limited.
CUSTOM ORB is a registered trademark of BlueScope Steel Limited.

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TOTAL CROSS SECTIONAL AREA	6967mm²
NETT OF FREEBOARD	5186mm²
WETTED PERIMETER	191mm

TOTAL CROSS SECTIONAL AREA OF GUTTER ONLY TO BE USED WHEN INSTALLED WITH OVERFLOW (SEE TABLE)

MANUFACTURED IN PALMERSTON NORTH, HAMILTON, CROMWELL, CHRISTCHURCH, NEW PLYMOUTH

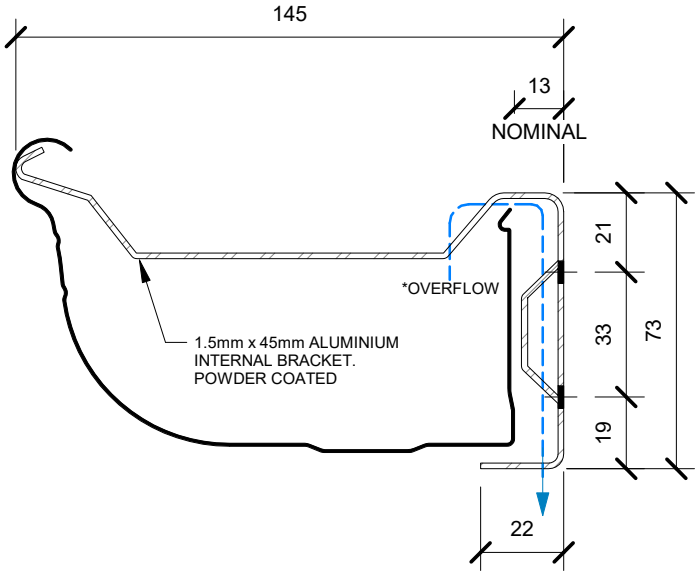
OVERFLOW WITH SOFFIT =

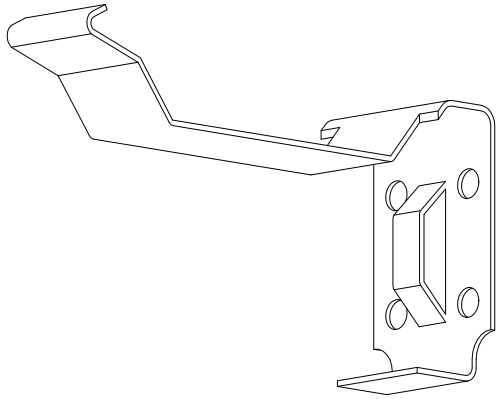
BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 3mm.

OVERFLOW WITH NO SOFFIT OVERHANG =

BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 10mm.

AS PER SECTION 5.3.2.3B OF THE NZ MRM COP.





3D GUTTER BRACKET

BRACKET SPACINGS 750MM MAX EXCEPT FOR SNOW LOAD AREAS = 600MM MAX.

NOTES:
- ALL DIMENSIONS ARE NOMINAL AND MAY VARY WITH MATERIAL
- *THE OVERFLOW SHOULD HAVE ADEQUATE CAPACITY. THE OVERFLOW OF THE GUTTER NEEDS TO BE CONSIDERED WHEN DESIGNING AND INSTALLING THE METALCRAFT ROOFING GUTTER*

Metalcraft Roofing
www.metalcraftgroup.co.nz

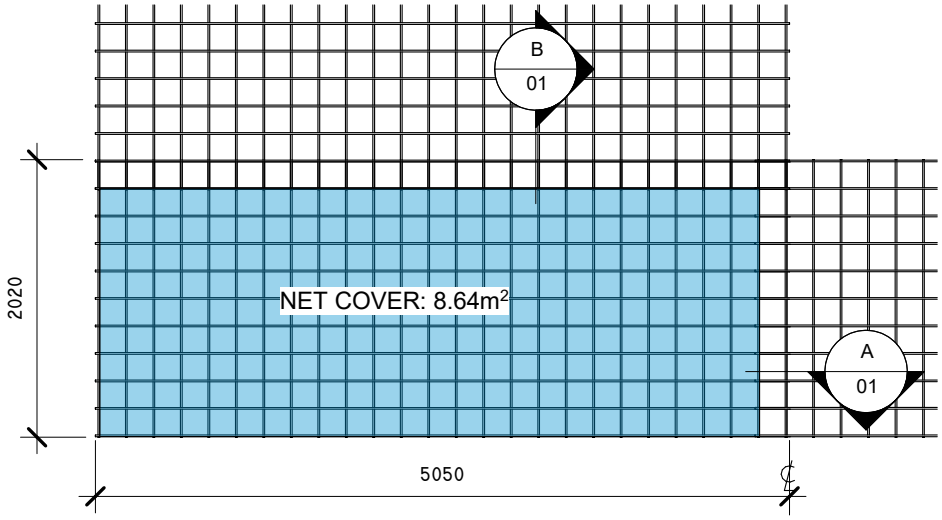
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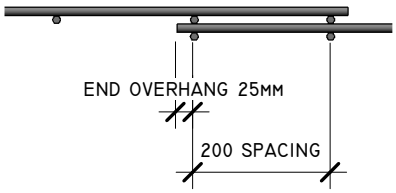
Colonial Quad Gutter

Reference MC Gutters | Date MAY 2024 | Scale 1 : 2 @ A4 | Sheet 02

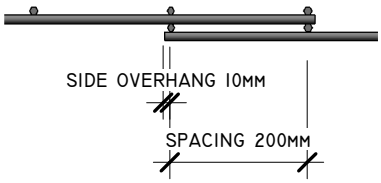
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UNITED STEEL
Stay strong.





A Section A
1 : 10



B Section B
1 : 10

MAIN WIRE DIAMETER	6.10mm
LONG WIRE LENGTH	5050mm
SHORT WIRE LENGTH	2020mm
SHEET GROSS	10.201m²
SHEET NET	8.64m²
SPACING	200mm
SIDE OVERHANG	10mm
END OVERHANG	25mm
LAP	200mm*

*This lap has been determined by extensive test programme to validate it's physical performance and verified by a certified engineer

STRENGTH (KN/METER WIDTH)	73.0617
WIRE GRADE	500E
TOTAL WEIGHT (KG)	24.78
KG'S PER m²	2.29385m²

YIELD STRENGTH	≥500Mpa & ≤600MPa
CROSS SECTION	146.12
UNIFORM ELONGATION	≥10%

United Steel Ductile SE62 Standard Mesh

M62

Reference Designer

Manufactured in accordance with ASNZS4671:2019 Steel Reinforcing Materials. Batch test certificates available on request. Lap diagrams in accordance with NZS3103:2006 Concrete Structures Standard. Please consult your engineer for your project specific lap splice.

Drawn by. United Steel

Date MAR 2023

Scale As indicated

Sheet 01

United Steel

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BRANZ Appraised
Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY



Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Free phone: 0800 806 595
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www.thermakraft.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
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Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

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Building Regulations

New Zealand Building Code (NZBC)

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

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

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

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Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

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

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

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Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

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

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

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Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

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

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

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

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

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Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

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

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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BRANZ

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

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

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innova™ INNOVATIVE BUILDING SYSTEMS

BGC FIBRE CEMENT - NZ

1 - IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME	BGC Fibre Cement Sheets
OTHER NAMES	Duraliner Plus / Durasheet / Duratex / Duralattice / Duralux Plus / Duraplank / Ultraform / Compressed / Ceramic & Tile Underlay / Vinyl and Cork Underlay / Nuline Plus / Duracom / Duragrid / Durascape / Duragroove / Stonesheet / Stratum / Stratum Duo / Stratum Duo Offset / Stratum Trio / Stratum Contour / Durafloor / Durabarrier / Intergroove / Duracom Greystone Charcoal / Duracom Greystone Natural / Duracom Greystone Basalt / Durascape Greystone / Durapanel / Duracom Earthstone Quartzite / Duracom Earthstone Anthracite / Duracom Eartstone Ochre
UN NUMBER	None Allocated
DANGEROUS GOODS CLASS & SUBSIDARY RISK	None Allocated
HAZCHEM CODE	None Allocated
POISONS SCHEDULE NUMBER	None Scheduled
USE(S)	Fibre cement sheets for use on internal/external wall linings and soffits and internal/external flooring. Refer to product manual for installation.
COMPANY	BGC (Australia) Pty Ltd T/A BGC Fibre Cement
ADDRESS	77 Cryers Rd, East Tamaki, Auckland 2013
WEBSITE	www.bgcinnovadesign.co.nz
TELEPHONE	09 273 1457
FAX	09 273 1461
EMERGENCY PHONE NUMBER	111 Fire Brigade, Police and Ambulance
POISON INFORMATION CENTRE	0800 764 766

2 - HAZARDS IDENTIFICATION

The potential health hazards are related to dust generated from these materials during cutting, sanding and the use of power tools.

The intact BGC Fibre cement products do not give off dust or fume during installation or when installed. However, cutting, breaking, drilling, sanding, rebating or sawing the boards may generate dust. Inhaling dust liberated from BGC Fibre cement may aggravate pre-existing respiratory conditions and may cause cancer.

Smoking and inhalation of airborne particulates from other sources may increase the risk of lung disease.

Work areas and storage areas should be deemed smoke-free zones.

GHS CATEGORY	PICTOGRAM	SIGNAL WORD	HAZARD CODE	HAZARD STATEMENTS
Carcinogenicity, Cat 1A		Danger	H350	May cause cancer through inhalation of dust
Specific target organ toxicity (repeated exposure), Cat 1		Danger	H372	Causes damage to respiratory system through prolonged or repeated exposure

OTHER CLASSIFICATIONS	Contact with dust and fibres from this product may cause skin and eye irritation due to physical reaction (e.g. rubbing or scratching).
PRECAUTIONARY STATEMENTS	Observe the following precautionary measures when handling, installing or processing the product.

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BGC FIBRE CEMENT - NZ

Prevention Precautionary Statement Codes

CODE	PRECAUTIONARY STATEMENT
P201	Obtain special instruction before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe in dust.
P264	Wash hands and face thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P281	Use personal protective equipment as required.

Response

P308+P313	If exposed or concerned: get medical advice.
P314	Get medical advise if you feel unwell.

Disposal

P501	Dispose products in accordance with local/region/national/international regulations.

3 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	PROPORTION	EXPOSURE LIMITS
Calcium silicate hydrate	66997-15-1	40%-60%	10.0 mg/m³ measured as inspirable dust
Crystalline silica	14808-60-7	20%-60%	0.05 mg/m³ measured as inspirable dust
Paper pulp (cellulose)	9004-34-6	< 10%	10 mg/m³ measured as inspirable dust
Calcium silicate aluminate	21645-51-2	< 5%	10 mg/m3 measured as inspirable dust
Water		< 15%	
Other non-hazardous ingredients (pigments, sealers, coatings)		< 5%	

4 - FIRST AID MEASURES

SWALLOWED	Give copious amounts of water to drink to dilute stomach contents. Wash mouth and lips with water. Do not induce vomiting. If symptoms persist, seek medical attention.
EYE	Remove contact lens or eyeglasses. Flush thoroughly with flowing water for at least 10 minutes. If redness persists, seek medical attention.
SKIN	Wash thoroughly with soap and water. Contact physician if irritation persists or later develops.
INHALED	Remove to fresh air.
ADVICE TO DOCTOR	Treat symptomatically.

5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS	BGC Fibre Cement products are non-flammable and non-combustible.
SUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
UNSUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
PRODUCT OF COMBUSTION	BGC Fibre Cement products are non-combustible and non-flammable.

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BGC FIBRE CEMENT - NZ

6 - ACCIDENTAL RELEASE MEASURES

SPILL AND DISPOSAL	Use wet sweeping and/or vacuuming to clean up dust and waste. Dry sweeping should not be attempted. Vacuuming with an M or H class industrial vacuum is recommended. Do not wash material down storm water drains. Bagged waste should be placed in containers and disposed of with other construction waste in accordance with local authority guidelines.

7 - STORAGE AND HANDLING

STORAGE	Fibre cement sheets should be stored flat and level in a covered dry area. Avoid contact with strong acids and strong oxidizing agents.
HANDLING	Crystalline silica dust may be generated during processing and handling. Use appropriate personal protective equipment to reduce exposure to respirable silica dust. Keep dust generation to a minimum using proper tools. Wear protective equipment to prevent skin and eye contamination. Manual handling should be in accordance with Manual Handling Regulations and Codes. Maintain the work area clean by using wet sweeping or vacuuming with an M or H class filter. Keep fibre cement from incompatible materials. Read and understand all safety precautions before handling fibre cement.

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE STANDARDS	BGC Fibre Cement has adopted the following maximum exposure limits, corresponding to the limits set out by the CoA, NOHSC; Exposure Standards for Atmospheric Contaminants in the Occupational Environment:- • Calcium silicates: 10 mg/m³ time-weighted average (TWA) as inspirable dust • Cellulose: 10 mg/ m³ TWA as respirable dust • Crystalline silica (quartz): 0.05 mg/ m³ TWA as respirable dust BGC Fibre Cement recommends keeping exposures to dust as low as practicable and work in a well-ventilated space.
ENGINEERING CONTROLS	Keep exposures to dust as low as practicable, preferably below 5 mg/m3 TWA (time-weighted average) of inspirable dust, to prevent respiratory discomfort. Cutting, sanding, rebating, drilling, grinding and other machining activities will generate dust. Power tools should be fitted with a local dust extraction device with a HEPA M or H class filter. Hand tools (unpowered) generate less dust when cutting or sanding. If generated dust cannot be avoided, follow recommendations for protective equipment. Work in the open air or near external openings in the building, for adequate ventilation. Where dust is generated, in confined spaces, local mechanical ventilation should be used, to direct the dust away from the work areas. Personal protective equipment should be used in confined spaces and where dust levels exceed the maximum levels. Use safe work practices to minimize dust release and exposure. Clean work areas regularly by wet sweeping or vacuuming with a HEPA class M or H filtered vacuum. Never attempt dry sweeping as it excites silica dust into the workers' breathing zone.
VENTILATION	Where safe work practices, adequate engineering and material handling controls are in place, ventilation is not normally required. Use local mechanical ventilation and or dust extraction in confined areas and where dust could escape into the working environment.

TOOLS AND EQUIPMENT-

REPAIR AND MAINTENANCE	Vacuum and or wipe down all tools and equipment prior to maintenance and repair work. Avoid compressed air cleaning where possible, follow recommended exposure controls and protective equipment as listed below.
SKIN PROTECTION	Avoid direct skin contact with fibre cement products. Wear loose appropriate clothing, such as long sleeved shirts and long trousers, head protection and standard duty leather or equivalent gloves, which comply with Australian Standard AS 2161: Industrial Safety Gloves and Mittens. Wash work clothes regularly and do not shake out dust.
EYE PROTECTION	Wear dust resistant non-fogging safety goggles or glasses, which comply with Australian and New Zealand Standard AS/NZS 1336: Recommended Practices for Eye Protection.

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BGC FIBRE CEMENT - NZ

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION cont.

RESPIRATORY PROTECTION	BGC Fibre Cement recommends particulate respirator , which comply with Australian and New Zealand Standard AS/NZS 1715: Selection, Use and Maintenance of Respiratory Protective Devices, and Australian and New Zealand Standard AS/NZS 1716: Respiratory Protective Devices when Exposed to Dust), be used at all times. The type of respirator to be used will depend on the level of exposure determined through sampling. If in doubt about the exposure level, use a respirator that offers the highest protection from respirable silica.
PERSONAL HYGEINE	Do not eat, drink, or smoke whilst handling and working with fibre cement. Wash dust from skin with mild soap and water after working with fibre cement.
FLAMMABILITY	Fibre cement products are non-combustible and non-flammable.

9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Factory applied blue tint on face of the Duratex™, and a white tint to the face of 4.5, 6.0, 9.0 and 12mm Compressed while all other products are cement grey finish.	BOILING POINT (°C)	Not Applicable
VAPOUR PRESSURE	Not Applicable	SPECIFIC GRAVITY (H_2O = 1)	Not Relevant
FLASH POINT	Not Applicable	FLAMMABILITY LIMITS	Not Flammable
SOLUBILITY IN WATER	Not Relevant	REACTIVITY (I.E. WITH WATER OR AIR)	Not Reactive
AUTO-IGNITION TEMPERATURE (°C)	-	ODOUR THRESHOLD	Slight cement odour
LOWER EXPLOSION LIMIT	-	UPPER EXPLOSION LIMIT	-
SELF ACCELERATING DECOMPOSITION	-		

10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY	Stable and non-reactive.
HAZARDOUS REACTIONS	None
CONDITIONS TO AVOID	Dust generation during handling, processing and inhalation.
INCOMPATIBLE MATERIALS	Strong acids and strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS	None

11 - TOXICOLOGICAL INFORMATION

Health Effects: Acute (short term)

SWALLOWED	Unlikely to occur, however may result in symptoms of acute indigestion.
EYES	Excessive dust may cause eye irritation.
SKIN	The dust, particularly in association with heat and sweat, can cause irritation, but it is not absorbed through skin.
INHALED	Inhaled dust may cause nasal, throat and lung irritation, symptomatic through excess mucus and coughing.

Health Effects: Chronic (long term)

INHALED	If respirable crystalline silica levels are not controlled, repeated exposure to excessive dusts of fibre cement products could result in chronic lung disease silicosis. However, if the practices noted in this SDS are followed during cutting and sanding, exposure to airborne dusts should be within recommended occupational exposure standards and no long-term effects are expected.

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BGC FIBRE CEMENT - NZ

12 - ECOLOGICAL INFORMATION

ECO-TOXICITY	BGC Fibre Cement products are not toxic to aquatic and terrestrial organisms.
PERSISTENCE AND DEGRADABILITY	No data
BIOACCUMULATIVE POTENTIAL	No data
MOBILITY IN SOIL	A low mobility would be expected in a landfill situation.

13 - DISPOSAL CONSIDERATION

DISPOSAL	BGC Fibre Cement products must be disposed into a landfill site in accordance with local authority guidelines. Measures should be taken to prevent dust generation during disposal, and exposure and personal precautions should be observed (see above).

14 - TRANSPORT INFORMATION

TRANSPORT	No special transport requirements are necessary.

15 - REGULATORY INFORMATION

Not scheduled.

16 - OTHER INFORMATION

For further information on this product, please contact:
BGC (Australia) Pty Ltd (ABN 6200 5736 005 008) T/A BGC Fibre Cement
77 Cryers Rd, East Tamaki, Auckland 2013
Phone: 09 273 1457
Fax: 09 273 1461

ADDITIONAL INFORMATION

Australian Standards References

AS/NZ 1336	Recommend Practices for Occupational Eye Protection
AS/NZ 1715	Selection, Use and Maintenance of Respiratory Protective Devices
AS/NZ 1716	Respiratory Protection Devices
AS 2161	Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)

Other References

NOHSC:1008 (2004)	Approved Criteria for Classifying Hazardous Substances
MODEL CODE OF PRACTICE	Preparation of Safety

AUTHORISATION

REASON FOR ISSUE	Add new product names in Section 1. Updated Section 2, 3 and 8.
DATE OF ISSUE	May 2023

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INSTALLATION GUIDE

Thermakraft™
ALUBAND
Window Flashing Tape



Thermakraft™ ALUBAND

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Bituminous adhesive flexible window flashing tape.

Kingspan Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Product usage

Aluband Window Flashing Tape is installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.

BRANZ Appraised
Appraisal No.878 [2019]

Kingspan®

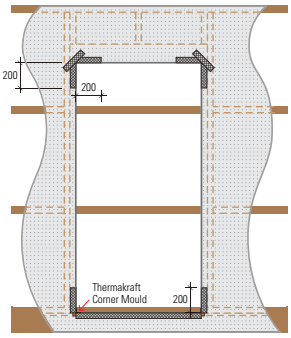
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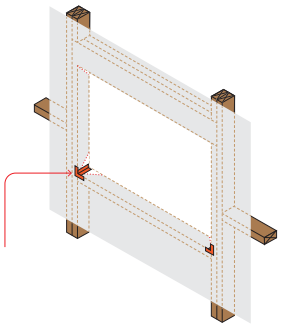
Aluband

Bituminous adhesive flexible window flashing tape

Application Method

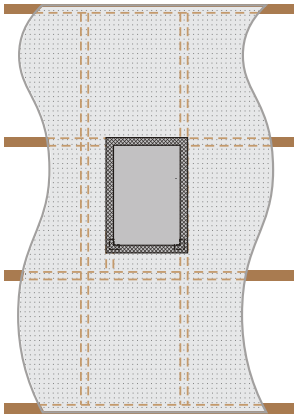
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes. Note the following: 150mm wide tape is used for 100mm wide window or door framing, and the 200mm wide tape is used for 140mm to 150mm wide reveals. (With steel framed houses use Double Sided Tape to attach the Corner Moulded Piece to metal framing).
- Measure 200mm up both jambs, add 400mm to the length of the window sill and cut to suit that measurement.
- First remove the release film from the tape; align the back edge of the tape with the inside edge of the sill.
- Using an appropriate tool, firmly press the tape onto the wall underlay to ensure good adhesion and ensure the tape is fitted tightly into the jamb to sill corners.
- At the sill/jamb corners cut the tape from the external edge of the frame outwards. Fold flaps back onto the wall underlay/air barrier and press tape firmly for good adhesion.
- Proceed to fit the Window Flashing Tape to the top corners of the frame (200mm across lintel x 200mm down jamb).
- For window or door lintel to jamb junction, apply a butterfly using the 75mm wide x 100mm long Aluband. Fix at a 45° angle to the jamb with an overlap at the corner of 3mm.
- Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.
- Window Flashing Tape is used to seal the up stand of the window head flashing to the building underlay. (Refer to the cladding manufacturer's details).
- Aluband must NOT be left exposed to the weather or UV for more than 42 days.

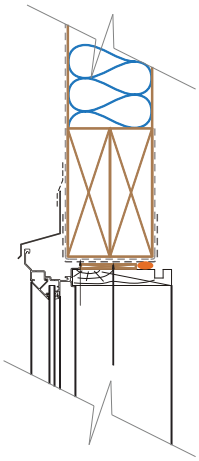




Window and door frames

- Staple orange corner piece to the bottom corner sill. Place tape 200mm up the jambs and across the full width of the sill opening. Align tape with the back of the frame opening.
- At the top corner place tape 200mm down the jamb and 200mm across the lintel. Place a strip of 75mm tape across the top corner.





Application Tips

- Always use an appropriate tool to apply firm pressure onto the tape during installation. This will ensure proper adhesion of the tape to the building underlay or other substrates.
- Install the Aluband Window Flashing above 5°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

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Aluband

Bituminous adhesive flexible window flashing tape

Important Information

To assist the adhesion of Aluband window flashing tape, Kingspan suggests the following two options. This is particularly relevant in the following conditions:

- In temperatures below 5°C.
- When adhering to difficult to bond substrates such as rough/uneven surfaces.
- When the tape has been lifted or moved after initial application.

Application of Heat:

- Press the window sill tape into position in the usual manner.
- Apply a gentle heat, using a heat gun on low heat to the top of the window sill tape.
- Once the adhesive starts to soften use an appropriate tool or a roller to firmly press the tape into the wall underlay ensuring good adhesion.
- Take care not to damage the foil face lining.

Difficult to Bond Substrates Surface Preparation:

- Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes.
- Application of Scotch® Super 77™ Spray Adhesive: When installing Aluband Flashing Tapes on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

Adhesives and Sealants:

- After the installation of Aluband window flashing tape, ensure that the edges do NOT come into contact with solvent based sealants or adhesives. Solvents in these products can adversely affect the adhesion or dissolve the bituminous adhesive and cause it to run.
- If the application of solvent based adhesives or sealants are necessary, cover the edges with Thermakraft joining tape or a true aluminium foil tape to form a barrier. With a true aluminium foil tape, the installer must test the bonding strength.
- The installer must check the compatibility of the Aluband window flashing tape with the sealant or adhesive product to ensure the components are fully compatible.

Handling and Storage

Aluband window flashing tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

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

BRANZ Appraised
Appraisal No.878 [2019]

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Issue 5.0, September 2022



INSTALLATION GUIDE

Thermakraft™
THERMAKRAFT
215

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Thermakraft™

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as 'Building Paper' Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Kingspan®

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof Pitch	Span	Underlay Support Required	
		Horizontally Installed	Vertically Installed
≥ 10°	> 1200mm	Yes	Yes
	≤ 1200mm	No	No
< 10° (Min 3°)	> 1200mm	Yes	Yes
	≤ 1200mm	No	Yes

- Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.
  Note: Thermakraft 215 can move downwards. To prevent this, it must be 'Captured' by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Kingspan recommend using Ausmesh Roof Safety Mesh, Ausnet hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.
- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft 215 may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with E2/AS1 8.2.5.
- Do NOT Run Thermakraft 215 longer than 10m in length.

Application Method (Wall)

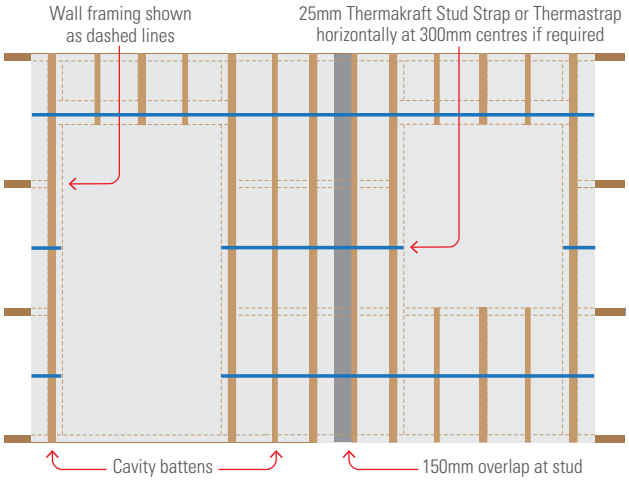
- Fix Thermakraft 215 underlay with the lap line printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215 underlay is not cut and prepared for window installation until the arrival of the windows. Minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft Stud Strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 7 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

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

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

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

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Issue 2.0, September 2022

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INSTALLATION GUIDE

Thermakraft™ WATERGATE Plus



Thermakraft ONE WRAP SYSTEM

10 Products - One system
One warranty

Thermakraft™ WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay for use behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

CodeMark BRANZ-CM-1002-Rev 2

BRANZ Appraised Appraisal No.695 [2017]

Kingspan®

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Watergate Plus

Premium Synthetic Wall Wrap

Application Method

- Fix Watergate Plus underlay with printed side facing the exterior and run horizontally.
- Fix to all exterior walls from below bearers to the top plate. Watergate Plus underlay is available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to cover from below the bottom plate to the top plate.
- **Timber Framing:** Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically.
- **Steel Framing:** Ensure frame is free from oil, dust and dirt. Fix securely using construction grade double-sided tape or adhesive or galvanized flat head screws that are appropriate for external framing and roofing use, at 300mm centres.

  Note: Check adhesive compatibility with Watergate Plus and the steel framing materials before use.

  If using a tape: Apply double-sided tape onto steel frame studs and only peel off the forward-facing liner once Watergate Plus is ready to be installed. When ready, peel off approximately 2m of tape liner at a time and press Watergate Plus firmly onto tape, ensuring it is taut.

  Note: The double-sided tape is to temporarily hold the Watergate Plus in place until the batten and/or cladding is installed. The screws used to fix these are the permanent fixings for Watergate Plus.
- Minimum of 150mm lap is required at joins. All vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of Watergate Plus.
- Cover all windows and door openings with Watergate Plus underlay. It is recommended that the Watergate Plus underlay is not cut and prepared for window installation until the arrival of the windows.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should be cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.

  Note: In accordance with NZBC Acceptable Solution E2/AS1 and NASH Building Envelope Solutions: 2019 (E2/AS4), wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm, Thermakraft Stud Strap or Thermastrap run horizontally at 300 centres is an acceptable means of prevention.
- Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 90 days. Watergate Plus underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZBC B2 Durability.
- Repair small damaged areas with any Thermakraft window flashing tape or Thermakraft Premium Joining Tape. Any large areas which require repair may be covered with a second layer of underlay with a lap of 150mm and then taping.
- Watergate Plus underlay must be installed by, or under the guidance of a licensed building practitioner.



Fix Watergate Plus securely to the frame.

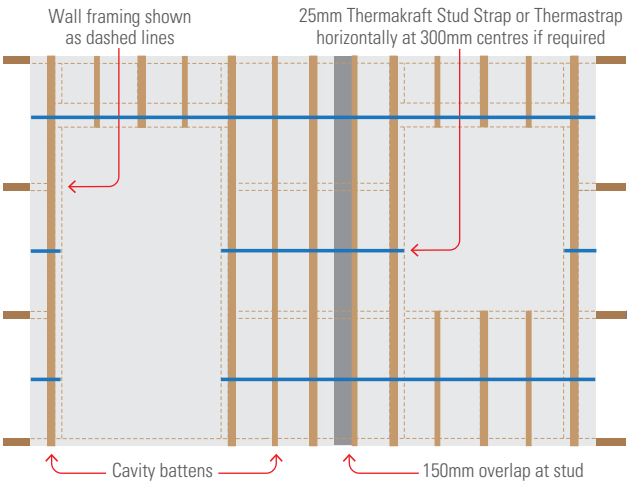




On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

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



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Watergate Plus

Premium Synthetic Wall Wrap

Handling and Storage

Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

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

CodeMark BRANZ-CM-1002-Rev 2

BRANZ Appraised
Appraisal No.695 [2017]

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Issue 5.0, September 2022

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BRANZ Appraised
Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY



Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Porirua 5240,
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Tel: 04 237 1170
branz.co.nz

Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Building Regulations

New Zealand Building Code (NZBC)

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

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

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

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

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

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

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Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

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

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

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Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

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

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

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

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

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Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

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

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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BRANZ

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

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

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

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

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Technical Data

IN-LINE FAN KITS - SF Shower Fan Models

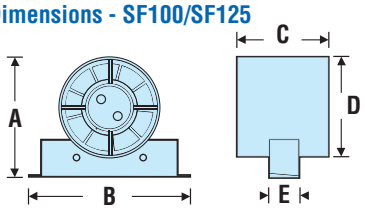
GENERAL INFORMATION

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)

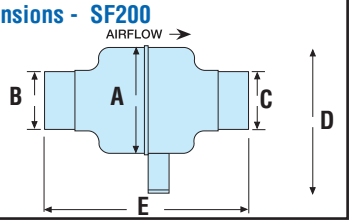
DIMENSION INFORMATION

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	-

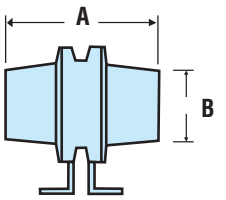
Dimensions - SF100/SF125



Dimensions - SF200



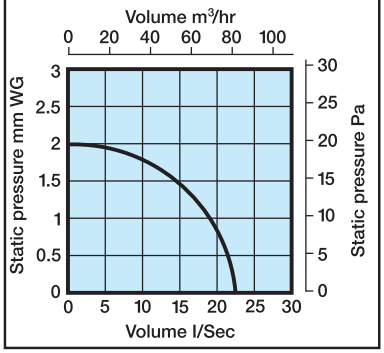
Dimension - SF150



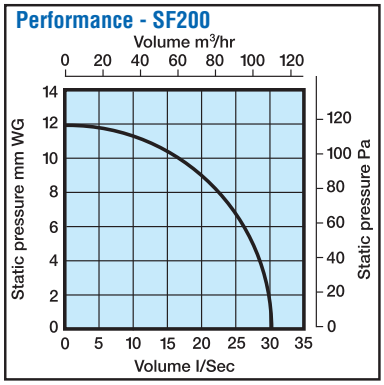
TECHNICAL SPECIFICATION

Models	SF100	SF200	SF125	SF150
Fan	ID100	CFD200	ID125	Hyper
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan Performance	23l/s, 85m³/hr	31l/s, 110m³/hr	36l/s, 130m³/hr	89l/s, 320m³/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

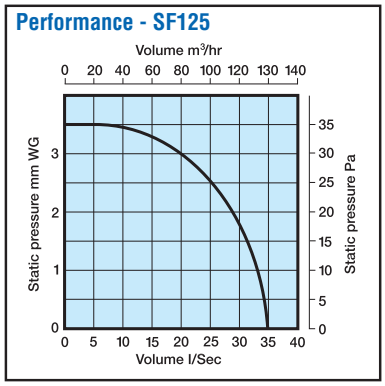
Performance - SF100



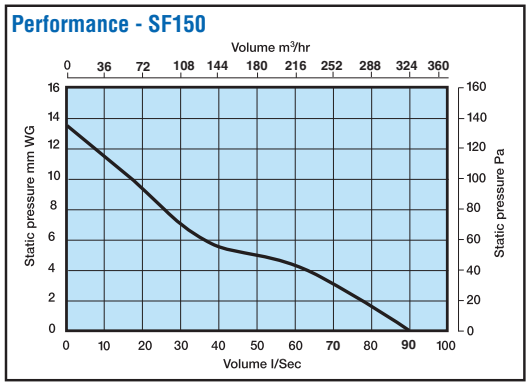
Performance - SF200



Performance - SF125



Performance - SF150



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

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HURUNUI DISTRICT COUNCIL
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Phone: 03 314-8816 | Email: info@hurunui.govt.nz
Web: hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil

To comply with the Global Stormwater Discharge Consent conditions for Hurunui District Council (HDC), an Erosion and Sediment Control Plan (ESC) is required before construction commences.

1. The Erosion and Sediment Control Plan shall meet the requirements of the 'Erosion and Sediment Control Guideline, Environment Canterbury' https://esccanterbury.co.nz/ for construction,
   and 'Water Sensitive Design for Stormwater' (GD004)
   https://content.aucklanddesignmanual.co.nz/regulations/technical-guidance/Documents/GD04%20WSD%20Guide.pdf
   for design and operation.

2. Prior to commencing works authorised by this consent, the consent holder shall submit a Sediment & Erosion Control Plan to the 3 Waters Planning Team. The plan shall include, as a minimum:-

   i. the mechanisms used to ensure that waterborne sediment does not leave the site, during and/or after construction;

   ii. the mechanisms used to control dust;

   iii. the procedures for keeping stormwater systems, adjacent footpaths and roads free of mud, debris and obstructions.

   iv. how parking associated with construction will be managed.

   v. the nature and location of signage to be erected to warn pedestrians of the construction site and associated construction vehicles.

3. Sediment-laden water must not be allowed to leave the site.

4. The best possible means shall be employed to minimise windblown dust, soil and the associated wind erosion.

5. Adequate drainage and silt control must be in place during and following the earthworks, so as to avoid or mitigate any adverse environmental effects.

6. The consent holder shall implement suitable measures to prevent earth being deposited on public roads. In the event that the materials are deposited on the road, the consent holder shall take immediate action at their own expense to remediate the contamination resulting from the construction works. The measures shall remain in place until completion of work.

7. Any damage/sediment build up to the stormwater components (kerb and channel, sumps, Stormwater manholes, soakpits, retention/detention basins etc.), as a result of unapproved construction phase discharge, shall be cleaned/repaired at the consent holder's expense.

8. The Site Manager will ensure that the works are executed in accordance with the approved plans and will continue to supervise and monitor the ESCP works. This will be verified by the HDC Building Officers.

9. All earthworks shall be undertaken in accordance with the provisions of N.Z.S 4431 (only applicable for Resource Consents/Land use consents or BCs where large volume of earthworks is involved).

10. Immediately upon completion of earthworks, all earth worked areas shall be regrassed or planted to ensure the surface is stabilised.



Small construction sites

THE ABSOLUTELY ESSENTIAL HEALTH AND SAFETY TOOLKIT

WORKSAFE

ABOUT THIS TOOLKIT

This toolkit[1] provides useful checklists for common health and safety issues on small construction sites. It will help you manage or avoid these issues to ensure the health and safety of everyone on and around your worksite, including workers, clients and members of the public. Links to more detailed advice are included where relevant.

Doing nothing is not an option

Construction is among the top four sectors for highest worker injury rates. Worker fatalities are more than double the average for all other sectors. The most common injuries are ones to the lower back and spine. The most common cause of serious harm injuries are slips, trips and falls from height. Males aged 20-24 are most likely to be injured.

The costs of workplace injuries to New Zealand business are substantial – ACC pay more than $100 million dollars per year in the construction sector. The direct and indirect costs of all workplace injuries in New Zealand are over $1.3 billion.

Make use of this toolkit. If we all work together we can make the construction industry a healthier and safer place to work in.

Health and safety legislation

The Health and Safety at Work Act 2015 (HSWA) is New Zealand's key work health and safety law. It introduces new responsibilities for managing the work related risks that can cause serious injury, illness or even death.If you have good health and safety practices in place now, you are likely to be well on your way. However the new Act introduces some new features and it's important for you to review your approach to work health and safety.

How to contact WorkSafe

For further advice on health and safety at work, contact the WorkSafe Response Team on (freephone) **0800 030 040**.

[1] The content in this toolkit has been adapted from the Health and Safety Executive publication *The absolutely essential health and safety toolkit for the smaller construction contractor* published in 2008 and available at www.hse.gov.uk
It does not cover legal requirements and is a guide only; for information on how to comply with the law, see the relevant legislation at www.legislation.govt.nz

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1.0 General management

IN THIS SECTION:

1.1 Managing a small construction site

1.2 When to notify WorkSafe

1.3 Contracting and subcontracting

1.1 Managing a small construction site

The checklists below cover some things to consider when managing a small construction site under the Health and Safety at Work Act 2015 (HSWA) which will imposes duties on the 'PCBU'.

What is a PCBU?

The HSWA defines 'PCBU'. It is essentially a person conducting a business or undertaking, whether alone or with others and whether for profit or gain or not. The PCBU is in the best position to control risks to work health and safety. This is why the PCBU has the primary duty to ensure health and safety.

Despite its name, a PCBU can be a business entity, such as a company, as well as an individual person. An individual person will generally be a PCBU if they are a sole trader or a self-employed person.

Examples of a PCBU include:

- a manufacturing business
- an import business
- an owner-driver of their own courier business
- a self-employed person operating their own business
- a partnership
- a building company, whether a principal contractors or a sub-contractors
- a not-for-profit organisation that employs admin staff.

PCBUs have a number of duties under the Health and Safety at Work Act. PCBUs with overlapping duties must work together to achieve health and safety at work.

Keep this in mind when reading the checklists. Many of the things covered in this booklet will help PCBUs to meet their duties under the HSWA.

See the WorkSafe website for more information.

Do you make sure workers:

- are trained, competent and fit to do the job safely and without putting their own or others' health and safety at risk?
- are properly supervised and given clear instructions?
- have access to washing and toilet facilities?
- have the right tools, equipment, plant and personal protective equipment?
- are involved in discussions about health and safety issues?
- are given opportunities to participate in improving health and safety?



1.2 When to notify WorkSafe

In an emergency: *call the emergency services by dialling **111***.

A PCBU must notify WorkSafe as soon as possible if any of the following 'notifable events' occur:

- the death of a person
- a notifiable injury or illness
- notifiable incident.

Call the WorkSafe Response Team on freephone **0800 030 040** (24 hours) and choose option 1.

Fill in and submit a notification form within seven days at worksafe.govt.nz *Reporting: Serious Harm*.

Some types of work also require you to notify WorkSafe. These include where a worker could fall 5 m or more, some excavation work, working involving asbestos or working underground. For a full list of notifiable work and more information on notifable events, see the WorkSafe website.

For a hazardous substances emergency: call the New Zealand Fire Service on 111 and then the WorkSafe Response Team directly on 0800 030 040.

DON'T DISTURB THE SCENE

You must not interfere with an accident scene until authorised by a health and safety inspector. Exceptions include certain situations, such as when people or property are at risk. If you require scene clearance or other immediate assistance from a health and safety inspector, call WorkSafe on 0800 030 040.

1.3 Contracting and subcontracting

When contracting or subcontracting work do you:

- check the health and safety performance of the people you plan to use?
- give them the health and safety information they need for the work?
- talk about the work with them?
- hold regular discussions about how the work is going, including safety problems and concerns?
- make sure that you have provided everything you agreed (eg safe scaffolds, the right plant, access to toilets and other welfare facilities, etc)?
- check their performance and remedy any shortcomings?

For more information for PCBUs check for updates on the WorkSafe and New Zealand Legislation websites:

worksafe.govt.nz

www.legislation.govt.nz

2.0 Health and safety checklist

IN THIS SECTION:

2.1 Site and services

2.2 Working at height

2.3 Moving material

2.4 Working with vehicles and machinery

2.5 Critical health risks

2.6 Worker wellbeing

2.7 Emergency situations

The following pages provide you with an essential checklist of some of the hazards most commonly found on construction sites.

The questions will help you decide whether your site is a safe and healthy place to work. It is not a full list.

2.1 Site and services

Access on site

- Can everyone get to their place of work safely – and work there safely?
- Are access routes in good condition and clearly signposted?
- Do edges that people could fall from have suitable edge protection?
- Are holes protected with clearly marked and fixed covers to prevent falls?
- Is the site tidy, and are materials stored safely?
- Is lighting good enough?



Electricity and other services

- Have all necessary services been provided on site before work begins? Have you also identified existing services present on site (eg electric cables or gas mains) and taken effective steps, if necessary, to prevent harm from them?
- Is the supply isolated from earth with a voltage between phase and earth conductors not exceeding 230 volts?
- Are electrical extension cords connected to power tools using a Residual Current Device (RCD) or Isolating Transformer?

- Are cables and leads protected from damage?
- Are all connections to the system properly made and are suitable plugs used?
- Are tools and equipment checked by users, visually examined on site and regularly inspected and tested by a competent person?
- Have hidden electricity cables and other services been located (eg with a locator and plans) and marked, and have you taken precautions for safe working?
- Where there are overhead lines, has the electricity supply been turned off, or have other precautions been taken, such as providing 'goal posts' or taped markers?



Protecting the public

- Is the worksite fenced off from the public?
- Do roadworks have barriers around them and are the barriers lit?
- Are the public protected from falling material?
- Is clear signage present to warn people of danger (eg 'Keep out', 'Asbestos removal in progress')?

When work has stopped for the day:

- is the boundary secure?
- have steps been taken to prevent any unauthorised access (eg are all ladders removed or their rungs boarded so they can't be used)?
- are excavations and openings securely covered or fenced off?
- is all plant immobilised to prevent unauthorised use?
- are bricks and materials safely stacked?
- are flammable or dangerous substances locked away in secure storage places?



2.2 Working at height

- Have you ensured there is appropriate and fit-for-purpose means to prevent workers from falling from height?
- Have you planned the work properly and identified suitable precautions to make sure work can be carried out safely?
- Have you thought about whether you can avoid working at height by using different equipment or a different work method?
- Can you use equipment that will prevent a fall from happening, such as scaffolding or a mobile elevating work platform?
- Can you put in place measures to reduce the distance and consequences of a fall should one happen, such as nets, soft landing systems or personal fall prevention and protection equipment (eg a harness system)?
- Will the weather conditions threaten the health and safety of those carrying out the work?
- Have you thought about all the options and are you certain that you are gaining access to height using the safest means possible?

For more information, see worksafe.govt.nz

Scaffolds

- Are scaffolds erected, altered and dismantled by competent people?
- Are all uprights provided with base plates (and, where necessary, timber soleboards)?
- Are all uprights, ledgers, braces and out riggers in position?
- Is the scaffold secured to the building or structure in enough places to prevent collapse?
- Are there double guard rails and toe boards, or other suitable protection, at every edge to prevent falling?
- Are additional guards provided to prevent stacked materials such as bricks falling from scaffolds (eg kickboards, toeboards or screens)?
- Are the working platforms fully planked, and are the planks arranged to avoid tipping or tripping?
- Are there effective barriers or warning notices in place to stop people using an incomplete scaffold (eg where working platforms are not fully planked)?
- Is the scaffold strong enough to carry the weight of materials stored on it and are these evenly distributed?



- Are scaffolds being properly maintained?
- Does a competent person inspect the scaffold or proprietary mobile scaffold regularly (eg at least once a week; and always after it has been altered, damaged and following bad weather)?
- Are the results of inspections recorded?
- Are scaffolds erected using using safe work methods, and are they being used according to the supplier's and/or manufacturer's instructions?
- Have the wheels of mobile scaffolds been locked when in use and are the platforms empty when they are moved?
- Are gates (including guardrails being used as gates) and hatches across access points self-closing?
- Are working platforms placed as close as practicable to the working face to reduce the risk of people or materials falling through the gap?

For more information see worksafe.govt.nz

Ladders

- Choose the right tool for the job – can you buy or hire some alternative equipment that would provide a safer means of access?
- Are they in good condition?
- Do ladders rest against a solid surface and not on fragile or insecure materials?



- Are ladders secured at the top and bottom to prevent them slipping sideways and outwards?
- Do ladders rise at least a metre above the landing place? If not, are there other handholds available?
- Are the ladders positioned so that users don't have to overstretch?
- Do you have to use the top three rungs of a stepladder? If so your stepladder is too short.
- Is the user competent? Those using ladders should be trained to use the equipment safely.
- Can users maintain three points of contact at all times?
- Are materials being transported safely (ie not carried up a ladder)? Carrying materials up a ladder increases the risk of falling.

For more information see worksafe.govt.nz

Roofwork

- Is there edge protection to stop people or materials falling?
- Where nets are used, have they been installed properly?
- Have you identified brittle roof materials, such as cement sheets and roof lights?
- Have you taken precautions to stop people falling through fragile materials when working on the roof (eg by providing barriers, covers or working platforms)?
- Are people kept away from the area below the roof work?
- Are roofworkers trained and experienced to recognise the risks and are they competent to do the work?

For more information see worksafe.govt.nz

2.3 Moving material

Manual handling

- Are there heavy materials such as roof trusses, steel beams, kerbstones or bagged products that could cause injury if they have to be moved by hand?
- If so, can you:
  - choose lighter materials?
  - use trolleys, hoists, telehandlers and other plant or equipment so that manual lifting of heavy objects is kept to a minimum?
  - order materials such as cement and aggregates in units that are a manageable weight (eg 25 kg bags)?
  - avoid the repetitive laying of heavy building blocks or other masonry units (eg weighing more than 20 kg)?
- Have people been instructed and trained how to use lifting aids and other handling equipment safely?
- Have people been trained how to lift safely?

For more information see worksafe.govt.nz



Loading and unloading goods

- Have you checked that the load has not moved or destabilised during the journey to site?
- Is there an exclusion zone around the loading/unloading area to keep people who are not involved away from the work?
- Have you planned your method of unloading?

- Does your lifting equipment have a current annual certificate?
- Do you have to access the back of the truck at all, or can the preparation work be done from ground level? If not:
  - do you have a safe way of getting up and down from the back of the vehicle?
  - what do you have in place to prevent workers from falling off the back of the vehicle?
  - are your employees provided with sensible safety footwear with a good grip?

For more information see worksafe.govt.nz

Excavations

- Is the stability of the ground known to ensure against collapse? Or if the stability of the ground is not known, is there a support system in place for the excavation to prevent collapse, or has it been sloped or battered back to a safe angle? (Note: an excavation more than 1.5 m deep that is deeper than it is wide at the top must be notified to WorkSafe.)
- Is a safe method used for putting in the support, without people working in an unsupported trench?
- Is there safe access into the excavation (eg a sufficiently long, secured ladder)?
- Are there barriers or other protection to stop people and vehicles falling in?
- Is the excavation fenced off from unauthorised access?
- Are properly secured stop blocks provided to prevent tipping vehicles falling in?
- Could the excavation affect the stability of neighbouring structures or services?
- Are materials, spoil and plant stored away from the edge of the excavation to reduce the chance of a collapse?
- Is the excavation regularly inspected by a competent person?
- Are the results of inspections recorded?

For more information see worksafe.govt.nz

2.4 Working with vehicles and machinery

Traffic, vehicles and plant

- Have prestart checks been done, and any issues dealt with?
- Are vehicles well maintained, and are log books and maintenance records present and up to date?
- Are vehicles only operated by people trained to do so (where applicable) and are manufacturer's instructions followed?
- Are vehicles and pedestrians kept apart?
- If not, do you:
  - provide barriers to separate them as much as you can?
  - display warning signs?
- Are people kept away from slewing vehicles, or, if not, can you use a zero tail swing machine?
- Are vehicles and plant properly maintained, for example:
  - do the steering, brakes, hydraulics, mirrors and any other vision aid work properly?
  - are tyres in good condition and at the correct pressure?
  - are reversing alarms active?

- Can reversing be avoided (eg by using a one-way system or a turning area? If not, are properly trained spotters used)?
- Have drivers received proper training and are they competent and fit to use the vehicles or plant they are operating?
- Are loads properly secured?
- Have you made sure that passengers are only carried on vehicles designed to carry them?
- Have you made sure that plant and vehicles are not used on dangerous slopes?
- If you need to work on or drive across sloping ground, have you checked that the plant and vehicles are safe to use?
- Do you check that securing pins are in place on excavator quick hitches?

Tools and machinery

- Are the right tools or machinery being used for the job?
- Are all dangerous parts guarded (eg gears, chain drives, projecting engine shafts)?
- Are guards secured and in good repair?
- Are tools and machinery maintained in good repair and are all safety devices operating correctly?
- Are all operators trained and competent?

For more information see worksafe.govt.nz

2.5 Critical health risks

Hazardous substances

- Have you identified all harmful substances and materials, such as asbestos, lead, solvents, paints, cement and silica dust (eg from cutting concrete, bricks, rocks etc)?
- Is protective clothing and respiratory equipment provided?
- Have you checked whether a worker with the relevant approval is needed to deal with asbestos on site? (Most work with asbestos requires permission from WorkSafe, although you can do some very limited work with materials that contain asbestos without one.)



- Have you identified and put into place precautions to prevent or control exposure to hazardous substances, by:
  - doing the work in a different way, to remove the risk entirely?
  - using a less hazardous material?
  - using tools fitted with dust extraction?
  - using tools fitted with water suppression?
  - installing warning signs to show where work involving hazardous substances is taking place?
- Have workers had information and training so they know what the risks are from the hazardous substances used and produced on site, and what they need to do to avoid those risks?
- Have you arranged health monitoring for employees exposed to certain hazardous substances (eg lead, silica, cement, sensitisers such as twopack adhesives or coatings)?

For more information see worksafe.govt.nz

Noise

- Have you identified and assessed workers' exposure to noise?
- Have workers had information and training so they know what the risks are from noise on site, and what they need to do to avoid those risks?
- Can the noise be reduced by using different working methods or selecting quieter plant (eg by fitting breakers and other plant or machinery with silencers)?
- Are people not involved in the work kept away from the source of the noise?
- Is suitable hearing protection provided and worn in noisy areas?
- Have hearing protection zones been marked?
- Have you arranged health surveillance for employees exposed to high levels of noise?

Personal protective equipment

- Is suitable equipment provided to protect the head, eyes, hands and feet where appropriate?
- Do workers wear their protective equipment, and do they wear it correctly?
- Have workers been trained in the safe use, care and storage of protective equipment?

For more information see worksafe.govt.nz



2.6 Worker wellbeing

Amenities and facilities

- Has a suitable toilet been provided?
- Is there a clean wash basin, hot/warm water, soap and towel?
- Is wet-weather gear provided for those who have to work in wet conditions?
- Is there a place where workers can take shelter and have meals? Do they have access to drinking water?
- Is there a suitable first-aid kit?

For more information see worksafe.govt.nz

Workloads and fatigue

- Do workers take regular, quality rest breaks in their working day?
- Are working hours reasonable and not too long? If longer working days are required, are start and finish times staggered, and/or are longer rest breaks and periods off work allowed?
- Are tasks scheduled suitably throughout a work period (eg critical jobs are avoided during the low body clock period of 3 pm to 5 pm)?
- Is work scheduled to allow enough time for completion?
- Are monitoring and limitations in place for overtime worked, consecutive night shifts, shift swapping and on-call duties?
- Are jobs rotated to minimise exposure to extreme temperature and excessive mental or physical demands?
- Is fit-for-purpose plant, machinery and equipment used?
- Are workloads practical and manageable, with consideration given to any work flow changes (eg machinery breakdowns or unplanned absences)?

Alcohol and drugs

- Is there a policy and procedure in place to constructively manage alcohol- and other drug-related hazards?
- Are workers monitored for signs of alcohol and drug use (eg dizziness, slurred speech, drowsiness, sudden aggressive or violent behaviour, lack of or impaired coordination/relflexes)?

For more information see worksafe.govt.nz



2.7 Emergency situations

Emergencies

- Are there emergency procedures (eg for evacuating the site in case of fire)?
- Do people on site know what the procedures are and where the nearest emergency centre is?
- Is there a means of raising the alarm, and does it work?
- Is there a way to contact the emergency services from site?
- Are there enough suitable escape routes and are these kept clear?
- Are first aid arrangements good enough for the site, and is there someone available who can administer first aid if needed?

Fire

- Is the quantity of flammable materials, liquids and gases kept to a minimum?
- Are they properly stored (eg are gas cylinders chained in position)?
- Are flammable gas cylinders returned to a ventilated store at the end of the shift?
- Are smoking and other ignition sources banned in areas where gases or flammable liquids are stored or used?
- Are gas cylinders, associated hoses and equipment properly maintained and in good condition?
- When gas cylinders are not in use, are the valves fully closed?
- Is flammable and combustible waste removed regularly and stored in suitable bins or skips?
- Are suitable fire extinguishers provided?

Notes

Disclaimer

This publication provides general guidance. It is not possible for WorkSafe to address every situation that could occur in every workplace. This means that you will need to think about this guidance and how to apply it to your particular circumstances.

WorkSafe regularly reviews and revises guidance to ensure that it is up-to-date. If you are reading a printed copy of this guidance, please check worksafe.govt.nz to confirm that your copy is the current version.

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Solid/Liquid/Fuel Heater Installer's Installation Certificate

Building Consent Number : Site Address :

Make : Model : Clean Air Registration Number :

☐ Solid Fuel Heater ☐ Liquid Fuel Heater ☐ Free Standing ☐ Inbuilt

	Yes	No	N/A
The existing chimney has been cleaned prior to installation	☐	☐	☐
Is the fireplace surround/chimney face junction sealed up with heat resistant material	☐	☐	☐
The flue pipe is constructed of austenitic stainless steel	☐	☐	☐
Seismic restraint has been fitted	☐	☐	☐
The flue sections are secured together with stainless steel rivets	☐	☐	☐
The flue is secured to the appliance	☐	☐	☐
The chimney void has been vented at the top	☐	☐	☐
Is the Solid Fuel Burner and Flue as per the building consent	☐	☐	☐
Flue joints sealed in accordance with manufactures instructions	☐	☐	☐
Fire safety valve connected and working correctly (diesel burners)	☐	☐	☐
Flue and appliance clearances have been achieved in terms of the manufacturer's instructions (NZS 7421 or AS/NZS 2918:2001)	☐	☐	☐
The flue height meets the minimum specified in the manufacturer's instructions, NZS7421, and Regional Council rules	☐	☐	☐
The application has been installed and commissioned in accordance with the manufacture's installation and operating instructions (Liquid fuel only)	☐	☐	☐
The liquid fuel storage tank and feed system has been installed in accordance with AS1691, or equivalent, and with the requirements of the Council's Hazardous Substances Officer	☐	☐	☐
Smoke detectors as detailed on the building consent documents are installed	☐	☐	☐

If response to any of the items is 'no' please comment :

Water heater – model and part number :

I **(name)** certify that the above specified installation has been carried out as described and in accordance with the manufacturers installation instructions and the current approved building code requirements

Installers Signature : (Installer) Date :

RESOURCE MANAGEMENT ACT MATTERS – LIQUID FUEL HEATER

	Yes	No
Does the fuel storage tank have secondary containment in accordance with the District Plan (NB: Audit monitoring will be carried out)	☐	☐

If response is 'no' please comment why :

GoGet Processing Summary Report

Consent No: 250252

Site Address: 52 Benn Street, Amberley

Description: New 4 bedroom dwelling with Wood Burner

Checklist/Elements	Status	Notes	Processed By
Pre-consent	Pass		Madeline Blacktopp
MagiQ Items to Set	Pass		MRB
Confirm Formally Received Status has been set	Pass		MRB
Confirm Formally Received Date field is completed	Pass		MRB
Owner/agent details	Pass		MRB
Fixed fee category	Pass		MRB
Are PIM checks required?	Pass		MRB
PIM & Processing Locations required	Pass		MRB
Do you think Trade Waste is required?	N/A		MRB
Building	Pass		MRB
Planning	Pass		MRB
Utilities	Pass		MRB
Roading	N/A		MRB
Health / Tradewaste	N/A		MRB
Simpli Vetting Checklist	Pass		MRB
Update LF Form Vetting Checklist	Pass		MRB
Record of Title to invoice?	N/A		MRB
Contacts removed in GoGet (CoA only)	N/A		MRB
1 Storey Dwelling	Pass		Mark Milnes
General	Pass		MSM
Property File Information Considered	Pass	Considered - no issues noted	MSM
New building work	Pass	Building work has not been started - Confirmed	MSM
Building Complexity	Pass	R1 - Residential outbuilding & ancillary building; Single storey detached dwelling (SH) designed to a common standard (NZS 3604, NZS 4229) risk matrix score less than or equal to 6	MSM
PIM Information Considered	Pass	Considered - PIM complete and PIM notes added to consent	MSM
Service Plan Review	Pass	Services locations & type correct as per plans provided	MSM
Earthquake zone	Pass	Earthquake zone 3	MSM
Altitude	Pass	Altitude 35-36m	MSM
Snow zone & load	Pass	Snow zone 4	MSM
Wind zone	Pass	Wind zone A	MSM
Exposure zone	Pass	Exposure zone C medium	MSM
Ground	Pass	Liquefaction very low potential Zone 3	MSM
Wind speed	Pass	Wind speed High	MSM
Importance level	Pass	Importance level 2	MSM
Building use - Schedule 2 Building Regulation 2005	Pass	Building use SH	MSM
Procedure for inspections included	Pass	Yes - HDC inspections scheduled as required	MSM
Are record/s of works completed correctly	Pass	Designer - all aspects of their design included correctly	MSM
Modular components BuiltReady	N/A		MSM
Registered Product Certificates	N/A	All well known products used in building industry in local area	MSM
Alternative plans/specifications for pre-	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
approval			
Alternative product certificates provided for pre-approval	N/A		MSM
Exisiting drainage	N/A		MSM
Building Act 2004 Sections	Pass		MSM
Sec 28 - Cases Involving Bans	Pass	None identified in documents	MSM
Sec 30 A -H - National multiple-use approval	N/A		MSM
Sec 50 - Refusal of application for building consent	N/A		MSM
Sec 99A - Refusal of application for Certificate of Acceptance	N/A		MSM
Sec 67 - Waivers or Modifications	Pass	None requested in application	MSM
Sec 71-74 - Building on Land Subject to Natural Hazards	N/A		MSM
Sec 75 - Building on 2 or More Allotments	N/A		MSM
Sec 102 - When compliance schedule must be issued	N/A		MSM
Sec 112 - Alterations to Existing Buildings	N/A		MSM
Sec 133AT - Alterations to buildings subject to EPB notice	N/A		MSM
Sec 113 - Specified Intended Life	Pass	Specified as Indefinite but not less than 50 years;	MSM
Sec 114 - Change of use	Pass	New building - no requirement	MSM
Sec 116A - Subdivision	Pass	N/A - no subdivision required as part of this application	MSM
NZ Building Code Handbook	Pass		MSM
A1 Classified Use	Pass	Housing - Detached dwelling	MSM
B1 Structure	Pass		MSM
Foundations	Pass	Means of compliance - AS1 Standard NZS 3604:2011 - Fig 7.13 (b) - in-situ concrete	MSM
Good Ground	Pass	Means of compliance - AS1 300mm min foundation depth (top soil) Excavation inspection to be carried out to confirm good ground.	MSM
Floor Slab and mesh	Pass	Means of compliance - AS1 100mm 500E mesh reinforced concrete	MSM
DPM	Pass	Means of compliance - AS1 250 micron 1 ply polyethylene sheet	MSM
Steel concrete cover	Pass	Means of compliance - AS1 Adequate support, min 30mm to concrete top surface	MSM
Supplementary bars	Pass	Means of compliance - AS1 Positions comply (Fig. 7.18)	MSM
Shrinkage control	Pass	Means of compliance - AS1 Saw-cuts - positions comply (Fig 7.19) Crack inducer - positions comply (Fig 7.19) see sht 5	MSM
Slab thickenings (see truss design data)	N/A		MSM
Piles (incl. bracing)	N/A		MSM
Bearers	N/A		MSM
Floor joists	N/A		MSM
Load-bearing walls	Pass	Means of compliance - AS1 All loads transferred to exterior walls/footings	MSM
Stud centres (ground level)	Pass	Means of compliance - AS1 SG8 90 x 45mm @ 600mm crs	MSM
Long studs	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
Lintels	Pass	Means of compliance - AS1 By truss manufacturer - see drawings and PS1	MSM
Bracing (ground level)	Pass	Means of compliance - AS1 GIB "Ezybrace" system	MSM
Brace calculations	Pass	Means of compliance - AS1 See specification - calculations all OK	MSM
Bracing distribution	Pass	Means of compliance - AS1 Sufficiently even bracing distribution - complies	MSM
Ceiling Diaphragms	N/A		MSM
Support beams	N/A		MSM
Trusses	Pass	Means of compliance - VM1 Proprietary timber trusses - refer manufacturer's details and PS1	MSM
Trusses - Truss point loads	Pass	Means of compliance - VM1 All truss types loading to exterior walls/foundations	MSM
Trusses - Truss fixings	Pass	Means of compliance - VM1 Proprietary manufacturer's fixings - see dwgs and PS1	MSM
Timber rafters	Pass	Means of compliance - AS1 Top chord of truss for verandah 90 x 45 as per Truss design	MSM
Rafter fixings	N/A	Top chord of truss for verandah	MSM
Purlins/tile battens	Pass	Means of compliance - AS1 SG8 70 x 45mm on flat @ 900mm crs less than or equal to 900mm span	MSM
Purlin/batten fixings	Pass	Means of compliance - AS1 1/10g self-drilling screw, min 80mm long	MSM
Roof bracing	Pass	Means of compliance - AS1 Lumberlok "Multi-brace" cross bracing (complies with Sec. 10.4)	MSM
Gable braces	Pass	Means of compliance - AS1 Lumberlok "Multi-brace" cross bracing (complies with Sec. 10.4)	MSM
Ceiling battens/restraints	Pass	Means of compliance - AS1 70 x 35mm timber @ less than or equal to 600mm crs less than or equal to 900mm span	MSM
Entry columns/beams	Pass	Means of compliance - AS1 100 x 100mm timber Entry beam: 140 x 90 PL10	MSM
Verandah Posts	Pass	Means of compliance - AS1 100 x 100mm timber	MSM
Footing sizes (uplift)	Pass	Means of compliance - AS1 600 x 600 x 600 sized as per NZS 3604 table 9.2 Bowmac B138 Stainless Steel	MSM
Verandah beams	Pass	Means of compliance - AS1 verandah beam 315 x 90 PL12	MSM
Timber rafters	N/A		MSM
Deck piles	N/A		MSM
Deck Bearers	N/A		MSM
Deck joists	N/A		MSM
Decking	N/A		MSM
Retaining walls	N/A		MSM
Siting/surcharge	N/A		MSM
Stair construction	N/A		MSM
Footings and construction	N/A		MSM
Solid fuel heater compliance	Pass	Means of compliance - NZS2918:2001	MSM
Non Clean-Air-approved burner model	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
Clean-air approved burner model	Pass	Means of compliance - AS/NZS 2918:2001 Metro Xtreme Rad freestanding (dry)	MSM
Clean air approved number	Pass	Clean air approved number #200998	MSM
Hearth/Slab	Pass	Means of compliance - AS/NZS 2918:2001 Steel floor protector	MSM
Chimney/flue	Pass	Means of compliance - AS/NZS 2918:2001 Foley 150mm dia. S/S flue kit	MSM
Fire/Flue Durability applications	Pass	Means of compliance - AS1 Grade 304 S/S flue system - 15 years	MSM
B2 Durability	Pass		MSM
Fixings	Pass	Quality Means of compliance - AS1 materials from reputable manufacturers specified as required	MSM
Durability evaluation	Pass	Means of compliance - AS1 Quality materials from reputable manufacturers	MSM
Durability; materials suitable for application	Pass	Means of compliance - AS1 Durability of all materials specified suitable for proposed applications - OK	MSM
Timber treatments - In ground	N/A		MSM
Timber treatments - Sub-floor	N/A		MSM
Timber treatments - Floor	N/A		MSM
Timber treatments - Ext. trims	Pass	Means of compliance - AS1 H3.2	MSM
Timber treatments - Cavities	Pass	Means of compliance - AS1 H3.1	MSM
Timber treatments - Plywood	Pass	Means of compliance - AS1 H3.2	MSM
Timber treatments - Interior wall framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Exterior wall framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Roof framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Exterior deck piling	N/A		MSM
Timber treatments - Exterior deck framing	N/A		MSM
C1 - C6 Protection from Fire	Pass		MSM
Solid Fuel heater (heat transfer)	Pass	Means of compliance - AS/NZS 2918:2001 Manufacturer's test approved clearances provided	MSM
Woodburner make and model	Pass	Means of compliance - AS/NZS 2918:2001 Make: Metro Model: Xtreme Rad	MSM
Risk group assessed	Pass	Means of compliance - AS2 SH	MSM
Fire protection system	Pass	Means of compliance - AS2 Suitable fire protection system not shown as required Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms required --- RFI Details --- C1-C6 Protection from Fire Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms as required C/AS1 --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:11pm ---	MSM

Checklist/Elements	Status	Notes	Processed By
		complies - wireless inter-connected domestic smoke alarms as required	
Consent RFI			
Request: C1-C6 Protection from Fire Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms as required C/AS1			MSM
Response: Sheet 2 revised			MSM
Escape path lengths	Pass	Means of compliance - AS2 Match protection system Yes	MSM
Distance to boundary (1m min)	Pass	Means of compliance - AS2 Greater than 1m, 30 min life rating achieved	MSM
Life/Property rating system	Pass	Means of compliance - AS2 Allowable unprotected areas correct	MSM
D1 Access Routes	Pass		MSM
Slip resistance to external access	Pass	Means of compliance - AS1 Broomed/wood floated conc. compliant with Table 2 see sht 9	MSM
Stair	N/A		MSM
Tread and risers	N/A		MSM
Handrails	N/A		MSM
D2 Mechanical Access	N/A	No mechanical installations for access detailed as part of this building consent application.	MSM
E1 Surface Water	Pass		MSM
Acceptable Solution Suitable	Pass	Ecan Flood Assessment not required	MSM
Protection from flooding	Pass	Adequate contours to direct surface water away - OK	MSM
Minimum FFLs	Pass	Adequate FFL height above road crown(150mm min) +475mm	MSM
Gutters	Pass	Quad/box ext gutters - comply with E1 Fig. 15	MSM
Down pipes	Pass	Standard downpipes - comply with E1, Table 5	MSM
Discharge pipe size	Pass	100mm diameter	MSM
Pipe gradients: mains	Pass	1:120 minimum	MSM
Soak pit/other	Pass	Standard soak pit - comply with E1, Para. 9 and Fig. 13 Donnie confirmed ok	MSM
ECAN Ctby land and water rule 5.96	N/A		MSM
Driveway drainage	Pass	FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to overflow drain from soak pit to kerb --- RFI Details --- E1 Surface water: FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to overflow drain from soak pit to kerb --- Customer Response --- Sheets 1 and 6 revised Sheet 6 will be in Donnies reply --- Council Response - Accepted - MSM - 7 Aug 2025 4:13pm --- sheet 1 & 6 revised comply E1/AS1	MSM
Consent RFI			
Request: E1 Surface water: FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to			MSM

overflow drain from soak pit to kerb			
Response: Sheets 1 and 6 revised Sheet 6 will be in Donnies reply			MSM
Retaining wall drainage	N/A		MSM
E2 External Moisture	Pass		MSM
Floors	Pass	Means of compliance - AS1 Crown of road +35.550 FFL +36.025	MSM
Weathertightness risk factors	Pass	Means of compliance - AS1 See Risk Matrix calcs - all complies	MSM
Building Wrap type / Sill tape	Pass	Means of compliance - AS1 Thermakraft "Watergate Plus"	MSM
Cladding systems	Pass	Means of compliance - AS1 70 series clay brick veneer on nom. 40mm cavity BGC Duo board vertical - fixed on cavity	MSM
Brick tie spacings - SED	N/A		MSM
Cladding on frame - bare GL	Pass	Means of compliance - AS1 Greater than or equal to 225mm	MSM
Clad on frame - paved GL	Pass	Means of compliance - AS1 Greater than or equal to 150mm	MSM
Cav. veneer clad - bare GL	Pass	Means of compliance - AS1 Greater than or equal to 125mm	MSM
Cav. Veneer clad - paved GL	Pass	Means of compliance - AS1 Greater than or equal to 25mm	MSM
Flashings	Pass	Means of compliance - AS1 Standard flashings - Comply with E2 Table 7	MSM
Roofing systems	Pass	Means of compliance - AS1 Longrun coated metal - corrugated	MSM
Roof pitch	Pass	Means of compliance - AS1 Greater than or equal to 0°less than or equal to 25°	MSM
Roofing underlay type	Pass	Means of compliance - AS1 Thermakraft 215 bituminous self supporting	MSM
E3 Internal Moisture	Pass		MSM
Surface finishes	Pass	Means of compliance - AS1 Refer drawings sheet 14 and spec	MSM
Fungal growth prevention	Pass	Means of compliance - AS1 Appropriate surfaces/finishes installed/applied	MSM
Wet area shower	Pass	Means of compliance - AS1 Proprietary shower cubicle - refer spec for manuf. Data --- RFI Details --- E3 Internal moisture: Please amend sheet 2 to show position of showerdoors for the shower cubicles --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:15pm --- sheet 2 amended show doors	MSM
Consent RFI			
Request: E3 Internal moisture: Please amend sheet 2 to show position of showerdoors for the shower cubicles			MSM
Response: Sheet 2 revised			MSM
F1 Hazardous Agents	Pass		MSM
F1 Hazardous Agents	Pass	Means of compliance - AS1 No report or mitigation measures required	MSM

Checklist/Elements	Status	Notes	Processed By
F2 Hazardous Building Materials	Pass		MSM
Hazardous building materials	Pass	Glazing only to consider; Please amend elevations to complete safety glazing indication. --- RFI Details --- F2 Hazardous building materials: Please amend elevations to complete safety glazing indication. --- Customer Response --- Sheet 3 shows SG and SS to windows? --- Council Response - Not Accepted - MSM - 7 Aug 2025 4:47pm --- Not compliant with NZS4223.3.2016 transom at sill height OK	MSM
Consent RFI			
Request: F2 Hazardous building materials: Please amend elevations to complete safety glazing indication.			MSM
Response: Sheet 3 shows SG and SS to windows?			MSM
Consent RFI			
Request: F2 Hazardous building materials: Please amend elevations to complete safety glazing indication. --- The safety glazing is not complete;: Please refer to NZS4223.3.2016 regarding fig 1A and amend elevations accordingly.			MSM
Response: Im unsure where else we need it, I spoke to a window supplier and they said the sliders dont need safety glass, the rail to the sliders is at the same height as the sill in the bedroom Windows also , also these sliders are the same I use on all my Jobs and never a problem. if you could advise would be great cheers			MSM
F3 Hazardous Substances	N/A	No hazardous substances to be stored as part of this consent application.	MSM
F4 Safety from Falling	Pass		MSM
Opening windows	Pass	Means of compliance - AS1 FFL - GL <1m - protection not required	MSM
Barriers	N/A		MSM
F5 Construction Hazards	Pass		MSM
F5 Construction Hazards	Pass	Means of compliance - AS1 Protection provided 2m high security fence with lockable gate shown on site plan	MSM
F6 Visibility in Escape Routes	N/A	Does not apply to Detached Dwellings, household units within Multi-unit Dwellings, Outbuildings, or Ancillary buildings.	MSM
F7 Warning Systems	Pass		MSM
Locations	Pass	F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms --- RFI Details --- F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:53pm --- correct location of smoke alarms provided	MSM
Consent RFI			
Request: F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms			MSM

Checklist/Elements	Status	Notes	Processed By
Response: Sheet 2 revised			MSM
F9 Means of restricting access to residential pools	N/A	No pools detailed within this consent application.	MSM
G1 Personal Hygiene	Pass		MSM
No. of sanitary fixtures	Pass	Means of compliance - AS1 2 x WC's provided	MSM
Basin in WC space	Pass	Means of compliance - AS1 Wash basin in ensuite & immediate adjacent bathroom to WC	MSM
G2 Laundering	Pass		MSM
Laundering facilities	Pass	Means of compliance - AS1 Wash tub; washing machine connection provided	MSM
G3 Food Prep and Prevention of Contamination	Pass		MSM
Appliances and Facilities	Pass	Means of compliance - AS1 Appliances and facilities including prep sink, cooktop, storage, refrigerator/ freezer are provided	MSM
G4 Ventilation	Pass		MSM
Ventilation	Pass	Means of compliance - AS1 Natural openings + extract to Bathrooms and Kitchen	MSM
Ventilation rate	Pass	Means of compliance - AS1 Mechanical - Refer designer's calculations	MSM
G5 Interior Environment	N/A	Shall apply only to habitable spaces, bathrooms and recreation rooms in old	MSM
G6 Airborne and Impact Sound	N/A	No building elements between common occupancies.	MSM
G7 Natural Light	Pass		MSM
Vertical windows in external walls	Pass	Means of compliance - AS1 Greater than or equal to 10% of floor area for window area to all habitable spaces	MSM
Outside environment awareness	Pass	Means of compliance - AS1 Sufficient natural light levels and outside env. awareness	MSM
G8 Artificial Light	Pass		MSM
Illuminance	Pass	Means of compliance - AS1 Illuminance at floor level will meet 20 lux minimum see electrical layout	MSM
G9 Electricity	Pass		MSM
Electrical installation	Pass	Means of compliance - AS1 Refer dwgs for fitting locations and spec for details	MSM
G10 Piped Services	N/A	No piped services to be installed as part of this consent application.	MSM
G11 Gas as an Energy Source	N/A	No gas installation within consent application.	MSM
G12 Water Supply	Pass		MSM
Water supply - source	Pass	Means of compliance - AS1 Connected to Local Authority supply	MSM
Water supply - quantity	Pass	Means of compliance - AS1 Adequate council supply - OK	MSM
Water supply - quality	Pass	Means of compliance - AS1 Adequate council supply quality - OK	MSM
Safe tray installed	Pass	Means of compliance - AS1 Yes	MSM
HW Tempering	Pass	Means of compliance - AS1 Output max 50°C	MSM

Checklist/Elements	Status	Notes	Processed By
Seismic restraints/ tank supports	Pass	Means of compliance - AS1 Standard restraints - Fig.14	MSM
Drain/relief vent material	Pass	Means of compliance - AS1 Suitably sized copper pipe to outside building	MSM
Solar heating system	N/A		MSM
Solar support/fixing	N/A		MSM
G13 Foul Water	Pass		MSM
Effluent disposal system (EDS)	Pass	Means of compliance - AS2 Connected to local authority services	MSM
ECAN rule 5.8	Pass	Means of compliance - AS2 Checksheet against Rule 5.8 completed	MSM
Bedroom numbers	N/A		MSM
EDS tank size	N/A		MSM
EDS daily flow	N/A		MSM
Inspection Points	Pass	Means of compliance - AS2	MSM
Gully traps	Pass	Means of compliance - AS2 See drainage plan for locations	MSM
Support and thermal movement	Pass	Means of compliance - AS2 Adequate support and thermal movement allowed for - OK	MSM
Discharge pipe size	Pass	Means of compliance - AS2 100mm diameter	MSM
Drain ventilation	Pass	Means of compliance - AS2 80mm TV/MV at head of drain	MSM
Pipe/joint materials	Pass	Means of compliance - AS2 PVC	MSM
Pipe gradients: mains	Pass	Means of compliance - AS2 1:60 minimum	MSM
Pipe gradients: fittings	Pass	Means of compliance - AS2 40mm@1:40	MSM
Sanitary plumbing	Pass	Means of compliance - AS2 Refer fitting layout on designer's drawings	MSM
Bedding and backfill	Pass	Means of compliance - AS2 Bedded in adequate fill, to Fig. 7 - OK	MSM
Drains under buildings	N/A		MSM
Inspection chamber (see PIM notes)	Pass	Means of compliance - AS2 Inspection chamber detailed on drawings in accordance with PIM requirements.	MSM
H1 Energy Efficiency	Pass		MSM
Means of Compliance	Pass	Means of compliance - AS1 Calculation method	MSM
Thermal Envelope	Pass	Means of compliance - AS1 Construction R values calculations provided:	MSM
Hot water system	Pass	Means of compliance - AS1 HWC and pipework suitably insulated	MSM
Changes made during processing	N/A		MSM
Phone to resolve	N/A		MSM
Processing Sign Off Checklist	Pass		MSM
Reminder to start checklist	Pass		MSM
PIM Planning	Pass		Aidan Chrystal
Nature of work	Pass		AMC
New dwelling	Pass	New 4 bedroom dwelling	AMC
Shed/Garage	N/A		AMC
Internal alterations	N/A		AMC
Temporary activities	N/A		AMC

Checklist/Elements	Status	Notes	Processed By
Other	N/A		AMC
Planning Maps	Pass		AMC
Zone	Pass	Residential 1A	AMC
Minimum site area per dwelling	Pass	700m2 > 400 m2	AMC
Outstanding Landscape	Pass	Clear of ONL area	AMC
Notable Trees	Pass	None	AMC
Heritage Buildings/Archaeological Site	Pass	Not a Heritage Building or Archaeological Site	AMC
Power Transmission Lines	Pass	None	AMC
Coastal Hazard Area	Pass	Located landward of the Coastal Hazard line.	AMC
Slope Assessment Area	Pass	Clear	AMC
Fault Lines	Pass	Clear	AMC
Coastal Environment	Pass	Located clear of Coastal Environment Area	AMC
Flooding/Ponding/Inundation	Pass	Clear	AMC
Indigenous Biodiversity Clearance	Pass	None proposed	AMC
Rail Network	Pass	Clear	AMC
Statutory Acknowledgment Area	Pass	Not located adjacent to a Statutory Acknowledgment Area.	AMC
Designated Site	Pass	Not located in a Designated Site.	AMC
Relevant RCs or Planning Notes	Pass	RC210185 - 125 lot subdivision with five reserves and two roads in two stages - (any conditions as per Consent Notice) RC220131 - To change condition 23 of resource consent RC210185 with respect to the depth of sewer laterals - (any conditions as per Consent Notice)	AMC
Record of Title	Pass		AMC
Record of Title Number	Pass	1112975	AMC
RT copy less than 6 months	Pass	24/07/25	AMC
Consent Notice (s221)	Pass	None	AMC
Easements	Pass	Appurtenant hereto is a water easement created by Transfer 386795.1- dominant tenement Land covenant in favour of HDC 12727469.11 No structure or tree of permanent nature will cause damage or impede the functionality of the soakage pit. Does not include vehicle crossing provided access lids are trafficable and accessible - clear	AMC
Contaminated Land	Pass		AMC
ECAN LLUR Register	Pass	File saved is for original parent lot of 'The Clearing' Lot 79 (52 Benn Street) is part of HAIL site 236238 - Persistent pesticide bulk storage or use. The entire clearing site including Lot 79 was part of a Detailed site investigation in May 2022 INV 300213 that has not been summarised by ECAN. Under S95 RC210185 contaminated levels found to be at or below background levels based on DSI conducted and detailed under Appendix 2 in working.	AMC
Vehicle Access	Pass		AMC
Vehicle Crossing	Pass	No existing vehicle crossing. Bond required to be entered into.	AMC
Vehicle Crossing onto State Highway	N/A		AMC
Is VC clear of all roadside features?	Pass	Clear of street tree	AMC
Onsite Carparking	Pass	Residential activity - 1 per dwelling provided	AMC
Residential Zone rules	Pass		AMC

Checklist/Elements	Status	Notes	Processed By
Is it a PA?	Pass	Complies as a Permitted Activity - as per Rule 4.5.1 as a residential activity.	AMC
Minimum Site Area per Dwelling	Pass	700m2 > 400 m2	AMC
Setback	Pass	North = 13.2 metres > 1 metres East = 2.5 metres > 1 metres South = 5.8 metres > 4.5 metres West = 1.5 metres > 1 metres	AMC
Site Coverage	Pass	230.9 / 700 x 100 = 32.99% < 35% *includes eaves over front door and rear of lot*	AMC
Height	Pass	Proposed height = 5.2 < 8m	AMC
Access to Sunlight	Pass	North: Visually assessed complies East: Angle 48 Setback 3 Complies West: visually assessed complies boundary borders RoW (Roach lane)	AMC
Building Length	Pass	Building length = 21.527 > 20m, and Western elevation does not have an offset in plan or height > 2 metres.	AMC
Earthworks	Pass	Not located near any National Grid Lines or water bodies.	AMC
Frost Control Fans	Pass	Not located within 1km of a Frost Control Fan.	AMC
Other Rules	N/A		AMC
Rural	N/A		AMC
Hanmer Design Standards	N/A		AMC
Ashley Forest Village Comprehensive Development Zone	N/A		AMC
Mt Lyford Design Standards	N/A		AMC
Claverley Comprehensive Development Zone	N/A		AMC
Development Contributions	N/A		AMC
Settlements (Business Zone)	N/A		AMC
Settlements (Industrial Zone)	N/A		AMC
Settlements (Open Plan Zone)	N/A		AMC
Resource consent requirements	Pass		AMC
Resource consent required	Yes	S37 requirement Disallow inspection bookings	AMC
Documents to accompany PIM/BC	Pass		AMC
Documents in Processing Files folder	Pass	All related documents to accompany PIM/BC added to the Processing Files folder	AMC
Planning check complete	Pass		AMC
Confirm planning check complete	Pass		AMC
SWPermit	Pass		Donnie Choi
Discharge into ground - soakpit	Pass		DXC2
Application form (GoGet/Simpli)	Pass		DXC2
Soil profile & photos (recommended)	N/A		DXC2
Soakage test result (Form W1 or W2)	N/A		DXC2
Soakpit design documents	N/A		DXC2
Soakpit layout	Pass		DXC2
Drainage plan for stormwater including connections and overflow.	Pass		DXC2
Stormwater device management & maintenance plan	Pass		DXC2
Discharge to surface - tank	N/A		DXC2
Discharge to other	N/A		DXC2

Checklist/Elements	Status	Notes	Processed By
Erosion and Sediment Control Plan	Pass		DXC2
Sediment Fence	Pass		DXC2
Material Storage Area	Pass		DXC2
Stabilised entry/exit pad	Pass		DXC2
Diversion of runoff and/or catch pit	N/A		DXC2
Producer Statement Assessment 1	Pass		Mark Milnes
Producer statement category	Pass		MSM
Category	Pass	PS 1	MSM
Producer statement content	Pass		MSM
Heading	Pass	Headed with Producer Statement	MSM
Address details	Pass	The Producer Statement is generic addressed for the attention of all Councils	MSM
Author details	Pass	Clear identification of the person who has completed the design work: yes The author's name and signature: In Ling Ng Qualifications suitable for work undertaken: BE (Hons) Address of author: MiTek New Zealand LTD Registration number: #146585 Membership of professional organisation: MIPENZ	MSM
Written statement	Pass	That clearly identifies the building consent work covered by the Producer Statement: Truss design The product name and specifications for application of products used: MiTek 20/20, GANG-NAIL connectors The parts/clauses of the Building Code that the work relates to: B1/VM1, B2/AS1 The appropriateness of the Producer Statement for site specific conditions: Fabricator statement checked	MSM
Date	Pass	Date the PS1 was produced 16 - 04 - 25	MSM
Professional indemnity insurance	Pass	The sum of Professional Indemnity Insurance held is identified $500,000	MSM
Decisions and outcome	Pass		MSM
Acceptance	Pass	I have accepted this Producer Statement because the documentation is COMPLETE	MSM
PIM Utilities BC Checklist	Pass		Cynthia Otto,Sharlene Jayne
Water Services	Pass		OTTOC,SJ
HDC mains	N/A		SJ
Utilities Service Plans attached	Pass		SJ
Water	Pass	Water: Connection to Amberley Township water supply available on application. $792 fee applies. Application sent to agent. For a full chemical analysis of your water supply please visit our website: https://www.hurunui.govt.nz/roading-water/water/water-testing-reports. Please note that your water supply is rated as moderately hard. For further information and advice, head to our website: https://www.hurunui.govt.nz/roading-water/water/faqs-frequently-asked-questions/hard-water.	OTTOC,SJ
Wastewater Services	Pass		OTTOC,SJ
Sewerage	Pass	Wastewater: Connection to Amberley Township sewerage available on application. $285 fee applies. Application sent to agent. An inspection chamber will have to be installed less than one metre inside the property boundary before connection of the	OTTOC,SJ

Checklist/Elements	Status	Notes	Processed By
		sewer drain into the Council lateral. See Drawing D05 of the HDC Development Engineering Standards for details.	
Stormwater Services	Pass		OTTOC,SJ
Amberley Stormwater	Pass	Stormwater: Stormwater discharge to comply with the consent conditions as per Amberley Stormwater Consent CRC082988. A $286 discharge application fee applies. Stormwater discharge from roof run-off to soak pit with overflow to kerb and channel as per RC210185. At the time of building on the lot, stormwater runoff from buildings and hardstand areas resulting from up to and including the 24hr 2% AEP rainfall event shall be managed so no runoff enters any other property. For on-site soak pits, the following shall apply: * Soak pits shall be designed to cater for runoff from up to and including the 24 hour 2% AEP rainfall event, with allowance made for overflow from up to and including the 24 hour 2% AEP rainfall event; * For soak pits dealing with roof and/or non-trafficable hardstand areas, roofs shall not be zinc-coated (galvanised), and systems shall be sealed to prevent entry of contaminants; * For soak pits dealing with trafficable hardstand areas, soak pit base levels shall be at least 1 metre above the water table, and pre-treatment shall be provided (eg vegetated swales and/or submerged outlet sumps). *Condition 16 of CRC082988 states that discharges to ground shall not be from an exposed Zinc coated (Galvanized) roof.	OTTOC,SJ
Hanmer Stormwater	N/A		SJ
Township Stormwater	N/A		SJ
Rural Stormwater	N/A		SJ
Erosion and Sediment document attached	Pass	Stormwater (cont.): An Erosion and Sediment Control Plan needs to be supplied to the stormwater team for approval before earthworks start.	SJ
Stage 1: Processing applications	N/A	As per stormwater discharge application	OTTOC
Stage 2: Decision letter sent	N/A	As per stormwater discharge application	OTTOC
Stage 3: Licencing	N/A	As per stormwater discharge application	OTTOC
Utilities Admin	Pass		OTTOC
MagiQ fees	Pass		OTTOC
Stormwater fee note	Pass		OTTOC
Email to agent	Pass		OTTOC
Technical Utilities Officer approval	Pass		OTTOC
Services	Pass		OTTOC
Water	Pass		OTTOC
Sewer	Pass		OTTOC
Stormwater	N/A		OTTOC
Utilites check complete	Pass		OTTOC
Utilities PIM Notes	Pass		OTTOC
Confirm utilities check complete	Pass		OTTOC
Processing Sign Off Checklist	Pass		Mark Milnes
All consents	Pass		MSM
Alternative solutions	N/A		MSM
Location of construction	Pass	Building work carried out on site	MSM
Required inspections	Yes	Required inspections identified and added	MSM

Checklist/Elements	Status	Notes	Processed By
Required documents	Yes	Required documents identified and added	MSM
Advice notes	Yes	Advice notes correctly identified and added	MSM
Conditions	N/A		MSM
Engineer inspections	N/A		MSM
Sec 72	N/A		MSM
Sec 75	N/A		MSM
The S75 cert has been forwarded to LINZ (if applicable)	N/A		MSM
Sec 37 Is a resource consent required for this building work	N/A		MSM
Waiver or modification	N/A		MSM
Specified intended life	Yes	A specified intended life is applicable to this consent 50 years	MSM
Additional charges	N/A		MSM
Current lawfully established use	Yes	Classified use is recorded in consent	MSM
Multi-unit project	N/A		MSM
Consent files	Yes	Documents stamped Documents filed in correct order Approved documents copied to "Consent Documents" folder (PDF format)	MSM
Processing summary	Yes	Processing summary has been saved	MSM
Run Time Report	Y	Time report has been saved to Processing Summaries Folder	MSM
Timesheet	Yes	Time recorded in MagiQ Job Costing against consent number	MSM
Recommendation to Refuse	N/A		MSM
Recommendation to Grant (self-validation only)	N/A		MSM
Add Validation Processing Location	Y		MSM
Stormwater approval	Pass		MSM
Fixed or variable fee considered	Pass		MSM
Commercial only	N/A		MSM

Consent RFI

Request: Hi, DXC2

1. Please make Type 1 sump drain to be connected after the soakpit.

Regards,

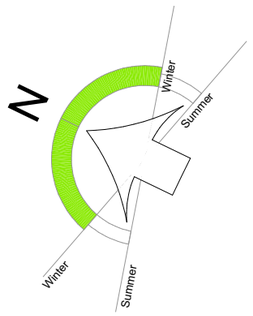
Donnie

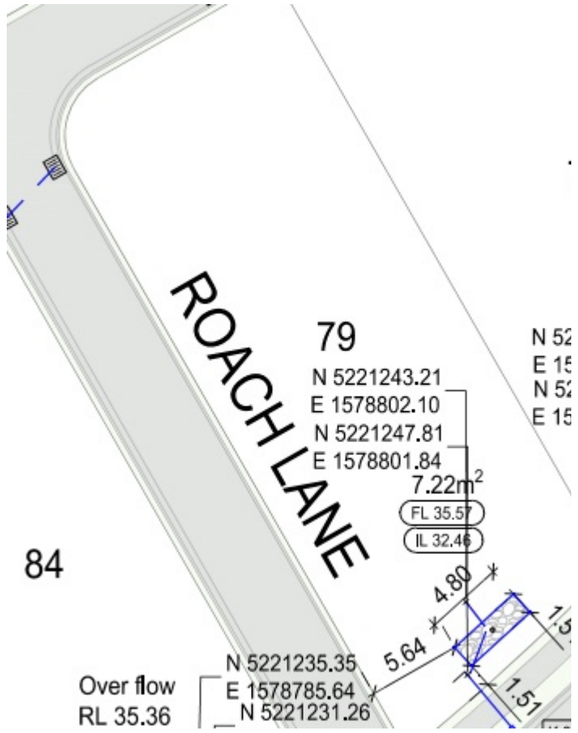
Response: Sheet 6 revised DXC2

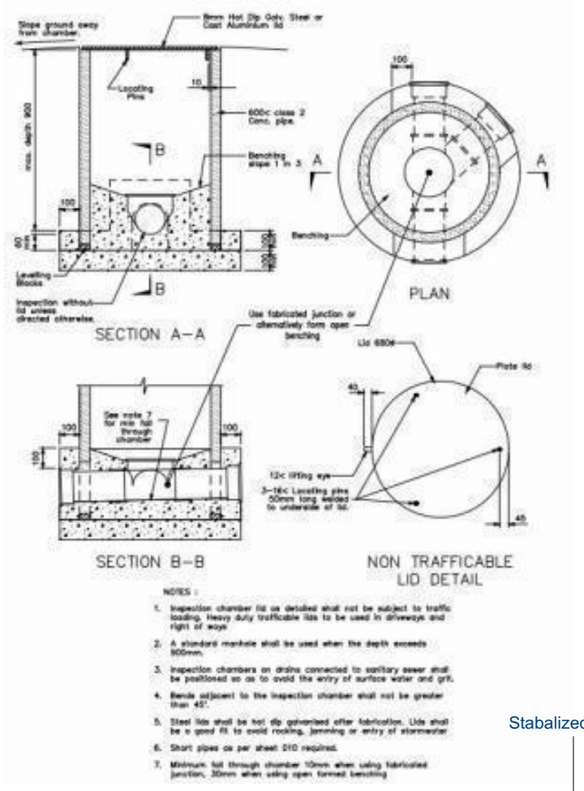
I am satisfied on reasonable grounds that the provisions of the Building Code will be met if the building work in relation to the attached application is properly completed in accordance with the attached plans and specifications.

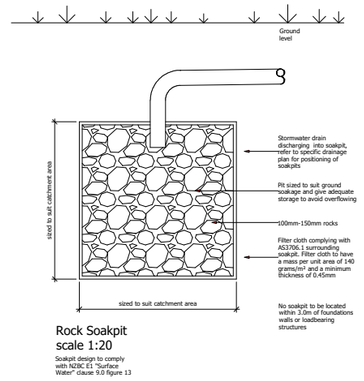
Signed: _____ Date: 13 August 2025 9:00 am

Mark Milnes









Rock Soakpit
scale 1:20

Soakpit design to comply with NZBC E1 "Surface Water" clause 9.0 figure 13

LEGEND	
LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES

Refer to Drainage Plan for specific drainage information

Refer to sediment control plan in specification and implement where required.

Convey surface water from sealed drive areas to an appropriate approved outfall.

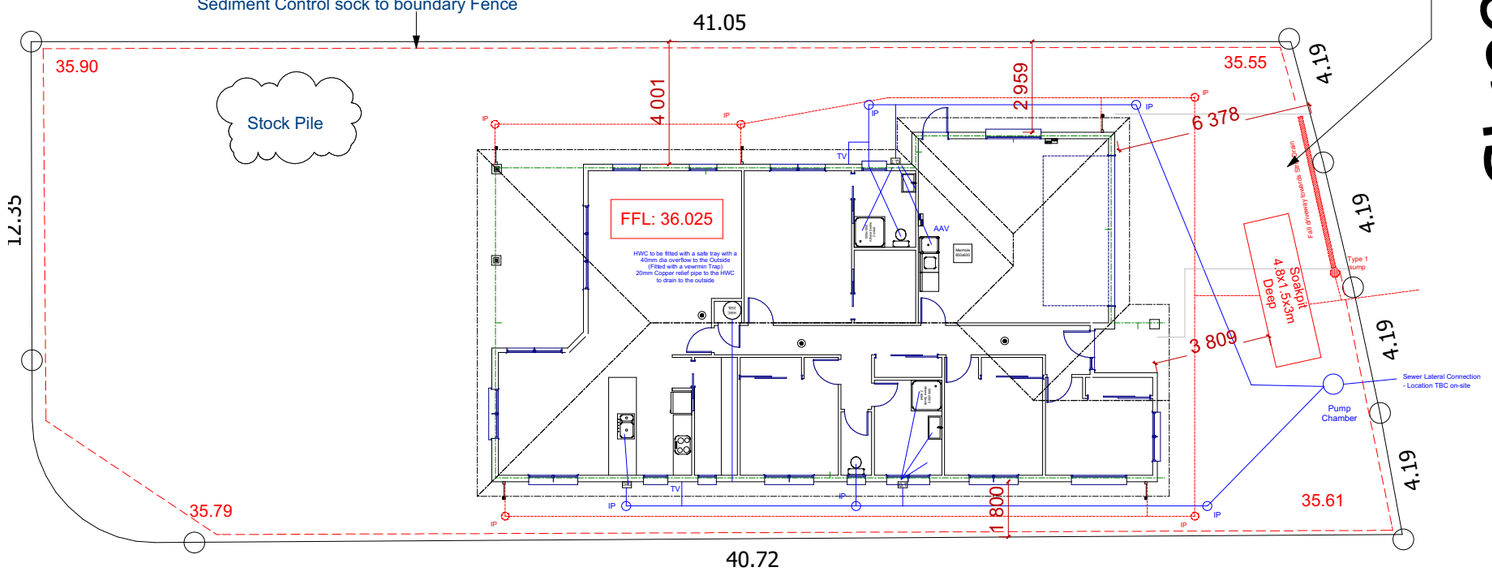
Dimensions are shown to cladding face

SITE INFORMATION	
Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE	
Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

Stabalized entry pad to the site

Sediment Control sock to boundary Fence

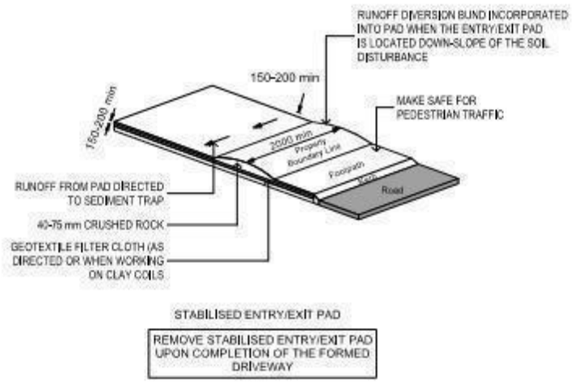


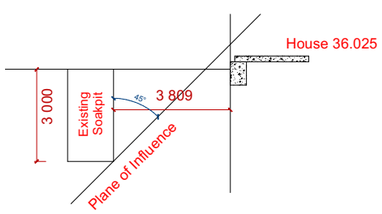
Crown of Road 35.50

Benn Street

Roach Lane

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.





FL 35.57
IL 32.46

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	2500	1
Scale: 1:1000	Date: 7/08/2025	OF: 15

ecoply®

ecoply® FLOORING

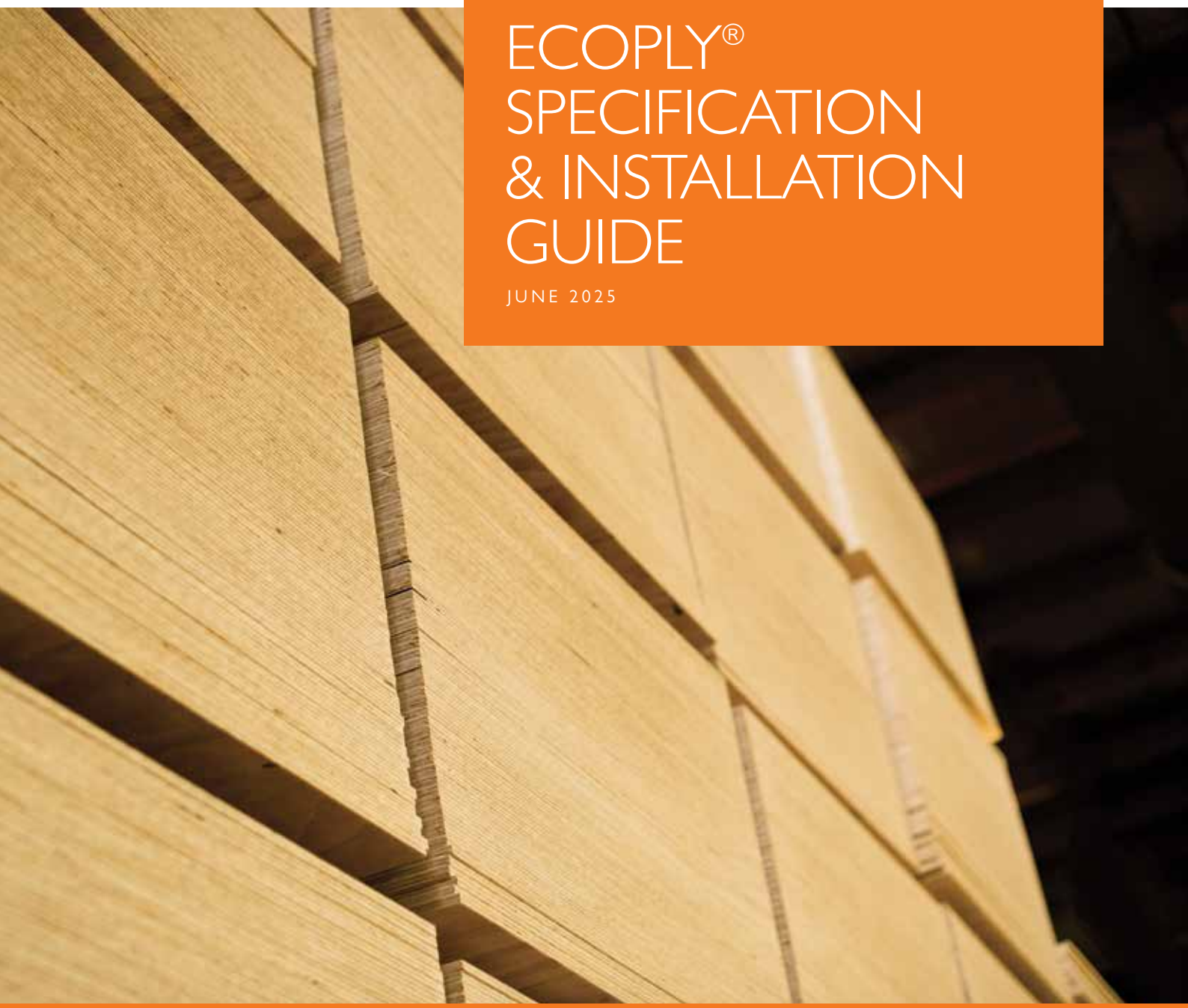
ecoply® ROOFING

ecoply® Square EDGE

ecoply® BARRIER

ECOPLY® SPECIFICATION & INSTALLATION GUIDE

JUNE 2025



CHH PLY

Information contained within is specific to Ecoply® structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

ecoply®

ECOPLY® SPECIFICATION & INSTALLATION GUIDE



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CHH PLY



1.0 ECOPLY® PRODUCT RANGE

Manufactured and/or distributed by Carter Holt Harvey Plywood, the Ecoply® portfolio represents a range of structurally rated plywood products.

Ecoply is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural.

For information relating to Shadowclad® panels and plywood used as an exterior cladding, refer to the current Shadowclad Specification and Installation Guide for Cavity Construction. For information relating to Ecoply Barrier used as a rigid air barrier refer to the current Ecoply Barrier Specification and Installation Guide. Both of these documents can be downloaded from www.chhply.co.nz.

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

1.1 TECHNICAL INFORMATION & CAD DETAILS

When specifying or installing any Ecoply plywood products visit www.chhply.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

The information contained in this document is current as at June 2025. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Ecoply® structural plywood products manufactured and/or distributed by Carter Holt Harvey Plywood and must not be used with any other plywood manufacturer's product no matter how similar they may appear.

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

1.2 PRODUCT DESCRIPTION & RANGE

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

The strength of Ecoply plywood is optimised for maximum performance parallel to the face grain with cross plies providing enhanced stability across the grain.

The Ecoply plywood range can be specified for:

- Surface grade (e.g. CD) - where the first letter describes the face veneer appearance and the second letter describes the back veneer of the Ecoply sheet. Surface grades are defined in AS/NZS 2269 and summarised in Tables 2A and 2B.
- Stress grade - utilises the symbol F and a suffix for both parallel and perpendicular to the grain directions, for example;
  - F8/F8 as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade in both directions.
  - For plywood 15mm thick and below all Ecoply products are minimum F8/F8.
  - For Ecoply plywood products 17mm thick and above most products are F8/F5.
  - Ecoply 19mm Longspan Flooring is F11/F8 stress grade (See Tables 1, 4 and 5).
- Thickness - ranging from 7mm to 25mm.
- Length - being 2400mm and 2700mm with a standard nominal width of 1200mm.
- Preservative treatment - being untreated, H3.2 CCA or H3.1 LOSP Azole treated.
- Edge finish - being square edge or for Ecoply Flooring and Roofing, routed on the long edges of the sheet with a polypropylene plastic tongue inserted into one side for a tongue-in-groove joint.

For general installation advice refer to section 2.0: General Installation Guide.

For specification and installation advice for Ecoply used in typical applications refer to the following sections.

Typical Application	Section
Structural bracing and ceiling diaphragms	3.0
Roofs and decks	4.0
Flooring	5.0

Note: Technical notes referenced in this guide can be downloaded from www.chhply.co.nz or contact Carter Holt Harvey Plywood on 0800 326 759.

Table 1: Ecoply® Product Range

Stress Grade (UNO)		F8/F8								F8/F5							
Nominal Thickness (mm)		7		9		12		15		17		19		21		25	
Sheet length (x 1200mm width)		2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700
Ecoply® Structural Square Edge	CD	●		●	●	●	●			●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD											●[1]	●[1]	●	●	●	
Ecoply Roofing (pt)[1]	DD								●								

● Available untreated only
● Available either untreated or H3.2 CCA
● Available H3.2 CCA only

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200mm cover.

1 Ecoply 15mm Roofing and Ecoply 19mm Longspan Flooring are supplied as standard in F11/F8 stress grade.

- Full range may not always be available ex stock, check with your Ecoply supplier to ensure availability.
- Non standard specifications, including thicker sheets may be available to special order in significant quantities.

1.3 SURFACE GRADES

Table 2A summarises the surface appearance grades in which Ecoply® structural plywood is available with some typical applications for each surface grade.

The surface grade specifications are defined in AS/NZS 2269. Table 2B details surface appearance grades for speciality Ecoply plywood and typical applications.

Table 2A: Ecoply® Structural Square Edge Products

Face Grade C	Face Grade D
	
Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish. Ecoply panels may include minor imperfections associated with veneer based wood products. Ecoply Panels are subject to natural characteristics of timber, Ecoply may contain filler and require additional preparation prior to coating application to achieve the desired aesthetic requirements.	Non appearance grade allowing open imperfections up to 75mm across the face veneer. Splits and knots allowable.
Possible Uses:	**Possible Uses:**
• Structural gussets • Stressed skin panels • Bins, boxes, crates • Hoardings • Membrane substrate	• Non visual bracing • Strength critical pallets • Structural components • Portal frame gussets

Table 2B: Speciality Ecoply® Products

Flooring CD	Roofing DD
	
Solid sanded C grade surface with tongue and groove profile on long edges.	Unfilled D grade surface with tongue and groove profile on long edges.
Possible Uses:	**Possible Uses:**
• Substrate for flooring overlays such as linoleum, tiles and rigid coverings • Substrate for membrane roofing and decking where visible appearance is critical	• Substrate for asphalt shingles • Substrate for roof systems where a smooth substrate is not required

Notes: A higher visual grade may be substituted if required. e.g. Ecoply® CD can be used anywhere DD is used. Pictures shown above are scaled down versions of typical Ecoply sheets. Grain pattern and colour may vary. If sheet appearance is critical select panels individually.

1.4 PRESERVATIVE TREATMENT

Ecoply® structural plywood is available untreated or treated in accordance with AS/NZS 1604.3:2012 If treated, Ecoply structural plywood is treated with either H3.2 CCA (Copper Chrome Arsenate) or H3.1 LOSP (Azole) clear treatment.

H3.2 CCA and H3.1 LOSP treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, subject to periodic moderate wetting and leaching."

Ecoply® plywood is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Soudal® Metalex® Concentrated Timber Preservative Clear (Soudal® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

The characteristics of the treatments are shown in Table 3.

Table 3: Preservative Treatment

	Untreated	H3.2 CCA	H3.1 LOSP (Azole)
Preservative Carrier	N/A	Water	Light organic oil (white spirits)
Colour	Natural	Green	Clear (i.e. natural)
Fungicide	Heat treated dry wood	Copper	Propiconazole and Tebuconazole
Insecticide	Heat treated dry wood	Arsenate	Permethrin
Other Chemicals	N/A	Chrome (to fix preservative in wood)	Butyl Oxitol (co-solvent to assist active stability)
Mouldicide	N/A	Copper (limited efficacy)	IPBC
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Dried after treatment to average 18% moisture content for use in service at higher moisture contents	Solvent does not affect dimensions. Solvent smell disappears over time
Availability	Readily available	Standard treatment	Treated to order for CD, DD, flooring and roofing products.
Applications (Refer NZS 3602)	Interior dry protected	Exterior/Interior damp (service performance subject to detailing and coatings)	

H3.2 CCA

Ecoply structural plywood, which is H3.2 CCA treated (waterborne preservative with a green colour), is dried following treatment so that sheets may return to the correct dimensions. The moisture content after treatment with CCA and drying will be higher than the limits placed in AS/NZS 2269 on untreated product. The target is for an average moisture content of approximately 18% to provide a panel closer to the expected equilibrium moisture content for most H3.2 CCA applications.

The fillets used to separate sheets in drying may leave marks on the sheet surface. These will fade over time as the plywood weathers, and can be disguised with paint but may be visible under stain. The process of treating with H3.2 CCA and subsequent drying is likely to increase the face checking of the panel.

For more information on face checking refer to section 1.8 General Design Considerations - Aesthetics.

H3.1 LOSP

H3.1 LOSP treated Ecoply retains the wood colour and does not contain moisture so the plywood remains at the same dimensions and moisture content during treatment. However, the plywood when freshly treated may contain more than 60 litres of organic fluid per cubic metre. When coating H3.1 LOSP treated plywood, traces of residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

The H3.1 LOSP solvent smell can be quite strong and venting is recommended until most of the solvent has evaporated. Untreated plywood is recommended for internal applications where NZS 3602 allows the use of untreated plywood.

Mechanical fasteners are recommended to fix H3.1 LOSP treated Ecoply to framing. If adhesives are required, thorough venting is recommended and H3.1 LOSP tolerant adhesives should be applied according to the adhesive manufacturer's instructions. See section 2.3 Adhesives.

1.5 SECTION PROPERTIES

Table 4A: Section Properties of Ecoply® Structural Plywood

			Section Properties per mm width					
			Parallel to the Face Grain			Perpendicular to the Face Grain		
Nominal Plywood Thickness[2] (mm)	**ID Code[2]**	**Mass** (kg/m²)	**Parallel Moment of Inertia** (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant[3]** I/Q (mm²)	**Perpendicular Moment of Inertia** I (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant[3]** I/Q (mm²)
7	7-24-3	4.6	30.0	8.3	5.2	2.1	1.0	1.6
9	9-30-3	5.9	58.6	13.0	6.5	4.0	1.5	2.0
12	12-24-5	7.8	114.9	19.0	9.3	33.4	8.3	5.2
15	15-30-5	9.8	224.5	29.7	11.6	65.2	13.0	6.5
17	17-24-7	11.0	284.5	33.5	12.2	122.5	19.0	9.3
19	19-30-7	12.3	450.7	46.5	13.8	156.8	21.7	10.5
21	21-30-7	13.6	555.7	52.3	15.3	239.2	29.7	11.6
25	25-30-9	16.2	896.7	72.0	18.0	381.1	38.1	13.5

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design

			Nominal Strengths (Limit States) per mm width					
			Parallel to the Face Grain			Perpendicular to the Face Grain		
Nominal Plywood Thickness[2] (mm)	**ID Code[2]**	**Stress Grade**	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm²)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	F8/F8	1046.0	475.2	15.8	303.7	208.0	8.8
15	15-30-5	F8/F8	2043.0	742.5	19.8	593.2	325.0	11.1
	15-30-5	F11/F8	2357.3	920.7	21.0	593.2	325.0	11.1
17	17-24-7	F8/F5	2589.0	836.6	20.7	845.1	266.1	13.8
	17-24-7	F11/F8	2987.3	1037.3	22.0	1114.6	475.2	15.8
19	19-30-7	F8/F5	4101.4	1162.5	23.4	1082.0	304.2	15.5
	19-30-7	F11/F8	4732.4	1441.5	24.8	1427.0	543.3	17.8
21	21-30-7	F8/F5	5056.7	1307.1	25.9	1650.6	415.8	17.2
25	25-30-9	F8/F5	8159.8	1800.9	30.5	2629.7	533.7	19.9

[1] Actual thickness of Ecoply® sheets manufactured to thickness tolerances stated in AS/NZS 2269.

[2] Identification code: panel thickness – outermost veneer thickness x 10 – number of plies.

[3] I/Q values for rolling shear are for stress at the neutral axis calculated as in NZS 3603.

Notes:

- The section properties in Tables 4A and B have been calculated in accordance with AS/NZS 2269.
- For section properties for other thicknesses and Shadowclad® products contact CHH Plywood on 0800 326 759.

Structural Properties of Ecoply® Plywood

The majority of Ecoply® plywood is either F8/F8 or F8/F5 grade (exceptions are identified in section 1.2: Product Description and Range) and the characteristic values may be used in conjunction with both NZS 3603 and NZS AS 1720.1 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Table 4B.

Table 5: Structural Properties of Ecoply® Plywood

	Characteristic Strength MPa		
Stress Grade	**F5**	**F8**	**F11**
Bending (f_{pb})	14	25.0	31.0
Tension (f_{pt})	9.6	15.0	18.0
Panel Shear (f_{ps})	3.7	4.2	4.5
Rolling Shear (f_{pr})	1.5	1.7	1.8
Compression in Plane of Sheet (f_{pc})	12.0	20.0	22.0
Compression Normal to the Plane of the Sheet (f_{pp})		9.7	12.0
Modulus of Elasticity (E)	6900	9100	10500
Modulus of Rigidity (G)	345	455	525

Source: AS/NZS 2269

Wood is strongest when stressed parallel to the grain and weakest across the grain, so the lay up or arrangement of veneers in the panel determines the properties. Because of its cross banded construction, plywood possesses significant strength and stiffness both parallel and perpendicular to the direction of the face grain, but is generally strongest and stiffest along the direction of the face grain.

The section properties of structural plywood in Table 4A are calculated in accordance with AS/NZS 2269 to allow for the reduced contribution of veneers perpendicular to the direction of stress. For engineering design to NZS 3603 and/or NZS AS 1720.1, the section properties are multiplied by stresses and 'k' and ø factors to determine resistances for limit states design.

Resistances and nominal strengths in Table 4B assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ø and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Strength Reduction Factors and Capacity Reduction Factors can be taken from NZS 3603 Clause 2.5 and NZS AS 1720.1 Clause ZZ2.3 as applicable.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name and/or manufacturer: e.g. ECOPLY.
- Face grade, back grade: e.g. CD.
- Intended application: e.g. STRUCTURAL.
- Panel construction code: e.g. 15-30-5 (Thickness (mm)-Face veneer thickness (mm x 10)-Number of veneers).
  Note: In some cases the Panel construction code may be replaced by the Section Properties, in which case the values of second moment of area (moment of inertia) (I) and section modulus (Z) in the grain orientations are declared: e.g. 626.2, 58.6/191.7,25.4.
- Glue bond: e.g. A BOND.
- Formaldehyde emission class: E0 for A Bond Ecoply.
- Australasian Standard: e.g. AS/NZS 2269.
- Treatment Standard (if applicable): e.g. AS/NZS 1604.3:2012.
- Date and time of manufacture: e.g. 01/12/15 12:23:45.
- Stress grade: e.g. F8 (exceptions include Shadowclad® and Grooved Lining which are performance rated).
- Where applicable sheets may note the country of manufacture: e.g. "Made in Australia."

Untreated example:

ECOPLY CD FLOORING STRUCTURAL
19-30-7 A BOND EO AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E H3.2 CCA RETREAT CUTS
PAT 12/12/2023 12:23:45 F11/F8 CHH.COM

Treated example:

ECOPLY CD STRUCTURAL
12-24-5 A BOND EO AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA RETREAT CUTS
PAT 12/12/2023 12:23:45 F8/F8 CHH.COM

Alternate branding (untreated example):

STRUCTURAL CD 19-30-7 F8/F8 A BOND EO AS/NZS
2269.0:2012 PAT 12/12/23
MANUFACTURED BY ######### - DISTRIBUTED AS
ECOPLY BY CHH PLY CHH.COM

Note: Performance based products like Grooved Lining and Shadowclad® may include brand identification instead of visual quality, stress grade, and panel code. These panels, when accompanied with specification literature, are still deemed to comply with AS/NZS 2269.

1.7 CODE COMPLIANCE

Ecoply® plywood manufacture is third-party audited through a product quality control programme.

Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural, is referenced in the NZBC Acceptable Solutions and Verification Methods through:

- NZS 3602 The Use of Timber and Wood-based products for Use in Building.
- NZS 3603 Timber Structures.
- NZS 3604 Timber Framed Buildings.
- AS/NZS 1604.3:2012 Specification for Preservative Treatment, Part 3:Plywood.
- E2/AS1 External Moisture.

WARNING: Plywood which is non-certified or is manufactured to standards other than AS/NZS 2269, such as US voluntary standard PS1-95, is not referenced in the NZBC. There can be significant differences between AS/NZS 2269 certified and non certified plywood around bond durability, structural ratings and veneer quality.

Structure B1

Design to NZS 3603 Timber Structures complies with the NZBC in Verification Method B1/VM1 Clause 6.0 Timber. Plywood is the only sheet material with properties listed in NZS 3603. Ecoply structural plywood is available in F8/F5 and F8/F8 stress grade. Some specialty products are available F11/F8 or with specifically designed properties for specialised applications.

1.8 GENERAL DESIGN CONSIDERATIONS

Durability (Clause B2) and Exterior Moisture (Clause E2)

Ecoply plywood is made from wood veneer. Designers should assess the level of exposure to biological, moisture, and other hazards and apply appropriate preservative treatment and detailing to minimise exposure to these hazards.

Information in this manual outlines suggested practices for detailing building components to exclude moisture to comply with the durability requirements of the NZBC.

Formaldehyde

Ecoply plywood is manufactured using phenol formaldehyde resins which are fully cured in the hot press. Cured resin is thermally and moisture stable and formaldehyde emissions for the glued plywood are similar to background levels for the wood by itself when tested to AS/NZS 2098.11 Determination of formaldehyde emissions for plywood. Accordingly every panel is branded with the lowest emission class (less than 0.5mg/litre for E_0).

Moisture Content and Dimensional Change

At the time of leaving the factory, the moisture content of untreated Ecoply plywood should generally be in the range of 8% to 15% as required by AS/NZS 2269. All wood products including plywood respond to changes in ambient humidity so the eventual moisture content of plywood varies according to how dry or how wet the environment is. After manufacture, the moisture content will move to equilibrium with the environment, and the veneers swell or shrink across the grain in response. The total expansion both along and across a 2400 x 1200mm panel can be in the order of 1.5mm to 3mm as the plywood changes from a dry to a saturated state.

Ecoply that is treated with waterborne preservatives (e.g. H3.2 CCA) is expected to be used in applications that have higher humidity than interior dry use, so following treatment it is dried to a higher average moisture content of approximately 18%. This provides for a more stable panel in service than placing a dry (less than 15%) sheet in a higher moisture environment.

Detailing and construction must allow for movement if the plywood will be subject to cycles of moisture change. Seasonal and daily cycles can be significant depending on the end use.

Temperature

Wood will expand upon heating as do practically all solids. The thermal expansion of plywood is quite small and there is little effect on the structural performance or durability of plywood when used in temperatures below 54°C. The average co-efficient of thermal expansion of plywood is 4.5×10^{-6} mm/mm/°C. At temperatures above 55°C wood begins to deteriorate. Colours of coatings and finishes should be selected to reduce heat gain. For extreme conditions, further technical information is available by calling CHH Plywood on 0800 326 759.

The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 Methods of determining the total thermal resistance of parts of buildings. e.g. Plywood has a Conductivity (k) of 0.13W/mK so a 12mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Aesthetics

Ecoply® plywood products can be selected for weather protection functions as well as structural performance. Acceptable Solution E2/AS1- External Moisture allows plywood manufactured to AS/NZS 2269, (minimum CD appearance grade, minimum 12mm thickness and treated as required by NZS 3602) to be used for exterior cladding. For exterior cladding applications CHH Plywood strongly recommends Shadowclad® exterior cladding rather than smooth faced plywood such as Ecoply.

Shadowclad features a textured (bandsawn) face which reduces the visibility of face checking and other appearance related issues which can occur on smooth faced plywood if not regularly maintained by the homeowner. For more information on plywood used as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction.

Face Checks on Plywood Exposed to Weather

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. **If you are the specifier, it is important to discuss these issues with your client and consider the length of exterior exposure, climate conditions and protection offered by the surface coating before finalising product choice.**

Overlaps in Plywood

Overlaps, pleats and core gaps are a function of manufacture and lay-up of individual veneers within plywood. Overlap is where there is overlapping of the individual veneers, often cross-bands, that are then pressed together to create plywood. In general, and as noted in AS/NZS 2269.0 Clause 3.4.4, overlaps and pleats are permitted "provided the strength or utility of the sheet is not reduced". Overlaps do not affect the durability, structural integrity or weathertightness of plywood.

Durability

The durability of Ecoply structural plywood will depend on the application. Detailing, treatment and installation details need careful consideration to satisfy the requirements of the NZBC.

Normally, 50 year durability can be achieved with untreated Ecoply in dry, interior exposure. For internal environments subject to high humidity or condensation H3.2 CCA treated Ecoply should be used.

For plywood as a rigid air barrier (including rigid air barrier acting as bracing) refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhply.co.nz.

Fire, Spread of Flame and Smoke Development

Data on early fire hazard properties of uncoated plywood are available in our Technical Note: "Early Fire Hazard Properties of Ecoply Products."

For plywood with decorative finish coatings or intumescent coating, performances depend on spread rates of the coating. For advice on specific coating systems and their suitability for use with Ecoply products, always refer to the coating manufacturer.

Fire Rated Systems

The NZBC has specific requirements about the use of combustible materials in buildings. As a wood veneer based product, plywood is considered to be a combustible material.

For specific information about the use of combustible materials used in building solutions please refer to the NZBC Clauses C1 - C6 - Protection from Fire.

1.9 ENVIRONMENT, SOCIAL AND GOVERNANCE (ESG)

Carter Holt Harvey has developed a new Environment, Social and Governance (ESG) reporting programme. The company has focused on setting out what its stakeholders have identified as material ESG issues, how it manages, or plans to manage those issues, and key environmental indicators. In the future, Carter Holt Harvey will celebrate its ESG achievements and acknowledge those areas where it needs to improve, keeping on a path of steady improvement that will further strengthen Carter Holt Harvey in the years to come.

1.10 FSC® AND SUSTAINABILITY ACCREDITATIONS

CHH Plywood sources plywood and/or logs from sustainably managed plantation forests. The globally recognised independent body, the Forest Stewardship Council® (FSC®) has recognised the Tokoroa mill for using and trading responsibly sourced wood and plywood, awarding CHH Plywood with FSC certification (FSC® C012019). This measure provides a formal assurance that gives CHH Plywood's customers confidence about its sustainability credentials. CHH Plywood's products can be supplied with a FSC certificate on request.

To view and download certificates and documents related to Sustainability please visit www.chhply.co.nz/sustainability

1.11 HEALTH & SAFETY

Ecoply should be handled in accordance with the Safety Data Sheets (SDS) for untreated, H3.2 CCA and H3.1 LOSP treated Ecoply, which can be downloaded from www.chhply.co.nz.

Always wear safety glasses or non-fogging goggles when machining Ecoply panels.

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

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

1.12 STORAGE & HANDLING

Ecoply panels must be stored and handled with care to maintain good condition before use and after installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity.
- Support for the sheets must 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 must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage.
- The sheets must be stacked flat, NOT on edge.
- To avoid staining, fading and surface checking, the sheets must not be exposed to the weather while awaiting installation.
- Store in well-ventilated areas away from sources of heat, flames or sparks.

2.0 GENERAL INSTALLATION GUIDE

The following is a general guide to be followed unless otherwise specified. For additional installation instructions for typical applications refer to sections 3, 4 and 5.

2.1 FRAMING

Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. All timber frame sizes and set out must comply with NZS 3604 (or be specifically designed to NZS 3603). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz. Ecoply® may be specified for frame spacing determined by design, or using tables in section 3 for specific product applications such as bracing, flooring and as a substrate for shingle roofs or membrane roofs and decks.

H3.1 LOSP treated framing should be vented before fixing and if construction adhesives are required (for example to screw and glue floor panels) the adhesive must be compatible with H3.1 LOSP. See section 1.4: Preservative Treatment.

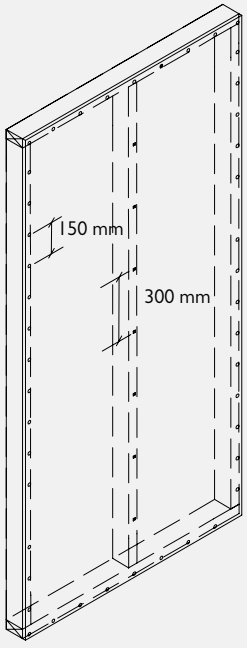
For plywood used as exterior cladding refer to the current Shadowclad® Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhply.co.nz.

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhply.co.nz.

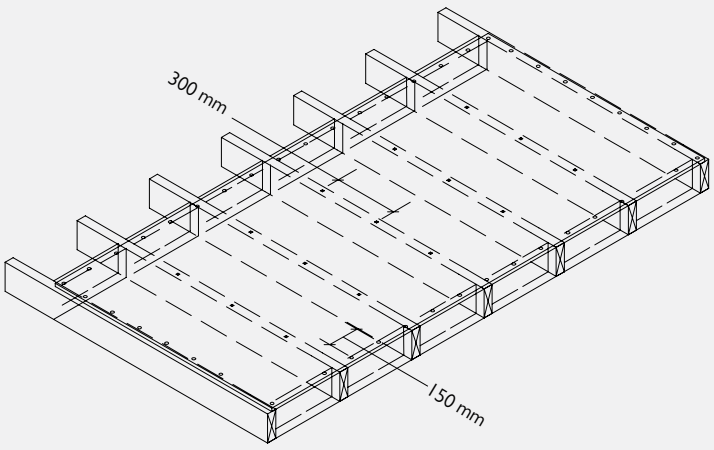
2.2 SHEET FASTENERS & FIXING

- Where there is risk of panel size change due to changes in moisture levels, allow a 2 to 3mm expansion gap between sheets.
- Use only flathead nails or screws, with or without construction adhesives.
- Fastener length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is the greater. Longer or ring shank nails may be specified.
- Fasteners must be at least 7mm from the edge of the sheet.
- Where using power driven nails some applications including bracing may require full round head nails: Confirm prior to installation.
- For tongue and groove products such as flooring and roofing fasten 15mm from tongue and groove edges.
- Standard fixing pattern: unless otherwise specified fasten edges and ends of sheets at 150mm centres, and within the panel at no more than 300mm centres (see diagram below).
- Use hot dipped galvanised fasteners or corrosion resistant fasteners (i.e. stainless steel) determined by design for specific hazards.
- Where using stainless steel nails, nails must be annular grooved
- Refer to Table 7 for minimum fastener sizes.
- Do not overdrive power driven nails.

EC001: Fastener Spacings for Ecoply®



Ecoply® fastened in vertical plane



Ecoply® fastened in horizontal plane

EC002: Fastener Spacings from Edges

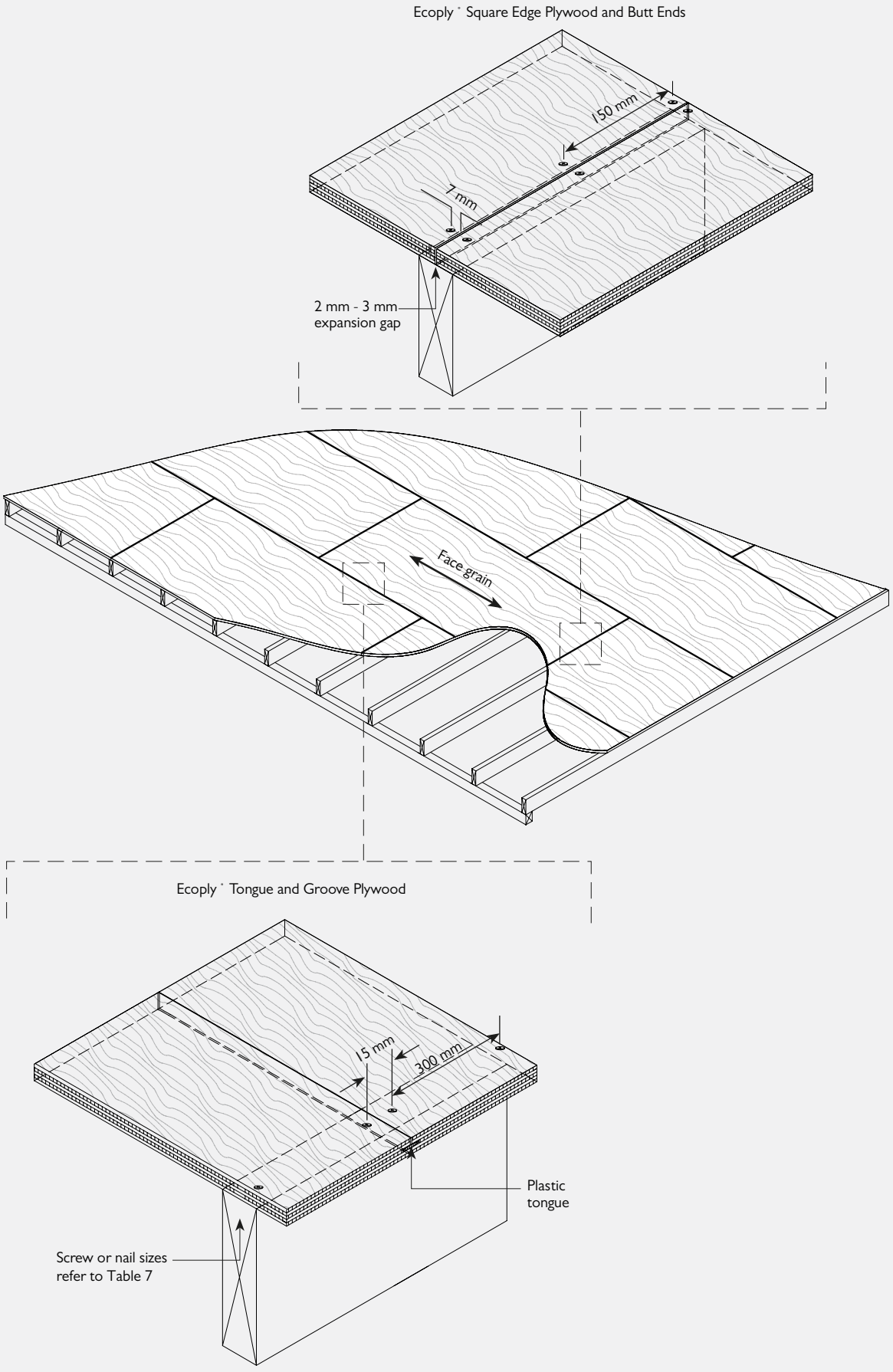


Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm / 9mm	Load[1]	12mm / 15mm	Load[1]	17mm	Load[1]	19mm / 21mm	Load[1]	25mm	Load[1]
Minimum nail size in timber framing[2]	40 x 2.5mm	570	60 x 2.8mm	736	60 x 2.8mm	736	60 x 2.8mm	736	75 x 3.15mm	883
Screw size in timber framing[2]	8g x 30mm	1230	8g x 40mm	1230	10g x 40mm	1650	10g x 45mm	1650	10g x 50mm	1650
1.15mm steel framing[3]	10-24-35[4]	1300	10-24-40[4]	2000	10-16-45[4]	2100	10-16-45[4]	2100	10-16-45[4]	2100
Screw size in 2.80mm steel framing[3]	10-24-35[4]	1200	10-16-40[4]	1200	14-20-45[4]	3000	14-20-45[4]	4000	14-20-45[4]	5000

[1] The load is the characteristic load (N) for one fastener in single shear.

[2] Characteristic load based on fixing into a timber of J5 joint group or better.

[3] Self tapping, self countersinking screw.

[4] Screw Numbers indicate: Gauge – Threads per inch – Length (mm).

Notes:

- Steel thickness, screw sizes, characteristic loads, refer to assemblies actually tested.
- Other screw sizes may be used. Screw properties vary between screw suppliers and the suitability of a particular size should be verified by the designer for performance under changing physical conditions and cyclic loading.
- Non-standard nailing may be specifically designed with NZS 3603, NZS AS 1720.1 or similar.

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 section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Notes: H3.2 CCA treated timber should not be fixed in direct contact with light gauge steel products. Refer to the framing manufacturer for advise on fixing and treatments.

2.3 ADHESIVES

Tube Applied Construction Adhesives

Site applied construction adhesive may be used together with nails and screws for non-permanent loads, reduced fastener popping, and to lower the risk of squeaking in floors. Available types include polyurethane (e.g. Soudal® Gorilla Grip) and solvent (e.g. Soudal® Gorilla Grab or Bostik® "tuff as Nails") based adhesives.

Adhesives should have appraisal from an independent authorising body such as BRANZ or equivalent authorities (e.g. AFG 01 Adhesives for field gluing) for plywood to wood framing for the specific application proposed. Follow manufacturer's recommendations. In addition:

- Use a bead or daubs of adhesive as per manufacturer's recommendations.
- Apply pressure using fastener patterns outlined in section 2.2: Sheet Fasteners and Fixing.
- Work from the middle of the sheet outwards to develop glueline pressure.
- Ensure adhesives are compatible with treatment in the framing timber, see section 1.4: Preservative Treatment.

Structural Adhesive Joints

Structural bonds are generally only achievable in factory controlled conditions using approved structural adhesives in accordance with approved standards for glue lamination, e.g. Resorcinol formaldehyde joints made to AS/NZS 1328 Glued laminated structural timber. Site gluing is not recommended for structural plywood components and is subject to specific engineering design.

3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply® bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZBC - B1 Structure, and NZS 3604 Timber Framed Buildings or specifically designed to NZS 3603 Timber Structures Standard.

Any Ecoply structural panel may be used for bracing as long as it is 7mm, 9mm or 12mm thick, has a minimum wall length as described in Table 9, treated for the specific application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this guide.

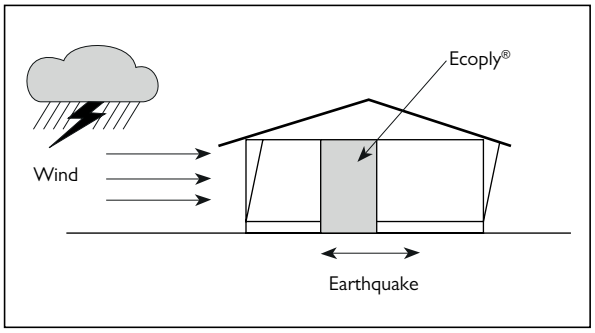
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Plywood have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Specific Design



Ecoply structural plywood is manufactured to AS/NZS 2269, and it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Demand is calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz.

EP bracing systems properties can be easily loaded into the EzyBrace software by way of an Excel patch downloadable from www.chhply.co.nz together with loading instructions.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120BUs/m.

Durability

Ecoply plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in buildings. If the product is used, handled and installed in accordance with CHH Plywood product literature it will meet the durability Clauses of the NZBC.

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the required preservative treatment and fastener material.

Table 8: Ecoply® Suitability for Bracing Applications Including Treatment Type and Fastener Material

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray): E.g. Interior linings.	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B and C, as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/without cavity battens behind cladding.	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/without cavity battens behind cladding.	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply® Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones, as per section 4 of NZS 3604 (including sea spray).	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

Note: Power driven nails are suitable for use. Do not overdrive, nails must be full round head.

Rain Wetting and Construction Bracing

Untreated Ecoply® will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and Condensation

In conditions where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3.1 LOSP or H3.2 CCA treated to resist decay or insect hazard.

Subfloor Sheet Bracing

H3.2 CCA treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, 100% acrylic exterior coating system with a light reflectance value of 50% or greater.

Ecoply Bracing Used in Internal Wet Area Applications

Ecoply Structural plywood can be used for bracing behind a bath or shower providing it is protected by an impervious lining and must be installed in accordance with the bracing specification, where plywood is H3.2 CCA treated stainless steel fasteners are required.

Best building and design practice would be to relocate the bracing element along the bracing line, if possible, where it was away from the shower liner.

Plywood expands and contracts with environmental changes so therefore design consideration should be given to the impervious lining used over the top of it, to protect the plywood.

Note: A dummy liner may then be required over the plywood to ensure the plywood sheet remains complete from bottom plate to top plate in situations where the shower design requires the base to be checked into the lining.

Adjustments for Wall Height

Use section 5 of NZS 3604 to calculate bracing values: "Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from Table 9 should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4m high shall be rated as if they are 2.4m high.
(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
(c) Walls with heights < 1.5m, Specific Engineering Design is required.

Joining Panels for Walls Higher Than Maximum Sheet Length

Ecoply bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.4m, Ecoply and Shadowclad is available in 2.7m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications and must be a minimum of 0.3m in height. (e.g. 2.4m x 1.2m sheet with a 0.3m x 1.2m part sheet above it to give a 2.7m x 1.2m bracing element).

Joining Panels for Walls Longer Than Maximum Sheet Width

Ecoply bracing panels must be fixed from start to finish of bracing element. For panel lengths greater than the width of a plywood sheet a part sheet, or sheets, can be stacked next to a full sheet, butt jointed a stud with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications and must be a minimum of 0.3m in width. (e.g. 2.4m x 1.2m sheet with a 2.4m x 0.3m part sheet next to it to give a 2.4m x 1.5m bracing element).

Cladding as Bracing

12mm Ecoply® (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weathertight cladding and bracing element when installed in accordance with E2/AS1.

It should be noted smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Plywood to be a manufacturing or product fault. For more information refer to section 1.8: General Design Considerations - Face Checks on Plywood Exposed to Weather. H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

Plywood for Exterior Cladding

Plywood for exterior cladding applications where a high visual appearance is desired, CHH Plywood recommends the use of Shadowclad® as an exterior cladding. Shadowclad has a textured (bandsawn) face which reduces the visibility of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhply.co.nz.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100mm above decks or paved ground and a minimum of 175mm above unprotected ground.

Service Penetrations in Bracing Elements

A small opening (e.g. power outlet) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element, or a waste pipe outlet of maximum 150mm diameter placed at no closer than 150mm to the edge of the braced element. Maximum one penetration per bracing panel.

3.2 ECOPLY® BRACING SPECIFICATIONS SUMMARY

CHH Plywood has a range of bracing specifications called the EP bracing series. The EP bracing series simplifies the design and construction of bracing elements using plywood, by itself or in conjunction with GIB® Plasterboard and features:

- Single sided and double sided bracing elements
  High performance bracing element utilising GIB® Standard plasterboard.
- A single type, GIB Handibrac®, hold-down for all bracing elements.
- Specifications for each bracing element type.

Table 9: Summary P21 Ratings for 2.4m High Ecoply® Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.4m	Ecoply® one side	80	95
	0.6m		95	105
	1.2m		120	135
EPG	0.4m	Ecoply one side and 10mm GIB® Standard plasterboard other side	100	115
	1.2m		150	150

Note: Bracing and other technical information has been specifically tested using Ecoply® branded structural plywood. This information cannot be used with any other plywood brand and bracing data must be sought directly from the specific plywood manufacturer.

More Information

The following pages provide a full specification of EP bracing elements. Copies of specifications can be downloaded from www.chhply.co.nz.

NZS 3604 provides the method of calculating demand on a building. Calculation sheets are available from BRANZ or GIB EzyBrace® software is available as a free download from www.gib.co.nz. Information is available at www.chhply.co.nz which can be placed in the custom elements of GIB EzyBrace® for ease of calculation.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC 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 manufactured and/or distributed by CHH Plywood and SG8 timber framing, 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.

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3.3 ECOPLY® BRACING SPECIFICATION - EPI

Table 10: Singled Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1_0.4	0.4m	Ecoply® one side	80	95
EP1_0.6	0.6m	Ecoply one side	95	105
EP1_1.2	1.2m	Ecoply one side	120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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 7mm, 9mm or 12mm Ecoply® plywood fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

The panels must be installed with the long side of each panel orientated vertically to the framing members.

Fastening the Ecoply® Panels

Fasten with 50 x 2.8mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

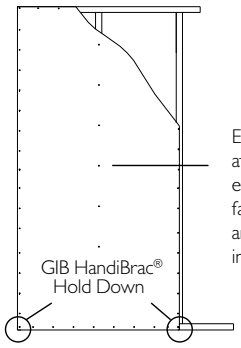
Fasteners for H3.2 CCA Treated Ecoply Panels

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC 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 manufactured and/or distributed by CHH Plywood and SG8 timber framing, 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.

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Table 11: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray):	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B and C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply® Specification and Installation Guide.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC 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 manufactured and/or distributed by CHH Plywood and SG8 timber framing, 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.

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3.4 ECOPLY® BRACING SPECIFICATION – EPG

Table 12: Structural Plywood Brace With Plasterboard Other Side

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EPG_0.4	0.4m	Ecoply® one side and 10mm	100	115
EPG_1.2	1.2m	GIB® Standard plasterboard other side	150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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

Side 1: One layer of 7mm, 9mm or 12mm Ecoply® plywood exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

The panels must be installed with the long side of each panel orientated vertically to the framing members.

Side 2: One layer of 10 or 13mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® Panels

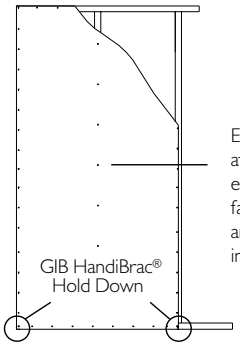
Fasten with 50 x 2.8mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC 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 manufactured and/or distributed by CHH Plywood and SG8 timber framing, 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.

JUNE 2025

Fastening the GIB® Plasterboard

32mm x 6g GIB® Grabber® Screws or 35mm GIB® Nails.

Fastening Centres

Fasten 50, 100, 150, 225 and 300mm from each corner and 150mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12mm from paper bound edges and 18mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.

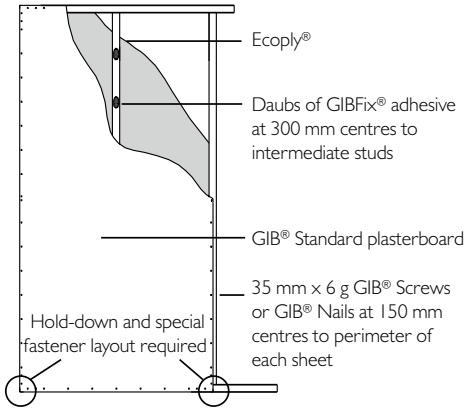


Table 13: Ecoply® Suitability for Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones including sea spray, as per section 4 of NZS3604):	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones1 B and C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone1 D (sea spray), as per section 4 of NZS3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zone D, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

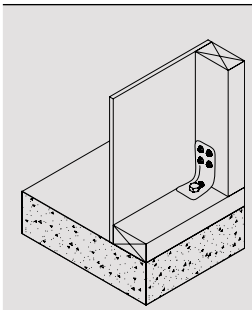
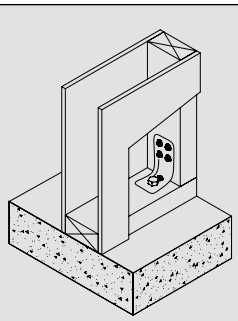
* Refer to Table 8, page 16 of Ecoply® Specification and Installation Guide.

3.5 GIB HANDIBRAC® – RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as the 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

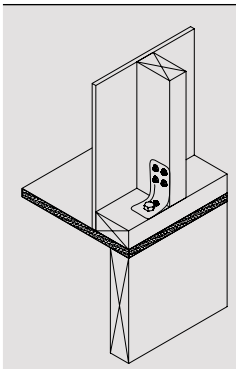
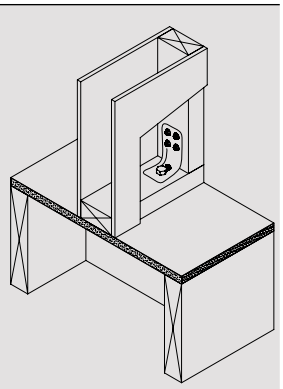
External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/ plate junction.

Hold-down Fastener Requirements

Bowmac Screw Bolt

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Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer.	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.

Hold-down Fastener Requirements

Bowmac Screw Bolt

3.6 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 of NZS 3604 13.5.2 which allows for plywood not less than 6mm thick and a minimum of three ply for:

(a) Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
(b) Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs.

Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

(a) The length of diaphragm shall not exceed twice its width measured between supporting walls.
(b) The ceiling lining must consist of plywood over the entire area of the diaphragm.
(c) Complete sheets with a minimum size of 1800 x 900 must be used.
(d) Framing size and spacing must comply with NZS 3604.
(e) Fastener size should comply with Table 7 of this guide. E.g. 40mm x 2.5mm flat head nails for 7mm and 9mm Ecoply®.
(f) Fastening is at 150mm centres around the perimeter of each sheet and at 300mm centres to intermediate framing.
(g) Fixings are no closer than 10mm from sheet edges.
(h) Perimeter ceiling framing must be connected to wall framing by a perimeter 140mm x 35mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55mm thick steel angle or proprietary steel channel.
(i) Sheets must be layed in a staggered pattern.
(j) The basic shape of a ceiling diaphragm should be rectangular. Protrusions are permitted but cut-outs are not (see Figure 13.4 NZS 3604).

4.0 ROOFS & DECKS

The section below covers the use of Ecoply® plywood used as a substrate for flexible membrane and tile systems in roofing and decking applications. The information below should be considered as supplementary to system specifications from roofing and decking suppliers.

Further guidance on installation and detailing factors can be found in the EWPAA Technical Note; Plywood Roofing and Flooring: Installation and Detailing Factors.

Ecoply is not recommended as a substrate for exterior decks without a properly detailed barrier material such as butyl rubber, vinyl or E.P.D.M to protect the surface from weathering.

Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products.

4.1 FLEXIBLE MEMBRANE SYSTEMS

- Roofing and decking membranes may comprise synthetic rubber sheeting glued to the Ecoply, or torch welded bitumen membranes.
- Always ensure Ecoply is dry and free of imperfections such as surface dust and blemishes as membranes coatings will telegraph any substrate imperfections.
- Use Ecoply Flooring or Structural Square Edge (CD Grade).
- Where Ecoply Flooring is used consider the use of a small daub of glue or nail in the Tongue and Groove of each sheet if potential movement of the plastic tongue joint is not acceptable.
- For trafficable decks use a minimum 17mm thickness, refer to Table 15A and 15C for specification.
- Use countersunk stainless steel screws and adhesive on framing to avoid head popping. Apply adhesive between screw locations.
- Use kiln dried timber framing such as Laserframe® or appropriate LVL framing from the Futurebuild® range.
- Consult the membrane manufacturer regarding use of bond breaker tapes over joints to allow elongation with natural plywood movement.
- Where treatment is required use only H3.2 CCA treated Ecoply. Do not use H3.1 LOSP treated Ecoply (solvent based carrier). It is not compatible with most membrane systems. If there is evidence of treatment salt crystals on the Ecoply surface remove by scrubbing with a small amount of water and allow the surface to dry prior to laying the membrane system.

Plywood Substrates, Face Checking and Flexible Membrane Systems

All natural wood based products (including Ecoply) have the potential to develop natural surface face checks when exposed to external environmental conditions. The degree of face checking is dependent on a number of factors including the length of time and level of exposure to weather during construction which is outside the manufacturing control of CHH Plywood. For more information see section 1.8: General Design Considerations - Face Checking on Plywood Exposed to Weather.

Face checks, while typically not present after manufacture, do not affect structural performance of the sheet and are acceptable under AS/NZS 2269. They are not a manufacturing fault.

Designers and membrane suppliers must carefully consider the suitability of plywood as a substrate for the membrane system in question if the potential of telegraphing of face checks onto the membrane surface is not acceptable.

The risk of telegraphing can be reduced by protecting the plywood surface from weather and moisture during the construction process.

Where the potential of face checking in the plywood substrate is not acceptable designers should consult the membrane supplier for a more suitable membrane or an alternative substrate.

Allowing for Moisture Expansion of Plywood Under Roof and Floor Coverings

Membrane suppliers have held different views on the requirements for plywood substrates. The fixing instructions within this guide are the starting point but designers must detail joints that allow for expansion in accordance with practices recommended by the chosen membrane supplier.

CHH Plywood's view, and the recommendation of a number of suppliers here and in North America is that expansion and contraction at sheet edges should be allowed for by loosely butting tongue and grooved edges so that the tongues can absorb movement and providing a small gap (2 to 3mm) between square sawn edges. Use a bond breaking tape over these joints to spread elongation in the membrane over a longer distance than the narrow gap in the joint itself. This tape can double as a rain seal over the sheet edges during construction.

Other membrane suppliers believe that sheets should be tightly butted and glued and screwed hard up to each other. This practice constrains movement at the small joint between sheets, but over a wider area requires significant allowance for movement around the perimeter of a roof segment. Junctions between the roof slopes and walls need careful detailing to allow for the potential movement. Movement control joints should be provided at regular intervals following the recommendation of the membrane manufacturer, especially if this method is adopted.

4.2 ROOF TILE SYSTEMS

Most fibreglass, asphalt or wooden shingle and tile systems will tolerate DD grade surface characteristics.

- Use unsanded Ecoply® Roofing (DD grade), or sanded Ecoply of the required thickness in Table 15A.
- The unsanded surface provides extra grip on steeper roofs for roofers.
- Fix tiles according to the tile manufacturer's specification.
- Under asphalt shingles use felt underlay over the Ecoply.

4.3 ROOFING & DECKING – PRODUCT SELECTION GUIDE

Table 14: Roofing and Decking Product Selection Guide

	Structural Square Edge (CD Grade)	Flooring (CD Grade)	Roofing (DD Grade)
Product Description	CD face grade sheets are available in a range of thicknesses and size	Solid sanded C grade surface with tongue and groove profile on long edges	Unfilled D grade surface with tongue and groove profile on long edges
Recommended Applications	Substrate for flexible coverings requiring a smooth substrate and where avoidance of visible surface indentations is critical. Use as a substrate for flexible roof and deck membranes and thin roofing tiles		Substrate for coverings with the ability to span holes in the D face grade (up to 75mm in diameter) such as asphaltic roof tiles and torch welded polyester reinforce membranes. Do not use under flexible membrane coverings or where avoidance of visible surface indentation is critical
Face Grades	Front: C solid sanded. Back: D unsanded		Front and Back: D unsanded
	Refer to Table 1 for range and treatment options		
Product Features	Blocking required to support all edges	Blocking not required to support tongue and groove edges (unless otherwise specified).	Specifically designed for use under shingles and tiles that have a courser finish. Unsanded surface for extra grip for installers on steep roofs. Blocking not required to support[2] tongue and groove edges (unless otherwise specified).
Thicknesses Available	12, 15, 17, 19, 21, 25mm	17, 19, 21, 25mm	15mm
Sheet Sizes Available	2400/2700 x 1200m		
Stress Grades Available	F8/F8, F8/F5[1] (F11/F8 available upon request)	F8/F5 (F11/F8 available upon request) 19mm Longspan supplied F11/F8 as standard	F11/F8
Treatment	Untreated, H3.2 CCA and H3.1 LOSP	Untreated, H3.2 CCA, (H3.1 LOSP available upon request)	
Span Capabilities	Refer to frame spacings in Tables 15A to 15C		

[1] Refer to Table 1 and 4B for availability of F8/F8 and F8/F5 products and thicknesses.

[2] Where roofing products use tongue and groove CHH Plywood recommends fastening the tongue to rafters/joists at a minimum of one point.

4.4 FRAME SPACINGS FOR ECOPLY® ROOFS & DECKS

Table 15A: Roofing - Sheathing, Non Trafficable, Above 2 Degree Pitch

Application	Roof Pitch	Maximum Wind Zone	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing			
			Ecoply Nominal Thickness (mm)			
			15	19	21	25
			Stress Grade			
			F11/F8	F8/F5		
Sheathing, non trafficable roof for all roof pitches above 2 degrees. Suitable for roof mass up to 30kg/m² (additional to Ecoply® weight or 40kg/m² including Ecoply).	>2°	Extra High		800	800	900
	>28°	High	900			
		Very High	800			
		Extra High	800			
	>20°	Very High	900			
		Extra High	800			

- Suggested applications include substrates for Asphalt Shingle and Membrane type roofs. The above suggested maximum framing spans are based on the following deflection criteria:
- Under a short term 1kN point load, deflection is less than Span/130.
- Under a long term self weight load, deflection is less than Span/400.
- Under a short term wind gust load, deflection is less than Span/150.

Table 15B: Sub-Sheathing

Application	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing				
	Ecoply Nominal Thickness (mm)				
	12	15	19	21	25
	Stress Grade				
	F8/F8	F11/F8	F8/F5		
Under steel or self supporting cladding for support of building paper or lateral diaphragm action. Sag not critical.	800	1200			

Table 15C: Decking

Application	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing			
	Ecoply Nominal Thickness (mm)			
	17	19	21	25
	Stress Grade			
	F8/F5	F11/F8	F8/F5	
1. Trafficable roof decking limited by dynamic response of roof as floor	540	600	600	750
2. Roof decking to Clause 8.5.5.1 c) of E2/AS1	400	400	400	400

- The current requirement in E2/AS1 is extremely conservative when compared with calculations determined for other applications using VM1 Clause 6 and calibrating the spans against codes of practice from North America and Australia. CHH Plywood recommends designers consider the alternative solution in row 1 of Table 15C for membrane decking in consultation with the membrane manufacturer.
  Unless otherwise stated spans apply equally to square edge or tongue and groove panels. Check Table 1 for availability of grades and lengths to match span multiples in Table 16.
- Use the next lower recommended frame spacing or thicker Ecoply® where appearance is critical.
- To suit trusses at 900 centres, 2700 long sheets are available. See Table 16.

Table 16: Frame Set Outs to Match 2400mm and 2700mm Sheet Modules

Length (mm)	Typical Frame Spacing to Suit Sheet Length			
2400	400	480	600	800
2700	450	540	675	900

- **Limitation for the use of Table 16.**
- CHH Plywood does not have access to information about designs for specific sites. Table 16 is a guide to estimate the initial selection of a span for design. Each site should be evaluated by qualified persons to ensure all loading parameters and site conditions have been considered, and appropriate changes should be made by the building designer.

4.5 ROOFING – DESIGN CONSIDERATIONS

Durability

In general, H3.2 CCA treatment of Ecoply® plywood with waterborne preservatives is recommended for roofing.

Roofing Materials

Various roofing materials used over Ecoply plywood have different durability expectations, normally in excess of the 15 years required by the NZBC Clause B2. Durability of the roofing is subject to the specifications, installation and maintenance requirements of the roofing manufacturer. The durability of the Ecoply can only be assured as long as the overlying roofing and detailing excludes moisture. With good building practice and maintenance, roofing materials can be repaired or replaced at regular intervals to achieve life from the Ecoply in excess of the original roofing. The durability of Ecoply structural plywood will continue to satisfy the relevant requirements of the NZBC for 50 years, if installed in accordance with the instructions and limitations within this guide and the roof system is adequately maintained.

High Humidity, Condensation and Solar Driven Moisture

Where the moisture content of wood may exceed 18% for prolonged periods, Ecoply must be H3.2 CCA treated, to resist decay hazard. This includes Ecoply used under roof coverings that may be subject to condensation, or where rain moisture soaked in the roof covering can be driven into the Ecoply by the sun. Appropriate building detailing and ventilation is recommended which can reduce the need for treatment.

Roof Ventilation

Good ventilation and the avoidance of moisture are important design considerations when using H3.2 CCA treated Ecoply panels. Poorly ventilated spaces can develop very high temperature and moisture levels. The most likely source of moisture is the condensation of vapour from warm interior air on the underside of cold roofing. Good ventilation can limit the build up of excess moisture vapour in warmer climates but in regions where winter nights are consistently colder, H3.2 CCA treated Ecoply should be used. Moisture induced decay is only one risk that needs to be managed. If incorrectly detailed, roof spaces can be very tight and the dark colour of many roofing materials means that excessive heat can build up causing distortion in plywood or even framing members. Use the suggested details or alternatives to suit. Designers must consider roofing type, seasonal conditions, wind effects and the intended use of the building.

As a minimum, CHH Plywood recommends a vent area of 1/300th of the ceiling plan area (approx. 3350mm^2 per square metre of ceiling) equally distributed at the eaves and ridge to allow free flow under the Ecoply, up the roof slope, and out.

Roofing material suppliers should detail vent systems suited to their specific membrane or tile roofing. Proprietary ridge capping profiles or vents are available from roofing suppliers.

Detail gaps of 25mm in the plywood at ridges, and at walls where a roof slopes up to an upper storey. For flat roofs, natural ventilation flows may be impeded. Use proprietary roof vents. Consider forced ventilation as appropriate.

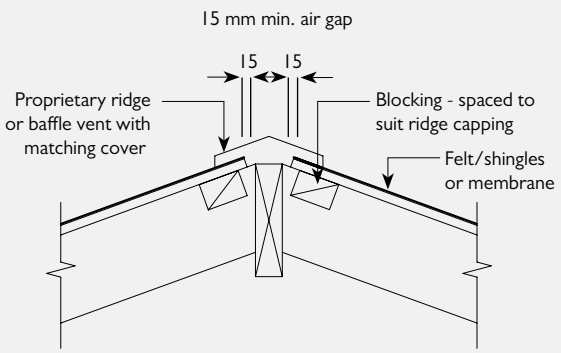
Bubbling

Plywood bubbling occurs when moisture trapped in knot holes in inner veneers expands as the temperature rises. This moisture will dissipate through the face veneer and will not affect the structural integrity of the plywood panel. As membrane coverings can prevent moisture dissipation, Ecoply Flooring and Structural Square Edge CD is recommended if the visual appearance of bubbling is not acceptable, or a higher visual finish is required.

Soil

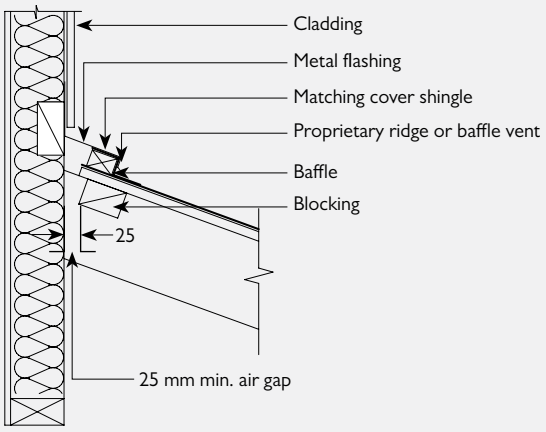
Ecoply plywood (untreated or H3.1 LOSP/H3.2 CCA treated) must not be allowed to come in contact with soil. Surfaces, flashings and gutters should be detailed to avoid trapping detritus and moisture.

EC003: Ridge Detail With Ridgeboard

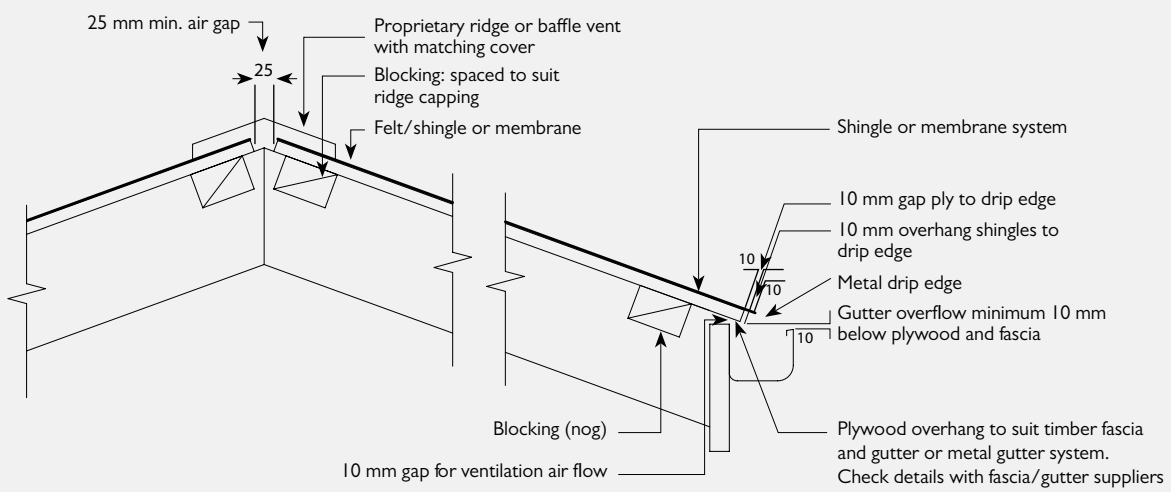


(use also with Hip Rafter if extra ventilation required)

EC004: Roof to Wall Junction Vent



EC005: Truss Ridge Detail



Rain Wetting and Construction Time

Untreated Ecoply® will withstand a reasonable amount of rain wetting and exposure during construction for up to three months. In extreme weather conditions of high temperature and/or high rainfall this period may be less. Appearance issues such as discolouration and face checking of the sheet surface can be expected if Ecoply is exposed. For roofs uncovered for longer periods use H3 treated Ecoply to lower the risk of decay. Return Ecoply to below 18% moisture content before installing moisture sensitive materials, coverings, coatings or adhesives. Where a high visual finish is desired (such as membrane roofing and decking) protect Ecoply from exterior moisture during construction. For detailed information see section 4.1 Flexible Membrane Systems.

Gutter Details

Where Ecoply structural plywood sub-sheathing supports roofing at gutters, a metal drip edge must be provided with appropriate gaps to shed water. Gutters should have a front edge overflow or ends lower than the back to shed water overflow away from framing and sub-sheathing Ecoply.

H3.2 CCA treatment is recommended for Ecoply sheets that protrude into gutters, with regular maintenance to avoid leaf mould (soil) development. Untreated Ecoply must not be exposed to gutter splash or moisture.

Fastener Spacing for Wind Suction

Wind pressure applies withdrawal loads to nails holding plywood to purlins and trusses. For the frame spacing in Table 15A designers may use the following guidelines for wind zones expressed in NZS 3604.

Note: Full penetration of fasteners into the supporting member is assumed.

The Main Body of the Roof

For wind zones up to and including high, use 60 x 2.8mm nails spaced at 150mm centres on all cross framing. For very high and extra high wind zones, use 75 x 3.15mm nails spaced at 150mm centres on all cross framing.

Roof Edges

All Ecoply structural plywood used at local pressure suction zones at the roof edges, gutters, eaves and gable ends must be supported on framing, and fixed at 75mm centres with minimum 60 x 2.8mm nails for regions up to, and including high wind zones (use 75 x 3.15mm nails for very high and extra high wind zones). Local pressure zones are interpreted from AS/NZS 1170 as being within 20% of the building length, width or the average of the gutter and ridge height.

Designers and builders should review site conditions to ensure adequate fixing is applied. Buildings in exposed sites and lee zones should be specifically designed using the loading standard (AS/NZS 1170) and the timber structures standard NZS 3603. In some wind conditions, the tiles themselves may be sucked from the plywood. Use a consulting engineer to assess site conditions, calculate wind pressures for the specific site, and determine the fastening and span requirements, and to check that the truss system can resist the loads being applied through the plywood.

Fixing of Roofing

Fixing methods for tile, shingle and membrane systems must be designed for the expected wind and weather exposure to protect the Ecoply substrate. Some shingle systems may not be suitable for use in very high or cyclonic wind zones.

Follow the specifications of the roofing manufacturer and refer to the appropriate BRANZ Appraisals.

4.6 ROOFING – INSTALLATION

Framing

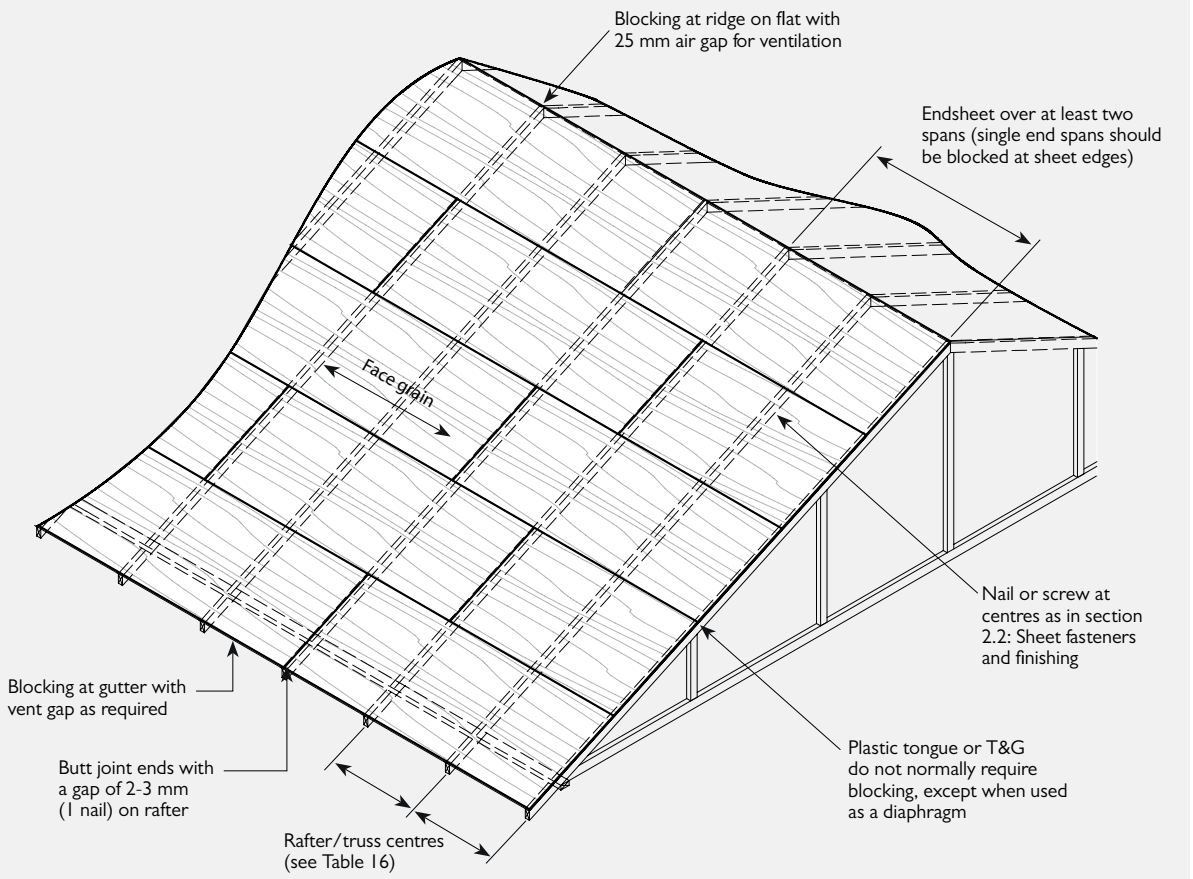
Frames should be at spacings to suit plywood thicknesses in Table 15A, page 25. Additional requirements for roof framing are:

- Ensure top edges of framing are properly aligned.
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to lower moisture level in roof spaces, second floor spaces, and reduce differential truss, rafter or joist deflections.

Blocking (Nogs, Dwangs)

- Block all edges of Ecoply® Structural Square Edge plywood.
- Block all edges at the ridge and gutter lines to prevent sag at capping or gutters.
- Block for high face loads or under areas accessed for maintenance.
- Blocking within the body of the roof is not required under tongue and grooved edges when using Ecoply Flooring and Roofing, unless required for framing stability or the plywood is being used as a diaphragm to resist horizontal wind or earthquake loads. In this case fixings transfer shear across the joints and details should be specified on drawings.
- Use blocking on the flat to provide gaps where air flow is needed for ventilation.
- Specific roofing suppliers may require blocking to suit their system.

EC006: Sheet and Framing Layout



Sheet Layout

- Ensure Ecoply® sheets are dry before installation.
- Place face grain at right angles to supports.
- Sheets must be continuous over at least two spans (three framing members).
- Lay the sheets in a staggered pattern.
- Allow sufficient clearance inside confining structure such as concrete or brick walls adjacent to the roof. Use extra allowances with large areas.
- Allow clearance for ventilation as required.

Fixing of Sheets

Ecoply may be fixed to different types of framing with nails, screws or a combination of fasteners and construction adhesives.

Fasteners should be corrosion resistant to a level appropriate to the end use life expectancy (15 or 50 years) and expected exposure to moisture. Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

The integrity of a plywood based roof system is directly related to how well the panels are fixed to the framing. Ecoply must be fixed to resist wind suction loads, and to maintain surface qualities of the overlying roof covering.

- Always refer to the roofing system supplier for system requirements.
- For roofing, check the additional requirements according to wind exposure.
- For very exposed sites, cyclonic conditions or roofs above 10 metres in height, carry out specific structural design to the relevant standards.
- Screw fixing must be used for membrane roofing, and is preferred for all systems because of increased holding power and avoidance of head popping.
- For minimum fastener spacing for wind suction, refer section 4.5 Roofing - Design Considerations - Fastener spacing for wind suction.

Fixing to Timber Frames

- Ring shank nails or annular grooved nails or screws are recommended for additional holding power.
- Use flathead nails. Do not use jolt or bullet head nails.
- Stainless steel nails must be annular grooved.
- Ensure fastener is compatible with the roofing cover (consult roofing system supplier).
- Staples may be used provided that the withdrawal load is equivalent to the hand driven galvanised flathead nail. A suggested minimum is a 50mm long staple with 12mm crown and legs 1.8mm diameter. Space staples 20% closer than nails. Refer to the manufacturer's information for corrosion resistance and durability.

Fixing to Steel Frames

- Fix directly to roll formed steel (up to 2mm thick) with self-drilling, self-tapping screws. If plywood gets damp and expands, screws in thicker steel may shear. Keep Ecoply dry or use larger screws or;
- Bolt or screw battens to the steel and apply Ecoply as above for timber. Ensure that battens have adequate thickness for the minimum nail or screw length.
- H3.2 CCA treated plywood must not be fixed to steel framing.

5.0 FLOORING

The following section covers the use of Ecoply® Flooring plywood used as a flooring substrate with flexible and rigid overlays.

Ecoply Flooring is suitable as a substrate for overlays such as carpet, tiles and some membrane products (refer to flooring manufacturer).

5.1 FLOORING – RANGE

- The tongue and groove on long sheet edges does not require support blocking under the joint (unless otherwise specified).
- Supplied in F8/F5 stress grade (F11/F8 available upon request).
- Ecoply 19mm Longspan Flooring supplied as standard in F11/F8 stress grade.
- Supplied standard with a sanded C grade surface with D grade back.
- Designers must expect the surface to dent or mark more easily than hardwood flooring systems as Ecoply is manufactured from relatively soft timber veneers.
- Available untreated or H3.2 CCA treated, (H3.1 LOSP treated available upon request).
- LOSP treated plywood is not recommended for internal applications.
- Refer to Table 1 for range and treatment options.
- Flooring - Critical Radiant Flux C/VM2 Appendix B gives a value of 2.2kW/m² for plywood and timber floors more than 12mm thick.

5.2 FLOORING – INSTALLATION

Table 17: Flooring Frame Spacings

Application	Maximum Frame Centres (mm) for Ecoply® with Face Grain Across Framing			
	Ecoply Nominal Thickness (mm)			
	17	19	21	25
1. Domestic flooring 2kPa - 1.8kN	540	600 F11/F8 Longspan	600	750
2. Institutional and public assembly up to 4kPa - 2.7kN	300	480	540	750
3. Institutional and crowd assembly up to 5kPa - 3.6kN		400	450	600
4. Corridors, industrial up to 5kPa - 4.5kN		300	400	540
5. Domestic garage floor** 2.5kPa - 9kN				270

** Provide blocking to all edges of the sheet.

- Use the next lower recommended frame spacing or thicker Ecoply® flooring where appearance is critical.
- To suit frames at 900 centres, 2700 long sheets are available. See Table 16.

Floor Loads

For domestic garage floors blocking is required under all edges to control wheel loads on the tongue. Testing with 113mm diameter load head (0.01m²) confirms commercial floor capabilities.

Refer to Table 16 to match frame set outs with 2400mm and 700mm sheet modules.

Framing

- Joist spacings should be at spacings to suit plywood thicknesses in Table 17.
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to achieve a moisture content of 18% or less.

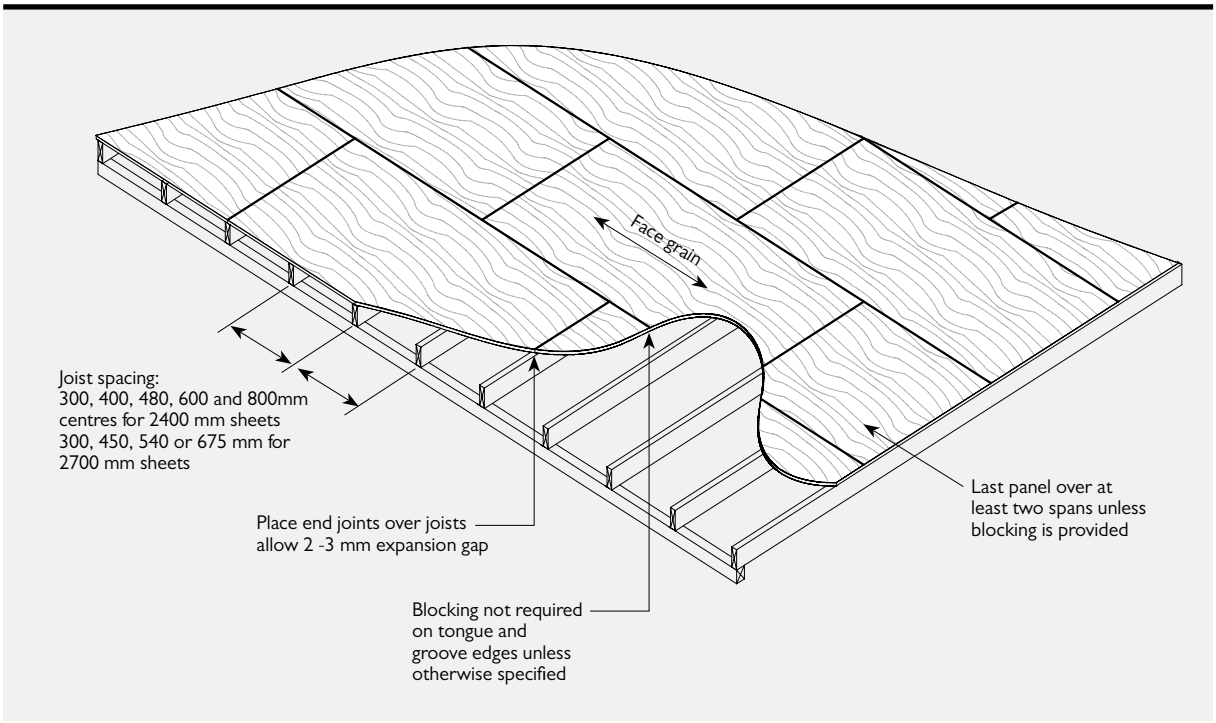
Blocking

- Blocking within the body of the floor is not required under tongue and groove edges unless otherwise specified (such as in domestic garage floors).

Sheet Layout

- Ensure Ecoply sheets are dry before installation.
- Place face grain at right angles to supports.
- Sheets must be continuous over at least two spans (three framing members).
- For panels at floor edges where a continuous two span coverage is not possible, sheet edges must be supported by blocking.
- Lay sheets in a staggered pattern.
- Allow clearance for ventilation as required.

EC007: Ecoply® Flooring Layout



Fastener Selection and Treatment

Fasteners should be corrosion resistant to a level appropriate to the end use, life expectancy (15 or 50 years) and expected exposure to moisture.

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 section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Fasteners and Fixing of Sheets

- Ecoply® Flooring may be fixed with nails or screws or a combination of mechanical fasteners and construction adhesives.
- For fastener specifications (including lay out and sizes) refer to section 2.2: Sheet Fasteners and Fixing.
- For construction adhesive specifications refer to section 2.3: Adhesives.
- Ring shank or annular grooved nails, or screws are recommended for additional holding power.
- To reduce the risk of fastener popping or floor squeak the use of construction adhesives is advised.
- Do not use jolt or bullet head nails.

5.3 FLOORING – FINISHING

- Overlays and coatings should be applied following the manufacturer's specifications.
- Avoid heavy sanding that may remove the critically important structural face veneer.
- Adhesives must be compatible with CCA (Copper Chrome Arsenic) treatment in H3.2 CCA treated sheets. Compatibility can often be improved by lightly washing, scrubbing and drying the plywood surface prior to fixing.
- Where clear or stained finishes are desired, designers should select sheets and protect the floor as much as possible from the weather and construction activities.
- Ecoply is made from relatively soft timber veneers and as such will dent or mark more easily than hardwood flooring systems. This is to be expected and designers must consider the long term appearance requirements of the project. Ecoply Flooring is a good substrate for harder wearing flooring overlays, and is not primarily intended for clear finishing, especially if it is exposed to moisture during construction.
- For improved surface finish, floors should be protected from weather during construction as soon as possible.

6.0 FREQUENTLY ASKED QUESTIONS

Q: How much space should be allowed for expansion?
A: Allow a 2 - 3mm expansion gap between square edges of Ecoply® sheets. If using Ecoply Flooring, a 5mm expansion gap is recommended at the perimeter of the floor or deck. Check by calculation for large areas.

Q: Can power driven nails be used to fix Ecoply®?
A: Paslode power driven nails have been tested for fixing Ecoply and Shadowclad® plywood products for particular bracing and cladding applications. For power driven nail specifications refer to the Paslode Special Fixing Applications document available from https://www.paslode.co.nz/wp-content/uploads/CHH-Woodproducts-Fixing-Matrix.pdf. Use the Paslode Impulse Compact Nailer fitted with a No Mar(k) work contact element to eliminate any contact marks on the plywood. Adjust the work contact element to the flush position and fire the nail at 90° to the work surface. Hammer any nails flush which are left proud. Do not overdrive.

Q: How close to sheet edges can I nail?
A: Fixings must be at least 7mm from the sheet edge.

Q: Do I have to use stainless steel nails when using Ecoply for bracing?
A: Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must 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. Where stainless steel nails are required, annular grooved nails must be used.

Q: What is the weight of Ecoply?
A: Refer to Table 4A for weight (kg/m^2) of different Ecoply thicknesses.

Q: What is the R-value of Ecoply?
A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (k) of 0.13W/mK so a 12mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Q: Are there any compatibility issues when using Ecoply with other materials?
A: Adhesives for flexible rubber membranes may react with LOSP treatment and should therefore only be applied to H3.2 CCA treated Ecoply unless the membrane supplier advises differently. Check with the membrane manufacturer if in doubt. H3.2 CCA treatment is also corrosive and this must be taken into account when specifying H3.2 CCA treated plywood next to metals. For further guidance, refer to Tables 21 and 22 in Acceptable Solution E2/AS1.

Q: Can Ecoply be used as a rigid sheathing (air barrier)?
A: CHH has a specific system called Ecoply Barrier. Ecoply Barrier has been developed as a rigid air barrier. Refer to the current Ecoply Barrier Specification and Installation Guide for further information. 7mm H3.2 CCA treated Ecoply can also be used if combined with building underlay in accordance with E2/AS1 for a rigid air barrier system.

Q: Flooring - what is the Critical Radiant Flux?
A: C/VM2 Appendix B gives a value of 2.2kW/m^2 for plywood and timber floors more than 12mm thick.

Q: What is the relevance of AS/NZS 2269?
A: Ecoply structural plywood is manufactured to AS/NZS 2269 Plywood Structural. This Standard is referenced by the NZBC Compliance Documents including NZS 3602 Timber and Wood-based Products for Use in Building, NZS 3603 Timber Structures, NZS 3604 Timber Framed Buildings, AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood and Acceptable Solution E2/AS1 - External Moisture. Plywood not manufactured to AS/NZS 2269 does NOT meet the requirements of these NZBC Compliance Documents.

Q: What is marine ply?
A: Marine plywood manufactured to AS/NZS 2272 Plywood Marine may contain species of low durability (source: BRANZ Good Practice Guide – Timber Cladding). Whilst marine plywood has a Type A glue bond, it is generally specified for its high surface appearance grade and lack of core knots as opposed to structural performance. AS/NZS 2272 limits marine plywood to a number of approved species that pass stringent property requirements for things like moisture permeability. These requirements are different from those in standards from other countries. Marine plywood is rarely treated as it is usually coated with resin, fibreglass, or a paint finish for long term durability.

Q: What should a specification for structural plywood include?
A: A specification for structural plywood should include:

Specification Check List	Example
Quantity/size	20 sheets of 2400 x 1200
Thickness	12mm
Edge finish	Square edge
Brand name	Ecoply® structural plywood
Reference to Standard	To AS/NZS 2269
Stress grade[1]/(layup)	F8/F5 (12-24-5)
Surface grade/bond type	CD A-Bond[2]
Accreditation	Third party product certified

[1] Stress grades and layups may vary between different manufacturers and products.

[2] Type A-bonds are suitable for permanent exposed applications and structural applications.

Q: What are F-grades?

A: The stress grading system is a ranking system which utilises the symbol F and a suffix 8, 11 etc. as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. For plywood of a given thickness, the higher the F-grade, the further it will span. For load bearing applications (e.g. flooring, roofing) the required F-grade as well as the plywood thickness must be specified to achieve the required span. F8/F5 is the most common structural plywood grade found in New Zealand. All Ecoply® structural products are F8 in parallel to the grain direction. Ecoply 19mm Longspan Flooring are F11/F8. Other Ecoply Flooring products are also available in F11/F8 upon request.

Q: What are surface/appearance grades (e.g. CD)?

A: Appearance grades (e.g. CD, DD) denote the appearance grade of the plywood including the number and size of knot holes as defined in AS/NZS 2269 and summarised in Table 2A and 2B of this guide. The first letter describes the appearance of the face veneer and the second letter describes the back face.

Q: How long can Ecoply® be left exposed to the weather?

A: Untreated Ecoply will typically maintain its structural integrity when exposed to the weather during construction for up to 3 months. The surface colour will start to silver off and face checking will become evident. Where the finished appearance of the Ecoply is important, it should be protected during construction. Ecoply is also available H3 treated to resist decay or insect hazard. When used in accordance with this guide, it can be specified to meet the durability requirements of the NZBC, however appearance issues such as face checking may still occur dependent upon the degree of exposure to weather during construction.

Q: What treatment levels and types are used for Ecoply?

A: Ecoply is available untreated or preservative treated. Ecoply is treated to the H3 hazard class for above ground use. The standard Ecoply treatment type is H3.2 CCA (Copper Chrome Arsenate) although H3.1 LOSP Azole (Light Organic Solvent Preservative) may also be specified where a clear treatment is required. LOSP Azole is the standard treatment type for Shadowclad®. CCA treatment gives the plywood sheets a green tinge and the drying process after CCA treatment may leave fillet marks on the face of the sheet.

Q: Does Ecoply have to be treated when used as structural bracing?

A: Ecoply used as bracing must be treated unless it is installed in an interior dry situation. Note, behind exterior cladding and in cavities (even if the Ecoply is covered with building wrap) are not considered to be an interior dry situation.

Q: Do I have to re-treat cut edges of treated Ecoply?

A: It is important to re-treat any cuts and holes with a brush on remedial treatment such as Holdfast® Metalex® Clear.

Q: What type of glue is used to manufacture Ecoply?

A: Phenol formaldehyde (PF) resins are used to bond the plywood veneers. This forms a Type A (Marine) bond suitable for structural applications and exterior use. Phenol formaldehyde resins are dark red/brown in colour. Product details printed on the back of Ecoply sheets indicate the 'A Bond'.

Q: Does Ecoply emit formaldehyde?

A: Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply and Shadowclad meet the E0 formaldehyde emission class, less than 0.5mg/litre.

Q: How should Ecoply be installed to maximise its stiffness properties?

A: Structural plywood has greatest stiffness along the long grain of the sheet (i.e. along its length). Therefore, flooring/roofing should be laid across joists/rafters rather than parallel to them.

7.0 REFERENCES & SOURCES OF INFORMATION

- New Zealand Building Code (NZBC).
- CHH Plywood technical notes - downloadable from https://chhply.co.nz/librarytools.
- NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber".
- NZS 3602:2003 "Timber and Wood-based products for use in Buildings".
- NZS 3603:1993 "Timber Structures Standard".
- NZS 3604:2011 "Timber Framed Buildings".
- AS/NZS 1170:2011 "Structural design actions".
- AS/NZS 2269:2012 "Plywood Structural".
- AS/NZS 1604.3:2012 "Specification for Preservative Treatment, Part 3: Plywood".
- US Product Standard PS1-95.
- Acceptable Solution 'E2/AS1 – External Moisture'.
- Acceptable Solution 'B2/AS1 – Durability'.
- BRANZ Bulletin 289: Asphalt shingle roofing.
- BRANZ Appraisals 307, 404, 411.
- BRANZ Bulletin 630: Roof Space Ventilation.
- BRANZ Bulletin 610: Preventing Moisture Problems In Timber-Framed Skillion Roofs.
- Shadowclad® Specification and Installation Guide for Cavity Construction.
- Ecoply® Barrier Specification and Installation Guide.
- Safety Data Sheets.
  - SDS Azole Treated Plywood, LVL and I-Joists.
  - SDS H3 CCA Treated Plywood and I-Joist.
  - SDS Untreated Plywood.
- APA (www.buildabetterhome.org).
- EWPAA (www.ewp.asn.au).
- Product Technical Statement and Building Product Information Sheet for Ecoply available online at www.chhply.co.nz/librarytools.
- EWPAA Technical Note - Plywood Roofing and Flooring: Installation and detail factors.

Standards can be purchased online at www.standards.co.nz. Building Code Compliance Documents can be downloaded free of charge at www.building.govt.nz/building-code-compliance/

8.0 LIMITATIONS

The information contained in this document is current as at June 2025 and is based on data available to CHH Plywood at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply products installed in accordance with this document or NZBC compliance documents.

This publication replaces all previous CHH Plywood design information and literature relating to Ecoply structural plywood products. CHH Plywood reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhply.co.nz to obtain current information.

CHH Plywood has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Plywood assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

ecoply®



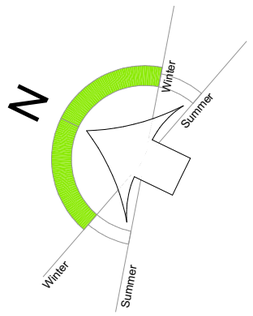
CHH PLY

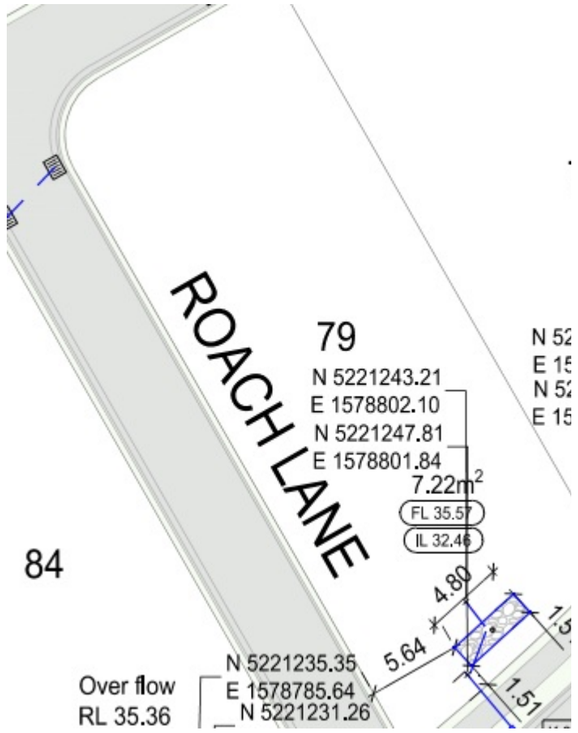
Private Bag 92-106
Victoria Street West
Auckland 1142
New Zealand

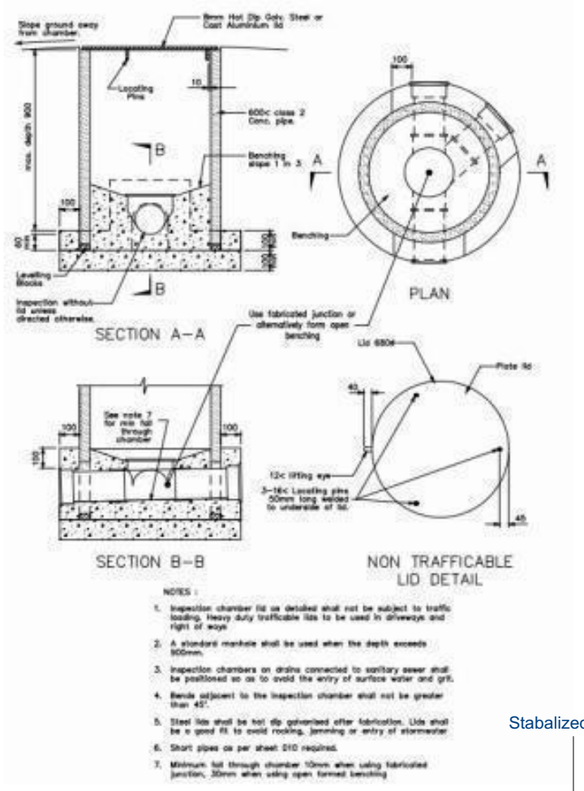
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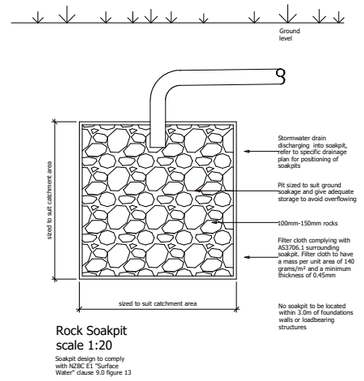
www.chhply.co.nz

June 2025
ECOPLY. V1, 11,06525







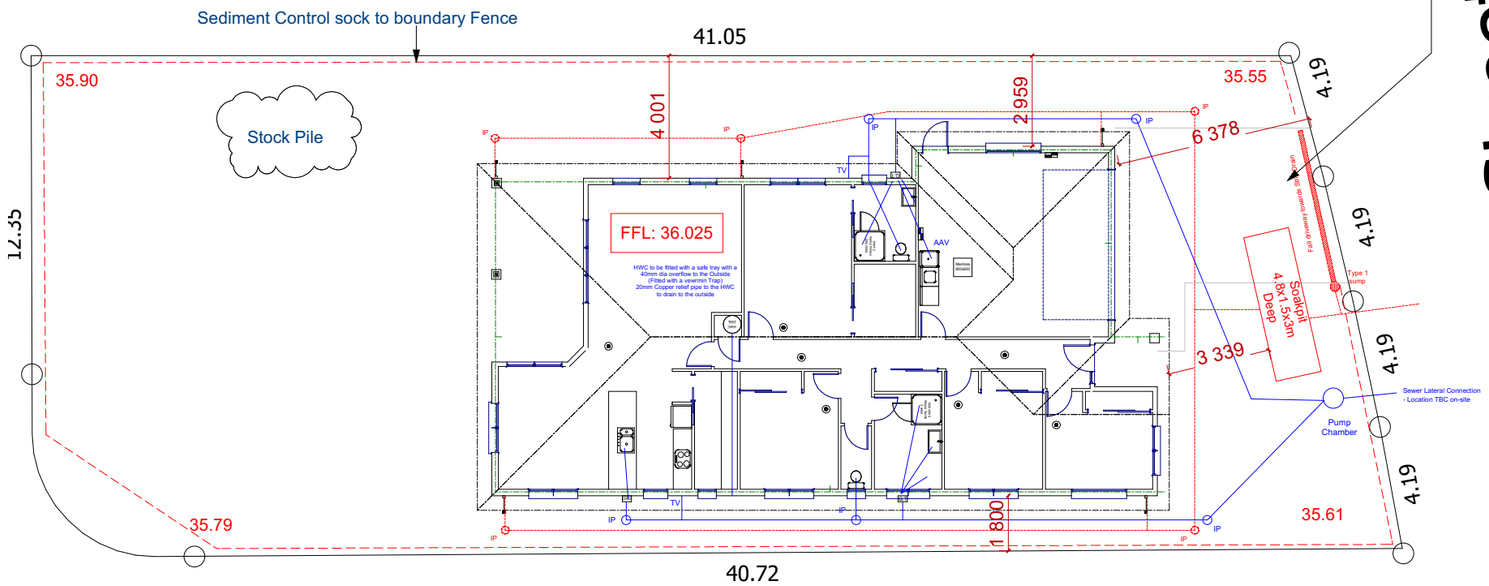


Rock Soakpit
scale 1:20

Soakpit design to comply with NZBC E1 "Surface Water" clause 9.0 figure 13

Stabalized entry pad to the site

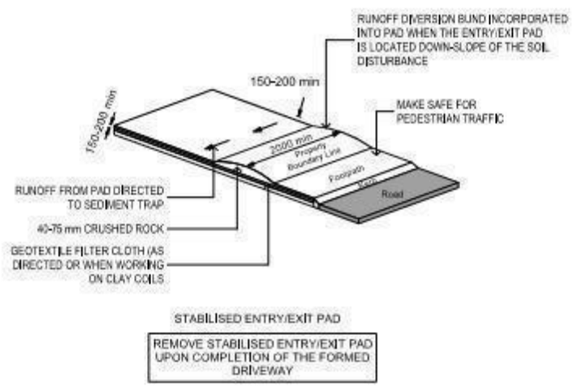
Sediment Control sock to boundary Fence

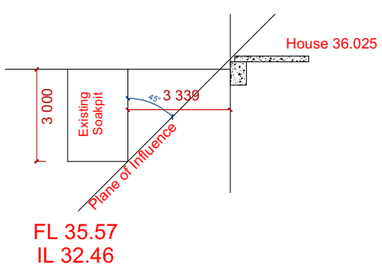


Benn Street

Crown of Road 35.50

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.





Roach Lane

LEGEND	
LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES
Refer to Drainage Plan for specific drainage information
Refer to sediment control plan in specification and implement where required.
Convey surface water from sealed drive areas to an appropriate approved outfall.
Dimensions are shown to cladding face

SITE INFORMATION	
Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE	
Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 1
Scale: 1:1000
Date: 14/08/2025
OF: 15



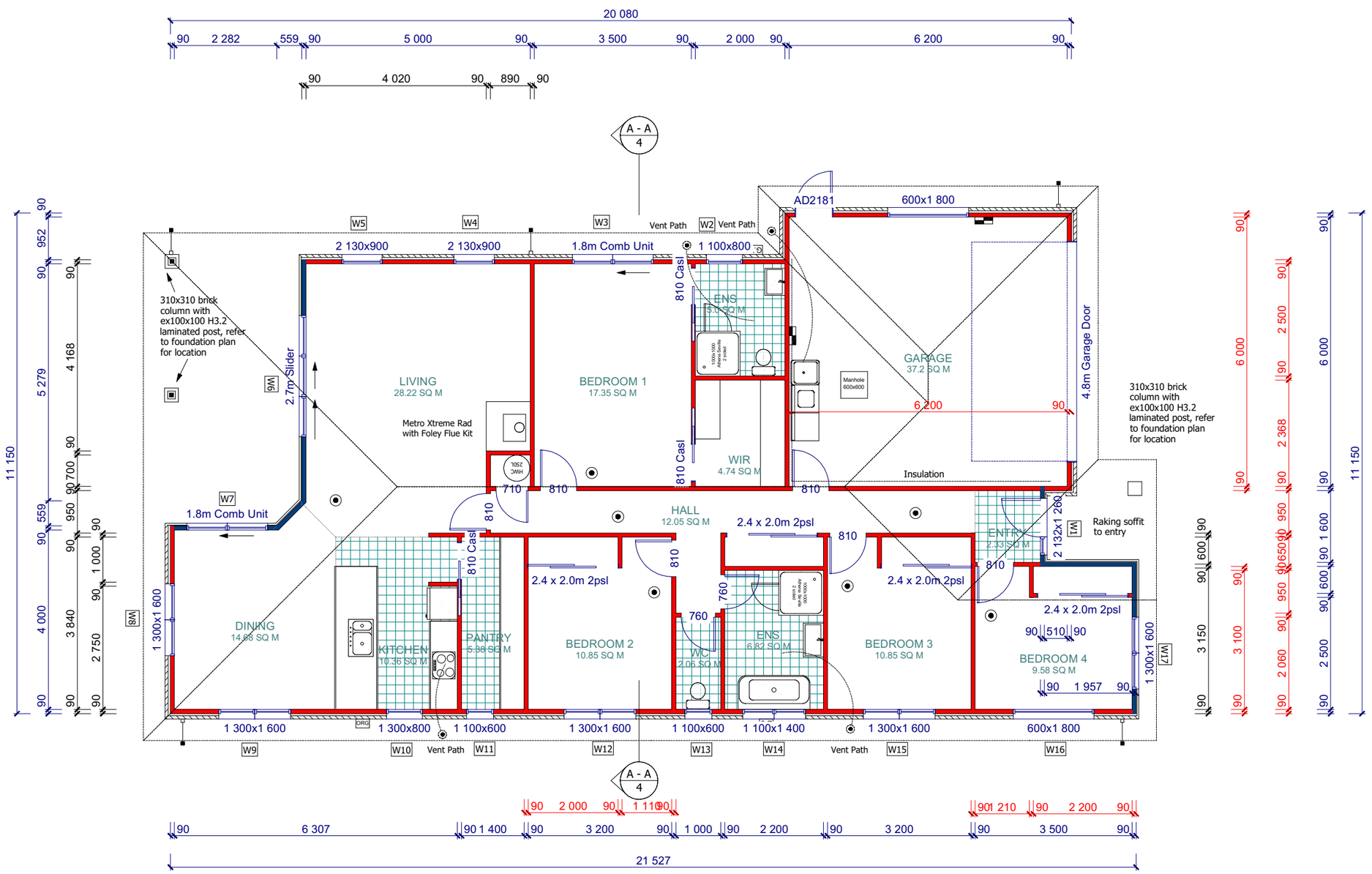
Key To Elevations

ROOF & WALL CLADDING

Roof -	25° Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame



BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame

GENERAL FLOOR PLAN NOTES

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be Interconnected and Located in each bedroom, Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A) and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

MISCELLANEOUS:
Dimensions shown are to the frame, GIB thickness not shown.
Refer to Construction Schedule (Page 2 & 3 of Specification) for additional construction information.
Entry through external doors
Mechanical ventilation
Air Seals to have PEF rod & low expansion foam
All windows and doors centered in room unless shown otherwise

FOUNDATION SYSTEM
Ribraft Foundation Design

WALL FRAMING -designed to high wind zone

Stud Height:	2420 mm
Exterior Walls:	90x45mm studs @ 600 mm crs
Interior Loadbearing wall:	90x45mm studs @ 600 mm crs
Dwangs Ext:	90x45 @ 800 crs
Non loadbearing:	90x45mm studs @ 600 mm crs
Dwangs Int:	90x45mm @ 800mm Crs

LINTELS AND BEAMS
Lintels and beams can be found on the Truss Design

BUILDING WRAP
Watergate Building Wrap, refer to manufacturers specifications attached

DOORS
Internal Height: 2000mm

INSULATION

Wall -	Pink Batts R2.6 Wall Batts
Ceiling -	Pink Batts R6.6 Ceiling Batts

WALL AND CEILING LININGS

Wall -	Standard 10mm GIB (unless required for bracing)
Ceiling -	Standard 13mm GIB 13mm GIB Aqualine (bathrooms)
Bathroom -	10mm GIB Aqualine
Corner Finish -	Square

FLOOR FINISHES
Carpet, Vinyl Plank , Tiles

EXTERIOR JOINERY

All Windows to be Thermally broken Aluminium frame
Double glazed with Ug of 1.10 with a thermally improved spacer as per ISO 10077 Annex G
Glass: Low E4/Clear, argon filled , to achieve R0.5.
Air Seals to have PEF rod and low expansion foam

Interior -	Shelf and rail to wardrobes

Electric Hot water system

KITCHEN COOKTOP
Electric Hobb

ROOF CLADDING AND STRUCTURE
Purlins - 70x45 SG8 H1.2 @ 900crs

GUTTER/FASCIA/DOWNPIPES/SOFFITS

Gutter -	Metalcraft Metalline Quad Gutter
Fascia -	Metalcraft Metalline 185 Fascia
Downpipes -	Marley 80mm Dia PVC
Soffits -	Hardiflex 4.5mm

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Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Floor Plan

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	2500	2
Scale: 1:100	Date: 7/08/2025	OF: 15

Drainage Schedule	NZBC G13	
(Drainage as per Schedule unless specified otherwise)		
Kitchen		
Sink:	Ø65mm @1:40	(3 discharge units)
Bathrooms		
Vanity:	Ø40mm @ 1:40	(1 discharge units per basin)
Shower:	Ø40mm @1:40	(2 discharge units)
Bath:	Ø40mm @1:40	(4 discharge units)
WC:	Ø100mm @1:40	(4 discharge units)
Laundry		
Sink:	Ø65mm @1:40 min	(5 discharge units)
Main Foulwater Drain	Ø100mm @1:60	
Stormwater Drain	Ø100mm @1:60 (1:120min)	
Terminal Vent	Ø80mm	
Vent	Ø50mm	

LEGEND.	
Sewer Pipe	————
S/W Pipe	– – – – – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV
Vent	V
Inspection Point	IP
Air Admittance Valve	AAV

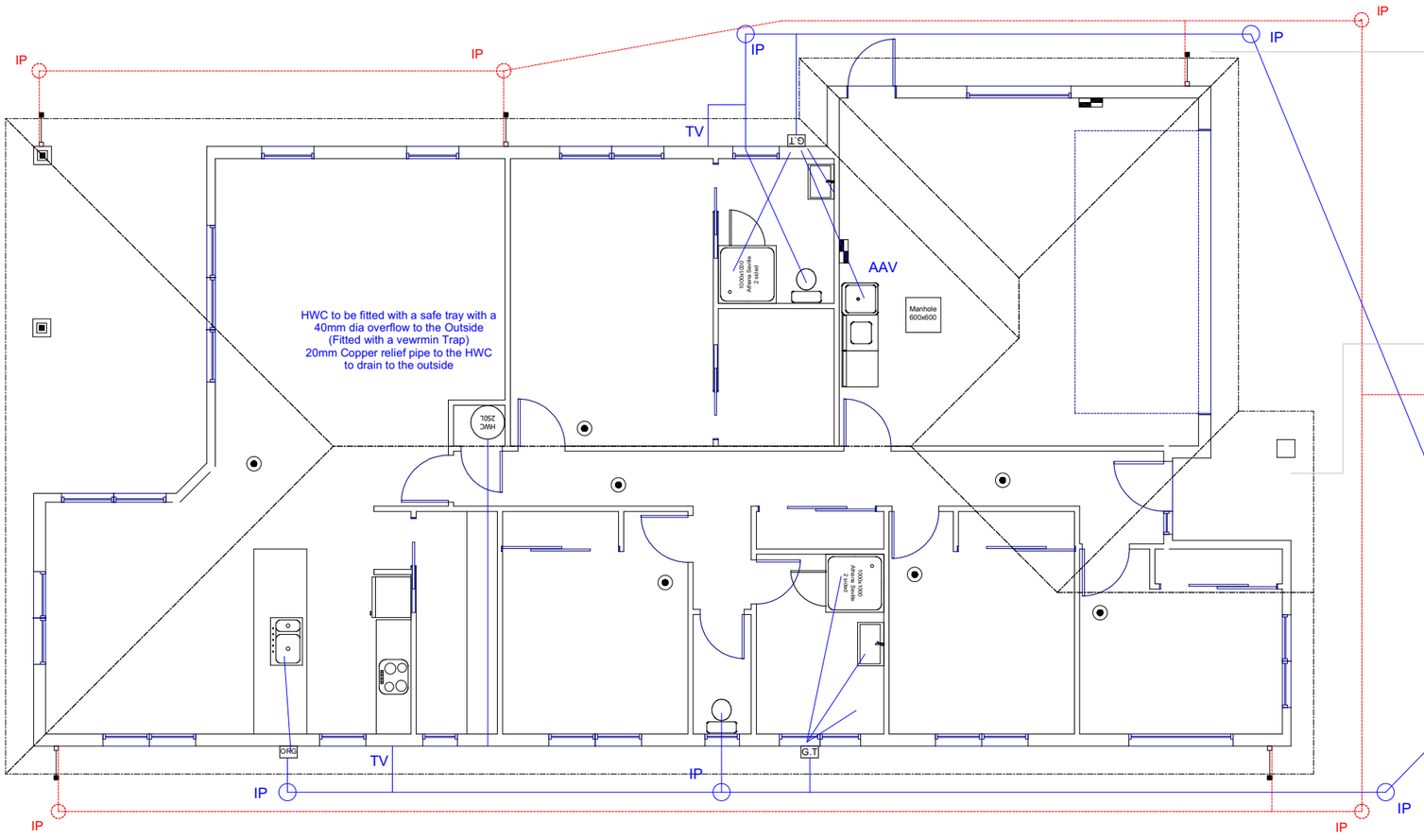


Figure 8: Type-one Surface Water Sump
Paragraph 3.6.2

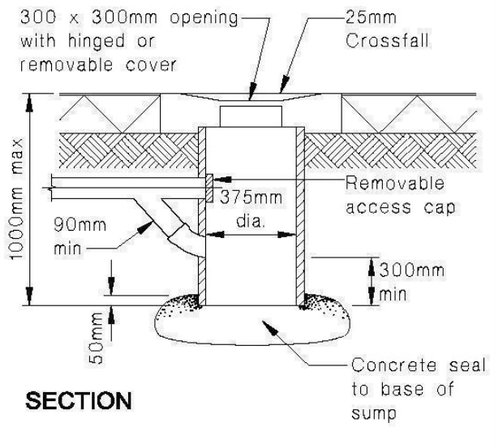
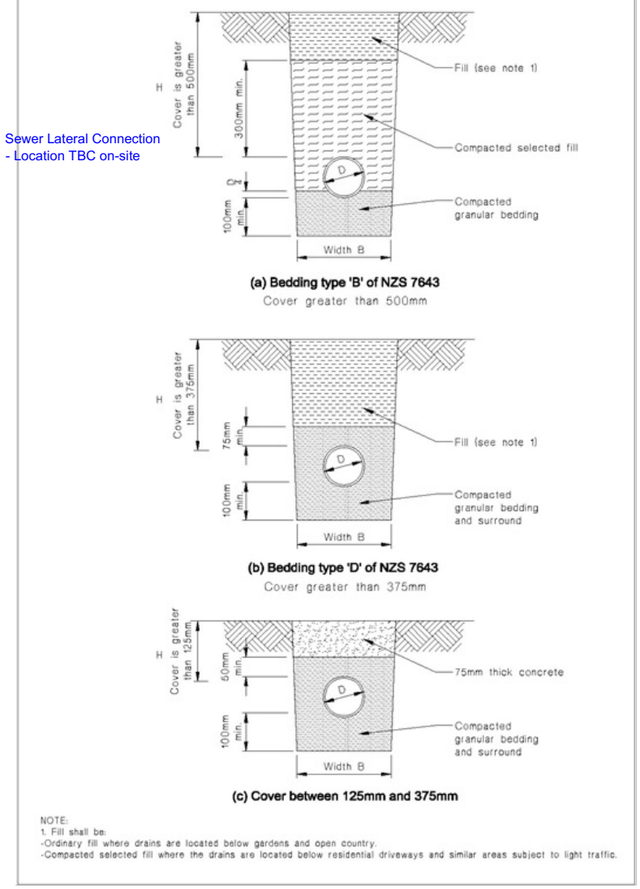


Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



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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Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Drainage Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 6
Scale: 1:100
Date: 7/08/2025
OF: 15

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	UWC Ltd
Street and Number:	52 Benn St
Lot and DP Number:	Lot 79 Dp 587128
City/Town/District:	Amberley
Designer:	JKH
Company:	
Date:	Saturday, 12 April 2025

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.9
Building Height to Apex (m)	5.2
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	24.6
Building Width (m)	11.2
Building Plan Area (m^2)	196.3

Building Location

Wind Zone = High

Earthquake Zone 3

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**625**	**1500**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1603**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									625	1603
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1687 270%	1771 110%
a	1	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	4	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	5	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	External Length =				24.6				720 OK	810 OK
b	1	3.20		2.4	GS1-N	GIB®	221	192		
	2	3.20		2.4	GS1-N	GIB®	221	192		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	External Length =				24.6				498 OK	437 OK
c	1	0.90		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	86	95		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	4	1.00		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	95	105		
	External Length =				24.6				469 OK	524 OK

GIB EzyBrace® Bracing Software

Single Level Across Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									1500	1603
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1773 118%	1721 107%
m	1	0.45		2.4	BLP-H	GIB®	56	62		
	2	0.55		2.4	BLP-H	GIB®	72	77		
	3	0.50		2.4	BLP-H	GIB®	64	69		
	4	0.50		2.4	BLP-H	GIB®	64	69		
	External Length = 11.2								255 OK	278 OK
n	1	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								214 OK	186 OK
o	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	2.40		2.4	GS1-N	GIB®	166	144		
	External Length = 11.2								380 OK	330 OK
p	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								428 OK	372 OK
q	1	1.10		2.4	EP1/EPB1-0.5	EcoPly & EP Barrier	105	116		
	2	1.10		2.4	EP1/EPB1-0.5	EcoPly & EP Barrier	105	116		
	External Length = 11.2								209 OK	231 OK
r	1	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	External Length = 4								288 OK	324 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
EcoPly & EP Barrier	EP1/EPB1-0.4	0.4	80	95
EcoPly & EP Barrier	EP1/EPB1-0.6	0.6	95	105
EcoPly & EP Barrier	EP1/EPB1-1.2	1.2	120	135
OSB	OSB	0.4	90	101
EP Barrier	EPBS-0.4	0.4	60	60
EP Barrier	EPBS-1.2	1.2	65	70
EP Barrier	EPBS-2.4	2.4	80	90
EcoPly & EP Barrier	EPG/EPBG-0.4	0.4	100	115
EcoPly & EP Barrier	EPG/EPBG-1.2	1.2	150	150
EcoPly & EP Barrier	EP2/EPB2-0.6	0.6	105	115
Villa Board	VV	0.6	130	101
GBPF2100S	Gamma Brace	1	20.6	22.8
IBS	S7	0.6	100	100
IBS	S7	0.4	94	104
Home RAB	RAB	0.4	85	91

File No.: 41793

22 May 2025

UWC Limited
40 Taranaki Street
Te Aro
WELLINGTON 6011

Attention: Earl Hope-Pearson

Email: ehopepearson@egmontdixon.com

Dear Earl,

SHALLOW GEOTECHNICAL INVESTIGATION – 52 BENN STREET, AMBERLEY (LOT 79 DP 587128)

1.0 INTRODUCTION

Davis Ogilvie & Partners Ltd. (Davis Ogilvie) has been commissioned by UWC Limited to confirm the underlying ground conditions, determine the ground bearing capacity, and provide foundation recommendations to support the building consent application for the proposed residential development at Lot 79 which is situated in Stage 1, The Clearing, Amberley.

The published geology is described as *"grey to grey-brown river alluvium of undifferentiated Late Quaternary age"*[1].

Davis Ogilvie undertook geotechnical soil testing for subdivision consent across the 32.7 ha site in 2022[2], including the area of subject Stages 1 and 2. Results showed that the natural soil profile consisted of surficial topsoil underlain by silt and sand mixtures to 1.0 – 2.0 m below (pre-subdivision) ground level, and dense sandy gravel to a maximum (test) depth of 4.4 m. Groundwater monitoring encountered groundwater between 3.0 – 4.0 m below the pre-subdivision ground level.

The site liquefaction performance in terms of the Ministry of Business, Innovation and Employment (MBIE 2017)[3] is assessed as being *"Very Low Liquefaction Vulnerability"* across Stages 1 and 2.

[1] Forsyth, Barrell, Jongens (compilers), 2008. Geology of the Christchurch area. GNS Science Ltd 1:250 000 geological map 16.
[2] Davis Ogilvie - Geotechnical Report for Subdivision: 187 & 193 Carters Road and 52 Amberley Beach Road, Amberley, Lots 2 & 3 DP 559093. Project 41793. Dated 16 May 2022.
[3] MBIE (2017), Planning and engineering guidance for potentially liquefaction-prone land, published 26 September 2017.

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Davis Ogilvie undertook engineering design and supervision throughout the subdivision construction, and upon completion, earthworks certification was issued in October 2023 for Stages 1 and 2[4]. The appended as-built fill plans (DWG AB 32)[5], indicates up to 0.9 m of engineered fill has been placed across the lot.

2.0 SOIL TESTING AND RESULTS

Prior to any filling and topsoil placement on the lot, site inspections of the natural ground conditions were undertaken by Davis Ogilvie to confirm the presence of suitable subgrade soils. Any areas of unsuitable or soft soils were removed and backfilled with engineered fill as per NZS 4431:1989[6] (and its replacement NZS 4431:2022[7]). Visual inspection and Dynamic Cone Penetrometer (DCP) testing confirmed appropriate in-situ soil materials and bearing capacity in the subgrade soils.

Following earthworks, four DCP tests and two Hand Augers (HA) were undertaken on the lot to confirm the finished (i.e. topsoiled) soil profile and determination of the available static geotechnical ultimate bearing capacity (GUBC). The shallow testing indicates a subsurface profile consisting of up to 0.4 m of topsoil underlain by engineered fill (gravelly sand) with refusal occurring at 0.5 – 0.7 m below Existing Ground Level (EGL). Test locations are presented on the attached Geotechnical Site Plan (DWG G79 A).

The indicative soil profile encountered by the shallow testing on the site is presented in Table 1, with logs and DCP test results attached to this report.

Table 1: Summarised Soil Profile from Shallow Investigation

Summary of Soil Type	DCP (blows / 100 mm)	Relative Density / Consistency	Depth (m) below EGL***			
			HA + DCP 79-1	DCP 79-2**	HA + DCP 79-3	DCP 79-4**
TOPSOIL	1 – 6	*	0.0 – 0.3	0.0 – 0.3	0.0 – 0.4	0.0 – 0.4
ENGINEERED FILL	19 – 45	Very dense	0.3 – 0.5	0.3 – 0.7	0.4 – 0.6	0.4 – 0.6

* Relative density not assigned to topsoil.
** Soil type and depth inferred from DCP results and nearby testing.
*** Depths rounded to the nearest 0.1 m and may vary across the site from the test locations.

[4] Davis Ogilvie - Geotechnical Completion Report: Stages 1 & 2, The Clearing, Amberley Beach Road, Amberley, version 1, dated October 2023.
[5] Davis Ogilvie - The Clearing – Amberley Beach Road, Amberley Subdivision, 224 – As-Builts Stages 1 & 2, Fill Plan – Asbuilts Sheets 3/3. Project 41793. Dated 10/2023.
[6] NZS 4431:1989 - Code of practice for earth fill for residential development, published 30 May 1989.
[7] NZS 4431:2022 - Engineered fill construction for lightweight structures, published 27 May 2022.

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\\chsvr\JobData\projects\41s\41793 - Amberley Beach Road\Geotech\003 Report\Lot reports\Lot 79\250517.hc.44366.TheClearing_GeotechReport_Lot79.docx

3.0 FOUNDATION RECOMMENDATIONS

Based on the in-situ soil testing, 'Good Ground' as defined by NZS 3604:2011[8] and the availability of a GUBC of 300 kPa has generally been achieved at a depth of approximately 0.4 m below EGL.

Davis Ogilvie anticipates a concrete slab is the preferred founding solution for the site. In this regard, the following foundation solutions are considered appropriate for this lot:

- A NZS 3604:2011 tied slab foundation.
- A proprietary 'Technical Category 1 (TC1)' waffle slab foundation.

We note that all lots contain a buried stormwater disposal soak pit, and that foundation elements should be offset from the surface edges of the boulder pit by at least 3.0 m (DWG G79 A) or be specifically designed by a Structural Engineer.

For specific engineered designed foundations, it is recommended that a suitably qualified and experienced engineer verify that adequate ground conditions have been achieved onsite and that all topsoil, turf, loose / soft, compressible, organic, suspect, or unsuitable material has been removed from the foundation footprint before the placement of foundations or gravel fill.

In accordance with NZS 3604:2011[9], site preparation should ensure that *all* topsoil, turf, and any other unsuitable material is removed from the foundation footprint before the placement of foundations or gravel fill. During excavation, should soft, organic, suspect, or unsuitable ground conditions be encountered onsite, the builder / contractor or owner must contact Davis Ogilvie or an appropriately qualified and experienced engineer to confirm foundation requirements.

Placement and testing of engineered fill, if required, must be carried out in accordance with NZS 4431:2022 – *Engineered fill construction for lightweight structures.*

[8] NZS 3604:2011 Timber-framed buildings. Published 14/02/2011.
[9] NZS 3604 clauses 3.3.7.1 and 7.5.9.2.

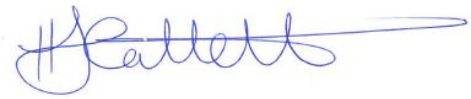
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4.0 CLOSURE

Should you have any queries regarding this report, or wish to arrange a subgrade inspection at the time of construction, please contact the undersigned.

Yours faithfully,

DAVIS OGILVIE & PARTNERS LTD.





Prepared By:
HAMISH CATTELL
Engineering Geologist
BSc (Hons), PhD, MEngNZ

Email: hamishc@do.nz

Reviewed By:
BJORN RAASCH
Principal Engineering Geologist
BSc (Hons), CMEngNZ (PEngGeol)

Email: bjorn@do.nz

Enclosed:

1 x Geotechnical Site Plan (DWG G79 A)
4 x DCPs with 2 x HA Logs
1 x As-Built Fill Plan (DWG AB 32)

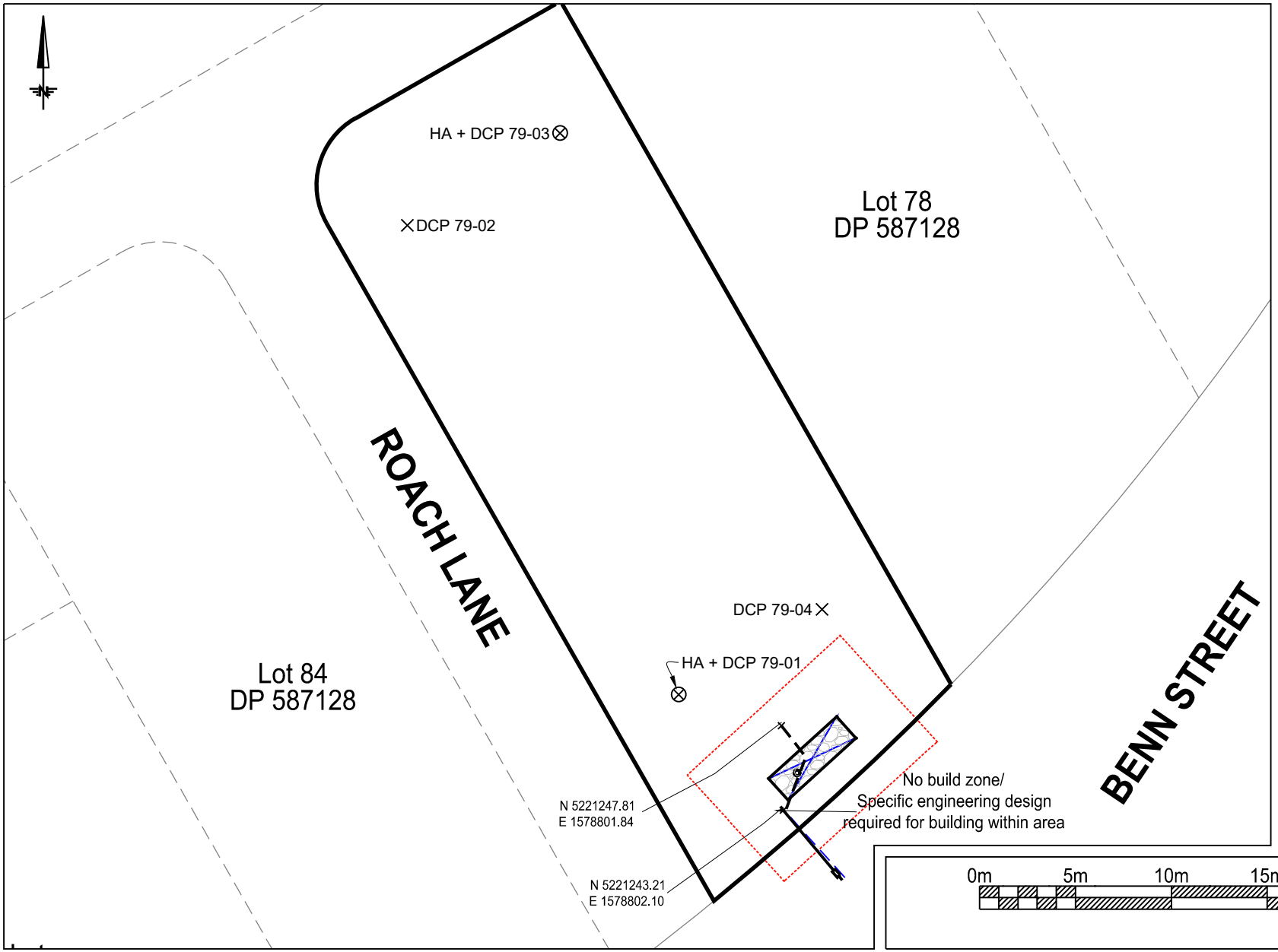
Limitations

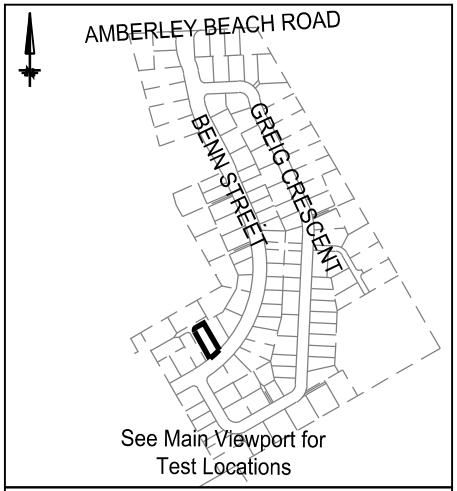
Davis Ogilvie did not perform a complete assessment of all possible conditions or circumstances that may exist at the site. Conditions may exist which were undetectable given the limited investigation of the site. Variations in conditions may occur between investigatory locations, and there may be conditions onsite which have not been revealed by the investigation, which have not been taken into account in the report. Assessments made in this report are based on the conditions found onsite. No warranty is included; either expressed or implied that the actual conditions will conform to the assessments contained in this report.

This report has been prepared solely for the purposes of UWC Limited. The information contained herein is confidential, and shall not be passed on to any third party, other than the Local Building Consent Authority, without prior written permission of Davis Ogilvie & Partners Ltd. No responsibility is accepted for any use outside the scope of this report. This report does not cover susceptibility of the site to flooding.

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Disclaimer: This document shall only be reproduced in full with approval from a Davis Ogilvie engineer, contractor to locate all existing services & verify all dimensions before commencing work





Scale 1:10,000

Key:

: Site Boundary
: Abuttal Boundary
: Road Boundary
: Easement
⊗ : Hand Auger (HA) + Dynamic Cone Penetrometer (DCP)
× : Dynamic Cone Penetrometer (DCP)
: 3.0 m Minimum Offset to Soakpit

Test and soakpit offset locations shown are approximate (scaled and aligned using boundaries).
Shallow geotechnical testing undertaken 24/04/2025.
Boundaries are indicative only, obtained from Davis Ogilvie Scheme Plan 300 F approved 28/04/2022.

CAD ref: 231031.41793.GeotechnicalLotTesting.dwg

DAVIS OGILVIE
ENGINEERS / SURVEYORS / PLANNERS
Davis Ogilvie & Partners Ltd - Ph. 0800 999 333

Geotechnical Site Plan
52 Benn Street, Amberley
Lot 79 DP 587128

/ design	/ drawn	/ QA check	/ dwg
HC	TM	HC	G79
/ scale @ A4	/ date	/ file	/ issue
1:300	05/25	41793	A

DAVIS OGILVIE
Level 1, 24 Moorhouse Avenue, Addington, Christchurch 8140
P: 0800 999 333 | hello@do.nz | WWW.DO.NZ

SHALLOW INVESTIGATION RESULTS

Job No.: 41793_Lots
Test No.: Lot 79-01

Project: The Clearing, Stages 1 & 2, Amberely
Date: 24/04/25

Client: UWC Limited
Time: 3:00 PM

Test Location: Refer to attached Geotechnical Site Plan (DWG G79 A)
Excavation Method: DCP+HA

DEPTH (m)	STRATA DESCRIPTION	USCS	Graphic Log	Ground Water
	0.00 - 0.25m: Sandy SILT; light brown. Moist. Sand is fine (TOPSOIL).	TS		Groundwater Not Encountered
	0.25 - 0.35m: Gravelly fine to coarse SAND; yellowish brown. Very dense, moist. Gravel is subangular, fine to medium greywacke (ENGINEERED FILL).	FILL		
0.5	Auger terminated at 0.35m - Refusal in gravelly soil.			
1.0				
1.5				
2.0				
2.5				
3.0				

Strata description in general accordance with Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. NZ Geotechnical Society Inc, December 2005

DCP Results

	DCP 79-01 Adjacent to Excavation (Blows / 100mm)	DCP 79-02 (Blows / 100mm)
0.0 - 0.1m	2	1
0.1 - 0.2m	4	6
0.2 - 0.3m	5	5
0.3 - 0.4m	19 >>	20 >>
0.4 - 0.5m	37 >>	41 >>
0.5 - 0.6m		34 >>
0.6 - 0.7m		30 >>

RL (m)

Logged By: HC
Plotted By: HC
Checked By: HC

Notes:

Dynamic Cone Penetrometer (DCP) tests and logs give an indication of the ground conditions at the location of the tests only. While they may be representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building.

Dynamic Cone Penetrometer tests are performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)

Produced with Core-GS by Geroc

DAVIS OGILVIE
Level 1, 24 Moorhouse Avenue, Addington, Christchurch 8140
P: 0800 999 333 | hello@do.nz | WWW.DO.NZ

SHALLOW INVESTIGATION RESULTS

Job No.: 41793_Lots
Test No.: Lot 79-03

Project: The Clearing, Stages 1 & 2, Amberely
Date: 24/04/25

Client: UWC Limited
Time: 3:00 PM

Test Location: Refer to attached Geotechnical Site Plan (DWG G79 A)
Excavation Method: DCP+HA

DEPTH (m)	STRATA DESCRIPTION	USCS	Graphic Log	Ground Water
	0.00 - 0.35m: Sandy SILT; light brown. Moist. Sand is fine (TOPSOIL).	TS		Groundwater Not Encountered
0.5	0.35 - 0.40m: Gravelly fine to coarse SAND; yellowish brown. Very dense, moist. Gravel is subangular, fine to medium greywacke (ENGINEERED FILL).	FILL		
	Auger terminated at 0.40m - Refusal in gravelly soil.			

Strata description in general accordance with Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. NZ Geotechnical Society Inc, December 2005

DCP Results

DCP 79-03 Adjacent to Excavation (Blows / 100mm)	DCP 79-04 (Blows / 100mm)
2	1
5	3
3	3
14 >>	4
35 >>	25 >>
45 >>	30 >>

RL (m)

Logged By:	HC
Plotted By:	HC
Checked By:	HC

Notes:

Dynamic Cone Penetrometer (DCP) tests and logs give an indication of the ground conditions at the location of the tests only. While they may be representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building.

Dynamic Cone Penetrometer tests are performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)

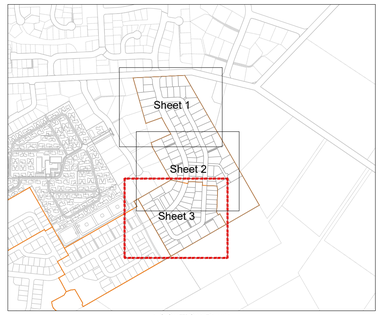
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Contractor to locate all existing services & verify all dimensions before commencing work

Rev.	Date	Reason	Approved
A1	18/10/2023	224 - Asbuilts - Fill plan	BVB

AS BUILT



LOCATION PLAN
Scale 1:10,000 m

Levels Table			
Number	Minimum Level	Maximum Level	Color
1	0.300	0.400	
2	0.400	0.500	
3	0.500	0.600	
4	0.600	0.700	
5	0.700	0.800	
6	0.800	0.900	
7	0.900	1.000	
8	1.000	1.608	

STAGE 1&2 CUT/FILL LEGEND	
Lot No.	Max site fill
1	0.45m
2	0.43m
3	0.41m
4	0.40m
8	0.51m
9	0.54m
10	0.76m
11	0.42m
12	0.45m
13	0.77m
14	1.25m
15	1.25m
16	0.84m
17	0.85m
18	1.23m
19	1.14m
20	1.24m
21	1.60m
22	1.25m
23	0.40m
24	0.52m
25	0.73m
26	1.03m
27	0.80m
28	0.95m
29	1.04m
30	0.54m
31	0.68m
32	1.01m
33	0.62m
34	0.51m
35	0.49m
36	0.55m
37	0.72m
38	0.36m
42	0.45m
43	0.61m
44	0.92m
47	0.54m
48	0.56m
55	0.40m

STAGE 1&2 CUT/FILL LEGEND	
Lot No.	Max site fill
56	0.35m
58	1.0m
60	0.47m
61	0.86m
62	0.92m
63	0.61m
66	1.01m
67	0.82m
71	0.79m
72	0.72m
78	0.96m
79	0.94m
82	0.81m
83	0.66m
84	0.71m
85	0.56m
86	0.62m
90	0.61m
91	0.91m
92	0.97m
97	0.62m
99	0.91m
102	0.90m
103	0.90m
104	0.76m
107	1.11m
108	1.11m
109	0.63m
110	0.50m
111	0.50m
112	0.42m
113	0.96m
114	0.50m
116	1.45m
117	1.56m
118	1.58m
119	1.59m
120	0.77m
121	0.67m
122	0.55m
123	0.65m

CAD ref: 41793.DwgSet4.Water & Services

DAVIS OGILVIE
ENGINEERS / SURVEYORS / PLANNERS
Davis Ogilvie & Partners Limited
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Office 0800 999 333 Email hello@do.nz
www.do.nz

THE CLEARING - AMBERLEY BEACH ROAD, AMBERLEY
SUBDIVISION

224 - AS-BUILTS STAGES 1 & 2
FILL PLAN - ASBUILTS SHEETS 3/3

Design	Drawn	QA Check	Dwg No.
JW	SM	BVB	AB32
Scale @ A1	Date	Job No.	Rev.
1:500	10/23	41793	A

Action History (UTC+12:00) Auckland, Wellington

Submit by Madeline Blacktopp 24/07/2025 1:24:09 PM (Message Start Event)

Submit & Save to LF by Madeline Blacktopp 25/07/2025 9:46:04 AM (Add Consent Number)

- The task was assigned to Building Team - Vetting & Processing 24/07/2025 1:24:09 PM
- Madeline Blacktopp assigned the task to Madeline Blacktopp 25/07/2025 9:45:54 AM

Simpli Application Vetting Checklist

HURUNUI District Council

Building Checks

Simpli Submission Number *

HURUN200634

Building Consent Number *

250252

What type of Submission are you vetting ?

- (●) Building Consent
- ( ) Solid Fuel Burner
- ( ) PIM only
- ( ) Amendment
- ( ) Certificate of Acceptance
- ( ) Shed
- ( ) Marquee

Engineers Design Memorandum

( ) Yes ( ) No (●) N/A

Producer Statements Signed

( ) Yes ( ) No (●) N/A

Producer Statements Addressed to HDC

( ) Yes ( ) No (●) N/A

Designers Design Memorandum

(●) Yes ( ) No ( ) N/A

Ownership Checks

Proof of Ownsership is current *

Must be less than 3 Months old. Proof of ownership must be a current Record Of Title.

(●) Yes ( ) No ( ) N/A

Ownership is for Correct Address / LOT / DP

(●) Yes ( ) No

Owner Name Matches

(●) Yes ( ) No

HDC to search Title

( ) Yes ( ) No (●) N/A

If owner is a Business / Organisation is there a contact name ?

○ Yes ○ No ◉ N/A

Drawings / Plans

Site Plan Provided (existing and Proposed)

Including clear site location including boundary and dimensions

◉ Yes ○ No ○ N/A

Site Plan Measurements

from Boundary to Building

◉ Yes ○ No ○ N/A

Floor Plan

◉ Yes ○ No ○ N/A

Elevations

◉ Yes ○ No ○ N/A

Cross Sections

◉ Yes ○ No ○ N/A

Drainage Plans

◉ Yes ○ No ○ N/A

Bracing Plan

◉ Yes ○ No ○ N/A

Bracing Calculations

◉ Yes ○ No ○ N/A

Construction Details

◉ Yes ○ No ○ N/A

Lighting Plan / Statement

○ Yes ○ No ◉ N/A

Risk Score

(Weather tightness / E2 Risk Matrix)

Building Complexity

Truss Design

◉ Yes ○ No ○ N/A

Truss Producer Statement

◉ Yes ○ No ○ N/A

Written Specifications

◉ Yes ○ No ○ N/A

Map Information

Exp Zone

Earthquake Zone

Wind Zone

Snow

Altitude

Plan Zone

Application Streamlining Checks

Does the Consent fall into these area's *

- [ ] Flood Assessment Zone
- [ ] Hanmer Springs Design Standards
- [ ] Mt Lyford Design Standards
- [ ] Rural
- [ ] Frost Control Fans Zones
- [ ] Urban Amberley / Hanmer Stormwater
- [ ] Liquefaction Zone
- [x] None of these apply

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley | 7441 | 66 Carters Road | Amberley | 7410
Phone 03 314-8816 | Fax 03 314-9181 | Email info@hurunui.govt.nz
Web hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil
Skype hdc_customer_services | twitter.com/hurunuidc

52 Benn St
Amberley 7410

11 August 2025

Approval to construct stormwater discharge as designed for BC250252 . Application No. WS250235.

The Council has reviewed and approved your application based on the submitted and supporting documents to connect/discharge stormwater via soakpit. Any future change to the stormwater system will need to be approved in writing by Hurunui District Council. You are required to comply with the building consent, **BC250252** , for the inspections. Once a detailed as-built plan and producer statement (PS3) has been provided we will issue a licence to discharge in accordance with the Hurunui District Council Three Waters Bylaw, Development Engineering Standards and Amberley Stormwater Discharge Consent, CRC082988.

If the design is accepted under zero soakage rate conditions, the applicant must submit the soakage test results to the Three Waters team, amend the stormwater design accordingly, and apply to the building team for a change to the Building Consent conditions.

Please note that you as the property owner will be liable for the maintenance and inspection of the stormwater management system in your property.

A copy of the licence and the management plan for the Stormwater Disposal system will be held on the property file for future reference and it has been attached for your convenience.

This letter does not cover checks, requirements & compliances of other departments (such as planning, building, etc.). Its only covers the stormwater utility connection.

Please contact me if you have any queries.

Yours sincerely

Donnie Choi
Stormwater Engineer

Call 03 314 8816
Email Donnie.choi@hurunui.govt.nz | web hurunui.govt.nz
Mail PO Box 13, Amberley 7441

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BUILDING CONSENT

Form 5, Section 51, Building Act 2004

Building Consent No:	250252	**Issued By:**	Hurunui District Council
Valuation No:	2143017384	**Issued:**	24 September 2025

Street address of building:	52 Benn Street, Amberley
Legal description of land where building is located:	Lot 79 DP 587128
Building name:	
Location of building within site/block number:	
Level/unit number:	0

OWNER

Name of owner:	UWC Ltd
Contact person:	Earl Hope
Mailing Address:	c/o 70 Reserve Terrace, Amberley
Street address/registered office:	
Contact phone number:	0275073118
Contact alternative phone number:	
Contact email address:	ehopepearson@propertygroup.co.nz

First point of contact for communication with the Council/Building Control Authority (BCA):

Jeremy Harrison	12 Murfitt St, Pegasus 7612 jeremy@jandadesign.co.nz

BUILDING WORK

The following building work is authorised by this Building Consent:	Project: New 4 bedroom dwelling with Wood Burner Current, lawfully established use: Housing

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

STANDARD CONDITIONS

This building consent is subject to the following conditions:

Section 90 of the Building Act 2004: Inspections by building consent authorities

(1) Every building consent is subject to the condition that agents authorised by the building consent authority for the purposes of this section are entitled, at all times during normal working hours or while building work is being done, to inspect—

a) land on which building work is being or is proposed to be carried out; and

b) building work that has been or is being carried out on or off the building site; and

c) any building.

(2) The provisions (if any) that are endorsed on a building consent in relation to inspection during the carrying out of building work must be taken to include the provisions of this section.

(3) In this section, inspection means the taking of all reasonable steps to ensure that building work is being carried out in accordance with a building consent.

COMPLIANCE SCHEDULE
The building consent does not require a Compliance Schedule.

ATTACHMENTS		
Copies of the following documents are attached to this Building Consent:	☒Plans and specifications for building work ☒Section 37 Certificate ☐Section 75 Certificate ☐Project Information Memorandum ☐Development Contribution Notice	☒Required items ☐Section 73 Certificate

Signature: Madeline B

Name: Madeline Blacktopp
Position: Building Support Officer

On behalf of Hurunui District Council

Date: 24 September 2025

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley 7441 | 66 Carters Road | Amberley 7410
Phone: 03 314-8816 | Email: info@hurunui.govt.nz
Web: hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil

Required Items

(To accompany the Building Consent Document)

Building Consent: 250252

Advice Notes:

This Building Consent should be read in conjunction with the following advice notes:

Building
A minimum of 24hrs notice must be given to the HDC building team prior to requiring an inspection.
All boundary site pegs are to be clearly defined and flagged prior to the work commencing and be visible for the building officer at the time of the first inspection.
Conditions/advice notes of the building consent and/or documents must be drawn to the attention of the subcontractors.
It is recommended that a copy of the approved plans and specifications are kept on site at all times for building contractors.
Under section 52 of the Building Act 2004 a building consent will lapse in 12 months from date of issue if the building works concerned have not been commenced.
Construction, fixings and materials are to be in accordance with the approved consent documents authorised under the Building Act 2004, any variance may require an application for an amendment.
This is a permitted activity under the Hurunui District Plan.
All Plumbing and Drainage work is to be carried out by suitably qualified tradesman in accordance with the requirements of the Plumbers, Gasfitters and Drainlayers Act.
Provide finalised roof truss and lintel beam Producer Statement - Design and layout plan before construction of the slab begins.

Council (BCA) inspections required:

Council BCA Inspections required		
No	**Inspection Type**	**Notes**
1	Site Cut	
1	Foundation - Concrete footings	
1	Foundation - Slab	
1	Pre-Roof	
1	Pre-Cladding - Wrap	
1	Pre-Cladding - Mid Cladding	
1	Half-Height Masonry	
1	Pre-Line	
1	Pre-Stop	
1	Drains	
1	Heating Unit - Solid Fuel	
1	Final - Residential	
12	Total Inspections	

You will need to provide the following documentation to support your approved building consent:

The following documentation will need to be provided to council before a final inspection is able to be booked:	
Application for CCC	
Electrical safety certificate (itemised)	
As-built drainage plan	
Plumbers pressure test declaration	

The following documentation will need to be provided to council before a final inspection is able to be booked:	
Design statement (truss manufacturer)	
Design statement (frame manufacturer)	
Woodburner installers certificate	
Under-slab hardfill compaction certificate	

Licensed Building Practitioner forms required:	
Designer	Jeremy Harrison
Carpentry	
Foundations	
Bricklaying and Blocklaying	
Roofing	

A printed copy of all approved plans and specifications must be kept with the building consent. Our building officers need access to the site and plans and specifications before they can carry out an inspection.

How do I book an inspection?

- Please give at least 72 hours' notice prior to any inspection
- HDC will make every attempt to book inspections when required. However, this is not always possible - flexibility is often required. Please note that inspections are not available in all areas every day, please check the table below to see when an inspector will be in your area
- When you call to book an inspection, please supply: Your building consent number, site address, type of inspection, contact name and phone number
- To make a booking for inspection, email building@hurunui.govt.nz or telephone 03 314 8816

Hurunui District Council Building Inspection - days/areas

- Amberley/Leithfield/Waipara areas: Monday - Friday, all days
- Hanmer Springs/Waiau/Culverden/Waikari areas: Monday, Wednesday, Friday
- Omihi/Scargill/Cheviot/Parnassus areas: Tuesday & Thursday

What happens when the building project is finished?

On completion of the project, please complete the Code Compliance Application (Form 6) via the Simpli portal here: https://simpli.govt.nz/login/ and arrange for a final inspection. Applying for the Code Compliance Certificate indicates that consented building work has been completed in accordance with the consent documents.

We look forward to working with you during the construction of your project. Please feel free to contact the Hurunui District Council Building Department to discuss any aspect of your project. Our contact details are Ph: 03 314 8816 or email: building@hurunui.govt.nz

24 September 2025

HURUNUI DISTRICT COUNCIL
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To comply with the Global Stormwater Discharge Consent conditions for Hurunui District Council (HDC), an Erosion and Sediment Control Plan (ESC) is required before construction commences.

1. The Erosion and Sediment Control Plan shall meet the requirements of the 'Erosion and Sediment Control Guideline, Environment Canterbury' https://esccanterbury.co.nz/ for construction,
   and 'Water Sensitive Design for Stormwater' (GD004)
   https://content.aucklanddesignmanual.co.nz/regulations/technical-guidance/Documents/GD04%20WSD%20Guide.pdf
   for design and operation.

2. Prior to commencing works authorised by this consent, the consent holder shall submit a Sediment & Erosion Control Plan to the 3 Waters Planning Team. The plan shall include, as a minimum:-

   i. the mechanisms used to ensure that waterborne sediment does not leave the site, during and/or after construction;

   ii. the mechanisms used to control dust;

   iii. the procedures for keeping stormwater systems, adjacent footpaths and roads free of mud, debris and obstructions.

   iv. how parking associated with construction will be managed.

   v. the nature and location of signage to be erected to warn pedestrians of the construction site and associated construction vehicles.

3. Sediment-laden water must not be allowed to leave the site.

4. The best possible means shall be employed to minimise windblown dust, soil and the associated wind erosion.

5. Adequate drainage and silt control must be in place during and following the earthworks, so as to avoid or mitigate any adverse environmental effects.

6. The consent holder shall implement suitable measures to prevent earth being deposited on public roads. In the event that the materials are deposited on the road, the consent holder shall take immediate action at their own expense to remediate the contamination resulting from the construction works. The measures shall remain in place until completion of work.

7. Any damage/sediment build up to the stormwater components (kerb and channel, sumps, Stormwater manholes, soakpits, retention/detention basins etc.), as a result of unapproved construction phase discharge, shall be cleaned/repaired at the consent holder's expense.

8. The Site Manager will ensure that the works are executed in accordance with the approved plans and will continue to supervise and monitor the ESCP works. This will be verified by the HDC Building Officers.

9. All earthworks shall be undertaken in accordance with the provisions of N.Z.S 4431 (only applicable for Resource Consents/Land use consents or BCs where large volume of earthworks is involved).

10. Immediately upon completion of earthworks, all earth worked areas shall be regrassed or planted to ensure the surface is stabilised.

GoGet Inspection Audit Report

Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Foundation - Slab**

Inspection Outcome: **Pass**

Inspected By: **Nigel Smith**

Inspection Date: **25 November 2025 8:29 a.m.**

Duration: **45 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Ok to proceed.**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None**	Pass
Concrete production **Prescribed mixes - as per NZS3104. Load dockets and Producer Statement provided.**	Pass
Engineering inspections carried out (Required items checked)	N/A
Inspection Photos **Photos Taken.**	Pass
Damp Proofing	Pass
DPM **Heavy polythene**	Pass
Lapping/Sealing **Lapped & taped**	Pass
Penetrations	Pass
Slab thickness **Nom. 100mm**	Pass
Base Course	Pass
Material **AP40**	Pass
Depth **300 - 500mm**	Pass
Sand blinding **Yes Minimum 20mm**	Pass
Compaction **Compaction OK**	Pass
Reinforcing	Pass
Mesh size **SE62 500E**	Pass
Mesh lapping **1¼ laps**	Pass
Mesh concrete cover **Nom. 30mm**	Pass
Mesh chairs **809 mm centres**	Pass

Floor tie lapping **Min. 600mm**	Pass
Floor tie connection	Pass
Supplementary bars **In place as per plan**	Pass
Equipotential Bonding in place **Bonding installed and connected**	Pass
Thickenings	N/A
Services	Pass
Materials **PVC**	Pass
Gradients	Pass
Sizes	Pass
Sleeving **Plastic & foam wrapped & taped**	Pass
Cylinder Drain **Copper pipe, in place**	Pass
Safe Tray Drain **40mm minimum drain installed**	Pass
Other items	Pass
Bottom plate anchors	N/A
Shrinkage control **Sawcuts made later & supp. bars**	Pass
Heating	N/A
Insulation **50mm polystyrene - placed OK**	Pass



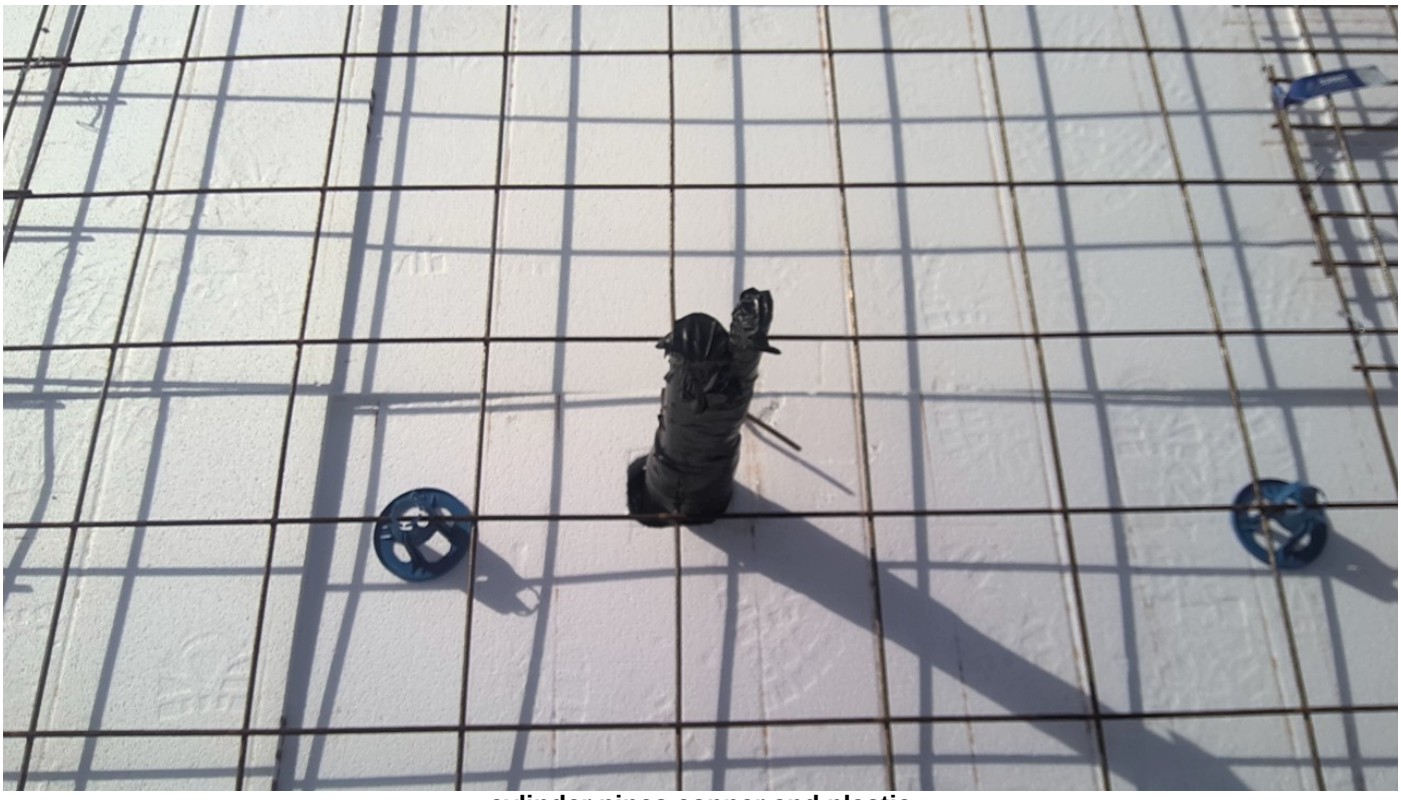
SE62 500E
Taken at 8:27 AM on Tuesday 25/11/2025



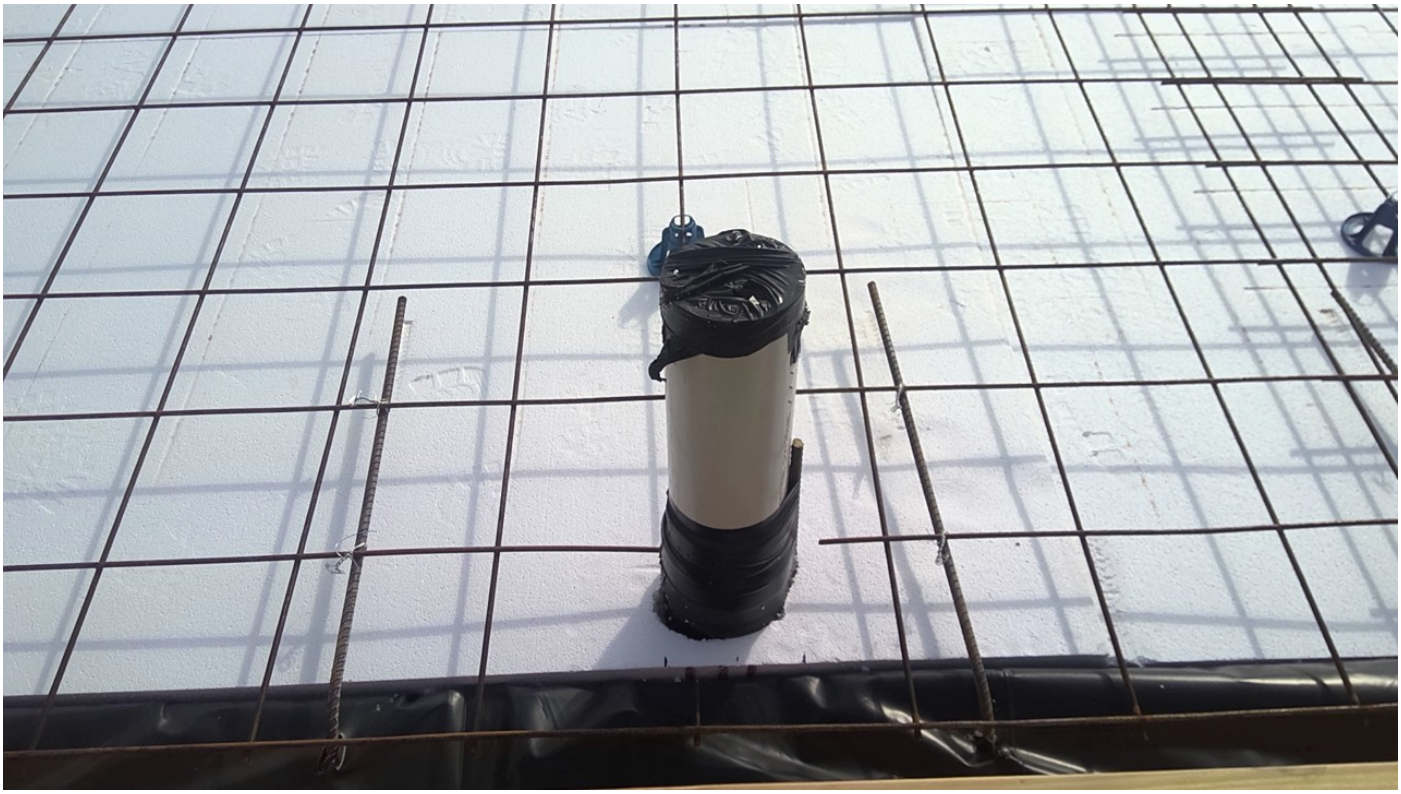
Taken at 8:29 AM on Tuesday 25/11/2025



back of house
Taken at 8:29 AM on Tuesday 25/11/2025



cylinder pipes copper and plastic
Taken at 8:30 AM on Tuesday 25/11/2025



Taken at 8:30 AM on Tuesday 25/11/2025



rebate for garage door

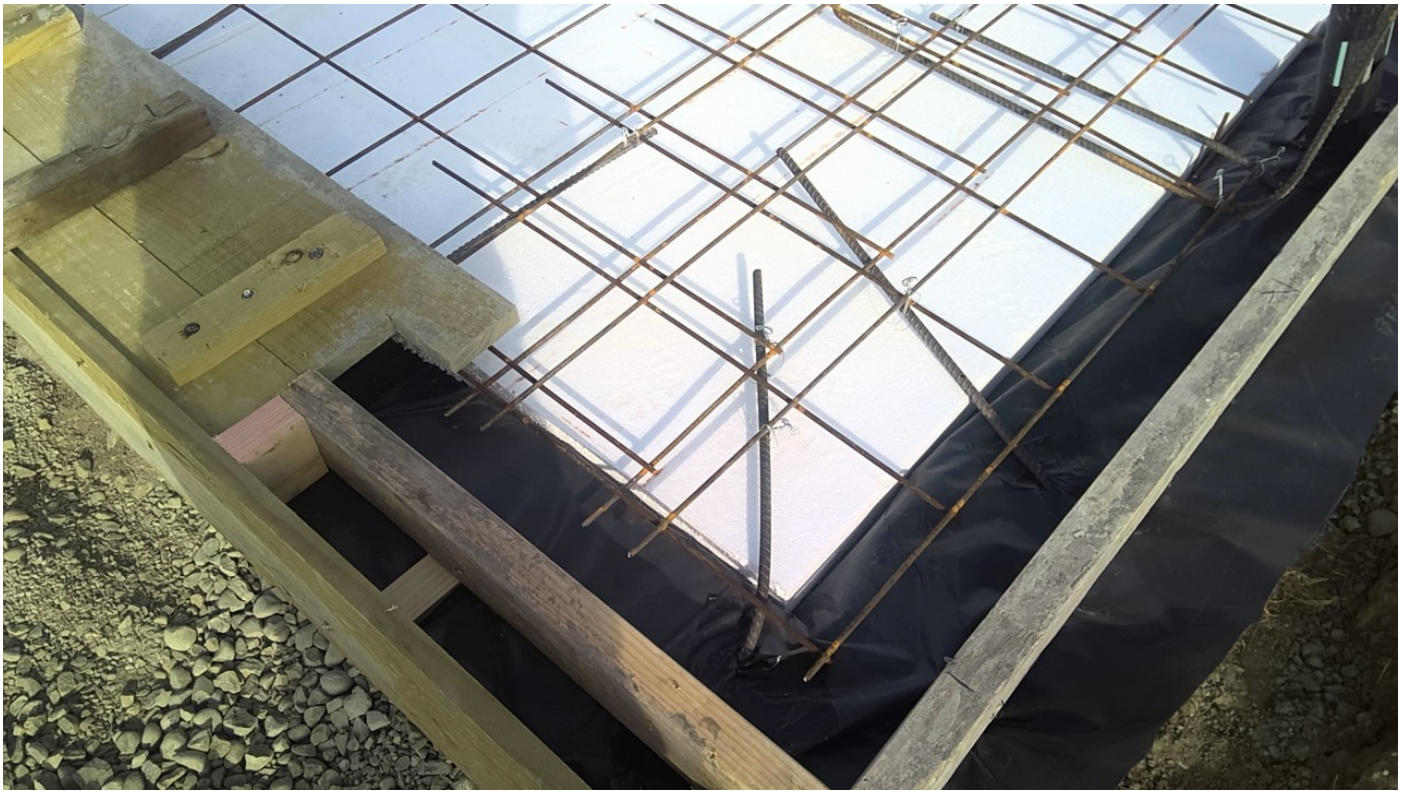
Taken at 8:30 AM on Tuesday 25/11/2025



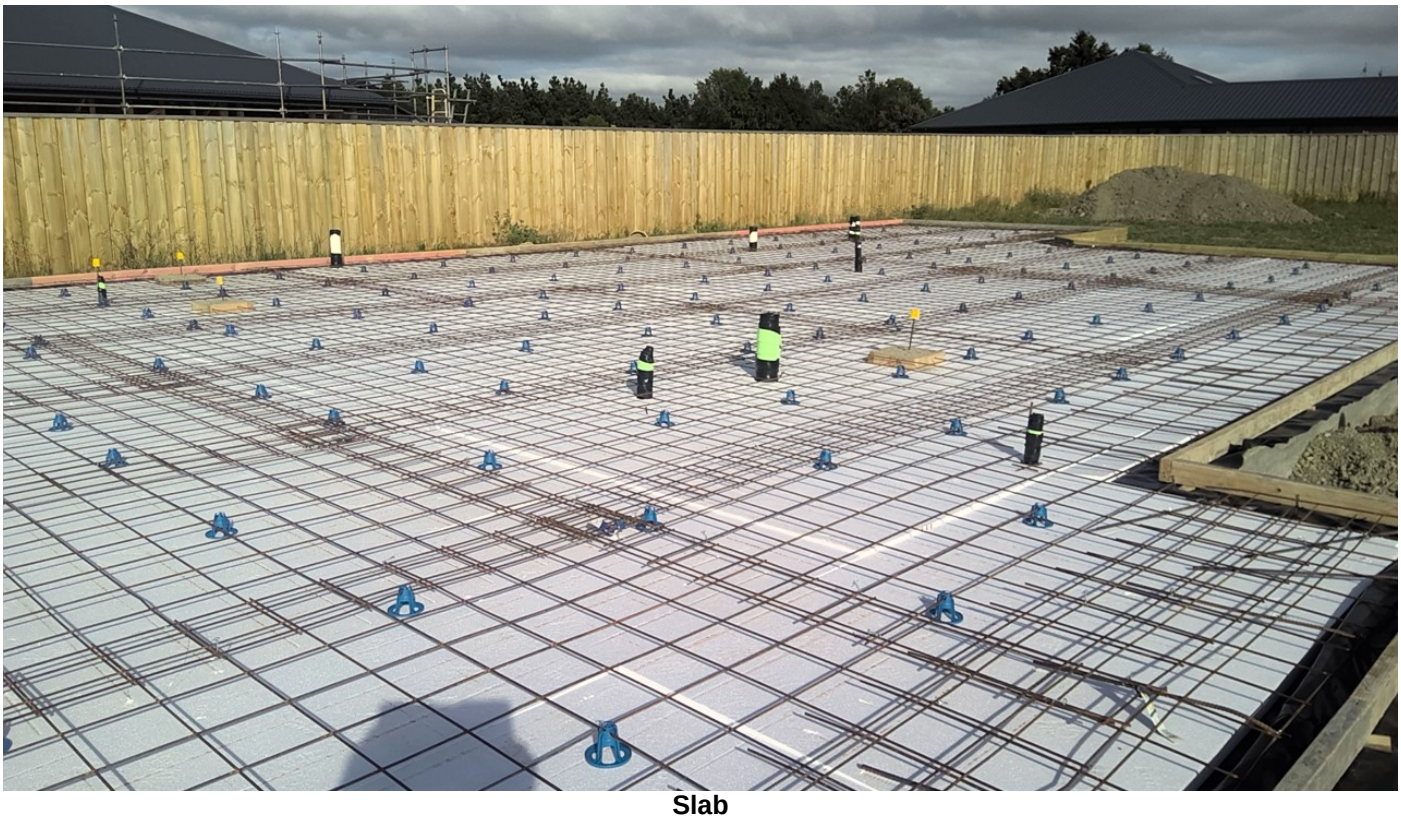
Earth bar
Taken at 8:31 AM on Tuesday 25/11/2025



Taken at 8:31 AM on Tuesday 25/11/2025



Taken at 8:31 AM on Tuesday 25/11/2025



Slab

Taken at 8:32 AM on Tuesday 25/11/2025

GoGet Inspection Audit Report

Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Drains**

Inspection Outcome: **Pass Non Compliance**

Inspected By: **Sven Rigarlsford**

Inspection Date: **27 November 2025 12:33 p.m.**

Duration: **30 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Yes**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None**	Pass
Inspection Photos **Photos Taken.**	Pass
Drainlayer details	Pass
Drainlayer registration number **D&B drainage Richard tap #24836**	Pass
Sewerage	Pass Non Compliance
Drain Material **100mm PVC**	Pass
Gradients **>1 in 80**	Pass
Inspection Points **In place where required**	Pass
Bedding Material **13mm chip**	Pass
Cover **<375mm - paving planned later**	Pass
Lateral Connection **Connection complete. Chamber still being installed**	Pass Non Compliance
Joint Test **Sighted**	Pass
Main Vent size/location **100mm stub-up in place as drawn.**	Pass
Branch Vent size/location **100mm stub-up in place as drawn.**	Pass
Septic Tank Type	N/A
Septic Tank Location	N/A
ECAN Effluent approved	N/A
Effluent Location	N/A
Effluent Type	N/A
Stormwater	Pass

Drain Material **PVC**	Pass
Gradients **>1 in 100**	Pass
Inspection Points **In place where required**	Pass
Bedding Material **13mm chip**	Pass
Cover **<375mm - paving planned later**	Pass
Lateral Connection **Storm water to Existing soak holes on site**	Pass
Soak Pit sizes **Sufficient volume for catchment**	N/A
Soak Pit filter cloth	N/A
Soak Pit Locations	N/A
Gutter Sizes and Overflows	N/A
Downpipe Positions **All sized and located as per plans**	Pass
Deck Drains	N/A
Internal Deck Overflows	N/A
Bubble-up Sumps	N/A
Driveway drainage - all pipework in place **Sumps in place as per plans. Strip drains and falls to be checked at final inspection.**	Pass



Connectio. To existing soak hole
Taken at 12:13 PM on Thursday 27/11/2025



zLateral connection
Taken at 12:13 PM on Thursday 27/11/2025



Head of drains south side
Taken at 12:14 PM on Thursday 27/11/2025



head of drains north side
Taken at 12:14 PM on Thursday 27/11/2025



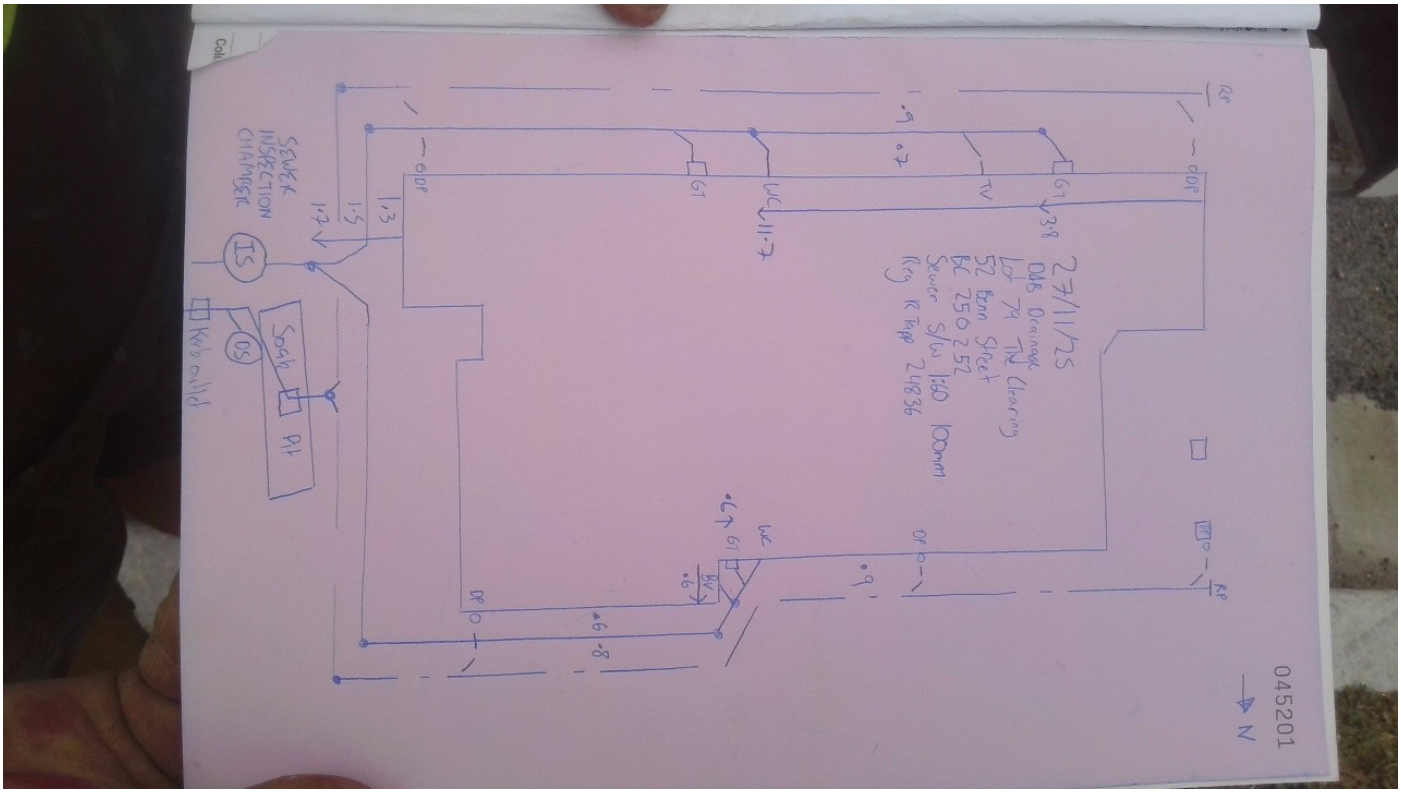
Branch
Taken at 12:16 PM on Thursday 27/11/2025



Sump connected to soak whole overflow
Taken at 12:21 PM on Thursday 27/11/2025



Taken at 12:22 PM on Thursday 27/11/2025



Taken at 12:33 PM on Thursday 27/11/2025



Taken at 12:54 PM on Thursday 27/11/2025

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Foundation - Concrete footings**
Inspection Outcome: **Pass**
Inspected By: **Nigel Smith**
Inspection Date: **17 November 2025 12:45 p.m.**
Duration: **45 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **OK to proceed,**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans	Pass
Concrete production **Audited plant - load dockets sighted.**	Pass
Engineering inspections carried out (Required items checked)	N/A
Inspection Photos **Photos Taken**	Pass
Site Factors	Pass
Survey Pegs **Sighted - locations OK**	Pass
Siting certifcate required (Required items checked)	N/A
Boundary Clearances **All distances as shown on plans**	Pass
Finished Floor level **150mm above crown of road.**	Pass
Site Stability **Level site**	Pass
Ground Bearing **Very firm, rocky dry gravel**	Pass
Vegetation **Cleared with site cut**	Pass
Excavations	Pass
Horizontal Rods **2 x D16 - as drawn**	Pass
Vertical Rods **D12 @ 600mm crs - as drawn** **SED - as drawn**	Pass
Starters/Floor Ties	N/A
Steel Identified **Seismic 300 E**	Pass
Bottom Cover **>50 & <=75mm**	Pass
Side Cover	Pass

>50 & <=75mm	
Lapping **600mm**	Pass
Tying **Wire tied - OK**	Pass
Depth **700mm to 500 mm deep**	Pass
Width **min 250mm**	Pass
Formwork **Constructed timber**	Pass
Level Bottom **Yes - OK**	Pass
Stepped Foundations	N/A
Other items	Pass
Waste Ducts **In place - OK**	Pass
Steel around blockouts **In place as shown**	Pass
Drains under building	N/A
Subfloor ventilation	N/A



peg Left hand side Front of section
Taken at 12:47 PM on Monday 17/11/2025



300 E
Taken at 12:50 PM on Monday 17/11/2025



starters 600 centres
Taken at 12:50 PM on Monday 17/11/2025



529 mm deep
Taken at 12:51 PM on Monday 17/11/2025



250 mm wide
Taken at 12:52 PM on Monday 17/11/2025



typical found detail
Taken at 12:52 PM on Monday 17/11/2025



sleeves in place
Taken at 12:52 PM on Monday 17/11/2025



front elevation house
Taken at 12:53 PM on Monday 17/11/2025



Taken at 12:53 PM on Monday 17/11/2025



150 Above Crownoff Rd
Taken at 12:54 PM on Monday 17/11/2025

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Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass Non Compliance**
Inspected By: **Sven Rigarlsford**
Inspection Date: **10 December 2025 12:31 p.m.**
Duration: **75 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency?	Pass
General	Pass Non Compliance
Inspection carried out **Ok to proceed with roof install once all 3 outside posts have been completed to resist uplift. Holes still being dug at time of inspection. Ensure 600mm depth is achieved as shown on plans.**	Pass Non Compliance
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None.**	Pass
Engineering inspections carried out (Required items checked)	N/A
Inspection Photos **Photos Taken.**	Pass
Framing	Pass Non Compliance
Timber Species **Pinus Radiata generally**	Pass
Timber Grades **SG8 generally**	Pass
Timber treatments **H1.2 throughout**	Pass
Stud sizes **90 x 45mm throughout**	Pass
Stud spacing **600mm centres throughout**	Pass
DPC bottom plates **In place as required**	Pass
Lintel sizes **All as per consent**	Pass
Beam sizes **All as per consent**	Pass
Post sizes	Pass Non Compliance
Truss layout **As per manufactures as built layout provided on site**	Pass
Truss support **Good**	Pass
Girder truss support **Good**	Pass
Purlin size/spacing **90 x 45mm SG6 on flat @ 900mm centres**	Pass
Tile Batten size/spacing	N/A

Rafters	N/A
Insulation to framing external corners	Pass
Steel beams	N/A
Portal frames	N/A
Fixings	Pass Non Compliance
Bottom Plates **M12 Bolts @ 900mm centers to load bearing walls with handy brackets & shots were required throughout.**	Pass
Top plate - stud **Stud lock screws as per manufactures specs**	Pass
Trusses - top plate **All as per manufactures as built fixing schedule.**	Pass
Rafters - top plate **Rafter above front entrance requires fixings**	Pass Non Compliance
Purlins/Tile Battens **1 gun nail & 1 blue screw**	Pass
Lintels **All as per manufactures as built fixing schedule provided on site.**	Pass
Steel angles	N/A
Steel beams	N/A
Portal frames	N/A
Post to foundations	Pass Non Compliance
Post to beams **Galv. steel brackets/ bolts as spec**	Pass
Fire wall frames	N/A
Stringers	N/A
Bracing wall and roof	Pass
Location/type **As shown on brace plan.**	Pass
Fixing/Connections **All as drawn on brace plan**	Pass
Ply nailing **All galv nailed 150mm centres**	Pass
Roof bracing **Steel strap cross bracing as spec**	Pass
Dragon ties	N/A
Ply treatment **H3.2 as reqd**	Pass
Cuts in slab **Cuts made located as per plan**	Pass
Flat roof	N/A
Internal gutters	N/A



pre roof elevation
Taken at 11:34 AM on Wednesday 10/12/2025



back roof elevation
Taken at 11:36 AM on Wednesday 10/12/2025



post hole back porch. Not yet to depth
Taken at 11:42 AM on Wednesday 10/12/2025



handy bracs side of garage door
Taken at 12:05 PM on Wednesday 10/12/2025

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass Non Compliance**
Inspected By: **Mark Milnes**
Inspection Date: **21 January 2026 2:44 p.m.**
Duration: **15 minutes**

Inspection Element	Status
General	Pass
Inspection carried out	Pass
Ok to proceed with roof install once all 3 outside posts have been completed to resist uplift. Holes still being dug at time of inspection. Ensure 600mm depth is achieved as shown on plans.	
----------	
reinspection completed - PASS	
Framing	Pass
Post sizes	Pass
All as per consent	
90 x 90 LVL	
Fixings	Pass Non Compliance
Rafters - top plate	Pass Non Compliance
Rafter above front entrance requires fixings	
----------	
re- inspection carried out	
suggest double cpc 40 to rarters where cut into either side of blocking above beam	
Post to foundations	Pass
Footings completed (wrap inspection)	
Galv. steel brackets/ bolts as spec	



post anchors completed
Taken at 2:37 PM on Wednesday 21/01/2026



post to beam connections completed
Taken at 2:38 PM on Wednesday 21/01/2026



entry post anchor complete
Taken at 2:39 PM on Wednesday 21/01/2026



entry post to beam connection complete
Taken at 2:39 PM on Wednesday 21/01/2026

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Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass**
Inspected By: **Sven Rigarlsford**
Inspection Date: **18 February 2026 2:07 p.m.**
Duration: **15 minutes**

Inspection Element	Status
Fixings	Pass
Rafters - top plate	Pass

Rafter above front entrance requires fixings
----
re- inspection carried out
Double cpc 40 to rarters where cut into either side of blocking above beam

GoGet Inspection Audit Report

Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Cladding - Mid Cladding**

Inspection Outcome: **Pass**

Inspected By: **Nigel Smith**

Inspection Date: **23 February 2026 9:26 a.m.**

Duration: **45 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Yes**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None.**	Pass
Inspection Photos **Photos Taken.**	Pass
Cladding System	Pass
Cladding system installed as per plans/ specs **Starturn**	Pass
Cladding Fixings **As per plans**	Pass
Cavity Batten size **Nom. 40 x 20mm horiz. notched timber w/slope**	Pass
Clearince of ground level. **Minimum 150mm provided. Must be maintained**	Pass
Cavity Batten spacing **600mm centres**	Pass
Cavity Batten treatment **H3.1 timber**	Pass
Vermin proofing **PVC vent strip in place**	Pass
Head flashings **Most joinery to soffit; folded alum. w/stop-ends to other**	Pass
Sill flashings **Proprietary PVC edge-adhered as design**	Pass
Jamb flashings **Not required for cavity system designed**	Pass
Wrap penetrations **As per photos sealed**	Pass
Meter box flashing	N/A
WANZ bars fitted **Fitted to joinery >600mm width**	Pass
Photos taken **YES - Any relevant photos taken**	Pass



north elevation
Taken at 9:17 AM on Monday 23/02/2026



north elevation
Taken at 9:18 AM on Monday 23/02/2026



Battern 600 mm centres
Taken at 9:18 AM on Monday 23/02/2026



Piles sealed
Taken at 9:19 AM on Monday 23/02/2026



north elevation
Taken at 9:19 AM on Monday 23/02/2026



front elevation
Taken at 9:20 AM on Monday 23/02/2026



Taken at 9:20 AM on Monday 23/02/2026



front of the house Gable
Taken at 9:20 AM on Monday 23/02/2026



Taken at 9:20 AM on Monday 23/02/2026

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Half-Height Masonry**
Inspection Outcome: **Pass**
Inspected By: **Mark Milnes**
Inspection Date: **9 March 2026 9:25 a.m.**
Duration: **30 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out	Pass
Approved plans reviewed ***Yes - Approved documents onsite checked***	Pass
Warnngs and Bans	Pass
Inspection Photos	Pass
Half-Height Veneer	Pass
Cavity Width **>40mm less than or equal to 55mm - OK**	Pass
Cavity clear **Yes**	Pass
Cavity closed soffit	Pass
Brick tie spacing **Not sufficient centres - rectification required** **600mm centres horiz. generally; Every 2nd course & every course @ openings - OK**	Pass
Brick tie type	Pass
Brick type **70 series hollow concrete**	Pass
Veneer siting on foundations **Slight overhang**	Pass
Cover to window and door joinery **>10mm less than or equal to 20mm - OK**	Pass
Mortar widths **8 - 10mm**	Pass
Weep holes/perpends **Every 2nd perpend**	Pass
Lintel material (galv/S/S)	N/A
Lintel fixing	N/A
Flashing and support	Pass
Vermin proofing **Drainage gap as required**	Pass
Head flashings **All joinery to soffit level**	Pass
Sill flashings **DPC on kick-out as drawn**	Pass
Jamb flashings **DPC dressed into alum. jamb**	Pass

Wrap penetrations	Pass
Meter box flashing	N/A
WANZ bars fitted	Pass

Fitted to every window & door



wanz bars fitted
Taken at 9:27 AM on Monday 9/03/2026



10mm foundation overhang
Taken at 9:28 AM on Monday 9/03/2026



control joints under window openings south wall
Taken at 9:30 AM on Monday 9/03/2026



penetrations flashed
Taken at 9:31 AM on Monday 9/03/2026

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Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Line**

Inspection Outcome: **Pass**

Inspected By: **Sven Rigarlsford**

Inspection Date: **18 February 2026 2:07 p.m.**

Duration: **60 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Ok to proceed. Ensure back blocking is installed at sheet joins where necessary. This will be checked at pre stop inspection.**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None.**	Pass
Engineering inspections carried out (Required items checked)	N/A
Building weathertight **Yes**	Pass
Inspection Photos	Pass
Framing	Pass
Framing Moisture **<16%**	Pass
Ceiling Batten Material **Pinus timber**	Pass
Ceiling Batten Size **70 x 35mm**	Pass
Ceiling Batten Centres **600mm**	Pass
Ceiling Batten Moisture **<16%**	Pass
Bracing location and type **Previously checked**	Pass
Bracing clear of wet areas **Yes**	Pass
Bracing fixings/connections **All as drawn**	Pass
Brace openings **All OK**	Pass
Diaphragms	N/A
Other	Pass
Safety Glazing **In place - as drawn & required - OK**	Pass
Window/joinery Rating **Joinery displays correct ID rating for site wind speed H**	Pass
Internal Ventilation	Pass

Natural - opening windows & doors	
Metal angle to showers	N/A
Insulation Material **EarthWool**	Pass
R Value Walls **R2.6 - as designed**	Pass
R Value Ceilings **R7 as designed. with R3.6 to perimeter to achieve clearance of roof underlay.**	Pass
Insulation Placement **Good - tidy**	Pass
Stair Head Clearance (2m min)	N/A
Opening Air Seals **Good, tidy**	Pass
Water Services	Pass
Plumber's name and rego **Jamie Young #19461**	Pass
Pipe materials **Polybutylene to hot & cold**	Pass
Jointing **Polybutylene, crimped**	Pass
Support/Clipping **Good - secure - OK**	Pass
Lagging **Inside insulated envelope**	Pass
Shut Off Valve **In place, as required**	Pass
Pressure Test **Carried out - OK- Plumber to supply test declaration.**	Pass
Equipotential Bonding in place **Bonding installed and connected**	Pass
Fire walls	N/A
Waste Services	Pass
Pipework	N/A
Sizes	N/A
Support	N/A
Gradients	N/A
Internal AAV's (hidden) **Fitted in framing - as drawn**	Pass



garage insulated
Taken at 2:01 PM on Wednesday 18/02/2026



Eater shut off and bonding
Taken at 2:01 PM on Wednesday 18/02/2026



moisture bottom of garage door opening stud
Taken at 2:02 PM on Wednesday 18/02/2026



Taken at 2:03 PM on Wednesday 18/02/2026



Main bathroom plumbing
Taken at 2:04 PM on Wednesday 18/02/2026



Plumbing en-suit
Taken at 2:04 PM on Wednesday 18/02/2026 Status: Pass



CA slider ensuite
Taken at 2:04 PM on Wednesday 18/02/2026

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Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Stop**

Inspection Outcome: **Pass**

Inspected By: **Sven Rigarlsford**

Inspection Date: **24 February 2026 10:47 a.m.**

Duration: **30 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Yes ok to proceed. Ensure only approved products are used during plastering process.**	Pass
Approved plans reviewed ***Yes - Electronic documents checked***	Pass
Warnngs and Bans **None**	Pass
Inspection Photos **Photos Taken**	Pass
Bracing	Pass
Locations **All located as shown on brace plan**	Pass
Types **All GIB systems - as drawn**	Pass
Ceiling Diaphragms	N/A
Edge Nailing **Wall bracing fixing patterns as required.**	Pass
Holes in elements **All OK**	Pass
Materials	Pass
Wet Areas **GIB "Aqualine"® board 10mm**	Pass
Wet Area Ceilings **13mm Gib Aqua-line**	Pass
Other Walls **Gib board standard 10mm with 10mm brace line located as shown.**	Pass
Other Ceilings **GIB board standard 13mm**	Pass
Back Blocking	Pass
Fire Walls	N/A



Brace-line both sides of garage door
Taken at 10:43 AM on Tuesday 24/02/2026



Aqua-line in en-suite
Taken at 10:45 AM on Tuesday 24/02/2026



Taken at 10:46 AM on Tuesday 24/02/2026

Hurunui District Council
66 Carters Road
PO Box 13
Amberley 7441
Phone (03) 314 8816

SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Foundation - Concrete footings**
Inspection Outcome: **Pass**
Inspected By: **Nigel Smith**
Inspection Date: **17 November 2025**

Passed Items

Site hazard check completed	
Is the inspection within my competency	**Yes the inspection is within my competency**
General	
Inspection carried out	**OK to proceed,**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	
Concrete production	**Audited plant - load dockets sighted.**
Inspection Photos	**Photos Taken**
Site Factors	
Survey Pegs	**Sighted - locations OK**
Boundary Clearances	**All distances as shown on plans**
Finished Floor level	**150mm above crown of road.**
Site Stability	**Level site**
Ground Bearing	**Very firm, rocky dry gravel**
Vegetation	**Cleared with site cut**
Excavations	
Horizontal Rods	**2 x D16 - as drawn**
Vertical Rods	**D12 @ 600mm crs - as drawn**
	SED - as drawn
Steel Identified	**Seismic 300 E**
Bottom Cover	**>50 & <=75mm**
Side Cover	**>50 & <=75mm**
Lapping	**600mm**
Tying	**Wire tied - OK**
Depth	**700mm to 500 mm deep**
Width	**min 250mm**
Formwork	**Constructed timber**
Level Bottom	**Yes - OK**

Other items

Waste Ducts	**In place - OK**
Steel around blockouts	**In place as shown**



peg Left hand side Front of section
Taken at 12:47 PM on Monday 17/11/2025



300 E
Taken at 12:50 PM on Monday 17/11/2025



starters 600 centres
Taken at 12:50 PM on Monday 17/11/2025



529 mm deep
Taken at 12:51 PM on Monday 17/11/2025



250 mm wide
Taken at 12:52 PM on Monday 17/11/2025



typical found detail
Taken at 12:52 PM on Monday 17/11/2025



sleeves in place
Taken at 12:52 PM on Monday 17/11/2025



front elevation house
Taken at 12:53 PM on Monday 17/11/2025



Taken at 12:53 PM on Monday 17/11/2025



150 Above Crownoff Rd
Taken at 12:54 PM on Monday 17/11/2025

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SITE NOTICE

Consent No:	**250252**
Applicant:	**Jeremy Harrison**
Site Address:	**52 Benn Street, Amberley**
Work Type:	**New 4 bedroom dwelling with Wood Burner**
Building Category:	**R1**

Inspection Type:	**Foundation - Slab**
Inspection Outcome:	**Pass**
Inspected By:	**Nigel Smith**
Inspection Date:	**25 November 2025**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	**Ok to proceed.**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None**
Concrete production	**Prescribed mixes - as per NZS3104. Load dockets and Producer Statement provided.**
Inspection Photos	**Photos Taken.**
Damp Proofing	
DPM	**Heavy polythene**
Lapping/Sealing	**Lapped & taped**
Penetrations	
Slab thickness	**Nom. 100mm**
Base Course	
Material	**AP40**
Depth	**300 - 500mm**
Sand blinding	**Yes Minimum 20mm**
Compaction	**Compaction OK**
Reinforcing	
Mesh size	**SE62 500E**
Mesh lapping	**1¼ laps**
Mesh concrete cover	**Nom. 30mm**
Mesh chairs	**809 mm centres**
Floor tie lapping	**Min. 600mm**
Floor tie connection	
Supplementary bars	**In place as per plan**
Equipotential Bonding in place	**Bonding installed and connected**
Services	

Materials	**PVC**
Gradients	
Sizes	
Sleeving	**Plastic & foam wrapped & taped**
Cylinder Drain	**Copper pipe, in place**
Safe Tray Drain	**40mm minimum drain installed**
Other items	
Shrinkage control	**Sawcuts made later & supp. bars**
Insulation	**50mm polystyrene - placed OK**



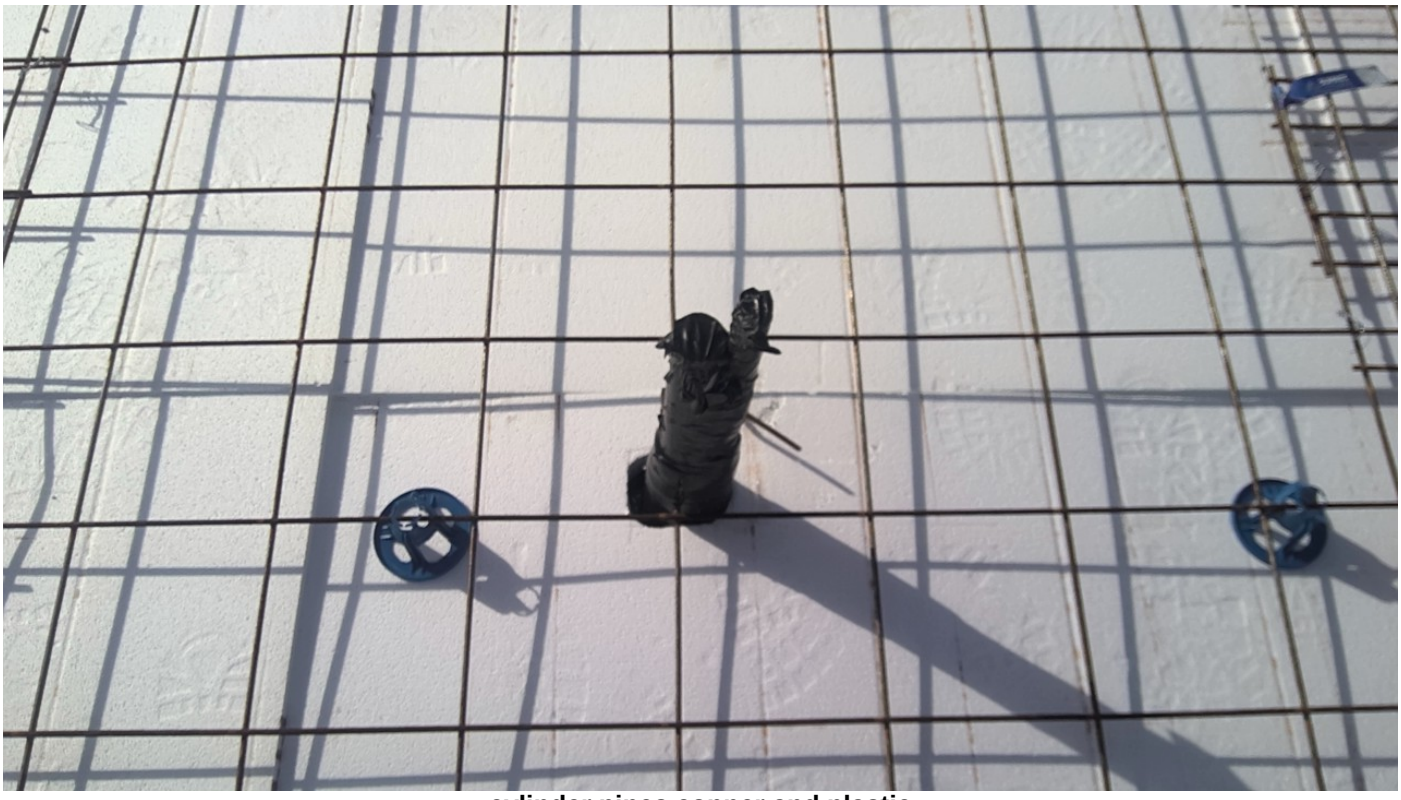
SE62 500E
Taken at 8:27 AM on Tuesday 25/11/2025



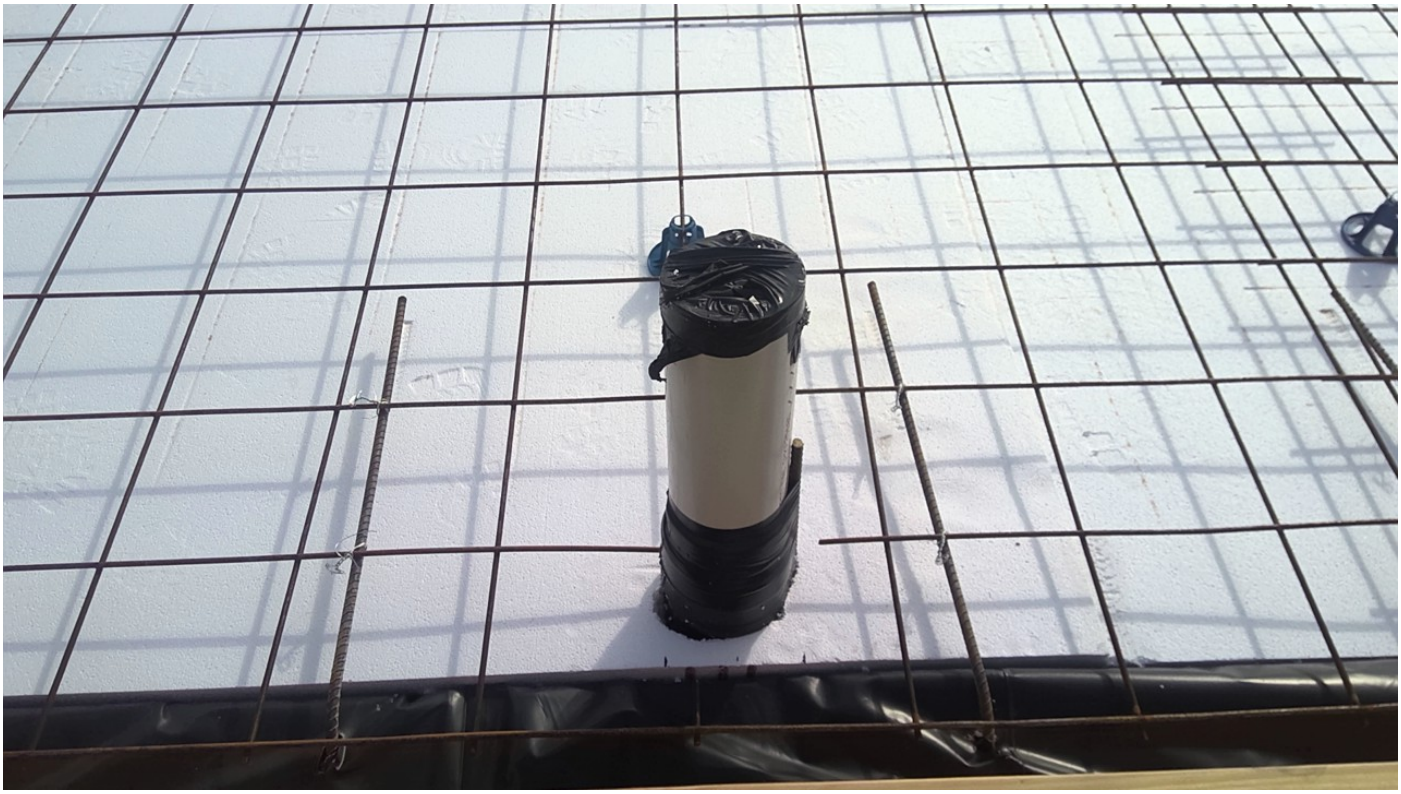
Taken at 8:29 AM on Tuesday 25/11/2025



back of house
Taken at 8:29 AM on Tuesday 25/11/2025



cylinder pipes copper and plastic
Taken at 8:30 AM on Tuesday 25/11/2025



Taken at 8:30 AM on Tuesday 25/11/2025



rebate for garage door

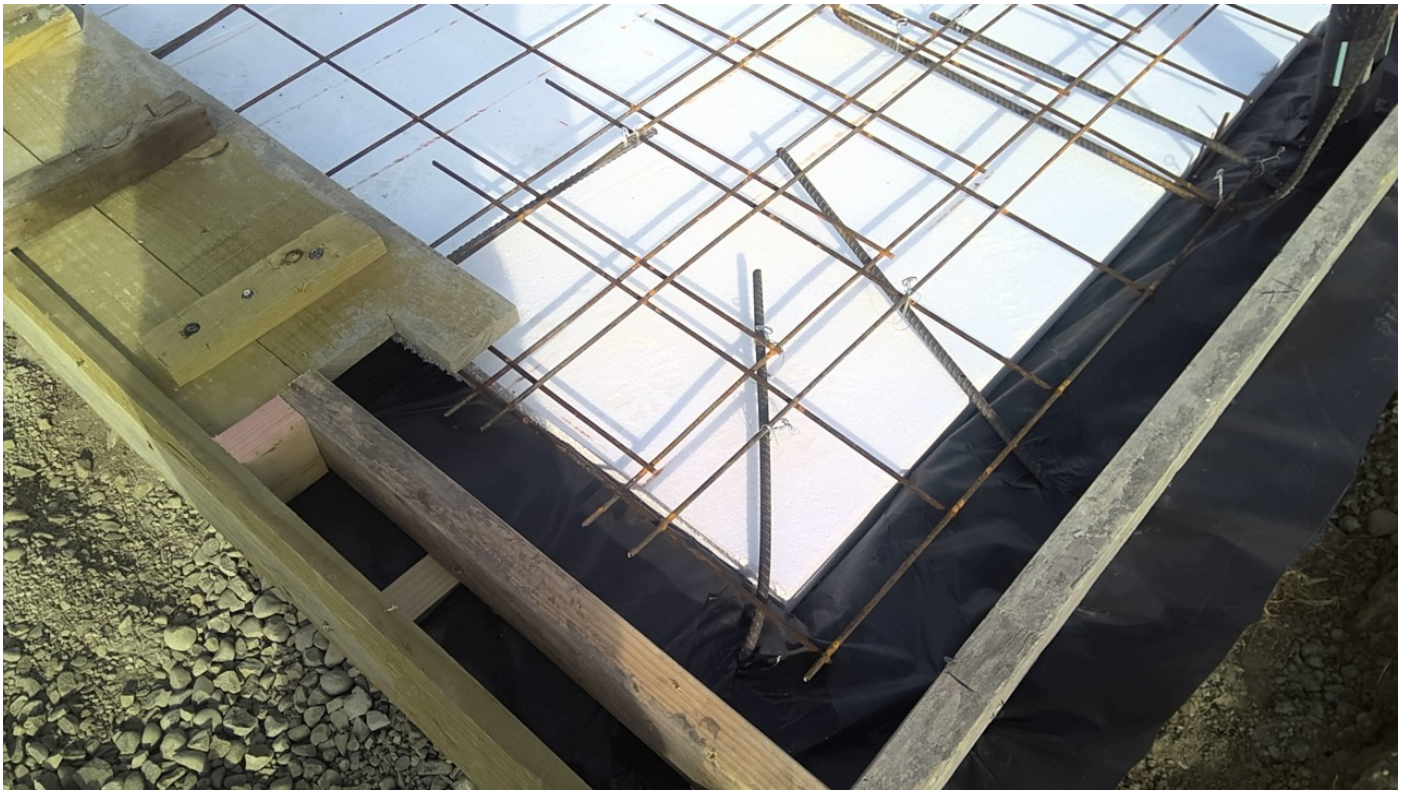
Taken at 8:30 AM on Tuesday 25/11/2025



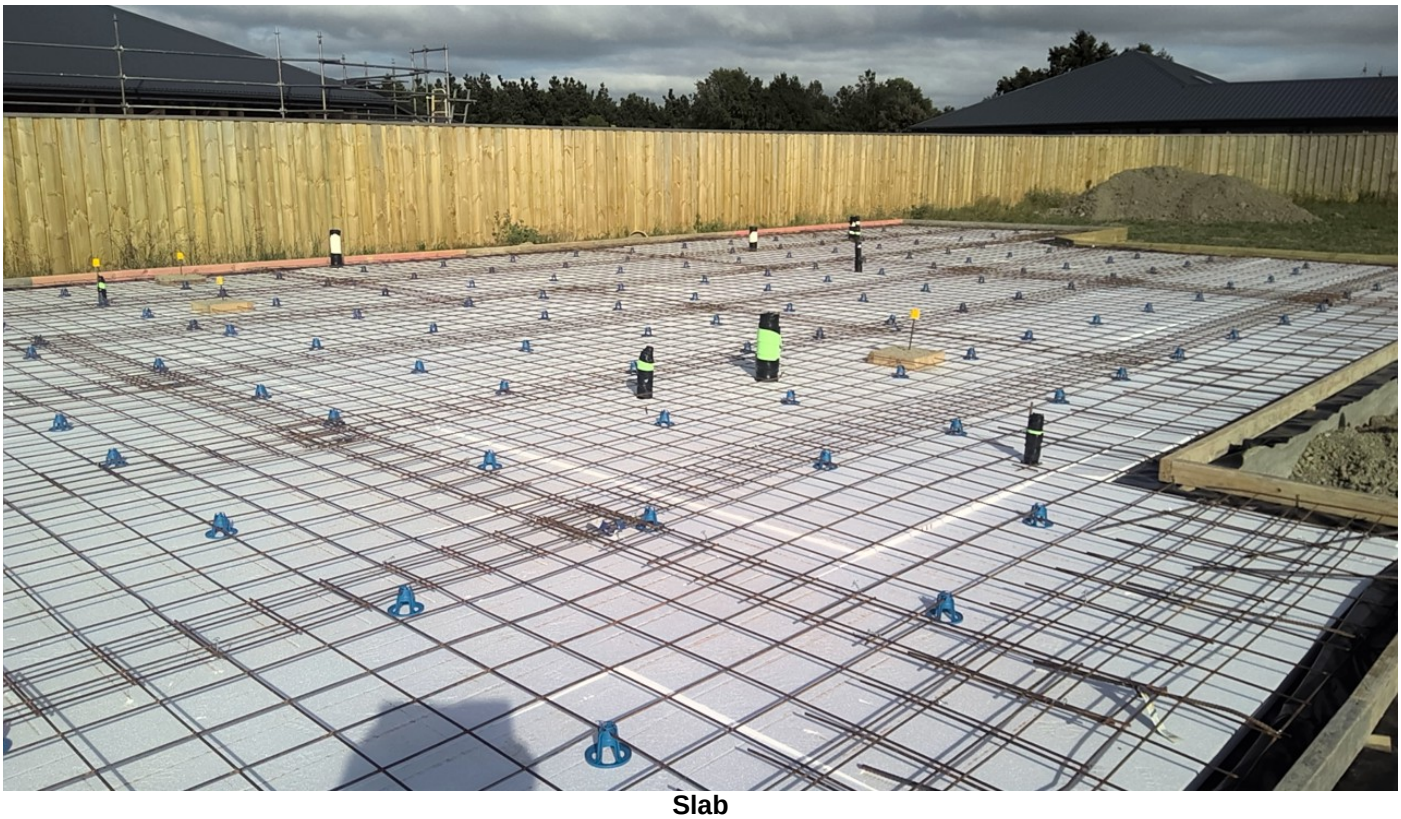
Earth bar
Taken at 8:31 AM on Tuesday 25/11/2025



Taken at 8:31 AM on Tuesday 25/11/2025



Taken at 8:31 AM on Tuesday 25/11/2025



Slab

Taken at 8:32 AM on Tuesday 25/11/2025

Hurunui District Council
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SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Drains**
Inspection Outcome: **Pass Non Compliance**
Inspected By: **Sven Rigarlsford**
Inspection Date: **27 November 2025**

Pass - Non Compliance

Sewerage

Lateral Connection	**Connection complete. Chamber still being installed**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	**Yes**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None**
Inspection Photos	**Photos Taken.**
Drainlayer details	
Drainlayer registration number	**D&B drainage Richard tap #24836**
Sewerage	
Drain Material	**100mm PVC**
Gradients	**>1 in 80**
Inspection Points	**In place where required**
Bedding Material	**13mm chip**
Cover	**<375mm - paving planned later**
Joint Test	**Sighted**
Main Vent size/location	**100mm stub-up in place as drawn.**
Branch Vent size/location	**100mm stub-up in place as drawn.**
Stormwater	
Drain Material	**PVC**
Gradients	**>1 in 100**
Inspection Points	**In place where required**
Bedding Material	**13mm chip**
Cover	**<375mm - paving planned later**
Lateral Connection	**Storm water to Existing soak holes on site**

Downpipe Positions	**All sized and located as per plans**
Driveway drainage - all pipework in place	**Sumps in place as per plans. Strip drains and falls to be checked at final inspection.**



Connectio. To existing soak hole
Taken at 12:13 PM on Thursday 27/11/2025



zLateral connection
Taken at 12:13 PM on Thursday 27/11/2025



Head of drains south side
Taken at 12:14 PM on Thursday 27/11/2025



head of drains north side
Taken at 12:14 PM on Thursday 27/11/2025



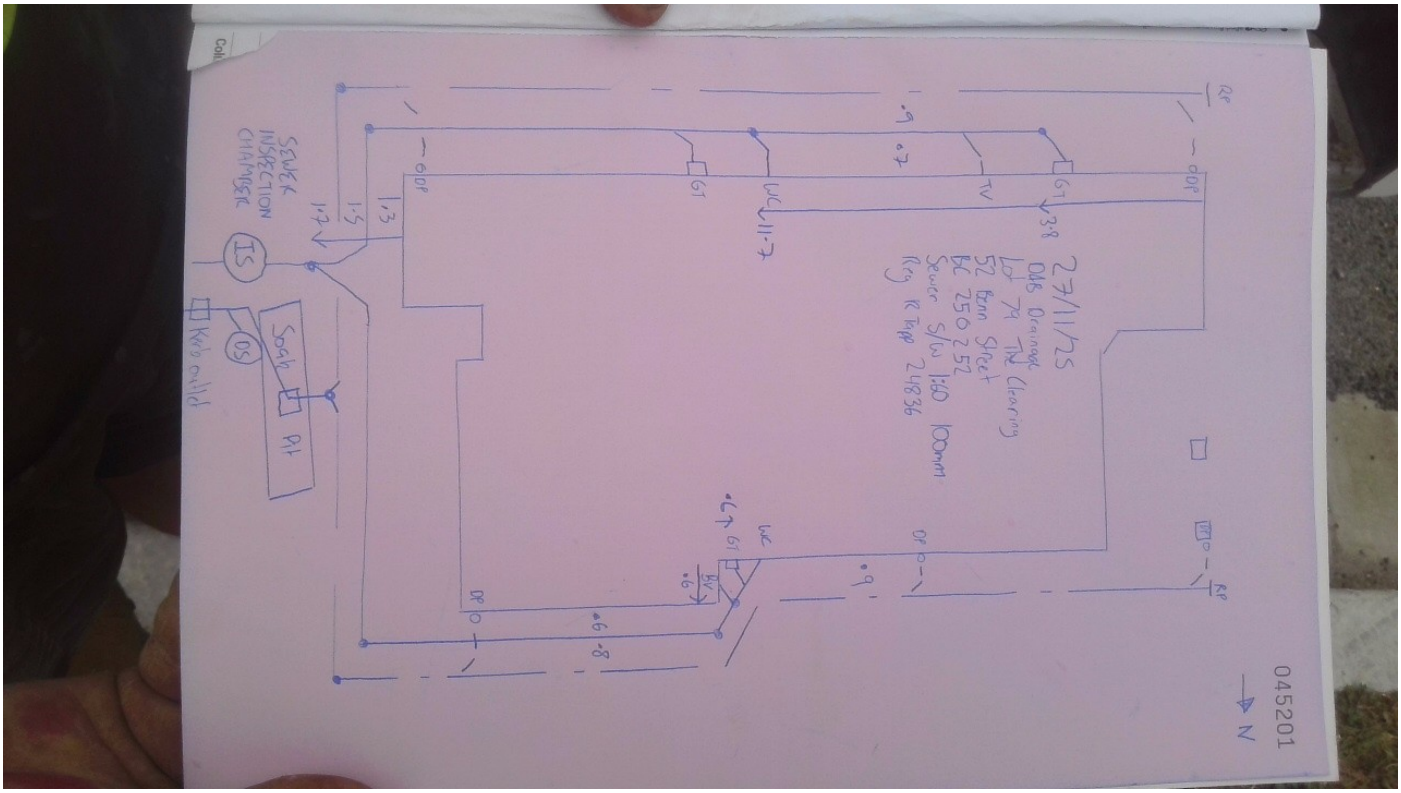
Branch
Taken at 12:16 PM on Thursday 27/11/2025



Sump connected to soak whole overflow
Taken at 12:21 PM on Thursday 27/11/2025



Taken at 12:22 PM on Thursday 27/11/2025



Taken at 12:33 PM on Thursday 27/11/2025



Taken at 12:54 PM on Thursday 27/11/2025

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SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass Non Compliance**
Inspected By: **Sven Rigarlsford**
Inspection Date: **10 December 2025**

Pass - Non Compliance

General

Inspection carried out	**Ok to proceed with roof install once all 3 outside posts have been completed to resist uplift. Holes still being dug at time of inspection. Ensure 600mm depth is achieved as shown on plans.**

Framing

Post sizes	

Fixings

Rafters - top plate	**Rafter above front entrance requires fixings**
Post to foundations	

Passed Items

Site hazard check completed

Is the inspection within my competency?

General

Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None.**
Inspection Photos	**Photos Taken.**

Framing

Timber Species	**Pinus Radiata generally**
Timber Grades	**SG8 generally**
Timber treatments	**H1.2 throughout**
Stud sizes	**90 x 45mm throughout**
Stud spacing	**600mm centres throughout**
DPC bottom plates	**In place as required**
Lintel sizes	**All as per consent**
Beam sizes	**All as per consent**
Truss layout	**As per manufactures as built layout provided on site**
Truss support	**Good**
Girder truss support	**Good**

Purlin size/spacing	**90 x 45mm SG6 on flat @ 900mm centres**
Insulation to framing external corners	
Fixings	
Bottom Plates	**M12 Bolts @ 900mm centers to load bearing walls with handy brackets & shots were required throughout.**
Top plate - stud	**Stud lock screws as per manufactures specs**
Trusses - top plate	**All as per manufactures as built fixing schedule.**
Purlins/Tile Battens	**1 gun nail & 1 blue screw**
Lintels	**All as per manufactures as built fixing schedule provided on site.**
Post to beams	**Galv. steel brackets/ bolts as spec**
Bracing wall and roof	
Location/type	**As shown on brace plan.**
Fixing/Connections	**All as drawn on brace plan**
Ply nailing	**All galv nailed 150mm centres**
Roof bracing	**Steel strap cross bracing as spec**
Ply treatment	**H3.2 as reqd**
Cuts in slab	**Cuts made located as per plan**



pre roof elevation
Taken at 11:34 AM on Wednesday 10/12/2025



back roof elevation
Taken at 11:36 AM on Wednesday 10/12/2025



post hole back porch. Not yet to depth
Taken at 11:42 AM on Wednesday 10/12/2025



handy bracs side of garage door
Taken at 12:05 PM on Wednesday 10/12/2025

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SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass Non Compliance**
Inspected By: **Mark Milnes**
Inspection Date: **21 January 2026**

Pass - Non Compliance

Fixings

Rafters - top plate	**Rafter above front entrance requires fixings** **----------** **re- inspection carried out** **suggest double cpc 40 to rarters where cut into either side of blocking above beam**

Passed Items

General

Inspection carried out	**Ok to proceed with roof install once all 3 outside posts have been completed to resist uplift. Holes still being dug at time of inspection. Ensure 600mm depth is achieved as shown on plans.** **----------** **reinspection completed - PASS**

Framing

Post sizes	**All as per consent** **90 x 90 LVL**

Fixings

Post to foundations	**Footings completed (wrap inspection)** **Galv. steel brackets/ bolts as spec**

Inspection Type: **Pre-Cladding - Wrap**
Inspection Outcome: **Pass**
Inspected By: **Mark Milnes**
Inspection Date: **21 January 2026**

Passed Items

Site hazard check completed

Is the inspection within my competency?	**Yes the inspection is within my competency**

General

Inspection carried out	**Yes**
Approved plans reviewed	**Yes - Approved documents onsite checked**

Warnngs and Bans	**None.**
Inspection Photos	**Photos Taken**
Wrap/tape	
Wrap/Barrier type	**Thermakraft Watergate Plus**
Wrap/Barrier fixing	**Good - fixed over plywood**
Wrap overhang to founds	**Minimum 50mm**
Sill tape type	**Thermakraft Aluband foil tape throughout (BRANZ No. 614)**
Roof Underlay	**Thermakraft 215 bituminous self supporting**
Flashings	
Flashing tape sill fixing	**Full length as per manuf. specs**
Flashing tape head fixing	**Fitted at corners as per manuf. specs**
Flashing tape jamb fixing	**Fitted with 200mm returns out from corners as per specs with building wrap folded around into jamb**



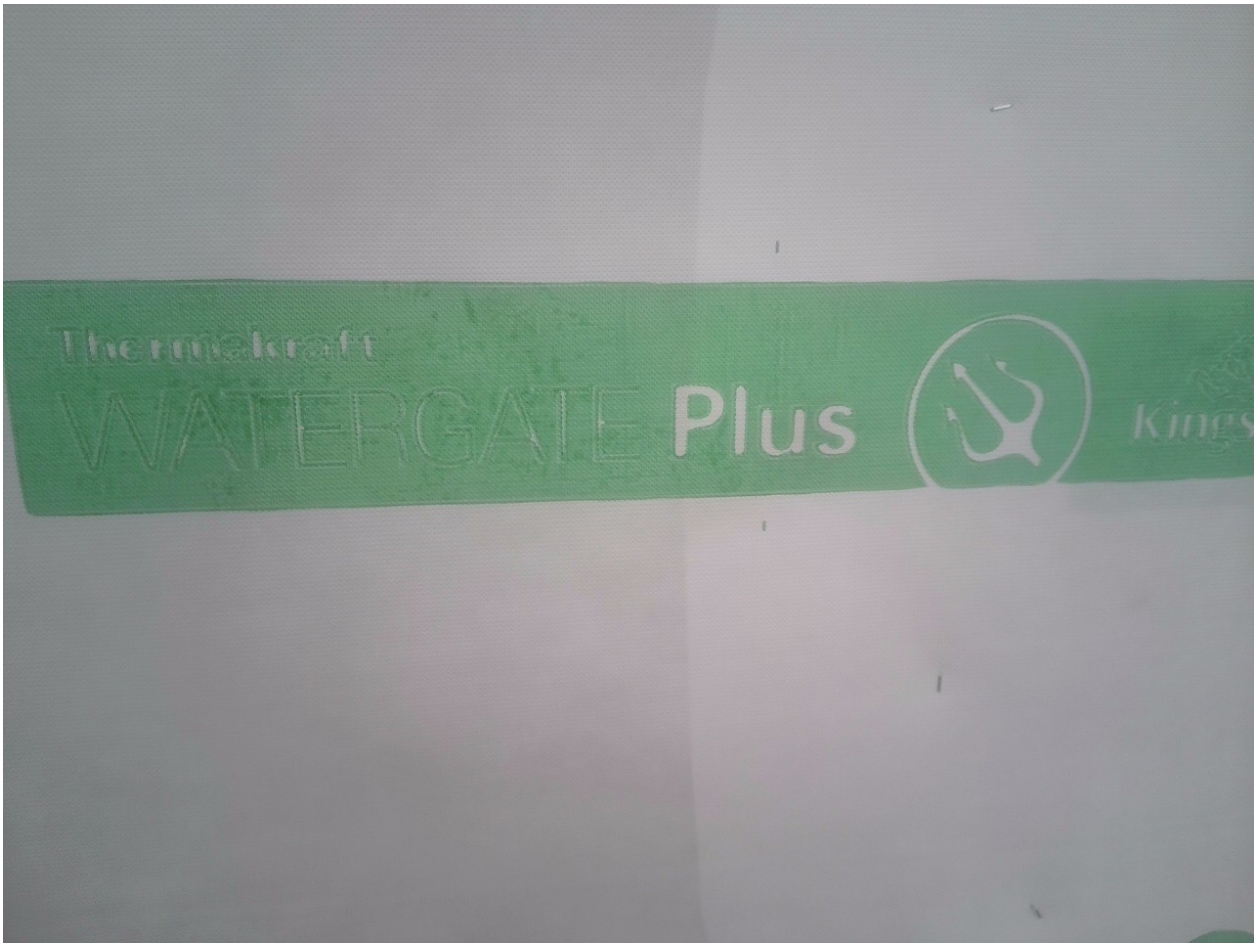
buterfy corners
Taken at 2:30 PM on Wednesday 21/01/2026



continuous sill tape
Taken at 2:30 PM on Wednesday 21/01/2026



south wall
Taken at 2:31 PM on Wednesday 21/01/2026



watergate plus over plywood
Taken at 2:32 PM on Wednesday 21/01/2026



aluband sill tape
Taken at 2:32 PM on Wednesday 21/01/2026



post anchors completed
Taken at 2:37 PM on Wednesday 21/01/2026



post to beam connections completed
Taken at 2:38 PM on Wednesday 21/01/2026



entry post anchor complete
Taken at 2:39 PM on Wednesday 21/01/2026



entry post to beam connection complete
Taken at 2:39 PM on Wednesday 21/01/2026

Hurunui District Council
66 Carters Road
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SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Pre-Roof**
Inspection Outcome: **Pass**
Inspected By: **Sven Rigarlsford**
Inspection Date: **18 February 2026**

Passed Items

Fixings

Rafters - top plate	**Rafter above front entrance requires fixings** **----------** **re- inspection carried out** **Double cpc 40 to rarters where cut into either side of blocking above beam**

Inspection Type: **Pre-Line**
Inspection Outcome: **Pass**
Inspected By: **Sven Rigarlsford**
Inspection Date: **18 February 2026**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	**Ok to proceed. Ensure back blocking is installed at sheet joins where necessary. This will be checked at pre stop inspection.**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None.**
Building weathertight	**Yes**
Inspection Photos	
Framing	
Framing Moisture	**<16%**
Ceiling Batten Material	**Pinus timber**
Ceiling Batten Size	**70 x 35mm**
Ceiling Batten Centres	**600mm**
Ceiling Batten Moisture	**<16%**
Bracing location and type	**Previously checked**
Bracing clear of wet areas	**Yes**

Bracing fixings/connections	**All as drawn**
Brace openings	**All OK**
Other	
Safety Glazing	**In place - as drawn & required - OK**
Window/joinery Rating	**Joinery displays correct ID rating for site wind speed H**
Internal Ventilation	**Natural - opening windows & doors**
Insulation Material	**EarthWool**
R Value Walls	**R2.6 - as designed**
R Value Ceilings	**R7 as designed. with R3.6 to perimeter to achieve clearance of roof underlay.**
Insulation Placement	**Good - tidy**
Opening Air Seals	**Good, tidy**
Water Services	
Plumber's name and rego	**Jamie Young #19461**
Pipe materials	**Polybutylene to hot & cold**
Jointing	**Polybutylene, crimped**
Support/Clipping	**Good - secure - OK**
Lagging	**Inside insulated envelope**
Shut Off Valve	**In place, as required**
Pressure Test	**Carried out - OK- Plumber to supply test declaration.**
Equipotential Bonding in place	**Bonding installed and connected**
Waste Services	
Internal AAV's (hidden)	**Fitted in framing - as drawn**



garage insulated
Taken at 2:01 PM on Wednesday 18/02/2026



Eater shut off and bonding
Taken at 2:01 PM on Wednesday 18/02/2026



moisture bottom of garage door opening stud
Taken at 2:02 PM on Wednesday 18/02/2026



Taken at 2:03 PM on Wednesday 18/02/2026



Main bathroom plumbing
Taken at 2:04 PM on Wednesday 18/02/2026



Plumbing en-suit
Taken at 2:04 PM on Wednesday 18/02/2026 Status: Pass



CA slider ensuite
Taken at 2:04 PM on Wednesday 18/02/2026

Hurunui District Council
66 Carters Road
PO Box 13
Amberley 7441
Phone (03) 314 8816

SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Pre-Cladding - Mid Cladding**
Inspection Outcome: **Pass**
Inspected By: **Nigel Smith**
Inspection Date: **23 February 2026**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	**Yes**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None.**
Inspection Photos	**Photos Taken.**
Cladding System	
Cladding system installed as per plans/ specs	**Starturn**
Cladding Fixings	**As per plans**
Cavity Batten size	**Nom. 40 x 20mm horiz. notched timber w/slope**
Clearince of ground level.	**Minimum 150mm provided. Must be maintained**
Cavity Batten spacing	**600mm centres**
Cavity Batten treatment	**H3.1 timber**
Vermin proofing	**PVC vent strip in place**
Head flashings	**Most joinery to soffit; folded alum. w/stop-ends to other**
Sill flashings	**Proprietary PVC edge-adhered as design**
Jamb flashings	**Not required for cavity system designed**
Wrap penetrations	**As per photos sealed**
WANZ bars fitted	**Fitted to joinery >600mm width**
Photos taken	**YES - Any relevant photos taken**



north elevation
Taken at 9:17 AM on Monday 23/02/2026



north elevation
Taken at 9:18 AM on Monday 23/02/2026



Battern 600 mm centres
Taken at 9:18 AM on Monday 23/02/2026



Piles sealed
Taken at 9:19 AM on Monday 23/02/2026



north elevation
Taken at 9:19 AM on Monday 23/02/2026



front elevation
Taken at 9:20 AM on Monday 23/02/2026



Taken at 9:20 AM on Monday 23/02/2026



front of the house Gable

Taken at 9:20 AM on Monday 23/02/2026



Taken at 9:20 AM on Monday 23/02/2026

Hurunui District Council
66 Carters Road
PO Box 13
Amberley 7441
Phone (03) 314 8816

SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Pre-Stop**
Inspection Outcome: **Pass**
Inspected By: **Sven Rigarlsford**
Inspection Date: **24 February 2026**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	**Yes ok to proceed. Ensure only approved products are used during plastering process.**
Approved plans reviewed	**Yes - Electronic documents checked**
Warnngs and Bans	**None**
Inspection Photos	**Photos Taken**
Bracing	
Locations	**All located as shown on brace plan**
Types	**All GIB systems - as drawn**
Edge Nailing	**Wall bracing fixing patterns as required.**
Holes in elements	**All OK**
Materials	
Wet Areas	**GIB "Aqualine"® board 10mm**
Wet Area Ceilings	**13mm Gib Aqua-line**
Other Walls	**Gib board standard 10mm with 10mm brace line located as shown.**
Other Ceilings	**GIB board standard 13mm**
Back Blocking	



Brace-line both sides of garage door
Taken at 10:43 AM on Tuesday 24/02/2026



Aqua-line in en-suite
Taken at 10:45 AM on Tuesday 24/02/2026



Taken at 10:46 AM on Tuesday 24/02/2026

Hurunui District Council
66 Carters Road
PO Box 13
Amberley 7441
Phone (03) 314 8816

SITE NOTICE

Consent No: **250252**
Applicant: **Jeremy Harrison**
Site Address: **52 Benn Street, Amberley**
Work Type: **New 4 bedroom dwelling with Wood Burner**
Building Category: **R1**

Inspection Type: **Half-Height Masonry**
Inspection Outcome: **Pass**
Inspected By: **Mark Milnes**
Inspection Date: **9 March 2026**

Passed Items

Site hazard check completed	
Is the inspection within my competency?	**Yes the inspection is within my competency**
General	
Inspection carried out	
Approved plans reviewed	**Yes - Approved documents onsite checked**
Warnngs and Bans	
Inspection Photos	
Half-Height Veneer	
Cavity Width	**>40mm less than or equal to 55mm - OK**
Cavity clear	**Yes**
Cavity closed soffit	
Brick tie spacing	**Not sufficient centres - rectification required** **600mm centres horiz. generally; Every 2nd course & every course @ openings - OK**
Brick tie type	
Brick type	**70 series hollow concrete**
Veneer siting on foundations	**Slight overhang**
Cover to window and door joinery	**>10mm less than or equal to 20mm - OK**
Mortar widths	**8 - 10mm**
Weep holes/perpends	**Every 2nd perpend**
Flashing and support	
Vermin proofing	**Drainage gap as required**
Head flashings	**All joinery to soffit level**
Sill flashings	**DPC on kick-out as drawn**
Jamb flashings	**DPC dressed into alum. jamb**
Wrap penetrations	
WANZ bars fitted	**Fitted to every window & door**



wanz bars fitted
Taken at 9:27 AM on Monday 9/03/2026



10mm foundation overhang
Taken at 9:28 AM on Monday 9/03/2026



control joints under window openings south wall
Taken at 9:30 AM on Monday 9/03/2026



penetrations flashed
Taken at 9:31 AM on Monday 9/03/2026

GoGet Inspection Audit Report

Consent No: **250252**

Applicant: **Jeremy Harrison**

Site Address: **52 Benn Street, Amberley**

Work Type: **New 4 bedroom dwelling with Wood Burner**

Inspection Type: **Pre-Cladding - Wrap**

Inspection Outcome: **Pass**

Inspected By: **Mark Milnes**

Inspection Date: **21 January 2026 2:35 p.m.**

Duration: **30 minutes**

Inspection Element	Status
Site hazard check completed	Pass
Is the inspection within my competency? **Yes the inspection is within my competency**	Pass
General	Pass
Inspection carried out **Yes**	Pass
Approved plans reviewed ***Yes - Approved documents onsite checked***	Pass
Warnngs and Bans **None.**	Pass
Inspection Photos **Photos Taken**	Pass
Wrap/tape	Pass
Wrap/Barrier type **Thermakraft Watergate Plus**	Pass
Wrap/Barrier fixing **Good - fixed over plywood**	Pass
Wrap overhang to founds **Minimum 50mm**	Pass
Sill tape type **Thermakraft Aluband foil tape throughout (BRANZ No. 614)**	Pass
Roof Underlay **Thermakraft 215 bituminous self supporting**	Pass
Netting support	N/A
Flashings	Pass
Flashing tape sill fixing **Full length as per manuf. specs**	Pass
Flashing tape head fixing **Fitted at corners as per manuf. specs**	Pass
Flashing tape jamb fixing **Fitted with 200mm returns out from corners as per specs with building wrap folded around into jamb**	Pass
Direct Fix cladding requirements met (sill and jamb blocks)	N/A
Thermal Barrier	N/A



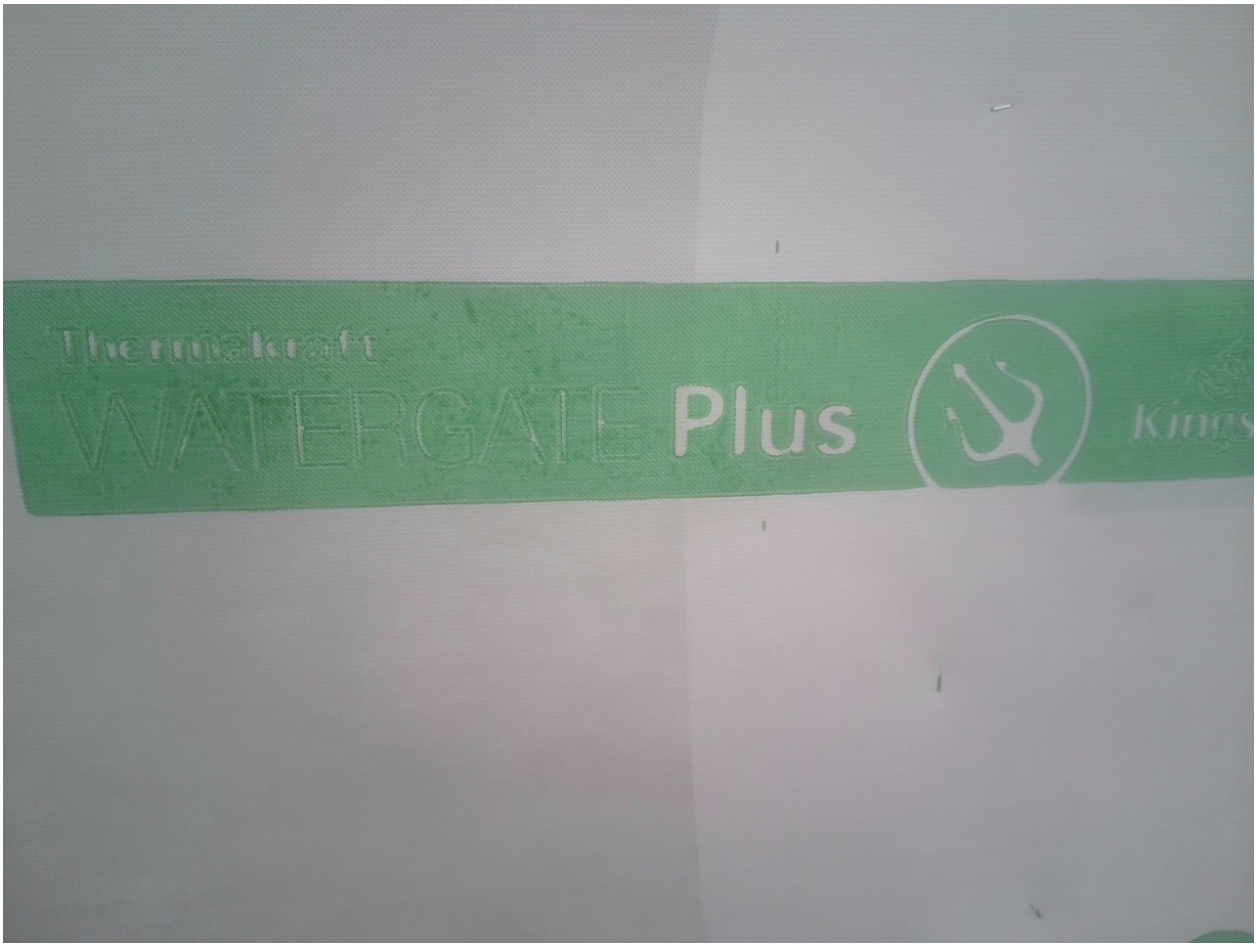
buterfy corners
Taken at 2:30 PM on Wednesday 21/01/2026



continuous sill tape
Taken at 2:30 PM on Wednesday 21/01/2026



south wall
Taken at 2:31 PM on Wednesday 21/01/2026



watergate plus over plywood
Taken at 2:32 PM on Wednesday 21/01/2026



aluband sill tape
Taken at 2:32 PM on Wednesday 21/01/2026

Vehicle Crossing Inspection – Pre Pour.

Pre-Inspection Checklist

Property Address	52 Benn Street
BC Number (If applicable)	BC250252
Contractor Name	Brendon Esler Builders
Contractor Contact Number	0276247630
Contractor email address	
WAP Details	
Inspection Time	28/04/26

On Site Inspection Checklist

Check in accordance with bond document including:	
Traffic Management in place. • If a busy location check, there is a qualified TMP on site.	Fail - Cones in place, however no TM in place. An approved WAP will need to be in place prior to pouring.
Distances Distances • Distance from boundary (1 mtr min) • Clear of above ground services and overflow bubble ups • If overflow bubble up has been shifted for VC, check it has been reinstalled.	Pass
Basecourse • Size 100mm AP40 • Well compacted • 150mm deep	Pass
Levels • Check fall of VC	Pass
Channel (if required) • 300mm wide • 250mm depth • Flat	N/A
Mesh and stools • 665 mesh • Mesh right into corners	Pass
Footpath • Saw Cut footpath (if required) back to 1mtr • Check 1.0mtr flat footpath. • Mesh not required in footpath	
Width of crossing • Minimum 3mtr to maximum 4.8mtr (6mtrs including taper) • Check approved plan as widths may differ	The vehicle crossing is just over the 4.8mtr allowed width, however going to pass. Please note this is not setting a precedent for other vehicle crossing going forward to be wider.
Notes	
Take photos	Yes

In Office Checklist

Save inspection sheet including photos to Lasefiche	
Notify contractor of outcome of inspection if not on site	

Inspection Photos



Water Supply

- Urban Main
- Urban Service Connection
- Urban Sub Main
- Point on main
- Fire Hydrant
- Manifold
- Valve less than or equal to 50mm
- Valve greater than 50mm

Sewer

- Gravity Main
- Service
- Manhole

Stormwater

- Gravity Main
- Service
- Manhole
- Soak Pit
- Sump - Bubble Up
- Sump - Double
- Sump - Entry

Other

- Parcel
- Hurunui Rating Unit
- Settlement Boundary



52 Benn Street, Amberley

Date:	25/07/2025
Scale:	1:564
Print Size:	A4 Landscape
Projection:	NZTM
Produced by:	arcservice

Hurunui District Council does not guarantee that the data in this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequences which may arise from relying on any information depicted. Cadastral and topographic data sourced from LINZ. Crown Copyright Reserved.

HURUNUI District Council

Attachment 2: Bond documentation

ACCESSWAY CONSTRUCTION BOND
BUILDING CONSENT BC250252

BY THIS BOND made the 5 day of November 2025

BETWEEN the Hurunui District Council (called "the Council") of the one part

AND Ian Bracken Cassels as ~~Director of UWC Limited (the~~ "Owners") 198 Sims Road, Otaki (with his/her/their ~~successors and assigns called~~ "the Owners")

Brendon Esler Builders Ltd

BACKGROUND:

A. The Owners wishes to undertake building works on the property situated at 52 Benn Street, Amberley, legal description – Lot 79 DP 587128 (hereinafter called "the Land").

B. The Council's District Plan for the Land provides that the creation of any new vehicle crossing, or the use of an existing vehicle crossing for a new activity, (including the relocation of such) shall meet the standards of Rule 8.4.2 of the Hurunui District Plan.

C. The Applicant has applied for a building consent (BC250252) under the Building Act 2004. In order for the building consent to comply with Rule 8.4.2 of the District Plan, the Owner agrees to provide a Bond to secure the carrying out of the vehicle crossing construction. The construction of the vehicle crossing shall be undertaken within 12 months of the bond being entered into or before the use of the proposed activity commences, whichever is the lesser.

D. The estimated cost of the construction and formation of the vehicle crossing to the required standard under the District Plan is estimated to be the sum of $2700.

CONDITIONS OF BOND:

Urban Vehicle Crossing
A vehicle crossing shall be provided to the Land in accordance with Figure 8.11 as per the District Plan.

The bond will not be deemed to be given effect to until the following requirements have been completed:

1. The bond has been paid,
2. A completed and signed bond document has been returned to the Council,
3. A Corridor Access permit has been applied for and obtained from Council,
4. A temporary crossing on the site has been approved by the Consents Engineer.

THIS AGREEMENT RECORDS:

1. The Owners has deposited with the Council the sum of **$3,260** as surety for this Bond and agree that the Council may hold the said sum of money until the conditions of this Bond have been fully met or the moneys shall have otherwise been disbursed in accordance with the terms of this Agreement.

2. The Owners acknowledges that the following vehicle crossing inspections are compulsory and the owner is required to give the Councils engineer two working days' notice prior to any inspection.

   - Pre-construction
   - Excavation to sub grade
   - Pre-Seal
   - Final

3. The Owners shall complete the Work to the reasonable satisfaction of the Council within 12 months of the date of this bond or within such longer period as the Council may approve.

4. The sum deposited with the Council includes a non-refundable fee of $560 for administration and inspection costs incidental to the preparation and release of this Bond.

5. The Owners acknowledges that their liability under this Agreement shall not be released, varied, or affected in any way by any delay, extension of time, or other indulgence suffered or permitted by the Council or by any failure or neglect by the Council to enforce the terms of this Agreement.

   5.1 If the Owners shall be in breach of any of the obligations under this Agreement, it shall be lawful for the Council, at the sole option of the Council to arrange for the satisfactory completion of all of the works and for this purpose the Council may employ its servants or agents or such contractors as the Council may see fit.

   5.2 The Owners shall pay all costs incurred by the Council in arranging for the completion of those works and the Owners shall be liable for any sum so expended by the Council or any expenses incurred by the Council in excess of the sum bonded.

   5.3 The Council may apply the moneys deposited with the Council towards payment of all such costs and expenses and in the event that the sum deposited with the Council is not sufficient to carry out the said works the Council may recover any excess from the Owner as a liquidated debt.

   5.4 In the event that costs and expenses incurred by the Council for the formation of the vehicle crossing are less than that sum deposited with the Council then the Owners shall be entitled to the repayment of the balance in accordance with the provisions in Clause 5.

6. Upon completion of the work to the reasonable satisfaction of the Council in accordance with the District Plan the Owners shall be entitled to repayment to them of the moneys deposited with the Council but without any entitlement to interest and any of the costs payable under clause 5 of this bond.

7. In the event of the Owner not proceeding with the building works then the sum bonded will be refunded to them in accordance with Clause 5.

8. The Owners shall pay any costs and disbursements incurred by the Council for additional inspections and in the enforcement by the Council of any of its rights under this Agreement.

9. If there is dispute between the parties arising out of, or in connection with, this bond, neither of the parties is to commence any proceedings relating to that dispute until the following procedure had been complied with:

   9.1 The party claiming a dispute has arisen must give written notice to the other party specifying the nature of the dispute.

   9.2 The parties will endeavour, in good faith to resolve the dispute referred to in the notice by using informal dispute resolution techniques.

   9.3 If the parties do not agree on a dispute resolution technique within 14 days after the date notice of a dispute was given, the dispute is to be mediated according to the standard Bond of LEADR New Zealand Incorporated (Lawyers Engaged in Alternative Dispute Resolution), and the Chair of LEADR (or the Chair's nominee) will select the mediator and determine the mediator's remuneration.

   9.4 A party seeking urgent interlocutory relief may, by notice to the other party, elect not to comply with the provisions of this clause, but only to the extent of the relief sought, and only for the period required to dispose of the application for interlocutory.

   9.5 Pending resolution of the dispute, this Bond will remain in full effect without prejudicing the parties' respective rights and remedies.

SIGNED by

Sarah Esler

and

SE

in the presence of:

Julie Topp

Name of Witness

Signature of Witness

3 Reserve Rd, Balclutha

Address of Witness

Estimator

Occupation of Witness

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley | 7441 | 66 Carters Road | Amberley | 7410
Phone 03 314-8816 | Fax 03 314-9181 | Email info@hurunui.govt.nz
Web hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil
Skype hdc_customer_services | twitter.com/hurunuidc

31 July 2025

UWC Limited
C/- J Harrison
12 Murfitt Street
Pegasus 7612

Dear Jeremy

BUILDING CONSENT BC250252 - VEHICLE CROSSING BOND LETTER

In order to promote the safe and efficient use and development of the transportation network, the Hurunui District Plan has rules for vehicle access onto properties. No activity, including the construction of a dwelling, can be commenced unless the property is provided with adequate site access in terms of Rule 8.4.3 of the Hurunui District Plan.

In order to enter into the vehicle crossing bond agreement with the council to allow building work to proceed, you must:

Enter into the attached bond agreement with the Council to secure compliance with the vehicle crossing standards of the District Plan. Once the bond agreement has been entered into, and the Council has issued the building consent, building works may proceed. Please find attached a copy of the bond documents so that you can enter into the bond agreement with the Council. Please complete two copies and return one copy to the Council with **$3,260**. The bond is made up of a refundable $2700 and a non-refundable fee of $560 for administration and inspections.

In order for building inspections to be booked the following 3 items need to be completed to enter into the council's vehicle crossing bond.

1. **Signed bond document**,
2. **Paid bond and inspection fee,**
3. **Completed Temporary Vehicle Crossing**.

A guideline on how to complete your vehicle crossing has been provided with this letter.

The construction of the vehicle crossing must be undertaken within 12 months of the bond being entered into or before the use of the proposed activity commences, whichever is the lesser.

The vehicle crossing bond payment is to be made into the Hurunui District Council's bank account number: **03 0802 0946666 00.** Please ensure the payment details refer to the building consent number noted in this letter and that the payment is for a vehicle crossing bond. **Please also ensure that the bond is only paid once through the building consent invoice or to the provided bank account on the bond documentation as any refunds may take up to 31 days to be returned.**

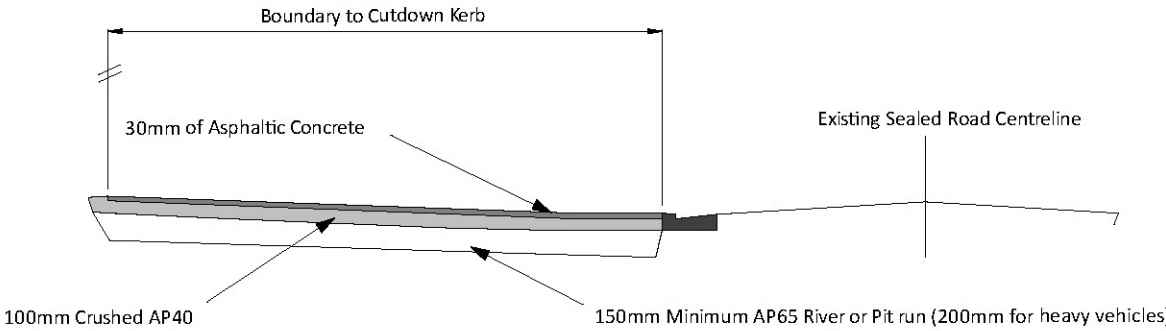
Please do not hesitate to contact the planning team (planning@hurunui.govt.nz) should you wish to discuss the options available to you in further detail.

Yours faithfully

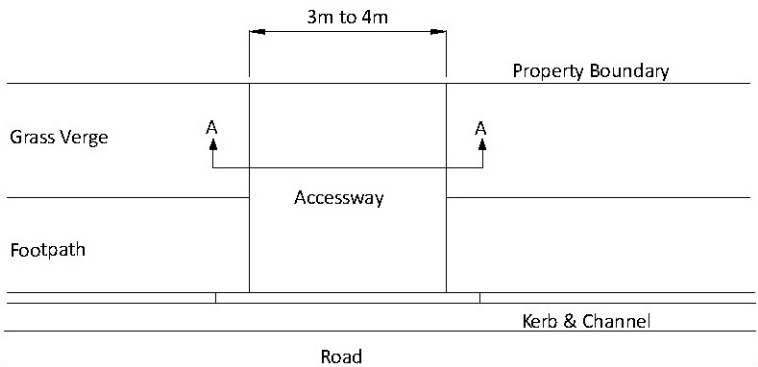


Aidan Chrystal
Planner

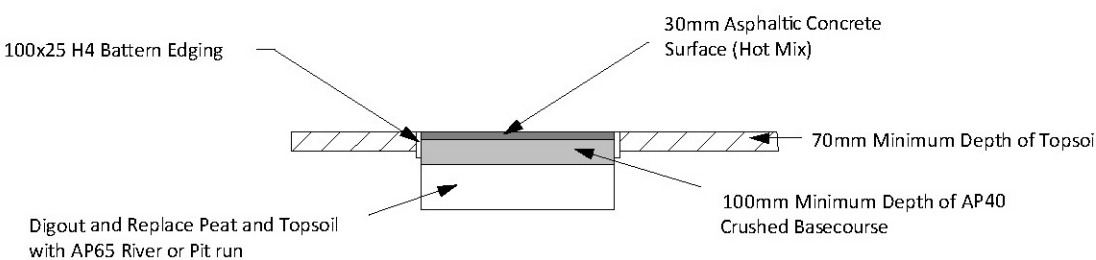
Encl.
Attachment 1: Vehicle crossing design and construction standards.
Attachment 2: Bond documentation
Attachment 3: Bond Guide



Typical Longsection



Typical Plan



Cross Section A-A

Attachment 2: Bond documentation

ACCESSWAY CONSTRUCTION BOND
BUILDING CONSENT BC250252

BY THIS BOND made the _____ day of _____ 2025

BETWEEN the Hurunui District Council (called "the Council") of the one part

AND Ian Bracken Cassels as Director of UWC Limited (the "Owners") 198 Sims Road, Otaki (with his/her/their successors and assigns called "the Owners")

BACKGROUND:

A. The Owners wishes to undertake building works on the property situated at 52 Benn Street, Amberley, legal description – Lot 79 DP 587128 (hereinafter called "the Land").

B. The Council's District Plan for the Land provides that the creation of any new vehicle crossing, or the use of an existing vehicle crossing for a new activity, (including the relocation of such) shall meet the standards of Rule 8.4.2 of the Hurunui District Plan.

C. The Applicant has applied for a building consent (BC250252) under the Building Act 2004. In order for the building consent to comply with Rule 8.4.2 of the District Plan, the Owner agrees to provide a Bond to secure the carrying out of the vehicle crossing construction. The construction of the vehicle crossing shall be undertaken within 12 months of the bond being entered into or before the use of the proposed activity commences, whichever is the lesser.

D. The estimated cost of the construction and formation of the vehicle crossing to the required standard under the District Plan is estimated to be the sum of $2700.

CONDITIONS OF BOND:

Urban Vehicle Crossing
A vehicle crossing shall be provided to the Land in accordance with Figure 8.11 as per the District Plan.

The bond will not be deemed to be given effect to until the following requirements have been completed:

1. The bond has been paid,
2. A completed and signed bond document has been returned to the Council,
3. A Corridor Access permit has been applied for and obtained from Council,
4. A temporary crossing on the site has been approved by the Consents Engineer.

THIS AGREEMENT RECORDS:

1. The Owners has deposited with the Council the sum of **$3,260** as surety for this Bond and agree that the Council may hold the said sum of money until the conditions of this Bond have been fully met or the moneys shall have otherwise been disbursed in accordance with the terms of this Agreement.

2. The Owners acknowledges that the following vehicle crossing inspections are compulsory and the owner is required to give the Councils engineer two working days' notice prior to any inspection.

   - Pre-construction
   - Excavation to sub grade
   - Pre-Seal
   - Final

3. The Owners shall complete the Work to the reasonable satisfaction of the Council within 12 months of the date of this bond or within such longer period as the Council may approve.

4. The sum deposited with the Council includes a non-refundable fee of $560 for administration and inspection costs incidental to the preparation and release of this Bond.

5. The Owners acknowledges that their liability under this Agreement shall not be released, varied, or affected in any way by any delay, extension of time, or other indulgence suffered or permitted by the Council or by any failure or neglect by the Council to enforce the terms of this Agreement.

   5.1 If the Owners shall be in breach of any of the obligations under this Agreement, it shall be lawful for the Council, at the sole option of the Council to arrange for the satisfactory completion of all of the works and for this purpose the Council may employ its servants or agents or such contractors as the Council may see fit.

   5.2 The Owners shall pay all costs incurred by the Council in arranging for the completion of those works and the Owners shall be liable for any sum so expended by the Council or any expenses incurred by the Council in excess of the sum bonded.

   5.3 The Council may apply the moneys deposited with the Council towards payment of all such costs and expenses and in the event that the sum deposited with the Council is not sufficient to carry out the said works the Council may recover any excess from the Owner as a liquidated debt.

   5.4 In the event that costs and expenses incurred by the Council for the formation of the vehicle crossing are less than that sum deposited with the Council then the Owners shall be entitled to the repayment of the balance in accordance with the provisions in Clause 5.

6. Upon completion of the work to the reasonable satisfaction of the Council in accordance with the District Plan the Owners shall be entitled to repayment to them of the moneys deposited with the Council but without any entitlement to interest and any of the costs payable under clause 5 of this bond.

7. In the event of the Owner not proceeding with the building works then the sum bonded will be refunded to them in accordance with Clause 5.

8. The Owners shall pay any costs and disbursements incurred by the Council for additional inspections and in the enforcement by the Council of any of its rights under this Agreement.

9. If there is dispute between the parties arising out of, or in connection with, this bond, neither of the parties is to commence any proceedings relating to that dispute until the following procedure had been complied with:

    9.1 The party claiming a dispute has arisen must give written notice to the other party specifying the nature of the dispute.

    9.2 The parties will endeavour, in good faith to resolve the dispute referred to in the notice by using informal dispute resolution techniques.

    9.3 If the parties do not agree on a dispute resolution technique within 14 days after the date notice of a dispute was given, the dispute is to be mediated according to the standard Bond of LEADR New Zealand Incorporated (Lawyers Engaged in Alternative Dispute Resolution), and the Chair of LEADR (or the Chair's nominee) will select the mediator and determine the mediator's remuneration.

    9.4 A party seeking urgent interlocutory relief may, by notice to the other party, elect not to comply with the provisions of this clause, but only to the extent of the relief sought, and only for the period required to dispose of the application for interlocutory.

    9.5 Pending resolution of the dispute, this Bond will remain in full effect without prejudicing the parties' respective rights and remedies.

SIGNED by

_____ and

_____

in the presence of:

_____
Name of Witness

_____
Signature of Witness

_____
Address of Witness

_____
Occupation of Witness

VEHICLE CROSSING FORMATION GUIDELINES

ROADING REQUIREMENTS

- **Complete Roading requirements (CAR, TMP, BeforeUDig, WAP)**
    - **Contact roading team to obtain these: Roading@hurunui.govt.nz**

ENTERING INTO THE BOND

- **Sign and return provided bond documentation (planning@hurunui.govt.nz).**
- **Pay bond and inspection fee.**
- **Contact the planning department to organise a discussion with the consent engineer to begin forming your temporary crossing.**
- **Once your temporary crossing is formed and confirmation received by the planning team the bond is regarded as being entered into.**
- **The vehicle crossing RM hold will now be removed.**
- **Building inspections can now be booked if there no other RM requirements on the building consent.**

FINAL CROSSING REQUIREMENTS

- **Construct the final vehicle crossing when ready to the design standards provided within the bond documentation. (This step will require a Pre-Pour Inspection)**
- **Contact the planning team to have the consent engineer organise a final inspection.**
- **If passed the final crossing is formed.**

BOND REFUND PROCEDURE

- **In order to have the bond refunded after the final crossing is formed and confirmation is received by the planning team:**
    - How to get the vehicle bond refunded:
        - Ensure that council has received confirmation that the final crossing has passed the final inspection. Send an email to planning@hurunui.govt.nz requesting a bond refund. Include proof of your bank account. (This requires you bank number, name, and bank branch in the image.)
        - We will look to refund the same bank account that paid the bond invoice where possible.
        - Once all the paperwork is complete, the bond is refunded. *

*Note: Payment is on the 20th of each month, or usually on the Monday or day after a public holiday should the 20th fall on a weekend or a public holiday.

Please ensure only one payment is paid through either the building consent invoice or to the provided bank account on the bond documentation.

Vehicle Crossing Inspection – Pre Pour.

Pre-Inspection Checklist

Property Address	52 Benn Street
BC Number (If applicable)	250252
Contractor Name	Brendon Esler Builders Ltd
Contractor Contact Number	0276247630
Contractor email address	
WAP Details	E1170838
Inspection Time	29/04/26

On Site Inspection Checklist

Check in accordance with bond document including:	
Traffic Management in place. • If a busy location check, there is a qualified TMP on site.	Yes
Distances Distances • Distance from boundary (1 mtr min) • Clear of above ground services and overflow bubble ups • If overflow bubble up has been shifted for VC, check it has been reinstalled.	Pass
Basecourse • Size 100mm AP40 • Well compacted • 150mm deep	Pass
Levels • Check fall of VC	Pass
Channel (if required) • 300mm wide • 250mm depth • Flat	n/a
Mesh and stools • 665 mesh • Mesh right into corners	Pass
Footpath • Saw Cut footpath (if required) back to 1mtr • Check 1.0mtr flat footpath. • Mesh not required in footpath	Pass
Width of crossing • Minimum 3mtr to maximum 4.8mtr (6mtrs including taper) • Check approved plan as widths may differ	Pass – Just over 4.8mtr but approved
Notes	
Take photos	Yes

In Office Checklist

Save inspection sheet including photos to Lasefiche	
Notify contractor of outcome of inspection if not on site	Yes called Brendon

Inspection Photos



Vehicle Crossing Inspection – Sub Grade and Compaction.

Pre-Inspection Checklist

Property Address	52 Benn St
BC Number (If applicable)	BC250252
Contractor Name	Brendon Esler Builders
Contractor Contact Number	
Contractor email address	
WAP Details	No. R1135402
Bond Document signed and paid?	
Inspection Time	31/10/25 – am

On Site Inspection Checklist

Check in accordance with bond document including:	
Traffic Management in place. • If a busy location check, there is a qualified TMP on site.	Yes
Distances • Distance from boundary (1 mtr min) • Clear of above ground services and overflow bubble ups	Pass
Dig out depth. • 300ml minimum from top of footpath or top of soil (provided relatively flat)	Pass
Width of dig out • Minimum 3mtr to maximum 4.8mtr (6mtrs including taper)	Pass
Base • Check its hard and not soft	Pass
Check decent compactor onsite	
Base course been compacted	
Notes	
Take photos	Yes

In Office Checklist

Save inspection sheet including photos to Lasefiche	
Notify contractor of outcome of inspection if not on site	Brendon onsite
If inspection passed email planning to release RC requirement	

Photo of dig out

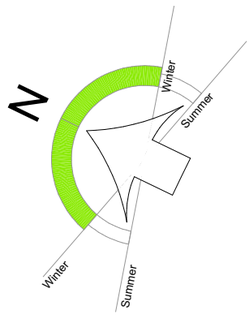


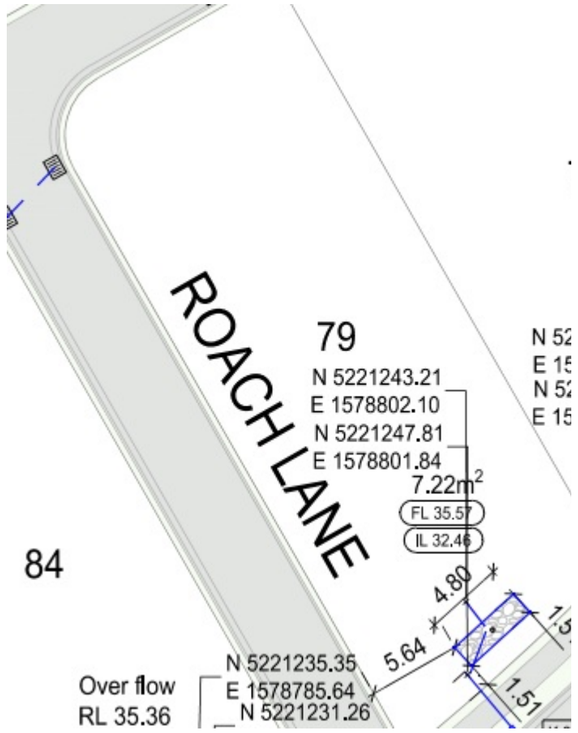
Photo of compaction

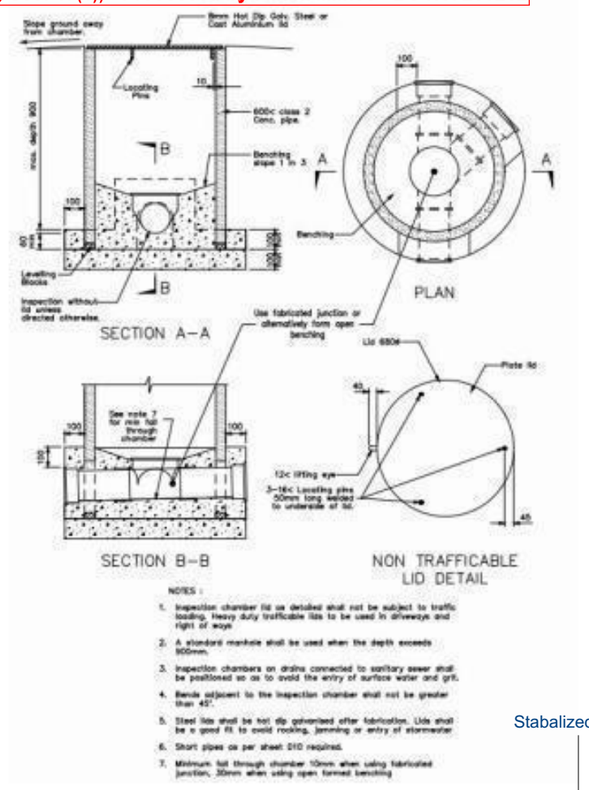


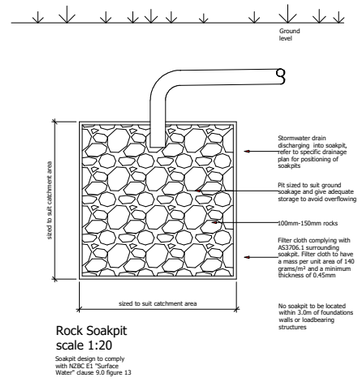


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Rock Soakpit
scale 1:20

Soakpit design to comply with NZBC E1 "Surface Water" clause 9.0 figure 13

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Stabalized entry pad to the site

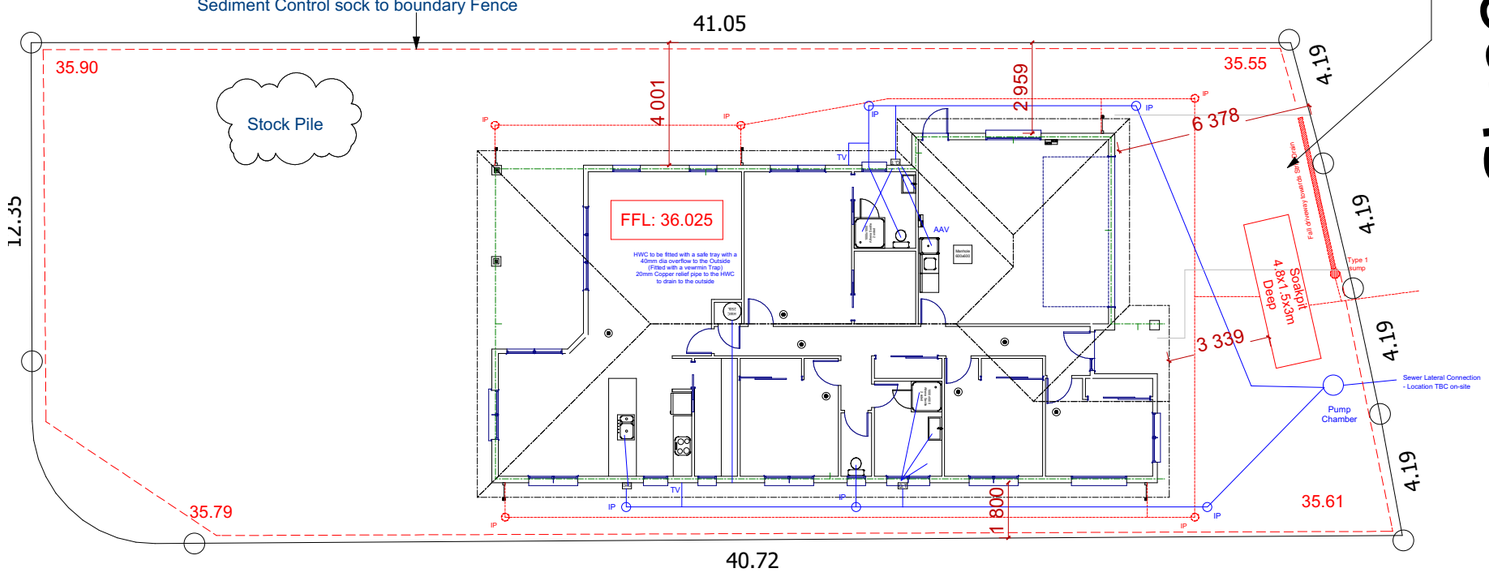
LEGEND	
LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES
Refer to Drainage Plan for specific drainage information
Refer to sediment control plan in specification and implement where required.
Convey surface water from sealed drive areas to an appropriate approved outfall.
Dimensions are shown to cladding face

SITE INFORMATION	
Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE	
Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

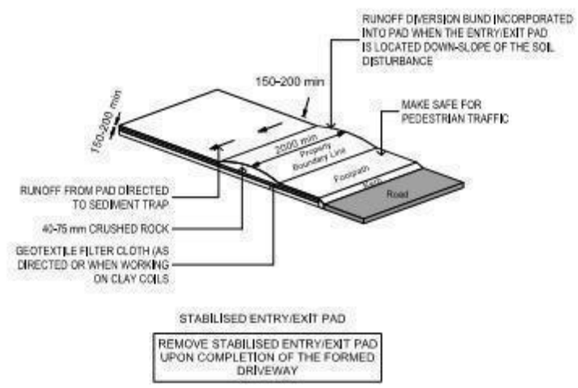
Sediment Control sock to boundary Fence



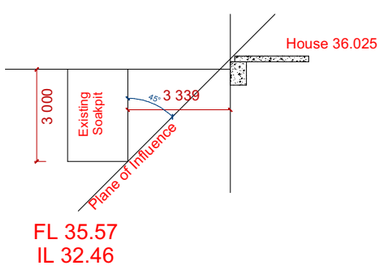
Benn Street

Crown of Road 35.50

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.



Roach Lane



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Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 1
Scale: 1:1000
Date: 14/08/2025
OF: 15

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Key To Elevations

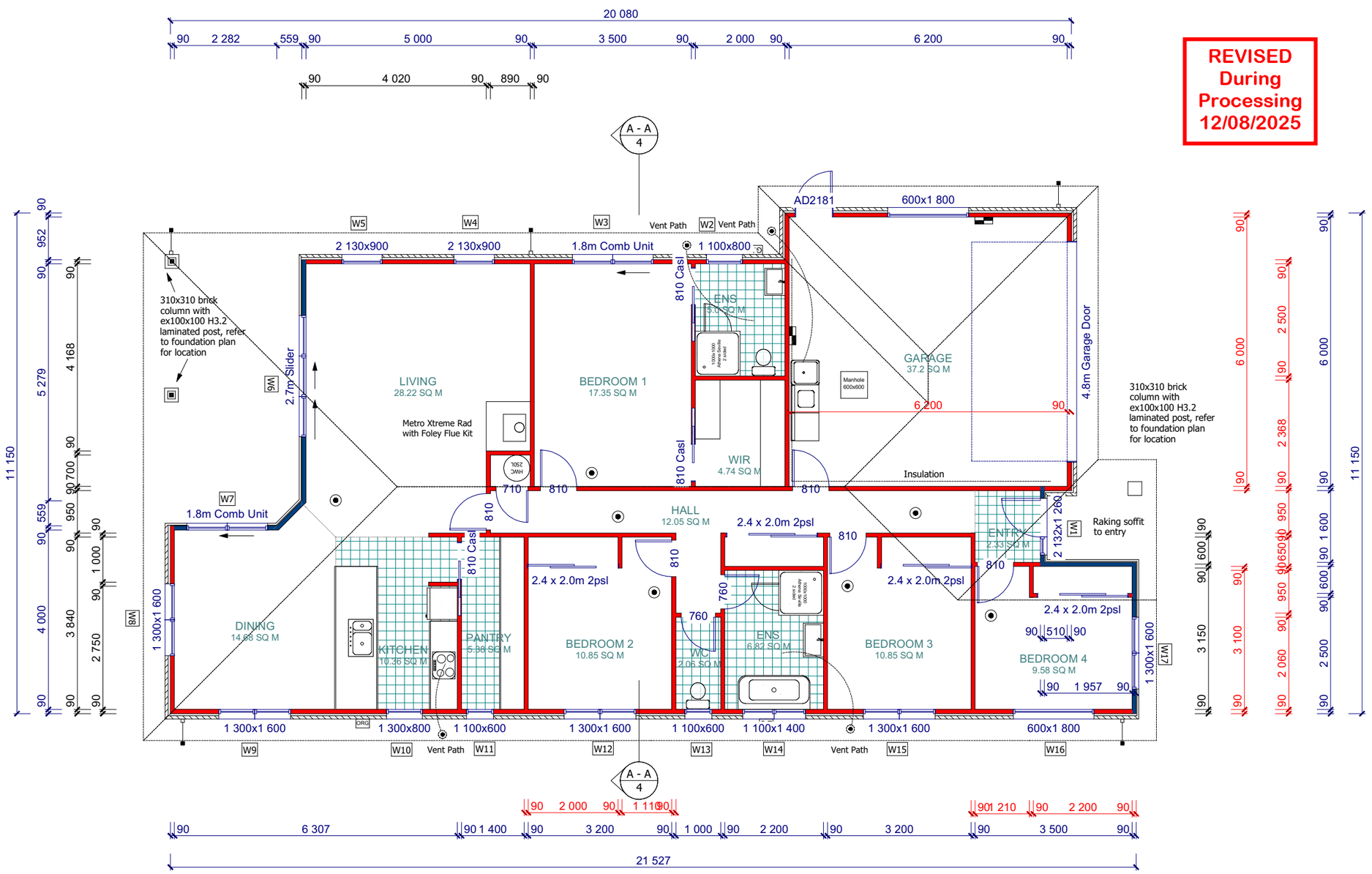
ROOF & WALL CLADDING

Roof -	25° Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame

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GENERAL FLOOR PLAN NOTES

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be Interconnected and Located in each bedroom, Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A) and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

MISCELLANEOUS:
Dimensions shown are to the frame, GIB thickness not shown.
Refer to Construction Schedule (Page 2 & 3 of Specification) for additional construction information.
Entry through external doors
Mechanical ventilation
Air Seals to have PEF rod & low expansion foam
All windows and doors centered in room unless shown otherwise

FOUNDATION SYSTEM
Ribraft Foundation Design

WALL FRAMING -designed to high wind zone

Stud Height:	2420 mm
Exterior Walls:	90x45mm studs @ 600 mm crs
Interior Loadbearing wall:	90x45mm studs @ 600 mm crs
Dwangs Ext:	90x45 @ 800 crs
Non loadbearing:	90x45mm studs @ 600 mm crs
Dwangs Int:	90x45mm @ 800mm Crs

LINTELS AND BEAMS
Lintels and beams can be found on the Truss Design

BUILDING WRAP
Watergate Building Wrap, refer to manufacturers specifications attached

DOORS
Internal Height: 2000mm

INSULATION

Wall -	Pink Batts R2.6 Wall Batts
Ceiling -	Pink Batts R6.6 Ceiling Batts

WALL AND CEILING LININGS

Wall -	Standard 10mm GIB (unless required for bracing)
Ceiling -	Standard 13mm GIB 13mm GIB Aqualine (bathrooms)
Bathroom -	10mm GIB Aqualine
Corner Finish -	Square

FLOOR FINISHES
Carpet, Vinyl Plank , Tiles

EXTERIOR JOINERY

All Windows to be Thermally broken Aluminium frame
Double glazed with Ug of 1.10
with a thermally improved spacer
as per ISO 10077 Annex G
Glass: Low E4/Clear, argon filled , to achieve R0.5.
Air Seals to have PEF rod and low expansion foam

Interior -	Shelf and rail to wardrobes

Electric Hot water system

KITCHEN COOKTOP
Electric Hobb

ROOF CLADDING AND STRUCTURE
Purlins - 70x45 SG8 H1.2 @ 900crs

GUTTER/FASCIA/DOWNPIPES/SOFFITS

Gutter -	Metalcraft Metalline Quad Gutter
Fascia -	Metalcraft Metalline 185 Fascia
Downpipes -	Marley 80mm Dia PVC
Soffits -	Hardiflex 4.5mm

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Floor Plan

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	2500	2
Scale: 1:100	Date: 7/08/2025	OF: 15

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ROOF & WALL CLADDING	
Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

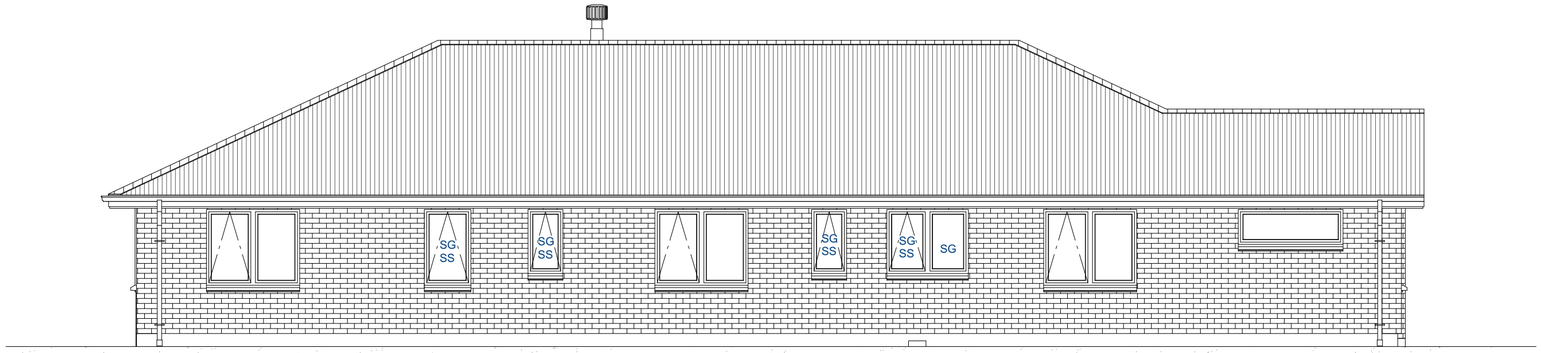
GENERAL ELEVATION NOTES

Air Barrier to unlined wall and gables, refer to the Construction Schedule in the Specification for type.

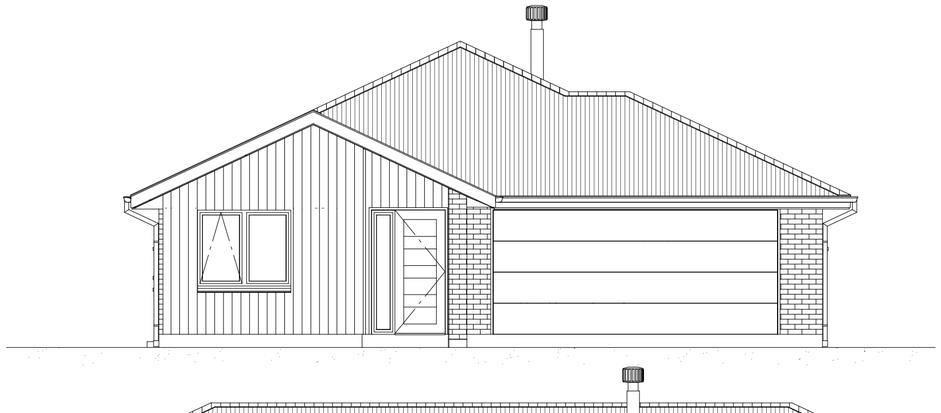
This sheet to be read in conjunction with the Risk Matrix in specification.

Driveway to fall from 20mm max below garage rebates (By Others).

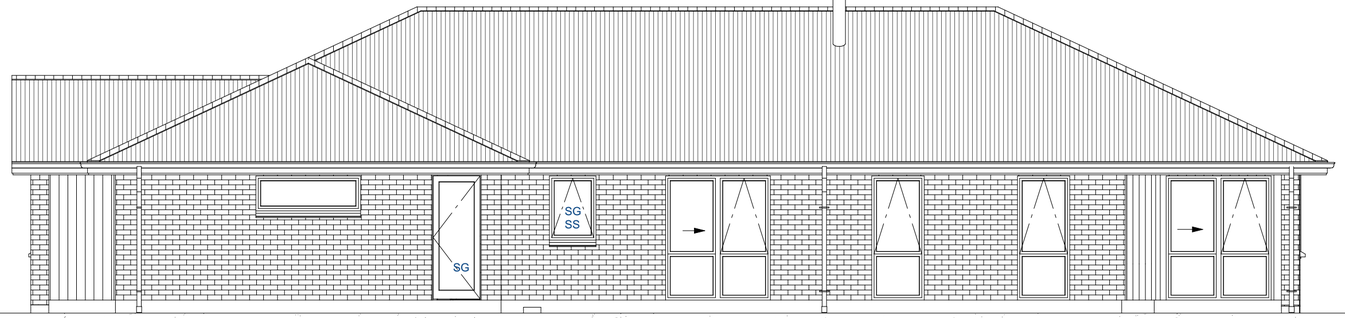
Key
SS: Security Stay
SG: Safety Glass



Elevation A



Elevation B



Elevation C



Elevation D

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Elevations

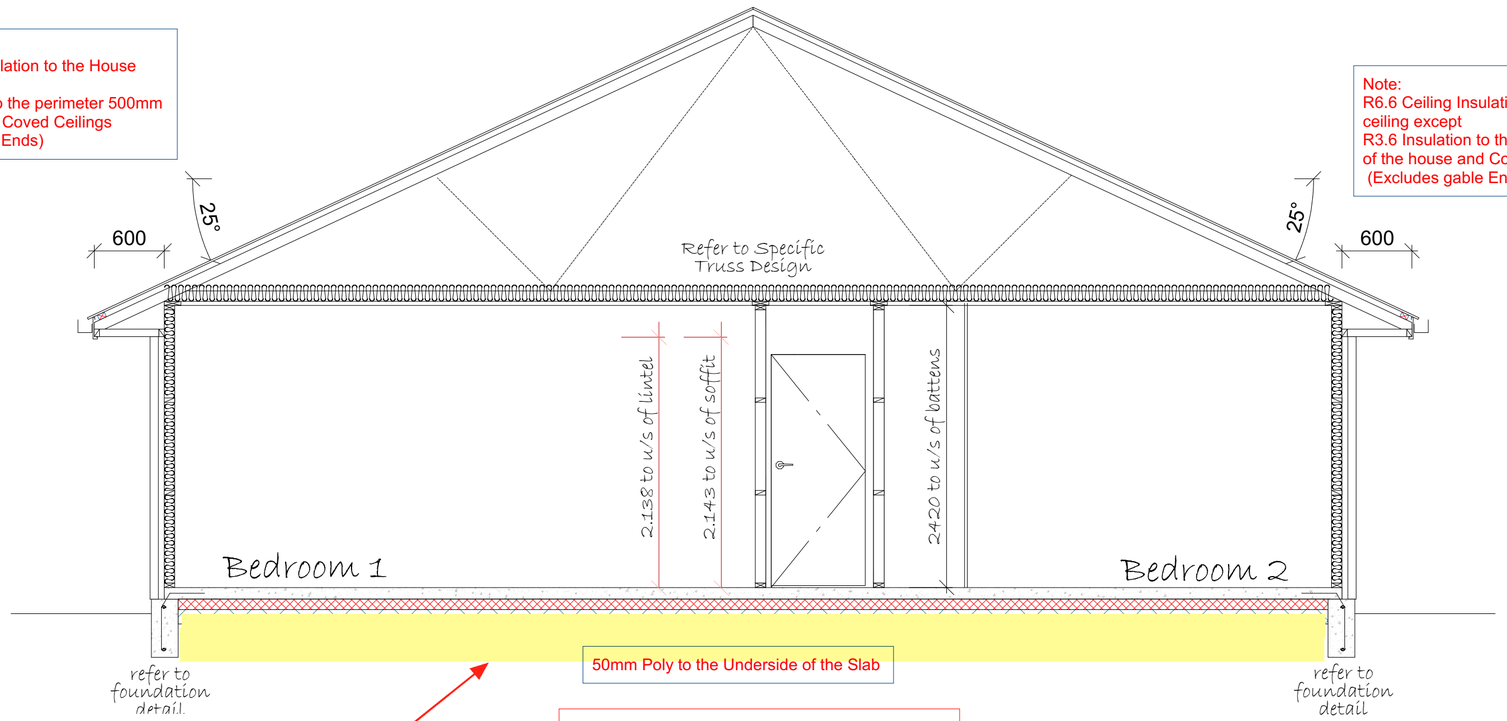
Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	**2500**	**3**
Scale: 1:100	Date: 24/07/2025	OF: **15**

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Note:
Min 35mm cover from the underside of the roof underlay to the top of the Insulation.

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)



Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)

NOTE:
Refer to Geotech report - Minimum excavation to 400mm below ground level

Cross Section A - A

LEGEND

Refer to the Construction Schedule (Page 2 & 3) in the Specification for sizing of Building Elements.
General Notes:

1 - Corrugated Colorsteel roofing by Metalcraft on self supporting ThermaKraft 215 roof underlay on 70x45mm SG8 H1.2 Purlins @ 900crs fixings 1/10g self-drilling screw, 80mm long

2 - Metalcraft fascia & quad gutter system with 4.5mm Hardies soffit lining on 70x35mm H1.2 eaves bearers on edge fixed to ribbon board.

3 - 4.5mm Hardies Soffit lining

4 - 13mm Standard GIB ceiling lining to underside of Rondo metal ceiling battens @ 600 crs with R6.6 Pink Batts insulation.

5 - 70 Series Brick Veneer on a 50mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).

5 - BGC Duo Cladding on a 20mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).
(Dwangs @ 480mm crs)

6 - Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

7 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. (exterior walls) unless otherwise stated

9 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. 2 min. (interior loadbearing & non-loadbearing walls) unless otherwise stated

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

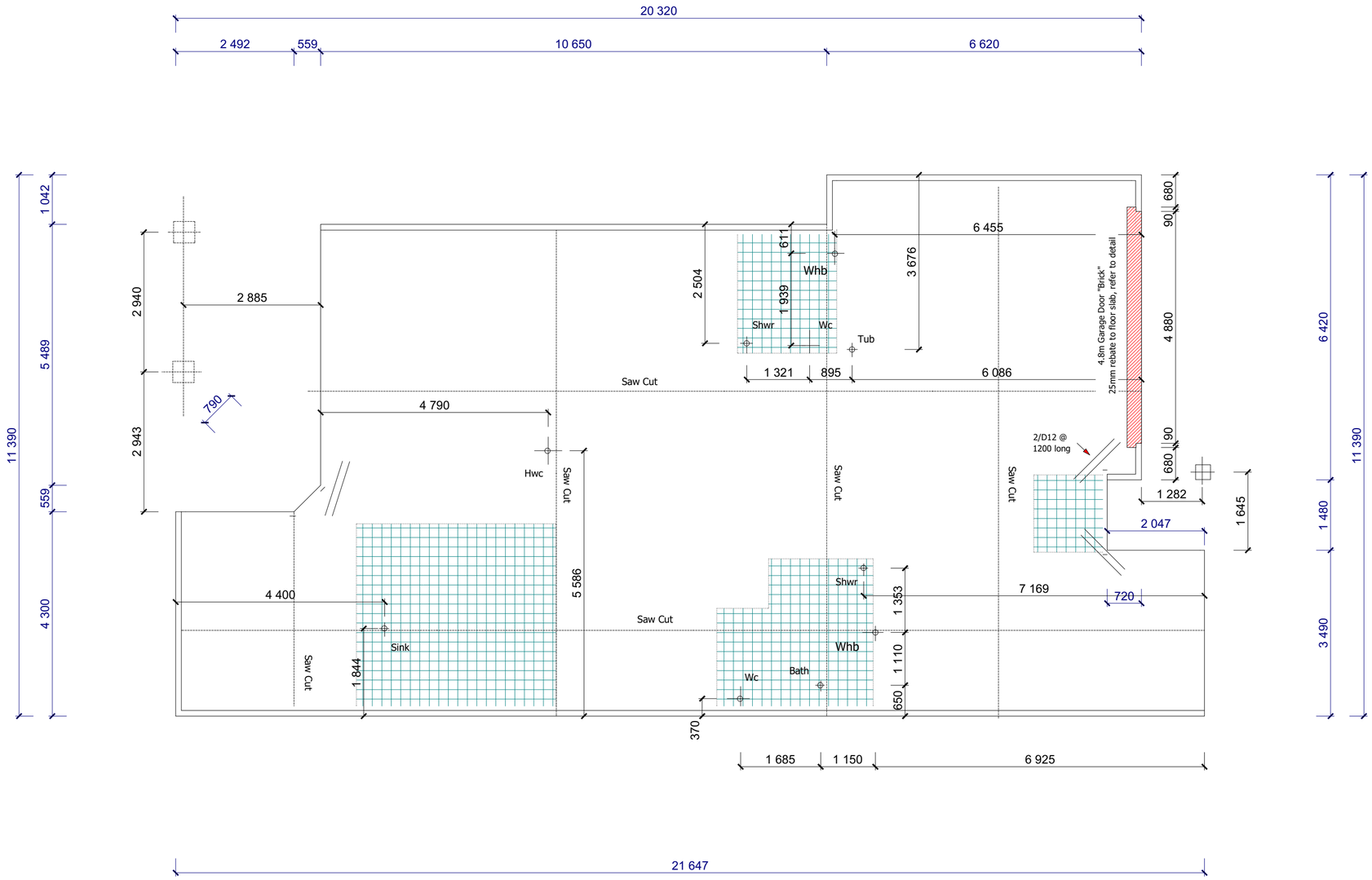
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UWC Ltd
Proposed Dwelling At:
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Cross Section
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: 1:50
Job Number: 2500
Date: 24/07/2025
SHEET: 4
OF: 15

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GENERAL FOUNDATION NOTES

1) All dimensions over foundation face. Allow (120mm rebate) 70mm veneer & 50mm cavity.
2) No construction joints / shrinkage control joints under marked tile areas where possible.
3) The maximum plan dimension of concrete between shrinkage control joints is 6m with mesh to slab. (Standard joint to be formed with 25mm min sawcut & free joint to be at 24m crs max & as per detail CON001AFL).
4) No saw cuts under length of load bearing and bracing walls. (As fixing may not achieve full strength if embedded in sawcuts).
5) Supplementary reinforcing to internal corners to comply with NZS 3604:2011 clause 7.5.8.6.4.
6) W/C location indicated on plan has assumed a 160mm offset from internal frame line, please consult manufacturer's documentation to confirm offset. Contractor to consult manufacturer's documentation to determine the correct location for all wastes positioned through floor slabs.
7) Gully trap positions indicated on ground floor plan.
8) Earth bar to be bonded to the reinforcing mesh
9) Refer to Truss design for exact location of slab thickenings
10) Flexible silicone bondage sealer to fill the saw cuts through vinyl floor areas.

BOTTOM PLATE FIXING

Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

REINFORCING

All reinforcing is to be Ductility Class E, in accordance with NZS 4671

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3

CONCRETE STRENGTH

All concrete to comply with NZS3604:2011 Section 4 Durability Clause 4.5.2

50mm Poly to the Underside of the Slab

Note:
Slab Mesh : SE62-500
320mm Min Cover
Concrete cover to Mesh 30mm min top cover
Against ground 75mm
Against formwork 50mm

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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Foundation Plan

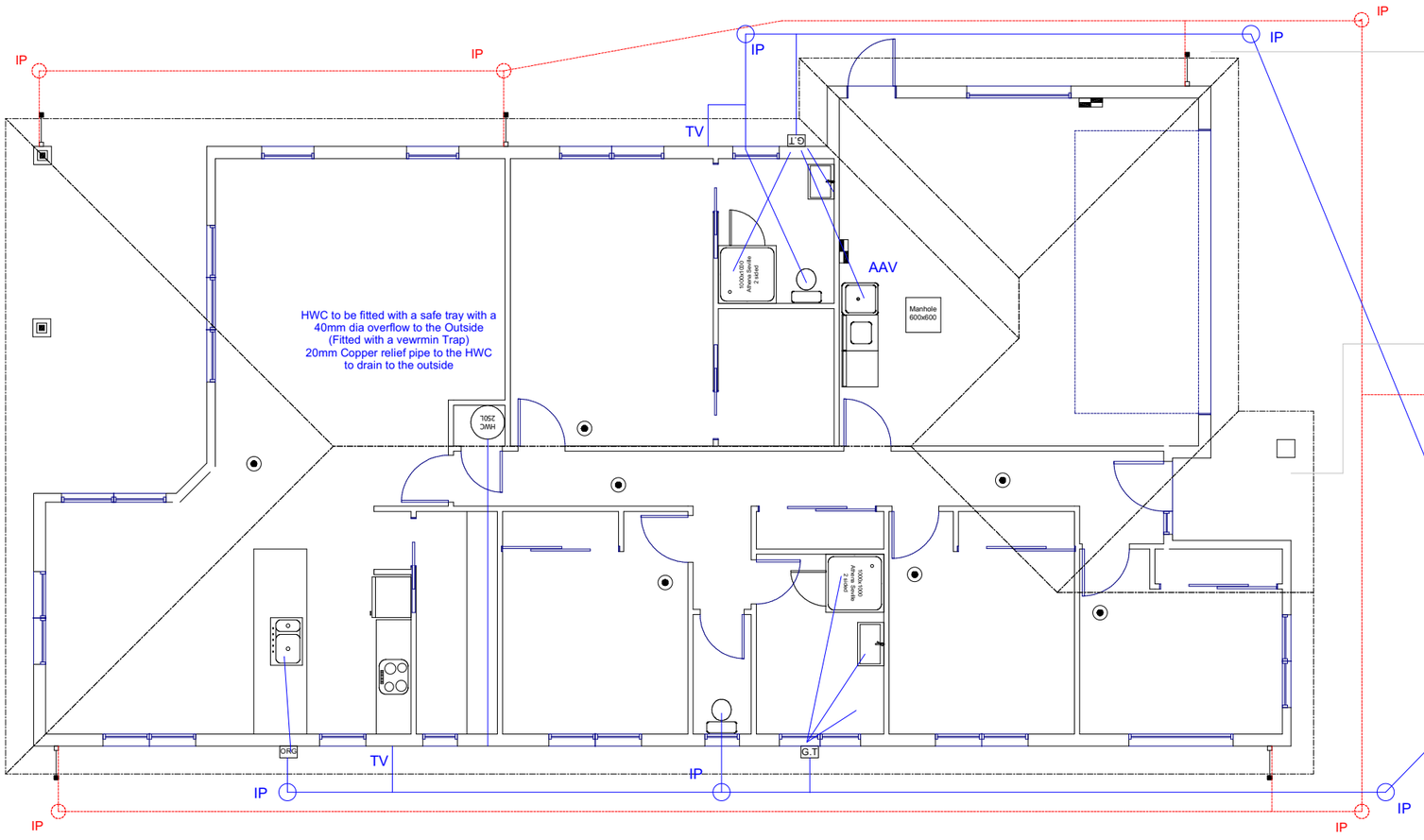
Consent Plans

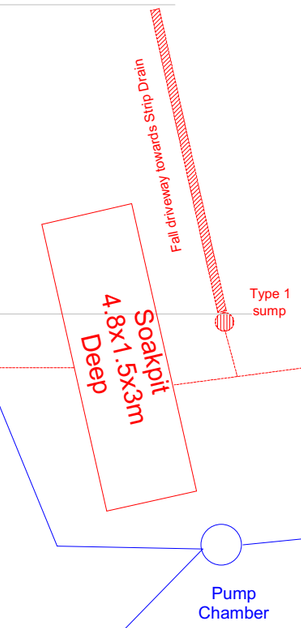
Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 5
Scale: 1:100
Date: 24/07/2025
OF: 15

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Drainage Schedule	NZBC G13	
(Drainage as per Schedule unless specified otherwise)		
Kitchen		
Sink:	Ø65mm @1:40	(3 discharge units)
Bathrooms		
Vanity:	Ø40mm @ 1:40	(1 discharge units per basin)
Shower:	Ø40mm @1:40	(2 discharge units)
Bath:	Ø40mm @1:40	(4 discharge units)
WC:	Ø100mm @1:40	(4 discharge units)
Laundry		
Sink:	Ø65mm @1:40 min	(5 discharge units)
Main Foulwater Drain	Ø100mm @1:60	
Stormwater Drain	Ø100mm @1:60 (1:120min)	
Terminal Vent	Ø80mm	
Vent	Ø50mm	

LEGEND.	
Sewer Pipe	————
S/W Pipe	– – – – – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV
Vent	V
Inspection Point	IP
Air Admittance Valve	AAV





REVISED During Processing 12/08/2025

Figure 8: Type-one Surface Water Sump
Paragraph 3.6.2

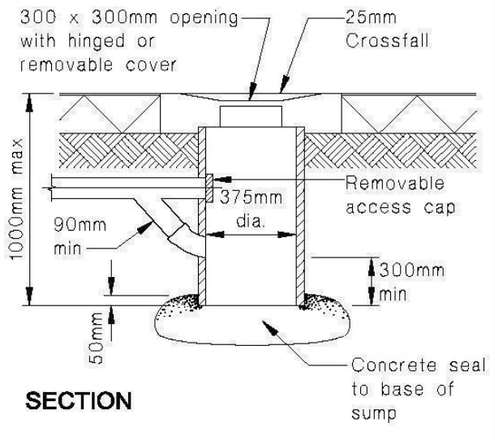
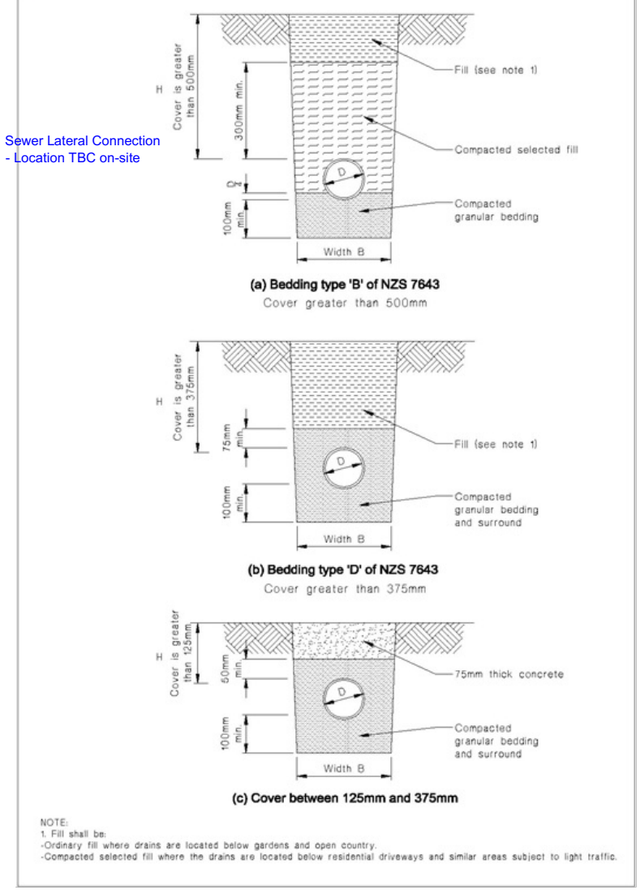


Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



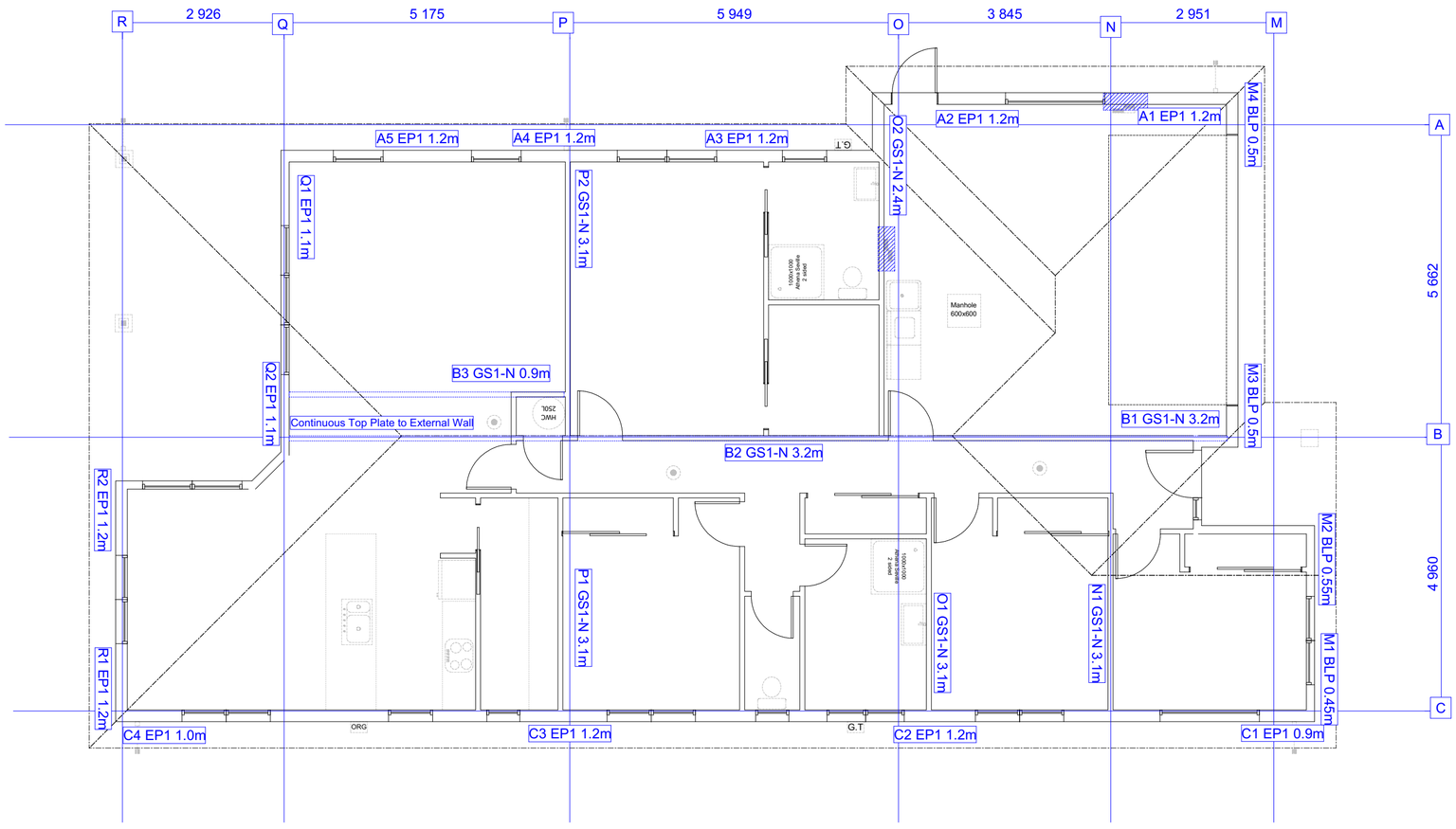
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Drainage Plan
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 6
Scale: 1:100
Date: 7/08/2025
OF: 15

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GENERAL BRACING NOTES

Bracing plan to be read in conjunction with supplementary bracing calculations

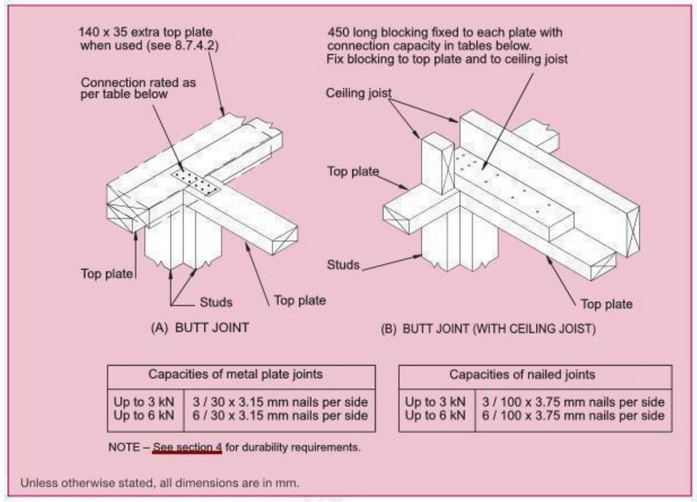
Refer to the supporting documents in the specification for purlin/batten fixing, truss fixing, stud to top plate fixing & lintel fixing schedules.

To be read in conjunction with minimal length bracing detail TAJ002AWA

BRACING SYSTEM

Wall bracing designed in accordance with NZS 3604:2011 & GIB Ezybrace system

Designed to:
Wind: High
Earthquake: 3



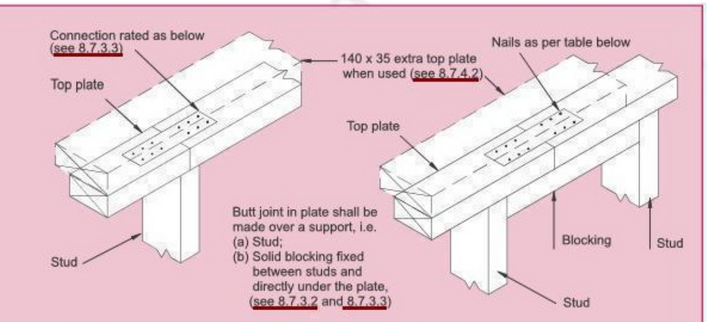
Capacities of metal plate joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

Figure 8.16 – Connecting top plates to external walls at right angles – Walls containing bracing (see 8.7.3.4)



Capacities of metal plate joints(2)	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints(2)	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE –
(1) See section 4 for durability requirements.
(2) Not required when extra top plate is used.

Unless otherwise stated, all dimensions are in mm.

Figure 8.15 – Connecting top plates in line – Walls containing bracing (see 8.7.3.3)

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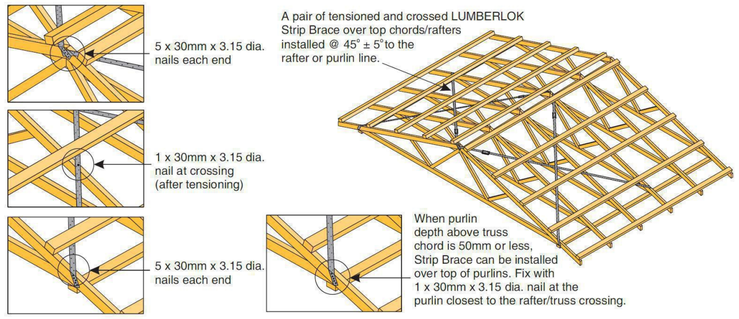
Bracing Plan

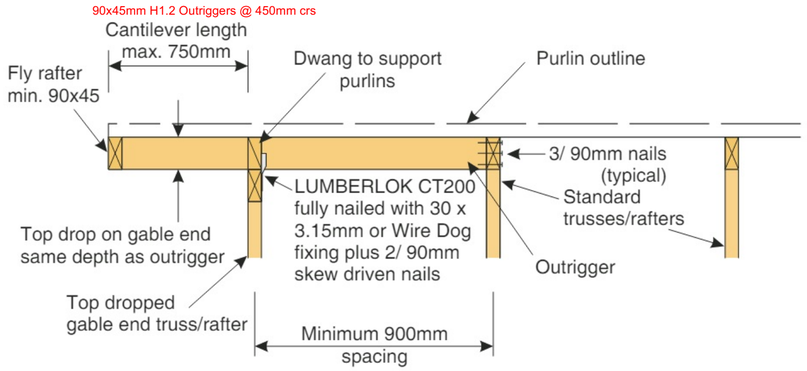
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: 1:100
Job Number: 2500
Date: 24/07/2025
SHEET: 7
OF: 15

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





CROSS SECTION

GENERAL ROOF PLAN NOTES

Refer to the Construction Schedule (Page 2 & 3) in the Specification and the manufacturer's specification attached for the gutter and down pipe rainfall catchment area calculations.

RPB - Roof Plane Bracing as per NZS:3604 (Figure: 10.22)

LSB - Lumberlok Strip bracing as per Lumberlok Roof Bracing Specification

ROOF CLADDING

Roof - 25º Corrugated Colorsteel Profile on Thermakraft 215 roof underlay

TRUSS FIXINGS

Refer to the Truss design for truss fixings

PURLINS OR BATTENS

Purlins: 70x45 SG8 H1.2 @ 900crs, fixings 1/10g self-drilling screw, 80mm long
End span of purlins to be 600 crs as per E2 Table 11

TOP PLATE FIXING

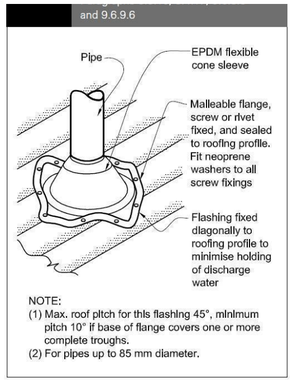
Use Lumberlock top plate fixing chart attached to the main specifications to determine top plate fixings

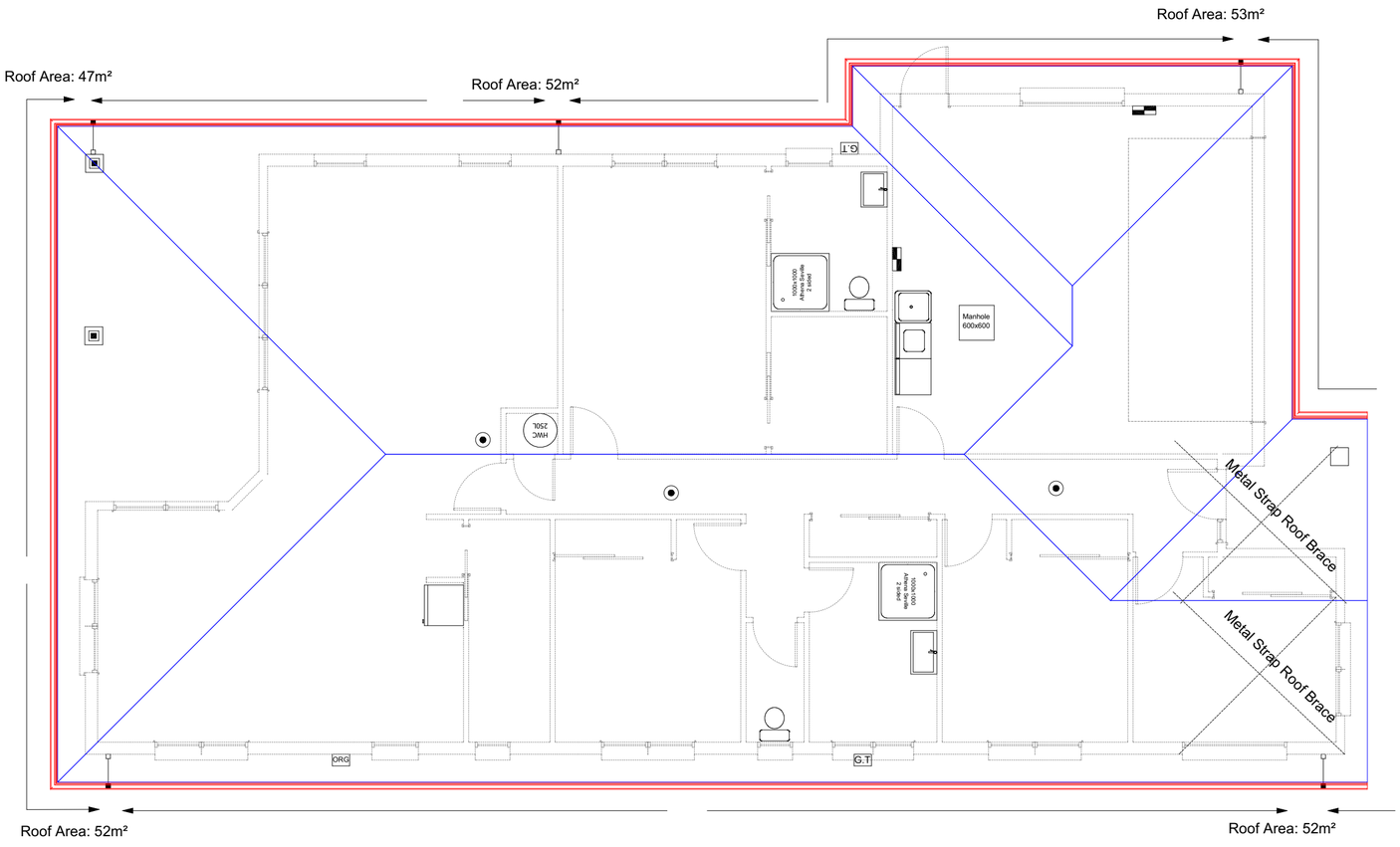
TIMBER GRADE

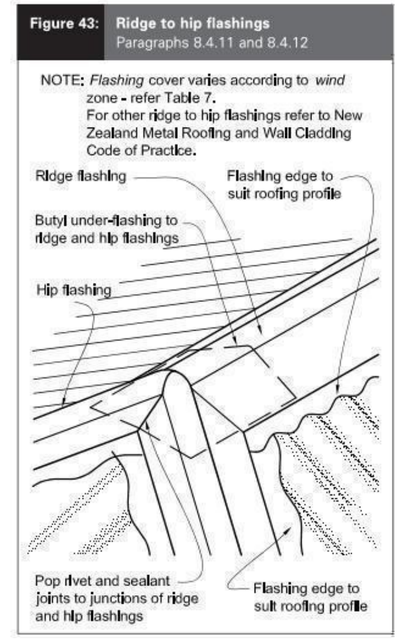
Timber members specified on these drawings are to be a minimum of strength of SG8 graded as per NZS3604:2011

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3







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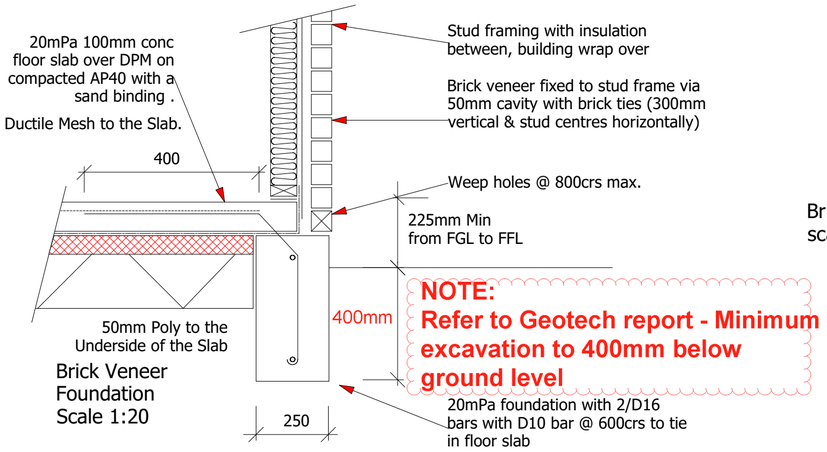
Project: UWC Ltd
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Roof Plan

Consent Plans

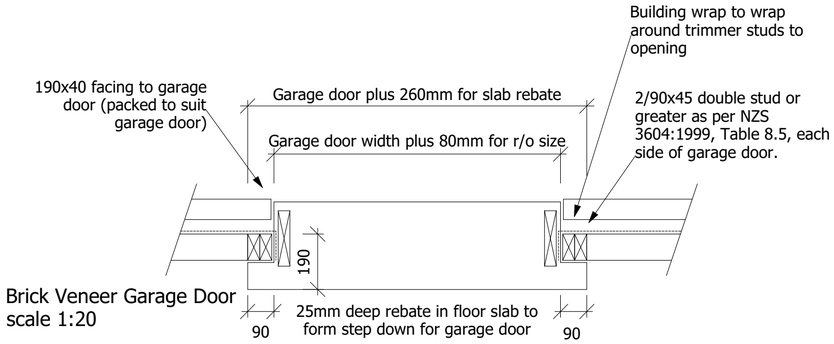
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Job Number: 2500
SHEET: 8
Scale: 1:100
Date: 24/07/2025
OF: 15

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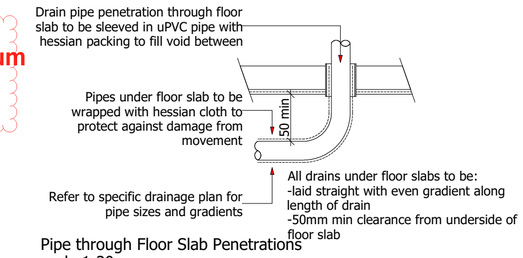


NOTE:
Refer to Geotech report - Minimum excavation to 400mm below ground level

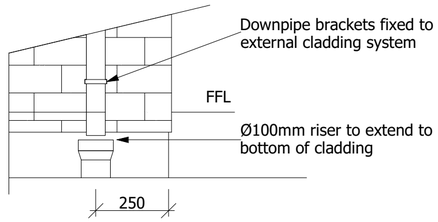
Brick Veneer Foundation
Scale 1:20



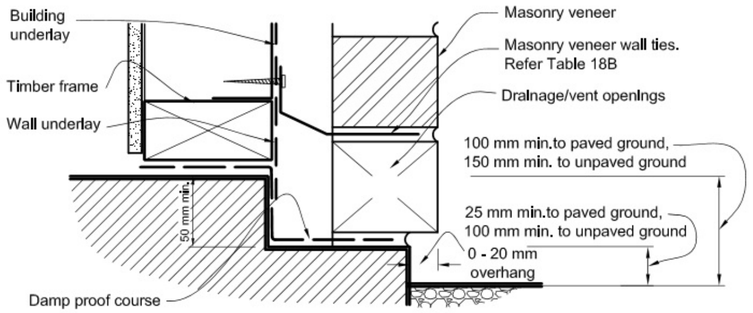
Brick Veneer Garage Door
scale 1:20



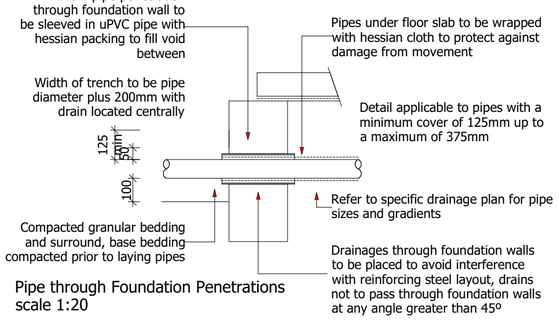
Pipe through Floor Slab Penetrations
scale 1:20



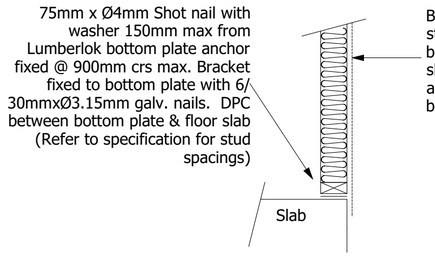
Downpipe Corner Offsets
(Brick)
Scale 1:20



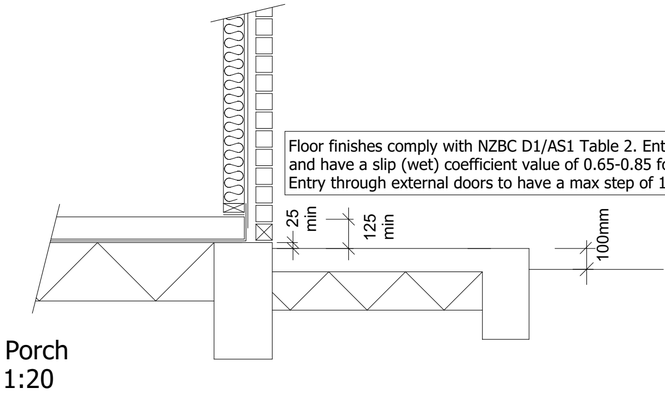
(I) MASONRY VENEER - FLOOR REBATE DETAIL



Pipe through Foundation Penetrations
scale 1:20



Exterior stud framing to slab
Scale 1:20



Entry Porch
scale 1:20

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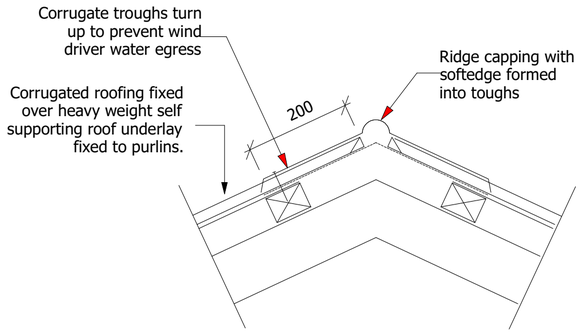
Project:
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Proposed Dwelling At:
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52 Benn St , Amberley

Details

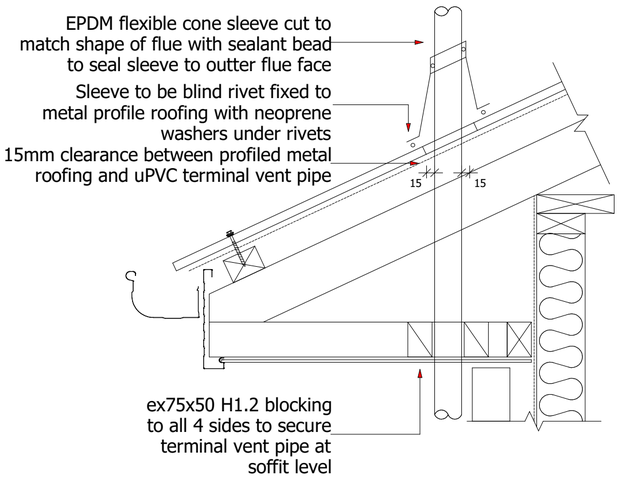
Consent Plans

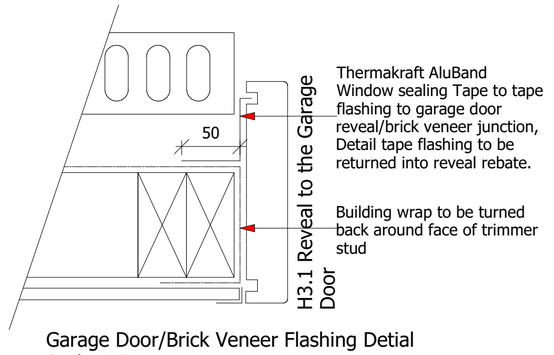
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SHEET: 9
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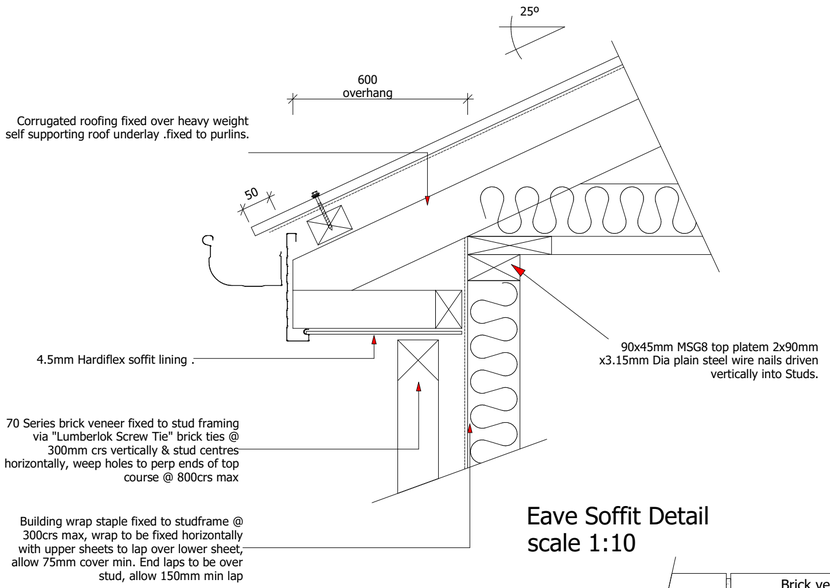


Metal Ridge Capping Detail
scale 1:10





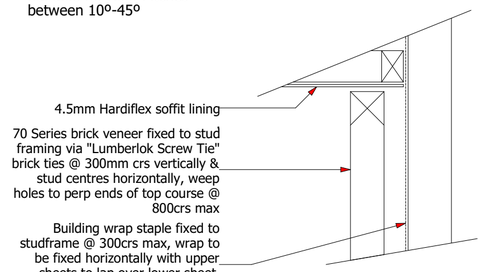
Garage Door/Brick Veneer Flashing Detial
Scale 1:5



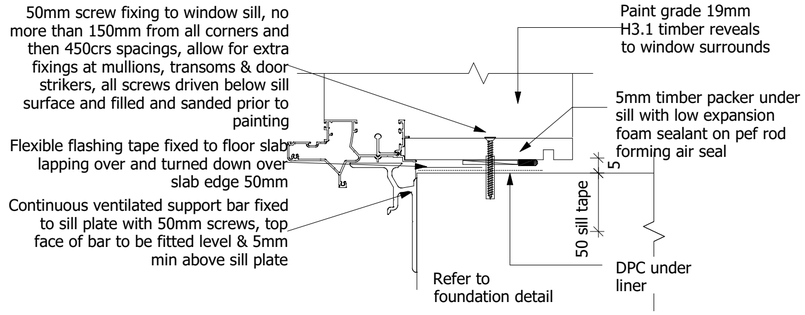
Eave Soffit Detail
scale 1:10

Terminal Vent to Roofing Penetration Detail "Section"
scale 1:10

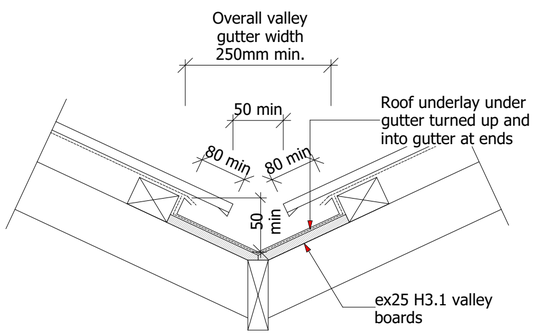
Suitable for Roof Pitches between 10º-45º



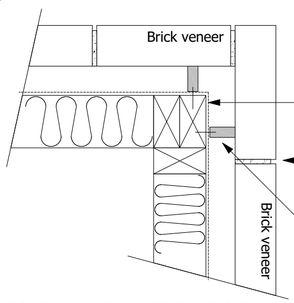
Brick Eave Soffit Detail
Scale 1:10



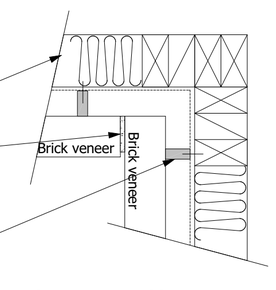
Sliding Door Sill to Slab Detail
scale 1:5



Longrun Valley Gutter Detail
scale 1:10



BRICK EXTERNAL CORNER DETAIL
Scale 1:5



BRICK INTERNAL CORNER DETAIL
Scale 1:5

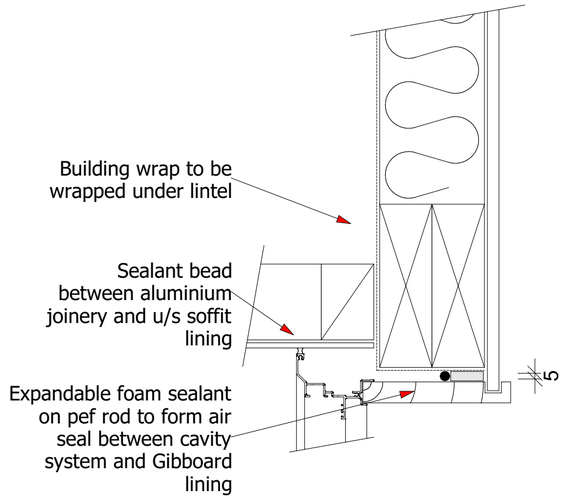
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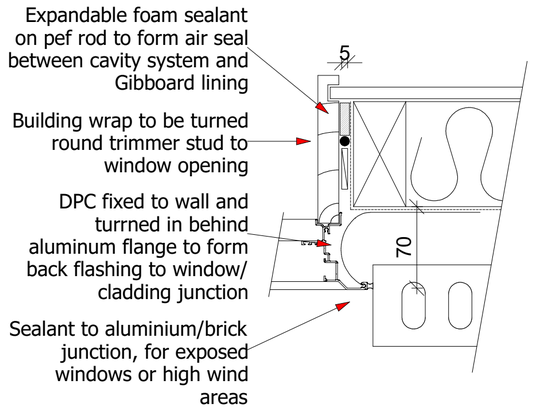
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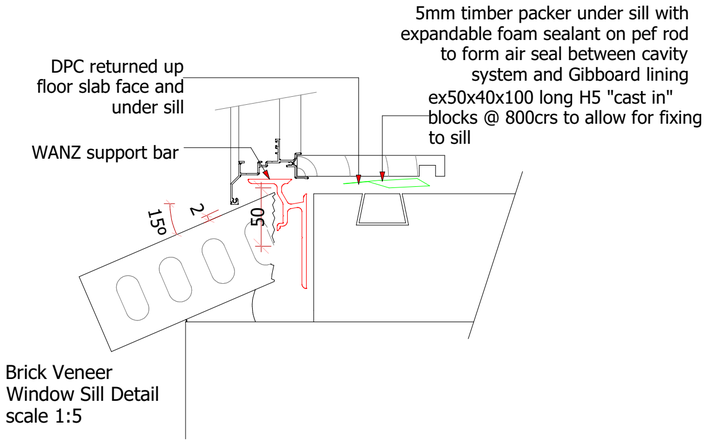
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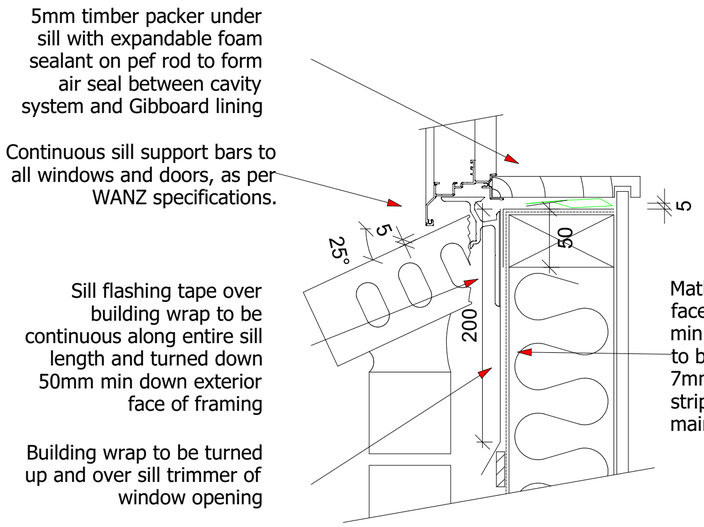
Brick Veneer Window Head to Soffit Detail
scale 1:5



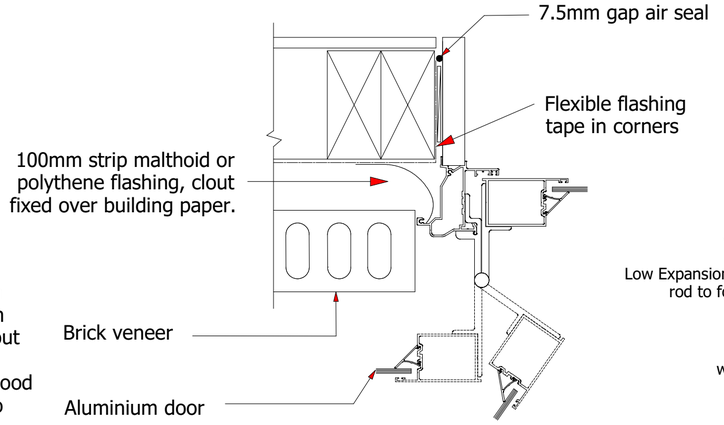
Brick Veneer Window Jamb Detail
scale 1:5



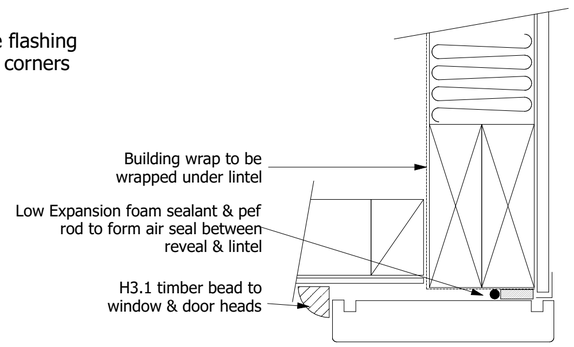
Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Door Jamb Detail (Aluminium)
scale 1:5



Garage Door Head to Soffit Detail
scale 1:5

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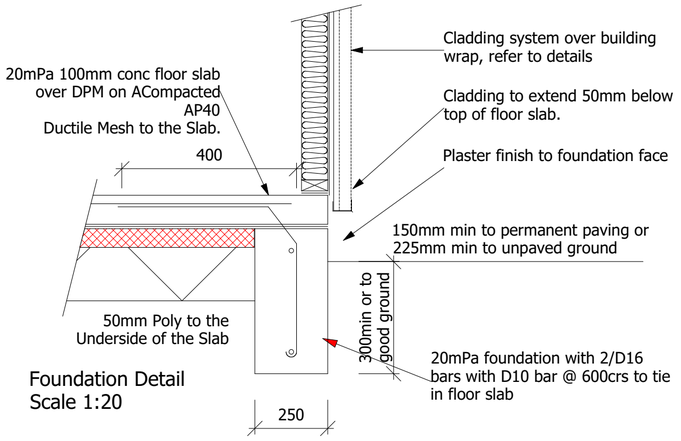
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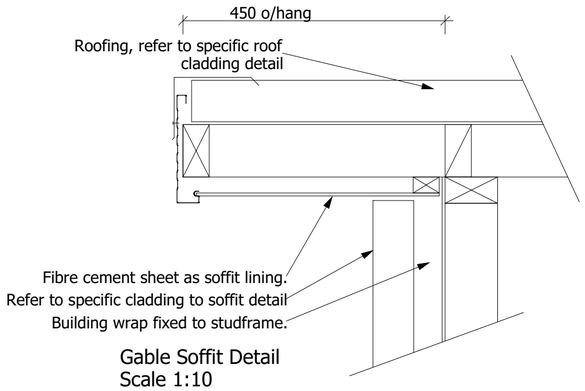
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 11
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Date: 24/07/2025
OF: 15

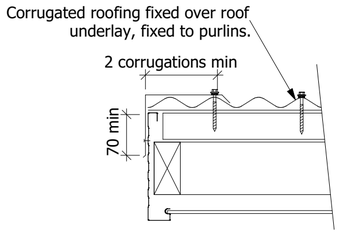
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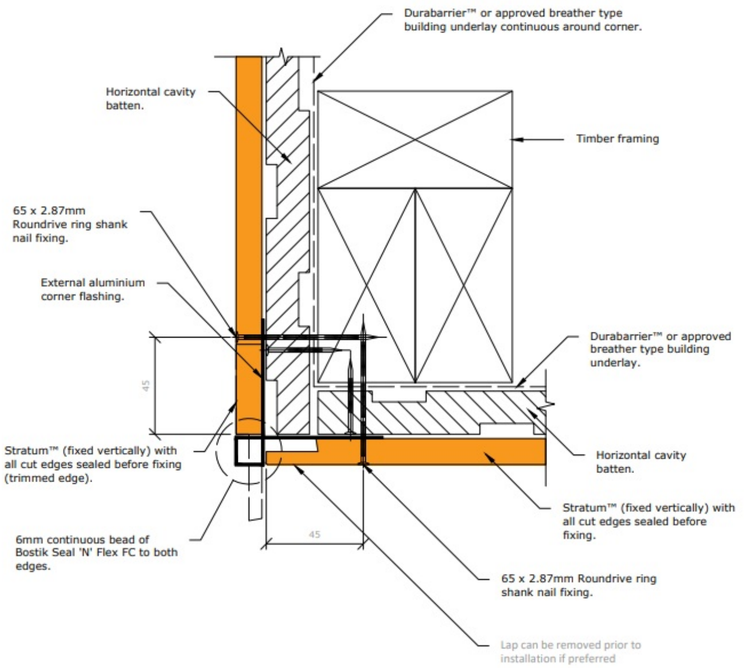
Foundation Detail
Scale 1:20



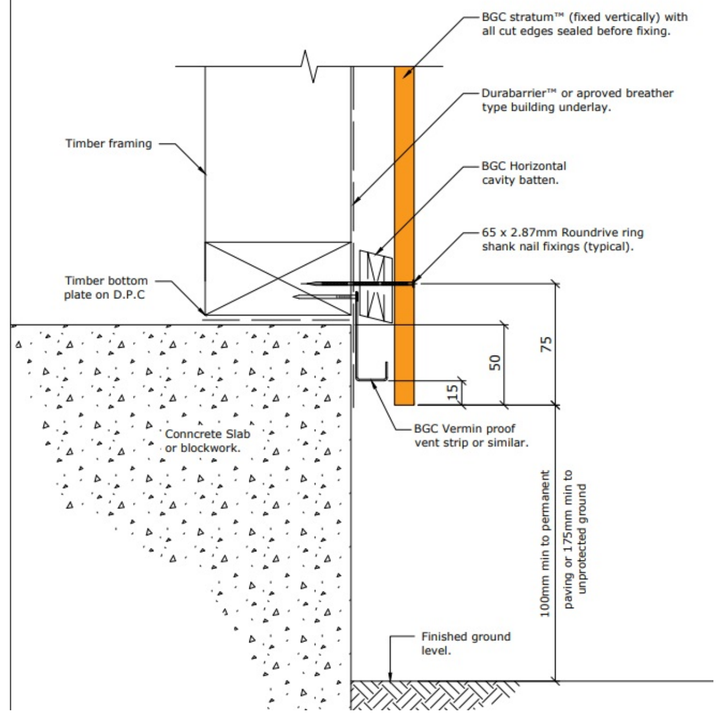
Gable Soffit Detail
Scale 1:10



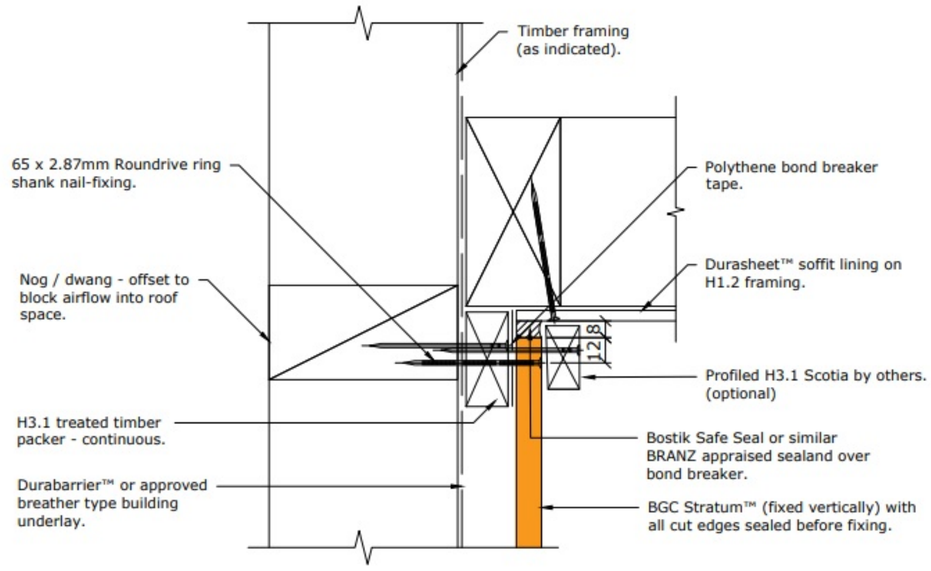
Gable Soffit Detail
Scale 1:10



External Corner Detail



Cladding Base Detail



Soffit Junction Detail

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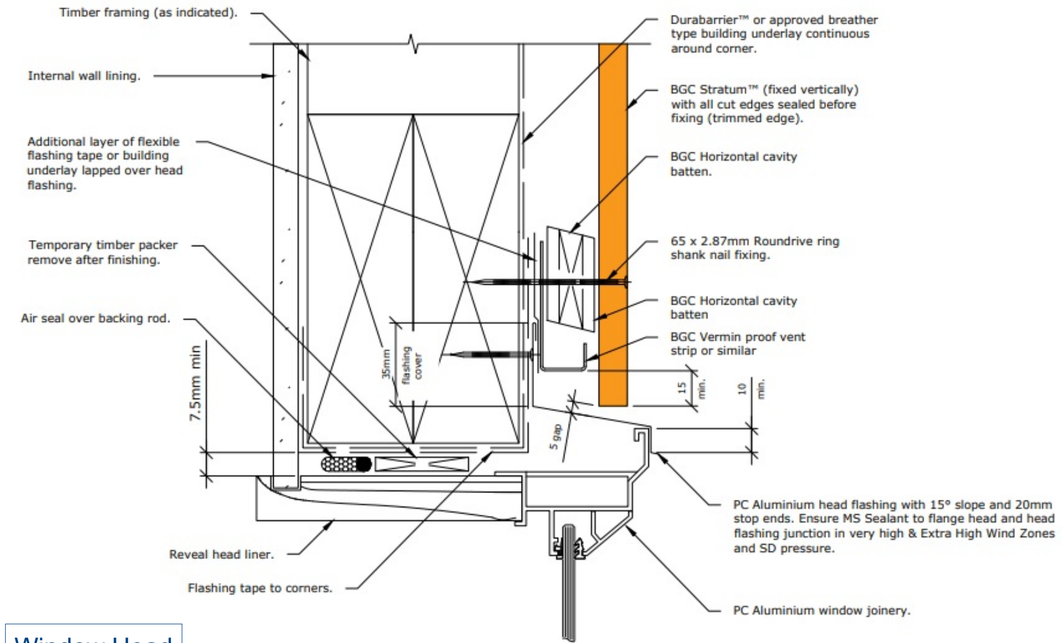
Project:
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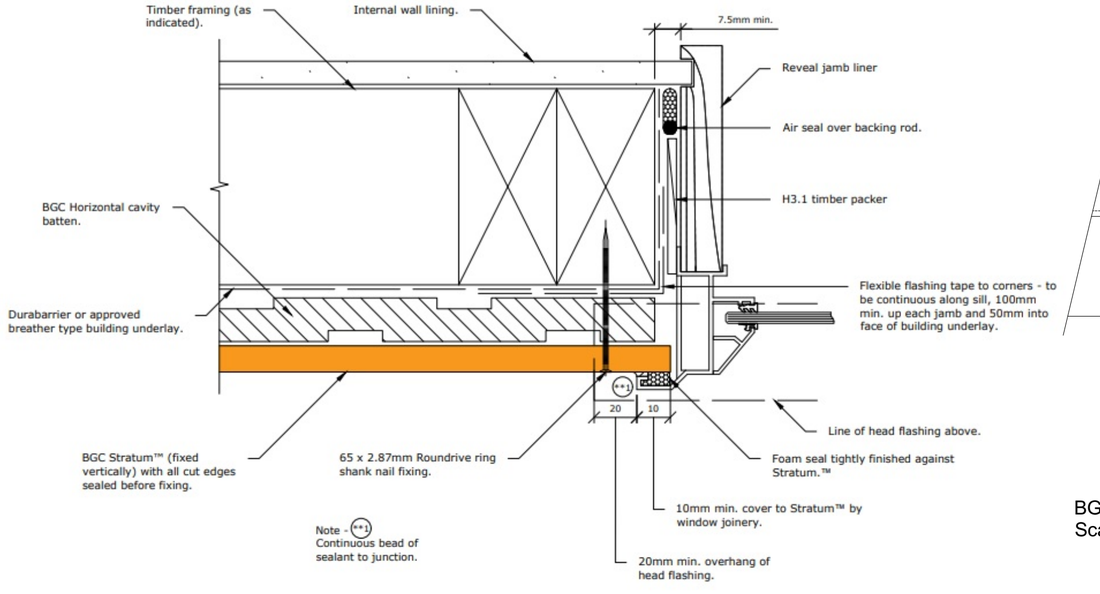
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: varies
Job Number: 2500
Date: 24/07/2025
SHEET: 12
OF: 15

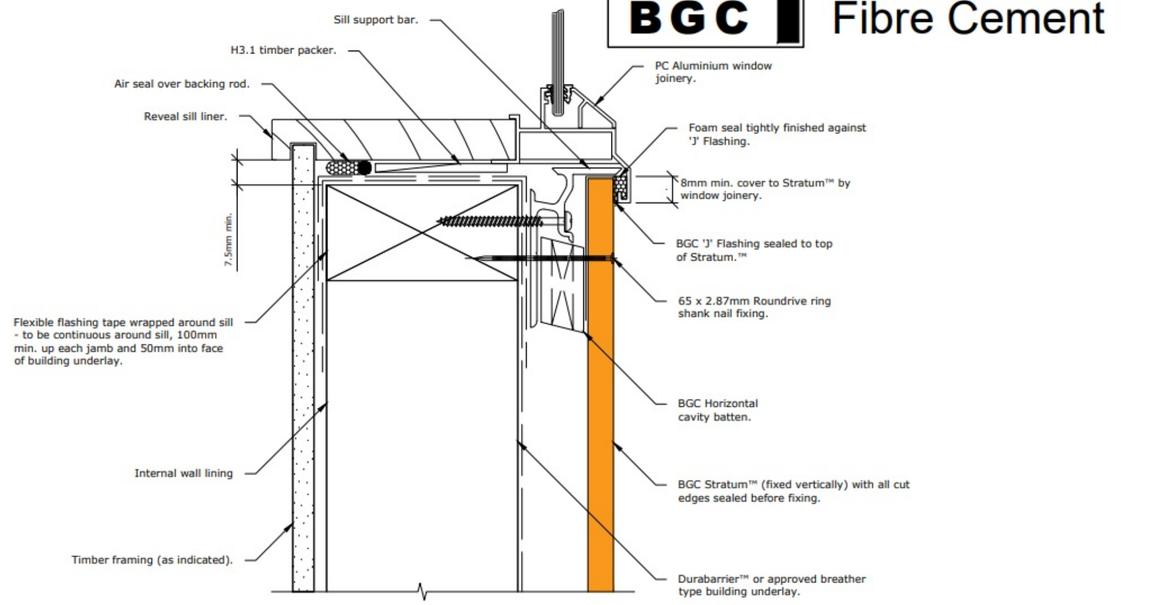
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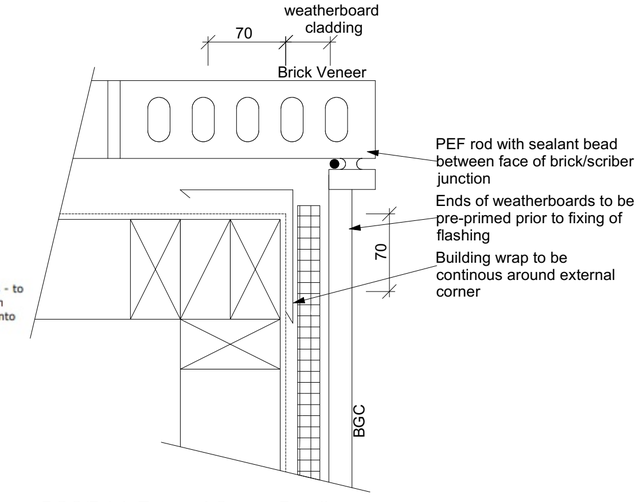
Window Head



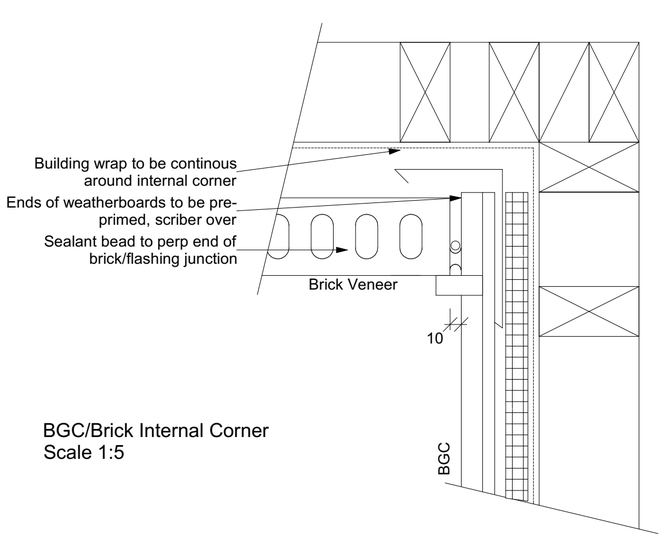
Window Jamb



Window Sill



BGC/Brick External Corner Detail
Scale 1:5



BGC/Brick Internal Corner
Scale 1:5

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Details

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: varies

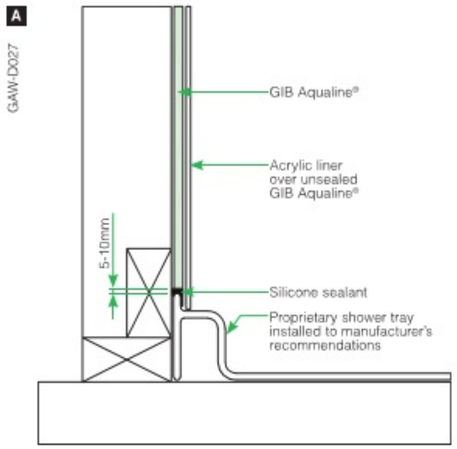
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Date: 24/07/2025

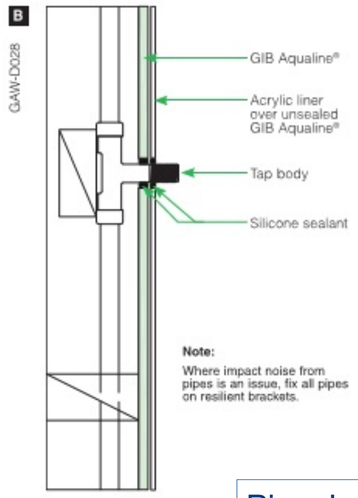
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OF: **15**

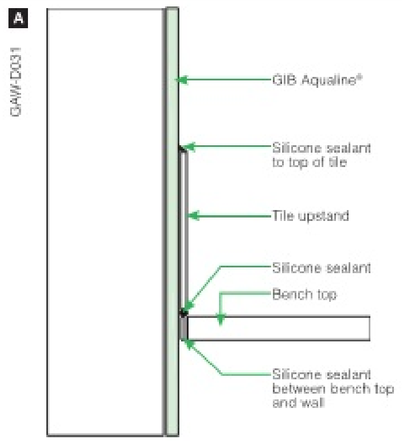
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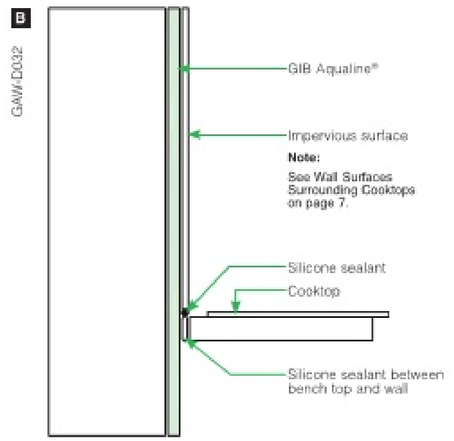
Shower Base



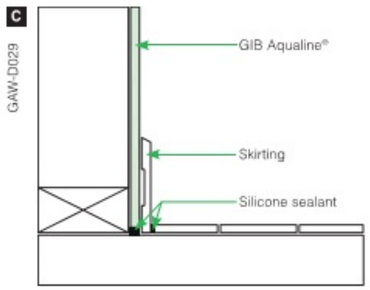
Pipe Junction



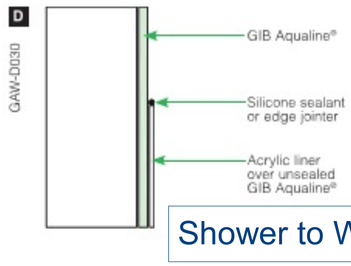
Bench top to wall



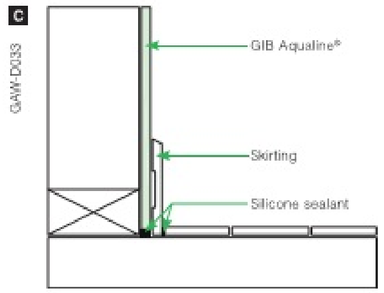
Bench top/ Cooktop to wall



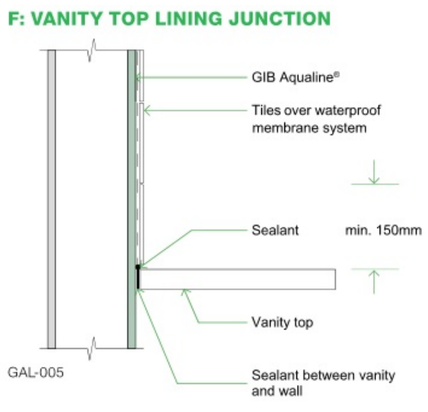
Skirting Detail



Shower to Wall



Skirting Detail









J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Details

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: varies

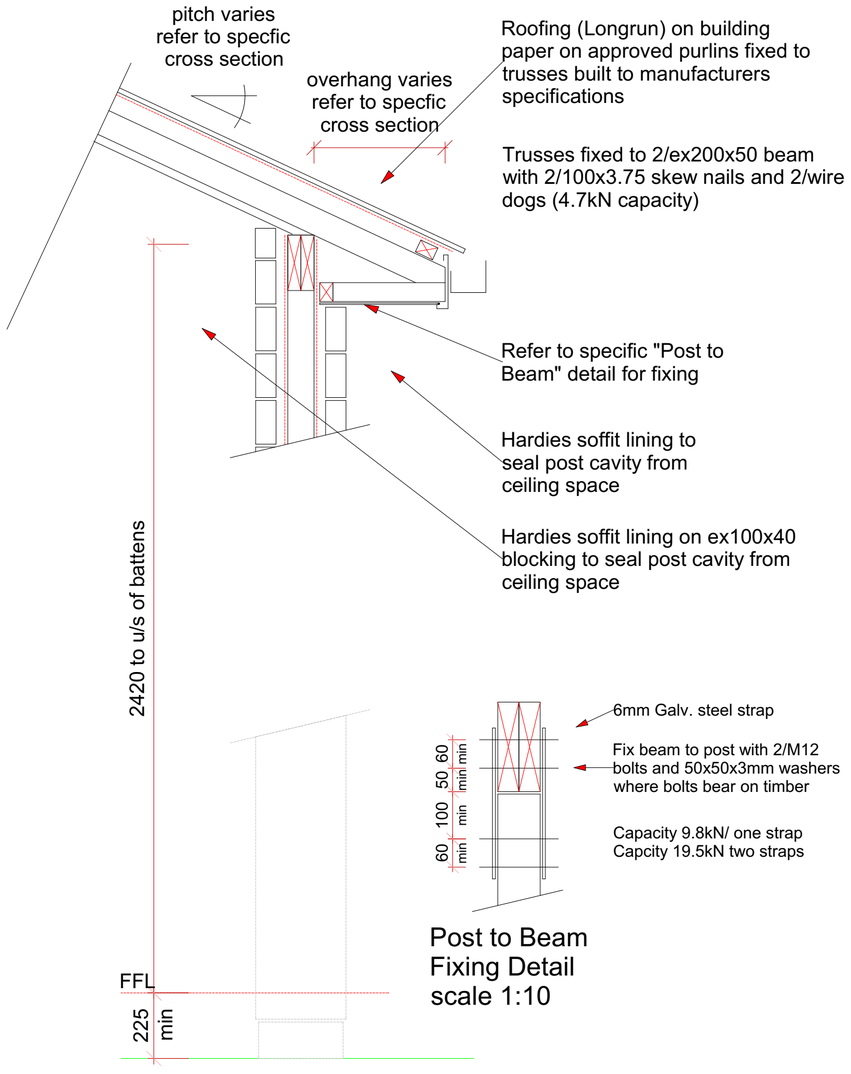
Job Number: 2500

Date: 24/07/2025

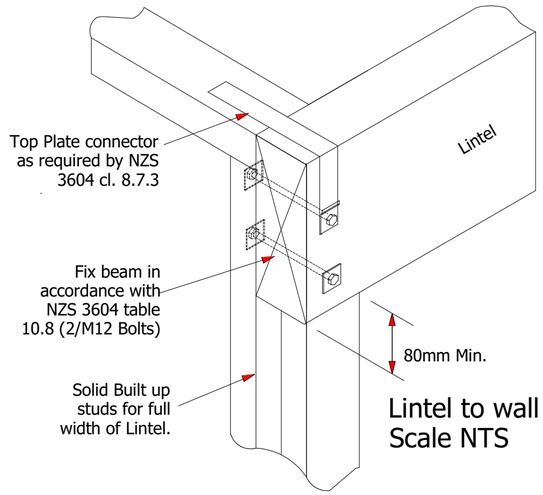
SHEET: 14

OF: 15

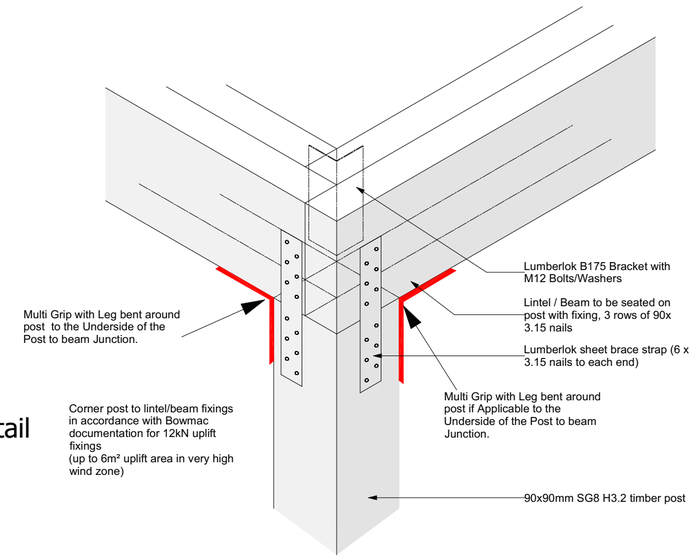
HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

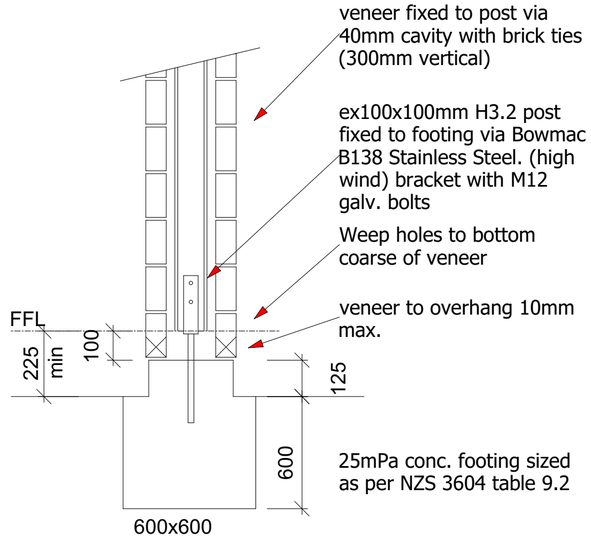


Post to Beam
Fixing Detail
scale 1:10



Lintel to wall detail
Scale NTS





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Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: varies
Job Number: 2500
Date: 24/07/2025
SHEET: 15
OF: 15

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley 7441 | 66 Carters Road | Amberley 7410
Phone: 03 314-8816 | Email: info@hurunui.govt.nz
Web: hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil

PROJECT INFORMATION MEMORANDUM

250252

Section 34, Building Act 2004

THE BUILDING	
Street address of building:	52 Benn Street, Amberley
Legal description of land where building is located:	Lot 79 DP 587128
Valuation number:	2143017384
Building Name:	
Location of building within site/block number:	
Level/unit number:	0

THE OWNER	
Name of owner:	UWC Ltd
Contact person:	Earl Hope
Mailing address:	c/o 70 Reserve Terrace, Amberley
First point of contact for communications with the council/building consent authority:	Jeremy Harrison 12 Murfitt St, Pegasus 7612 0277715816 jeremy@jandadesign.co.nz

BUILDING WORK	
This project information memorandum is confirmation that the following building work is to be undertaken:	Project: New 4 bedroom dwelling with Wood Burner Current, lawfully established use: Housing

This project information memorandum is confirmation that the proposed building work may be undertaken, subject to the provisions of the Building Act 2004, and any requirements of the building consent attached.

Resource Consent Requirements
VEHICLE CROSSING: Under Hurunui District plan rule 8.4.3.2 Vehicular access is required to local roads for activities generating up to 100 equivalent car movements per day. The site doesn't appear to have a existing vehicle crossing. The owner will need to enter into a bond with Council or construct the vehicle crossing to the District Plan standard in figure 8.11 prior to building work starting. Bond documentation to be sent with PIM to the applicant for their consideration - please contact the Duty Planner on 314 8816 to arrange a preconstruction meeting before excavation. Note that anyone working in the road reserve will first need to obtain a Works Access Permit (by applying for a Corridor Access permit from Council via the beforeUdig service - apply at beforeUdig.co.nz or ph 0800 248 344).
BUILDING LENGTH: Resource consent required for breach of Hurunui District Plan rule 4.6.10, no wall or ridgeline of any building shall be more than 20 m long without having an offset in plan of at least 2 m or an offset in height of at least 2 m. The Western elevation is 21.527m without having an offset in plan of at least 2 m or an offset in height of at least 2 m. Please apply for resource consent or amend plans accordingly.
*** NO BUILDING WORK TO PROCEED UNTIL ITEMS ARE ADDRESSED ***

Utilities
Water: Connection to Amberley Township water supply available on application. $792 fee applies. Application received. For a full chemical analysis of your water supply please visit our website: https://www.hurunui.govt.nz/roading-water/water/water-testing-reports. Please note that your water supply is rated as moderately hard. For further information and advice, head to our website: https://www.hurunui.govt.nz/roading-water/water/faqs-frequently-asked-questions/hard-water.
Wastewater: Connection to Amberley Township sewerage available on application. $291 fee applies. Application received. An inspection chamber will have to be installed less than one metre inside the property boundary before connection of the sewer drain into the Council lateral. See Drawing D05 of the HDC Development Engineering Standards for details.
Stormwater (cont.): An Erosion and Sediment Control Plan needs to be supplied to the stormwater team for approval before earthworks start.
Stormwater: Stormwater discharge to comply with the consent conditions as per Amberley Stormwater Consent CRC082988. A $286 discharge application fee applies. Stormwater discharge from roof run-off to soak pit with overflow to kerb and channel as per RC210185. At the time of building on the lot, stormwater runoff from buildings and hardstand areas resulting from up to and including the 24hr 2% AEP rainfall event shall be managed so no runoff enters any other property. For on-site soak pits, the following shall apply: * Soak pits shall be designed to cater for runoff from up to and including the 24 hour 2% AEP rainfall event, with allowance made for overflow from up to and including the 24 hour 2% AEP rainfall event; * For soak pits dealing with roof and/or non-trafficable hardstand areas, roofs shall not be zinc-coated (galvanised), and systems shall be sealed to prevent entry of contaminants; * For soak pits dealing with trafficable hardstand areas, soak pit base levels shall be at least 1 metre above the water table, and pre-treatment shall be provided (eg vegetated swales and/or submerged outlet sumps). *Condition 16 of CRC082988 states that discharges to ground shall not be from an exposed Zinc coated (Galvanized) roof.

Signature: 

Name: Madeline Blacktopp
Position: Building Support Officer

On behalf of Hurunui District Council

Date: 6 August 2025

HURUNUI DISTRICT COUNCIL
P.O. Box 13 | Amberley 7441 | 66 Carters Road | Amberley 7410
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Web: hurunui.govt.nz | facebook.com/HurunuiDistrictCouncil

CERTIFICATE ATTACHED TO PROJECT INFORMATION MEMORANDUM 250252

Form 4, Section 37, Building Act 2004

Restrictions on commencing building work under the Resource Management Act 1991

The building work referred to in the attached project information memorandum is also required to have the following resource consents under the Resource Management Act 1991:

- VEHICLE CROSSING: Under Hurunui District plan rule 8.4.3.2 Vehicular access is required to local roads for activities generating up to 100 equivalent car movements per day. The site doesn't appear to have a existing vehicle crossing. The owner will need to enter into a bond with Council or construct the vehicle crossing to the District Plan standard in figure 8.11 prior to building work starting. Bond documentation to be sent with PIM to the applicant for their consideration - please contact the Duty Planner on 314 8816 to arrange a preconstruction meeting before excavation. Note that anyone working in the road reserve will first need to obtain a Works Access Permit (by applying for a Corridor Access permit from Council via the beforeUdig service - apply at beforeUdig.co.nz or ph 0800 248 344).
- BUILDING LENGTH: Resource consent required for breach of Hurunui District Plan rule 4.6.10, no wall or ridgeline of any building shall be more than 20 m long without having an offset in plan of at least 2 m or an offset in height of at least 2 m. The Western elevation is 21.527m without having an offset in plan of at least 2 m or an offset in height of at least 2 m. Please apply for resource consent or amend plans accordingly.
- *** NO BUILDING WORK TO PROCEED UNTIL ITEMS ARE ADDRESSED ***

As these resource consents will or may materially affect the building work to which the attached project information memorandum relates, until they have been granted no building work may proceed.

Failure to comply with the requirements of this notice may result in legal action being taken against you under the Resource Management Act 1991.

Signature: Madeline B

Name: Madeline Blacktopp

Position: Building Support Officer

On behalf of: Hurunui District Council

Date: 6 August 2025



Small construction sites

THE ABSOLUTELY ESSENTIAL HEALTH AND SAFETY TOOLKIT

WORKSAFE

ABOUT THIS TOOLKIT

This toolkit[1] provides useful checklists for common health and safety issues on small construction sites. It will help you manage or avoid these issues to ensure the health and safety of everyone on and around your worksite, including workers, clients and members of the public. Links to more detailed advice are included where relevant.

Doing nothing is not an option

Construction is among the top four sectors for highest worker injury rates. Worker fatalities are more than double the average for all other sectors. The most common injuries are ones to the lower back and spine. The most common cause of serious harm injuries are slips, trips and falls from height. Males aged 20-24 are most likely to be injured.

The costs of workplace injuries to New Zealand business are substantial – ACC pay more than $100 million dollars per year in the construction sector. The direct and indirect costs of all workplace injuries in New Zealand are over $1.3 billion.

Make use of this toolkit. If we all work together we can make the construction industry a healthier and safer place to work in.

Health and safety legislation

The Health and Safety at Work Act 2015 (HSWA) is New Zealand's key work health and safety law. It introduces new responsibilities for managing the work related risks that can cause serious injury, illness or even death.If you have good health and safety practices in place now, you are likely to be well on your way. However the new Act introduces some new features and it's important for you to review your approach to work health and safety.

How to contact WorkSafe

For further advice on health and safety at work, contact the WorkSafe Response Team on (freephone) **0800 030 040**.

[1] The content in this toolkit has been adapted from the Health and Safety Executive publication *The absolutely essential health and safety toolkit for the smaller construction contractor* published in 2008 and available at www.hse.gov.uk
It does not cover legal requirements and is a guide only; for information on how to comply with the law, see the relevant legislation at www.legislation.govt.nz

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1.0 **General managment** 2

1.1 Managing a small construction site 3

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1.3 Contracting and subcontracting 4

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2.5 Critical health risks 12

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1.0 General management

IN THIS SECTION:

1.1 Managing a small construction site

1.2 When to notify WorkSafe

1.3 Contracting and subcontracting

1.1 Managing a small construction site

The checklists below cover some things to consider when managing a small construction site under the Health and Safety at Work Act 2015 (HSWA) which will imposes duties on the 'PCBU'.

What is a PCBU?

The HSWA defines 'PCBU'. It is essentially a person conducting a business or undertaking, whether alone or with others and whether for profit or gain or not. The PCBU is in the best position to control risks to work health and safety. This is why the PCBU has the primary duty to ensure health and safety.

Despite its name, a PCBU can be a business entity, such as a company, as well as an individual person. An individual person will generally be a PCBU if they are a sole trader or a self-employed person.

Examples of a PCBU include:

- a manufacturing business
- an import business
- an owner-driver of their own courier business
- a self-employed person operating their own business
- a partnership
- a building company, whether a principal contractors or a sub-contractors
- a not-for-profit organisation that employs admin staff.

PCBUs have a number of duties under the Health and Safety at Work Act. PCBUs with overlapping duties must work together to achieve health and safety at work.

Keep this in mind when reading the checklists. Many of the things covered in this booklet will help PCBUs to meet their duties under the HSWA.

See the WorkSafe website for more information.

Do you make sure workers:

- are trained, competent and fit to do the job safely and without putting their own or others' health and safety at risk?
- are properly supervised and given clear instructions?
- have access to washing and toilet facilities?
- have the right tools, equipment, plant and personal protective equipment?
- are involved in discussions about health and safety issues?
- are given opportunities to participate in improving health and safety?



1.2 When to notify WorkSafe

In an emergency: *call the emergency services by dialling **111***.

A PCBU must notify WorkSafe as soon as possible if any of the following 'notifable events' occur:

- the death of a person
- a notifiable injury or illness
- notifiable incident.

Call the WorkSafe Response Team on freephone **0800 030 040** (24 hours) and choose option 1.

Fill in and submit a notification form within seven days at worksafe.govt.nz *Reporting: Serious Harm*.

Some types of work also require you to notify WorkSafe. These include where a worker could fall 5 m or more, some excavation work, working involving asbestos or working underground. For a full list of notifiable work and more information on notifable events, see the WorkSafe website.

For a hazardous substances emergency: call the New Zealand Fire Service on 111 and then the WorkSafe Response Team directly on 0800 030 040.

DON'T DISTURB THE SCENE

You must not interfere with an accident scene until authorised by a health and safety inspector. Exceptions include certain situations, such as when people or property are at risk. If you require scene clearance or other immediate assistance from a health and safety inspector, call WorkSafe on 0800 030 040.

1.3 Contracting and subcontracting

When contracting or subcontracting work do you:

- check the health and safety performance of the people you plan to use?
- give them the health and safety information they need for the work?
- talk about the work with them?
- hold regular discussions about how the work is going, including safety problems and concerns?
- make sure that you have provided everything you agreed (eg safe scaffolds, the right plant, access to toilets and other welfare facilities, etc)?
- check their performance and remedy any shortcomings?

For more information for PCBUs check for updates on the WorkSafe and New Zealand Legislation websites:

worksafe.govt.nz

www.legislation.govt.nz

2.0 Health and safety checklist

IN THIS SECTION:

2.1 Site and services

2.2 Working at height

2.3 Moving material

2.4 Working with vehicles and machinery

2.5 Critical health risks

2.6 Worker wellbeing

2.7 Emergency situations

The following pages provide you with an essential checklist of some of the hazards most commonly found on construction sites.

The questions will help you decide whether your site is a safe and healthy place to work. It is not a full list.

2.1 Site and services

Access on site

- Can everyone get to their place of work safely – and work there safely?
- Are access routes in good condition and clearly signposted?
- Do edges that people could fall from have suitable edge protection?
- Are holes protected with clearly marked and fixed covers to prevent falls?
- Is the site tidy, and are materials stored safely?
- Is lighting good enough?



Electricity and other services

- Have all necessary services been provided on site before work begins? Have you also identified existing services present on site (eg electric cables or gas mains) and taken effective steps, if necessary, to prevent harm from them?
- Is the supply isolated from earth with a voltage between phase and earth conductors not exceeding 230 volts?
- Are electrical extension cords connected to power tools using a Residual Current Device (RCD) or Isolating Transformer?

- Are cables and leads protected from damage?
- Are all connections to the system properly made and are suitable plugs used?
- Are tools and equipment checked by users, visually examined on site and regularly inspected and tested by a competent person?
- Have hidden electricity cables and other services been located (eg with a locator and plans) and marked, and have you taken precautions for safe working?
- Where there are overhead lines, has the electricity supply been turned off, or have other precautions been taken, such as providing 'goal posts' or taped markers?



Protecting the public

- Is the worksite fenced off from the public?
- Do roadworks have barriers around them and are the barriers lit?
- Are the public protected from falling material?
- Is clear signage present to warn people of danger (eg 'Keep out', 'Asbestos removal in progress')?

When work has stopped for the day:

- is the boundary secure?
- have steps been taken to prevent any unauthorised access (eg are all ladders removed or their rungs boarded so they can't be used)?
- are excavations and openings securely covered or fenced off?
- is all plant immobilised to prevent unauthorised use?
- are bricks and materials safely stacked?
- are flammable or dangerous substances locked away in secure storage places?



2.2 Working at height

- Have you ensured there is appropriate and fit-for-purpose means to prevent workers from falling from height?
- Have you planned the work properly and identified suitable precautions to make sure work can be carried out safely?
- Have you thought about whether you can avoid working at height by using different equipment or a different work method?
- Can you use equipment that will prevent a fall from happening, such as scaffolding or a mobile elevating work platform?
- Can you put in place measures to reduce the distance and consequences of a fall should one happen, such as nets, soft landing systems or personal fall prevention and protection equipment (eg a harness system)?
- Will the weather conditions threaten the health and safety of those carrying out the work?
- Have you thought about all the options and are you certain that you are gaining access to height using the safest means possible?

For more information, see worksafe.govt.nz

Scaffolds

- Are scaffolds erected, altered and dismantled by competent people?
- Are all uprights provided with base plates (and, where necessary, timber soleboards)?
- Are all uprights, ledgers, braces and out riggers in position?
- Is the scaffold secured to the building or structure in enough places to prevent collapse?
- Are there double guard rails and toe boards, or other suitable protection, at every edge to prevent falling?
- Are additional guards provided to prevent stacked materials such as bricks falling from scaffolds (eg kickboards, toeboards or screens)?
- Are the working platforms fully planked, and are the planks arranged to avoid tipping or tripping?
- Are there effective barriers or warning notices in place to stop people using an incomplete scaffold (eg where working platforms are not fully planked)?
- Is the scaffold strong enough to carry the weight of materials stored on it and are these evenly distributed?



- Are scaffolds being properly maintained?
- Does a competent person inspect the scaffold or proprietary mobile scaffold regularly (eg at least once a week; and always after it has been altered, damaged and following bad weather)?
- Are the results of inspections recorded?
- Are scaffolds erected using using safe work methods, and are they being used according to the supplier's and/or manufacturer's instructions?
- Have the wheels of mobile scaffolds been locked when in use and are the platforms empty when they are moved?
- Are gates (including guardrails being used as gates) and hatches across access points self-closing?
- Are working platforms placed as close as practicable to the working face to reduce the risk of people or materials falling through the gap?

For more information see worksafe.govt.nz

Ladders

- Choose the right tool for the job – can you buy or hire some alternative equipment that would provide a safer means of access?
- Are they in good condition?
- Do ladders rest against a solid surface and not on fragile or insecure materials?



- Are ladders secured at the top and bottom to prevent them slipping sideways and outwards?
- Do ladders rise at least a metre above the landing place? If not, are there other handholds available?
- Are the ladders positioned so that users don't have to overstretch?
- Do you have to use the top three rungs of a stepladder? If so your stepladder is too short.
- Is the user competent? Those using ladders should be trained to use the equipment safely.
- Can users maintain three points of contact at all times?
- Are materials being transported safely (ie not carried up a ladder)? Carrying materials up a ladder increases the risk of falling.

For more information see worksafe.govt.nz

Roofwork

- Is there edge protection to stop people or materials falling?
- Where nets are used, have they been installed properly?
- Have you identified brittle roof materials, such as cement sheets and roof lights?
- Have you taken precautions to stop people falling through fragile materials when working on the roof (eg by providing barriers, covers or working platforms)?
- Are people kept away from the area below the roof work?
- Are roofworkers trained and experienced to recognise the risks and are they competent to do the work?

For more information see worksafe.govt.nz

2.3 Moving material

Manual handling

- Are there heavy materials such as roof trusses, steel beams, kerbstones or bagged products that could cause injury if they have to be moved by hand?
- If so, can you:
  - choose lighter materials?
  - use trolleys, hoists, telehandlers and other plant or equipment so that manual lifting of heavy objects is kept to a minimum?
  - order materials such as cement and aggregates in units that are a manageable weight (eg 25 kg bags)?
  - avoid the repetitive laying of heavy building blocks or other masonry units (eg weighing more than 20 kg)?
- Have people been instructed and trained how to use lifting aids and other handling equipment safely?
- Have people been trained how to lift safely?

For more information see worksafe.govt.nz



Loading and unloading goods

- Have you checked that the load has not moved or destabilised during the journey to site?
- Is there an exclusion zone around the loading/unloading area to keep people who are not involved away from the work?
- Have you planned your method of unloading?

- Does your lifting equipment have a current annual certificate?
- Do you have to access the back of the truck at all, or can the preparation work be done from ground level? If not:
  - do you have a safe way of getting up and down from the back of the vehicle?
  - what do you have in place to prevent workers from falling off the back of the vehicle?
  - are your employees provided with sensible safety footwear with a good grip?

For more information see worksafe.govt.nz

Excavations

- Is the stability of the ground known to ensure against collapse? Or if the stability of the ground is not known, is there a support system in place for the excavation to prevent collapse, or has it been sloped or battered back to a safe angle? (Note: an excavation more than 1.5 m deep that is deeper than it is wide at the top must be notified to WorkSafe.)
- Is a safe method used for putting in the support, without people working in an unsupported trench?
- Is there safe access into the excavation (eg a sufficiently long, secured ladder)?
- Are there barriers or other protection to stop people and vehicles falling in?
- Is the excavation fenced off from unauthorised access?
- Are properly secured stop blocks provided to prevent tipping vehicles falling in?
- Could the excavation affect the stability of neighbouring structures or services?
- Are materials, spoil and plant stored away from the edge of the excavation to reduce the chance of a collapse?
- Is the excavation regularly inspected by a competent person?
- Are the results of inspections recorded?

For more information see worksafe.govt.nz

2.4 Working with vehicles and machinery

Traffic, vehicles and plant

- Have prestart checks been done, and any issues dealt with?
- Are vehicles well maintained, and are log books and maintenance records present and up to date?
- Are vehicles only operated by people trained to do so (where applicable) and are manufacturer's instructions followed?
- Are vehicles and pedestrians kept apart?
- If not, do you:
  - provide barriers to separate them as much as you can?
  - display warning signs?
- Are people kept away from slewing vehicles, or, if not, can you use a zero tail swing machine?
- Are vehicles and plant properly maintained, for example:
  - do the steering, brakes, hydraulics, mirrors and any other vision aid work properly?
  - are tyres in good condition and at the correct pressure?
  - are reversing alarms active?

- Can reversing be avoided (eg by using a one-way system or a turning area? If not, are properly trained spotters used)?
- Have drivers received proper training and are they competent and fit to use the vehicles or plant they are operating?
- Are loads properly secured?
- Have you made sure that passengers are only carried on vehicles designed to carry them?
- Have you made sure that plant and vehicles are not used on dangerous slopes?
- If you need to work on or drive across sloping ground, have you checked that the plant and vehicles are safe to use?
- Do you check that securing pins are in place on excavator quick hitches?

Tools and machinery

- Are the right tools or machinery being used for the job?
- Are all dangerous parts guarded (eg gears, chain drives, projecting engine shafts)?
- Are guards secured and in good repair?
- Are tools and machinery maintained in good repair and are all safety devices operating correctly?
- Are all operators trained and competent?

For more information see worksafe.govt.nz

2.5 Critical health risks

Hazardous substances

- Have you identified all harmful substances and materials, such as asbestos, lead, solvents, paints, cement and silica dust (eg from cutting concrete, bricks, rocks etc)?
- Is protective clothing and respiratory equipment provided?
- Have you checked whether a worker with the relevant approval is needed to deal with asbestos on site? (Most work with asbestos requires permission from WorkSafe, although you can do some very limited work with materials that contain asbestos without one.)



- Have you identified and put into place precautions to prevent or control exposure to hazardous substances, by:
  - doing the work in a different way, to remove the risk entirely?
  - using a less hazardous material?
  - using tools fitted with dust extraction?
  - using tools fitted with water suppression?
  - installing warning signs to show where work involving hazardous substances is taking place?
- Have workers had information and training so they know what the risks are from the hazardous substances used and produced on site, and what they need to do to avoid those risks?
- Have you arranged health monitoring for employees exposed to certain hazardous substances (eg lead, silica, cement, sensitisers such as twopack adhesives or coatings)?

For more information see worksafe.govt.nz

Noise

- Have you identified and assessed workers' exposure to noise?
- Have workers had information and training so they know what the risks are from noise on site, and what they need to do to avoid those risks?
- Can the noise be reduced by using different working methods or selecting quieter plant (eg by fitting breakers and other plant or machinery with silencers)?
- Are people not involved in the work kept away from the source of the noise?
- Is suitable hearing protection provided and worn in noisy areas?
- Have hearing protection zones been marked?
- Have you arranged health surveillance for employees exposed to high levels of noise?

Personal protective equipment

- Is suitable equipment provided to protect the head, eyes, hands and feet where appropriate?
- Do workers wear their protective equipment, and do they wear it correctly?
- Have workers been trained in the safe use, care and storage of protective equipment?

For more information see worksafe.govt.nz



2.6 Worker wellbeing

Amenities and facilities

- Has a suitable toilet been provided?
- Is there a clean wash basin, hot/warm water, soap and towel?
- Is wet-weather gear provided for those who have to work in wet conditions?
- Is there a place where workers can take shelter and have meals? Do they have access to drinking water?
- Is there a suitable first-aid kit?

For more information see worksafe.govt.nz

Workloads and fatigue

- Do workers take regular, quality rest breaks in their working day?
- Are working hours reasonable and not too long? If longer working days are required, are start and finish times staggered, and/or are longer rest breaks and periods off work allowed?
- Are tasks scheduled suitably throughout a work period (eg critical jobs are avoided during the low body clock period of 3 pm to 5 pm)?
- Is work scheduled to allow enough time for completion?
- Are monitoring and limitations in place for overtime worked, consecutive night shifts, shift swapping and on-call duties?
- Are jobs rotated to minimise exposure to extreme temperature and excessive mental or physical demands?
- Is fit-for-purpose plant, machinery and equipment used?
- Are workloads practical and manageable, with consideration given to any work flow changes (eg machinery breakdowns or unplanned absences)?

Alcohol and drugs

- Is there a policy and procedure in place to constructively manage alcohol- and other drug-related hazards?
- Are workers monitored for signs of alcohol and drug use (eg dizziness, slurred speech, drowsiness, sudden aggressive or violent behaviour, lack of or impaired coordination/relflexes)?

For more information see worksafe.govt.nz



2.7 Emergency situations

Emergencies

- Are there emergency procedures (eg for evacuating the site in case of fire)?
- Do people on site know what the procedures are and where the nearest emergency centre is?
- Is there a means of raising the alarm, and does it work?
- Is there a way to contact the emergency services from site?
- Are there enough suitable escape routes and are these kept clear?
- Are first aid arrangements good enough for the site, and is there someone available who can administer first aid if needed?

Fire

- Is the quantity of flammable materials, liquids and gases kept to a minimum?
- Are they properly stored (eg are gas cylinders chained in position)?
- Are flammable gas cylinders returned to a ventilated store at the end of the shift?
- Are smoking and other ignition sources banned in areas where gases or flammable liquids are stored or used?
- Are gas cylinders, associated hoses and equipment properly maintained and in good condition?
- When gas cylinders are not in use, are the valves fully closed?
- Is flammable and combustible waste removed regularly and stored in suitable bins or skips?
- Are suitable fire extinguishers provided?

Notes

Disclaimer

This publication provides general guidance. It is not possible for WorkSafe to address every situation that could occur in every workplace. This means that you will need to think about this guidance and how to apply it to your particular circumstances.

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Solid/Liquid/Fuel Heater Installer's Installation Certificate

Building Consent Number : Site Address :

Make : Model : Clean Air Registration Number :

☐ Solid Fuel Heater ☐ Liquid Fuel Heater ☐ Free Standing ☐ Inbuilt

	Yes	No	N/A
The existing chimney has been cleaned prior to installation	☐	☐	☐
Is the fireplace surround/chimney face junction sealed up with heat resistant material	☐	☐	☐
The flue pipe is constructed of austenitic stainless steel	☐	☐	☐
Seismic restraint has been fitted	☐	☐	☐
The flue sections are secured together with stainless steel rivets	☐	☐	☐
The flue is secured to the appliance	☐	☐	☐
The chimney void has been vented at the top	☐	☐	☐
Is the Solid Fuel Burner and Flue as per the building consent	☐	☐	☐
Flue joints sealed in accordance with manufactures instructions	☐	☐	☐
Fire safety valve connected and working correctly (diesel burners)	☐	☐	☐
Flue and appliance clearances have been achieved in terms of the manufacturer's instructions (NZS 7421 or AS/NZS 2918:2001)	☐	☐	☐
The flue height meets the minimum specified in the manufacturer's instructions, NZS7421, and Regional Council rules	☐	☐	☐
The application has been installed and commissioned in accordance with the manufacture's installation and operating instructions (Liquid fuel only)	☐	☐	☐
The liquid fuel storage tank and feed system has been installed in accordance with AS1691, or equivalent, and with the requirements of the Council's Hazardous Substances Officer	☐	☐	☐
Smoke detectors as detailed on the building consent documents are installed	☐	☐	☐

If response to any of the items is 'no' please comment :

Water heater – model and part number :

I **(name)** certify that the above specified installation has been carried out as described and in accordance with the manufacturers installation instructions and the current approved building code requirements

Installers Signature : (Installer) Date :

RESOURCE MANAGEMENT ACT MATTERS – LIQUID FUEL HEATER

	Yes	No
Does the fuel storage tank have secondary containment in accordance with the District Plan (NB: Audit monitoring will be carried out)	☐	☐

If response is 'no' please comment why :

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SPECIFICATION

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

UWC Ltd

52 Benn St
Amberley

Date: 2 April 2025

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CONSTRUCTION SCHEDULE

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:
Waffle Slab Foundation

SG8
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: Lumberlok Bottom Plate Fixing Anchors as per manufacturer’s specifications @ 900mm crs on all external walls and within 150mm of each end of the plate. 75mmx4mmØ shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:
Exterior & Interior Loadbearing wall: 90x45mm studs @ 600 crs
Dwangs Ext: 90x45 @ 800crs
Non loadbearing: 90x45mm studs @ 600 crs
Dwangs Int: 90x45mm @ 800mm crs

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

Building Wrap: Watergate building wrap with Aluband flexible flashing tape
Building wrap to be strapped @ 300crs between dwangs.

INSULATION, ENERGY EFFICIENCY:
Refer to H1 Schedule, Energy Efficiency Calculations
Exterior Walls: Batts – R 2.6 Wall
Ceilings: Batts – R6.6 Ceiling
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)
Purlins: 70x45 SG8 H1.2 @ 900crs (Fixings in specification)

Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated)
Fascia & Gutter system:
Refer to manufacturers specification attached,
Down pipes: 75x55mm Colorsteel
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 of loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.
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
Aqualine Gib with Enamel paint finish, refer to details attached.

KITCHEN JOINERY
Bench top –Melamine (High Pressure laminate), 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, Manrose SF 150)

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be
Interconnected and Located in each bedroom,
Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A)
and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

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
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

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Roof Pitch: As noted in the project information on the plan.
Maximum Catchment Area: 0º-25º =60m² as per NZBC E1/AS1 Table 5

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PRELIMINARIES AND GENERAL

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.

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PREPARATION AND GROUNDWORK

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.

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 (CONCTRETE AS PER ENGINEERS DESIGNS)

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

Bar Diameter	Lap
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.

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.

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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.

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CARPENTRY

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
Battens: Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip).
TIMBER TRUSSES
Moisture content at supply: 18%.

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

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.

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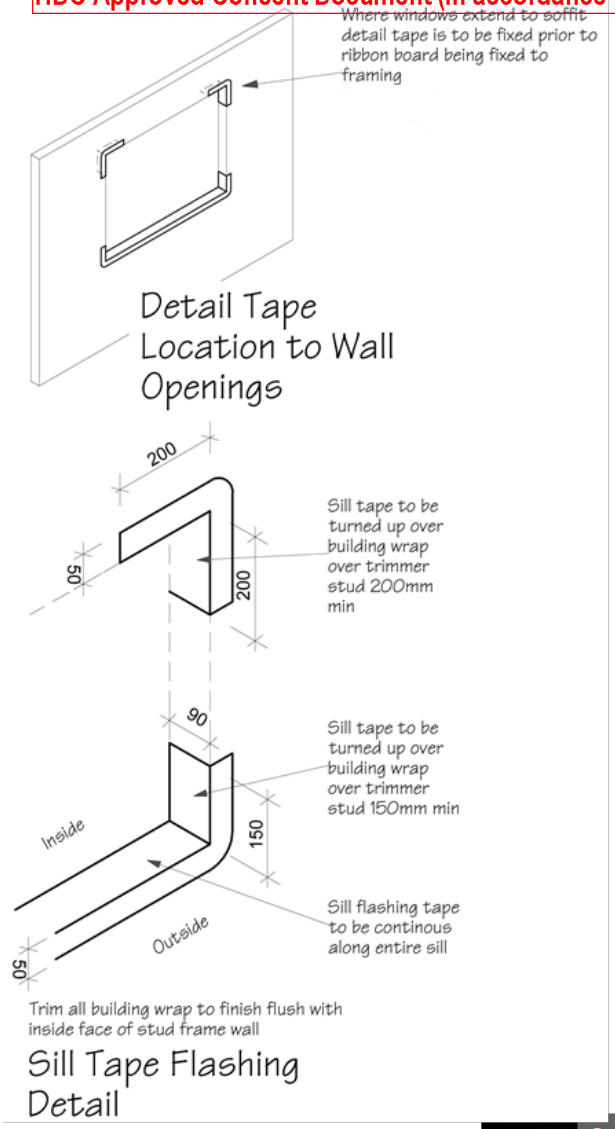
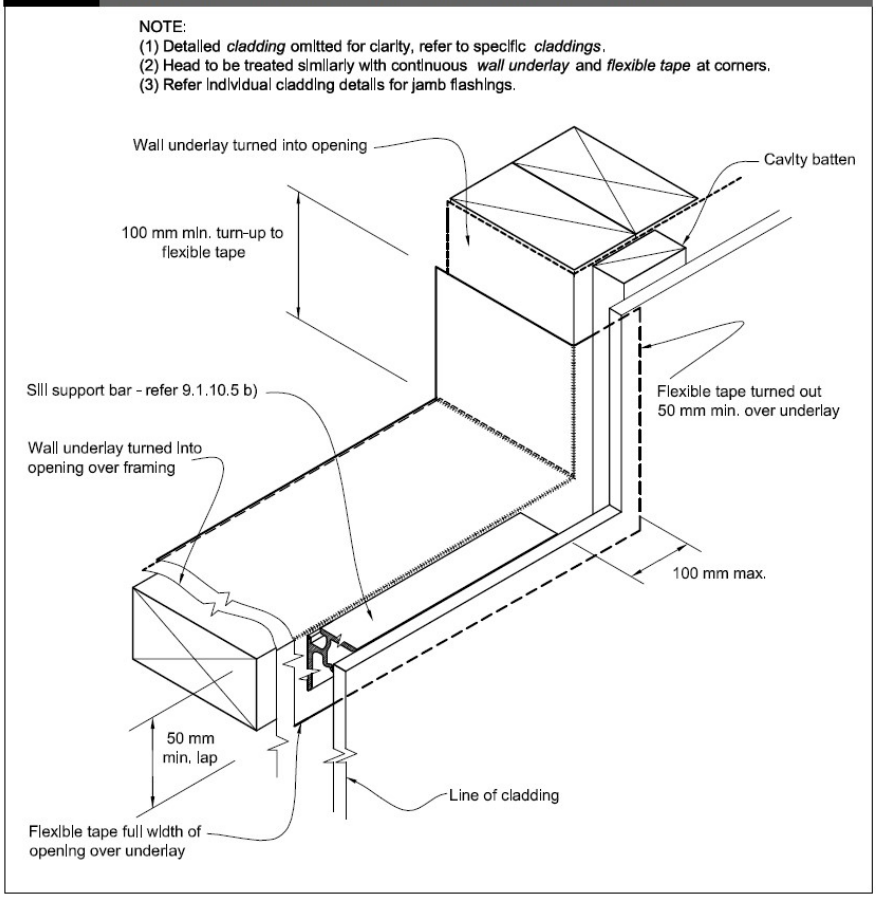


Figure 72B: **General window and door opening with drainage cavity**
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128



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BRICK VENEER CLADDING

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 5º 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 *damp-proof course* Bottom of veneer panel supported on steel angle lintel	Within 300 mm or two courses (whichever is the smaller) from bottom of veneer
Bottom of veneer panel in masonry rebate with *membrane damp-proof course*	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) Horizontal	Vertical	Tie type (4)(5)	Maximum spacings (1) 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.

METAL PROFILED ROOFING

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
NZ Metal Roof and Wall Cladding Code of Practice

QUALIFICATIONS
Roofers to be Approved Installers.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

PERFORMANCE
Install roofing material and associated flashings and accessories to form a weather tight and durable system.

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

MARKING AND CUTTING PROFILED METAL ROOFING
Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

INSTALLING PROFILED METAL ROOFING
Install and fix 0.40 gauge roofing in accordance with NZ Steel's Installers Guide and to the Manufacturer Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.
Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

FLASHINGS GENERALLY
Formable grade 0.55 BMT for galvanised, aluminium/zinc and pre-coated steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to the Manufacturers standard flashing details.

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

NZBC E2/AS1 clause 4.5.2 Metal flashing joints
Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joins of metal flashings shall have the following features:
a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
i) compatible with the flashing material as per NZBC E2 Table 21 and Table 22, and ii) sealed against moisture, or iii) of a sealing type or blind rivet,
b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel, ii) 8 metres for copper, & iii) 8 metres for aluminium.
c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
d) Where necessary, expansion joints shall be formed as shown in Figure 6, with: i) minimum 200 mm laps, and ii) sliding clips at both sides of the lap.

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.

FASTENERS GENERALLY
Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

FIXING SCREWS
Screws appropriate to the roofing material and the supporting member, as recommended by the Manufacturer.

RIVETS
Sealed aluminium, minimum diameter 4 mm.

SEALANT
Neutral curing silicone or polymer sealant as required by the Manufacturer and used as directed.

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

CLOSURE STRIPS
Compressible, profiled, closed cell foam strips to fit the sheet profile.

LAP SEALING TAPE
Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

END LAPS
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

AVOID DAMAGE
Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

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

Remove metal filings from roofing surfaces at least daily.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

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Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting's, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

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ALUMINIUM WINDOWS AND DOORS

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

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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INSULATION

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

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 Aqualine® 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
Battens:Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip
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

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.

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.

MOVEMENT CONTROL JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.

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CARPETING

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

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

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PAINT SYSTEMS TO EXTERIOR AREAS
Undercoat: Resene SpaceCote “Flat white”
Top coat: Resene SpaceCote “Flat white”

RAINWATER SYSTEMS

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/m^2) 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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HOT AND COLD WATER SYSTEM

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 50º) The storage water heater control thermostat shall be set at a temperature of not less than 50º 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.

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.

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 onsite supply 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:
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.

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

ELECTRIC HOT WATER CYLINDER

Brand/model number:	Rheem
Capacity:	250 litres

NZBC G12/AS1

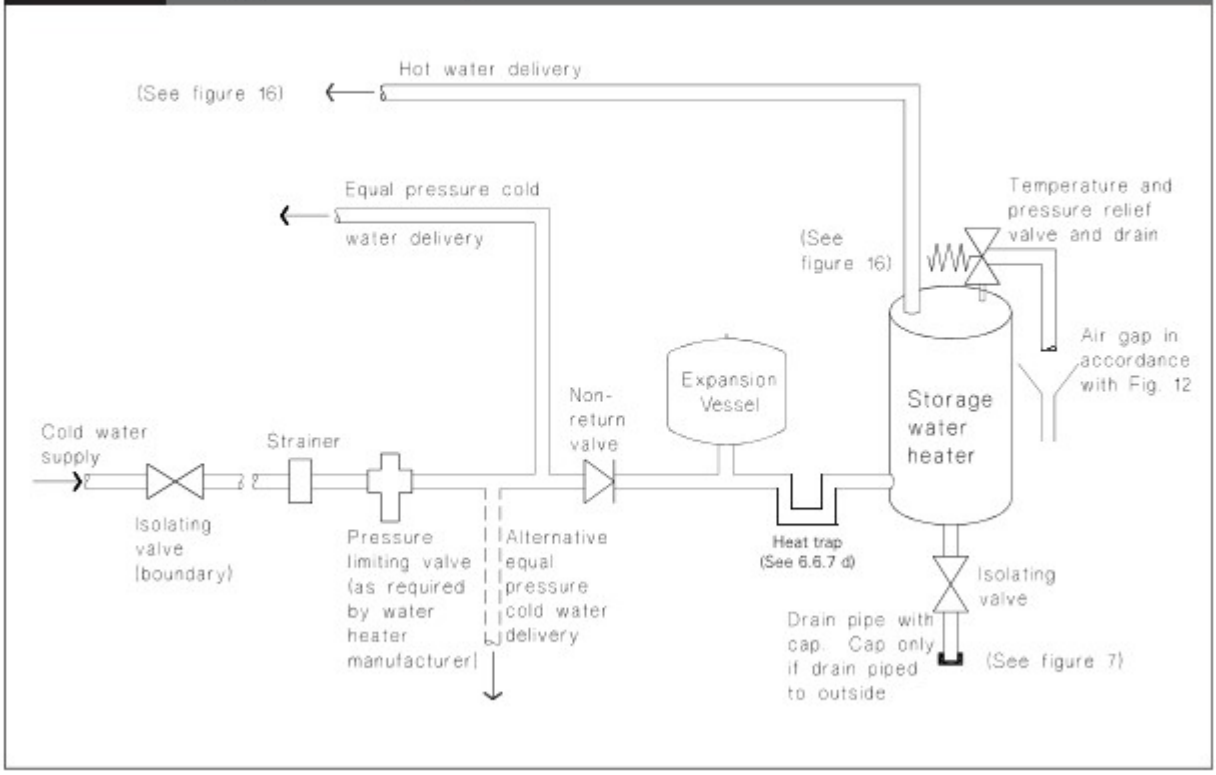
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Table 7: Water Supply Pipework Support Spacing
Paragraph 7.1.3

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

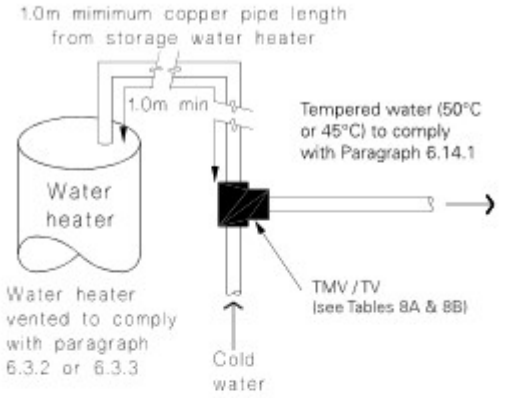
Note:
The spacing for these pipe materials is based on the pipes being located within the *building* structure.

Figure 8(a): Mains Pressure Storage Water Heater System (unvented) - Expansion Vessel
Paragraphs 6.1.2 and 6.2.1 c)

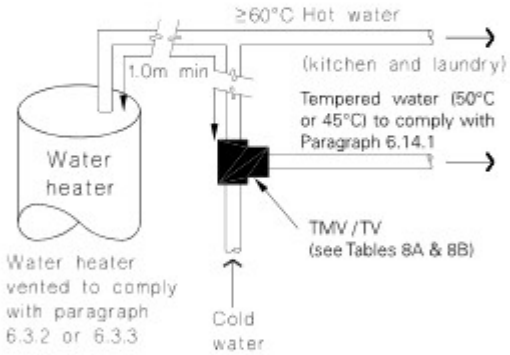


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Figure 16: Tempering Valve or Thermostatic mixing Valve Installation
Tables 8A and 8B



(a) Where all hot water is tempered



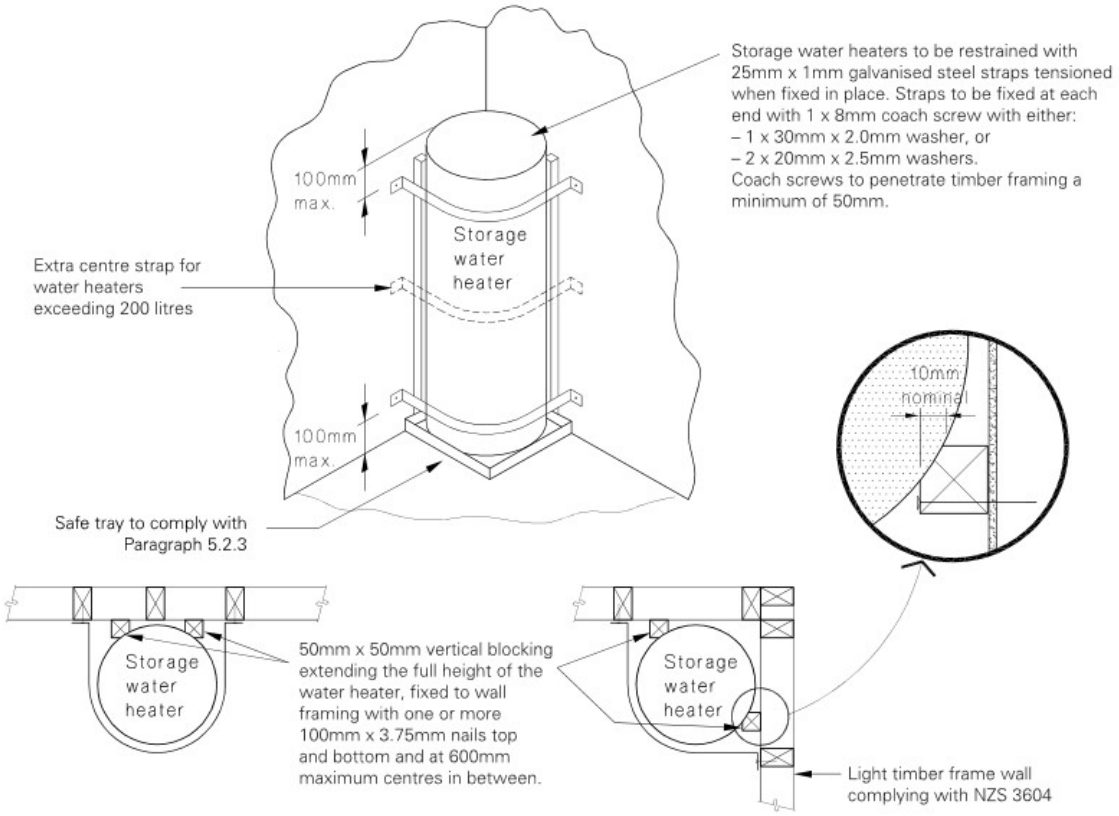
(b) With untempered hot water to laundry and kitchen fixtures and appliances

Notes:

1. For optimum system efficiency the temperature control device, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the temperature control device.
2. 1.0 m minimum copper pipe length from storage water heater to temperature control device.
3. Untempered hot water must not be provided to fixtures or appliances from a storage water heater that is connected to an uncontrolled heat source, such as a wet-back or solar water heater.

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Figure 14: Seismic Restraint of Storage Water Heaters 90 – 360 litres
Paragraph 6.11.4



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SANITARY PLUMBING

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.
Corrugated metal 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

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
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.

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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

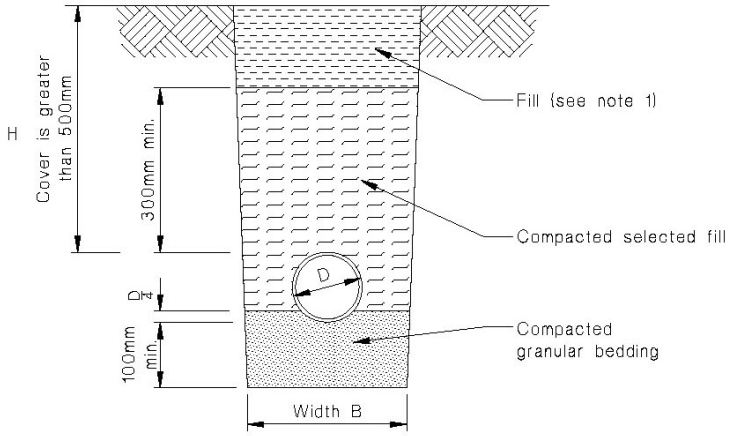
NZS 7643 Section 11 gives an acceptable method for ensuring watertightness of below ground uPVC drainage pipework.

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.

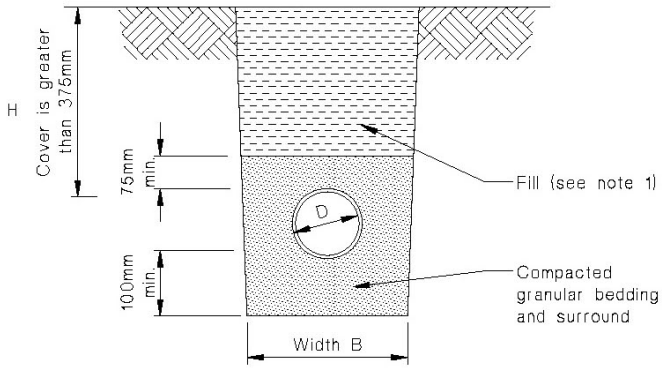
NZBC G13/AS2

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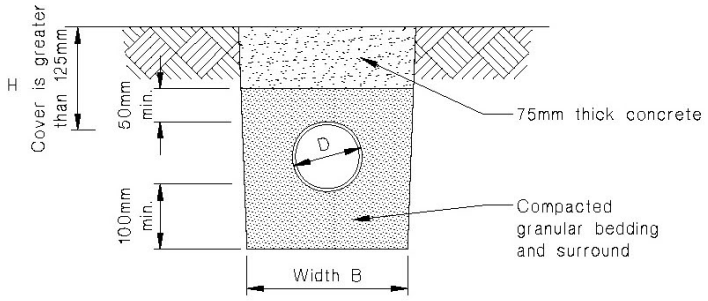
Figure 7: **Bedding and backfilling**
Paragraphs 5.2.1, 5.3.1 and 5.4.1



(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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ELECTRICAL

Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundering – 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
NZECP 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)

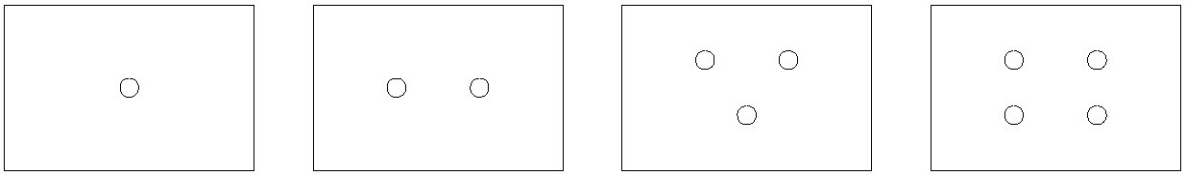
LIGHTING SCHEDULE (Minimum per area/room)

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 10m² 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 5m² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Single (1LF) Double (2 LF) Triple (LF) Quad (4 LF)

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 mm^2, 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.

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 mm^2 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

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 personel. 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

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

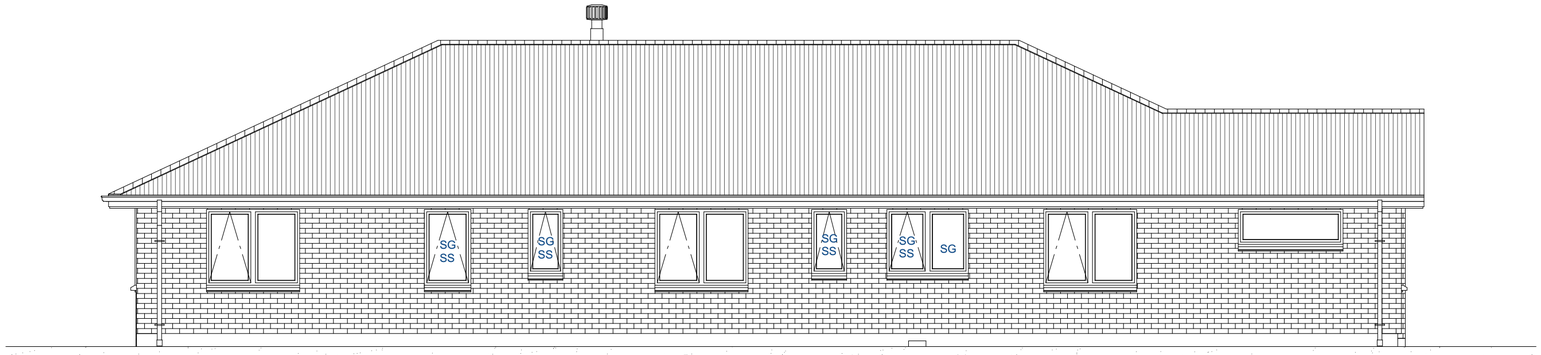
The main contractor will use the relevant erosion and sediment control measures to meet the requirements for this site.

Provide protection for neighbouring sites from rubbish or sediment contamination.

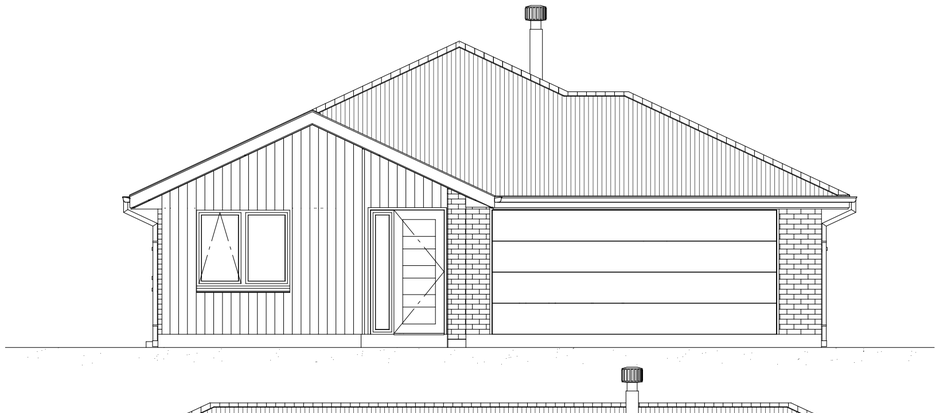
Erosion Control
Minimum existing vegetation and soil will be removed from the site,
Sediment Control measures will be in place before earthworks begin
Earthworks will keep to a minimum.
Stockpiles will be delivered as late as possible, located within the sediment control zone, and protected from runoff 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.

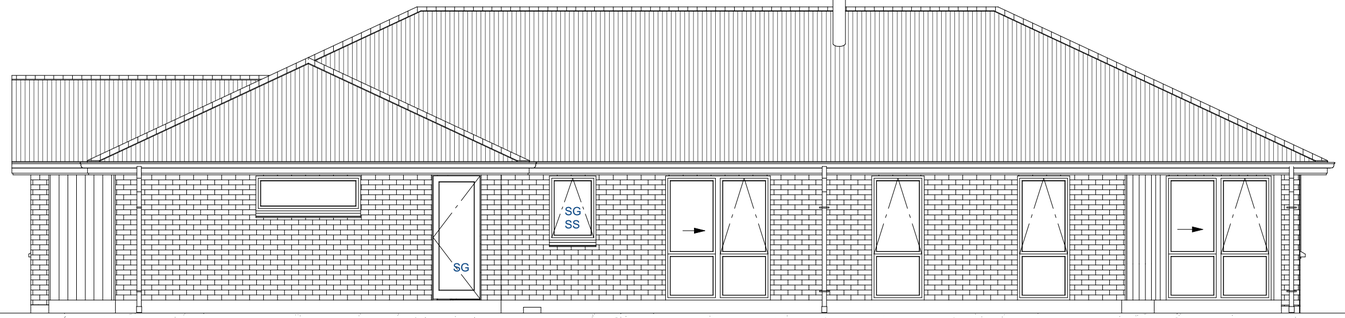
Site Access
Stabilised access from the road to the platform will be provided.
A runoff diversion bund will be included in the site access way if required.
Sediment on footpaths and roads will be removed as soon as practicable



Elevation A



Elevation B



Elevation C



Elevation D

ROOF & WALL CLADDING	
Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

GENERAL ELEVATION NOTES

Air Barrier to unlined wall and gables, refer to the Construction Schedule in the Specification for type.

This sheet to be read in conjunction with the Risk Matrix in specification.

Driveway to fall from 20mm max below garage rebates (By Others).

Key
SS: Security Stay
SG: Safety Glass

Risk Matrix Elevation A

Risk Factor	low	medium	high	Extra high	
Wind Zone			1		1
No of Storeys	0				0
Roof/Wall	0				0
Eaves Width	0				0
Building Envelope	0				0
Decks & Balconies	0				0
				Total	1

Risk Area 2 Elevation B

Risk Factor	low	medium	high	Extra high	
Wind Zone			1		1
No of Storeys	0				0
Roof/Wall	0				0
Eaves Width		1			1
Building Envelope			3		3
Decks & Balconies	0				0
				Total	5

Risk Area 3 Elevation C

Risk Factor	low	medium	high	Extra high	
Wind Zone			1		1
No of Storeys	0				0
Roof/Wall	0				0
Eaves Width	0				0
Building Envelope	0				0
Decks & Balconies	0				0
				Total	1

Risk Area 4 Elevation D

Risk Factor	low	medium	high	Extra high	
Wind Zone			1		1
No of Storeys	0				0
Roof/Wall	0				0
Eaves Width	0				0
Building Envelope			3		3
Decks & Balconies	0				0
				Total	4

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Elevations

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: 1:100

Job Number: 2500

Date: 24/07/2025

SHEET: 3

OF: 15

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File No.: 41793

22 May 2025

UWC Limited
40 Taranaki Street
Te Aro
WELLINGTON 6011

REVISED
During
Processing
14/08/2025

Attention: Earl Hope-Pearson

Email: ehopepearson@egmontdixon.com

Dear Earl,

SHALLOW GEOTECHNICAL INVESTIGATION – 52 BENN STREET, AMBERLEY (LOT 79 DP 587128)

1.0 INTRODUCTION

Davis Ogilvie & Partners Ltd. (Davis Ogilvie) has been commissioned by UWC Limited to confirm the underlying ground conditions, determine the ground bearing capacity, and provide foundation recommendations to support the building consent application for the proposed residential development at Lot 79 which is situated in Stage 1, The Clearing, Amberley.

The published geology is described as *"grey to grey-brown river alluvium of undifferentiated Late Quaternary age"*[1].

Davis Ogilvie undertook geotechnical soil testing for subdivision consent across the 32.7 ha site in 2022[2], including the area of subject Stages 1 and 2. Results showed that the natural soil profile consisted of surficial topsoil underlain by silt and sand mixtures to 1.0 – 2.0 m below (pre-subdivision) ground level, and dense sandy gravel to a maximum (test) depth of 4.4 m. Groundwater monitoring encountered groundwater between 3.0 – 4.0 m below the pre-subdivision ground level.

The site liquefaction performance in terms of the Ministry of Business, Innovation and Employment (MBIE 2017)[3] is assessed as being *"Very Low Liquefaction Vulnerability"* across Stages 1 and 2.

[1] Forsyth, Barrell, Jongens (compilers), 2008. Geology of the Christchurch area. GNS Science Ltd 1:250 000 geological map 16.
[2] Davis Ogilvie - Geotechnical Report for Subdivision: 187 & 193 Carters Road and 52 Amberley Beach Road, Amberley, Lots 2 & 3 DP 559093. Project 41793. Dated 16 May 2022.
[3] MBIE (2017), Planning and engineering guidance for potentially liquefaction-prone land, published 26 September 2017.

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Davis Ogilvie undertook engineering design and supervision throughout the subdivision construction, and upon completion, earthworks certification was issued in October 2023 for Stages 1 and 2[4]. The appended as-built fill plans (DWG AB 32)[5], indicates up to 0.9 m of engineered fill has been placed across the lot.

2.0 SOIL TESTING AND RESULTS

Prior to any filling and topsoil placement on the lot, site inspections of the natural ground conditions were undertaken by Davis Ogilvie to confirm the presence of suitable subgrade soils. Any areas of unsuitable or soft soils were removed and backfilled with engineered fill as per NZS 4431:1989[6] (and its replacement NZS 4431:2022[7]). Visual inspection and Dynamic Cone Penetrometer (DCP) testing confirmed appropriate in-situ soil materials and bearing capacity in the subgrade soils.

Following earthworks, four DCP tests and two Hand Augers (HA) were undertaken on the lot to confirm the finished (i.e. topsoiled) soil profile and determination of the available static geotechnical ultimate bearing capacity (GUBC). The shallow testing indicates a subsurface profile consisting of up to 0.4 m of topsoil underlain by engineered fill (gravelly sand) with refusal occurring at 0.5 – 0.7 m below Existing Ground Level (EGL). Test locations are presented on the attached Geotechnical Site Plan (DWG G79 A).

The indicative soil profile encountered by the shallow testing on the site is presented in Table 1, with logs and DCP test results attached to this report.

Table 1: Summarised Soil Profile from Shallow Investigation

Summary of Soil Type	DCP (blows / 100 mm)	Relative Density / Consistency	Depth (m) below EGL***			
			HA + DCP 79-1	DCP 79-2**	HA + DCP 79-3	DCP 79-4**
TOPSOIL	1 – 6	*	0.0 – 0.3	0.0 – 0.3	0.0 – 0.4	0.0 – 0.4
ENGINEERED FILL	19 – 45	Very dense	0.3 – 0.5	0.3 – 0.7	0.4 – 0.6	0.4 – 0.6

* Relative density not assigned to topsoil.
** Soil type and depth inferred from DCP results and nearby testing.
*** Depths rounded to the nearest 0.1 m and may vary across the site from the test locations.

REVISED During Processing 14/08/2025

[4] Davis Ogilvie - Geotechnical Completion Report: Stages 1 & 2, The Clearing, Amberley Beach Road, Amberley, version 1, dated October 2023.
[5] Davis Ogilvie - The Clearing – Amberley Beach Road, Amberley Subdivision, 224 – As-Builts Stages 1 & 2, Fill Plan – Asbuilts Sheets 3/3. Project 41793. Dated 10/2023.
[6] NZS 4431:1989 - Code of practice for earth fill for residential development, published 30 May 1989.
[7] NZS 4431:2022 - Engineered fill construction for lightweight structures, published 27 May 2022.

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3.0 FOUNDATION RECOMMENDATIONS

Based on the in-situ soil testing, 'Good Ground' as defined by NZS 3604:2011[8] and the availability of a GUBC of 300 kPa has generally been achieved at a depth of approximately 0.4 m below EGL.

Davis Ogilvie anticipates a concrete slab is the preferred founding solution for the site. In this regard, the following foundation solutions are considered appropriate for this lot:

- A NZS 3604:2011 tied slab foundation.
- A proprietary 'Technical Category 1 (TC1)' waffle slab foundation.

We note that all lots contain a buried stormwater disposal soak pit, and that foundation elements should be offset from the surface edges of the boulder pit by at least 3.0 m (DWG G79 A) or be specifically designed by a Structural Engineer.

For specific engineered designed foundations, it is recommended that a suitably qualified and experienced engineer verify that adequate ground conditions have been achieved onsite and that all topsoil, turf, loose / soft, compressible, organic, suspect, or unsuitable material has been removed from the foundation footprint before the placement of foundations or gravel fill.

In accordance with NZS 3604:2011[9], site preparation should ensure that *all* topsoil, turf, and any other unsuitable material is removed from the foundation footprint before the placement of foundations or gravel fill. During excavation, should soft, organic, suspect, or unsuitable ground conditions be encountered onsite, the builder / contractor or owner must contact Davis Ogilvie or an appropriately qualified and experienced engineer to confirm foundation requirements.

Placement and testing of engineered fill, if required, must be carried out in accordance with NZS 4431:2022 – *Engineered fill construction for lightweight structures.*

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14/08/2025

[8] NZS 3604:2011 Timber-framed buildings. Published 14/02/2011.
[9] NZS 3604 clauses 3.3.7.1 and 7.5.9.2.

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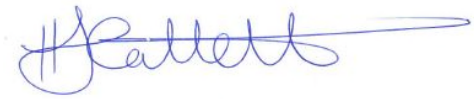
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4.0 CLOSURE

Should you have any queries regarding this report, or wish to arrange a subgrade inspection at the time of construction, please contact the undersigned.

Yours faithfully,

DAVIS OGILVIE & PARTNERS LTD.





Prepared By:
HAMISH CATTELL
Engineering Geologist
BSc (Hons), PhD, MEngNZ

Email: hamishc@do.nz

Reviewed By:
BJORN RAASCH
Principal Engineering Geologist
BSc (Hons), CMEngNZ (PEngGeol)

Email: bjorn@do.nz

REVISED
During
Processing
14/08/2025

Enclosed:

1 x Geotechnical Site Plan (DWG G79 A)
4 x DCPs with 2 x HA Logs
1 x As-Built Fill Plan (DWG AB 32)

Limitations

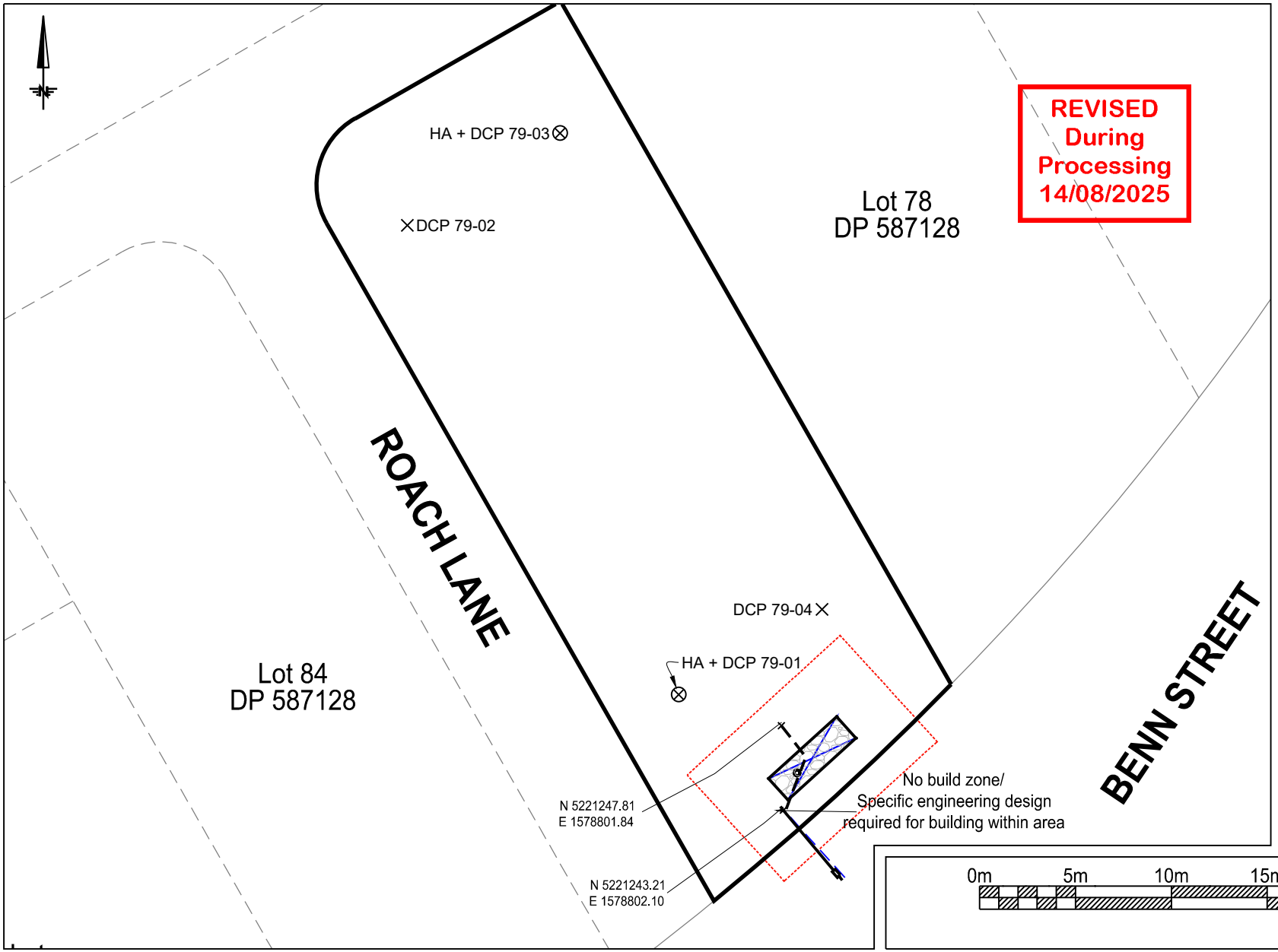
Davis Ogilvie did not perform a complete assessment of all possible conditions or circumstances that may exist at the site. Conditions may exist which were undetectable given the limited investigation of the site. Variations in conditions may occur between investigatory locations, and there may be conditions onsite which have not been revealed by the investigation, which have not been taken into account in the report. Assessments made in this report are based on the conditions found onsite. No warranty is included; either expressed or implied that the actual conditions will conform to the assessments contained in this report.

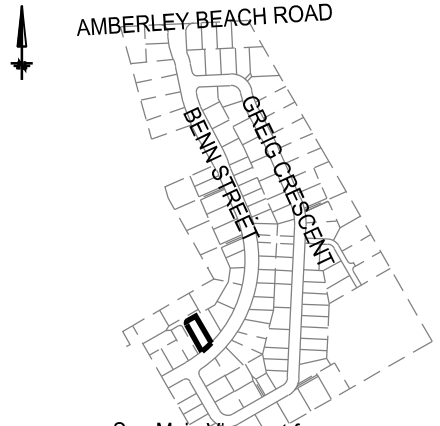
This report has been prepared solely for the purposes of UWC Limited. The information contained herein is confidential, and shall not be passed on to any third party, other than the Local Building Consent Authority, without prior written permission of Davis Ogilvie & Partners Ltd. No responsibility is accepted for any use outside the scope of this report. This report does not cover susceptibility of the site to flooding.

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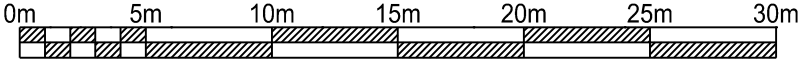
See Main Viewport for Test Locations

Scale 1:10,000

Key:

- : Site Boundary
- : Abuttal Boundary
- : Road Boundary
- : Easement
- ⊗ : Hand Auger (HA) + Dynamic Cone Penetrometer (DCP)
- × : Dynamic Cone Penetrometer (DCP)
- : 3.0 m Minimum Offset to Soakpit

Test and soakpit offset locations shown are approximate (scaled and aligned using boundaries).
Shallow geotechnical testing undertaken 24/04/2025.
Boundaries are indicative only, obtained from Davis Ogilvie Scheme Plan 300 F approved 28/04/2022.



Scale 1:300

CAD ref: 231031.41793.GeotechnicalLotTesting.dwg

DAVIS OGILVIE
ENGINEERS / SURVEYORS / PLANNERS
Davis Ogilvie & Partners Ltd - Ph. 0800 999 333

Geotechnical Site Plan
52 Benn Street, Amberley
Lot 79 DP 587128

/ design	/ drawn	/ QA check	/ dwg
HC	TM	HC	G79
/ scale @ A4	/ date	/ file	/ issue
1:300	05/25	41793	A

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DAVIS OGILVIE
Level 1, 24 Moorhouse Avenue, Addington, Christchurch 8140
P: 0800 999 333 | hello@do.nz | WWW.DO.NZ

SHALLOW INVESTIGATION RESULTS

Job No.: 41793_Lots
Test No.: Lot 79-01

Project: The Clearing, Stages 1 & 2, Amberely
Date: 24/04/25
Client: UWC Limited
Time: 3:00 PM
Test Location: Refer to attached Geotechnical Site Plan (DWG G79 A)
Excavation Method: DCP+HA

DEPTH (m)	STRATA DESCRIPTION	USCS	Graphic Log	Ground Water
	Strata description in general accordance with Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. NZ Geotechnical Society Inc, December 2005			
0.0	0.00 - 0.25m: Sandy SILT; light brown. Moist. Sand is fine (TOPSOIL).	TS	TS	Groundwater Not Encountered
0.25	0.25 - 0.35m: Gravelly fine to coarse SAND; yellowish brown. Very dense, moist. Gravel is subangular, fine to medium greywacke (ENGINEERED FILL).	FILL		
0.5	Auger terminated at 0.35m - Refusal in gravelly soil.			
1.0				
1.5				
2.0				
2.5				
3.0				

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DCP Results

DCP 79-01 Adjacent to Excavation (Blows / 100mm)	DCP 79-02 (Blows / 100mm)	RL (m)
2	1	
4	6	
5	5	
19 >>	20 >>	
37 >>	41 >>	
	34 >>	
	30 >>	

Logged By: HC
Plotted By: HC
Checked By: HC

Notes:

Dynamic Cone Penetrometer (DCP) tests and logs give an indication of the ground conditions at the location of the tests only. While they may be representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building.

Dynamic Cone Penetrometer tests are performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)

Produced with Core-GS by Geroc

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DAVIS OGILVIE
Level 1, 24 Moorhouse Avenue, Addington, Christchurch 8140
P: 0800 999 333 | hello@do.nz | WWW.DO.NZ

SHALLOW INVESTIGATION RESULTS

Job No.: 41793_Lots
Test No.: Lot 79-03

Project: The Clearing, Stages 1 & 2, Amberely
Date: 24/04/25
Client: UWC Limited
Time: 3:00 PM
Test Location: Refer to attached Geotechnical Site Plan (DWG G79 A)
Excavation Method: DCP+HA

DEPTH (m)	STRATA DESCRIPTION	USCS	Graphic Log
	Strata description in general accordance with Field Description of Soil and Rock. Guideline for the Field Classification and Description of Soil and Rock for Engineering Purposes. NZ Geotechnical Society Inc, December 2005		
0.00	0.00 - 0.35m: Sandy SILT; light brown. Moist. Sand is fine (TOPSOIL).	TS	
0.35	0.35 - 0.40m: Gravelly fine to coarse SAND; yellowish brown. Very dense, moist. Gravel is subangular, fine to medium greywacke (ENGINEERED FILL).	FILL	
0.40	Auger terminated at 0.40m - Refusal in gravelly soil.		

Groundwater Not Encountered

DCP Results

DCP 79-03 Adjacent to Excavation (Blows / 100mm)	DCP 79-04 (Blows / 100mm)
2	1
5	3
3	3
14 >>	4
35 >>	25 >>
45 >>	30 >>

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RL (m)

Logged By: HC
Plotted By: HC
Checked By: HC

Notes:

Dynamic Cone Penetrometer (DCP) tests and logs give an indication of the ground conditions at the location of the tests only. While they may be representative of typical conditions across the site, they do not identify variations in the ground away from the test locations. This log does not cover slope stability or suitability of the site for building.

Dynamic Cone Penetrometer tests are performed in accordance with NZS 4402 Test 6.5.2 (Procedure 1 and 2)

Produced with Core-GS by Geroc

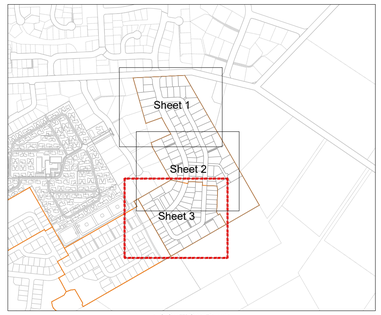
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Contractor to locate all existing services & verify all dimensions before commencing work

Rev.	Date	Reason	Approved
A1	18/10/2023	224 - Asbuilts - Fill plan	BVB

AS BUILT



LOCATION PLAN
Scale 1:10,000 m



Levels Table			
Number	Minimum Level	Maximum Level	Color
1	0.300	0.400	
2	0.400	0.500	
3	0.500	0.600	
4	0.600	0.700	
5	0.700	0.800	
6	0.800	0.900	
7	0.900	1.000	
8	1.000	1.608	

STAGE 1&2 CUT/FILL LEGEND	
Lot No.	Max site fill
1	0.45m
2	0.43m
3	0.41m
4	0.40m
8	0.51m
9	0.54m
10	0.76m
11	0.42m
12	0.45m
13	0.77m
14	1.25m
15	1.25m
16	0.84m
17	0.85m
18	1.23m
19	1.14m
20	1.24m
21	1.60m
22	1.25m
23	0.40m
24	0.52m
25	0.73m
26	1.03m
27	0.80m
28	0.95m
29	1.04m
30	0.54m
31	0.68m
32	1.01m
33	0.62m
34	0.51m
35	0.49m
36	0.55m
37	0.72m
38	0.36m
42	0.45m
43	0.61m
44	0.92m
47	0.54m
48	0.56m
55	0.40m

STAGE 1&2 CUT/FILL LEGEND	
Lot No.	Max site fill
56	0.35m
58	1.0m
60	0.47m
61	0.86m
62	0.92m
63	0.61m
66	1.01m
67	0.82m
71	0.79m
72	0.72m
78	0.96m
79	0.94m
82	0.81m
83	0.66m
84	0.71m
85	0.56m
86	0.62m
90	0.61m
91	0.91m
92	0.97m
97	0.62m
99	0.91m
102	0.90m
103	0.90m
104	0.76m
107	1.11m
108	1.11m
109	0.63m
110	0.50m
111	0.50m
112	0.42m
113	0.96m
114	0.50m
116	1.45m
117	1.56m
118	1.58m
119	1.59m
120	0.77m
121	0.67m
122	0.55m
123	0.65m

REVISED During Processing 14/08/2025

CAD ref: 41793.DwgSet4.Water & Services

DAVIS OGILVIE
ENGINEERS / SURVEYORS / PLANNERS
Davis Ogilvie & Partners Limited
Level 1, 24 Moorhouse Avenue, Addington, Christchurch 8140
Office 0800 999 333 Email hello@do.nz
www.do.nz

THE CLEARING - AMBERLEY BEACH ROAD, AMBERLEY SUBDIVISION

224 - AS-BUILTS STAGES 1 & 2
FILL PLAN - ASBUILTS SHEETS 3/3

Design	Drawn	QA Check	Dwg No.
JW	SM	BVB	AB32
Scale @ A1	Date	Job No.	Rev.
1:500	10/23	41793	A

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

Date: **16 April 2025**

Fabricator: **VIP Frames & Trusses**

Job Name: **Brendon Esler Builders**
New House
Lot 79 52 Benn Street
Amberley

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

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

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

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

Wind Zone	**Altitude**	**100m**
	Snow (Open Ground Load)	**0.900kPa**
Roof Material	**Snow (Basic Roof Load)**	**0.441kPa**

Treatment Definition:

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

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

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

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

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

Council Contacts:

Consents Officer: _____
Email #: _____
Phone: _____

Please forward to:

VIP Frames & Trusses
65-67 Wickham Street
Ph (03) 389-8200

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

Pre-consent Truss Design Agreement

By accepting this truss design from VIP Frames and Trusses you agree to the following

1) Truss designs are null and void if production is being completed by parties other than VIP Frame and Trusses

2) Truss design must be reviewed by the Architect and Engineer engaged on the project to ensure any crucial details are translated to the architectural and structural plans

3) Architect and Engineer review should also confirm plans have been interpreted correctly and the design is fit for purpose

4) Any bracing specified is indicative of location only and must be installed as per the manufacturers guidelines

MiTek New Zealand Limited

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

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

www.miteknz.co.nz

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **VIP Frames & Trusses**

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

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **400623** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited, **Date: Wednesday, 16 April 2025**



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

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
Printed: 14:28:32 16 Apr 2025

MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	~MSGx45 H1.2	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron .5mm	Material:	Gib Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
GE1	1D	3370	25.000	900	J12	1	2331	25.000	900	*R2	4	913	25.000	900	S2	2	7385	25.000	900	J21	1	2267	25.000	900
*H1	2	7942	18.249	900	J14	1	1431	25.000	900	*R3	4	913	25.000	900	S5	1	3370	25.000	900	J26	1	2267	25.000	900
*H2	1	3635	18.249	900	J15	1	1431	25.000	900	*R4	1	1144	25.000	900	S6	1	3370	25.000	900	T3	1	7385	25.000	900
*H3	1	3242	18.249	900	J16	1	3231	25.000	900	*R5	1	913	25.000	900	S7	1	5060	25.000	900	J6	1	3231	25.000	900
*H4	2	5306	18.249	900	J17	1	3231	25.000	900	*R6	1	1080	25.000	900	S8	2	5060	25.000	900	J11	1	3231	25.000	900
J1	1	3231	25.000	900	J18	1	3167	25.000	900	*R7	1	1080	25.000	900	T2	1	10108	25.000	900	J19	1	3167	25.000	900
J2	2	3231	25.000	900	J20	1	2267	25.000	900	*R8	1	6260	25.000	900	T4	1	7385	25.000	900	J24	1	3167	25.000	900
J3	1	3231	25.000	900	J22	1	1367	25.000	900	*R9	5	1305	0.000	760	V1	1	2275	25.000	900	S4	1	6380	25.000	553
J4	1	3231	25.000	900	J23	1	1367	25.000	900	*R10	2	1305	0.000	760	V2	1	1375	25.000	900	S3	1	6380	25.000	900
J5	1	3231	25.000	900	J25	1	2267	25.000	900	*R11	1D	1305	0.000	900	V3	1	1402	25.000	900	T1	1	10108	25.000	900
J7	1	2331	25.000	900	J27	1	1367	25.000	900	*R12	1	2350	25.000	900	V4	1	2302	25.000	900					
J9	1	1431	25.000	900	J28	1	1367	25.000	900	*R13	1D	2350	25.000	900	J8	1	2331	25.000	900					
J10	1	1431	25.000	900	*R1	1	1144	25.000	900	S1	11	10108	25.000	900	J13	1	2331	25.000	900					

Total quantity : 88

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

The computer design input has been carried out by:

Signed: .....

Date: ...Wednesday, 16 April 2025....

Name of Detailer: Anton Musson

Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
Printed: 14:28:20 16 Apr 2025

TRUSS FIXING SELECTION REPORT - Characteristic Loads

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

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
GE1	1D	3370	K	0.995	0.572	Wide		No fixing selected
			A	0.645	0.153	Wide		No fixing selected
			I	1.057	0.847	Wide		No fixing selected
			H	0.865	0.671	Wide		No fixing selected
			G	1.438	0.983	Wide		No fixing selected
			J	1.131	0.000	Wide		No fixing selected
*H1	2	7942						Refer NZS3604:2011 Tables 15.6
*H2	1	3635						Refer NZS3604:2011 Tables 15.6
*H3	1	3242						Refer NZS3604:2011 Tables 15.6
*H4	2	5306						Refer NZS3604:2011 Tables 15.6
J1	1	3231	B	4.322	0.739	Cross	1	Pair of Wire Dog Staples
			G	0.607	0.416	Butt	1	Pair of 3.15d Nails
			D	3.662	2.462	Cross	1	Pair of Wire Dog Staples
			I	0.760	0.266	Cross	1	Pair of Wire Dog Staples
			E	1.527	1.100	Cross	1	Pair of Wire Dog Staples
J2	2	3231	B	4.452	1.267	Cross	2	Pair of Wire Dog Staples
			F	2.225	1.357	Butt	2	JH 47x90
			D	1.003	0.664	Butt	2	JH 47x90
J3	1	3231	B	4.253	0.944	Cross	1	Pair of Wire Dog Staples
			E	0.447	0.341	Butt	1	Pair of 3.15d Nails
			D	4.017	2.628	Cross	1	Pair of Wire Dog Staples
			G	0.460	0.201	Cross	1	Pair of Wire Dog Staples
J4	1	3231	B	4.397	1.244	Cross	1	Pair of Wire Dog Staples
			D	2.598	1.745	Butt	1	JH 47x90
			F	0.787	0.299	Cross	1	Pair of Wire Dog Staples
J5	1	3231	B	4.318	0.973	Cross	1	Pair of Wire Dog Staples
			E	0.446	0.342	Butt	1	Pair of 3.15d Nails
			D	3.757	2.526	Cross	1	Pair of Wire Dog Staples
			G	0.756	0.274	Cross	1	Pair of Wire Dog Staples
J7	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J9	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J10	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J12	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J14	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J15	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J16	1	3231	A	2.914	0.599	Cross	1	Pair of Wire Dog Staples
			E	0.599	0.416	Butt	1	Pair of 3.15d Nails
			C	4.235	2.688	Cross	1	Pair of Wire Dog Staples
			F	0.548	0.122	Cross	1	Pair of Wire Dog Staples
			D	1.571	1.103	Cross	1	Pair of Wire Dog Staples
J17	1	3231	B	4.369	0.995	Cross	1	Pair of Wire Dog Staples
			E	0.444	0.344	Butt	1	Pair of 3.15d Nails
			D	4.364	2.779	Cross	1	Pair of Wire Dog Staples
J18	1	3167	B	4.388	1.244	Cross	1	Pair of Wire Dog Staples
			D	3.160	1.980	Butt	1	JH 47x90
J20	1	2267	A	2.323	0.846	Cross	1	Pair of Wire Dog Staples
			E	1.701	0.988	Butt	1	JH 47x90
			C	0.591	0.403	Butt	1	Pair of 3.15d Nails
J22	1	1367	B	2.639	0.575	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.916	0.777	Butt	1	JH 47x90
J23	1	1367	B	3.056	0.240	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.148	0.964	Cross	1	Pair of Wire Dog Staples
J25	1	2267	B	3.491	0.914	Cross	1	Pair of Wire Dog Staples
			F	1.588	0.967	Butt	1	JH 47x90
			D	0.670	0.411	Butt	1	Pair of 3.15d Nails
J27	1	1367	B	2.650	0.585	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.464	Butt	1	JH 47x90
			D	0.583	0.343	Butt	1	Pair of 3.15d Nails
J28	1	1367	B	3.092	0.245	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.144	1.000	Cross	1	Pair of Wire Dog Staples
*R1	1	1144						Refer NZS3604:2011 Tables 15.6
*R2	4	913						Refer NZS3604:2011 Tables 15.6
*R3	4	913						Refer NZS3604:2011 Tables 15.6
*R4	1	1144						Refer NZS3604:2011 Tables 15.6
*R5	1	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1080						Refer NZS3604:2011 Tables 15.6
*R7	1	1080						Refer NZS3604:2011 Tables 15.6
*R8	1	6260						Refer NZS3604:2011 Tables 15.6
*R9	5	1305						Refer NZS3604:2011 Tables 15.6
*R10	2	1305						Refer NZS3604:2011 Tables 15.6
*R11	1D	1305						Refer NZS3604:2011 Tables 15.6
*R12	1	2350						Refer NZS3604:2011 Tables 15.6
*R13	1D	2350						Refer NZS3604:2011 Tables 15.6
S1	11	10108	B	9.159	5.111	Cross	11	CT400
			J	9.159	5.111	Cross	11	CT400
S2	2	7385	B	4.523	1.775	Cross	2	Pair of Wire Dog Staples
			N	0.925	0.970	Butt	2	JH 47x90
			K	8.575	5.861	Cross	2	CT400
S5	1	3370	B	3.699	1.904	Cross	1	Pair of Wire Dog Staples
			J	4.068	2.028	Cross	1	Pair of Wire Dog Staples
			F	2.250	0.956	Cross	1	Pair of Wire Dog Staples
S6	1	3370	B	3.665	1.870	Cross	1	Pair of Wire Dog Staples
			I	4.324	2.159	Cross	1	Pair of Wire Dog Staples
			F	1.064	0.818	Cross	1	Pair of Wire Dog Staples
S7	1	5060	B	3.498	1.534	Cross	1	Pair of Wire Dog Staples
			F	1.122	0.492	Wide		No fixing selected
			H	4.757	3.090	Wide		No fixing selected
S8	2	5060	B	5.039	2.592	Cross	2	Pair of Wire Dog Staples
			F	4.133	2.525	Cross	2	Pair of Wire Dog Staples
T2	1	10108	B	9.035	5.136	Cross	1	CT400
			I	9.035	5.136	Cross	1	CT400
T4	1	7385	B	4.986	2.271	Cross	1	Pair of Wire Dog Staples
			N	2.297	0.899	Butt	1	JH 47x90
			K	6.526	4.324	Cross	1	CT400
V1	1	2275	A			Wide		No fixing selected
V2	1	1375	A			Wide		No fixing selected
V3	1	1402	A			Wide		No fixing selected
V4	1	2302	A			Wide		No fixing selected
J8	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J13	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J21	1	2267	A	2.480	1.183	Cross	1	Pair of Wire Dog Staples
			E	1.725	1.054	Butt	1	JH 47x90
J26	1	2267	B	3.652	1.245	Cross	1	Pair of Wire Dog Staples
			F	1.597	1.037	Butt	1	JH 47x90
T3	1	7385	B	4.403	1.916	Cross	1	Pair of Wire Dog Staples
			M	13.702	8.722	Cross	1	CT400
			Q	3.704	2.686	Butt	1	JH 47x90
J6	1	3231	B	5.668	2.358	Cross	1	Pair of Wire Dog Staples
			H	4.122	2.637	Butt	1	JH 47x90

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Job: 400623
Client: Brendon Esler Builders
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Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:
MiTek 20/20 Engineering 4.7.346.0
MiTek New Zealand Limited
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Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J11	1	3231	B	4.017	2.220	Cross	1	Pair of Wire Dog Staples
			F	3.910	2.915	Cross	1	Pair of Wire Dog Staples
J19	1	3167	B	5.652	2.278	Cross	1	Pair of Wire Dog Staples
			F	4.084	2.503	Butt	1	JH 47x90
J24	1	3167	B	5.541	2.265	Cross	1	Pair of Wire Dog Staples
			F	3.926	2.487	Butt	1	JH 47x90
S4	1	6380	A	5.659	5.127	Cross	1	CT400
			E	5.979	3.859	Cross	1	CT400
S3	1	6380	A	10.408	6.430	Cross	1	CT400
			E	11.250	6.490	Cross	1	CT400
T1	1	10108	B	17.770	10.733	Cross	1	CT400
			G	14.701	8.763	Cross	1	CT400

Fixing List

Qty	Selected Fixing
59	Pair of Wire Dog Staples
19	Pair of 3.15d Nails
23	JH 47x90
34	CT400
12	No fixing selected

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

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

Design Certificate

PROJECT

Project Name	**Brendon Esler Builders**
Project Address	Lot 79 52 Benn Street , Amberley

CALCULATION SUMMARY

Calculation Name	Product Code	Description	Product Length*
Garage Door	PL12H1-350100	Prolam 315x90 Non-Visual PL12 H1.2	5.0 m
VERANDA	PL10H1-200100	Prolam 190x90 Non-Visual PL10 H1.2	3.2 m

*Confirm required length with architectural drawings and/or on site prior to ordering. Non-bracing post lengths noted exclude footing embedment (if any).

1) GARAGE DOOR

Product Code	**PL12H1-350100**	Calculator	Lintel Supporting Multiple Girder Trusses
Product Description	Prolam 315x90 Non-Visual PL12 H1.2	Product Length	5.0 m

Lintel Span	**4.8 m**
Loaded Dimension	**3.2 m**
Supported Roof Width	**6.2 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Wet in Service	**No**

Snow Zone	**N4**
Site Elevation	**100**
Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**315 mm**
Member Width	**90 mm**
Max. Movement	**10.8 mm**
Deflection	**5.1 mm**
Capacity Ratio	**1.1**
Rigidity Ratio	**1.1**
Support Reaction	**12.3 kN**
Uplift Restraint Required	**6.5 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

2) VERANDA

Product Code	**PL10H1-200100**	Calculator	Lintel Roof and Ceiling
Product Description	Prolam 190x90 Non-Visual PL10 H1.2	Product Length	3.2 m

Lintel Span	**3.0 m**
Loaded Dimension	**2.4 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Snow Zone	**N4**
Site Elevation	**100**
Wet in Service	**No**

Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**190 mm**
Member Width	**90 mm**
Max. Movement	**4.9 mm**
Deflection	**2.7 mm**
Capacity Ratio	**1.8**
Rigidity Ratio	**2.4**
Support Reaction	**5.4 kN**
Uplift Restraint Required	**2.9 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

PRODUCER STATEMENT

Tasman Consulting Engineers Limited has been engaged by Prowood Limited to provide the design services that are as used for the Prolam on-line calculator (the Prolam Specifier). The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS 1170, NZS AS 1720.1:2022 and with reference to NZS 3604:2011. This producer statement covers that design work.

Provided that the Prolam Specifier has been used correctly and that all entered values are correct I believe, on reasonable grounds, that the resulting design will meet the requirements of NZBC clause B1 (structure) as an alternative means of verification.

Substitution of the Prowood products listed is not provided for and if substitution occurs then this statement is nullified.

28 March 2025 (3.1.0)

David King
ME(civil) CMEngNZ CPEng(no 145511) IntPE(NZ)
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050

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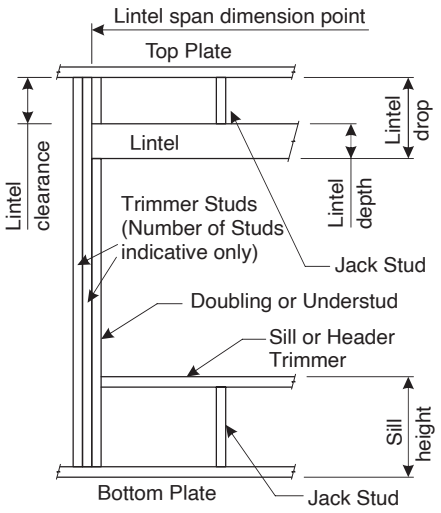
LINTEL FIXING SCHEDULE

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 0.20kPa
- 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
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	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

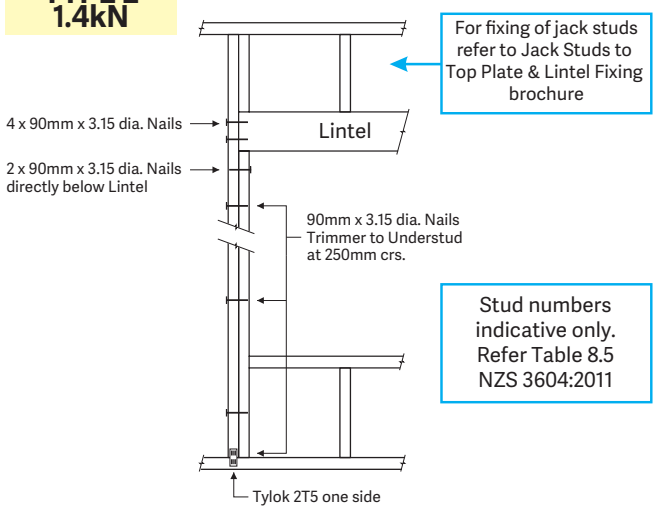
Selection Chart for Lintel Fixing											
Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	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	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	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	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	F	G	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-
5.4	2.0	F	F	G	H	H	E	F	G	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-

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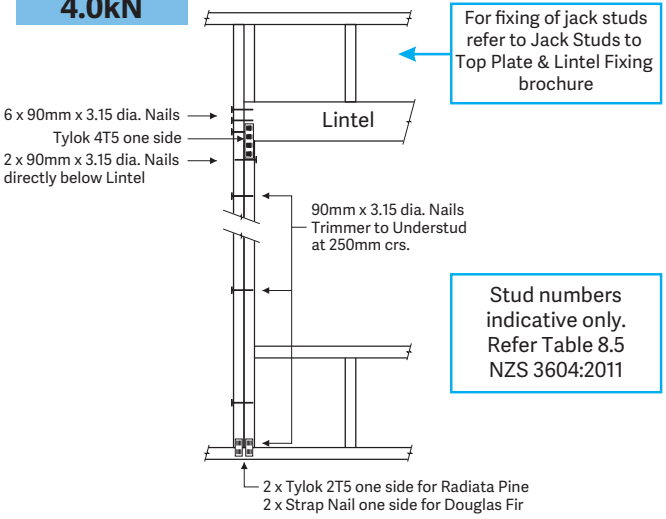
LINTEL FIXING OPTIONS

(Characteristic Uplift)

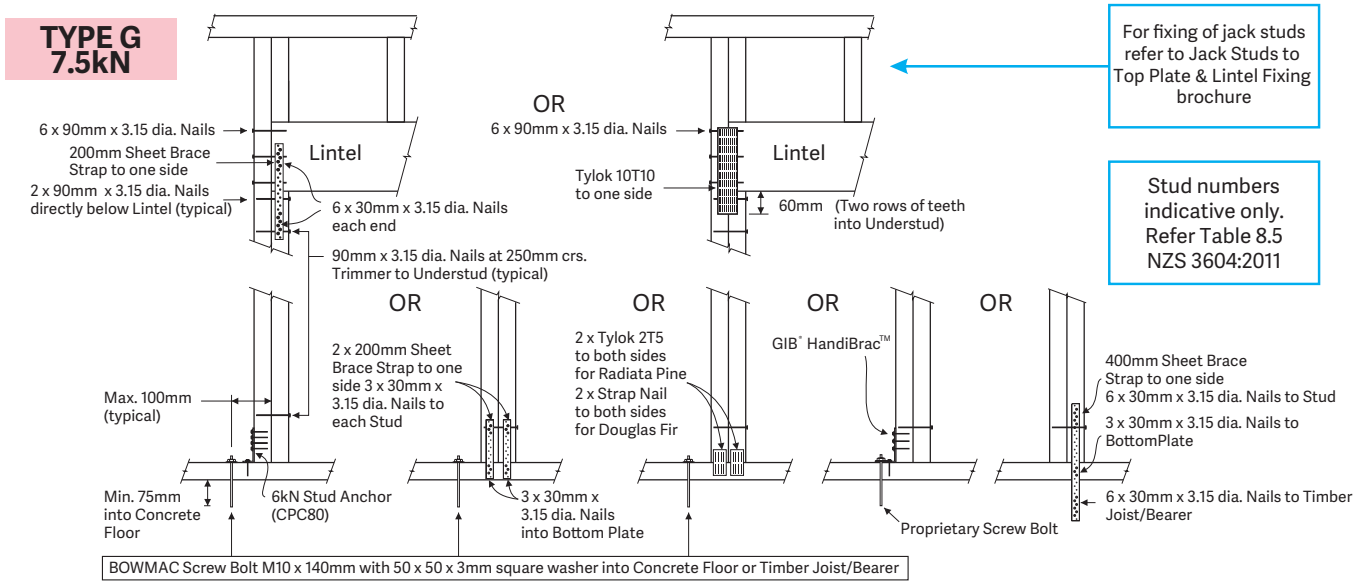
TYPE E 1.4kN



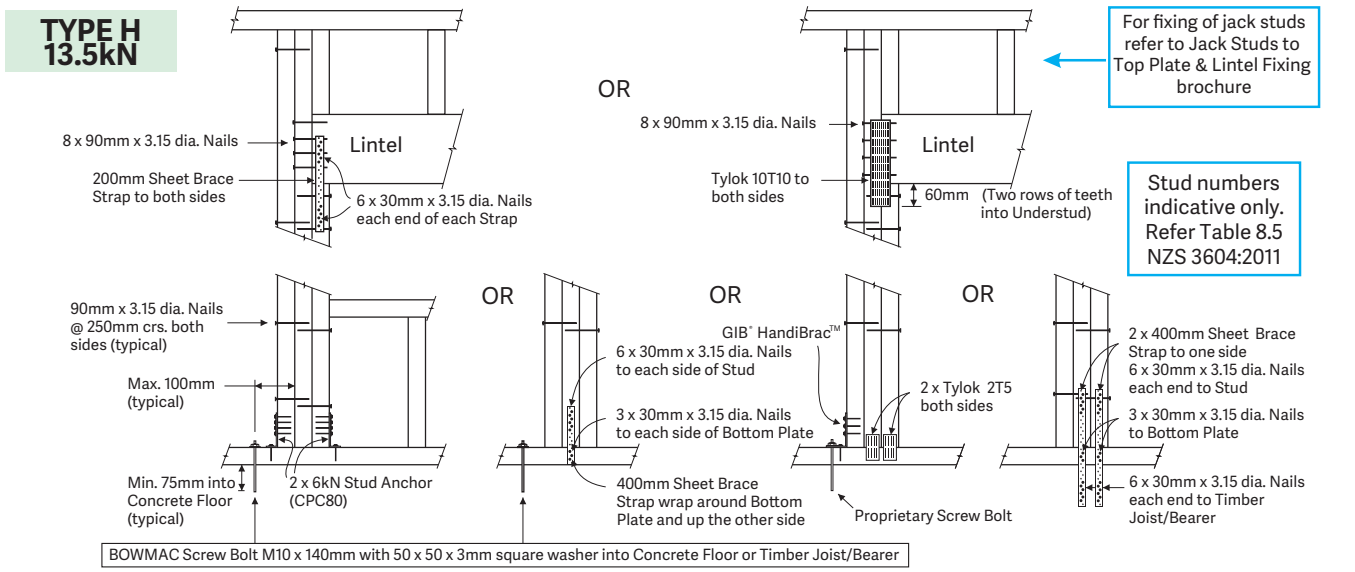
TYPE F 4.0kN

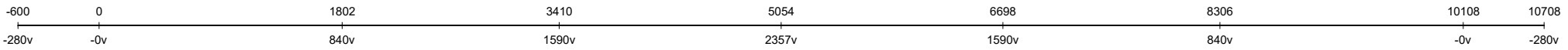


TYPE G 7.5kN

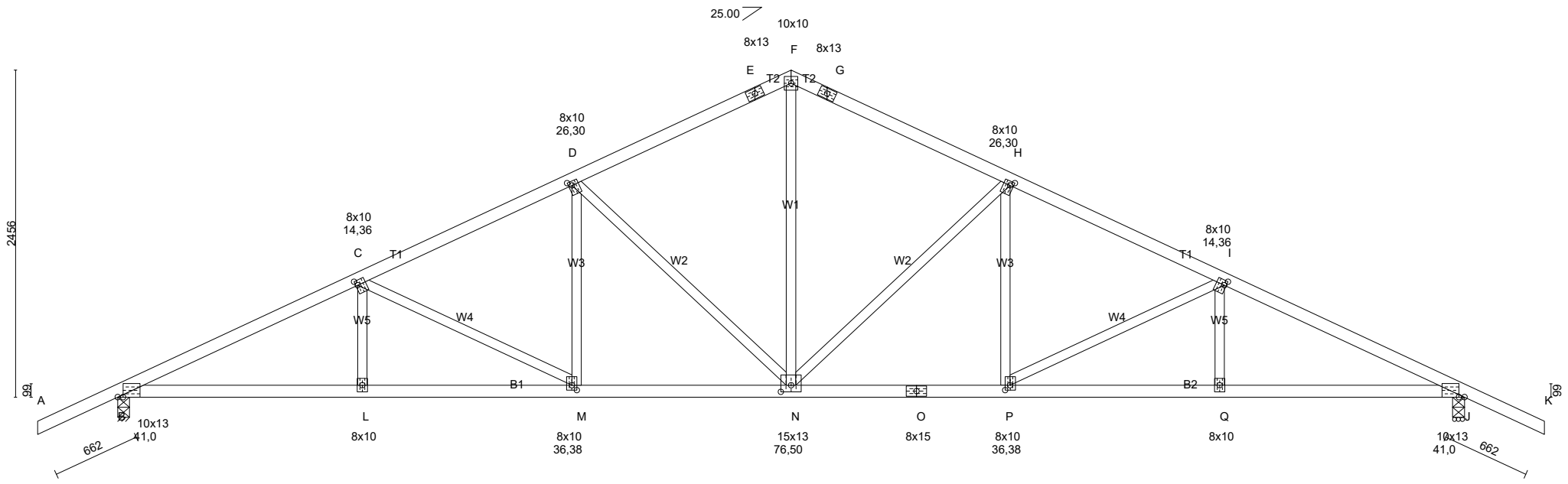


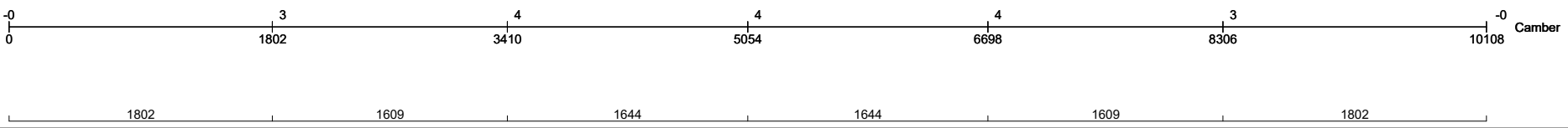
TYPE H 13.5kN





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*** Designed with warnings ***

Uplift at joint(s) B and J exceeds the capacity of two wire dogs. Please ensure that adequate fixing is provided
All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2736 mm

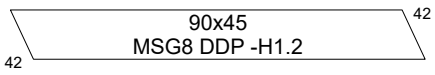
CHORDS
All: 90x45 DDP MSG8 H1.2

WEBS
All: 70x45 DDP MSG6 H1.2

CONNECTORS
176 of 176/GNQ-8x10
22 of 22/GNQ-10x10
44 of 44/GNQ-8x13
22 of 22/GNQ-8x15
44 of 44/GNQ-10x13
22 of 22/GNQ-15x13

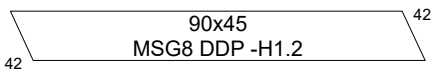
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Piece: T2 — 22/22 Off



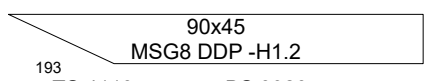
65.0
OL:342 TS:300 BS:300

Piece: T1 — 22/22 Off



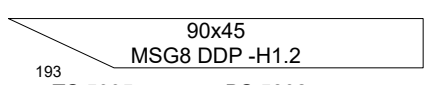
65.0
OL:5980 TS:5939 BS:5939

Piece: B2 — 11/11 Off



OL:4113 TS:4113 BS:3920

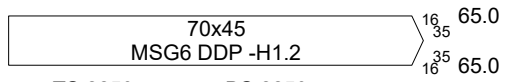
Piece: B1 — 11/11 Off



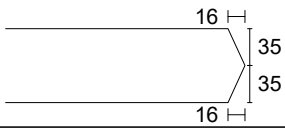
OL:5995 TS:5995 BS:5802

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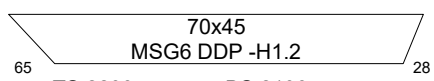
Piece: W1 — 11/11 Off



OL:2267 TS:2250 BS:2250

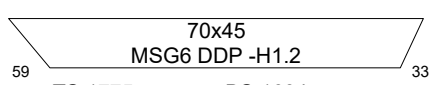


Piece: W2 — 22/22 Off



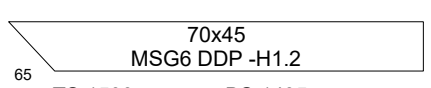
OL:2200 TS:2200 BS:2106

Piece: W4 — 22/22 Off



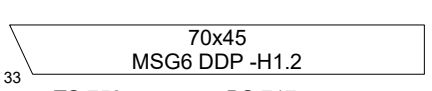
OL:1775 TS:1775 BS:1684

Piece: W3 — 22/22 Off
90.0



OL:1500 TS:1500 BS:1435

Piece: W5 — 22/22 Off
90.0



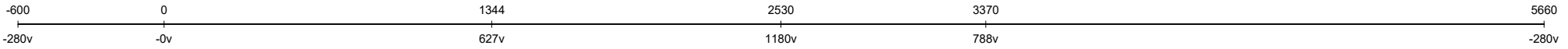
OL:750 TS:750 BS:717

Qty: 1 of 1 **Ply: 1** **Bundle: None** Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

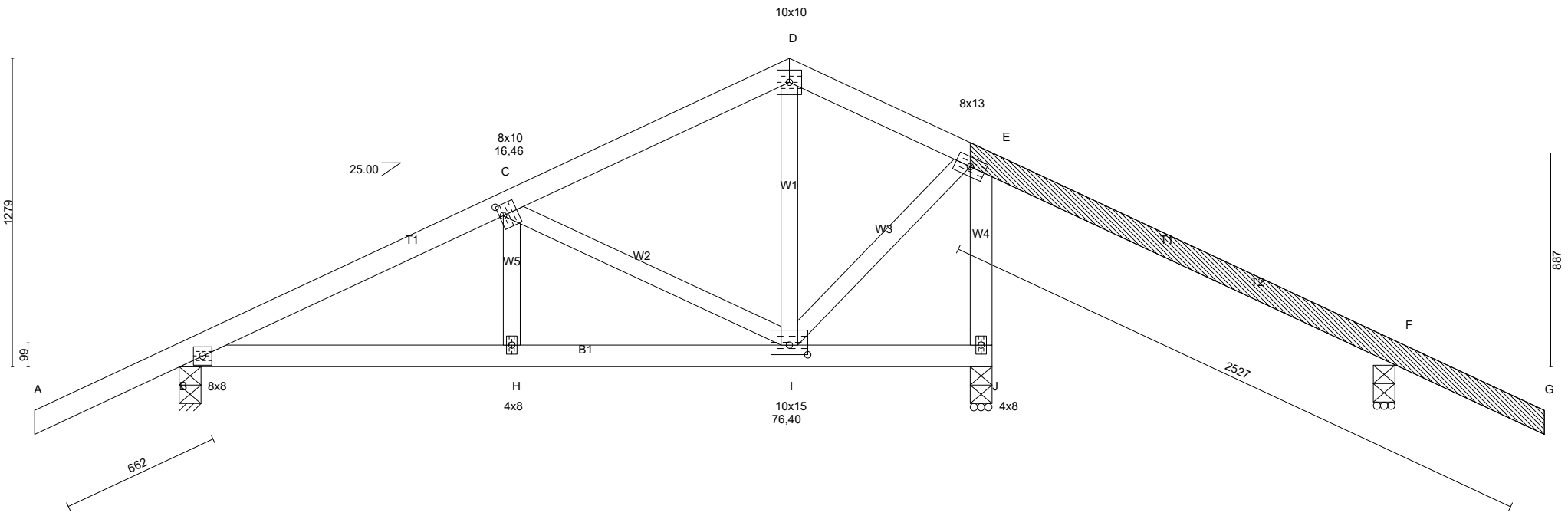
Client: Brendon Esler Builders
Phone:

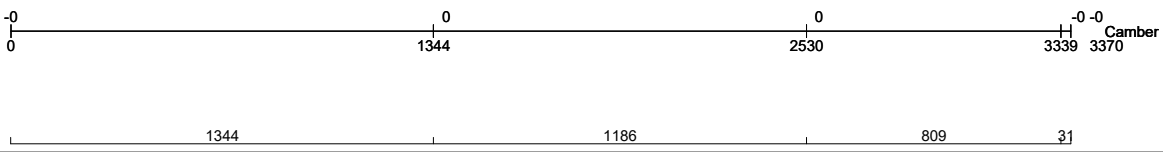
Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:



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Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1559 mm

CHORDS		**WEBS**	
All:	90x45 DDP MSG8 H1.2	**All:**	70x45 DDP MSG6 H1.2
CONNECTORS			
4 of 4/GNQ-4x8	2 of 2/GNQ-8x8	2 of 2/GNQ-8x10	2 of 2/GNQ-8x13
2 of 2/GNQ-10x10	2 of 2/GNQ-10x15		
SCAB NAILING			
T2	2 rows of 90 x 2.8 dia. nails at 80 mm		

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 1/1 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:2668 TS:2626 BS:2626

Piece: T1 — 2/2 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:3495 TS:3453 BS:3453

Piece: B1 — 1/1 Off
90x45 MSG8 DDP -H1.2
25.0 | 193 | 90.0
OL:3370 TS:3370 BS:3177

===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 1/1 Off
70x45 MSG6 DDP -H1.2
50.0 | 59 | 33 | 65.0
OL:1270 TS:1270 BS:1178

Piece: W1 — 1/1 Off
90.0
70x45 MSG6 DDP -H1.2
16 | 35 | 65.0
16 | 35 | 65.0
OL:1090 TS:1073 BS:1073
16 | 35 | 35 | 16

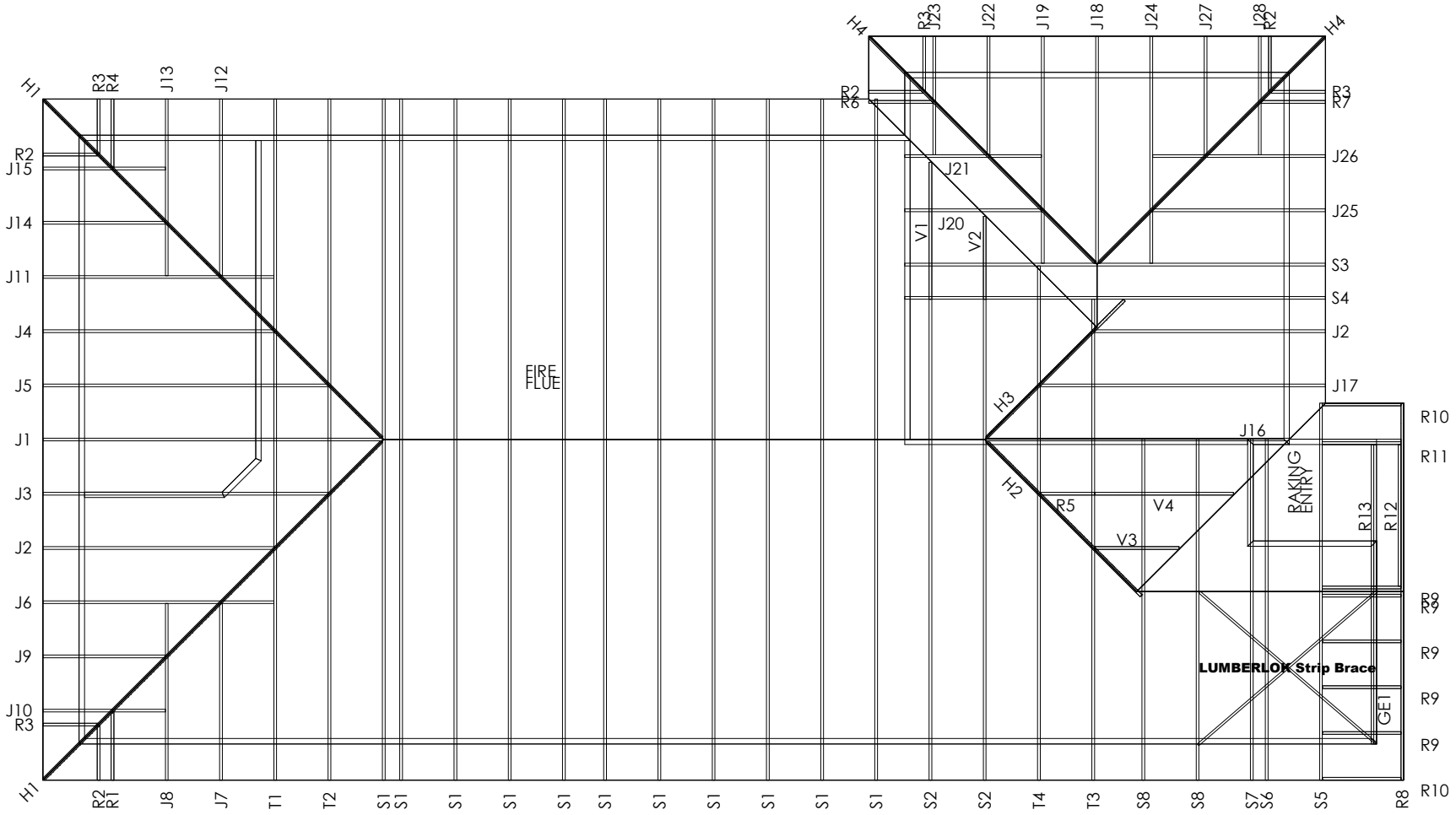
Piece: W3 — 1/1 Off
70x45 MSG6 DDP -H1.2
44.0 | 72 | 24 | 71.0
OL:1029 TS:1029 BS:932

Piece: W5 — 1/1 Off
70x45 MSG6 DDP -H1.2
65.0 | 33 | 90.0
OL:537 TS:537 BS:504

Piece: W4 — 1/1 Off
90.0
90x45 MSG8 DDP -H1.2
42 | 65.0
OL:740 TS:698 BS:740

Roof Bracing

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

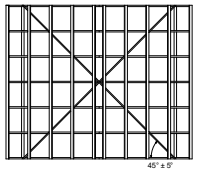
Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

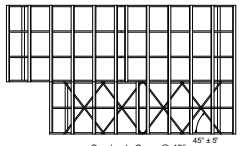
Pitch: 25.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.441

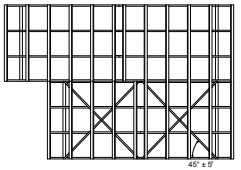
Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson
DATE 16 Apr,2025 PAGE 1 of

Roof Bracing Details


Single Cross @ 45°

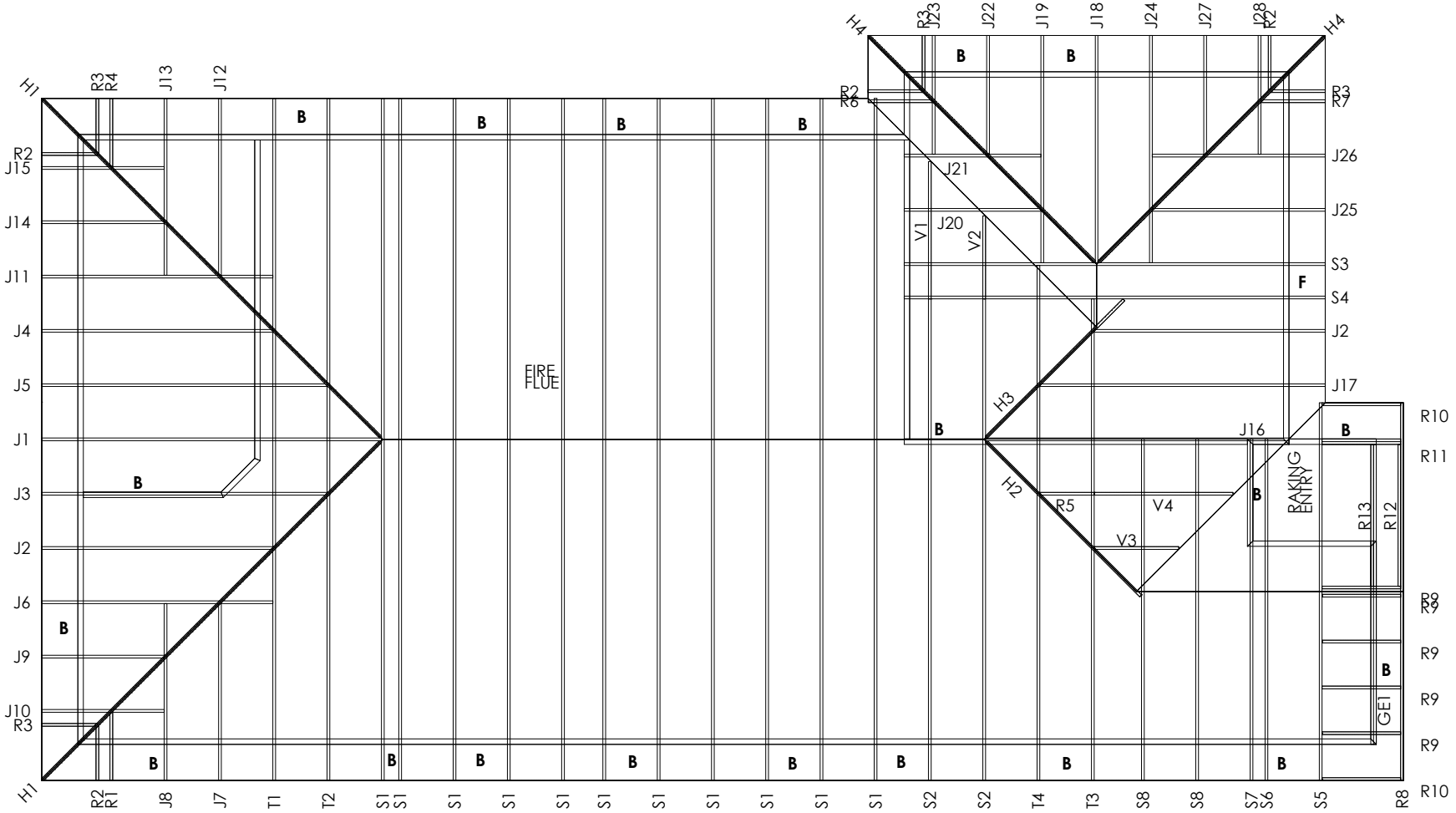

Quadruple Cross @ 45°


Double Cross @ 45°
(as diagram above)

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

All internal wall shown on this layout are considered to be Load Bearing(loads not exceeding 10 kN)
No slab thickening required

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VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

Pitch:	25.000
Roof Material:	Galv Iron .5mm
Soffit Overhang:	600
Wind Area:	High
Snow Load:	0.441

Trusses And Rafters At 900 Centres Unless Stated Otherwise

DRAWN BY Anton Musson

DATE 16 Apr,2025 PAGE 1 of

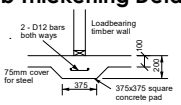
These lintels have been sized as per the GANGLAM and FLITCH BEAM selection manuals as provided by MiTek NZ Ltd.

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

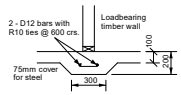
Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	SG8
B	140x90	PL10
C	190x90	PL10
D	240x90	PL10
E	290x90	PL10
F	315x90	PL12

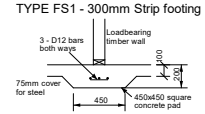
Slab Thickening Details



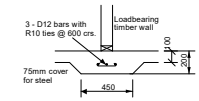
TYPE FP1 - 375x375mm Pad



TYPE FS1 - 300mm Strip footing



TYPE FP2 - 450x450mm Pad



TYPE FS2 - 450mm Strip footing

LUMBERLOK®

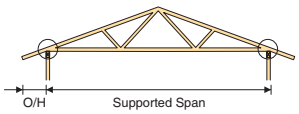
STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

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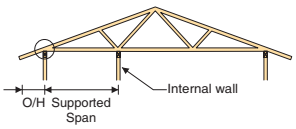
NOTE:

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

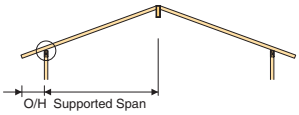
LOADED DIMENSION DEFINITION



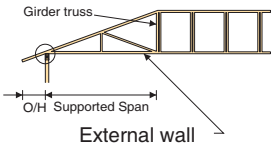
External wall
Standard truss



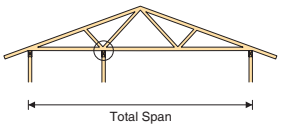
External wall
Internally supported truss



External wall
Rafter roof



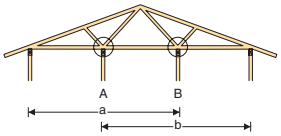
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

FIXING SELECTION CHART

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

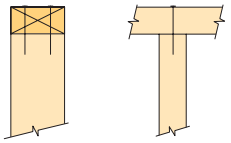
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

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

FIXING OPTIONS

FIXING TYPE A 0.7 kN

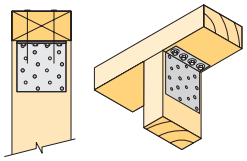
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



FIXING TYPE B 4.7 kN

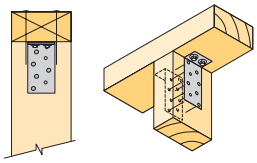
CHOOSE ANY OF THE 3 OPTIONS BELOW

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



Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

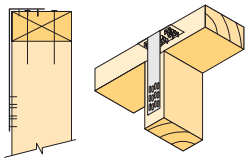
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

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



Plus
LUMBERLOK
Stud Strap
(one face only)

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

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GIB EzyBrace® Bracing Software

Demand Calculation Sheet

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Job Details

Name:	UWC Ltd
Street and Number:	52 Benn St
Lot and DP Number:	Lot 79 Dp 587128
City/Town/District:	Amberley
Designer:	JKH
Company:	
Date:	Saturday, 12 April 2025

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.9
Building Height to Apex (m)	5.2
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	24.6
Building Width (m)	11.2
Building Plan Area (m²)	196.3

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Building Location

Wind Zone = High

Earthquake Zone 3

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**625**	**1500**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1603**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									625	1603
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1687 270%	1771 110%
a	1	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	5	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	External Length =				24.6				720 OK	810 OK
b	1	3.20		2.4	GS1-N	GIB®	221	192		
	2	3.20		2.4	GS1-N	GIB®	221	192		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	External Length =				24.6				498 OK	437 OK
c	1	0.90		2.4	EP1/EPB1-06	EcoPly & EP Barrier	86	95		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.00		2.4	EP1/EPB1-06	EcoPly & EP Barrier	95	105		
	External Length =				24.6				469 OK	524 OK

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GIB EzyBrace® Bracing Software

Single Level Across Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									1500	1603
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1773 118%	1721 107%
m	1	0.45		2.4	BLP-H	GIB®	56	62		
	2	0.55		2.4	BLP-H	GIB®	72	77		
	3	0.50		2.4	BLP-H	GIB®	64	69		
	4	0.50		2.4	BLP-H	GIB®	64	69		
	External Length = 11.2								255 OK	278 OK
n	1	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								214 OK	186 OK
o	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	2.40		2.4	GS1-N	GIB®	166	144		
	External Length = 11.2								380 OK	330 OK
p	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	3.10		2.4	GS1-N	GIB®	214	186		
	External Length = 11.2								428 OK	372 OK
q	1	1.10		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	105	116		
	2	1.10		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	105	116		
	External Length = 11.2								209 OK	231 OK
r	1	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	External Length = 4								288 OK	324 OK

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Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
EcoPly & EP Barrier	EP1/EPB1-0.4	0.4	80	95
EcoPly & EP Barrier	EP1/EPB1-0.6	0.6	95	105
EcoPly & EP Barrier	EP1/EPB1-1.2	1.2	120	135
OSB	OSB	0.4	90	101
EP Barrier	EPBS-0.4	0.4	60	60
EP Barrier	EPBS-1.2	1.2	65	70
EP Barrier	EPBS-2.4	2.4	80	90
EcoPly & EP Barrier	EPG/EPBG-0.4	0.4	100	115
EcoPly & EP Barrier	EPG/EPBG-1.2	1.2	150	150
EcoPly & EP Barrier	EP2/EPB2-0.6	0.6	105	115
Villa Board	VV	0.6	130	101
GBPF2100S	Gamma Brace	1	20.6	22.8
IBS	S7	0.6	100	100
IBS	S7	0.4	94	104
Home RAB	RAB	0.4	85	91

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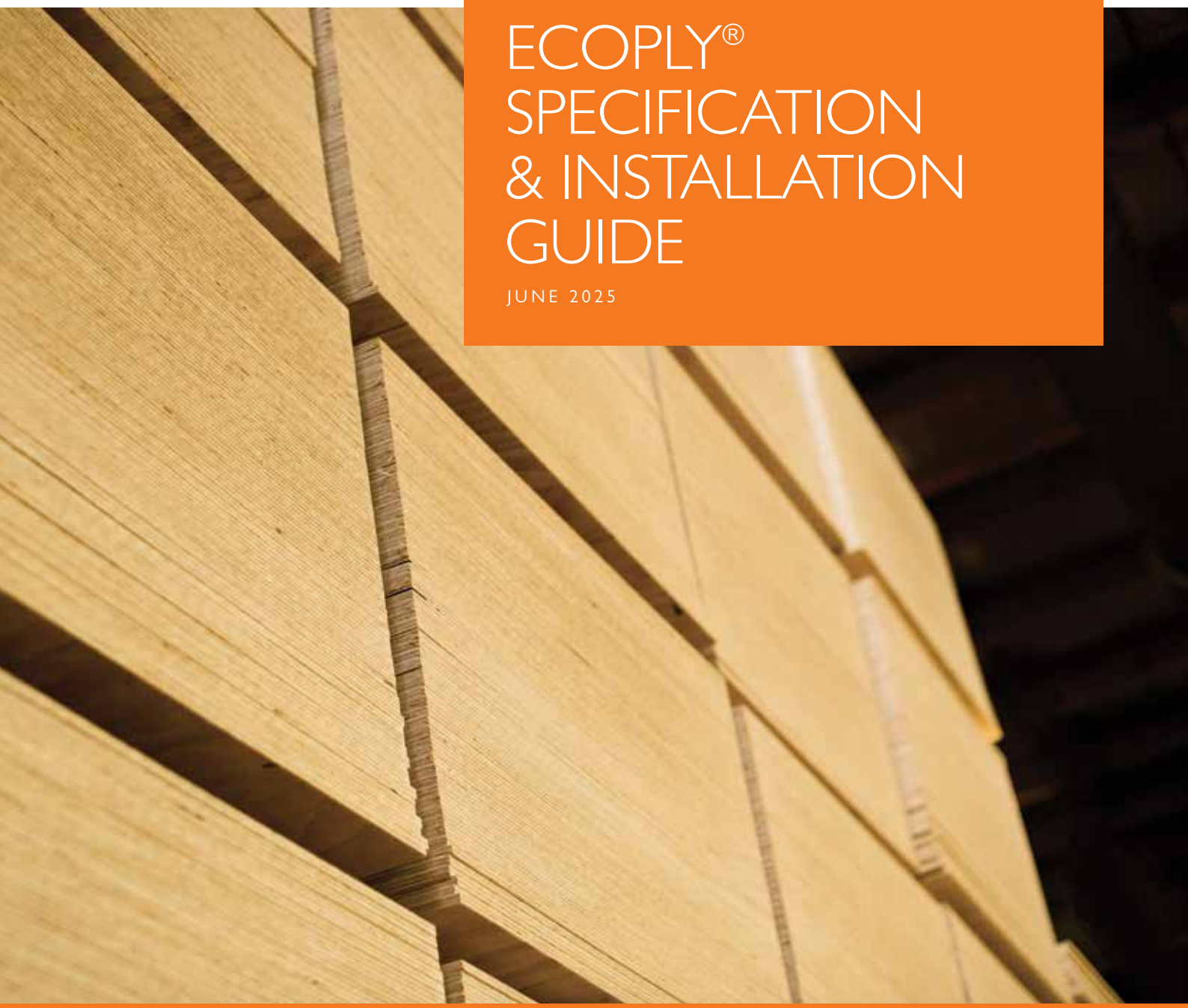
ecoply®

ecoply® FLOORING | ecoply® ROOFING | ecoply® Square EDGE | ecoply® BARRIER

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ECOPLY® SPECIFICATION & INSTALLATION GUIDE

JUNE 2025



CHH PLY

Information contained within is specific to Ecoply® structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

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ecoply®

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ECOPLY® SPECIFICATION & INSTALLATION GUIDE



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1.0 ECOPLY® PRODUCT RANGE

Manufactured and/or distributed by Carter Holt Harvey Plywood, the Ecoply® portfolio represents a range of structurally rated plywood products.

Ecoply is manufactured under a third party audited quality control programme to monitor compliance with AS/NZS 2269 Plywood Structural.

For information relating to Shadowclad® panels and plywood used as an exterior cladding, refer to the current Shadowclad Specification and Installation Guide for Cavity Construction. For information relating to Ecoply Barrier used as a rigid air barrier refer to the current Ecoply Barrier Specification and Installation Guide. Both of these documents can be downloaded from www.chhply.co.nz.

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

1.1 TECHNICAL INFORMATION & CAD DETAILS

When specifying or installing any Ecoply plywood products visit www.chhply.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

The information contained in this document is current as at June 2025. It is your responsibility to ensure you have the most up to date information available.

The information contained in this publication relates specifically to Ecoply® structural plywood products manufactured and/or distributed by Carter Holt Harvey Plywood and must not be used with any other plywood manufacturer's product no matter how similar they may appear.

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

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1.2 PRODUCT DESCRIPTION & RANGE

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

The strength of Ecoply plywood is optimised for maximum performance parallel to the face grain with cross plies providing enhanced stability across the grain.

The Ecoply plywood range can be specified for:

- Surface grade (e.g. CD) - where the first letter describes the face veneer appearance and the second letter describes the back veneer of the Ecoply sheet. Surface grades are defined in AS/NZS 2269 and summarised in Tables 2A and 2B.
- Stress grade - utilises the symbol F and a suffix for both parallel and perpendicular to the grain directions, for example;
  - F8/F8 as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade in both directions.
  - For plywood 15mm thick and below all Ecoply products are minimum F8/F8.
  - For Ecoply plywood products 17mm thick and above most products are F8/F5.
  - Ecoply 19mm Longspan Flooring is F11/F8 stress grade (See Tables 1, 4 and 5).
- Thickness - ranging from 7mm to 25mm.
- Length - being 2400mm and 2700mm with a standard nominal width of 1200mm.
- Preservative treatment - being untreated, H3.2 CCA or H3.1 LOSP Azole treated.
- Edge finish - being square edge or for Ecoply Flooring and Roofing, routed on the long edges of the sheet with a polypropylene plastic tongue inserted into one side for a tongue-in-groove joint.

For general installation advice refer to section 2.0: General Installation Guide.

For specification and installation advice for Ecoply used in typical applications refer to the following sections.

Typical Application	Section
Structural bracing and ceiling diaphragms	3.0
Roofs and decks	4.0
Flooring	5.0

Note: Technical notes referenced in this guide can be downloaded from www.chhply.co.nz or contact Carter Holt Harvey Plywood on 0800 326 759.

Table 1: Ecoply® Product Range

Stress Grade (UNO)		F8/F8								F8/F5							
Nominal Thickness (mm)		7		9		12		15		17		19		21		25	
Sheet length (x 1200mm width)		2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700	2400	2700
Ecoply® Structural Square Edge	CD	●		●	●	●	●			●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●			●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD											●[1]	●[1]	●	●	●	
Ecoply Roofing (pt)[1]	DD								●								

● Available untreated only
● Available either untreated or H3.2 CCA
● Available H3.2 CCA only

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200mm cover.

1 Ecoply 15mm Roofing and Ecoply 19mm Longspan Flooring are supplied as standard in F11/F8 stress grade.

- Full range may not always be available ex stock, check with your Ecoply supplier to ensure availability.
- Non standard specifications, including thicker sheets may be available to special order in significant quantities.

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1.3 SURFACE GRADES

Table 2A summarises the surface appearance grades in which Ecoply® structural plywood is available with some typical applications for each surface grade.

The surface grade specifications are defined in AS/NZS 2269. Table 2B details surface appearance grades for speciality Ecoply plywood and typical applications.

Table 2A: Ecoply® Structural Square Edge Products

Face Grade C	Face Grade D
	
Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish. Ecoply panels may include minor imperfections associated with veneer based wood products. Ecoply Panels are subject to natural characteristics of timber, Ecoply may contain filler and require additional preparation prior to coating application to achieve the desired aesthetic requirements.	Non appearance grade allowing open imperfections up to 75mm across the face veneer. Splits and knots allowable.
Possible Uses:	**Possible Uses:**
• Structural gussets • Stressed skin panels • Bins, boxes, crates • Hoardings • Membrane substrate	• Non visual bracing • Strength critical pallets • Structural components • Portal frame gussets

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Table 2B: Speciality Ecoply® Products

Flooring CD	Roofing DD
	
Solid sanded C grade surface with tongue and groove profile on long edges.	Unfilled D grade surface with tongue and groove profile on long edges.
Possible Uses:	**Possible Uses:**
• Substrate for flooring overlays such as linoleum, tiles and rigid coverings • Substrate for membrane roofing and decking where visible appearance is critical	• Substrate for asphalt shingles • Substrate for roof systems where a smooth substrate is not required

Notes: A higher visual grade may be substituted if required. e.g. Ecoply® CD can be used anywhere DD is used. Pictures shown above are scaled down versions of typical Ecoply sheets. Grain pattern and colour may vary. If sheet appearance is critical select panels individually.

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1.4 PRESERVATIVE TREATMENT

Ecoply® structural plywood is available untreated or treated in accordance with AS/NZS 1604.3:2012 If treated, Ecoply structural plywood is treated with either H3.2 CCA (Copper Chrome Arsenate) or H3.1 LOSP (Azole) clear treatment.

H3.2 CCA and H3.1 LOSP treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside, above ground, subject to periodic moderate wetting and leaching."

Ecoply® plywood is envelope preservative treated. Where sheets are cut, cuts must be coated with a brush on timber preservative. Soudal® Metalex® Concentrated Timber Preservative Clear (Soudal® Metalex® Clear) is recommended. Failure to do so will affect the long term durability of the panel.

The characteristics of the treatments are shown in Table 3.

Table 3: Preservative Treatment

	Untreated	H3.2 CCA	H3.1 LOSP (Azole)
Preservative Carrier	N/A	Water	Light organic oil (white spirits)
Colour	Natural	Green	Clear (i.e. natural)
Fungicide	Heat treated dry wood	Copper	Propiconazole and Tebuconazole
Insecticide	Heat treated dry wood	Arsenate	Permethrin
Other Chemicals	N/A	Chrome (to fix preservative in wood)	Butyl Oxitol (co-solvent to assist active stability)
Mouldicide	N/A	Copper (limited efficacy)	IPBC
Notes	Plywood for dry interior use, supplied ex mill at <15% moisture content	Dried after treatment to average 18% moisture content for use in service at higher moisture contents	Solvent does not affect dimensions. Solvent smell disappears over time
Availability	Readily available	Standard treatment	Treated to order for CD, DD, flooring and roofing products.
Applications (Refer NZS 3602)	Interior dry protected	Exterior/Interior damp (service performance subject to detailing and coatings)	

H3.2 CCA

Ecoply structural plywood, which is H3.2 CCA treated (waterborne preservative with a green colour), is dried following treatment so that sheets may return to the correct dimensions. The moisture content after treatment with CCA and drying will be higher than the limits placed in AS/NZS 2269 on untreated product. The target is for an average moisture content of approximately 18% to provide a panel closer to the expected equilibrium moisture content for most H3.2 CCA applications.

The fillets used to separate sheets in drying may leave marks on the sheet surface. These will fade over time as the plywood weathers, and can be disguised with paint but may be visible under stain. The process of treating with H3.2 CCA and subsequent drying is likely to increase the face checking of the panel.

For more information on face checking refer to section 1.8 General Design Considerations - Aesthetics.

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H3.1 LOSP

H3.1 LOSP treated Ecoply retains the wood colour and does not contain moisture so the plywood remains at the same dimensions and moisture content during treatment. However, the plywood when freshly treated may contain more than 60 litres of organic fluid per cubic metre. When coating H3.1 LOSP treated plywood, traces of residual solvent may be present on the sheet surface from the treatment process. Sheets feeling greasy to touch should be placed in a well ventilated area and allowed to flash off to ensure proper adhesion of paints and stains to the sheet surface.

The H3.1 LOSP solvent smell can be quite strong and venting is recommended until most of the solvent has evaporated. Untreated plywood is recommended for internal applications where NZS 3602 allows the use of untreated plywood.

Mechanical fasteners are recommended to fix H3.1 LOSP treated Ecoply to framing. If adhesives are required, thorough venting is recommended and H3.1 LOSP tolerant adhesives should be applied according to the adhesive manufacturer's instructions. See section 2.3 Adhesives.

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1.5 SECTION PROPERTIES

Table 4A: Section Properties of Ecoply® Structural Plywood

			Section Properties per mm width					
			Parallel to the Face Grain			Perpendicular to the Face Grain		
Nominal Plywood Thickness[2] (mm)	**ID Code[2]**	**Mass** (kg/m²)	**Parallel Moment of Inertia** (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant[3]** I/Q (mm²)	**Perpendicular Moment of Inertia** I (mm⁴)	**Section Modulus** Z (mm³)	**Shear Constant[3]** I/Q (mm²)
7	7-24-3	4.6	30.0	8.3	5.2	2.1	1.0	1.6
9	9-30-3	5.9	58.6	13.0	6.5	4.0	1.5	2.0
12	12-24-5	7.8	114.9	19.0	9.3	33.4	8.3	5.2
15	15-30-5	9.8	224.5	29.7	11.6	65.2	13.0	6.5
17	17-24-7	11.0	284.5	33.5	12.2	122.5	19.0	9.3
19	19-30-7	12.3	450.7	46.5	13.8	156.8	21.7	10.5
21	21-30-7	13.6	555.7	52.3	15.3	239.2	29.7	11.6
25	25-30-9	16.2	896.7	72.0	18.0	381.1	38.1	13.5

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design

			Nominal Strengths (Limit States) per mm width					
			Parallel to the Face Grain			Perpendicular to the Face Grain		
Nominal Plywood Thickness[2] (mm)	**ID Code[2]**	**Stress Grade**	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm²)	**Rolling Shear $f_{pr}I/Q$** (N)	**Bending Stiffness EI** (1000 Nmm²)	**Bending Moment $f_{pb}Z$** (Nmm)	**Rolling Shear $f_{pr}I/Q$** (N)
12	12-24-5	F8/F8	1046.0	475.2	15.8	303.7	208.0	8.8
15	15-30-5	F8/F8	2043.0	742.5	19.8	593.2	325.0	11.1
	15-30-5	F11/F8	2357.3	920.7	21.0	593.2	325.0	11.1
17	17-24-7	F8/F5	2589.0	836.6	20.7	845.1	266.1	13.8
	17-24-7	F11/F8	2987.3	1037.3	22.0	1114.6	475.2	15.8
19	19-30-7	F8/F5	4101.4	1162.5	23.4	1082.0	304.2	15.5
	19-30-7	F11/F8	4732.4	1441.5	24.8	1427.0	543.3	17.8
21	21-30-7	F8/F5	5056.7	1307.1	25.9	1650.6	415.8	17.2
25	25-30-9	F8/F5	8159.8	1800.9	30.5	2629.7	533.7	19.9

[1] Actual thickness of Ecoply® sheets manufactured to thickness tolerances stated in AS/NZS 2269.

[2] Identification code: panel thickness – outermost veneer thickness x 10 – number of plies.

[3] I/Q values for rolling shear are for stress at the neutral axis calculated as in NZS 3603.

Notes:

- The section properties in Tables 4A and B have been calculated in accordance with AS/NZS 2269.
- For section properties for other thicknesses and Shadowclad® products contact CHH Plywood on 0800 326 759.

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Structural Properties of Ecoply® Plywood

The majority of Ecoply® plywood is either F8/F8 or F8/F5 grade (exceptions are identified in section 1.2: Product Description and Range) and the characteristic values may be used in conjunction with both NZS 3603 and NZS AS 1720.1 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Table 4B.

Table 5: Structural Properties of Ecoply® Plywood

	Characteristic Strength MPa		
Stress Grade	**F5**	**F8**	**F11**
Bending (f_{pb})	14	25.0	31.0
Tension (f_{pt})	9.6	15.0	18.0
Panel Shear (f_{ps})	3.7	4.2	4.5
Rolling Shear (f_{pr})	1.5	1.7	1.8
Compression in Plane of Sheet (f_{pc})	12.0	20.0	22.0
Compression Normal to the Plane of the Sheet (f_{pp})		9.7	12.0
Modulus of Elasticity (E)	6900	9100	10500
Modulus of Rigidity (G)	345	455	525

Source: AS/NZS 2269

Wood is strongest when stressed parallel to the grain and weakest across the grain, so the lay up or arrangement of veneers in the panel determines the properties. Because of its cross banded construction, plywood possesses significant strength and stiffness both parallel and perpendicular to the direction of the face grain, but is generally strongest and stiffest along the direction of the face grain.

The section properties of structural plywood in Table 4A are calculated in accordance with AS/NZS 2269 to allow for the reduced contribution of veneers perpendicular to the direction of stress. For engineering design to NZS 3603 and/or NZS AS 1720.1, the section properties are multiplied by stresses and 'k' and ø factors to determine resistances for limit states design.

Resistances and nominal strengths in Table 4B assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ø and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Strength Reduction Factors and Capacity Reduction Factors can be taken from NZS 3603 Clause 2.5 and NZS AS 1720.1 Clause ZZ2.3 as applicable.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name and/or manufacturer: e.g. ECOPLY.
- Face grade, back grade: e.g. CD.
- Intended application: e.g. STRUCTURAL.
- Panel construction code: e.g. 15-30-5 (Thickness (mm)-Face veneer thickness (mm x 10)-Number of veneers).
  Note: In some cases the Panel construction code may be replaced by the Section Properties, in which case the values of second moment of area (moment of inertia) (I) and section modulus (Z) in the grain orientations are declared: e.g. 626.2, 58.6/191.7,25.4.
- Glue bond: e.g. A BOND.
- Formaldehyde emission class: E0 for A Bond Ecoply.
- Australasian Standard: e.g. AS/NZS 2269.
- Treatment Standard (if applicable): e.g. AS/NZS 1604.3:2012.
- Date and time of manufacture: e.g. 01/12/15 12:23:45.
- Stress grade: e.g. F8 (exceptions include Shadowclad® and Grooved Lining which are performance rated).
- Where applicable sheets may note the country of manufacture: e.g. "Made in Australia."

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Untreated example:

ECOPLY CD FLOORING STRUCTURAL
19-30-7 A BOND EO AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E H3.2 CCA RETREAT CUTS
PAT 12/12/2023 12:23:45 F11/F8 CHH.COM

Treated example:

ECOPLY CD STRUCTURAL
12-24-5 A BOND EO AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA RETREAT CUTS
PAT 12/12/2023 12:23:45 F8/F8 CHH.COM

Alternate branding (untreated example):

STRUCTURAL CD 19-30-7 F8/F8 A BOND EO AS/NZS
2269.0:2012 PAT 12/12/23
MANUFACTURED BY ######### - DISTRIBUTED AS
ECOPLY BY CHH PLY CHH.COM

Note: Performance based products like Grooved Lining and Shadowclad® may include brand identification instead of visual quality, stress grade, and panel code. These panels, when accompanied with specification literature, are still deemed to comply with AS/NZS 2269.

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1.7 CODE COMPLIANCE

Ecoply® plywood manufacture is third-party audited through a product quality control programme.

Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural, is referenced in the NZBC Acceptable Solutions and Verification Methods through:

- NZS 3602 The Use of Timber and Wood-based products for Use in Building.
- NZS 3603 Timber Structures.
- NZS 3604 Timber Framed Buildings.
- AS/NZS 1604.3:2012 Specification for Preservative Treatment, Part 3:Plywood.
- E2/AS1 External Moisture.

WARNING: Plywood which is non-certified or is manufactured to standards other than AS/NZS 2269, such as US voluntary standard PS1-95, is not referenced in the NZBC. There can be significant differences between AS/NZS 2269 certified and non certified plywood around bond durability, structural ratings and veneer quality.

Structure B1

Design to NZS 3603 Timber Structures complies with the NZBC in Verification Method B1/VM1 Clause 6.0 Timber. Plywood is the only sheet material with properties listed in NZS 3603. Ecoply structural plywood is available in F8/F5 and F8/F8 stress grade. Some specialty products are available F11/F8 or with specifically designed properties for specialised applications.

1.8 GENERAL DESIGN CONSIDERATIONS

Durability (Clause B2) and Exterior Moisture (Clause E2)

Ecoply plywood is made from wood veneer. Designers should assess the level of exposure to biological, moisture, and other hazards and apply appropriate preservative treatment and detailing to minimise exposure to these hazards.

Information in this manual outlines suggested practices for detailing building components to exclude moisture to comply with the durability requirements of the NZBC.

Formaldehyde

Ecoply plywood is manufactured using phenol formaldehyde resins which are fully cured in the hot press. Cured resin is thermally and moisture stable and formaldehyde emissions for the glued plywood are similar to background levels for the wood by itself when tested to AS/NZS 2098.11 Determination of formaldehyde emissions for plywood. Accordingly every panel is branded with the lowest emission class (less than 0.5mg/litre for E_0).

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Moisture Content and Dimensional Change

At the time of leaving the factory, the moisture content of untreated Ecoply plywood should generally be in the range of 8% to 15% as required by AS/NZS 2269. All wood products including plywood respond to changes in ambient humidity so the eventual moisture content of plywood varies according to how dry or how wet the environment is. After manufacture, the moisture content will move to equilibrium with the environment, and the veneers swell or shrink across the grain in response. The total expansion both along and across a 2400 x 1200mm panel can be in the order of 1.5mm to 3mm as the plywood changes from a dry to a saturated state.

Ecoply that is treated with waterborne preservatives (e.g. H3.2 CCA) is expected to be used in applications that have higher humidity than interior dry use, so following treatment it is dried to a higher average moisture content of approximately 18%. This provides for a more stable panel in service than placing a dry (less than 15%) sheet in a higher moisture environment.

Detailing and construction must allow for movement if the plywood will be subject to cycles of moisture change. Seasonal and daily cycles can be significant depending on the end use.

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Temperature

Wood will expand upon heating as do practically all solids. The thermal expansion of plywood is quite small and there is little effect on the structural performance or durability of plywood when used in temperatures below 54°C. The average co-efficient of thermal expansion of plywood is 4.5×10^{-6} mm/mm/°C. At temperatures above 55°C wood begins to deteriorate. Colours of coatings and finishes should be selected to reduce heat gain. For extreme conditions, further technical information is available by calling CHH Plywood on 0800 326 759.

The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 Methods of determining the total thermal resistance of parts of buildings. e.g. Plywood has a Conductivity (k) of 0.13W/mK so a 12mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Aesthetics

Ecoply® plywood products can be selected for weather protection functions as well as structural performance. Acceptable Solution E2/AS1- External Moisture allows plywood manufactured to AS/NZS 2269, (minimum CD appearance grade, minimum 12mm thickness and treated as required by NZS 3602) to be used for exterior cladding. For exterior cladding applications CHH Plywood strongly recommends Shadowclad® exterior cladding rather than smooth faced plywood such as Ecoply.

Shadowclad features a textured (bandsawn) face which reduces the visibility of face checking and other appearance related issues which can occur on smooth faced plywood if not regularly maintained by the homeowner. For more information on plywood used as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction.

Face Checks on Plywood Exposed to Weather

Face checks are lengthwise separations of wood fibres in the face veneer of the plywood. They result from the normal swelling and shrinking of wood as it gains and loses moisture. It is important to realise that these checks are superficial, being confined to the face veneer. They do not alter the structural integrity of the plywood in any way. **If you are the specifier, it is important to discuss these issues with your client and consider the length of exterior exposure, climate conditions and protection offered by the surface coating before finalising product choice.**

Overlaps in Plywood

Overlaps, pleats and core gaps are a function of manufacture and lay-up of individual veneers within plywood. Overlap is where there is overlapping of the individual veneers, often cross-bands, that are then pressed together to create plywood. In general, and as noted in AS/NZS 2269.0 Clause 3.4.4, overlaps and pleats are permitted "provided the strength or utility of the sheet is not reduced". Overlaps do not affect the durability, structural integrity or weathertightness of plywood.

Durability

The durability of Ecoply structural plywood will depend on the application. Detailing, treatment and installation details need careful consideration to satisfy the requirements of the NZBC.

Normally, 50 year durability can be achieved with untreated Ecoply in dry, interior exposure. For internal environments subject to high humidity or condensation H3.2 CCA treated Ecoply should be used.

For plywood as a rigid air barrier (including rigid air barrier acting as bracing) refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhply.co.nz.

Fire, Spread of Flame and Smoke Development

Data on early fire hazard properties of uncoated plywood are available in our Technical Note: "Early Fire Hazard Properties of Ecoply Products."

For plywood with decorative finish coatings or intumescent coating, performances depend on spread rates of the coating. For advice on specific coating systems and their suitability for use with Ecoply products, always refer to the coating manufacturer.

Fire Rated Systems

The NZBC has specific requirements about the use of combustible materials in buildings. As a wood veneer based product, plywood is considered to be a combustible material.

For specific information about the use of combustible materials used in building solutions please refer to the NZBC Clauses C1 - C6 - Protection from Fire.

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1.9 ENVIRONMENT, SOCIAL AND GOVERNANCE (ESG)

Carter Holt Harvey has developed a new Environment, Social and Governance (ESG) reporting programme. The company has focused on setting out what its stakeholders have identified as material ESG issues, how it manages, or plans to manage those issues, and key environmental indicators. In the future, Carter Holt Harvey will celebrate its ESG achievements and acknowledge those areas where it needs to improve, keeping on a path of steady improvement that will further strengthen Carter Holt Harvey in the years to come.

1.10 FSC® AND SUSTAINABILITY ACCREDITATIONS

CHH Plywood sources plywood and/or logs from sustainably managed plantation forests. The globally recognised independent body, the Forest Stewardship Council® (FSC®) has recognised the Tokoroa mill for using and trading responsibly sourced wood and plywood, awarding CHH Plywood with FSC certification (FSC® C012019). This measure provides a formal assurance that gives CHH Plywood's customers confidence about its sustainability credentials. CHH Plywood's products can be supplied with a FSC certificate on request.

To view and download certificates and documents related to Sustainability please visit www.chhply.co.nz/sustainability

1.11 HEALTH & SAFETY

Ecoply should be handled in accordance with the Safety Data Sheets (SDS) for untreated, H3.2 CCA and H3.1 LOSP treated Ecoply, which can be downloaded from www.chhply.co.nz.

Always wear safety glasses or non-fogging goggles when machining Ecoply panels.

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

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

1.12 STORAGE & HANDLING

Ecoply panels must be stored and handled with care to maintain good condition before use and after installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity.
- Support for the sheets must 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 must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage.
- The sheets must be stacked flat, NOT on edge.
- To avoid staining, fading and surface checking, the sheets must not be exposed to the weather while awaiting installation.
- Store in well-ventilated areas away from sources of heat, flames or sparks.

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2.0 GENERAL INSTALLATION GUIDE

The following is a general guide to be followed unless otherwise specified. For additional installation instructions for typical applications refer to sections 3, 4 and 5.

2.1 FRAMING

Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturer's specifications and treated in accordance with NZS 3602. All timber frame sizes and set out must comply with NZS 3604 (or be specifically designed to NZS 3603). The current Laserframe Product Guide can be downloaded from www.chhwoodproducts.co.nz. Ecoply® may be specified for frame spacing determined by design, or using tables in section 3 for specific product applications such as bracing, flooring and as a substrate for shingle roofs or membrane roofs and decks.

H3.1 LOSP treated framing should be vented before fixing and if construction adhesives are required (for example to screw and glue floor panels) the adhesive must be compatible with H3.1 LOSP. See section 1.4: Preservative Treatment.

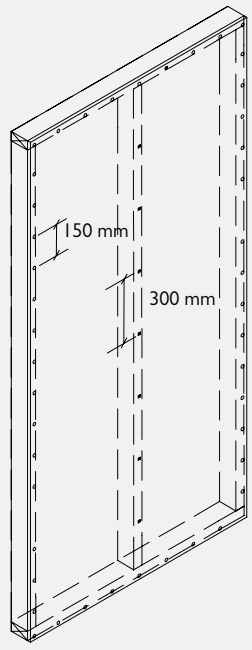
For plywood used as exterior cladding refer to the current Shadowclad® Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhply.co.nz.

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhply.co.nz.

2.2 SHEET FASTENERS & FIXING

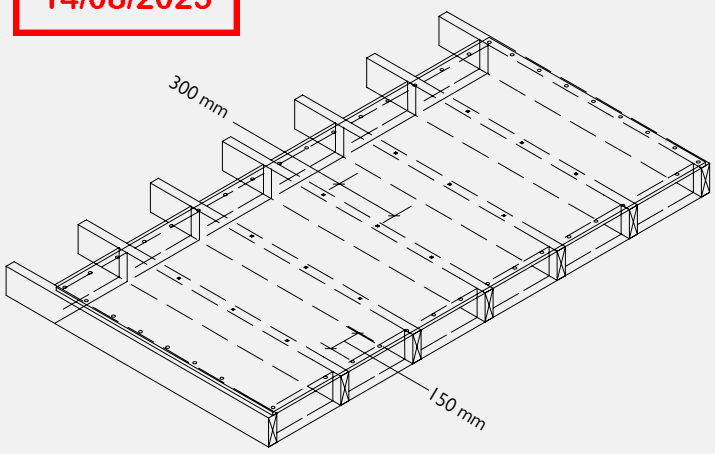
- Where there is risk of panel size change due to changes in moisture levels, allow a 2 to 3mm expansion gap between sheets.
- Use only flathead nails or screws, with or without construction adhesives.
- Fastener length should penetrate at least 10 nail diameters into the framing or be three times the sheet thickness, whichever is the greater. Longer or ring shank nails may be specified.
- Fasteners must be at least 7mm from the edge of the sheet.
- Where using power driven nails some applications including bracing may require full round head nails: Confirm prior to installation.
- For tongue and groove products such as flooring and roofing fasten 15mm from tongue and groove edges.
- Standard fixing pattern: unless otherwise specified fasten edges and ends of sheets at 150mm centres, and within the panel at no more than 300mm centres (see diagram below).
- Use hot dipped galvanised fasteners or corrosion resistant fasteners (i.e. stainless steel) determined by design for specific hazards.
- Where using stainless steel nails, nails must be annular grooved
- Refer to Table 7 for minimum fastener sizes.
- Do not overdrive power driven nails.

EC001: Fastener Spacings for Ecoply®



Ecoply® fastened in vertical plane

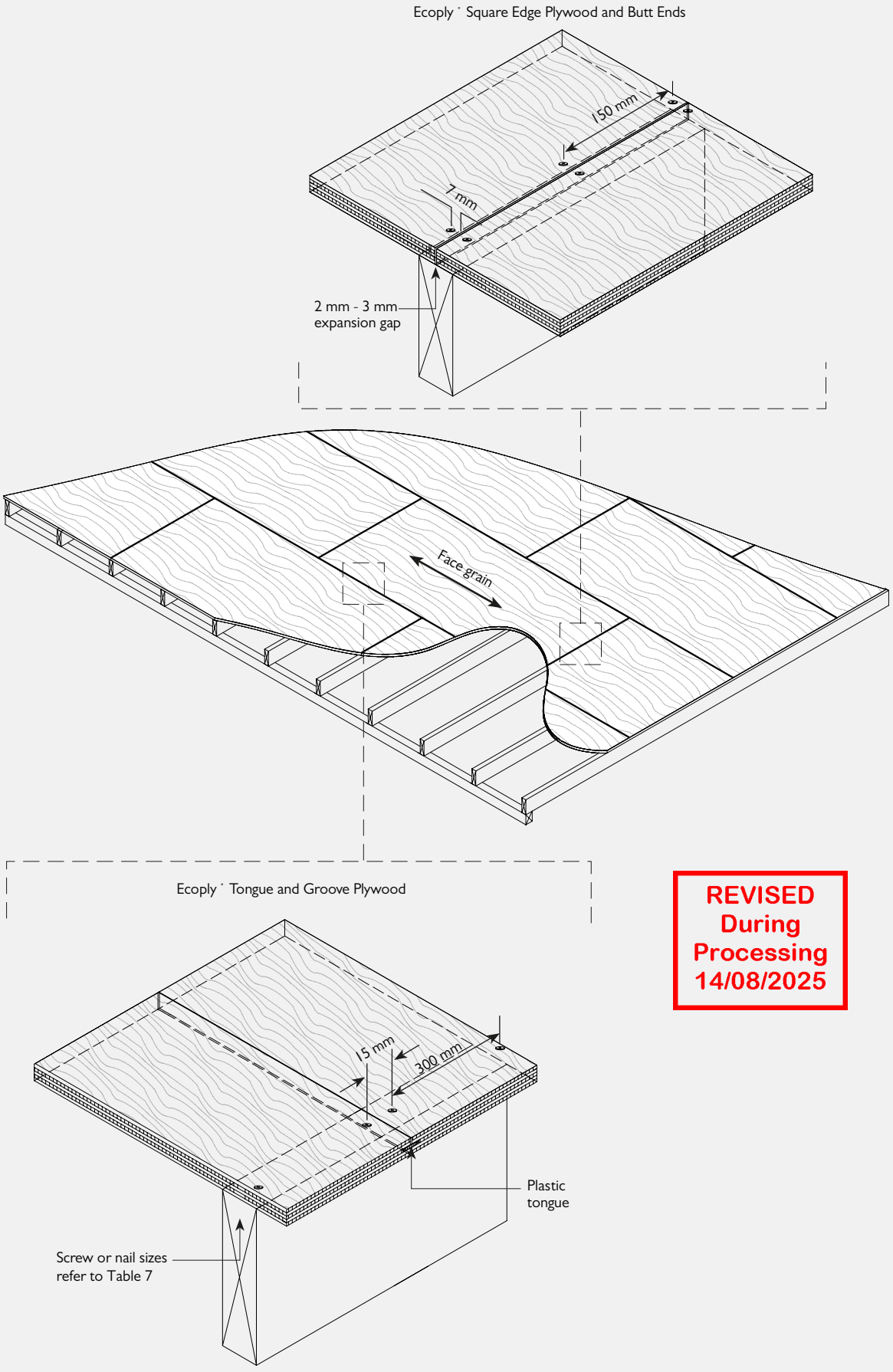
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Ecoply® fastened in horizontal plane

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EC002: Fastener Spacings from Edges



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Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm / 9mm	Load[1]	12mm / 15mm	Load[1]	17mm	Load[1]	19mm / 21mm	Load[1]	25mm	Load[1]
Minimum nail size in timber framing[2]	40 x 2.5mm	570	60 x 2.8mm	736	60 x 2.8mm	736	60 x 2.8mm	736	75 x 3.15mm	883
Screw size in timber framing[2]	8g x 30mm	1230	8g x 40mm	1230	10g x 40mm	1650	10g x 45mm	1650	10g x 50mm	1650
1.15mm steel framing[3]	10-24-35[4]	1300	10-24-40[4]	2000	10-16-45[4]	2100	10-16-45[4]	2100	10-16-45[4]	2100
Screw size in 2.80mm steel framing[3]	10-24-35[4]	1200	10-16-40[4]	1200	14-20-45[4]	3000	14-20-45[4]	4000	14-20-45[4]	5000

[1] The load is the characteristic load (N) for one fastener in single shear.

[2] Characteristic load based on fixing into a timber of J5 joint group or better.

[3] Self tapping, self countersinking screw.

[4] Screw Numbers indicate: Gauge – Threads per inch – Length (mm).

Notes:

- Steel thickness, screw sizes, characteristic loads, refer to assemblies actually tested.
- Other screw sizes may be used. Screw properties vary between screw suppliers and the suitability of a particular size should be verified by the designer for performance under changing physical conditions and cyclic loading.
- Non-standard nailing may be specifically designed with NZS 3603, NZS AS 1720.1 or similar.

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 section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Notes: H3.2 CCA treated timber should not be fixed in direct contact with light gauge steel products. Refer to the framing manufacturer for advise on fixing and treatments.

2.3 ADHESIVES

Tube Applied Construction Adhesives

Site applied construction adhesive may be used together with nails and screws for non-permanent loads, reduced fastener popping, and to lower the risk of squeaking in floors. Available types include polyurethane (e.g. Soudal® Gorilla Grip) and solvent (e.g. Soudal® Gorilla Grab or Bostik® "tuff as Nails") based adhesives.

Adhesives should have appraisal from an independent authorising body such as BRANZ or equivalent authorities (e.g. AFG 01 Adhesives for field gluing) for plywood to wood framing for the specific application proposed. Follow manufacturer's recommendations. In addition:

- Use a bead or daubs of adhesive as per manufacturer's recommendations.
- Apply pressure using fastener patterns outlined in section 2.2: Sheet Fasteners and Fixing.
- Work from the middle of the sheet outwards to develop glueline pressure.
- Ensure adhesives are compatible with treatment in the framing timber, see section 1.4: Preservative Treatment.

Structural Adhesive Joints

Structural bonds are generally only achievable in factory controlled conditions using approved structural adhesives in accordance with approved standards for glue lamination, e.g. Resorcinol formaldehyde joints made to AS/NZS 1328 Glued laminated structural timber. Site gluing is not recommended for structural plywood components and is subject to specific engineering design.

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3.0 STRUCTURAL BRACING & CEILING DIAPHRAGMS

The Ecoply® bracing system provides bracing resistance for walls and subfloor foundations for light timber framed buildings under wind and earthquake loading, to meet the requirements of the NZBC - B1 Structure, and NZS 3604 Timber Framed Buildings or specifically designed to NZS 3603 Timber Structures Standard.

Any Ecoply structural panel may be used for bracing as long as it is 7mm, 9mm or 12mm thick, has a minimum wall length as described in Table 9, treated for the specific application in accordance with NZS 3602 (summarised in Table 8) and fixed in accordance with Ecoply bracing specifications outlined in this guide.

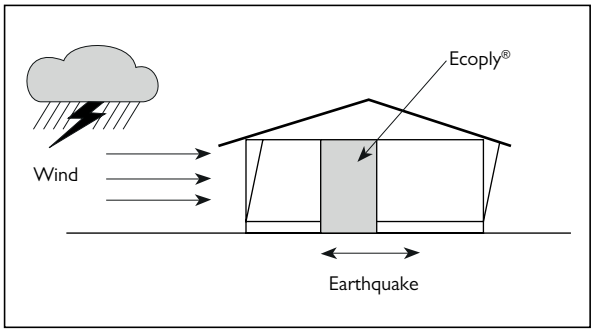
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure.

CHH Plywood have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Specific Design



Ecoply structural plywood is manufactured to AS/NZS 2269, and it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Demand is calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz.

EP bracing systems properties can be easily loaded into the EzyBrace software by way of an Excel patch downloadable from www.chhply.co.nz together with loading instructions.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120BUs/m.

Durability

Ecoply plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in buildings. If the product is used, handled and installed in accordance with CHH Plywood product literature it will meet the durability Clauses of the NZBC.

Table 8 summarises the applications in which Ecoply can be used as structural bracing together with the required preservative treatment and fastener material.

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Table 8: Ecoply® Suitability for Bracing Applications Including Treatment Type and Fastener Material

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray): E.g. Interior linings.	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B and C, as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/without cavity battens behind cladding.	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604: E.g. Plywood bracing and/or rigid underlay (rigid air barrier), fixed to framing with/without building paper/wrap over, with/without cavity battens behind cladding.	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply® Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones, as per section 4 of NZS 3604 (including sea spray).	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

Note: Power driven nails are suitable for use. Do not overdrive, nails must be full round head.

Rain Wetting and Construction Bracing

Untreated Ecoply® will withstand normal exposure conditions during construction for up to 3 months however aesthetically the sheet appearance will deteriorate as the level of exposure increases. Rain and exposure can cause thinner plywood panels to buckle. Plywood stability is related to the number of veneers and thickness of the panel. Where panel stability is critical, consider using thicker panels.

Humidity and Condensation

In conditions where the moisture content may exceed 18% for prolonged periods, Ecoply must be H3.1 LOSP or H3.2 CCA treated to resist decay or insect hazard.

Subfloor Sheet Bracing

H3.2 CCA treated Ecoply can be used as sheet bracing where dampness does not allow the use of untreated plywood or other sheet materials (section 5 of NZS 3604). Where Ecoply subfloor sheet bracing is exposed to both rain and sun, it must be coated with a three coat, 100% acrylic exterior coating system with a light reflectance value of 50% or greater.

Ecoply Bracing Used in Internal Wet Area Applications

Ecoply Structural plywood can be used for bracing behind a bath or shower providing it is protected by an impervious lining and must be installed in accordance with the bracing specification, where plywood is H3.2 CCA treated stainless steel fasteners are required.

Best building and design practice would be to relocate the bracing element along the bracing line, if possible, where it was away from the shower liner.

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Plywood expands and contracts with environmental changes so therefore design consideration should be given to the impervious lining used over the top of it, to protect the plywood.

Note: A dummy liner may then be required over the plywood to ensure the plywood sheet remains complete from bottom plate to top plate in situations where the shower design requires the base to be checked into the lining.

Adjustments for Wall Height

Use section 5 of NZS 3604 to calculate bracing values: "Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from Table 9 should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4m high shall be rated as if they are 2.4m high.
(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
(c) Walls with heights < 1.5m, Specific Engineering Design is required.

Joining Panels for Walls Higher Than Maximum Sheet Length

Ecoply bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.4m, Ecoply and Shadowclad is available in 2.7m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications and must be a minimum of 0.3m in height. (e.g. 2.4m x 1.2m sheet with a 0.3m x 1.2m part sheet above it to give a 2.7m x 1.2m bracing element).

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Joining Panels for Walls Longer Than Maximum Sheet Width

Ecoply bracing panels must be fixed from start to finish of bracing element. For panel lengths greater than the width of a plywood sheet a part sheet, or sheets, can be stacked next to a full sheet, butt jointed a stud with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply bracing specifications and must be a minimum of 0.3m in width. (e.g. 2.4m x 1.2m sheet with a 2.4m x 0.3m part sheet next to it to give a 2.4m x 1.5m bracing element).

Cladding as Bracing

12mm Ecoply® (CD face grade or better) can be H3 treated to meet the requirements of Acceptable Solution E2/AS1 and will perform as a structural, durable and weathertight cladding and bracing element when installed in accordance with E2/AS1.

It should be noted smooth faced plywood such as Ecoply may be prone to appearance related issues such as face checking which occurs naturally and is not considered by CHH Plywood to be a manufacturing or product fault. For more information refer to section 1.8: General Design Considerations - Face Checks on Plywood Exposed to Weather. H3.2 CCA treated Ecoply may also have a green tinge to the wood surface and may have fillet marks on the face of the sheet.

Plywood for Exterior Cladding

Plywood for exterior cladding applications where a high visual appearance is desired, CHH Plywood recommends the use of Shadowclad® as an exterior cladding. Shadowclad has a textured (bandsawn) face which reduces the visibility of face checking and is most commonly H3.1 LOSP treated (clear preservative treatment) which does not leave fillet marks on the panel face.

For further information on Shadowclad as an exterior cladding refer to the current Shadowclad Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhply.co.nz.

Soil

Ecoply must not be allowed to come in contact with soil. The bottom edge of the plywood sheet must be a minimum of 100mm above decks or paved ground and a minimum of 175mm above unprotected ground.

Service Penetrations in Bracing Elements

A small opening (e.g. power outlet) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the braced element, or a waste pipe outlet of maximum 150mm diameter placed at no closer than 150mm to the edge of the braced element. Maximum one penetration per bracing panel.

3.2 ECOPLY® BRACING SPECIFICATIONS SUMMARY

CHH Plywood has a range of bracing specifications called the EP bracing series. The EP bracing series simplifies the design and construction of bracing elements using plywood, by itself or in conjunction with GIB® Plasterboard and features:

- Single sided and double sided bracing elements
  High performance bracing element utilising GIB® Standard plasterboard.
- A single type, GIB Handibrac®, hold-down for all bracing elements.
- Specifications for each bracing element type.

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Table 9: Summary P21 Ratings for 2.4m High Ecoply® Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1	0.4m	Ecoply® one side	80	95
	0.6m		95	105
	1.2m		120	135
EPG	0.4m	Ecoply one side and 10mm GIB® Standard plasterboard other side	100	115
	1.2m		150	150

Note: Bracing and other technical information has been specifically tested using Ecoply® branded structural plywood. This information cannot be used with any other plywood brand and bracing data must be sought directly from the specific plywood manufacturer.

More Information

The following pages provide a full specification of EP bracing elements. Copies of specifications can be downloaded from www.chhply.co.nz.

NZS 3604 provides the method of calculating demand on a building. Calculation sheets are available from BRANZ or GIB EzyBrace® software is available as a free download from www.gib.co.nz. Information is available at www.chhply.co.nz which can be placed in the custom elements of GIB EzyBrace® for ease of calculation.

Ecoply® Bracing Systems are designed to meet the requirements of the NZBC 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 manufactured and/or distributed by CHH Plywood and SG8 timber framing, 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.

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3.3 ECOPLY® BRACING SPECIFICATION - EPI

Table 10: Singled Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EP1_0.4	0.4m	Ecoply® one side	80	95
EP1_0.6	0.6m	Ecoply one side	95	105
EP1_1.2	1.2m	Ecoply one side	120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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 7mm, 9mm or 12mm Ecoply® plywood fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

The panels must be installed with the long side of each panel orientated vertically to the framing members.

Fastening the Ecoply® Panels

Fasten with 50 x 2.8mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

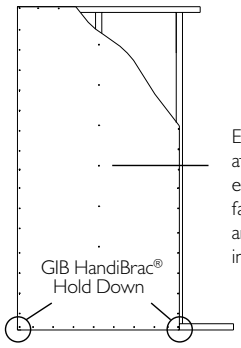
Fasteners for H3.2 CCA Treated Ecoply Panels

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

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Table 11: Ecoply® Suitability For Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones as per section 4 of NZS 3604, including sea spray):	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones B and C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone D (sea spray), as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zones D, as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply® Specification and Installation Guide.

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3.4 ECOPLY® BRACING SPECIFICATION – EPG

Table 12: Structural Plywood Brace With Plasterboard Other Side

Specification No.	Minimum Wall Length	Lining Requirements	BUs/m Wind	BUs/m Earthquake
EPG_0.4	0.4m	Ecoply® one side and 10mm	100	115
EPG_1.2	1.2m	GIB® Standard plasterboard other side	150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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

Side 1: One layer of 7mm, 9mm or 12mm Ecoply® plywood exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

The panels must be installed with the long side of each panel orientated vertically to the framing members.

Side 2: One layer of 10 or 13mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® Panels

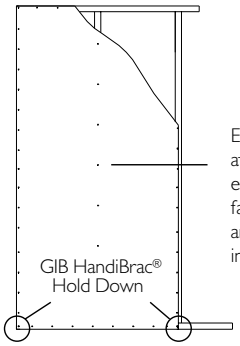
Fasten with 50 x 2.8mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

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



Ecoply® fixed with 50 x 2.8 mm nails at 150 mm centres to perimeter of each sheet at no less than 7 mm or 3 fastener diameters from sheet edge and at 300 mm centres to intermediate studs

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Fastening the GIB® Plasterboard

32mm x 6g GIB® Grabber® Screws or 35mm GIB® Nails.

Fastening Centres

Fasten 50, 100, 150, 225 and 300mm from each corner and 150mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12mm from paper bound edges and 18mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.

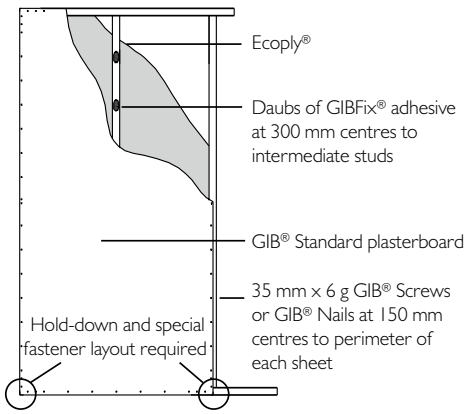


Table 13: Ecoply® Suitability for Bracing Applications Including Treatment Type and Fastener Material*

Application	Plywood Treatment	Fastener Material
Plywood bracing in interior spaces with no risk of exposure to weather or moisture penetration conducive to decay (all exposure zones including sea spray, as per section 4 of NZS3604):	Ecoply® Untreated	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zones1 B and C, as per section 4 of NZS 3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Hot dipped galvanised or better
Plywood bracing in enclosed spaces (protected from the weather) but with a risk of moisture penetration conducive to decay in exposure zone1 D (sea spray), as per section 4 of NZS3604:	Ecoply H3.1 LOSP/H3.2 CCA treated Ecoply Barrier (rigid air barrier)	Stainless steel
Rigid Air Barrier	Refer to Ecoply Barrier Specification and Installation Guide	
Bracing on framing exposed to ground atmosphere in exposure zones B and C, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Hot dipped galvanised or better
Bracing on framing exposed to ground atmosphere in exposure zone D, as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel
Bracing in wet process buildings in all exposure zones (including sea spray), as per section 4 of NZS 3604.	Ecoply H3.1 LOSP/H3.2 CCA treated	Stainless steel

* Refer to Table 8, page 16 of Ecoply® Specification and Installation Guide.

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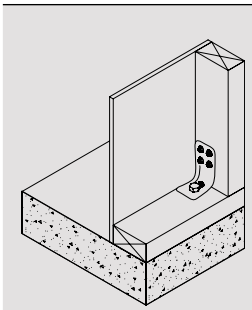
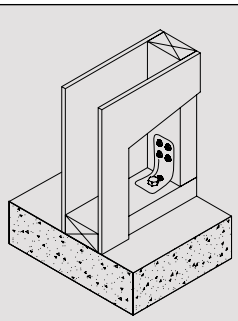
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3.5 GIB HANDIBRAC® – RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as the 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

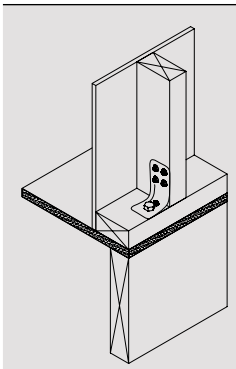
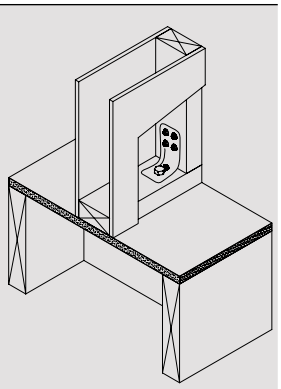
External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/ plate junction.

Hold-down Fastener Requirements

Bowmac Screw Bolt

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Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer.	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.

Hold-down Fastener Requirements

Bowmac Screw Bolt

3.6 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 of NZS 3604 13.5.2 which allows for plywood not less than 6mm thick and a minimum of three ply for:

(a) Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
(b) Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs.

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Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

(a) The length of diaphragm shall not exceed twice its width measured between supporting walls.
(b) The ceiling lining must consist of plywood over the entire area of the diaphragm.
(c) Complete sheets with a minimum size of 1800 x 900 must be used.
(d) Framing size and spacing must comply with NZS 3604.
(e) Fastener size should comply with Table 7 of this guide. E.g. 40mm x 2.5mm flat head nails for 7mm and 9mm Ecoply®.
(f) Fastening is at 150mm centres around the perimeter of each sheet and at 300mm centres to intermediate framing.
(g) Fixings are no closer than 10mm from sheet edges.
(h) Perimeter ceiling framing must be connected to wall framing by a perimeter 140mm x 35mm ribbon plate nailed to the top of the top plate or alternative such as a 0.55mm thick steel angle or proprietary steel channel.
(i) Sheets must be layed in a staggered pattern.
(j) The basic shape of a ceiling diaphragm should be rectangular. Protrusions are permitted but cut-outs are not (see Figure 13.4 NZS 3604).

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4.0 ROOFS & DECKS

The section below covers the use of Ecoply® plywood used as a substrate for flexible membrane and tile systems in roofing and decking applications. The information below should be considered as supplementary to system specifications from roofing and decking suppliers.

Further guidance on installation and detailing factors can be found in the EWPAA Technical Note; Plywood Roofing and Flooring: Installation and Detailing Factors.

Ecoply is not recommended as a substrate for exterior decks without a properly detailed barrier material such as butyl rubber, vinyl or E.P.D.M to protect the surface from weathering.

Always refer to the roofing and decking system supplier for installation, plywood selection and surface preparation requirements for specific roofing and decking products.

4.1 FLEXIBLE MEMBRANE SYSTEMS

- Roofing and decking membranes may comprise synthetic rubber sheeting glued to the Ecoply, or torch welded bitumen membranes.
- Always ensure Ecoply is dry and free of imperfections such as surface dust and blemishes as membranes coatings will telegraph any substrate imperfections.
- Use Ecoply Flooring or Structural Square Edge (CD Grade).
- Where Ecoply Flooring is used consider the use of a small daub of glue or nail in the Tongue and Groove of each sheet if potential movement of the plastic tongue joint is not acceptable.
- For trafficable decks use a minimum 17mm thickness, refer to Table 15A and 15C for specification.
- Use countersunk stainless steel screws and adhesive on framing to avoid head popping. Apply adhesive between screw locations.
- Use kiln dried timber framing such as Laserframe® or appropriate LVL framing from the Futurebuild® range.
- Consult the membrane manufacturer regarding use of bond breaker tapes over joints to allow elongation with natural plywood movement.
- Where treatment is required use only H3.2 CCA treated Ecoply. Do not use H3.1 LOSP treated Ecoply (solvent based carrier). It is not compatible with most membrane systems. If there is evidence of treatment salt crystals on the Ecoply surface remove by scrubbing with a small amount of water and allow the surface to dry prior to laying the membrane system.

Plywood Substrates, Face Checking and Flexible Membrane Systems

All natural wood based products (including Ecoply) have the potential to develop natural surface face checks when exposed to external environmental conditions. The degree of face checking is dependent on a number of factors including the length of time and level of exposure to weather during construction which is outside the manufacturing control of CHH Plywood. For more information see section 1.8: General Design Considerations - Face Checking on Plywood Exposed to Weather.

Face checks, while typically not present after manufacture, do not affect structural performance of the sheet and are acceptable under AS/NZS 2269. They are not a manufacturing fault.

Designers and membrane suppliers must carefully consider the suitability of plywood as a substrate for the membrane system in question if the potential of telegraphing of face checks onto the membrane surface is not acceptable.

The risk of telegraphing can be reduced by protecting the plywood surface from weather and moisture during the construction process.

Where the potential of face checking in the plywood substrate is not acceptable designers should consult the membrane supplier for a more suitable membrane or an alternative substrate.

Allowing for Moisture Expansion of Plywood Under Roof and Floor Coverings

Membrane suppliers have held different views on the requirements for plywood substrates. The fixing instructions within this guide are the starting point but designers must detail joints that allow for expansion in accordance with practices recommended by the chosen membrane supplier.

CHH Plywood's view, and the recommendation of a number of suppliers here and in North America is that expansion and contraction at sheet edges should be allowed for by loosely butting tongue and grooved edges so that the tongues can absorb movement and providing a small gap (2 to 3mm) between square sawn edges. Use a bond breaking tape over these joints to spread elongation in the membrane over a longer distance than the narrow gap in the joint itself. This tape can double as a rain seal over the sheet edges during construction.

Other membrane suppliers believe that sheets should be tightly butted and glued and screwed hard up to each other. This practice constrains movement at the small joint between sheets, but over a wider area requires significant allowance for movement around the perimeter of a roof segment. Junctions between the roof slopes and walls need careful detailing to allow for the potential movement. Movement control joints should be provided at regular intervals following the recommendation of the membrane manufacturer, especially if this method is adopted.

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4.2 ROOF TILE SYSTEMS

Most fibreglass, asphalt or wooden shingle and tile systems will tolerate DD grade surface characteristics.

- Use unsanded Ecoply® Roofing (DD grade), or sanded Ecoply of the required thickness in Table 15A.
- The unsanded surface provides extra grip on steeper roofs for roofers.
- Fix tiles according to the tile manufacturer's specification.
- Under asphalt shingles use felt underlay over the Ecoply.

4.3 ROOFING & DECKING – PRODUCT SELECTION GUIDE

Table 14: Roofing and Decking Product Selection Guide

	Structural Square Edge (CD Grade)	Flooring (CD Grade)	Roofing (DD Grade)
Product Description	CD face grade sheets are available in a range of thicknesses and size	Solid sanded C grade surface with tongue and groove profile on long edges	Unfilled D grade surface with tongue and groove profile on long edges
Recommended Applications	Substrate for flexible coverings requiring a smooth substrate and where avoidance of visible surface indentations is critical. Use as a substrate for flexible roof and deck membranes and thin roofing tiles		Substrate for coverings with the ability to span holes in the D face grade (up to 75mm in diameter) such as asphaltic roof tiles and torch welded polyester reinforce membranes. Do not use under flexible membrane coverings or where avoidance of visible surface indentation is critical
Face Grades	Front: C solid sanded. Back: D unsanded		Front and Back: D unsanded
	Refer to Table 1 for range and treatment options		
Product Features	Blocking required to support all edges	Blocking not required to support tongue and groove edges (unless otherwise specified).	Specifically designed for use under shingles and tiles that have a courser finish. Unsanded surface for extra grip for installers on steep roofs. Blocking not required to support[2] tongue and groove edges (unless otherwise specified).
Thicknesses Available	12, 15, 17, 19, 21, 25mm	17, 19, 21, 25mm	15mm
Sheet Sizes Available	2400/2700 x 1200m		
Stress Grades Available	F8/F8, F8/F5[1] (F11/F8 available upon request)	F8/F5 (F11/F8 available upon request) 19mm Longspan supplied F11/F8 as standard	F11/F8
Treatment	Untreated, H3.2 CCA and H3.1 LOSP	Untreated, H3.2 CCA, (H3.1 LOSP available upon request)	
Span Capabilities	Refer to frame spacings in Tables 15A to 15C		

[1] Refer to Table 1 and 4B for availability of F8/F8 and F8/F5 products and thicknesses.

[2] Where roofing products use tongue and groove CHH Plywood recommends fastening the tongue to rafters/joists at a minimum of one point.

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4.4 FRAME SPACINGS FOR ECOPLY® ROOFS & DECKS

Table 15A: Roofing - Sheathing, Non Trafficable, Above 2 Degree Pitch

Application	Roof Pitch	Maximum Wind Zone	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing			
			Ecoply Nominal Thickness (mm)			
			15	19	21	25
			Stress Grade			
			F11/F8	F8/F5		
Sheathing, non trafficable roof for all roof pitches above 2 degrees. Suitable for roof mass up to 30kg/m² (additional to Ecoply® weight or 40kg/m² including Ecoply).	>2°	Extra High		800	800	900
	>28°	High	900			
		Very High	800			
		Extra High	800			
	>20°	Very High	900			
		Extra High	800			

- Suggested applications include substrates for Asphalt Shingle and Membrane type roofs. The above suggested maximum framing spans are based on the following deflection criteria:
- Under a short term 1kN point load, deflection is less than Span/130.
- Under a long term self weight load, deflection is less than Span/400.
- Under a short term wind gust load, deflection is less than Span/150.

Table 15B: Sub-Sheathing

Application	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing				
	Ecoply Nominal Thickness (mm)				
	12	15	19	21	25
	Stress Grade				
	F8/F8	F11/F8	F8/F5		
Under steel or self supporting cladding for support of building paper or lateral diaphragm action. Sag not critical.	800	1200			

Table 15C: Decking

Application	Maximum Frame Centres (mm) for Ecoply® With Face Grain Across Framing			
	Ecoply Nominal Thickness (mm)			
	17	19	21	25
	Stress Grade			
	F8/F5	F11/F8	F8/F5	
1. Trafficable roof decking limited by dynamic response of roof as floor	540	600	600	750
2. Roof decking to Clause 8.5.5.1 c) of E2/AS1	400	400	400	400

- The current requirement in E2/AS1 is extremely conservative when compared with calculations determined for other applications using VM1 Clause 6 and calibrating the spans against codes of practice from North America and Australia. CHH Plywood recommends designers consider the alternative solution in row 1 of Table 15C for membrane decking in consultation with the membrane manufacturer.
  Unless otherwise stated spans apply equally to square edge or tongue and groove panels. Check Table 1 for availability of grades and [illegible] Table 16.
- Use the next lower recommended frame spacing or thicker Ecoply® where appearance is critical.
- To suit trusses at 900 centres, 2700 long sheets are available. See Table 16.

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Table 16: Frame Set Outs to Match 2400mm and 2700mm Sheet Modules

Length (mm)	Typical Frame Spacing to Suit Sheet Length			
2400	400	480	600	800
2700	450	540	675	900

- **Limitation for the use of Table 16.**
- CHH Plywood does not have access to information about designs for specific sites. Table 16 is a guide to estimate the initial selection of a span for design. Each site should be evaluated by qualified persons to ensure all loading parameters and site conditions have been considered, and appropriate changes should be made by the building designer.

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4.5 ROOFING – DESIGN CONSIDERATIONS

Durability

In general, H3.2 CCA treatment of Ecoply® plywood with waterborne preservatives is recommended for roofing.

Roofing Materials

Various roofing materials used over Ecoply plywood have different durability expectations, normally in excess of the 15 years required by the NZBC Clause B2. Durability of the roofing is subject to the specifications, installation and maintenance requirements of the roofing manufacturer. The durability of the Ecoply can only be assured as long as the overlying roofing and detailing excludes moisture. With good building practice and maintenance, roofing materials can be repaired or replaced at regular intervals to achieve life from the Ecoply in excess of the original roofing. The durability of Ecoply structural plywood will continue to satisfy the relevant requirements of the NZBC for 50 years, if installed in accordance with the instructions and limitations within this guide and the roof system is adequately maintained.

High Humidity, Condensation and Solar Driven Moisture

Where the moisture content of wood may exceed 18% for prolonged periods, Ecoply must be H3.2 CCA treated, to resist decay hazard. This includes Ecoply used under roof coverings that may be subject to condensation, or where rain moisture soaked in the roof covering can be driven into the Ecoply by the sun. Appropriate building detailing and ventilation is recommended which can reduce the need for treatment.

Roof Ventilation

Good ventilation and the avoidance of moisture are important design considerations when using H3.2 CCA treated Ecoply panels. Poorly ventilated spaces can develop very high temperature and moisture levels. The most likely source of moisture is the condensation of vapour from warm interior air on the underside of cold roofing. Good ventilation can limit the build up of excess moisture vapour in warmer climates but in regions where winter nights are consistently colder, H3.2 CCA treated Ecoply should be used. Moisture induced decay is only one risk that needs to be managed. If incorrectly detailed, roof spaces can be very tight and the dark colour of many roofing materials means that excessive heat can build up causing distortion in plywood or even framing members. Use the suggested details or alternatives to suit. Designers must consider roofing type, seasonal conditions, wind effects and the intended use of the building.

As a minimum, CHH Plywood recommends a vent area of 1/300th of the ceiling plan area (approx. 3350mm^2 per square metre of ceiling) equally distributed at the eaves and ridge to allow free flow under the Ecoply, up the roof slope, and out.

Roofing material suppliers should detail vent systems suited to their specific membrane or tile roofing. Proprietary ridge capping profiles or vents are available from roofing suppliers.

Detail gaps of 25mm in the plywood at ridges, and at walls where a roof slopes up to an upper storey. For flat roofs, natural ventilation flows may be impeded. Use proprietary roof vents. Consider forced ventilation as appropriate.

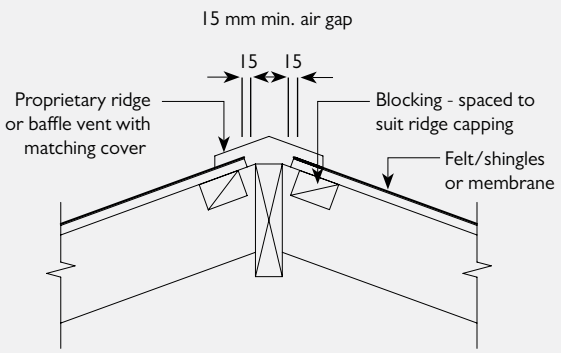
Bubbling

Plywood bubbling occurs when moisture trapped in knot holes in inner veneers expands as the temperature rises. This moisture will dissipate through the face veneer and will not affect the structural integrity of the plywood panel. As membrane coverings can prevent moisture dissipation, Ecoply Flooring and Structural Square Edge CD is recommended if the visual appearance of bubbling is not acceptable, or a higher visual finish is required.

Soil

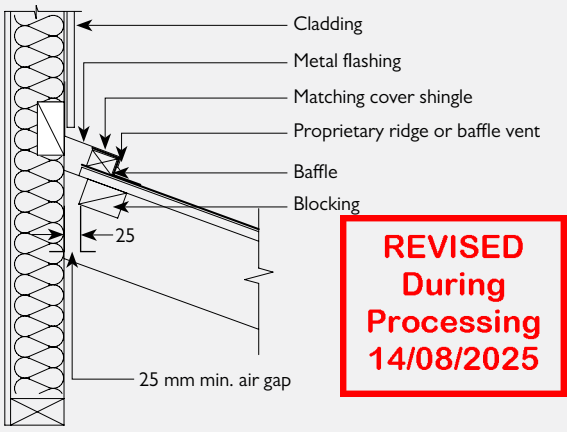
Ecoply plywood (untreated or H3.1 LOSP/H3.2 CCA treated) must not be allowed to come in contact with soil. Surfaces, flashings and gutters should be detailed to avoid trapping detritus and moisture.

EC003: Ridge Detail With Ridgeboard



(use also with Hip Rafter if extra ventilation required)

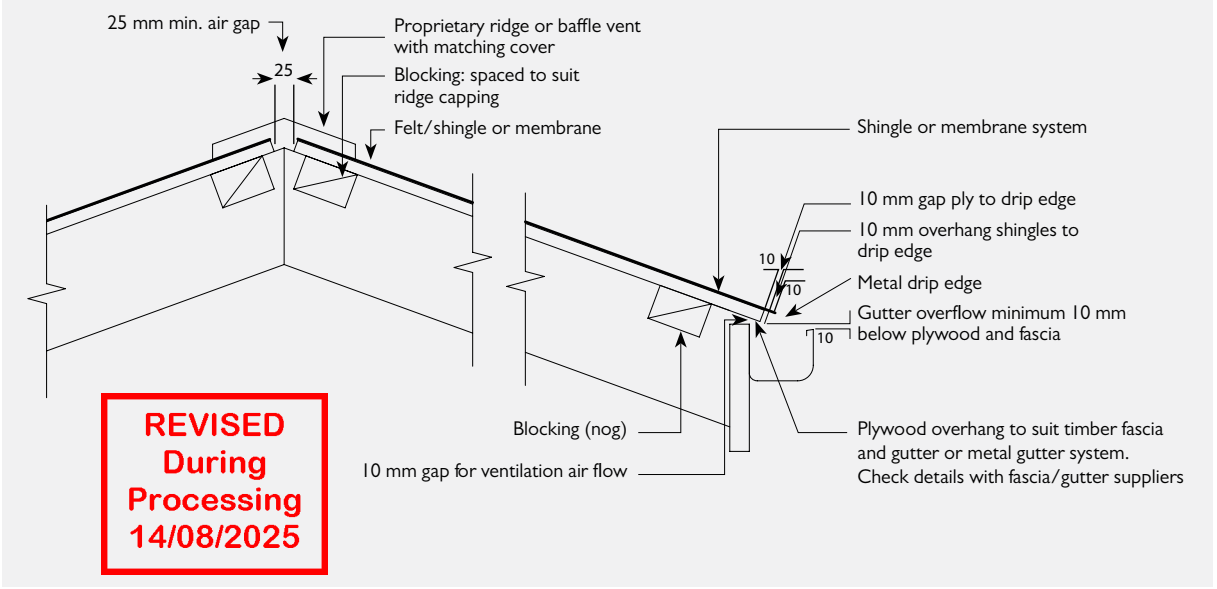
EC004: Roof to Wall Junction Vent



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EC005: Truss Ridge Detail



Rain Wetting and Construction Time

Untreated Ecoply® will withstand a reasonable amount of rain wetting and exposure during construction for up to three months. In extreme weather conditions of high temperature and/or high rainfall this period may be less. Appearance issues such as discolouration and face checking of the sheet surface can be expected if Ecoply is exposed. For roofs uncovered for longer periods use H3 treated Ecoply to lower the risk of decay. Return Ecoply to below 18% moisture content before installing moisture sensitive materials, coverings, coatings or adhesives. Where a high visual finish is desired (such as membrane roofing and decking) protect Ecoply from exterior moisture during construction. For detailed information see section 4.1 Flexible Membrane Systems.

Gutter Details

Where Ecoply structural plywood sub-sheathing supports roofing at gutters, a metal drip edge must be provided with appropriate gaps to shed water. Gutters should have a front edge overflow or ends lower than the back to shed water overflow away from framing and sub-sheathing Ecoply.

H3.2 CCA treatment is recommended for Ecoply sheets that protrude into gutters, with regular maintenance to avoid leaf mould (soil) development. Untreated Ecoply must not be exposed to gutter splash or moisture.

Fastener Spacing for Wind Suction

Wind pressure applies withdrawal loads to nails holding plywood to purlins and trusses. For the frame spacing in Table 15A designers may use the following guidelines for wind zones expressed in NZS 3604.

Note: Full penetration of fasteners into the supporting member is assumed.

The Main Body of the Roof

For wind zones up to and including high, use 60 x 2.8mm nails spaced at 150mm centres on all cross framing. For very high and extra high wind zones, use 75 x 3.15mm nails spaced at 150mm centres on all cross framing.

Roof Edges

All Ecoply structural plywood used at local pressure suction zones at the roof edges, gutters, eaves and gable ends must be supported on framing, and fixed at 75mm centres with minimum 60 x 2.8mm nails for regions up to, and including high wind zones (use 75 x 3.15mm nails for very high and extra high wind zones). Local pressure zones are interpreted from AS/NZS 1170 as being within 20% of the building length, width or the average of the gutter and ridge height.

Designers and builders should review site conditions to ensure adequate fixing is applied. Buildings in exposed sites and lee zones should be specifically designed using the loading standard (AS/NZS 1170) and the timber structures standard NZS 3603. In some wind conditions, the tiles themselves may be sucked from the plywood. Use a consulting engineer to assess site conditions, calculate wind pressures for the specific site, and determine the fastening and span requirements, and to check that the truss system can resist the loads being applied through the plywood.

Fixing of Roofing

Fixing methods for tile, shingle and membrane systems must be designed for the expected wind and weather exposure to protect the Ecoply substrate. Some shingle systems may not be suitable for use in very high or cyclonic wind zones.

Follow the specifications of the roofing manufacturer and refer to the appropriate BRANZ Appraisals.

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4.6 ROOFING – INSTALLATION

Framing

Frames should be at spacings to suit plywood thicknesses in Table 15A, page 25. Additional requirements for roof framing are:

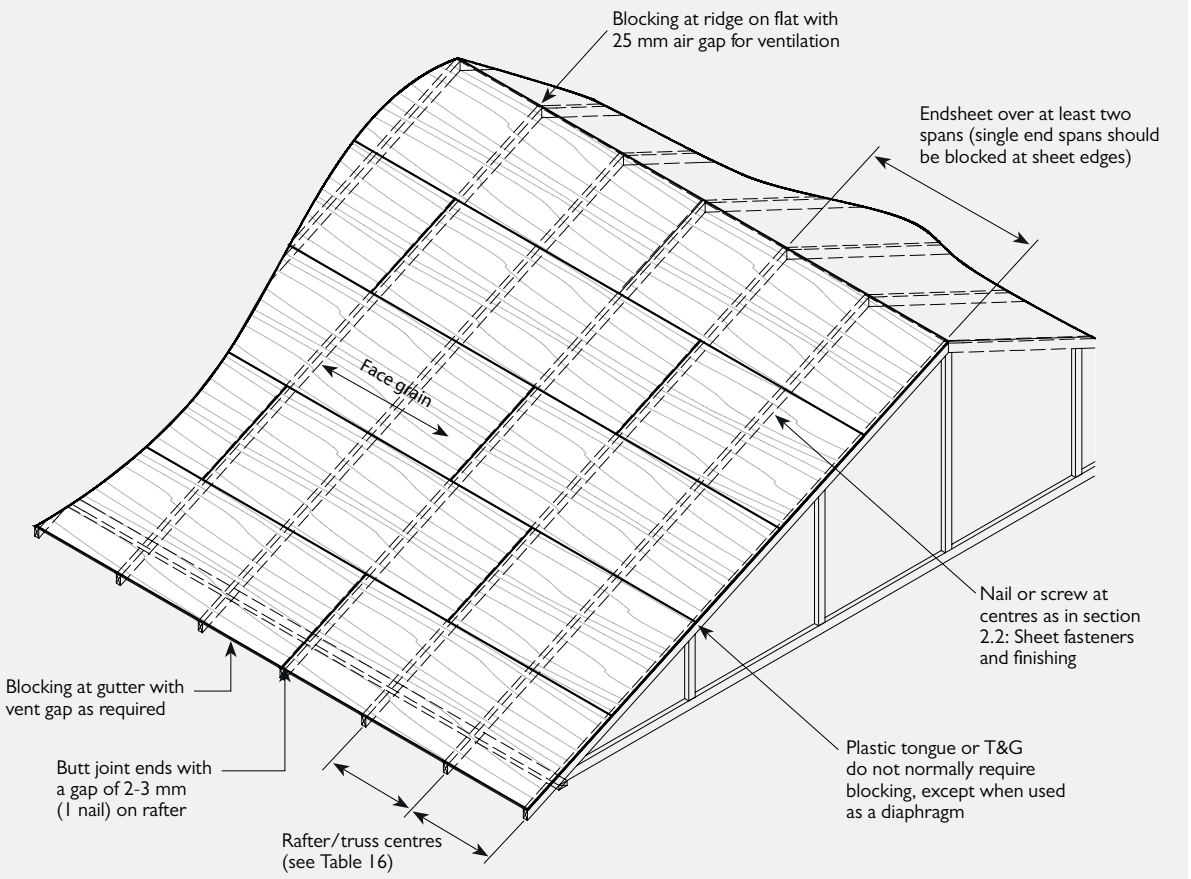
- Ensure top edges of framing are properly aligned.
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to lower moisture level in roof spaces, second floor spaces, and reduce differential truss, rafter or joist deflections.

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Blocking (Nogs, Dwangs)

- Block all edges of Ecoply® Structural Square Edge plywood.
- Block all edges at the ridge and gutter lines to prevent sag at capping or gutters.
- Block for high face loads or under areas accessed for maintenance.
- Blocking within the body of the roof is not required under tongue and grooved edges when using Ecoply Flooring and Roofing, unless required for framing stability or the plywood is being used as a diaphragm to resist horizontal wind or earthquake loads. In this case fixings transfer shear across the joints and details should be specified on drawings.
- Use blocking on the flat to provide gaps where air flow is needed for ventilation.
- Specific roofing suppliers may require blocking to suit their system.

EC006: Sheet and Framing Layout



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Sheet Layout

- Ensure Ecoply® sheets are dry before installation.
- Place face grain at right angles to supports.
- Sheets must be continuous over at least two spans (three framing members).
- Lay the sheets in a staggered pattern.
- Allow sufficient clearance inside confining structure such as concrete or brick walls adjacent to the roof. Use extra allowances with large areas.
- Allow clearance for ventilation as required.

Fixing of Sheets

Ecoply may be fixed to different types of framing with nails, screws or a combination of fasteners and construction adhesives.

Fasteners should be corrosion resistant to a level appropriate to the end use life expectancy (15 or 50 years) and expected exposure to moisture. Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must be a minimum of hot dip galvanised. In certain circumstances stainless steel fasteners may be required. Refer to section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

The integrity of a plywood based roof system is directly related to how well the panels are fixed to the framing. Ecoply must be fixed to resist wind suction loads, and to maintain surface qualities of the overlying roof covering.

- Always refer to the roofing system supplier for system requirements.
- For roofing, check the additional requirements according to wind exposure.
- For very exposed sites, cyclonic conditions or roofs above 10 metres in height, carry out specific structural design to the relevant standards.
- Screw fixing must be used for membrane roofing, and is preferred for all systems because of increased holding power and avoidance of head popping.
- For minimum fastener spacing for wind suction, refer section 4.5 Roofing - Design Considerations - Fastener spacing for wind suction.

Fixing to Timber Frames

- Ring shank nails or annular grooved nails or screws are recommended for additional holding power.
- Use flathead nails. Do not use jolt or bullet head nails.
- Stainless steel nails must be annular grooved.
- Ensure fastener is compatible with the roofing cover (consult roofing system supplier).
- Staples may be used provided that the withdrawal load is equivalent to the hand driven galvanised flathead nail. A suggested minimum is a 50mm long staple with 12mm crown and legs 1.8mm diameter. Space staples 20% closer than nails. Refer to the manufacturer's information for corrosion resistance and durability.

Fixing to Steel Frames

- Fix directly to roll formed steel (up to 2mm thick) with self-drilling, self-tapping screws. If plywood gets damp and expands, screws in thicker steel may shear. Keep Ecoply dry or use larger screws or;
- Bolt or screw battens to the steel and apply Ecoply as above for timber. Ensure that battens have adequate thickness for the minimum nail or screw length.
- H3.2 CCA treated plywood must not be fixed to steel framing.

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5.0 FLOORING

The following section covers the use of Ecoply® Flooring plywood used as a flooring substrate with flexible and rigid overlays.

Ecoply Flooring is suitable as a substrate for overlays such as carpet, tiles and some membrane products (refer to flooring manufacturer).

5.1 FLOORING – RANGE

- The tongue and groove on long sheet edges does not require support blocking under the joint (unless otherwise specified).
- Supplied in F8/F5 stress grade (F11/F8 available upon request).
- Ecoply 19mm Longspan Flooring supplied as standard in F11/F8 stress grade.
- Supplied standard with a sanded C grade surface with D grade back.
- Designers must expect the surface to dent or mark more easily than hardwood flooring systems as Ecoply is manufactured from relatively soft timber veneers.
- Available untreated or H3.2 CCA treated, (H3.1 LOSP treated available upon request).
- LOSP treated plywood is not recommended for internal applications.
- Refer to Table 1 for range and treatment options.
- Flooring - Critical Radiant Flux C/VM2 Appendix B gives a value of 2.2kW/m² for plywood and timber floors more than 12mm thick.

5.2 FLOORING – INSTALLATION

Table 17: Flooring Frame Spacings

Application	Maximum Frame Centres (mm) for Ecoply® with Face Grain Across Framing			
	Ecoply Nominal Thickness (mm)			
	17	19	21	25
1. Domestic flooring 2kPa - 1.8kN	540	600 F11/F8 Longspan	600	750
2. Institutional and public assembly up to 4kPa - 2.7kN	300	480	540	750
3. Institutional and crowd assembly up to 5kPa - 3.6kN		400	450	600
4. Corridors, industrial up to 5kPa - 4.5kN		300	400	540
5. Domestic garage floor** 2.5kPa - 9kN				270

** Provide blocking to all edges of the sheet.

- Use the next lower recommended frame spacing or thicker Ecoply® flooring where appearance is critical.
- To suit frames at 900 centres, 2700 long sheets are available. See Table 16.

Floor Loads

For domestic garage floors blocking is required under all edges to control wheel loads on the tongue. Testing with 113mm diameter load head (0.01m²) confirms commercial floor capabilities.

Refer to Table 16 to match frame set outs with 2400mm and 700mm sheet modules.

Framing

- Joist spacings should be at spacings to suit plywood thicknesses in Table 17.
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to achieve a moisture content of 18% or less.

Blocking

- Blocking within the body of the floor is not required under tongue and groove edges unless otherwise specified (such as in domestic garage floors).

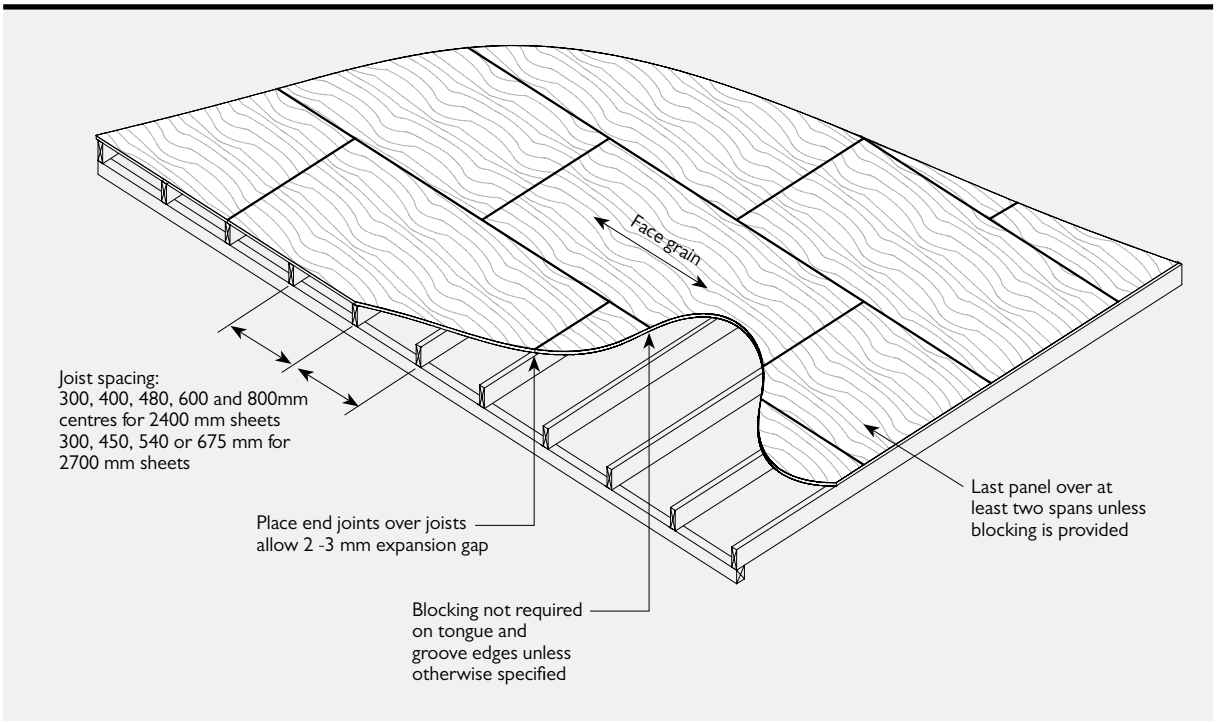
Sheet Layout

- Ensure Ecoply sheets are dry before installation.
- Place face grain at right angles to supports.
- Sheets must be continuous over at least two spans (three framing members).
- For panels at floor edges where a continuous two span coverage is not possible, sheet edges must be supported by blocking.
- Lay sheets in a staggered pattern.
- Allow clearance for ventilation as required.

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EC007: Ecoply® Flooring Layout



Fastener Selection and Treatment

Fasteners should be corrosion resistant to a level appropriate to the end use, life expectancy (15 or 50 years) and expected exposure to moisture.

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 section 4 of NZS 3604 for these circumstances. Where stainless steel nails are required, annular grooved nails must be used.

Fasteners and Fixing of Sheets

- Ecoply® Flooring may be fixed with nails or screws or a combination of mechanical fasteners and construction adhesives.
- For fastener specifications (including lay out and sizes) refer to section 2.2: Sheet Fasteners and Fixing.
- For construction adhesive specifications refer to section 2.3: Adhesives.
- Ring shank or annular grooved nails, or screws are recommended for additional holding power.
- To reduce the risk of fastener popping or floor squeak the use of construction adhesives is advised.
- Do not use jolt or bullet head nails.

5.3 FLOORING – FINISHING

- Overlays and coatings should be applied following the manufacturer's specifications.
- Avoid heavy sanding that may remove the critically important structural face veneer.
- Adhesives must be compatible with CCA (Copper Chrome Arsenic) treatment in H3.2 CCA treated sheets. Compatibility can often be improved by lightly washing, scrubbing and drying the plywood surface prior to fixing.
- Where clear or stained finishes are desired, designers should select sheets and protect the floor as much as possible from the weather and construction activities.
- Ecoply is made from relatively soft timber veneers and as such will dent or mark more easily than hardwood flooring systems. This is to be expected and designers must consider the long term appearance requirements of the project. Ecoply Flooring is a good substrate for harder wearing flooring overlays, and is not primarily intended for clear finishing, especially if it is exposed to moisture during construction.
- For improved surface finish, floors should be protected from weather during construction as soon as possible.

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6.0 FREQUENTLY ASKED QUESTIONS

Q: How much space should be allowed for expansion?
A: Allow a 2 - 3mm expansion gap between square edges of Ecoply® sheets. If using Ecoply Flooring, a 5mm expansion gap is recommended at the perimeter of the floor or deck. Check by calculation for large areas.

Q: Can power driven nails be used to fix Ecoply®?
A: Paslode power driven nails have been tested for fixing Ecoply and Shadowclad® plywood products for particular bracing and cladding applications. For power driven nail specifications refer to the Paslode Special Fixing Applications document available from https://www.paslode.co.nz/wp-content/uploads/CHH-Woodproducts-Fixing-Matrix.pdf. Use the Paslode Impulse Compact Nailer fitted with a No Mar(k) work contact element to eliminate any contact marks on the plywood. Adjust the work contact element to the flush position and fire the nail at 90° to the work surface. Hammer any nails flush which are left proud. Do not overdrive.

Q: How close to sheet edges can I nail?
A: Fixings must be at least 7mm from the sheet edge.

Q: Do I have to use stainless steel nails when using Ecoply for bracing?
A: Where fasteners are in contact with H3.2 CCA treated timber or plywood, fasteners must 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. Where stainless steel nails are required, annular grooved nails must be used.

Q: What is the weight of Ecoply?
A: Refer to Table 4A for weight (kg/m^2) of different Ecoply thicknesses.

Q: What is the R-value of Ecoply?
A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (k) of 0.13W/mK so a 12mm panel has a thermal resistance R = 0.012/0.13 = 0.09.

Q: Are there any compatibility issues when using Ecoply with other materials?
A: Adhesives for flexible rubber membranes may react with LOSP treatment and should therefore only be applied to H3.2 CCA treated Ecoply unless the membrane supplier advises differently. Check with the membrane manufacturer if in doubt. H3.2 CCA treatment is also corrosive and this must be taken into account when specifying H3.2 CCA treated plywood next to metals. For further guidance, refer to Tables 21 and 22 in Acceptable Solution E2/AS1.

Q: Can Ecoply be used as a rigid sheathing (air barrier)?
A: CHH has a specific system called Ecoply Barrier. Ecoply Barrier has been developed as a rigid air barrier. Refer to the current Ecoply Barrier Specification and Installation Guide for further information. 7mm H3.2 CCA treated Ecoply can also be used if combined with building underlay in accordance with E2/AS1 for a rigid air barrier system.

Q: Flooring - what is the Critical Radiant Flux?
A: C/VM2 Appendix B gives a value of 2.2kW/m² for plywood and timber floors more than 12mm thick.

Q: What is the relevance of AS/NZS 2269?
A: Ecoply structural plywood is manufactured to AS/NZS 2269 Plywood Structural. This Standard is referenced by the NZBC Compliance Documents including NZS 3602 Timber and Wood-based Products for Use in Building, NZS 3603 Timber Structures, NZS 3604 Timber Framed Buildings, AS/NZS 1604.3 Specification for Preservative Treatment, Part 3:Plywood and Acceptable Solution E2/AS1 - External Moisture. Plywood not manufactured to AS/NZS 2269 does NOT meet the requirements of these NZBC Compliance Documents.

Q: What is marine ply?
A: Marine plywood manufactured to AS/NZS 2272 Plywood Marine may contain species of low durability (source: BRANZ Good Practice Guide – Timber Cladding). Whilst marine plywood has a Type A glue bond, it is generally specified for its high surface appearance grade and lack of core knots as opposed to structural performance. AS/NZS 2272 limits marine plywood to a number of approved species that pass stringent property requirements for things like moisture permeability. These requirements are different from those in standards from other countries. Marine plywood is rarely treated as it is usually coated with resin, fibreglass, or a paint finish for long term durability.

Q: What should a specification for structural plywood include?
A: A specification for structural plywood should include:

Specification Check List	Example
Quantity/size	20 sheets of 2400 x 1200
Thickness	12mm
Edge finish	Square edge
Brand name	Ecoply® structural plywood
Reference to Standard	To AS/NZS 2269
Stress grade[1]/(layup)	F8/F5 (12-24-5)
Surface grade/bond type	CD A-Bond[2]
Accreditation	Third party product certified

[1] Stress grades and layups may vary between different manufacturers and products.

[2] Type A-bonds are suitable for permanent exposed applications and structural applications.

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Q: What are F-grades?

A: The stress grading system is a ranking system which utilises the symbol F and a suffix 8, 11 etc. as a code to apply a full suite of strength and stiffness properties to plywood products of that stress grade. For plywood of a given thickness, the higher the F-grade, the further it will span. For load bearing applications (e.g. flooring, roofing) the required F-grade as well as the plywood thickness must be specified to achieve the required span. F8/F5 is the most common structural plywood grade found in New Zealand. All Ecoply® structural products are F8 in parallel to the grain direction. Ecoply 19mm Longspan Flooring are F11/F8. Other Ecoply Flooring products are also available in F11/F8 upon request.

Q: What are surface/appearance grades (e.g. CD)?

A: Appearance grades (e.g. CD, DD) denote the appearance grade of the plywood including the number and size of knot holes as defined in AS/NZS 2269 and summarised in Table 2A and 2B of this guide. The first letter describes the appearance of the face veneer and the second letter describes the back face.

Q: How long can Ecoply® be left exposed to the weather?

A: Untreated Ecoply will typically maintain its structural integrity when exposed to the weather during construction for up to 3 months. The surface colour will start to silver off and face checking will become evident. Where the finished appearance of the Ecoply is important, it should be protected during construction. Ecoply is also available H3 treated to resist decay or insect hazard. When used in accordance with this guide, it can be specified to meet the durability requirements of the NZBC, however appearance issues such as face checking may still occur dependent upon the degree of exposure to weather during construction.

Q: What treatment levels and types are used for Ecoply?

A: Ecoply is available untreated or preservative treated. Ecoply is treated to the H3 hazard class for above ground use. The standard Ecoply treatment type is H3.2 CCA (Copper Chrome Arsenate) although H3.1 LOSP Azole (Light Organic Solvent Preservative) may also be specified where a clear treatment is required. LOSP Azole is the standard treatment type for Shadowclad®. CCA treatment gives the plywood sheets a green tinge and the drying process after CCA treatment may leave fillet marks on the face of the sheet.

Q: Does Ecoply have to be treated when used as structural bracing?

A: Ecoply used as bracing must be treated unless it is installed in an interior dry situation. Note, behind exterior cladding and in cavities (even if the Ecoply is covered with building wrap) are not considered to be an interior dry situation.

Q: Do I have to re-treat cut edges of treated Ecoply?

A: It is important to re-treat any cuts and holes with a brush on remedial treatment such as Holdfast® Metalex® Clear.

Q: What type of glue is used to manufacture Ecoply?

A: Phenol formaldehyde (PF) resins are used to bond the plywood veneers. This forms a Type A (Marine) bond suitable for structural applications and exterior use. Phenol formaldehyde resins are dark red/brown in colour. Product details printed on the back of Ecoply sheets indicate the 'A Bond'.

Q: Does Ecoply emit formaldehyde?

A: Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply and Shadowclad meet the E0 formaldehyde emission class, less than 0.5mg/litre.

Q: How should Ecoply be installed to maximise its stiffness properties?

A: Structural plywood has greatest stiffness along the long grain of the sheet (i.e. along its length). Therefore, flooring/roofing should be laid across joists/rafters rather than parallel to them.

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7.0 REFERENCES & SOURCES OF INFORMATION

- New Zealand Building Code (NZBC).
- CHH Plywood technical notes - downloadable from https://chhply.co.nz/librarytools.
- NZS 3640:2003 "Chemical Preservation of Round and Sawn Timber".
- NZS 3602:2003 "Timber and Wood-based products for use in Buildings".
- NZS 3603:1993 "Timber Structures Standard".
- NZS 3604:2011 "Timber Framed Buildings".
- AS/NZS 1170:2011 "Structural design actions".
- AS/NZS 2269:2012 "Plywood Structural".
- AS/NZS 1604.3:2012 "Specification for Preservative Treatment, Part 3: Plywood".
- US Product Standard PS1-95.
- Acceptable Solution 'E2/AS1 – External Moisture'.
- Acceptable Solution 'B2/AS1 – Durability'.
- BRANZ Bulletin 289: Asphalt shingle roofing.
- BRANZ Appraisals 307, 404, 411.
- BRANZ Bulletin 630: Roof Space Ventilation.
- BRANZ Bulletin 610: Preventing Moisture Problems In Timber-Framed Skillion Roofs.
- Shadowclad® Specification and Installation Guide for Cavity Construction.
- Ecoply® Barrier Specification and Installation Guide.
- Safety Data Sheets.
  - SDS Azole Treated Plywood, LVL and I-Joists.
  - SDS H3 CCA Treated Plywood and I-Joist.
  - SDS Untreated Plywood.
- APA (www.buildabetterhome.org).
- EWPAA (www.ewp.asn.au).
- Product Technical Statement and Building Product Information Sheet for Ecoply available online at www.chhply.co.nz/librarytools.
- EWPAA Technical Note - Plywood Roofing and Flooring: Installation and detail factors.

Standards can be purchased online at www.standards.co.nz. Building Code Compliance Documents can be downloaded free of charge at www.building.govt.nz/building-code-compliance/

8.0 LIMITATIONS

The information contained in this document is current as at June 2025 and is based on data available to CHH Plywood at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply products installed in accordance with this document or NZBC compliance documents.

This publication replaces all previous CHH Plywood design information and literature relating to Ecoply structural plywood products. CHH Plywood reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhply.co.nz to obtain current information.

CHH Plywood has used all reasonable endeavours to ensure the accuracy and reliability of the information contained in this document. However, to the maximum extent permitted by law, CHH Plywood assumes no responsibility or liability for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

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ecoply®

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14/08/2025



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June 2025
ECOPLY. V1, 11.06525

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GIB®

EzyBrace® Systems

Specification and installation manual



CBI 5113

AUGUST 2016

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GIB® HELPLINE

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute to bracing resistance.
- Potentially reduces the amount of fasteners[1]
- Encourages more even bracing distribution throughout the building.

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

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

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

PATENTS

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

Beware of substitution

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

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

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

	Acceptable alternative GIB® plasterboards								
Specified GIB® plasterboard	GIB® Standard	GIB Ultraline®	GIB Braceline/ Noiseline®	GIB Aqualine®	GIB Toughline®	GIB Fyreline®			
						10mm	13mm	16mm	19mm
GIB® Standard		OK	OK	OK	OK	Note 1 and 3			
GIB Braceline®	X	X		Note 2	OK	X	Notes 1, 2 and 3		

Note 1 *The fastener type and length must be as required for the relevant FRR system using the perimeter fixing pattern illustrated for the relevant bracing specification.*

Note 2 *The element must be 900mm or longer. Decrease perimeter fastener centres to 100mm. The bracing corner fastening pattern, as illustrated for the relevant specification applies to all four corners of the element. Panel hold-down fixings are required.*

Note 3 *Specify traditional wall framing layout (see figure 1) where a Fire Resistance Rating (FRR) is required.*

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Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

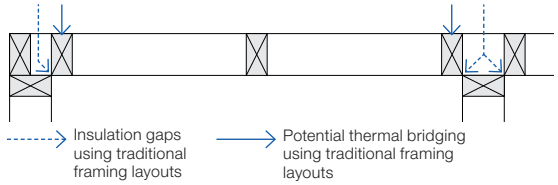
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

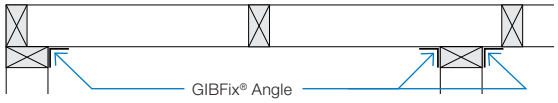
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

- Reduced potential for fastener pop and joint cracking of plasterboard linings.
- Enhanced thermal performance.
- Allows internal walls lined with GIB® plasterboard on both sides and fastened off as per the standard fixing requirements of the current GIB® Site Guide to contribute bracing resistance.
- Potentially reduces the amount of fasteners[1].
- Encourages more even bracing distribution throughout the building.

1. Actual savings dependent on building and bracing design.

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Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

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

NZBC CLAUSE B2 — DURABILITY

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

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

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 — ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

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

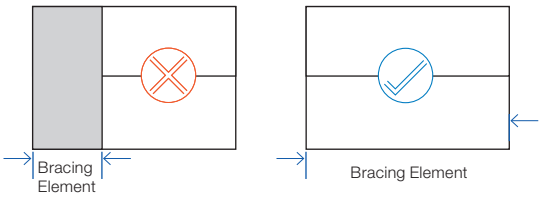
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Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

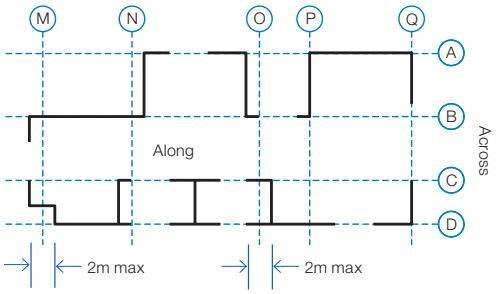
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

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Bracing demand

GIB EZYBRACE® CALCULATOR

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

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

DEMAND

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

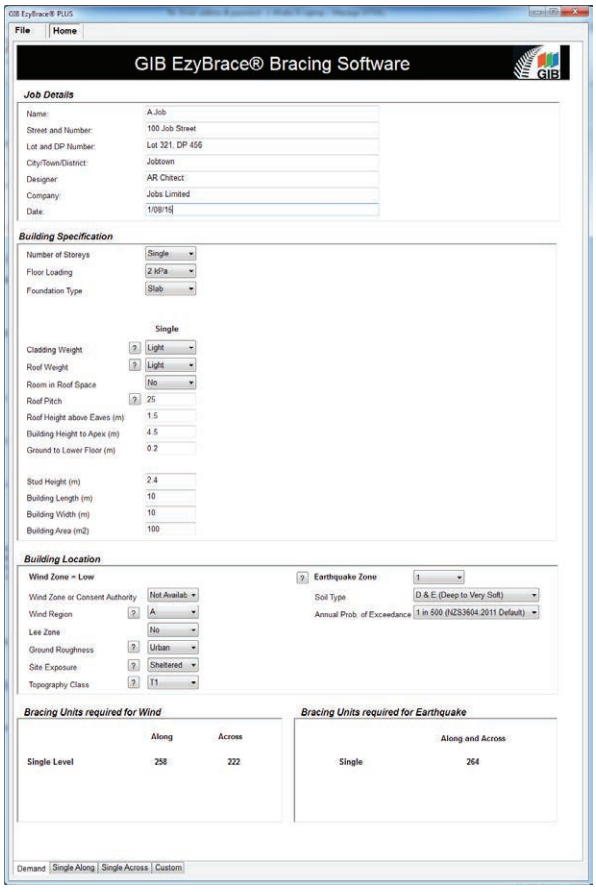
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

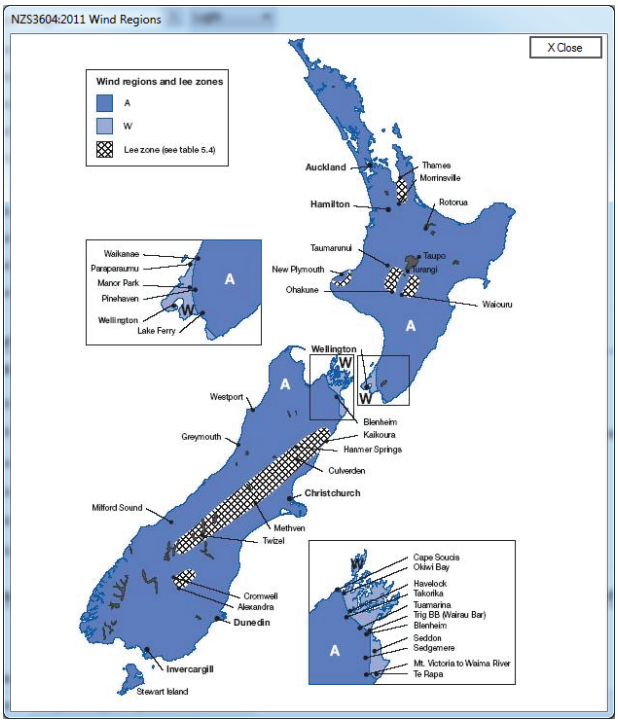
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design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

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

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

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





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

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Software functionality

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

The software compares bracing resistance achieved with demand and for wall bracing lines incorporating external walls, the external wall length can now be entered to check minimum bracing units required on that line. The NZS 3604:2011 rules and associated software output are not the only check. Designers must additionally check the building layout to ensure adequate bracing distribution.

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

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

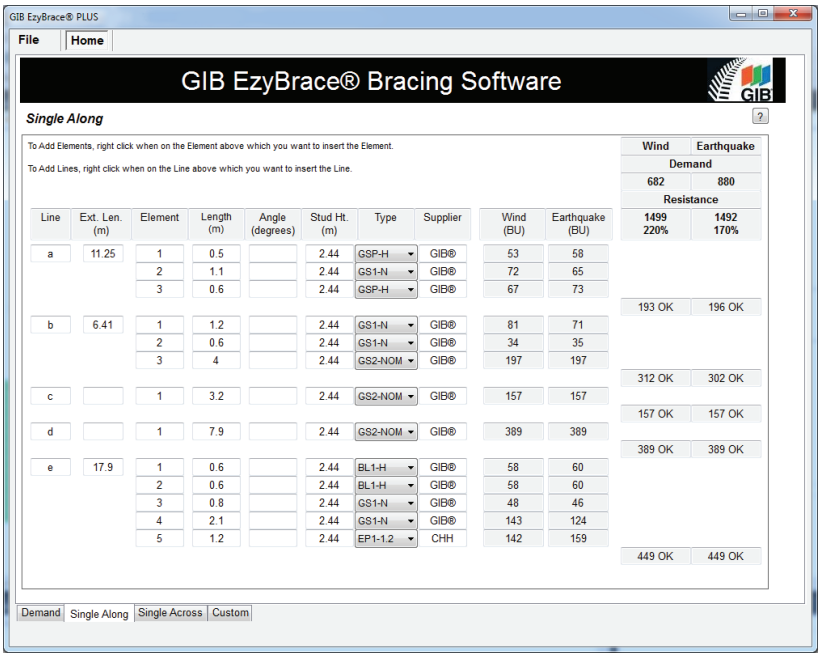
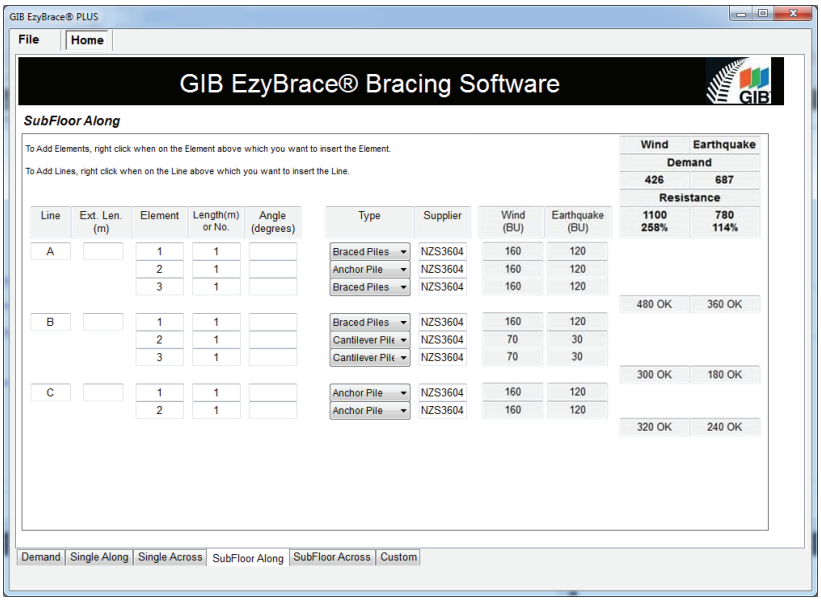


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET



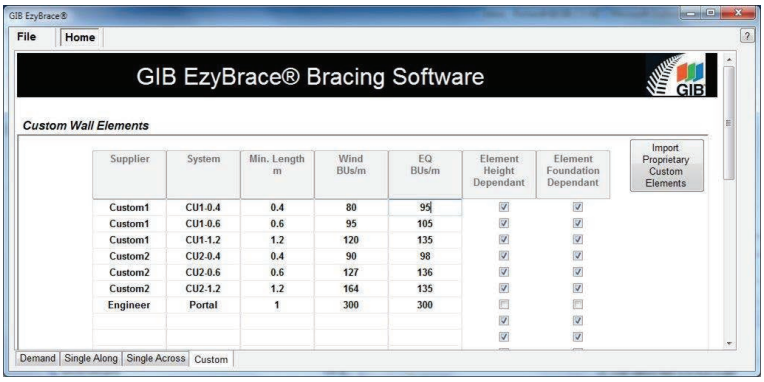
Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

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Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



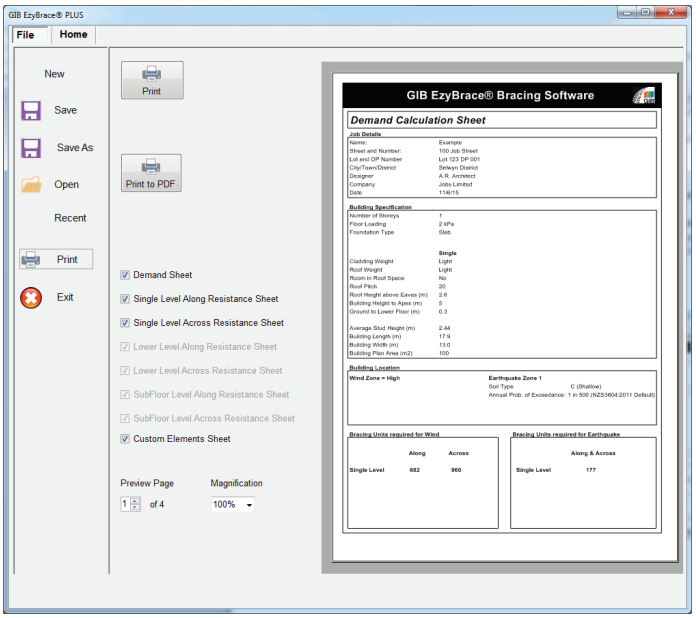
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

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

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

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

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



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

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GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

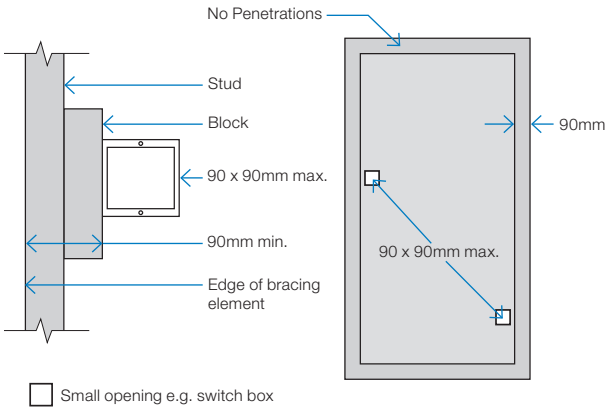
SMALL OPENINGS

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

LARGE OPENINGS

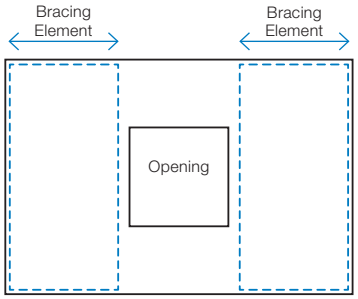
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



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Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

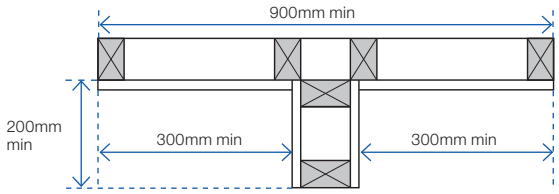
Guidelines for intersection walls

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

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

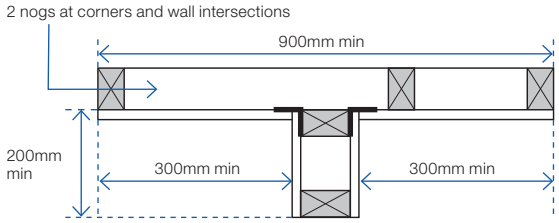
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



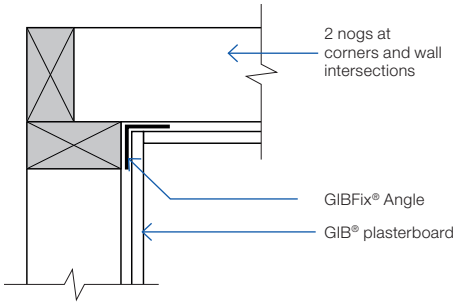
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



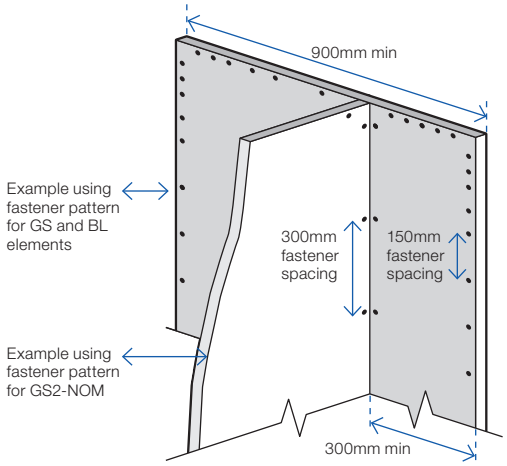
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

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Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

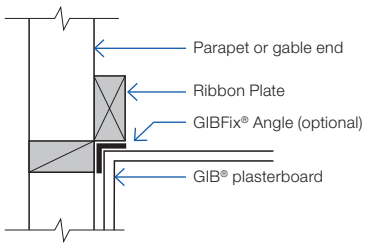
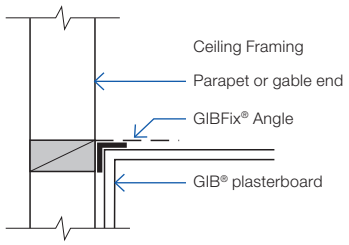


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

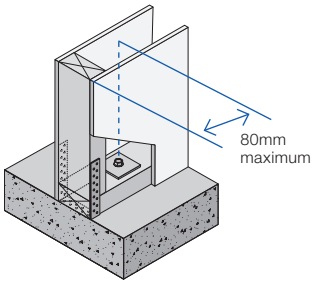
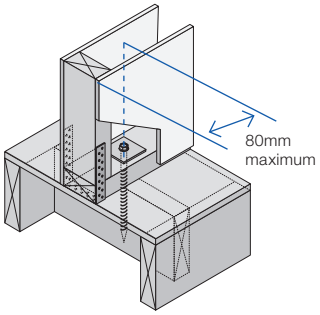
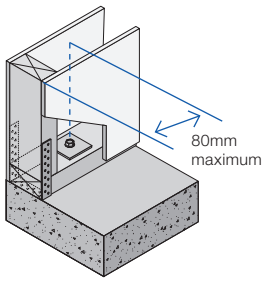
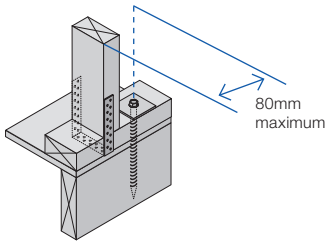
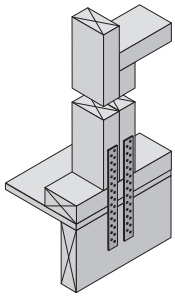
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

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Bracing strap installation

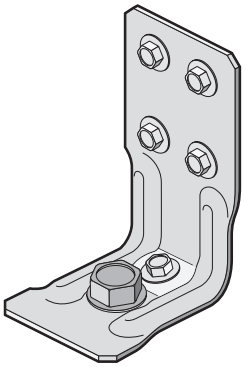
Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to the edge of the end stud as shown will allow the corner fastenings to be installed without having to penetrate the bracing strap.

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 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer to be fitted within 80mm of the end of the element.	
Internal wall	
 GEB004	 GEB005
External wall	
 GEB006	 GEB007
Note: Where applicable drawings have been produced for CAD design. These are identified by a unique number in the bottom corner of each detail box that can be found at gib.co.nz/library.	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.
	 GEB008

Hold-down fastener requirements	
Concrete floor	Timber floor
A mechanical fastening with a minimum characteristic uplift capacity of 15kN fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element.	12 x 150mm galvanised coach screw fitted with a 50 x 50 x 3mm square washer within 80mm of the ends of the bracing element

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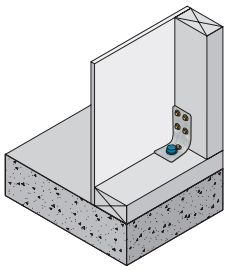
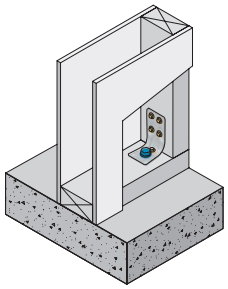
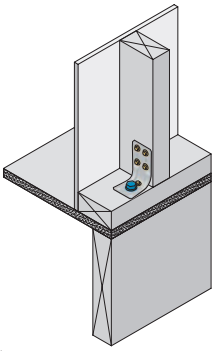
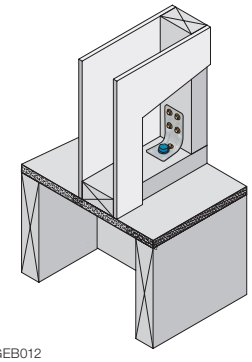
GIB HandiBrac® installation



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

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

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

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

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

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

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

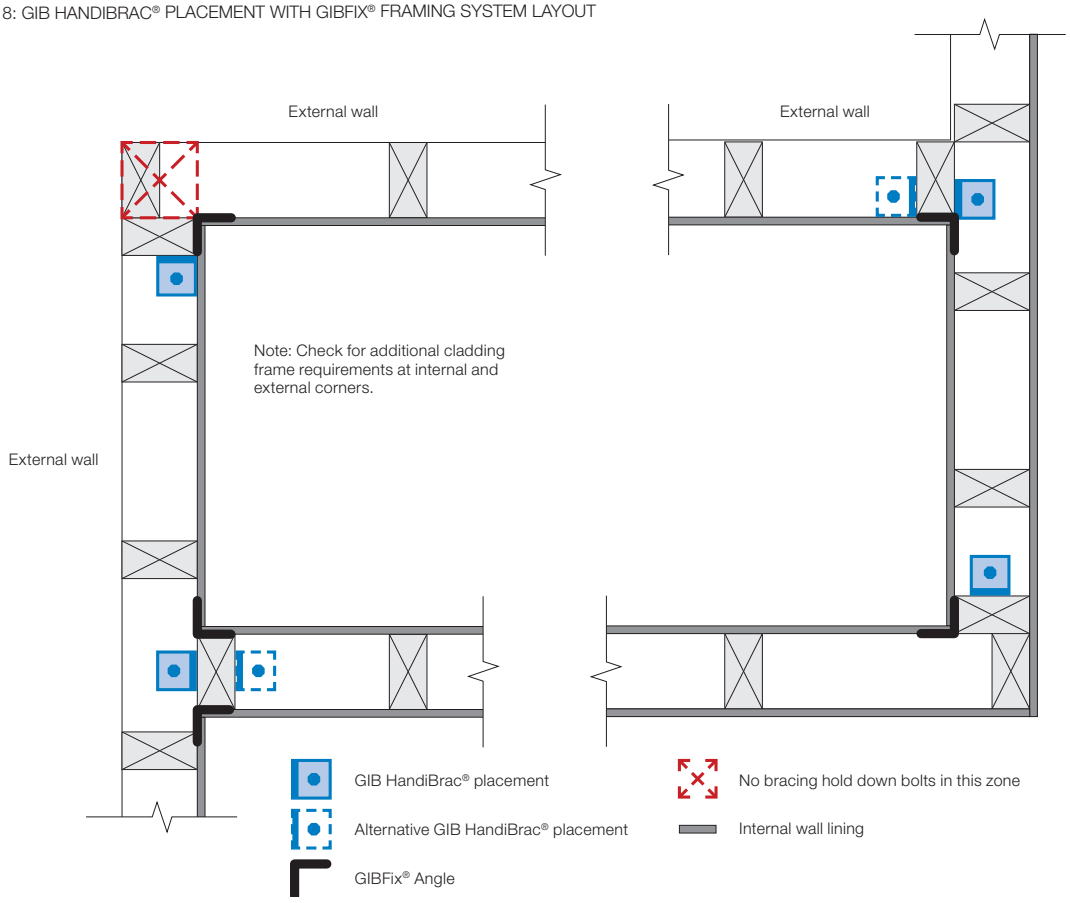
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

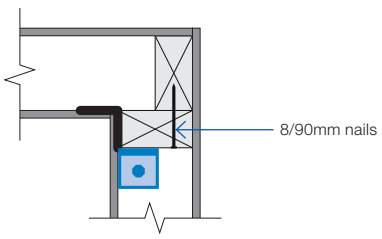
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

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Ceiling diaphragms

GIB® plasterboard ceiling diaphragms are stiff and strong horizontal elements which effectively transfer loads to bracing walls. They themselves do not have a bracing unit rating but are used when bracing lines exceed 6m separation. The basic shape of a ceiling diaphragm is square or rectangular. Protrusions are permitted but cut-outs are not. The length of a ceiling diaphragm shall not exceed twice its width. Dimensions are measured between supporting bracing lines. Supporting bracing lines shall have a bracing capacity no less than the greater of 100 bracing units or 15 bracing units per metre of diaphragm dimension, measured at right angles to the line being considered, see figure 21.

Limitations for GIB® plasterboard ceiling diaphragms

Ceiling diaphragms may be constructed using any GIB® plasterboard provided perimeter fixing is at;

150mm centres for: Diaphragms up to 7.5m in length, no steeper than 15°.

100mm centres for: Diaphragms up to 7.5m in length, no steeper than 45°. Diaphragms up to 12m in length, no steeper than 25°.

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

- Linings must be installed over the entire area of the diaphragm.
- Fastening must be no less than 12mm from sheet edges and not less than 18mm from sheet ends.
- Sheets must be supported by framing members (e.g., ceiling battens) spaced at no more than 500mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled, “GIB® Site Guide”. All joints shall be GIB® Joint Tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see “GIB® Site Guide”).
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see “GIB® Site Guide” and figure 22).
- Fasteners are placed at the specified centres around the ceiling diaphragm with the corners fastened using the GIB EzyBrace® fastener pattern.

FIGURE 20: PROTRUSIONS AND CUTOUTS

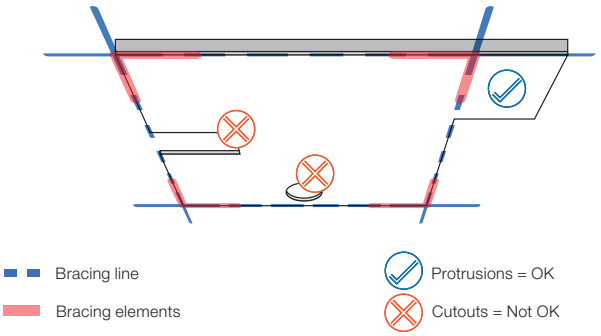


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

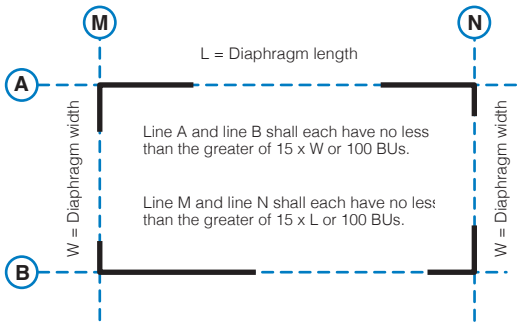
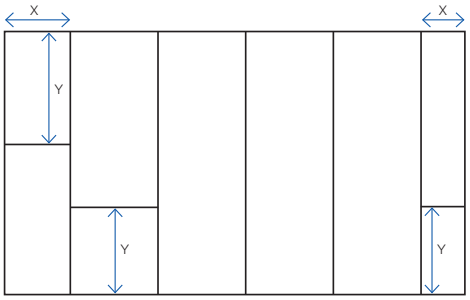


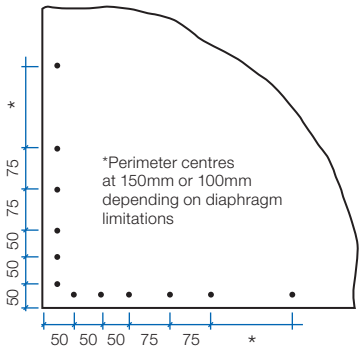
FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.

Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

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Ceiling battens in ceiling diaphragms

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.

Metal battens shall be GIB® Rondo® battens with two external flanges of 8mm to allow direct screw fixing to roof framing.

GIB® Rondo® metal battens shall be fixed with 2/32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws to supporting framing.

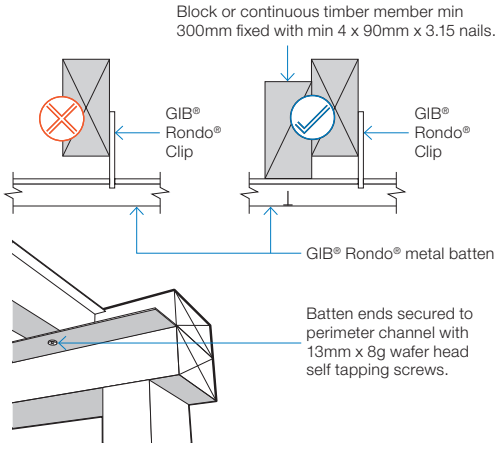
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal 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 or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

Linings are fastened to metal using 25mm x 6g GIB® Grabber® Self Tapping screws and to timber framing using 32mm x 6g GIB® Grabber® High Thread screws. Alternatively 32mm x 7g GIB® Grabber® Dual Thread screws can be used in both cases. Fastener centres are specified on p.18.

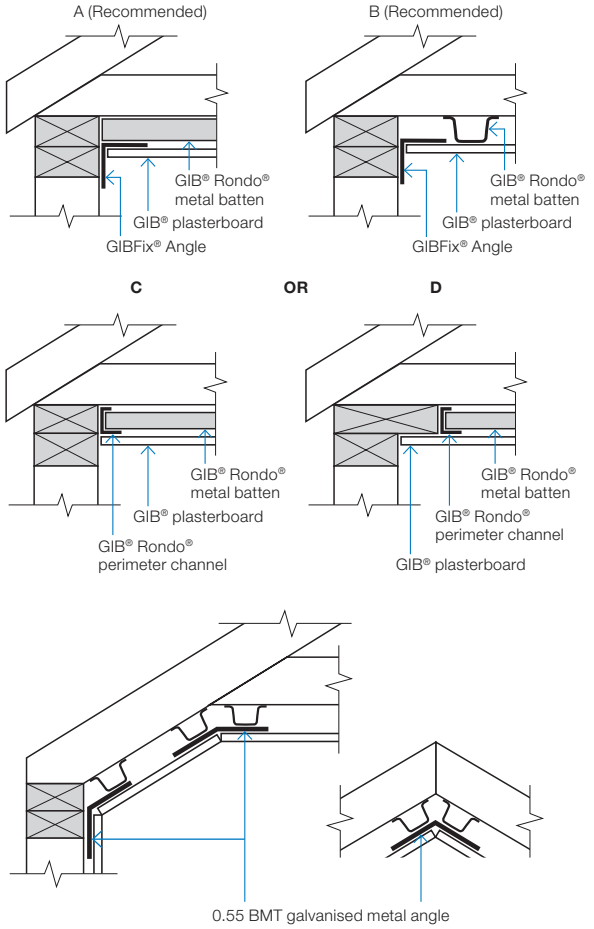
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



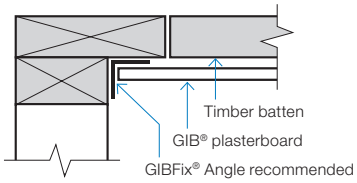
GEB016

FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

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Openings in ceiling diaphragms

SMALL OPENINGS

Small opening (e.g. down lights) of 90 x 90mm or less may be placed no closer than 90mm to the edge of the ceiling diaphragm.

LARGE OPENINGS

Openings are allowed withing the middle third of the diaphragms length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings or openings in other locations require specific engineering design.

Where fireplace flue or range hood openings are required in a ceiling diaphragm use a galvansed metal backing plate as shown in figure 25, with a maximum hole diameter of 350mm.

Figure 25 can also be used for range hood openings in walls.

For information on openings in ceiling diaphragms contact the GIB® Helpline on 0800 100 442.

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

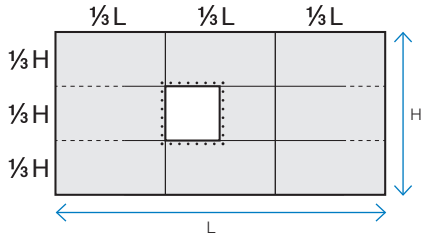
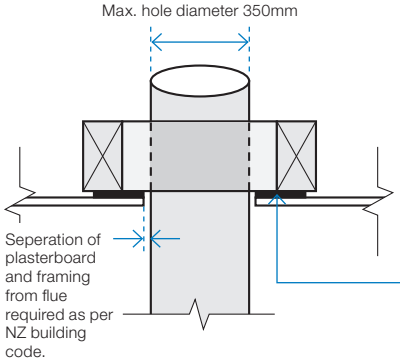
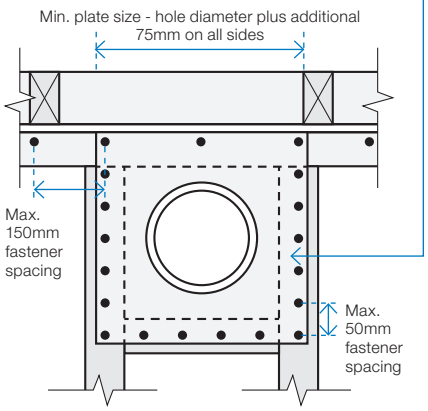


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



Steel plate
0.55 BMT Galvanised sheet Max. opening 350mm diameter. Installed prior to GIB® plasterboard.

Framing
90 x 45mm framing trimmed to provide extra fixing.

GIB® plasterboard ceiling
Installed over the steel plate and into framing using a minimum of 32mm x 6g GIB® Grabber High Thread or 32mm x 7g GIB® Grabber Dual Thread screws at 50mm max centre spacing.

Plasterboard ceiling not shown in plan view

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

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

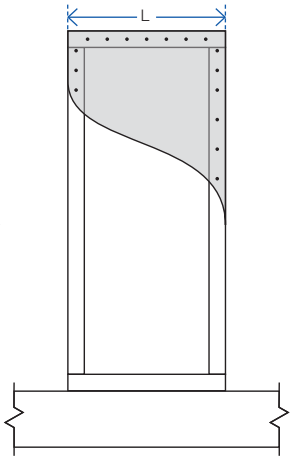
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

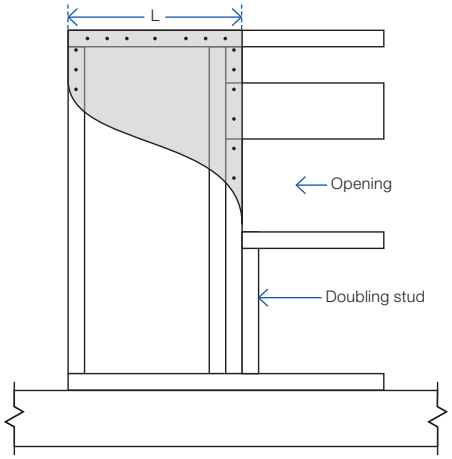
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



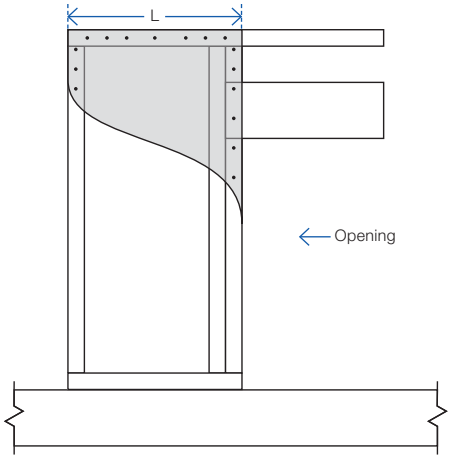
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



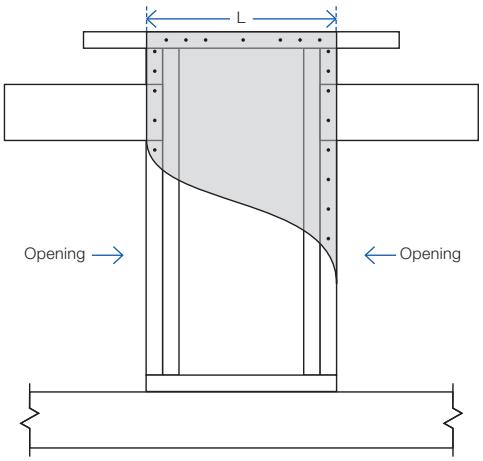
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

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

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

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

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

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

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

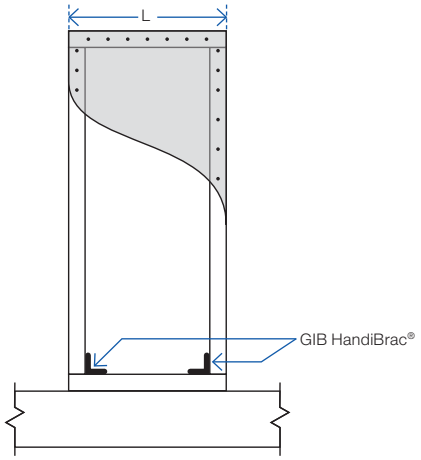
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

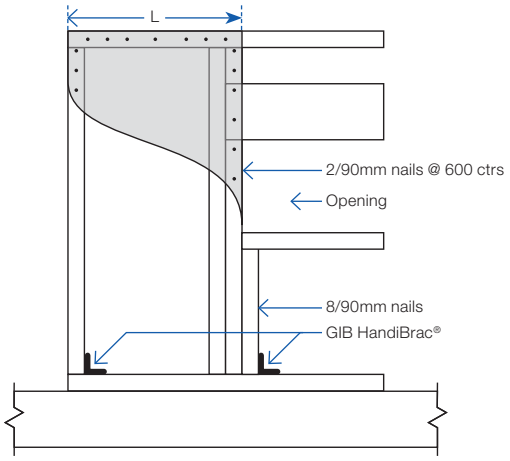
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



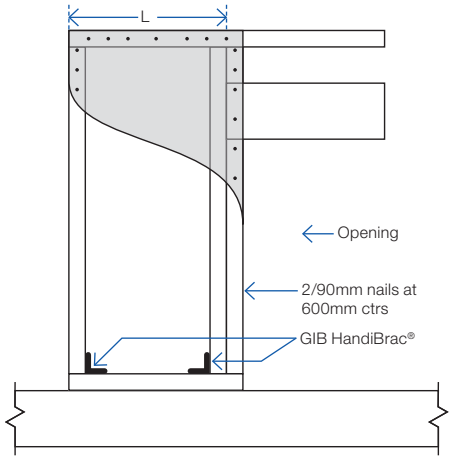
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



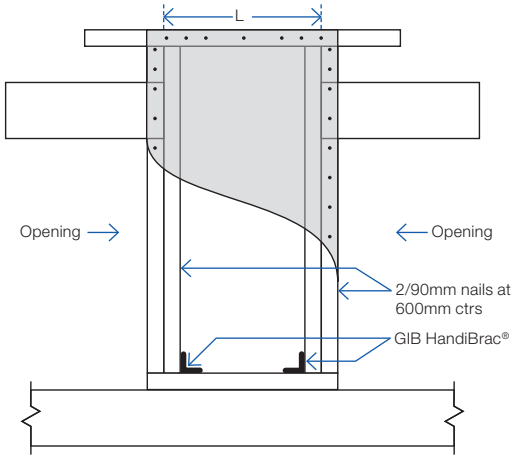
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

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GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

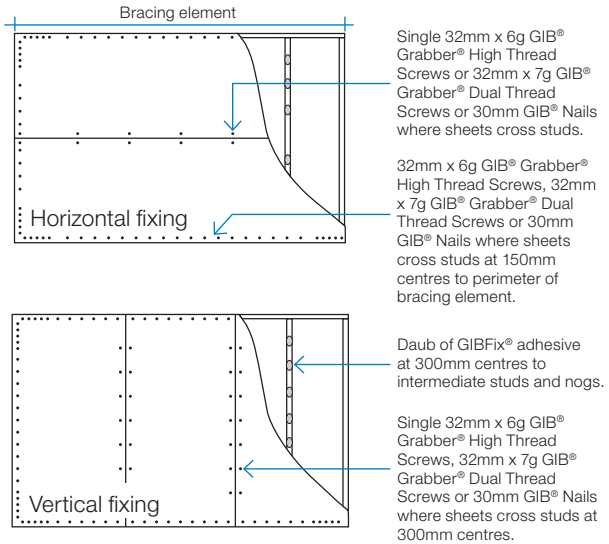
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

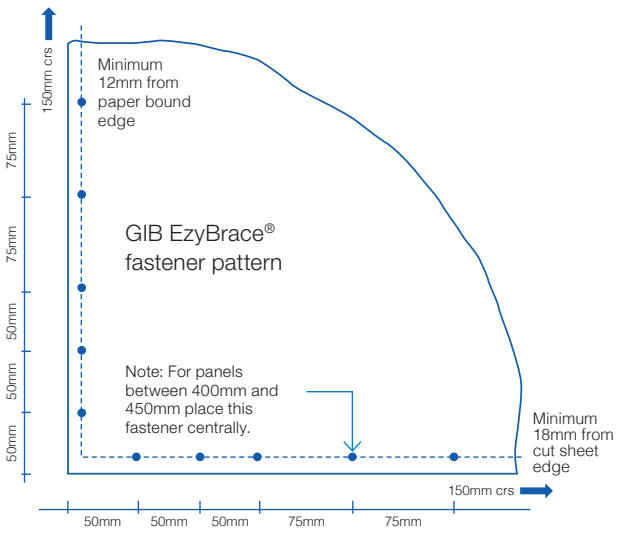
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GS2-NOM

Specification code	Minimum length (m)	Lining requirement
GS2-NOM	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

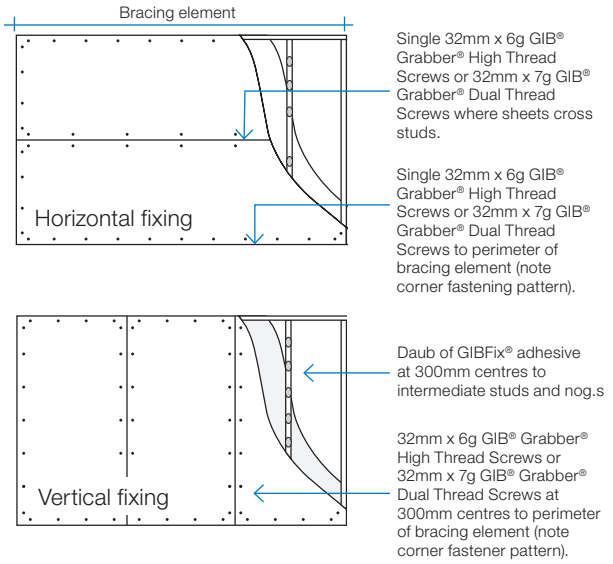
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

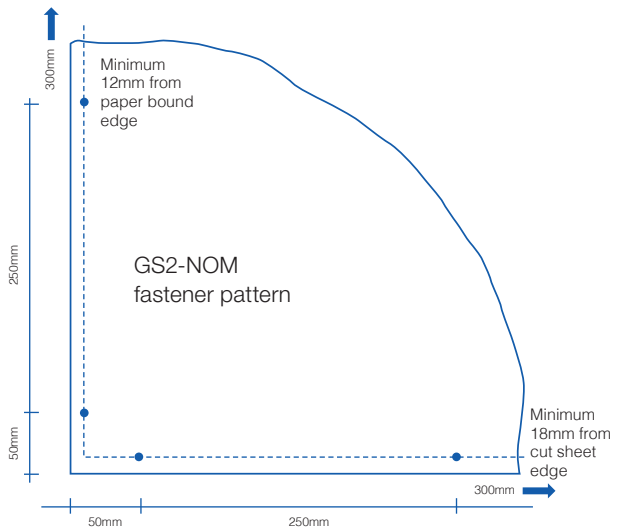
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

As an alternative to using screw fixings, a continuous 6-10mm bead of solvent based GIBFix® All-Bond can be applied along the full height studs immediately adjacent to an internal door opening and at the door lintel or head trimmer. The lining is then bedded into the adhesive and installed into the rebated jamb, as shown in figure 38.

This solvent based adhesive option may only be used with GS2-NOM specification and is designed to reduce popping of fasteners around door openings on internal walls.

FIGURE 37: SCREW FIX FOR OPENINGS

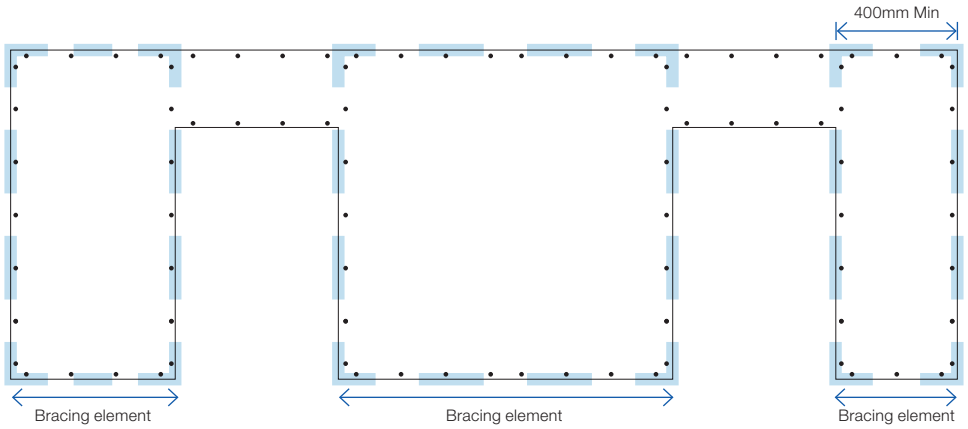
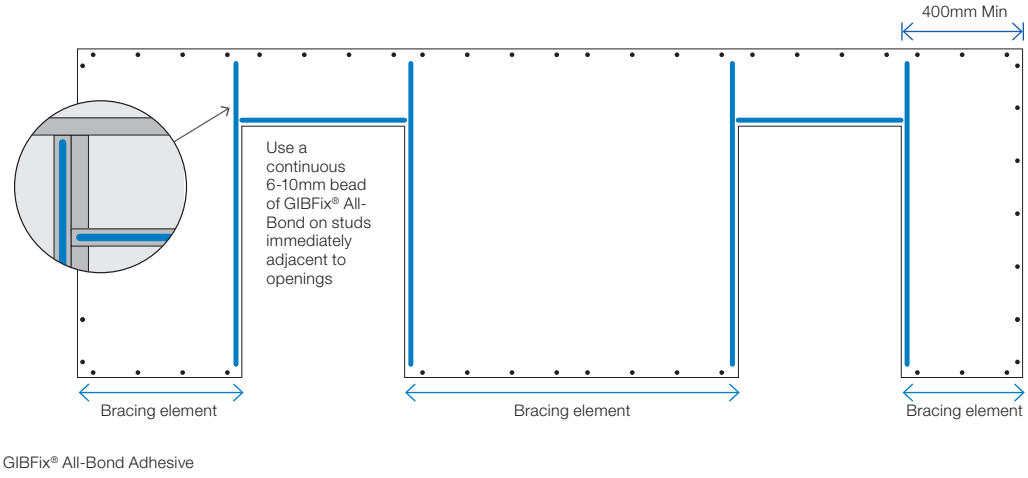
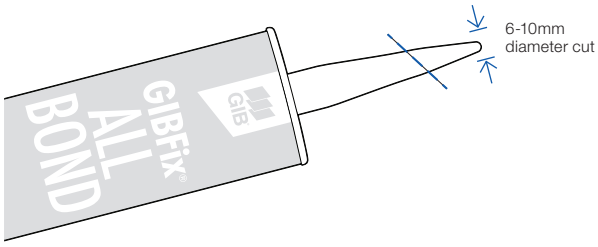


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



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GIB EzyBrace® Systems specification GS2-N

Specification code	Minimum length (m)	Lining requirement
GS2-N	0.4	Any 10mm or 13mm GIB® Standard plasterboard fixed to each side of the wall framing

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber Floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

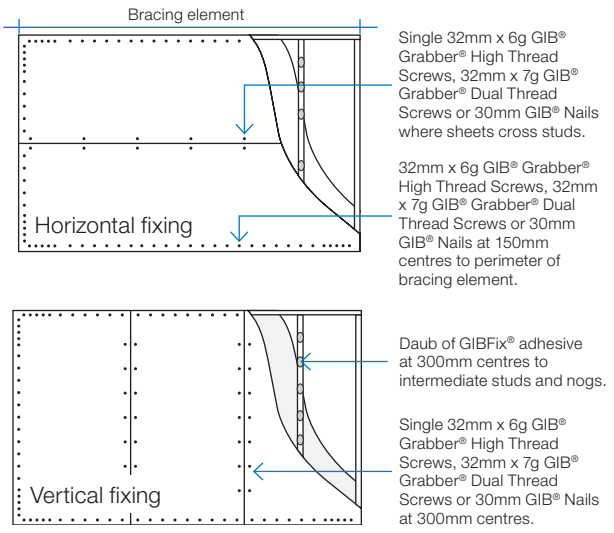
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

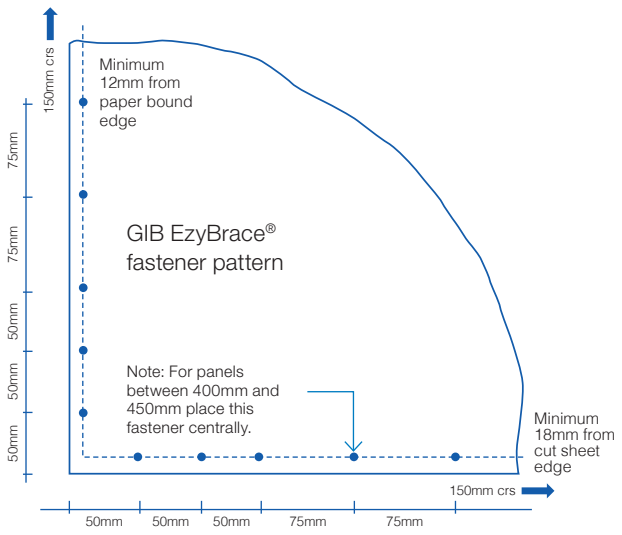
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GSP-H

Specification Code	Minimum length (m)	Lining requirement	Other requirements
GSP-H	0.4	Any 10mm or 13mm GIB® plasterboard lining to one side of framing and minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB® plasterboard to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally, with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails.

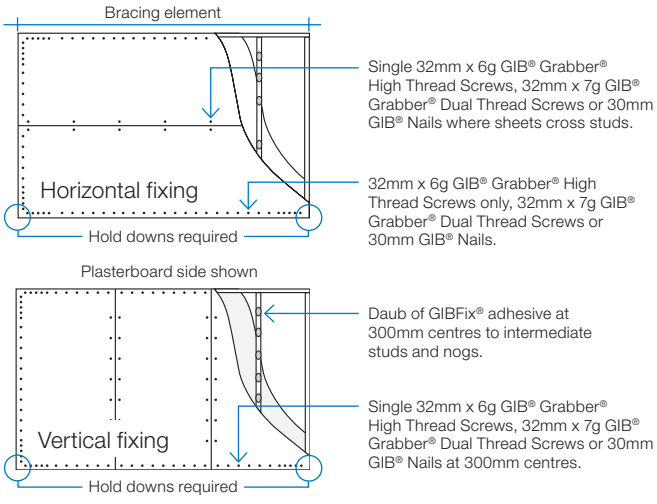
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

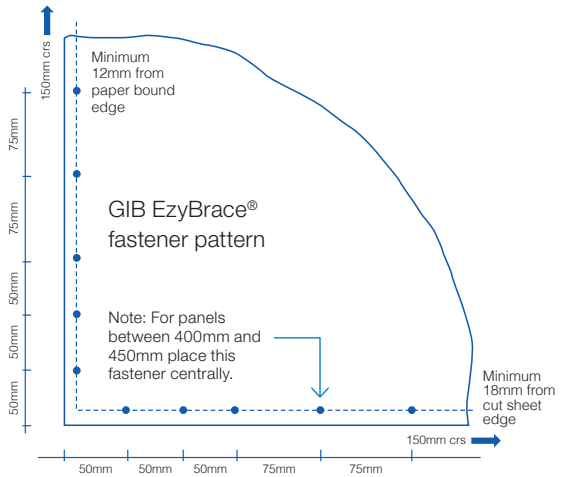
Fastener centres

GIB® plasterboard side: 50,100,150, 225, 300mm maximum from each corner and 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BL1-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

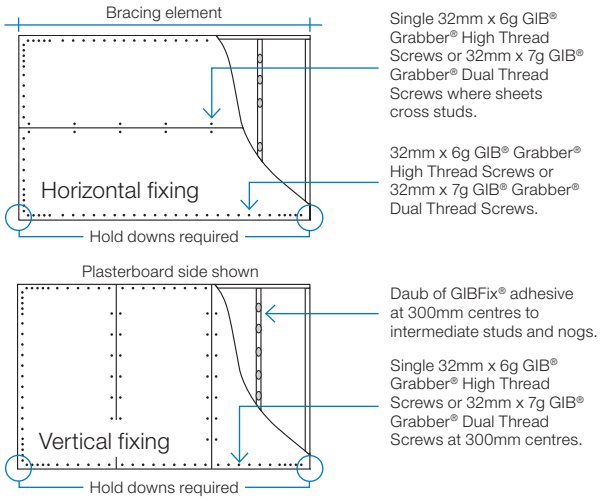
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

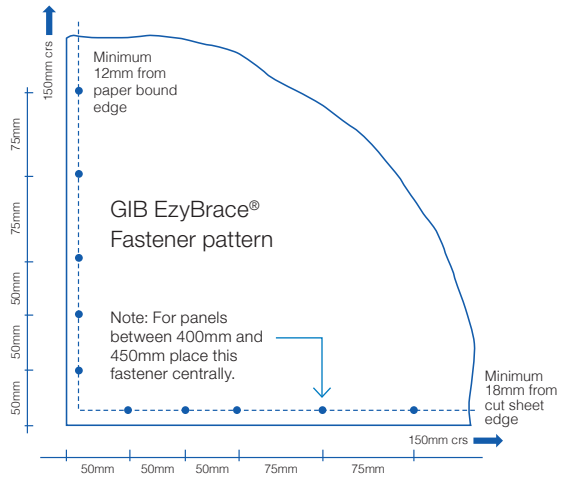
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BLG-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLG-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus any 10mm or 13mm GIB® plasterboard to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

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

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus any 10mm or 13mm GIB® plasterboard lining to the other side.
- Sheets can be fixed vertically or horizontally.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws.Other side: 32mm x 6g GIB® Grabber® High Thread Screws, 30mm GIB Nails or 32mm x 7g GIB® Grabber® Dual Thread Screws.

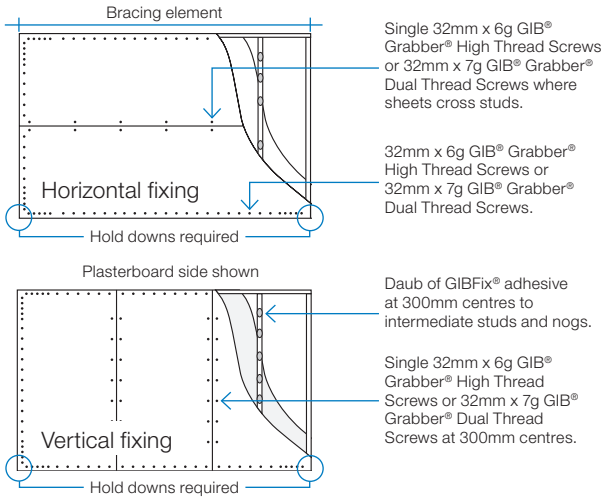
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

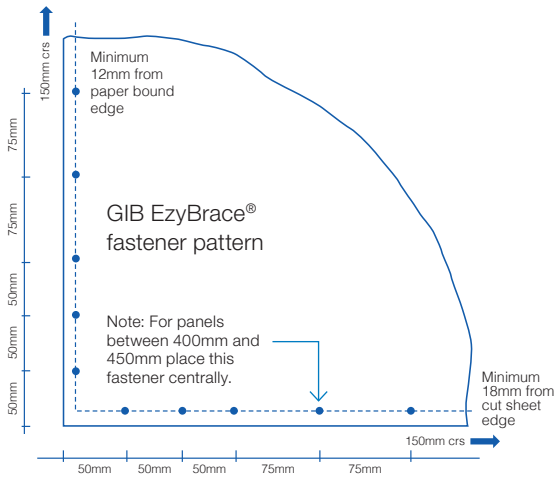
Fastener centres

50,100,150, 225, 300mm maximum from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm maximum centres to the intermediate sheet joints. For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

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GIB EzyBrace® Systems specification BLP-H

Specification code	Minimum length (m)	Lining requirement	Other requirements
BLP-H	0.4	10mm or 13mm GIB Braceline® to one side of the frame plus minimum 7mm structural plywood manufactured to AS/NZ 2269.0 :2012 to the other side	Hold downs

WALL FRAMING

Wall framing to comply with;

- NZBC B1 — Structure; B1/AS1 Clause 3 Timber (NZS 3604:2011).
- NZBC B2 — Durability B2/AS1 Clause 3.2 Timber (NZS 3602).

Framing dimensions and height as determined by NZS 3604:2011 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING

Timber floor

Use panel hold downs at each end of the bracing element. The GIB® HandiBrac is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide.

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or Three power driven 90 x 3.15mm nails at 600mm centres.

Concrete floor

Use panel hold downs at each end of the bracing element. The GIB HandiBrac® is recommended. See details in GIB EzyBrace® Systems or GIB® Site Guide. Within the length of the bracing element bottom plates are to be fixed in accordance with the requirements of AS/NZ 2269/0 :2012.

WALL LINING

- A layer of 10mm or 13mm GIB Braceline® to one side of the wall plus minimum 7mm structural plywood manufactured to AS/NZS 2269.0 :2012 to the other side.
- Sheets can be fixed vertically or horizontally.
- Plywood is to be fixed vertically with edges supported.
- Sheet joints shall be touch fitted.
- Use full length sheets where possible.

PERMITTED ALTERNATIVES

For permitted GIB® plasterboard alternatives refer to p. 5 in GIB EzyBrace® Systems literature.

FASTENING THE LINING

Fasteners

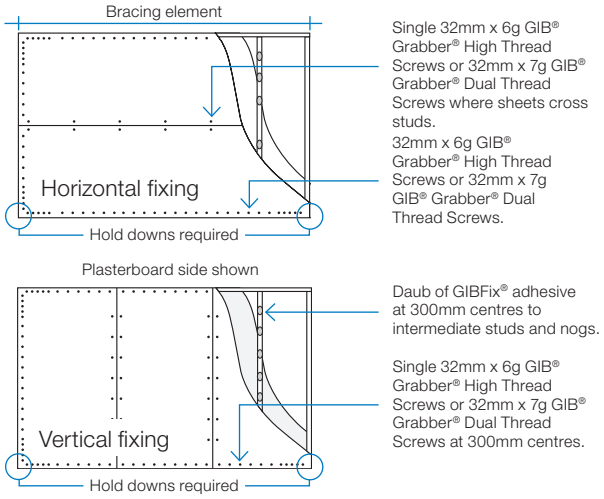
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

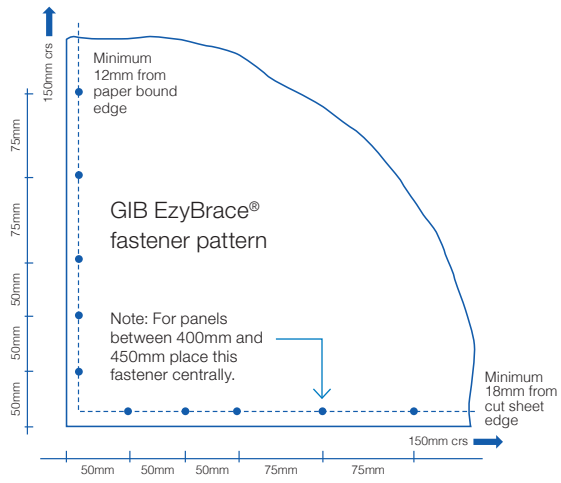
Fastener centres

GIB® Plasterboard side: 50,100,150, 225, 300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets place fasteners at 300mm centres to the 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. Plywood side: 150mm centres to the perimeter of each sheet. GIB® corner fastener pattern does not apply to the plywood side. 300mm centres to intermediate studs.

JOINTING

Joint strength is important in delivering bracing system performance. All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.





Unless stated all fastener spacings are maximums.

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems

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Winstone Wallboards is committed to protecting the environment. Environmental matters are integrated into all business activities:

- Our operations strive to exceed all environmental regulatory requirements at all times.
- Protection of the environment is a day to day responsibility that we all must accept.
- We allocate appropriate management time and resources to address relevant environmental issues and continuously improve our activities in that area.
- We will achieve our standards of performance through positive action, employee involvement and constant communication with our neighbours, local authorities and customers.

Minimise on-site waste when designing and/or installing GIB® Systems. For larger projects give consideration to our cut-to-length service to reduce waste. GIB® plasterboard off-cuts, if separated from other waste building materials, can be readily recycled.

For larger projects waste can be diverted to compost manufacturers who grind up the GIB® plasterboard and use it in compost. For smaller projects, the GIB® plasterboard can be ground up and spread around the building site.

GLOBAL GREENTAG^{CERTTM}

The Global GreenTag^{CertTM} certified eco-label acknowledges product as meeting the GreenRate Standard set by Global GreenTag.^{CertTM}

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

Declare is a database of non-toxic, sustainably sourced building products.

Many GIB® plasterboard products including GIB® Standard, GIB Braceline®, GIB Noiseline® and GIB Aqualine® have achieved Red List Free status in Declare certification.

For more information on Winstone Wallboards sustainability commitments visit gib.co.nz.

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Winstone Wallboards asserts its moral rights and reserves all other intellectual property rights in the materials contained in this brochure and related to GIBFix® Framing System and GIB EzyBrace® Systems.

TRADEMARKS

The names GIB®, GIB Fyreline®, GIB Ultraline®, GIB Braceline®, GIB Toughline®, GIB Noiseline®, GIB Aqualine®, GIB Nail®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, the colour mauve for GIB Toughline®, GIB HandiBrac®, GIB EzyBrace®, the colour blue for GIB Braceline®, the colour pink for GIB Fyreline®, the colour green for GIB Aqualine®, and the shield device are registered trademarks of Fletcher Building Holdings Limited.

PATENTS

GIBFix® Framing System and GIB EzyBrace® Systems, including componentry and design method, have patents pending (NZ Patent Number 596691, NZ Patent 709159 pending) and design and other IP rights.

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GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

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GIB®

Wet Area Systems

Specification and installation manual



CBI 5113

FEBRUARY 2021

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GIB® HELPLINE

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RESIDENTIAL AND NON-RESIDENTIAL APPLICATIONS. BATHROOMS, LAUNDRIES, TOILETS AND KITCHENS.

Protection from internal moisture is an important consideration when designing interior lining systems for homes, multi-unit apartments, educational, healthcare and commercial applications.

The New Zealand Building Code sets out minimum standards for wet area spaces in residential dwellings. However, often higher levels of performance and protection from internal moisture is demanded.

The GIB® Wet Areas System specification and installation manual provides internal lining options and details for specifiers, builders and building owners.

USE ONLY THE CURRENT SPECIFICATION

This manual supersedes the publication GIB Aqualine® Wet Area Systems March 2007. Winstone Wallboards Ltd accepts no liability for reliance upon publications that have been superseded.

If you are unsure whether this is the current publication, call the GIB® Helpline on 0800 100 442 or go to gib.co.nz

BEWARE OF SUBSTITUTION

The performance of GIB® Wet Area Systems requires accurate design detailing and construction practices. All GIB® Systems have been developed specifically for New Zealand conditions and independently tested, assessed or appraised, to ensure the required level of performance. It is important to use GIB® components where specified and to closely follow the specified design details and construction practices, to be confident that the required level of performance and quality is achieved on site.

BRANZ Appraised
Appraisal No.427 [2021]

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This publication

This publication is a best practice guide to the design and construction of wall and ceiling linings in wet areas with intermittent water exposure within residential and non-residential buildings, as covered by NZ Building Code Clause E3 Internal Moisture.

The information is designed to be helpful to designers, contractors and home-owners wishing to achieve a result that is easy to incorporate into modern design, simple and clear to construct, and that will satisfy the needs, requirements and expectations of both the NZ Building Code and the end user.

Wet areas in the home often require relatively frequent and expensive renovation or repair, often because of the ingress of water to the structure of the building.

To form a complete wet area system it is important to specify compatible materials and systems, designed to cope with conditions that are common in wet areas, and to ensure correct installation using best practice.

WET AREAS

Generally, wet areas are described as spaces to where fresh water is reticulated, such as bathrooms, toilets, laundries and kitchens. Within wet areas the following requirements apply;

1. NZBC Clause E3.3.4 states that wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.
2. NZBC Clause E3.3.6 states that surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

NZ Building Code Clause E3 also refers to other requirements not covered in this publication, such as ventilation, condensation control and overflow management. Ongoing maintenance of wet areas is also important to maximise service life.

GIB AQUALINE®, GIB TOUGHLINE® AQUA AND GIB WEATHERLINE®

Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

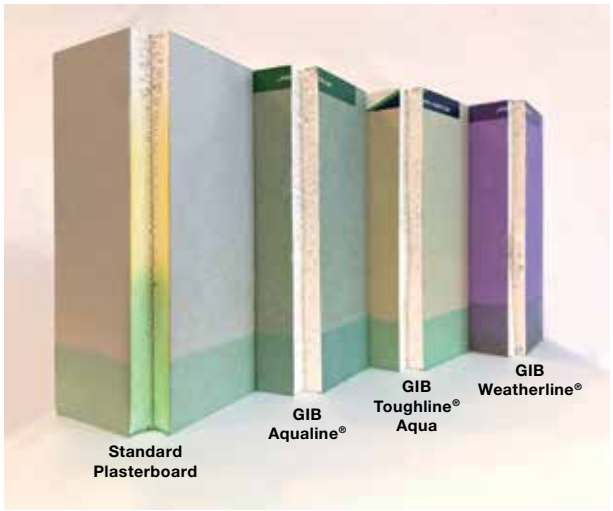
The NZ Building Code does not call for water resistant linings in wet areas but it is desirable to specify lining materials which will maintain their integrity longer when exposed more frequently to moisture, and to one-off events such as leaks or flooding.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® feature a water-resistant polymer impregnated core, designed for wet area applications. These core formulations not only resist penetration of moisture through the lining into the framing behind, but also resist water “wicking” up the core, a common cause of long-term damage where a water-resistant lining has not been used.

WATER ABSORPTION TEST

The illustrations below show how GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® compare with standard plasterboard after soaking for two-hours in green dye.





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WHERE TO USE GIB® WET AREA LININGS

In order to prolong the life expectancy of the space it is highly desirable to include wet area linings in situations where there is an increased risk of water or moisture damage. Applications include walls and ceilings in bath and shower rooms, and walls in laundries, toilets and kitchens.

BENEFITS

- Water resistant and durable linings help protect against water damage
- Proven substrate for paint, wallpaper, waterproofing membranes, tiles, sheet vinyl and rigid sheet shower linings
- Suitable for both residential and non-residential applications
- Dimensionally stable and an excellent substrate for ceramic tiles
- Conventional jointing methods
- Easy to cut and form openings
- Contains glass fibres and other additives to increase strength and fire resistance
- May be used in GIB® Bracing, GIB® Fire Rated and GIB Noise Control® Systems (see Compliance with the NZ Building Code, Clauses B1, C3 and G6). Consult the appropriate GIB® literature for installation details

HANDLING AND STORAGE

- GIB® plasterboard must be stored under cover, stacked flat and clear of the floor with sufficient support to avoid sagging
- GIB® plasterboard must be handled as a finishing material

LIMITATIONS

- GIB® wet area linings must not be used for bracing purposes in shower cubicles or above baths. For more information refer to page 9 of this manual
- Do not use GIB® wet area linings where exposed for extended periods to humidity levels above 90% RH, such as in group shower or steam rooms, or where exposed to moisture and chlorine rich environments such as in indoor swimming pools
- GIB® wet area linings used in a bathroom or other high humidity environment must not be directly applied to solid plaster (gypsum or cement), wood-based sheet linings or similar materials, masonry or concrete, without strapping or steel furring channels
- GIB® wet area linings must not be installed over a vapour barrier or a wall acting as a vapour barrier
- Cracked or damaged sheets must never be used
- GIB Aqualine® or GIB Toughline® Aqua must not be used in external applications
- GIB® plasterboard must not be exposed to temperatures in excess of 52°C for prolonged periods. Heat-generating devices may include halogen lighting, cooking elements, radiant heating, solid fuel exhausts and fire surrounds. Consult the appliance manufacturer for installation details

Table 1: GIB® Wet Area linings sheet dimensions and weights

Product	Sheet face colour	Thickness (mm)	Sheet width (mm)	Edge Type	Sheet length (mm)						Max. Weight (kg/m²)
					2400	2450	2700	3000	3600	4800	
GIB Aqualine®	Green	10	1200	TE/TE	■		■	■	■		8.0
			1200	TE/SE	■					■	
			1350	TE/SE	■				■		
		13	1200	TE/TE	■		■	■	■		11.0
GIB Toughline® Aqua	Mauve	13	1200	TE/TE	■		■	■			11.4
GIB Weatherline®	Purple	10	1200	SE/SE		■	■	■			9.0
		13	1200	SE/SE			■	■			11.5

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BOARD SUBSTITUTION OPTIONS

Acceptable GIB Aqualine® alternatives	
10mm GIB Aqualine® can be replaced with:	10mm GIB Weatherline® 13mm GIB Toughline® Aqua
13mm GIB Aqualine® can be replaced with:	13mm GIB Weatherline® 13mm GIB Toughline® Aqua

GIB® Wet Area System construction details in this manual refer to the use of GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® sheets may also be used in place of GIB Aqualine®.

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

- GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® are suitable substrates for flexible vinyl wall finishes in wet areas of residential, commercial or institutional buildings
- Framing requirements and installation procedures are presented in this literature, except that the lining gap at the floor is no more than 5mm when a pencil cove detail is used
- The installation of galvanised steel reinforcing angles behind internal lining corners is recommended for sheet vinyl applications in showers or shower over bath situations
- The lining must be jointed and stopped to a paint quality finish (Level 4) – trowel marks can telegraph even through a commercial grade 2mm vinyl
- A commercial grade vinyl is recommended in commercial or institutional bathrooms and showers
- In areas directly exposed to liquid water, all joints in flexible sheet vinyl must be heat welded
- Installation of flexible vinyl must be carried out strictly in accordance with the specifications provided by the suppliers/ manufacturers of the vinyl

RIGID SHEET SHOWER LININGS

- The wall surface must be free of dust before installation of the lining
- Avoid lining joints as much as possible and where necessary flush with plaster to achieve a level surface
- Do not preseal or paint areas which are to be covered by the rigid shower linings
- The suppliers of thin (usually 2-3mm) and rigid acrylic shower linings commonly recommend direct adhesive fixing to wall linings using solvent-based adhesives
- Care must be taken to ensure that rooms are adequately ventilated
- Water temperature changes will cause movement of the thin acrylic sheet, which in turn will stress the adhesive and wall lining substrate
- Consult the supplier of the shower lining for full installation details
- Suppliers of rigid sheet acrylic shower linings recommend a minimum of 24 hours for the adhesive to cure fully prior to the shower being put into service

WATERPROOF MEMBRANE SYSTEMS AND TILING

- A waterproof membrane system must be applied to lining materials used as a substrate for ceramic tiles in a shower or shower over bath situation
- The wall surface in a shower or shower over bath situation is not complete and ready for tiling until coated with a waterproof membrane system over the lining and once penetrations for shower mixers, taps and associated fittings are sealed
- The installation of galvanised steel reinforcing angles behind internal lining corners is required for tiled wall applications in showers or shower over bath situations
- In-situ waterproofing membrane materials manufactured to AS/NZS 4858:2004 “Wet Area Membranes” are recommended and must be applied to manufacturer’s recommendations. Typically, these types of membrane systems are not suitable for paint and wallpaper finishes
- Waterproof membrane systems must be fully cured and dry prior to application of tiling adhesives
- Preformed sheet membranes are also available and may be more suitable where curing times or specialist skills are an issue
- The details shown in this manual are generic in nature. For accurate detailing, follow the specifications provided by the supplier of the proprietary waterproof membrane system

For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

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PENETRATIONS AND SEALANTS

As leaks and water ingress typically occur at junctions between building elements and at penetrations, it is essential that particular attention is given to these details at the time of installation. Lack of attention to detail can result in water damage that could remain undetected for a long time.

- Ensure that all cut-outs for pipe penetrations are made neatly, and slightly oversize, with a hole saw. These penetrations should be of a diameter no more than 12mm greater than that of the pipe
- Ensure shower mixer and tap penetrations are sealed with a proprietary flange system to prevent the passage of moisture into the wall cavity
- Sealants should be of a mould inhibiting type and be paintable. Neutral cure silicones will generally meet these requirements
- Surfaces should be dry and free from dust before application, a minimum of a 4mm joint width provided and the depth should not exceed the width
- Apply a bead of sealant to the full depth of the lining in the following locations:
  - Around all tap/pipe bodies
  - The gap between the bath rim and the bottom edge of the wet area lining
  - Between the upstand of preformed shower bases and the bottom edge of the lining
  - Where an impervious junction is required at the floor/wall line, carefully seal the gap between the bottom edge of the board and the finished floor. Leave a 5-10mm gap at the bottom of the wall lining for this purpose, ensuring the gap is free from dirt and dust
- Do not locate shower heads or taps on fire rated or intertenancy walls. Should this be unavoidable always use tested and approved proprietary penetration seals

RENOVATIONS

Bathrooms, kitchens and laundries are the most renovated rooms in the house, partly due to fashion considerations and partly because of damage sustained by ingress of water and moisture.

When renovating these rooms it is often easier and more cost-effective to remove the existing linings and replace them. This allows for a new start in the room and offers sound substrates for new surfaces such as tiling and painting, where otherwise flaking paint or damaged plasterboard may compromise good and sound finish or practice. At the very least re-lining will:

- Allow for inspection of framing where damage may have occurred and provide the opportunity to repair such damage
- Allow plumbing and electrics to be checked and altered or replaced where required
- Provide the opportunity to install thermal and acoustic insulation, water-resistant linings, and propriety plumbing penetration flange systems where appropriate
- Make the job easier

MAINTENANCE

Lack of maintenance is frequently the cause of premature and often expensive failure of components and building elements within wet areas.

It is important to regularly inspect and repair any potential problem before it becomes expensive to reinstate. Good maintenance should include:

- Ongoing ventilation. At the very least, good passive ventilation (e.g. window vents); but good active ventilation (e.g. extraction fans) of an appropriate size for the room is recommended
- Impervious coatings and surfaces should be checked for wear and damage and maintained and re-coated before ingress of water to the substrate occurs
- Regular cleaning with appropriate cleaners so that build-up of matter, such as mould, is well controlled
- Sealants at junctions and penetrations should be checked for adhesion on a regular basis and replaced where adhesion failure to substrates occurs
- Where pipe leaks have become evident, however small, they should be repaired promptly and any area around such leaks dried out completely before any other repairs are carried out

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Compliance with the NZ Building Code

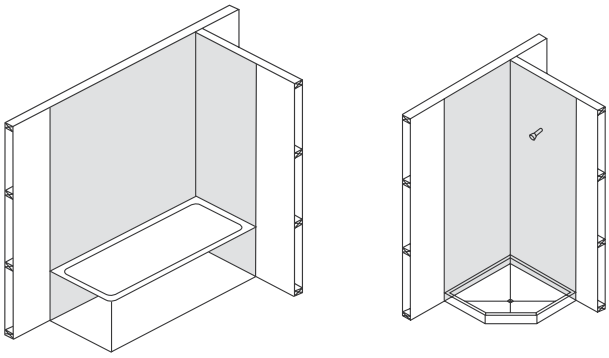
STRUCTURE – CLAUSE B1

The design and material specification for steel and timber framing used in GIB® Wet Area systems must be in accordance with the performance requirements of NZ Building Code Clause B1 (Structure).

Bracing elements are required to have a durability of 50 years. GIB® bracing elements are not to be located in shower cubicles or behind baths because of durability requirements, the likelihood of renovation, and practical issues associated with fixing bracing elements to perimeter framing members, such as at bath and shower tray locations.

Otherwise, GIB® Bracing Systems can be used in water-splash areas, provided these are maintained impervious for the life of the building.

GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. They can also be used in place of GIB Braceline® in GIB® bracing elements 900mm or longer, provided the perimeter of the element is fixed with GIB® Grabber 32mm x 6g screws at 100mm centres, using the GIB Braceline® corner fixing pattern. Refer to the GIB® Bracing System literature.



No bracing in the shaded areas.

DURABILITY – CLAUSE B2

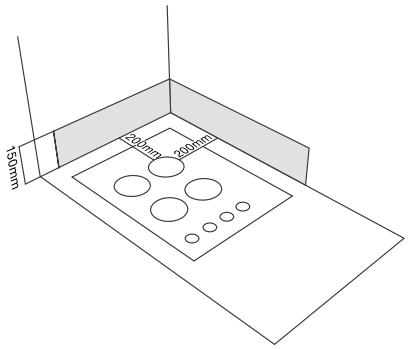
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers, showers over baths and splash-backs.

When used as a general wet area lining and maintained under normal dry internal conditions, GIB® Wet Area Systems have a serviceable life of at least 50 years and comply with NZ Building Code Clause B2 (Durability) for use within toilets, kitchens, bathrooms and laundries not directly exposed to liquid water.

FIRE AFFECTING AREAS BEYOND THE SOURCE – CLAUSE C3

GIB® Fire Rated Systems provide passive fire protection in accordance with the requirements of NZ Building Code Clause C3. When GIB Aqualine® or GIB Toughline® Aqua is substituted into fire rated systems in place of the equivalent thickness GIB Fyreline®, the Fire Resistance Rating (FRR) of that system will be maintained.

The protection of combustible surfaces surrounding gas cooking appliances is covered by the latest version of AS/NZS 5601.1.



As a guide the following options are acceptable for wall surfaces within 200mm of the periphery of a gas element to a height of 150mm above the element for the full dimension (width and depth) of the cooktop surface area:

- 5mm tiles on GIB® plasterboard
- 5mm toughened glass on GIB® plasterboard
- or any system that can be demonstrated to meet the specific requirements of AS/NZS 5601.1

GIB® plasterboard products must not be exposed to temperatures in excess of 52°C for sustained periods. Check with the appliance manufacturer that this requirement will be met. It would be unusual for surfaces outside 200mm to exceed 52°C for sustained periods.

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INTERNAL MOISTURE – CLAUSE E3

The New Zealand Building Code Clauses that relate to wall surfaces are;

E3.3.4 - Wall surfaces adjacent to sanitary fixtures or sanitary appliances must be impervious and easily cleaned.

E3.3.5 - Surfaces of the building elements likely to be splashed or become contaminated in the course of the intended use of the building, must be impervious and easily cleaned.

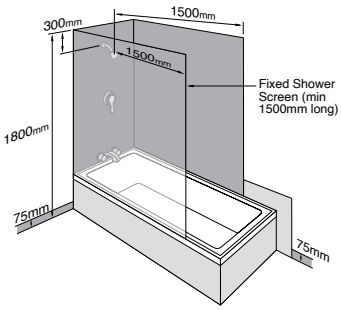
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

New Zealand Building Code Acceptable Solution E3/AS2 substantially refers to the Waterproof Membrane Association Incorporated (WMAI) Code of Practice for Internal Wet Area Membrane Systems (IWAM), August 2020.

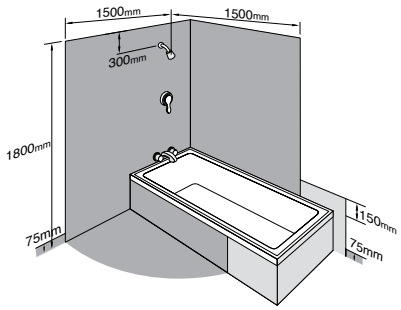
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

Shaded areas in the diagrams below represent the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

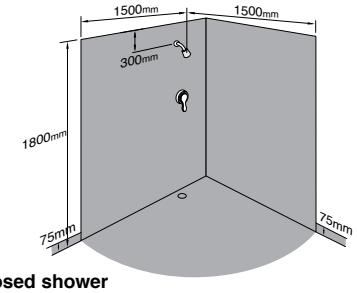
Enclosed shower over bath



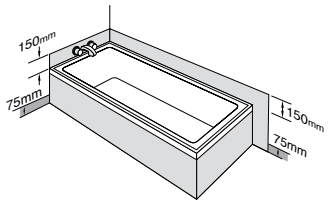
Unenclosed shower over bath



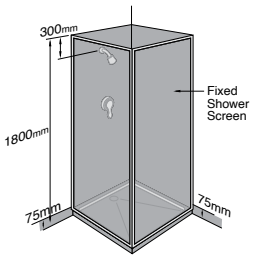
Unenclosed shower



Bath



Enclosed shower



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HAZARDOUS BUILDING MATERIALS – CLAUSE F2

At no stage during its serviceable life does GIB Aqualine® constitute a health hazard. It therefore meets the provisions of NZ Building Code Clause F2 (Hazardous Building Materials). Dust resulting from the sanding of stopping compounds may be a respiratory irritant and the use of a suitable facemask is recommended.

VENTILATION – CLAUSE G4

NZ Building Code Clause G4 (Ventilation) requires buildings to have a means of collecting or otherwise removing steam generated from laundering, utensil washing, bathing or showering. To prolong the life of interior linings and surface finishes and to minimise the risk of moisture related problems such as condensation and mould growth, adequate heating, thermal insulation and mechanical ventilation must be provided in kitchens, bathrooms and laundries.

AIRBORNE AND IMPACT SOUND – CLAUSE G6

GIB® Noise Control Systems can be used to provide ratings for Sound Transmission Class (STC) and Impact Insulation Class (IIC) in accordance with the requirements of NZ Building Code Clause G6 (Airborne and Impact Sound). When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyreline®, the STC and IIC rating of that system will be maintained. When GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur. For further information refer to the GIB Noise Control® Systems literature or contact the GIB® Helpline 0800 100 442.

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TIMBER WALL FRAMING

Framing dimensions must comply with the requirements of NZS 3604:2011.

- The moisture content of timber framing shall be 18% or less at the time of lining
- Studs shall be spaced at 600mm centres maximum for both 10mm and 13mm GIB® plasterboard
- Nogs to be evenly spaced with a maximum spacing of 1350mm. Alternatively, nogs may be staggered 150mm maximum either side of a horizontal joint line
- Nogs are not required behind horizontal joints except in shower situations or specific fire or noise control systems

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread screws.

FASTENER CENTRES

- 300mm centres to top and bottom plates and to perimeter studs
- Single fasteners to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Daubs of GIBFix® adhesive at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners. Sheet edges at door or window openings can be adhesive fixed unless forming part of the perimeter of a bracing element

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

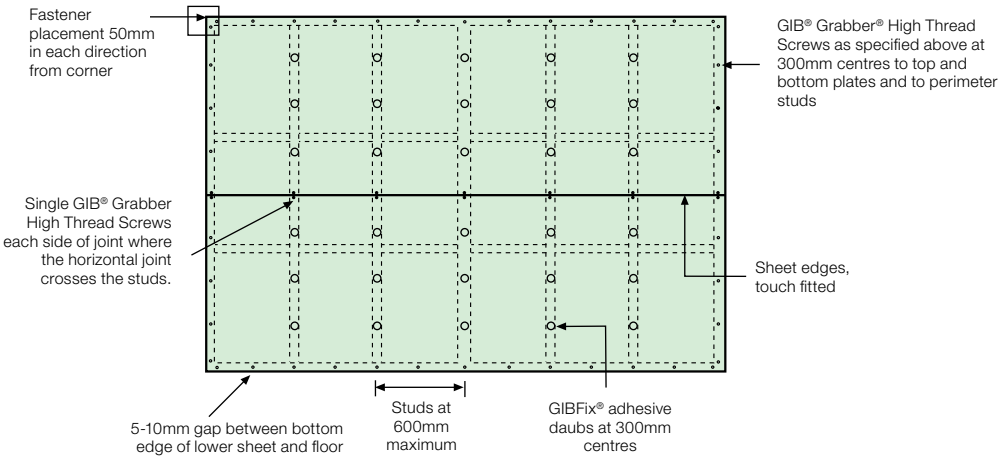
LINING

- Use minimum 10mm GIB® plasterboard
- Install the sheets leaving a 5-10mm gap at the floor line to allow for movement of the framing members and to allow for cleaning dirt and rubbish before sealing
- Sheets to be touch fitted.

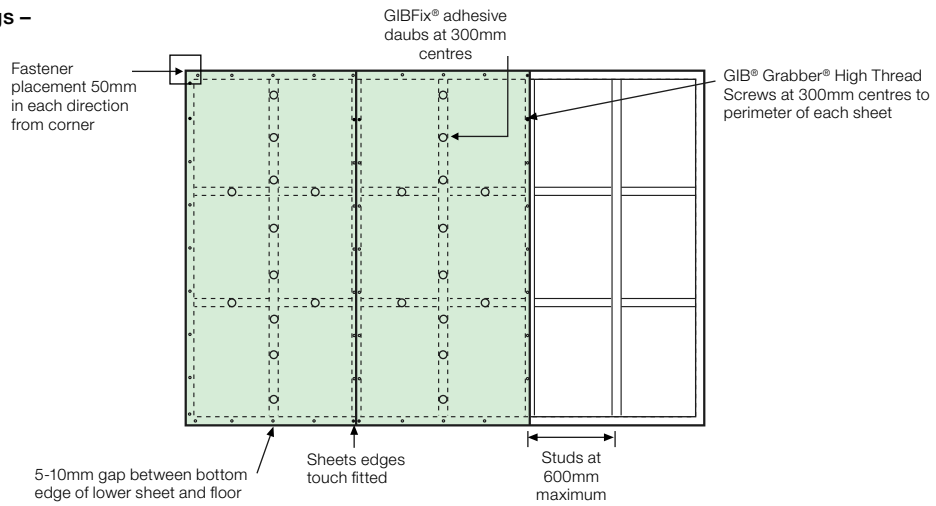
JOINTING

- Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide.

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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STEEL WALL FRAMING

The minimum sheet thickness for fixing on light gauge 0.55mm base metal thickness (BMT) steel framing is 13mm GIB® plasterboard. For bracing, noise control or fire rating applications consult the relevant GIB® technical publication.

Steel frame for residential construction is in accordance with NZBC B1/AS1 9.1 NASH Standard Part 2 Light Steel Framed Buildings, or by specific design. 10mm GIB plasterboard is commonly used on minimum 0.75mm BMT residential steel framing.

FASTENERS

— Minimum 25mm x 6g GIB® Grabber® Self Tapping Screws.

FASTENER CENTRES

— 300mm centres to top and bottom channels and to end studs

— Single screws to each stud where the horizontal joint crosses the studs

— Place fasteners 12mm from sheet edges and 18mm from sheet ends

— Daubs of GIBFix® All-Bond adhesive or screws at 300mm centres to intermediate studs

— Do not place adhesive at sheet edges or under fasteners.

— Sheet edges at door or window openings can be adhesive fixed.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

LINING

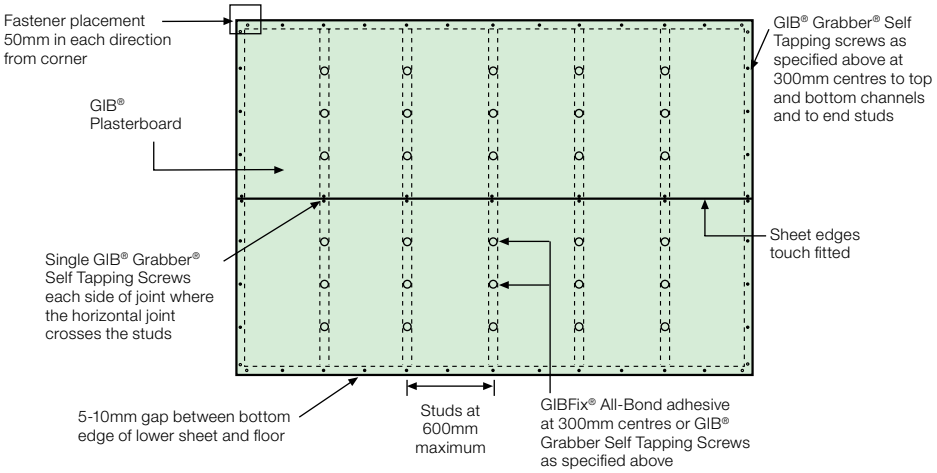
— Lay the sheets, leaving a 5-10mm gap at the floor line. Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry

— Sheets to be touch fitted.

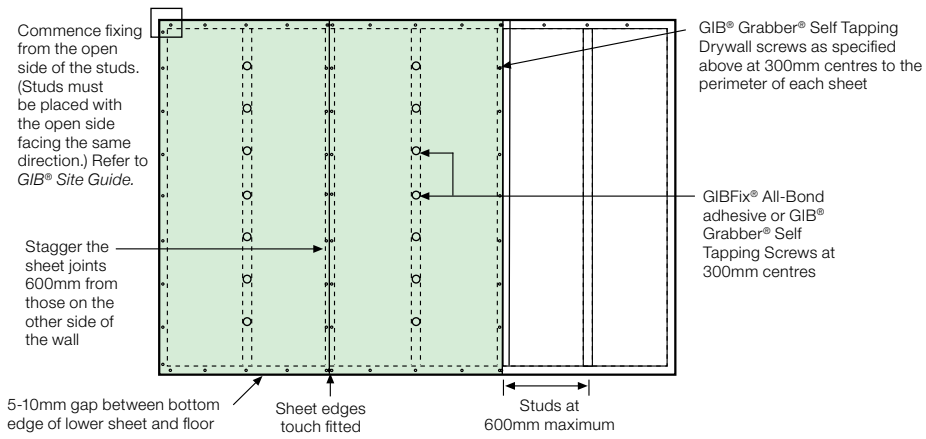
JOINTING

— Jointing shall be carried out in accordance with the instructions in the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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TIMBER WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NZS 3604:2011 Timber Framed Buildings, or relevant specific design Standard.

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings.

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® High Thread Screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Single fasteners to each stud where the horizontal joint crosses the studs
- Where relevant, fastener lengths must comply with the requirements of GIB® Fire Rated Systems or GIB® Noise Control Systems

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

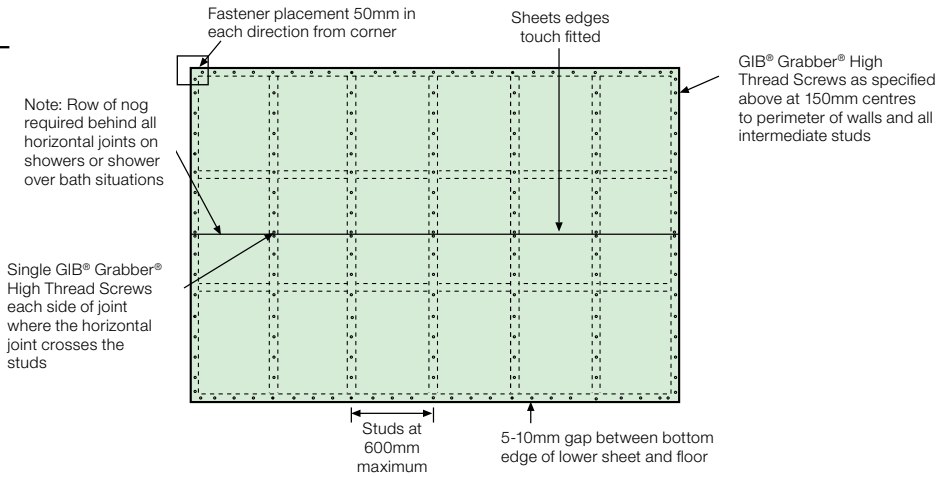
LINING AND TILE WEIGHTS

- Use minimum 10mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

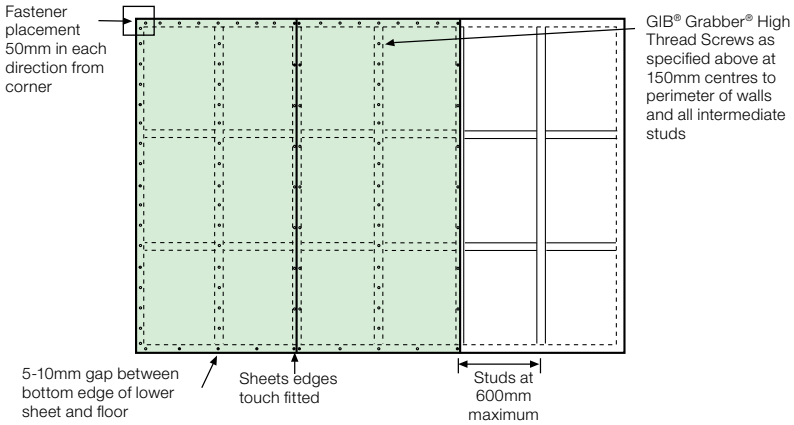
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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STEEL WALL FRAMING

Framing dimensions and spacing must be appropriate for the tile weight and comply with the requirements of NASH Standard Part 2:2019 Light Steel Framed Buildings, or relevant specific design Standard.

- Linings are placed hard to floor, bedded into a sealant bead
- Steel framing for tiling to have a minimum base metal thickness (BMT) of 0.75mm

NOGS

For impact protection in shower cubicles or shower over bath situations it is important that all sheet joints are made on solid framing. This may require vertical fixing or the installation of additional nogs. Also provide nogs:

- Adjacent to each pipe penetration and behind sink and tub flashings
- Between all studs above bath flanges and preformed shower bases

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. Angles need to be temporarily held in place until secured by the lining fixings

FASTENERS

- Minimum 32mm x 6g GIB® Grabber® Self Tapper screws

FASTENER CENTRES

- 150mm centres to perimeter of wall and all intermediate studs
- Adhesive is not to be used in place of mechanical fasteners
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends.

For bracing, noise control or fire rating applications including fastener lengths consult the relevant GIB® technical publication.

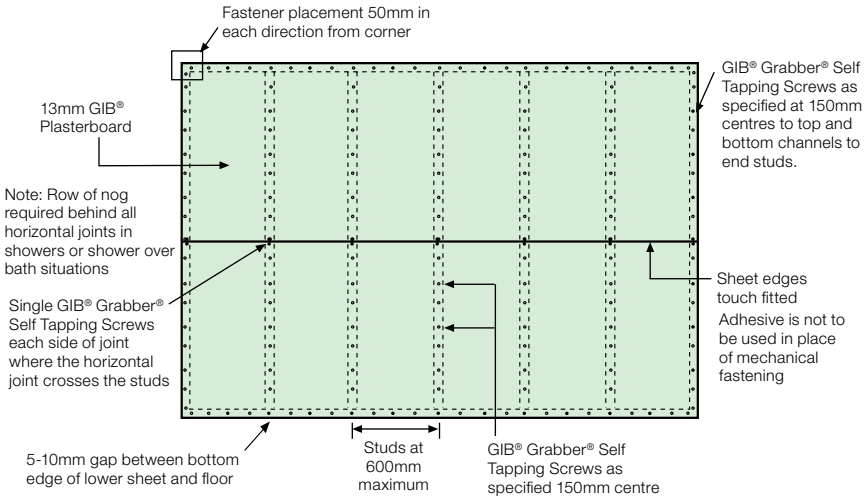
LINING AND TILE WEIGHTS

- Use minimum 13mm GIB® plasterboard
- For maximum permitted tile weights refer to pg 16 of this manual
- GIB® Wet Area linings may be fixed vertically or horizontally
- Sheets are touch fitted
- Provide a 5-10mm gap at the wall/floor junction and between the bottom edge of the lining and any bath rim or preformed shower base to allow for placement of sealant
- Do not tile on the resilient side of GIB Rail® or STWC Acoustic Clip (ST001) and channel noise control system
- GIB® Wet Area linings are suitable for tiling full height of walls, but if a wall is to be partially tiled (e.g. half high), only the area of wall under the tiles needs to be fixed as required for tiled areas. The remainder of the wall may be fixed as for non-tiled areas

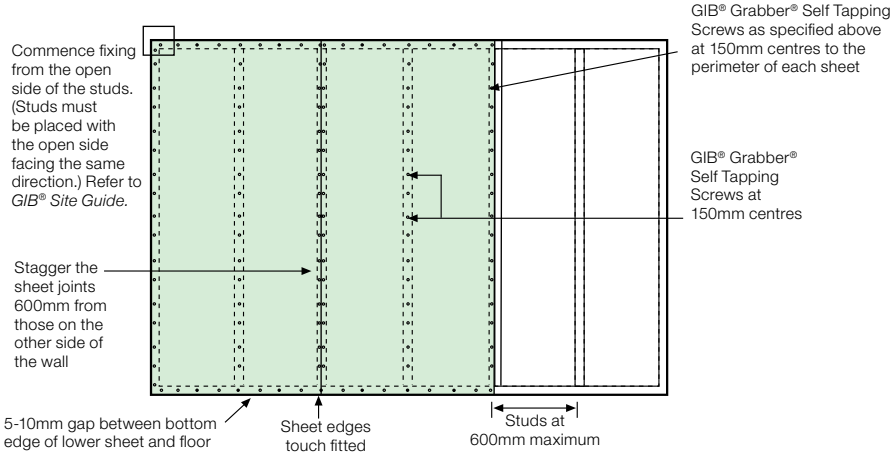
JOINTING

- Jointing shall be carried out in accordance with the instructions of the GIB® Site Guide

Fastening the Linings – Horizontal Fixing Only



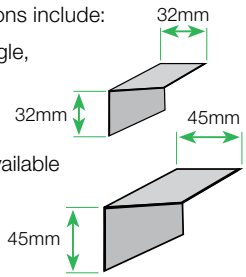
Fastening the Linings – Vertical Fixing Only



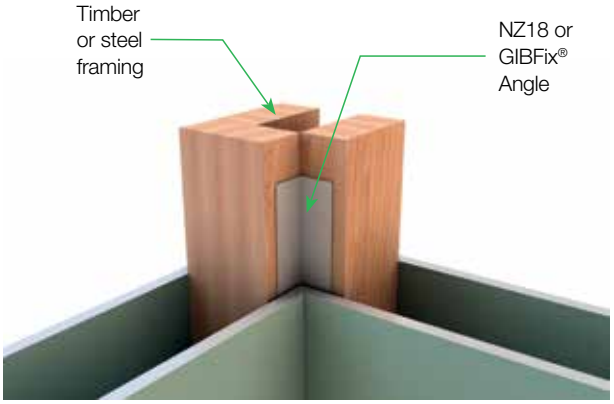
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METAL ANGLES FOR TILED INTERNAL CORNERS

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum 32 x 32 x 0.55mm galvanised metal angle.
- Suitable GIB® metal angle options include:
  - GIB® Rondo® NZ18 metal angle, available length: 3.0m
  - GIBFix® Angle metal angle, available lengths: 2.4m and 2.7m



- Angles need to be temporarily held in place until secured by the lining fixings
- Minimum height of the metal angle is 1800mm



WATERPROOF MEMBRANE SYSTEMS

A waterproof membrane system must be applied to all lining materials used as a substrate for ceramic tiles in a shower or shower over a bath application, or any other tiled application exposed to frequent water splash.

For further information see p10.

TILES AND TILE WEIGHTS

In areas likely to be directly exposed to water, tiles may be ceramic, porcelain or stone must comply with the over-surface finish requirements of the IWAM Code of Practice and be bedded with a suitable tile adhesive on the waterproof membrane system. See page 10 for the minimum extent of wall surfaces requiring impervious sheet materials or waterproof membrane systems prior to tiling.

Smaller mosaic tiles are often lighter, but the integrity of grout joints might be more prone to impact, whilst heavier tiles are larger and have less and deeper grout and sealant joints. For more information also see AS 3958:2007 Ceramic tiles – Guide to the installation of ceramic tiles.

Table 2: Recommended maximum tile weights

Maximum Tile Weights for GIB Aqualine®, GIB Toughline® Aqua or GIB Weatherline®			
Stud Centre (maximum)	**Fasteners Centre (maximum)**	**Lining Thickness**	**Tile Weight**
600mm maximum	150mm maximum	10mm	26kg/m^2
		13mm	40kg/m^2

ADHESIVE AND GROUT WEIGHTS

The weight of adhesive and grout can vary depending on the type of tile and the installation process used. The maximum tile weights stated in table 2 are conservative and refer to the tile weight excluding grout and adhesive used. An additional 3kg/m^2 has been factored into tile adhesion testing on top of the above stated tile weights to account for adhesive and grout weight used during the installation of the tile.

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CEILING FRAMING

Framing dimensions and spacing must comply with the requirements of NZS 3604:2011, NASH for steel or relevant NZ Standard.

For noise control or fire rating applications consult the relevant GIB® technical publication.

FASTENERS

- Steel battens – 25mm x 6g GIB® Grabber® Self Tapping screws
- Timber battens or Joists – 32mm x 6g GIB® Grabber® High Thread screws

ADHESIVES

- Steel battens - GIBFix® All-Bond
- Timber battens - GIBFix® All-Bond or GIBFix® One

FASTENERS CENTRES

- Single screws to the edges and centre of the sheets across each batten
- Single screw at 600mm maximum to the perimeter of the ceiling
- Screws to be 12mm from sheet edges
- Daubs of adhesive at 200mm centres between the screws
- Do not place adhesive at sheet edges or under fasteners, this may lead to screw pops

LINING

- The lining shall be fixed at right angles to the battens or joists
- Commence fixing from the centre of the sheets outwards.
- Sheets to be touch fitted
- Use long length sheets to minimise sheet end butt joints.
- Back-block sheet end butt joints
- See GIB® Site Guide for sheet edge backblocking requirements

BATTEN SPACINGS

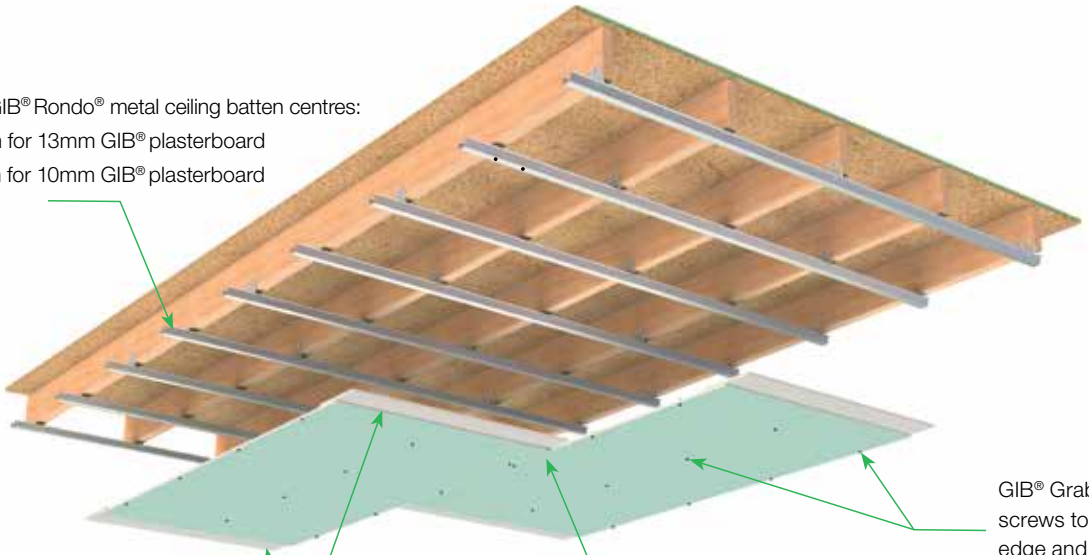
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

JOINTING

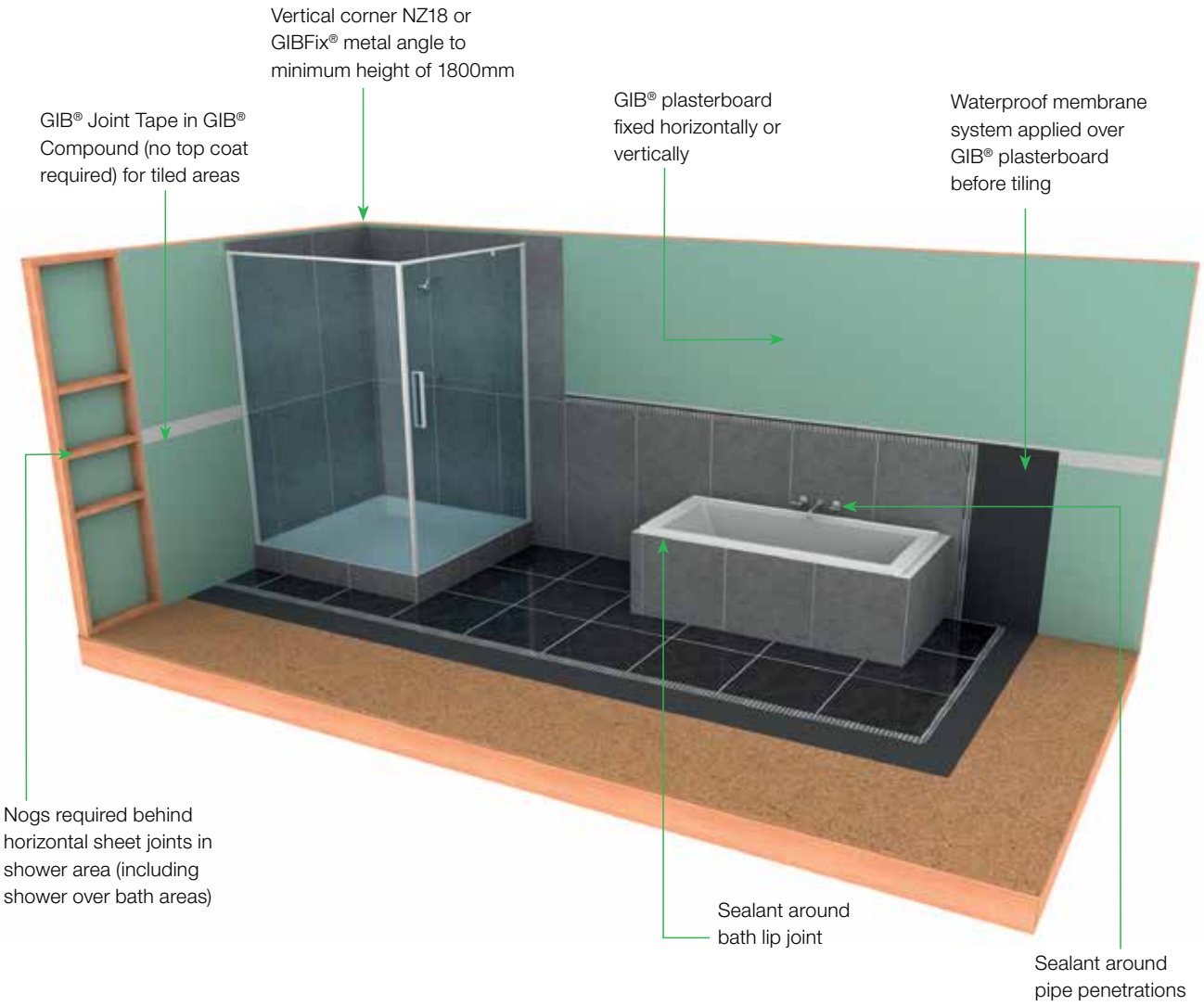
- All sheet joints must be paper tape reinforced and stopped in accordance with instructions in the GIB® Site Guide
- Do not fix tiles to GIB® plasterboard ceilings

Maximum GIB® Rondo® metal ceiling batten centres:

- 600mm for 13mm GIB® plasterboard
- 450mm for 10mm GIB® plasterboard

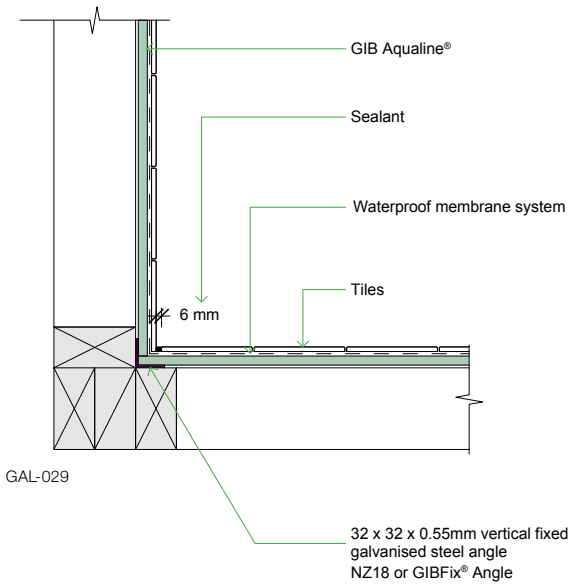


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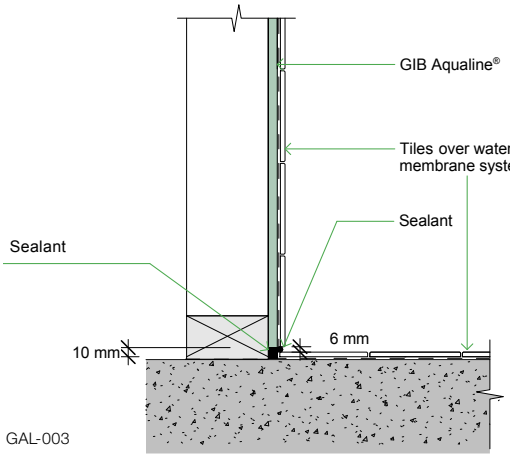
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A: TILED INTERNAL CORNER



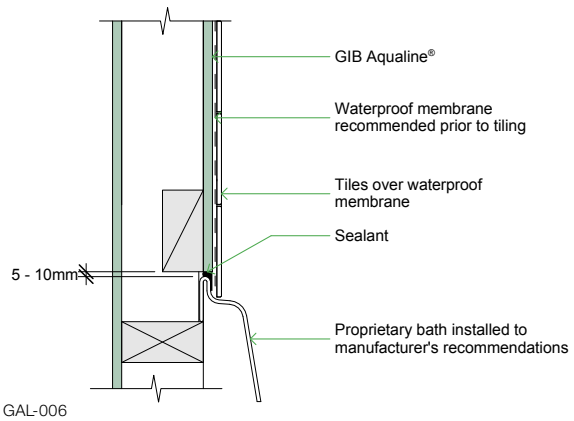
GAL-029

B: CERAMIC FLOOR LINING JUNCTION



GAL-003

C: BATH LINING JUNCTION

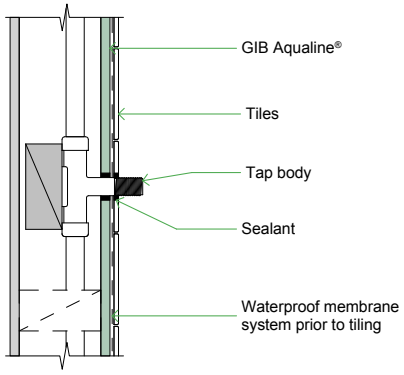


GAL-006

G: SHOWER MIXER PENETRATION IN WET WALL LININGS

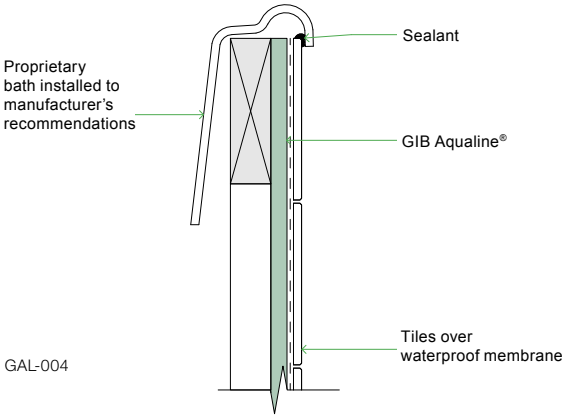
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

D: SEALING WET AREA PENETRATION



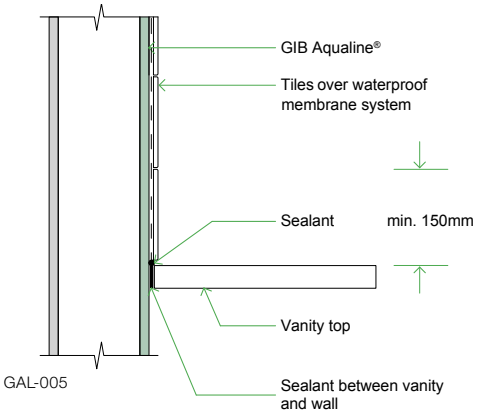
GAL-002

E: BATH CRADLE LINING DETAIL

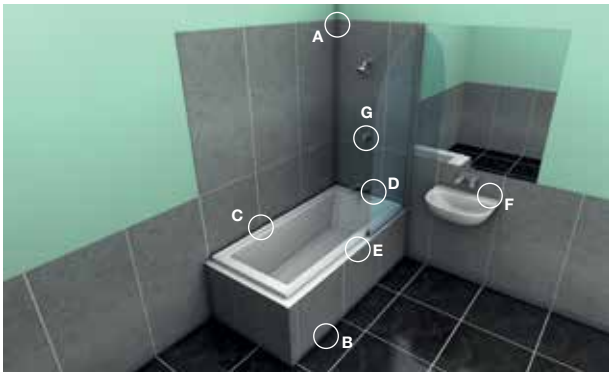


GAL-004

F: VANITY TOP LINING JUNCTION

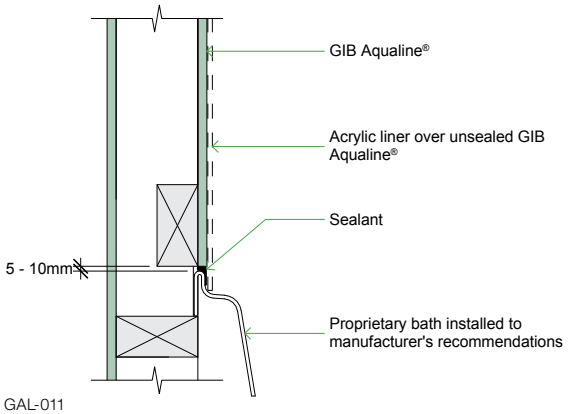


GAL-005



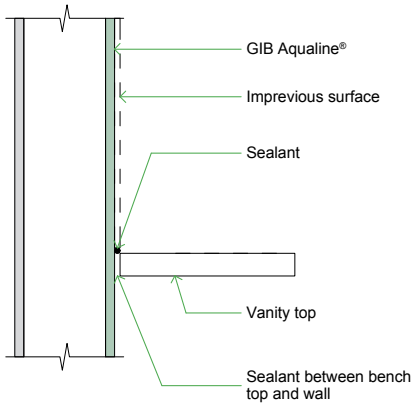
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A: BATH LINING JUNCTION



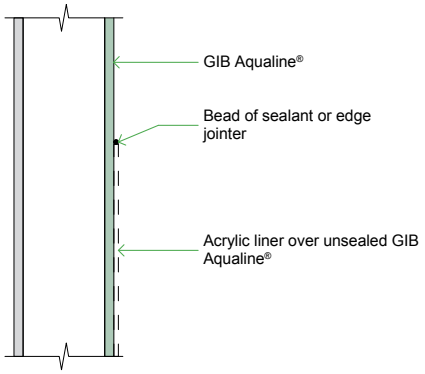
GAL-011

B: VANITY TOP LINING JUNCTION



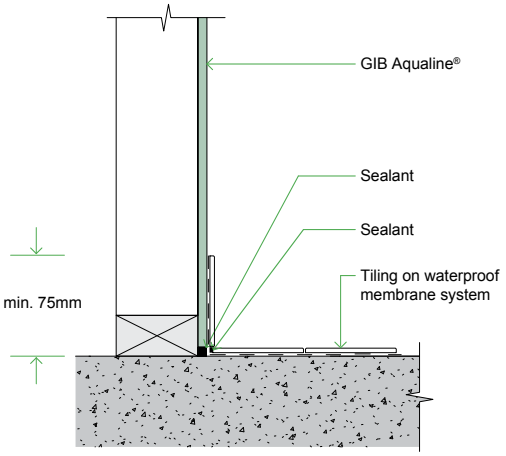
GAL-023A

C: UNSEALED PLASTERBOARD LINING



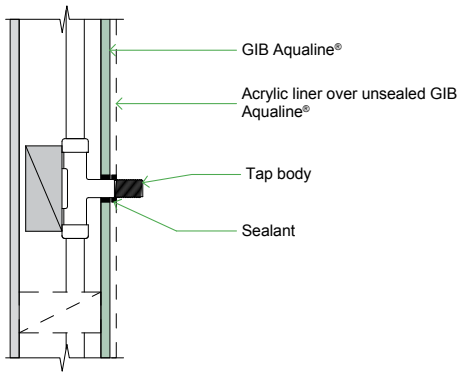
GAL-028

D: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

E: SEALING SEMI WET AREA PENETRATION



GAL-019

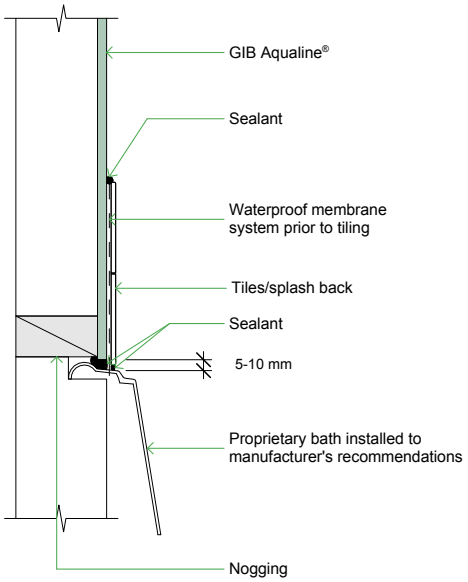
F: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



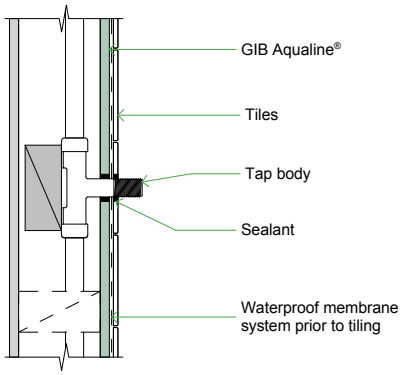
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A: BATH LINING JUNCTION



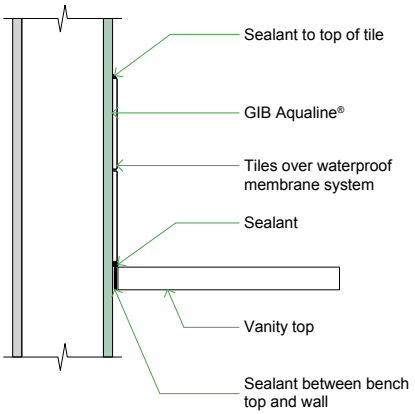
GAL-009

B: SEALING SEMI WET AREA PENETRATION



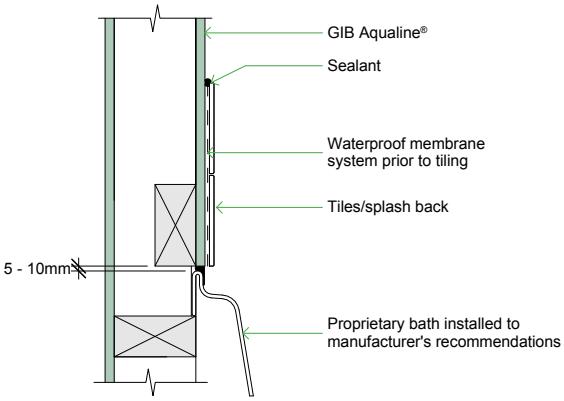
GAL-020

C: VANITY TOP LINING JUNCTION



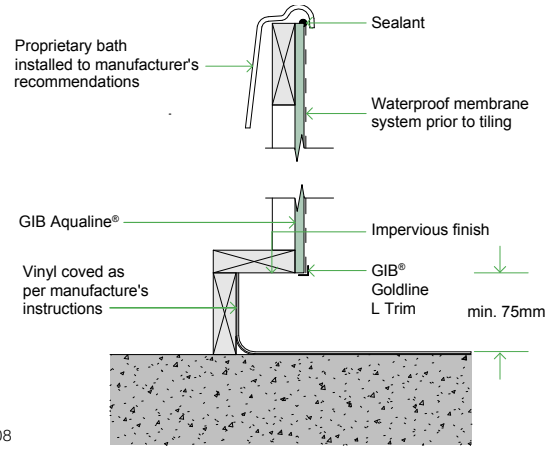
GAL-024

D: BATH LINING JUNCTION

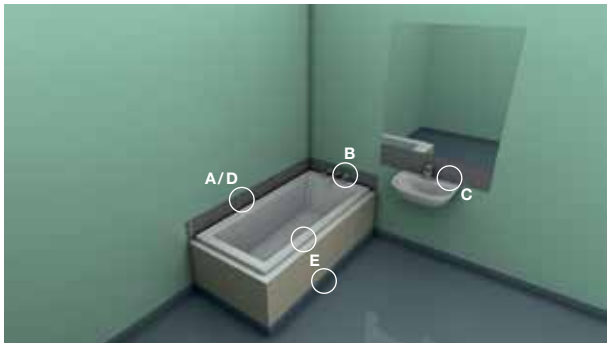


GAL-010

E: CRADLE VINYL LINING JUNCTION

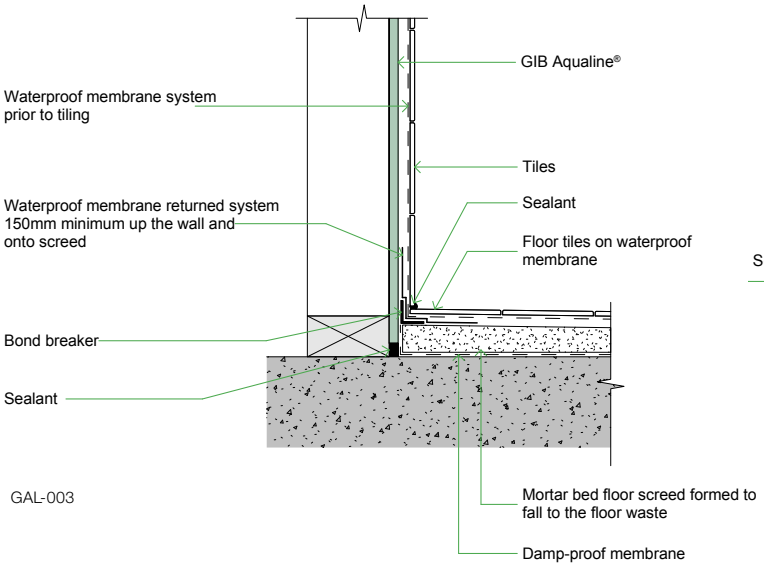


GAL-008



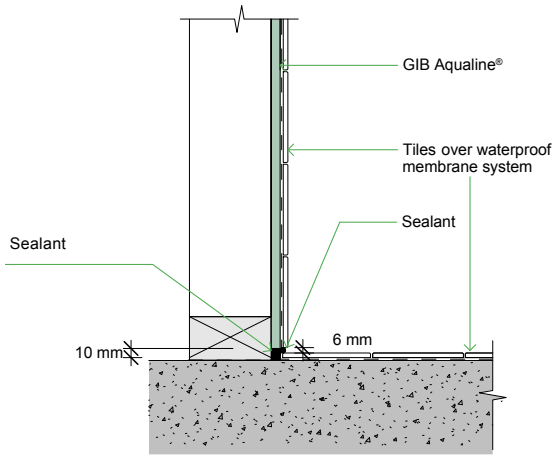
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A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



GAL-003

C: CERAMIC FLOOR LINING JUNCTION

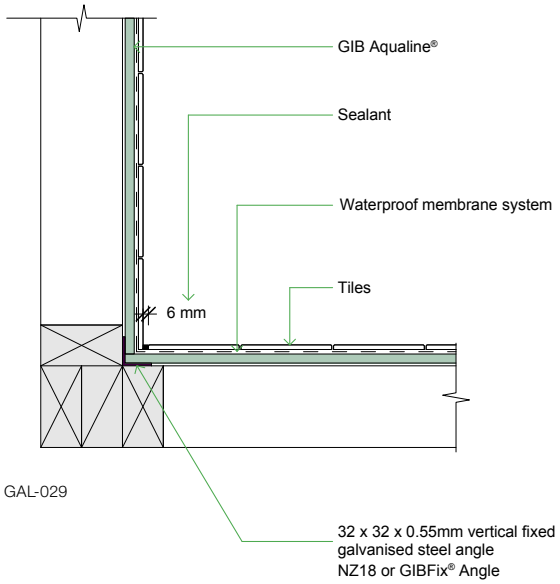


GAL-002A

PREFORMED SHOWER BASE JUNCTIONS

Refer to the shower base manufacturer for proprietary shower tray installation detailing including wet wall lining junction detailing.

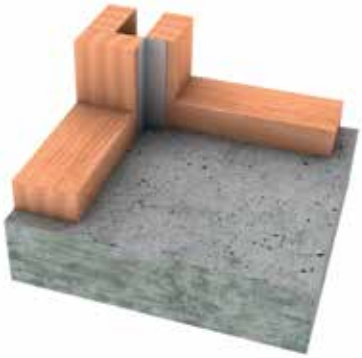
B: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.



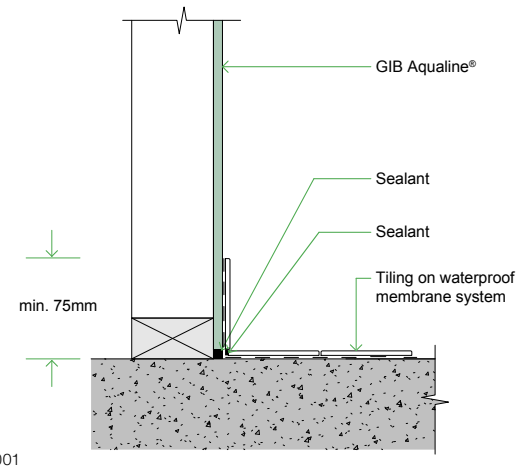
E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



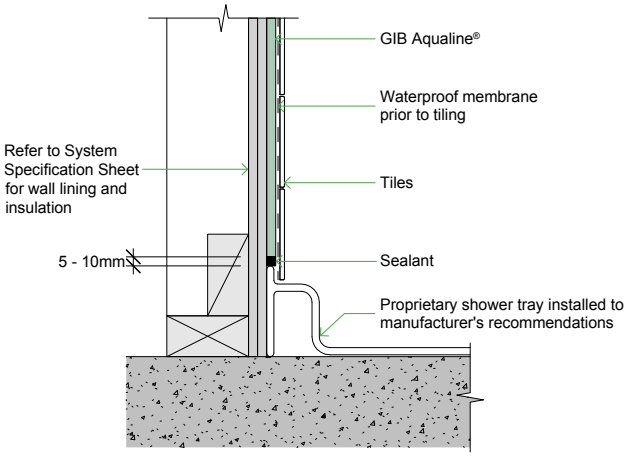
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A: CERAMIC FLOOR SKIRTING LINING JUNCTION



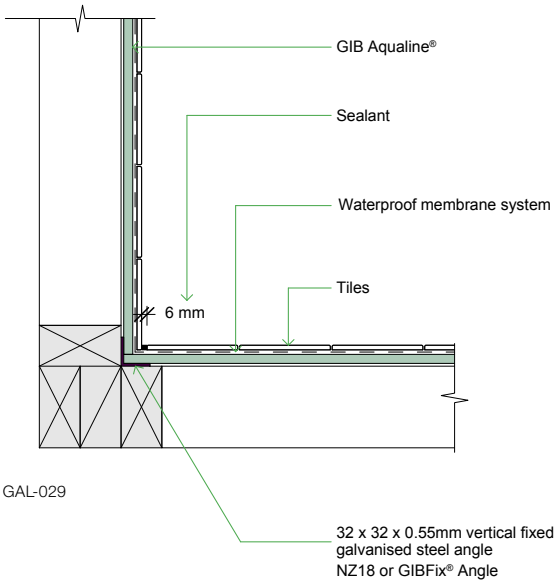
GAL-001

B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



GAL-016

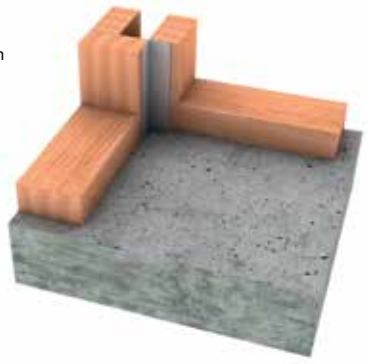
C: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

Refer to page 16 of this publication for specification and installation guidance.



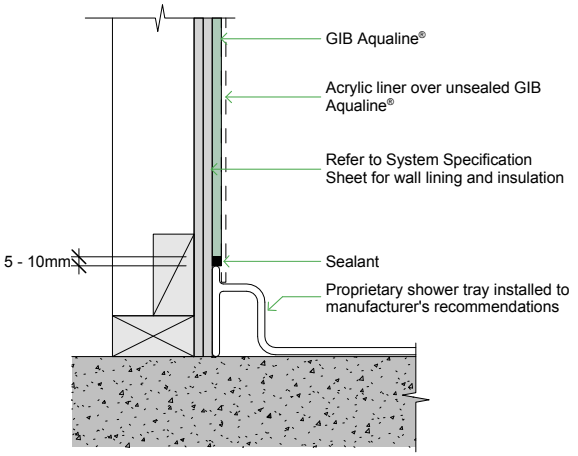
E: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



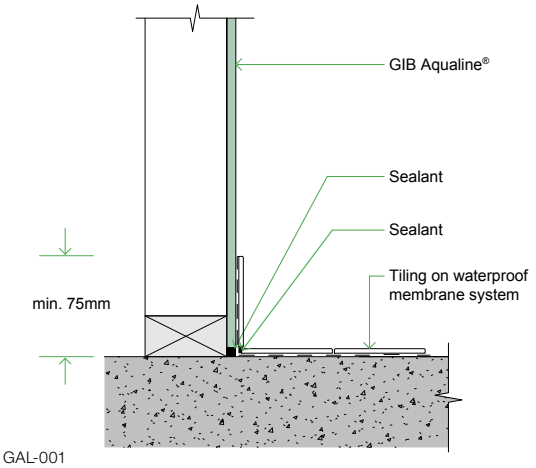
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A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



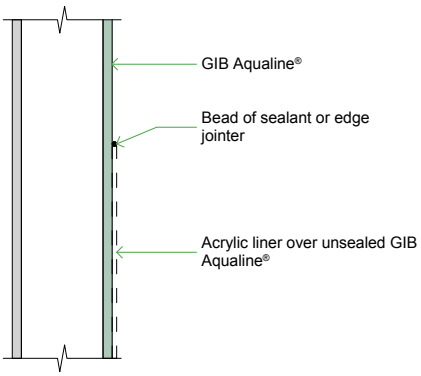
GAL-015

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

C: UNSEALED PLASTERBOARD LINING



GAL-028

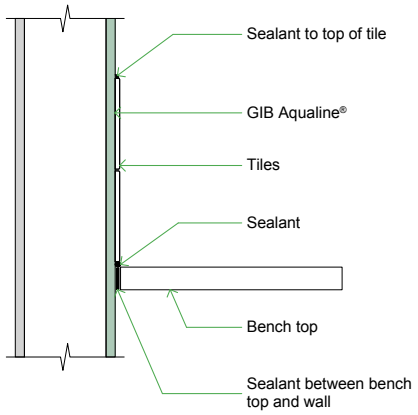
D: SHOWER MIXER PENETRATION IN WET WALL LININGS

Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



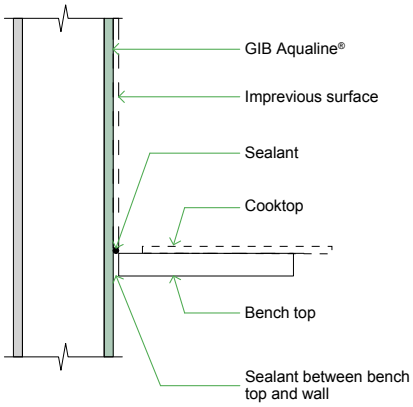
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A: BENCH TOP LINING JUNCTION



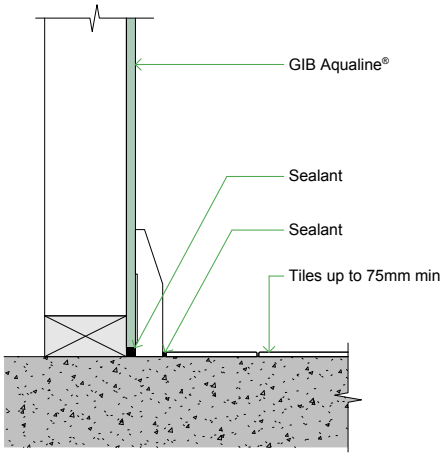
GAL-024

B: COOKTOP LINING JUNCTION



GAL-023B

CERAMIC FLOOR SKIRTING LINING JUNCTION

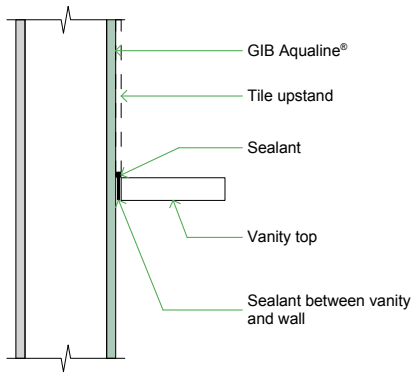


GAL-001A



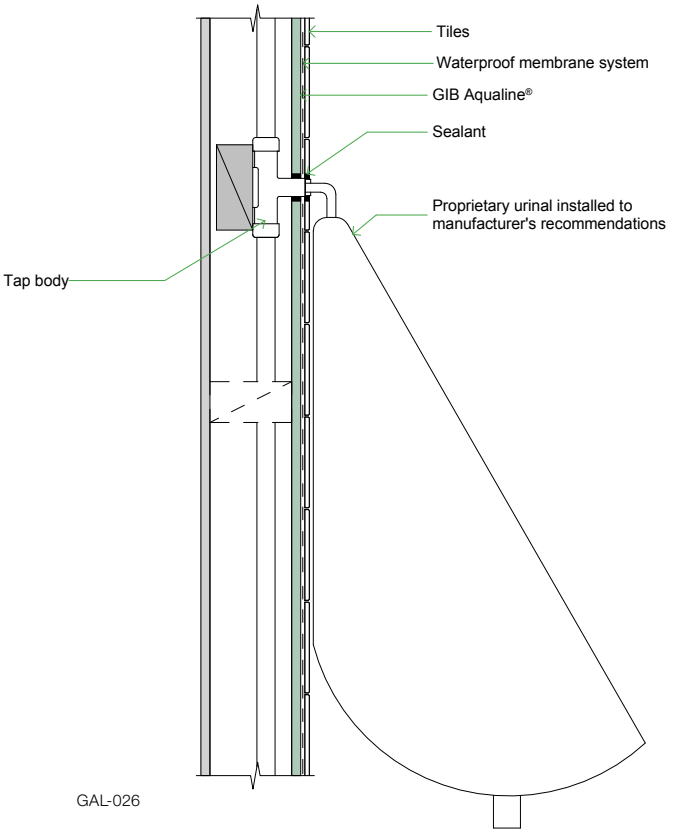
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A: VANITY TOP LINING JUNCTION



GAL-022

B: SEALING WET AREA PENETRATION LINING JUNCTION

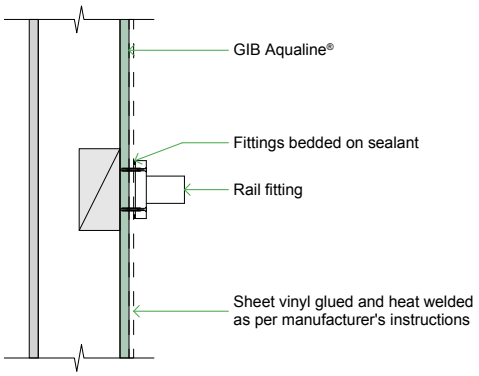


GAL-026



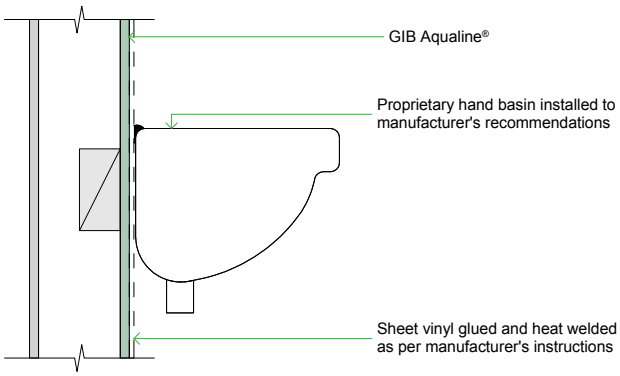
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A: SURFACE MOUNTED WITH NOG



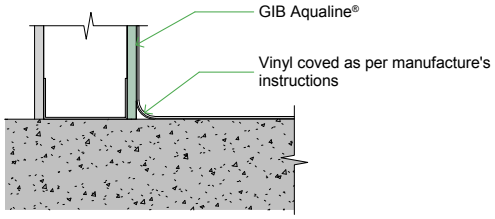
GAL-027

C: BASIN LINING JUNCTION



GAL-025

B: VINYL FLOOR LINING JUNCTION

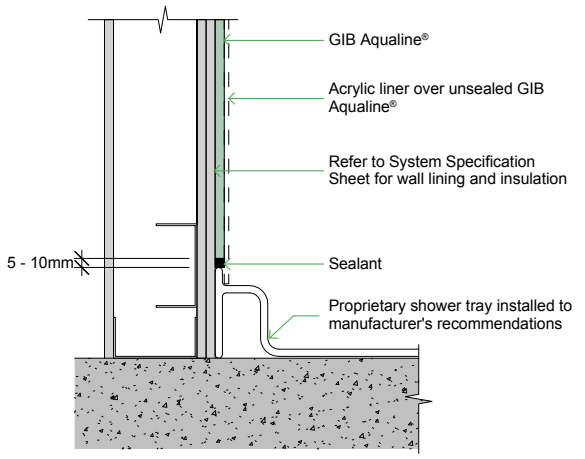


GAL-006A



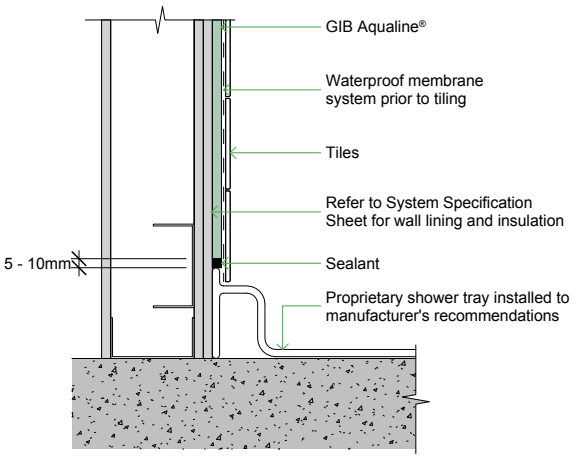
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A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



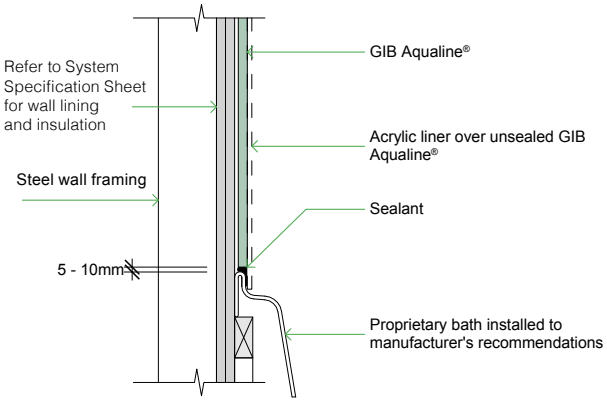
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



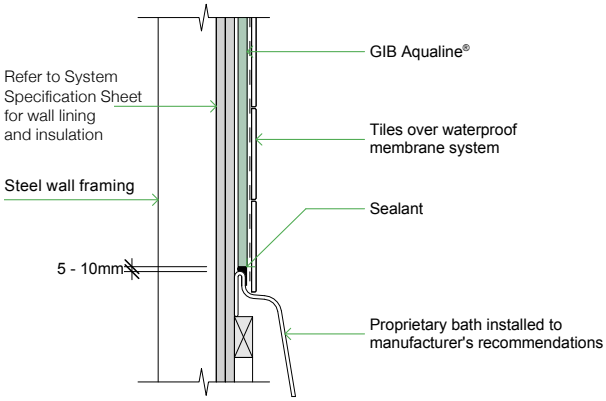
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



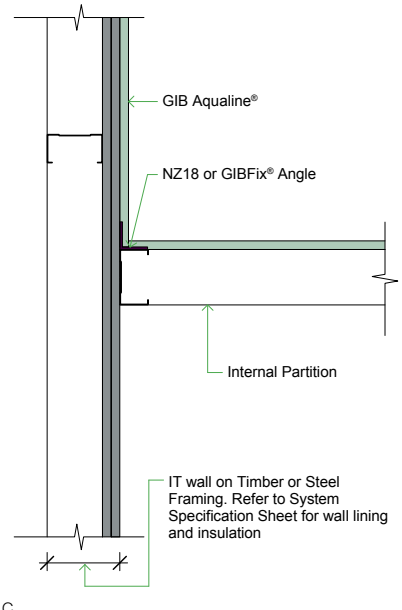
GAL-014

GIB® WET AREA SYSTEMS FIRE RESISTANCE AND NOISE CONTROL PERFORMANCE

Given recesses required for shower trays, bath upstands, etc., and the likelihood of renovations during the service life of the building, it is recommended that GIB® Wet Area linings in water splash areas are installed in addition to and over required fire and noise control systems in commercial or multi-residential applications.

Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

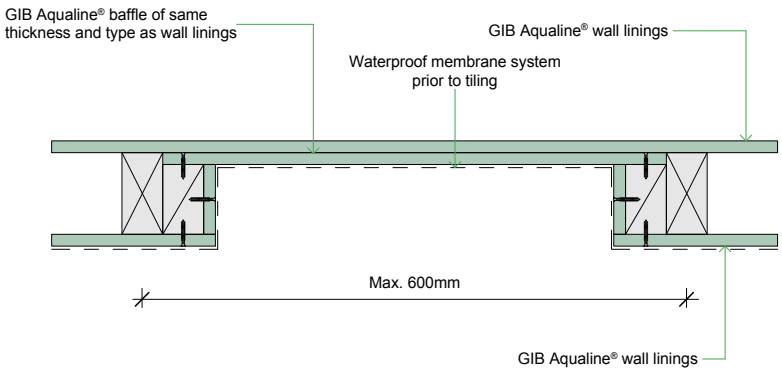
E: INTERTENANCY WALL AND WET AREA WALL JUNCTION



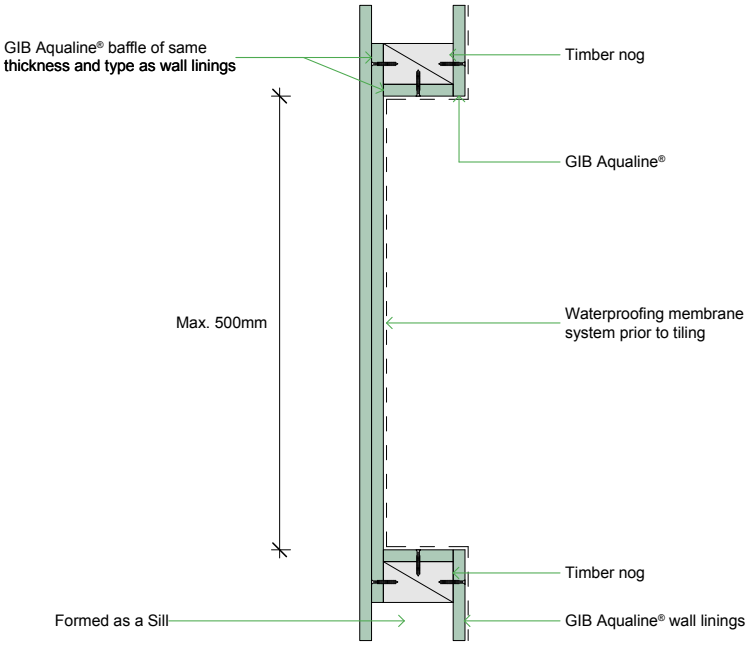
GAL-031C

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TIMBER FRAME TILE RECESS



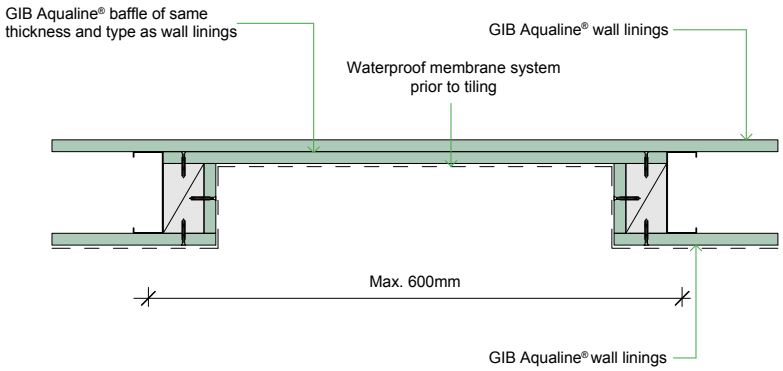
Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.



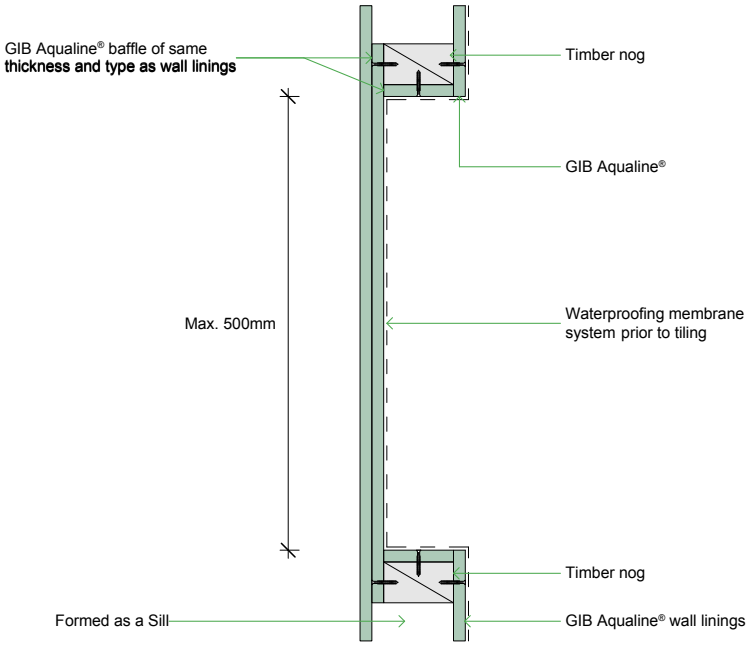
GAL-029B

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STEEL FRAME TILE RECESS



Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.



GAL-030

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GIB® Wet Area Systems, February 2021

LIMITATIONS

Winstone Wallboards Ltd accepts no liability if the GIB® Wet Area Systems and junction details are not installed in strict accordance with instructions contained within this publication.

USE ONLY THE CURRENT SPECIFICATION

This publication may be superseded by a new publication. Winstone Wallboards accepts no liability for reliance upon publications that have been superseded. You should check the GIB® website to ensure you are using the current publication. If you are unsure whether this is the current publication, simply call the GIB® Helpline on 0800 100 442.

SUBSTITUTION

GIB® Wet Area Systems have been specifically designed and tested to achieve the stated performance levels. To maintain the GIB® Product and System Warranty, all system components detailed in this publication must be used when specifying and installing GIB® Wet Area Systems.

TRADEMARKS

The names GIB®, GIB Fyreline®, GIB Ultraline®, GIB Toughline®, GIB Braceline® GIB Noiseline®, GIB Aqualine®, GIB Weatherline®, GIB Tradeset®, GIB Plus 4®, GIB-Cove®, GIB Lite Blue®, GIBFix®, GIB® Quiet Stud®, GIB Rail®, GIB Barrierline®, GIB X-Block®, GIB Fire Soundseal®, GIB Clip®, the colour mauve for GIB Toughline®, the colour blue for GIB Braceline® GIB Noiseline®, the colour pink for GIB Fyreline®, the colour green for GIB Aqualine®, the colour purple for GIB Weatherline® and the shield device are registered trademarks of Fletcher Building Holdings Limited.

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GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

February 2021

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BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	UWC ltd
Project name	
Address	52 Benn St , Amberley
Designer	JKH
Date	12/5/25

Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

Proposed Building

Element		Area (m²)	Proposed Building Heat Loss (W/K)	
Slab Floors		177.0	80.8	
Other Floors		0.0	0.0	
Roof		177.0	31.4	
Skylights		0.0	0.0	
Walls		153.1	69.6	
Glazing (walls & doors)	(19.0% of total wall area)	36.2	72.4	
Doors (opaque)		1.6	4.7	
		544.9	**Total**	**258.9**

Reference Building

Element	Area (m²)		Reference Building Heat Loss (W/K)	
Slab Floors	177.0	1.6	**110.6**	
Other Floors	0.0	3.0	**0.0**	
Total Roof (includes skylight area)	177.0	6.6	**26.8**	
Walls (70% of total wall area)	133.6	2.0	**66.8**	
Glazing allowance (30% of total wall area)	57.3	0.50	**114.5**	
	544.9		**Total**	**318.8**

Comparison of proposed building against the reference building — **PASS**

	Element type	Description	Embed heating?	Area (m²)	Construction R-value (m².K/W)	Heat Loss (W/K)	Errors
1	Slab Floors	Floor Slab	No	177.0	2.2	80.8	
2	Roof	Colorsteel Roof R6.6	No	138.0	7.0	19.8	
3	Roof	Colorsteel Roof R3.6	No	39.0	3.4	11.6	
4	Walls	Brick Veneer Exterior	No	93.0	2.2	42.3	
5	Walls	BGC Cladding	No	34.5	2.2	15.7	
6	Walls	Internal Wall	No	25.6	2.2	11.6	
7	Glazing (walls & doors)	W1		2.7	0.50	5.4	
8	Glazing (walls & doors)	W2		0.9	0.50	1.8	
9	Glazing (walls & doors)	W3		3.8	0.50	7.7	
10	Glazing (walls & doors)	W4		1.9	0.50	3.8	
11	Glazing (walls & doors)	W5		1.9	0.50	3.8	
12	Glazing (walls & doors)	W6		5.8	0.50	11.5	
13	Glazing (walls & doors)	W7		3.8	0.50	7.7	
14	Glazing (walls & doors)	W8		2.1	0.50	4.2	
15	Glazing (walls & doors)	W9		2.1	0.50	4.2	
16	Glazing (walls & doors)	W10		1.0	0.50	2.1	
17	Glazing (walls & doors)	W11		0.7	0.50	1.3	
18	Glazing (walls & doors)	W12		2.1	0.50	4.2	
19	Glazing (walls & doors)	W13		0.7	0.50	1.3	
20	Glazing (walls & doors)	W14		1.5	0.50	3.1	
21	Glazing (walls & doors)	W15		2.1	0.50	4.2	
22	Glazing (walls & doors)	W16		1.1	0.50	2.2	
23	Glazing (walls & doors)	W17		2.1	0.50	4.2	
24	Doors (opaque)	Internal Garage Door		1.6	0.34	4.7	
25							
26							

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BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	UWC ltd
Project name	
Address	52 Benn St , Amberley
Designer	JKH
Date	12/5/25

Territorial Authority	Hurunui District	**Climate Zone**	5
When submitted	After 2 November 2023	**Application**	Housing

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BRANZ H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

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When submitted	After 2 November 2023	**Application**	Housing

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 24/07/2024

Element Name (optional)

2.2 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Weatherboard Rusticated or Shiplap
R-value: 0.16

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

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Date: 11/10/2023

Element Name (optional) 2.20 m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - Brick 70mm
R-value: 0.06

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

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Construction R-value Calculator

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This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ( )

Date: 12/04/2025

Element Name (optional) — 2.09 m²°C/W

Type: Floor: Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Slab Floor - H1/AS1 Edition 5 and H1/AS2 Edition 1

Table F Slab Insulation (H1 Edition 5) - H1 Acceptable Solutions and Verification Methods

Slab floor area [m²]: 163.3

Area Perimeter Ratio: 2.56

Underslab insulation: Full — Insulation : 2.37

Perimeter:

	Length*	Masonry Veneer Wall	External Wall Thickness*	Edge Insulation
-	63.8 m	☑	90 mm	☐
+				

* required data. If empty the perimeter type will be ignored.

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Construction R-value Calculator

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This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ○

Date: 03/08/2024

Element Name (optional) **2.27** m²°C/W

Type: Wall: Timber Framed intertenancy Wall

Timber Framed intertenancy Wall [view detail]

internal surface 0.09

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4% *Cavity Area: 85.6%*

Framing :
R-value: 0.75

Insulation : 2.8

still Airgap: none
R-value: 0.00

Cladding : generic - None (Cladding is part of the insulation system)
R-value: 0.00

Timber Frame & Cavity : no framing (for example SIP Panels)

Wall Frame Area: 0.0% *Cavity Area: 100.0%*

Framing :
R-value: 0.00

Insulation :

still Airgap: none
R-value: 0.00

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

[Print Page]

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ◉

Date: 18/08/2023

Element Name (optional) — 3.35 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :

90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

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Construction R-value Calculator

This webpage calculates the R-value of walls, roofs and suspended floors for most insulation material R-values. It uses the "isothermal 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.

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 ◉

Date: 04/03/2024

Element Name (optional) — 6.98 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation : 6.6

Timber Frame & Cavity : 90mm rafters or joists @ 900mm, blocking @ 600mm

Roof Frame Area: 12.1%	*Cavity Area: 87.9%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : notched to cover bottom chord ☐

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

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EXPOL
Guaranteed Performance

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

1.0 - Product Overview

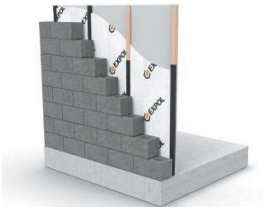
EXPOL ThermaSlab (Expanded Polystyrene / EPS) provides excellent compressive strength, moisture resistance, and thermal protection.

Ideally suited for residential applications**, EXPOL ThermaSlab** is a cost effective, easy to install insulation solution that achieves R-values above building regulations.

EXPOL ThermaSlab is available in grades S, M, H, VH and SL, and can be used in:

- Retaining Walls (S Grade)
- Skillion Roof Insulation (S, M H Grades)
- Concrete Floor Insulation (S, H, VH Grades
- Wall Insulation (SL Grade)
- Cladding Insulation (S and H Grades)





2.0 - Installation

2.1 There are no special requirements for PPE when handling or installing EPS. It is an inert, non-toxic material.

2.2 When transporting, storing or installing, ensure the EPS is not exposed to:

- Petroleum based solvents, or
- Fire, or
- Sustained direct sunlight.

2.3 PVC sheathed electrical cables should not be allowed direct contact with EPS.

2.4 EPS is compatible with all common construction products.

3.0 - Maintenance

3.1 No maintenance required

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4.0 - Warranty

We believe we manufacture and supply the highest quality UnderFloor, EPS and XPS Foam Insulation products and that is why we stand behind them with some of the best warranties in the industry.

4.1 We provide a 20-year warranty on our EPS Foam Insulation Products – for full warranty details visit www.expol.co.nz/expol-eps-warranty/

5.0 - Compliance with the New Zealand Building Code

EPS, when installed and maintained in accordance with the requirements outlined in this technical data sheet, will meet or contribute to meeting the following provisions of the New Zealand Building Code:

5.1 Clause B2 Durability, performance B2.3.1 (a), B2.3.1(b)

5.2 Clause E3 Internal moisture performance E3.3.1

5.3 Clause F2 Hazardous building materials performance F2.3.1(a)

EXPOL EPS is not subject to a warning or ban under the Building Act 2004.

6.0 - Quality Assurance

6.1 BRANZ, H1 Energy efficiency performance H1.3.1(a), H1.3.2(e)

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EXPOL
Guaranteed Performance

EXPOL THERMASLAB S GRADE – TECHNICAL DATA SHEET

7.0 - Technical Data

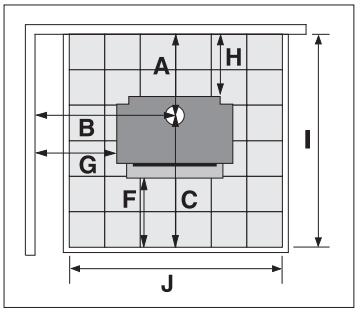
Properties	Test / Method / Standard	Test Results
Material	Expanded Polystyrene	
Density	16 kg / m3	
Sheet Size	2400 mm x 1200 mm	
Thickness / R Value	10mm	-
	20mm	R 0.53
	25mm	R 0.66
	30mm	R 0.79
	35mm	R 0.92
	40mm	R 1.05
	45mm	R 1.18
	50mm	R 1.32
	55mm	R 1.45
	60mm	R 1.58
	65mm	R 1.71
	70mm	R 1.84
	75mm	R 1.97
	80mm	R 2.11
	85mm	R 2.24
	90mm	R 2.37
	95mm	R 2.50
	100mm	R 2.63
	110mm	R 2.89
	120mm	R 3.16
Thermal Conductivity	ATSM 168	K – Value 0.038
Rate of water vapour transmission (max) measured parallel to rise at 23 deg C	AS 2498.5	520 mg/m2s
Permeability m/s	-	
Compressive Resistance KPA at 1% Compressive Resistance KPA at 2% Compressive Resistance KPA at 5% Compressive Resistance KPA at 10%	AS 2498.3	34 KPA 59 KPA 74 KPA 84 KPA
Youngs Modulus	-	3.8 MPA
Cross breaking strength KPA	AS 2498.4	165 KPA
Dimensional stability of length, width & thickness (max) at 70 deg C for 7 days	AS2498.6	1%
Long term water absorption by immersion	ASTM C72	- %v / v
Determination of flame propagation surface ignition Medium flame duration (max) Eighth vale	AS2122.1-1993	 2 sec 3 sec
Fire behavior Spread of flame index (0 – 10) Smoke developed index (0 – 10)	AS/NZS 1530.3:1999	 0 5
Recycled Content	5%	
Recyclability	EPS is 100% recyclable	
Environmental Statement	EPS is inert and non-toxic. There are no chemicals or gases harmful to the environment emitted from EPS either during manufacture or within use.	
Ozone Depleting Potential	EPS does not contain ozone-depleting CFC or HCFC gases, nor use them in its manufacture. As a result, EPS has zero ozone depletion potential.	
Vermin Resistance	EPS does not offer any nutritive value.	

For further technical information please contact us.
P: +64 9 634 3449 **F:** +64 9 634 0756 **T:** 0800 86 33 73 **E:** tech@expol.co.nz **W:** www.expol.co.nz

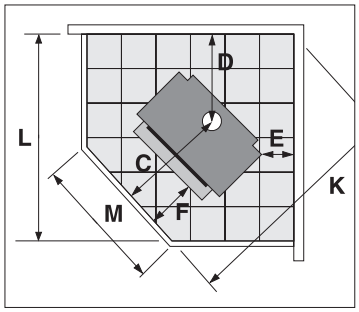
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Wood Fire Installation & Owner's Operation Manual









metrofires

Freestanding Wood Fires

Important information 2
Assembling your Metro fire 2
Floor protector 4
Flue installation 5
Wetback installation 6
Clearances and specifications 7
Important operation information 8
Where to install a Metro fire in your home 9
Optional wetbacks 9
Getting to know your Metro fire 10
Operating your Metro fire 10
Cleaning and maintenance 11
Troubleshooting 12
Metro Fires warranty 13
Replacement parts 14-15
Heating accessories 16

02/20 © PIONEER MANUFACTURING LTD

NZHHA New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER MANUFACTURING LIMITED

19 Oropuriri Road // New Plymouth 4312
info@metrofires.co.nz // www.metrofires.co.nz

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⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- The appliance and flue-system shall be installed in accordance with AS/NZS2918 and the appropriate requirements of the relevant building code or codes
- Any modification of the appliance that has not been approved in writing by the testing authority is considered to be in breach of the approval granted for compliance with AS/NZS4013 and will void the warranty
- The appliance must be installed correctly. We recommend a competent and suitably qualified NZHHA installer

⚠ CAUTION! Important Information

- Mixing of appliance or flue-system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted in the first instance
- Do not install a Metro fire if there is any sign of visible damage to the product
- This appliance must be regularly maintained.
- Use authorised Metro replacement parts only. The use of unauthorised parts may void the warranty
- This manual MUST be left with the home owner

All Metro wood fires comply with AS/NZS2918:2001 when installed in accordance with this manual. Please ensure you are fully conversant with the relevant standard and the contents of this manual. Correct installation is critical to the safe operation and performance of this wood fire.

Please take particular note of the following:

- It is recommended that Metro fires be installed with a Metro ECO flue system which has been developed to enhance the performance of Metro wood fires. Any alternative flue system must have a minimum flue pipe length of 4.2 metres of 150mm diameter flue pipe and have been tested to AS/NZS2918:2001 with a 12mm spaced ceiling plate of no less than 345mm square
- The 150mm active flue pipe must be fully encased from the ceiling to the underside of the flashing cone at the top of the flue system, (i.e. there must not be any 150mm flue pipe exposed)
- All flue pipe joints must be sealed and riveted. The bottom of the flue pipe in particular MUST be fully sealed into the flue outlet of the Metro fire
- In New Zealand, the Metro fire must be bolted through the floor protector into the floor to comply with the seismic restraint provisions of AS/NZS2918:2001
- All Metro's are extremely heavy, varying in weight from 75kgs up to 185kgs. During the installation process do not lift the appliance by yourself, and take care not to damage the panel coating
- Please take care when lifting the Metro fire into place onto the hearth or floor protector as point loading may break tiles and/or scratch surfaces.

Assembling your Metro wood fire

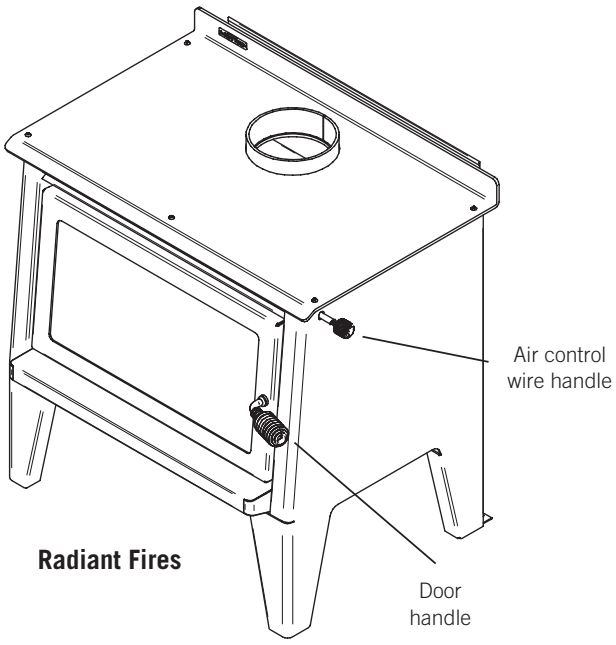
Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation. The Metro carton shows the model Metro you are about to install, enabling you to select the appropriate model's assembly instructions.

All Metro wood fires are packed in a single heavy-duty carton, and tek screwed to a wooden pallet. Having removed the packaging and located this manual, familiarise yourself with the illustrations on pages 2 & 3, and proceed as follows.

Metro radiant fires

These Metro's are supplied virtually fully assembled. Packed inside the firebox you will find bricks in a cardboard wrapper, a wire door handle and the air control wire handle.

- Remove the two tek screws located at the base of each rear leg which secure the Metro to the wooden pallet, and carefully 'walk' the Metro off the pallet
- Open the door fully and fit the side bricks to each side of the firebox. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2
- Attach the door handle to the door latch assembly by screwing it on clockwise
- Attach the air control wire handle by screwing it on clockwise.



Radiant Fires

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Assembling your Metro wood fire

Please note: You should only assemble this wood fire if you are suitably experienced in wood fire assembly and installation.

Metro pedestal and base model fires

To eliminate freight damage, the pedestal base has been packaged inside the firebox. To safely assemble your Metro, please proceed as follows:

- Lift off the top grill (convection models only) and place somewhere safe. Be careful not to chip the enamel coating or damage paint
- Open the door 45 degrees and lift the door off the hinge and place somewhere safe. Be careful not to damage the finish
- Remove the pedestal packed in a cardboard wrap
- Remove, rotate and re-fix the mount plate to the pedestal.

  Note: The pedestal mount plate is fixed to the back of the pedestal base with 4x screws. This mounting plate must be removed, rotated and re-fixed to the pedestal as detailed on page 4 in diagrams 3 and 3A. The return fold must face back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.
- Remove the pedestal heat shield

  Note: For some models the pedestal heat shield may be taped to the rear heat shield. The ECO Tiny Ped's pedestal heat shield is pre-fitted.
- Remove the side bricks, door handle and the bolt bag
- Remove the 2 tek screws at the base of the inside of the firebox that fix the wood fire to the pallet.

It is recommended that 2 people work together with the next step:

- Grab the underneath top of the firebox door opening with one hand, holding the flue spigot with the other, slowly lift the front of the wood fire all the way back and rest the wood fire on its rear heat shield on the floor. Remove the packaging pallet.
- Fit the pedestal heat shield over the 4 bolts as shown in Diagram 1, with the open edge facing the front of the Metro (up)
- Position the pedestal with its front facing over the 4 bolts and fit the washers and nuts supplied, check to ensure the pedestal is correctly aligned and securely tighten the nuts.

It is recommended that 2 people work together with the next step:

- Grab the flue spigot with one hand and the other hand underneath the top of the firebox door opening, lift upwards standing the wood fire onto its pedestal
- Fit the side bricks to each side of the fire box. Location lugs are fitted to the base and rear wall of the firebox to retain the side bricks in position. Refer to Diagram 2. (Classic Rad also features two side rear bricks).
- Re-fit the door and top grill (Convection models only)

All Metro models

Check to ensure the top baffle is in its correct position in the top chamber of the firebox. It should be resting on four support lugs (two on each side of the firebox). The baffle must be hard back against the rear of the firebox with the "promet extension" (white board) or return front steel edge of the baffle facing forward as illustrated in Diagram 2.

Note: Some models feature a two-piece top baffle.

Diagram 1

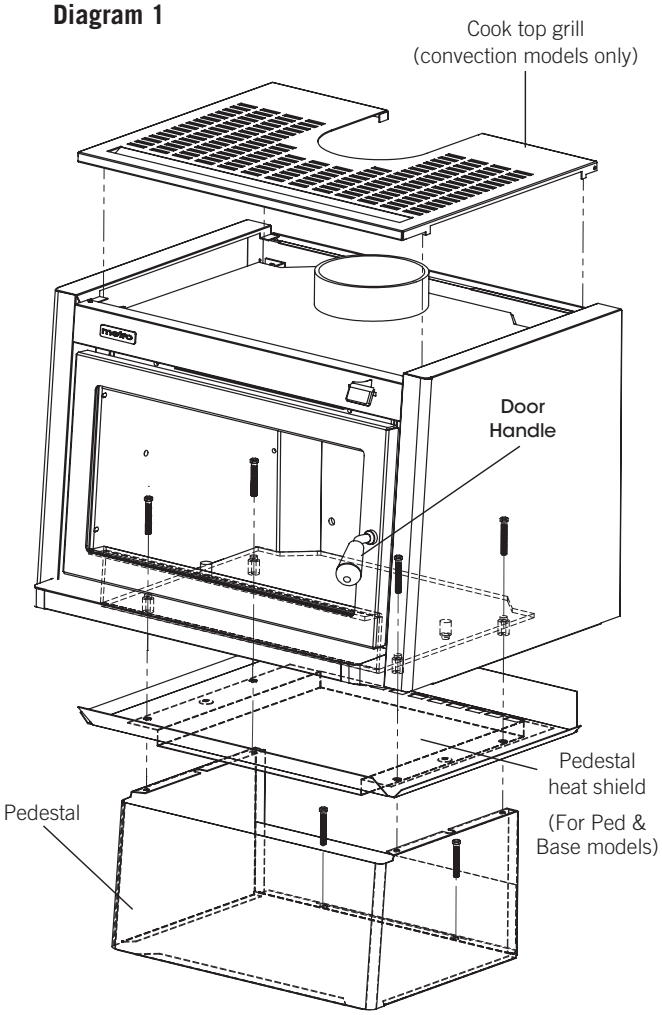
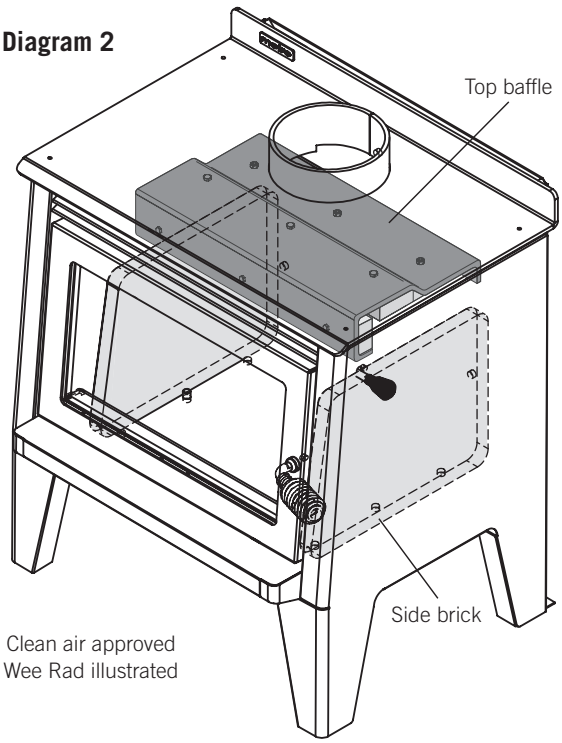


Diagram 2



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Floor protector size, construction and fitting

Pioneer manufacture an extensive range of Pioneer 'Ash Floor Protectors' which comply with the minimum floor protector requirements of AS/NZS2918:2001, and can be installed with any freestanding Metro wood fire. Metro freestanding wood fires do not require an insulated floor protector as they comply with the minimum floor protector requirements of AS/NZS2918:2001. These minimum floor protector requirements are;

- They must be of adequate size to give appropriate wall, rear and front clearances/projections as detailed below and in the chart illustrated on page 7. Note;
- The floor protector must extend 200mm horizontally to the rear and each side directly below the door opening, and 300mm forward of the door opening
- The upper surface of the floor protector must be made of non-combustible material.

A suitable floor protector for a Metro freestanding wood fire is therefore any non-combustible material which could include;

- Ceramic tiles with grouted joints fixed directly to a hard base over timber flooring
- A sheet of toughened glass, panel steel etc. laid directly onto a wooden or other combustible floor.

Metro radiant fires

Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded. Once the Metro's location on the floor protector is established and if the installation is within New Zealand, seismic restraint is required.

Using masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor, secure through the holes provided at the base, behind both rear legs.

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

Metro pedestal and base model fires

Prior to lifting the Metro fire onto the floor protector, ensure you have removed, rotated and re-assembled the mount plate from the back of the pedestal base as detailed in diagrams 3 & 3A above. This rear panel must be rotated with the return fold facing back the opposite way to create the mount plate and fixing points for seismic restraint of the wood fire.

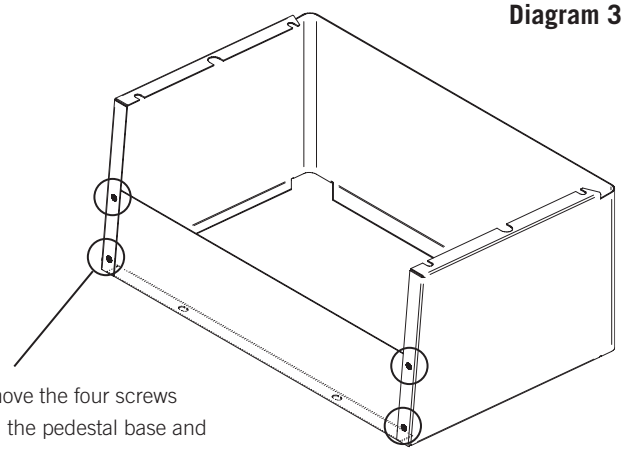
Lift the Metro fire onto the floor protector and using a suitable measuring device, ensure that the minimum wall clearances and front floor protector projections as detailed in the chart on page 7 are met or exceeded.

Once the location of the fire is established, you can then secure the Metro through the floor protector into the floor using the two seismic restraint holes in the rear edge of the mount plate. Use masonry anchors if the floor protector is on a concrete floor or coach bolts if a wooden floor

Note: The anchors must pass through the floor protector and securely anchor the Metro to the floor.

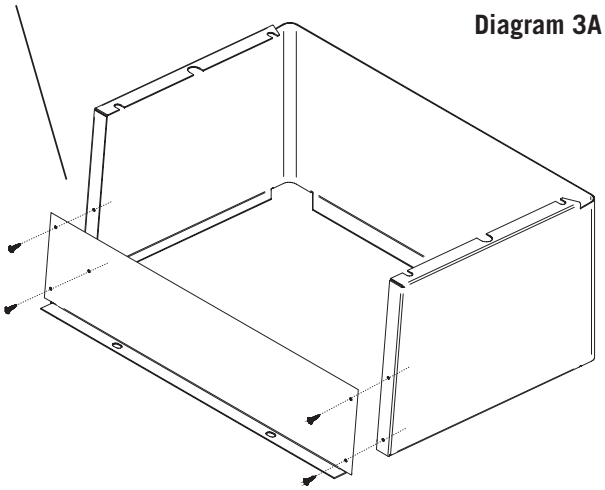
Preparing the mount plate

Diagram 3

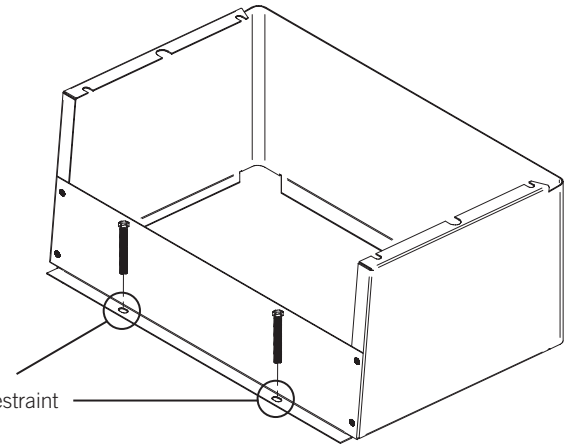


Remove the four screws from the pedestal base and rotate the mount plate so the return fold faces back the other way. Refix in place.

Diagram 3A



Correct mount plate position



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Flue installation

It is recommended that all Metro freestanding wood fires be installed with the energy efficient ECO Flue System which comes complete with a detailed installation manual. This installation manual must be presented with your application to gain consent with your local council.

A copy of the ECO Flue System installation manual can be downloaded from metrofires.co.nz, or a copy can be obtained from your Metro retailer. Any alternative flue system must comply with and be installed as detailed in AS/NZS2918:2001, and a copy of the installation manual must also be presented with your application to gain consent with your local council.

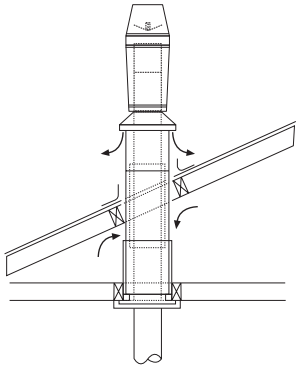
All Metro fires require a 150mm diameter flue. Please note:

- Metro ECO flue systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue Kit and ECO Option Kits are both installed
- The ECO Flue system must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- ECO Flue systems shall be installed in accordance with AS/NZS2918:2001 and the appropriate requirements of the relevant building codes
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted
- The flue systems 150mm diameter flue pipe must terminate a minimum of 4.6 metres above the top surface of the floor protector
- All joints in the flue pipe must be sealed with Pioneer fire cement (or similar) and riveted. The base of the flue pipe must also be sealed into the Metro fires flue outlet. This is critical for optimum operation.

All Metro fires have been tested with a Pioneer double flue shield. For the Metro fire to be installed with minimal clearances as the clearance table on page 7 states, only the Pioneer double flue shield can be used. All other flue shields will invalidate the installation.

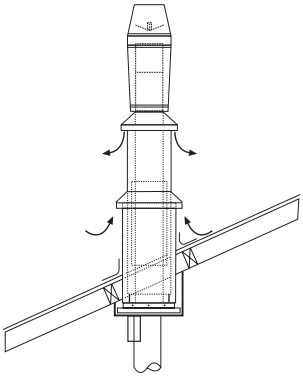
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



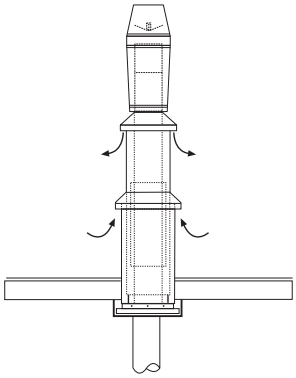
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

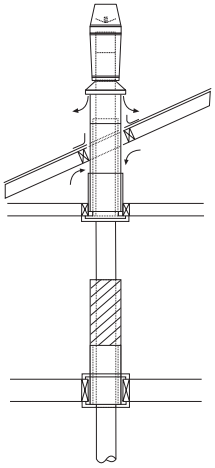
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



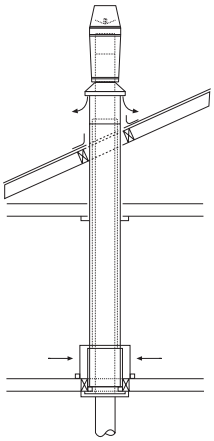
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS2918:2001



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS2918:2001

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Wetback installation

⚠ WARNING! Important Information

- DO NOT connect to an unvented hot water system
- Install in accordance with AS 3500.4.1 or NZS 4603 and the appropriate requirements of the relevant building code or codes.

⚠ CAUTION! Important Information

- Wetbacks must be connected with water before operating the fire and available to the wetback while the fire is in operation
- Wetback systems are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail
- Rainwater collection tanks installed lower than the wetback that use a water pump to supply the home, can cause problems if the pump is not operational. In these situations either the type of wetback or a roof header tank should be considered

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Wetback connections are as follows, taken facing the Metro/wall; the return pipe connection is directly above the inlet connection. Heights for all models are illustrated and detailed opposite on page 7.

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

All wetbacks are fitted to the inside rear wall of the firebox, with the exception of the Tiny Rad Woody, clean air Wee Series models and the Classic Rad model. Side wetback position for these models is to the outside left hand firebox wall. Please see the specific installation instructions in the 'Side Wetback' box for installation of a wetback into these appliances.

It is recommended the return pipe has a minimum rise of 1 in 12; performance will reduce as the distance to the storage cylinder increases.

To fit the wetback proceed as follows

1. Remove the rear panel of the Metro by removing the four pozi drive screws. Remove the two pre-punched knockouts from this panel.
2. Two further knockouts will be visible on the inner rear heatshield, remove these also. Once these are removed 6mm nuts will be visible through the knockout holes.
3. Open the Metro's door and locate two bolts securing the pressed washers which are visible on the left hand side of the firebox for both inlet and outlet connection points.
4. A further three bolt heads will also be visible on the inside rear wall of the firebox; these are threaded into the 6mm thick firebox. Remove all three.
5. Using the tube of sealant supplied with the wetback, apply a liberal bead of sealant around both the two connection pipes and also the outer circumference of the wetback which will face and press against the inside rear wall of the firebox. This will completely seal the wetback to the inside rear wall of the fire on installation.

Ensure there is no gap between pipe and rear wall access holes. This cement must fully cure before appliance use.

6. Fit the wetback into the firebox and carefully pass the connection pipes through the holes in the rear of the firebox. Securely attach the wetback using the three bolts previously removed from the rear face of the firebox, fitting them through the slots provided in the wetback's jacket.
7. The wetback is now ready for connection to the storage cylinder by a registered plumber.

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Metro clearances and specifications (Minimum clearances shown are in mm, with a Pioneer double flue shield fitted)

Minimum clearances

All Metro wood fires comply with AS/NZS2918:2001. Minimum clearances shown below are detailed in millimetres, with a Pioneer double flue shield fitted to the appliance. Measurements are taken from the following reference points as illustrated:

- From the nearest combustible wall or surface (A, B, D, E, G, H)
- From the Metro's flue centre (A, B, C, D)
- From the Metro's cabinet/heatshield outermost point (E, F, G, H)
- To the edge of the ash floor protectors non-combustible surface (C, F, I, J, K, L, M)

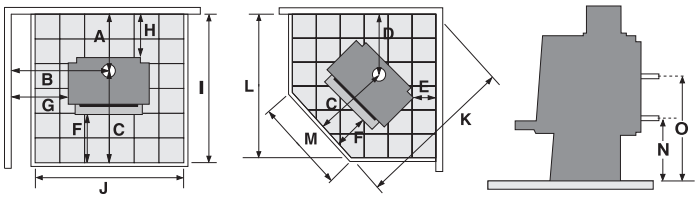
AS/NZS2918:2001 allows for a reduction in minimum clearances as detailed in Section 3, tables 3.1 and 3.2 of the standard.

Some Metro models have undergone additional testing which allows for reduced clearances. Please see the footnotes below the clearance table for the applicable models.

Wetback connections (taken facing the Metro/wall)

- ECO Tiny Ped and ECO Tiny Rad models are 92mm left of the flue centre
- The Tiny Rad Woody model is 184mm left of the flue centre
- Wee Series models are 226mm left of the flue centre
- The Classic Rad model is 184mm left of the flue centre
- All other models are 140mm left of the flue centre

Specifications were correct at the time of printing, but may alter and those detailed within should be used only as a guide. If in doubt, please consult your Metro retailer or metrofires.co.nz.



	Minimum installation clearances with a Pioneer double flueshield fitted (mm)													Wetback		Dimensions		
Clean air models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
ECO Tiny Ped	211	433	580	290	25	235	185	60	791	650	990	780	250	280	470	496	492	659
ECO Tiny Rad	230	553	585	419	150	232	300	75	815	650	1180	910	250	280	470	505	508	667
Tiny Rad Woody	251	568	580	382	110	232	310	100	831	650	1120	870	250	365	555	515	498	758
Wee Rad - Leg [1]	251	568	580	456	150	232	260	100	831	825	1225	1016	425	295	485	615	501	688
Wee Rad - Base	271	678	580	486	180	232	370	120	851	825	1270	1048	425	295	485	615	501	691
Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
Wee Rad V2 - Base	318	768	580	586	250	232	460	150	898	825	1410	1147	425	N/A	N/A	615	518	691
Wee Ped [2]	263	651	580	473	170	230	350	110	843	825	1250	1034	425	295	485	602	503	665
Classic Rad [3]	257	695	780	500	220	229	430	100	1037	728	1490	1170	328	393	583	530	708	680
Xtreme Ped	251	624	630	442	110	226	280	100	881	907	1260	1070	507	312	502	688	554	707
Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	312	502	740	554	743
Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	382	572	740	554	813
Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744
LTD rural models	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**Width**	**Depth**	**Height**
LTD Wee Rad - Leg	251	548	580	426	120	232	240	100	831	825	1185	989	425	295	485	615	501	688
LTD Wee Rad - Base	251	658	580	486	180	232	350	100	831	825	1270	1048	425	300	490	615	501	691
LTD Wee Rad - Woody	271	708	580	506	200	232	400	120	851	825	1295	1066	425	365	555	615	501	758
LTD Xtreme Rad - Leg	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Base	251	650	630	458	100	227	280	100	881	907	1280	1084	507	350	540	740	554	743
LTD Xtreme Rad - Woody	251	680	630	478	120	227	310	100	881	907	1306	1103	507	420	610	740	554	813
LTD Mega Rad	285	720	728	497	100	224	300	130	1013	1006	1435	1229	606	300	490	840	659	744

The Wee Rad installed with a Pioneer double flue shield with the Wee Rad corner wing shields fitted allows for reduced clearances as follows:

[1] Wee Rad - Leg corner clearance (E) can be reduced to 120mm. This in turn also reduces clearances (D) to 426mm, (K) to 1185mm and (L) to 987mm. When fitting the corner wing shields, the Wee Rad - Leg itself must be installed to a corner clearance (E) of 120mm. The corner wing shields are then fitted which gives a wall to shield corner clearance of 100mm.

The following models installed with a Pioneer double flue shield with the side extensions fitted allows for reduced clearances as follows:

[2] Wee Ped corner clearance (E) can be reduced to 115mm. This in turn also reduces clearances (D) to 418mm, (K) to 1170mm and (L) to 978mm.

[3] Classic Rad corner clearance (E) can be reduced to 180mm. This in turn also reduces clearances (D) to 460mm, (K) to 1435mm and (L) to 1131mm.

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⚠ WARNING! Important Information

- **WE HIGHLY RECOMMEND YOU READ THIS ENTIRE MANUAL AS INCORRECT OPERATION, MISUSE AND/OR LACK OF MAINTENANCE WILL VOID THE WARRANTY**
- Any modification of the appliance that has not been approved in writing by the testing authority is considered as breaching AS/NZS 4013 and will void the warranty
- Do not use flammable liquids or aerosols in the vicinity of this appliance when it is operating
- Never operate your Metro with the top grill removed
- Do not dry clothes on or near this appliance
- Do not use flammable liquids or aerosols to start or rekindle the fire OR store fuel within the Metro's specified installation clearances
- Never operate your Metro with the door ajar, except on initial start up
- Open the air control fully before opening the Metro's door.

⚠ CAUTION! Important Information

- This appliance should be maintained & operated at all times in accordance with this instruction manual
- This appliance should not be operated with cracked door glass, over worn, faulty or missing door seals
- Do not use driftwood, treated or unseasoned (wet) fuel, the use of most types of preservative treated wood as fuel can be hazardous and will damage your appliance
- Burning unseasoned (wet) fuel or incorrect operation on extended low burn cycles will cause excessive creosote to form. Creosote is very corrosive and excessive buildups will result in the flue pipe, flue spigot and upper burn chamber failing. Failure of the applicance and/or flue system due to creosote damage is not covered under warranty. The formation of such is not an appliance issue it is a fuel and operational issue
- This appliance must be regularly maintained and replacement parts must be authorised Metro parts only
- Do not empty ash into a combustible container.

Congratulations on the purchase of your Metro wood fire

This slow combustion appliance is designed to give you many years of warmth and service, subject to the following key factors. These key factors, if not adhered to are the major causes of unsafe installation, poor performance and flue blockages and potential product failure.

1. Your Metro wood fire must be installed correctly. Metro recommend a competent and suitably qualified NZHHA installer.
2. The only fuel to be used in this appliance shall be wood that meets the following criteria.
   - Less than 25% moisture content
   - Has not been treated with preservatives or impregnated with chemicals or glue,
   - Is not chipboard, particle board, or laminated board,
   - Is not painted, stained or oiled
   - Is not driftwood or other salt impregnated wood
3. The appliance shall be operated at all times in accordance with the "Installation and Operating Instructions" supplied with each appliance.
4. It is preferable that Metro wood fires should be installed with a Metro ECO Flue System.
5. Coal must not be used as a fuel.

Please also note the following important points:

- In New Zealand a building consent is required from your local building authority. The homeowner is responsible for obtaining this consent
- As correct installation is critical to the performance and safe operation of your Metro, it is recommended your Metro be installed by a NZHHA registered installer or a person suitably qualified in the installation of wood fires. Your Metro retailer will be able to arrange professional installation for you
- During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed; open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time
- Properly seasoned (dry) timber is necessary for the Metro to operate efficiently; firewood that contains a high moisture content will result in flue pipe blockages, reduce heat output and create other issues.

Note: Once split, Softwood usually takes 12 months to season - Hardwood can take up to 24 months to season - Wood must be stored in a location that enables air circulation. Unseasoned wood stored in a closed woodshed without air circulation will still be unseasoned 12 months later.

- It is critical that the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) this will cause air to leak into the fire, causing the appliance to 'over fire'
- It is critical that the fire not be operated with over worn, faulty or missing bricks, baffle plate, promet extension (white board on the baffle plate)
- It is critical that the fire not be operated with cracked or broken door glass.

Please note, the above 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. A glowing firebox or lower fluepipe is just one sign you are over firing your appliance. Please ensure you keep your proof of purchase/receipt on any parts you purchase.

- For optimum performance fuel must be loaded so the logs lay "front to rear" in preference to laying across the width of the firebox. Spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- A small hot fire loaded frequently is more efficient than a large fire burning on a low setting
- Your Metro is covered by a full unconditional 12 month warranty on replacement parts, and a 10 year firebox warranty.

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Where to install a Metro wood fire in your home

Wood fires are usually installed in the main living area, which is the section of the home that is usually kept the warmest, being the area in the home most frequently occupied. However, before deciding on the best location for your Metro wood fire you may wish to consider:

- Water heating. If you are intending to have a wetback it is important that the wood fire is as close as practically possible to the water storage cylinder
- Split level homes are best heated when the wood fire is installed on the lower level, as the heated air will rise to the higher levels
- Building construction is another consideration. Specified clearances from walls, curtains etc must be maintained and you need to ensure no structural beams or internal gutters etc are directly above your preferred site. If you have a two storey dwelling you need to consider the second storey to ensure you don't have the flue directly outside a second storey window.

Generally, you can install your Metro in your home anywhere that suits you; Pioneer offer various fan systems to transfer heat to other sections of the home that are not heated sufficiently. It is necessary if using a fan system that the Metro you have purchased has sufficient output to heat the total area you wish to heat. Your Metro retailer or installer will be able to advise if you are uncertain.

Optional wetbacks

Water heating is another key feature of your Metro wood fire; nearly all Metro models can be fitted with a wetback, which are designed to give maximum output with minimal effect on the operation of the fire. Only the Pioneer cast jacket wetback system should be fitted to your Metro; alternative wetbacks will void the Metro's emission approvals and may seriously affect the performance of the appliance and void its warranty.

Other considerations are:

- Distance from your Metro to the storage cylinder will affect the amount of hot water produced
- Your climate & the manner in which you will 'fire' your Metro will determine the amount of hot water produced.

Note: Wetbacks are not suitable for use in locations where the water supply has lime content. Lime build up inside the coil will eventually block the coil causing the wetback to fail.

Cost Savings

Wetbacks can enable substantial power savings, dependent on the climate in the area in which you live. If you live in a cold climate you are likely to use your Metro for many months of the year, in which case a Pioneer wetback will reduce or even eliminate your water heating costs over those months. If however you live in a warmer climate and use your Metro for only a few hours a day over the colder months, electricity savings will be considerably less.

Water Pressure

A common misconception is that you must have a low-pressure system to have a wetback; this is not true. You must have a 'vented' system and high-pressure cylinders are usually not vented. However you can install an 'indirect' cylinder which contains a secondary coil inside the storage cylinder, enabling you to have a wetback while retaining a high-pressure system.

Wetback	Suitable for models:
2kW Wetback 	• ECO Tiny Rad • ECO Tiny Ped
Side Wetback 	• Tiny Rad Woody • Wee Rad Leg & Wee Rad Base • Wee Rad Woody • Wee Ped • Classic Rad
3kW Wetback 	• Xtreme Rad Leg & Xtreme Rad Base • Xtreme Rad Woody • Xtreme Ped • Mega Rad • All LTD rural models
4kW Wetback 	• All LTD rural models

The Wee Rad V2 Base model cannot be fitted with a wetback.

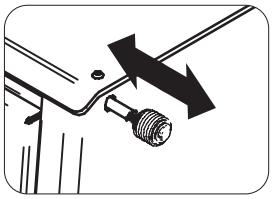
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Getting to know your Metro wood fire

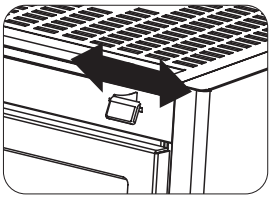
Operating your Metro fire is simple and you will quickly learn how to get the best from it. First take a minute to familiarise yourself with your new Metro.

- Raise the door handle anti-clockwise until the latch releases, and then slowly pull the door open. You will note that if you let the door go before it is at 90° to the appliance, it will fall closed. This is a safety feature that ensures the door cannot fall open if it is not latched securely. For the door to remain open, you must open it fully
- There is a single air control making your Metro fire easy to adjust. This control moves from left to right, which is 'low to high'.

All Metro radiant fires have a wire air control handle located at the upper right hand side of the appliance. Simply pull out to increase burn rate or push in to reduce burn rate.



Radiant fires air control



All other fires air control

All other Metro fires have an air control knob located on the upper front panel of the appliance.

Slide this control knob gently from right to left until you reach a stop. This is a pre-set 'low' position. Your Metro fire must not be operated at a lower burn rate than this pre-set low allows.

Operating your Metro wood fire

If your Metro has only been installed within the past few days, the fire cement seal at the base of the flue will not be fully cured. To ensure the cement sets without blistering it is recommended you burn 2-3 sheets of loosely crumpled newspaper at a time, approximately once every hour over a 6-8 hour period.

During the very first fire your Metro will give off an odour and fumes as the firebox paint cures. Do not be alarmed. Open all windows and externally opening doors in that room and close any internally opening doors. This curing process will last for approximately one hour and is likely to happen this one time.

Start up

Place a quantity of loosely crumpled newspaper on the base of the firebox until it is approximately half full of paper, or place firelighters on the base of the firebox. Add dry kindling and move the air control knob fully to the right, being the 'full open' position.

Light the paper at two or three locations across the front of the door opening and leave the door slightly ajar resting on the latch pin if necessary for a few minutes while the fire establishes. Once the kindling is burning well, open the door and add 2-3 small logs at a time until you have a well-established fire. Usually this will take approximately 30 minutes, during which time the air control should be set on "high" and the door should be closed, except for the initial few minutes and when fuel is being added.

Normal operation

Once the fire is well established, regulate the air control to achieve the desired burn rate and heat output. As you move the air control to the right, burn rate, firebox temperature and heat output will increase, if you move the control to the left they will decrease. Please note:

- Always open the air control fully prior to opening the door, then open the door slowly. Every time you refuel, leave the air control on 'high' for a minimum of 20-25 minutes
- When loading logs, place them end-on, 'front to back'; air spaces should be left between the logs to enable oxygen to get to as much of the surface of the fuel as possible
- Never use the door to force wood into the firebox, as this is likely to break the glass.

Extended burning (rural models only)

It is most important if your Metro is to be refuelled and turned down for an extended period, such as an overnight burn that you operate it correctly:

- The wood used as fuel for extended burning MUST BE FULLY SEASONED (DRY). Once the fuel is loaded, the appliance must be operated on high for a period of at least 20 minutes to drive out residual moisture from the fuel (dry wood is usually 20% water content) and ensure surface area combustion.
- Do not turn the air control down lower than you need to, if you want the Metro to burn overnight, endeavour to obtain an 8 hour burn time, not 12 hours. It will take a few burns to find the correct location of your Metro's air control setting to achieve the length of burn cycle you desire as this setting is affected by several variables including fuel density, flue length and outside wind velocity.
- A smouldering fire over a long time frame is likely to deposit corrosive elements into your system which could be detrimental to your Metro.

⚠ CAUTION! Important Information

- If not operated correctly on extended burn cycles, your Metro is likely to incur flue blockages, corrosion of the upper baffle, lower flue pipe and firebox flue spigot. As these are not covered under warranty if they fail through improper use, it is important you operate your Metro correctly.

Cooking

All Metro's are designed to enable cooking of soups, stews and casseroles etc, and your Metro will easily boil a flat bottom stainless steel kettle. The Radiant Series have a dedicated cooking top enabling large pots to be placed on the cook top, while all other models have a lift-off grill.

Note: Metro's supplied with a lift-off top grill have this feature to enable the grill to be removed for cleaning if you have a spill. The lift-off top grill must be left on when cooking, because if removed the wall temperatures next to the appliance may become excessive and the top of the firebox is generally too hot to cook on directly.

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Cleaning and maintenance for your Metro wood fire

Your Metro fire will give you many years of efficient service with minimal maintenance if operated correctly using seasoned fuel. Your Metro fire must be regularly maintained and replacement parts must be authorised Metro fires parts only.

The Metro radiant fires are painted wood fires and coated with 'Pioneer Metallic Black' high temperature paint and will require periodic repainting to keep them looking their best.

All other Metro fires are coated with vitreous enamel. Vitreous enamel is extremely durable and designed to last the life of the appliance. As vitreous enamel is glass, a solid or heavy object dropped or banged against a panel could chip the enamel surface.

All model Metro fires can be cleaned with a soft cloth when the appliance is not in operation.

Door glass

Providing your fuel is properly seasoned, under normal operating conditions the air-wash design of the Metro's firebox will keep the door glass clear. If the glass requires cleaning you may use either a razor blade scraper or crumpled wetted newspaper dipped in wood ash rubbed over the glass.

If your door glass breaks it must be replaced with 5mm thick ceramic glass which is available from your local Metro retailer.

Door seals

Over time, usually 3-4 years, the door and glass seals will become hard and cause air to leak into the firebox, causing the appliance to 'over fire'. Your Metro retailer stocks replacement woven fibreglass door and glass seals, which need replacing when they become hard and over worn.

The door of your Metro is easily removed. Hold it in both hands and lift the hinge end of the door up and over the top hinge pin, then lower the door from the bottom hinge pin.

Side bricks

Hair-line cracks are not uncommon and are a result of the intense heat within the Metro's firebox, coupled with mechanical damage caused by accidental impact when fuel is being loaded. However if the side bricks become cracked to the extent that they start to break up, they must be replaced.

Door adjustment

Provision is available on both sides of the door for adjustment.

To adjust the hinge end of the door, open the door fully, loosen the top hinge nut and slightly lift the latch end of the door; you will see the hinge assembly move back 1-2mm which will usually be sufficient. Retighten, then repeat by loosening the lower hinge nut, this time applying a slight downwards pressure onto the door to move the lower hinge assembly back a similar distance, then retighten.

The door latch is also adjustable, as the latch pin on the right side of the firebox is fitted through a slot which enables the latch pin to be loosened, moved back and re-tightened.

Ash removal

Over a period of time ash will build up in the base of the Metro's firebox and require removal. The time this build-up takes depends on the density and cleanliness of your fuel.

To remove the excess ash your Metro should not be operating.

- Open the door, and using a hearth shovel or similar, empty the excess ash directly into a steel or non-combustible container.
- If the ash is not disposed of immediately, be careful where you store it, as the ash can retain heat for many days and become a fire hazard.
- You must leave a bed of ash in the base of the firebox approximately 10mm deep; this insulates the base of the firebox and improves combustion.

Top baffle

This is a 'sacrificial' wear part of the firebox and should be checked monthly. Usually only the promet (white board) front/underneath section needs to be replaced when it starts to disintegrate.

Note: Cracks in the promet are not uncommon and have no adverse effect on the operation of your Metro. These cracks are the result of intense heat coupled with expansion and contraction. Burning wood which is not properly seasoned, i.e. 25% moisture content or more, will over time cause the promet to disintegrate and require replacement.

Flue systems

Should be checked annually, particularly the bottom end of the lower flue section at its rear lock formed joint. If deterioration is noticed contact your Metro retailer or installer.

The flue pipe should also be swept a minimum of once a year, or as required during the winter season. If smoke enters the room when you open the Metro's door this usually indicates the flue pipe is becoming restricted and needs cleaning. The frequency of flue pipe cleans depends on many factors, with the main variables being:

- The seasoning of the wood. If not properly seasoned you will require frequent flue pipe cleans.
- The density of the wood. Softwoods generally result in more deposits building up in the flue pipe.

To clean the flue pipe of your Metro, proceed as follows:-

- Open the Metro's door fully, reach inside with the palm of your hand face-up and extended, lift the top baffle approximately 20mm, then lift it forward out through the door opening, placing it on a sheet of newspaper you have placed on the front of the floor protector. To prevent jamming, removal and replacement of the top baffle is best performed using both hands.

Note: Some appliances have a two piece top baffle.

- Close the door and slide the air control to the left.
- Once on the roof, remove the cowl from the top of flue system and sweep the flue pipe using a 150mm-diameter flue pipe brush as detailed in the instructions provided with the fluebrush.
- Once the flue pipe is clear, clean and refit the cowl. Remove the excess soot which has fallen into the firebox, leaving a layer of ash 10mm deep on the base of the firebox, then refit the top baffle.

Note: The baffle must be fitted so its rear is touching the back of the firebox; if uncertain refer to page 3 in the installation section at the front of this manual, which shows illustrations of the baffle location.

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Troubleshooting your Metro wood fire

If your Metro is installed correctly, your fuel is dry and you operate your fire correctly, you will find it to be a pleasure to use. Metro's many years of experience within the wood heating industry has shown that dissatisfaction is mainly due to:

- unseasoned fuel
- faulty installation
- operational error
- or a combination of the above 3 points.

Correct operation

Modern day wood fires need to be operated hard and fast, more so than low and lazy to ensure the firebox and flue pipe runs hot and efficiently. If the fire and flue pipe is up to temperature it will perform extremely well, the smoke will draw up the flue pipe with ease, and the fire will produce good amounts of heat.

If the fire is operated on low a lot of the time, the door glass will run black, the flue pipe will tend to block up more frequently and the fire will end up smoking into the room when reloading. It's better to have a small fire running hard and fast, rather than a big fire running low and lazy.

The following may be of assistance if you are experiencing any problems with the operation of your Metro Fire.

Smoke enters the room when the Metro's door is ajar

(possible reasons and solutions)

Check flue pipe joins

If the flue pipe joins are not sealed correctly, the flue pipe will not draw as well as it should. The flue pipe join connecting into the flue spigot on top of the Metro is most critical, if this is not sealed correctly, smoke will enter the room when the door is ajar. To check this join is sealed correctly, run a match or lighter flame around the join. If the flame is sucked into the spigot then it is not sealed correctly. This check needs to be done when the fire is not going. Ensure you check the rear of the flue pipe/spigot join, as due to the seam in the flue pipe, this is the most common area for not being sealed correctly.

Ensure the fuel you are using is correctly seasoned

If you are burning unseasoned fuel (wet), the fire will cause nothing but problems. The Metro won't deliver much heat, it will be lazy, smoke will enter the room when the door is ajar, and the door glass will run black. Unseasoned fuel is the main contributor to excessive creosote deposits which can be corrosive to your appliance and flue system.

Flue pipe length is too short

Add more flue pipe as the longer the flue system, the better the draw of the flue pipe. Please note, if you did not purchase the Metro ECO Flue System, you will not have the ECO Cowl which increases draw. We highly recommend the Metro ECO Cowl is fitted as this will increase the draw. If you already have an ECO Cowl and smoke is still entering the room, please add another 600mm length of flue pipe.

Downdraft/Turbulence blockage

If you have checked all of the previous factors and the fire is still smoking into the room, it's possible there may be a down draft issue. Down draft is environmental and can be caused by many variables, and it is purely trial and error to ascertain the cause.

Air turbulence and/or negative air pressure influences around the flue termination can be caused by too close or overhanging trees or natural/artificial ridges etc. Address these where possible or look to extend the flue above the roofline.

Other options may be:

- 'H' Cowl, designed purely for downdraft issues, but if you have an ECO Cowl fitted as standard, you will also need to add another 600mm of flue pipe to compensate as the H Cowl is shorter in length
- Directional Cowl, designed for high wind areas.

Air control setting

Ensure the air control setting is on high before opening the door to reload, as this increases the draw up the flue pipe. Open the door slowly.

If your Metro did not smoke, but its starting too and is getting worse:

The flue pipe is in need of a clean. It is recommended that the flue pipe be cleaned every season, however if you are burning the fire on low a lot, or are using unseasoned fuel, flue pipe cleans will be required more frequently.

Other issues you may experience

I can smell smoke in the room after a low burn cycle

The smell is creosote that will be seeping through the flue pipe join or out of the flue spigot onto an external surface, thus creating the smell in your room. The cause will be either unseasoned fuel, fuel mass too large, incorrect operation on low burn cycles or a combination. Creosote is very corrosive and excessive buildups will result in the flue pipe and potentially the flue spigot and upper burn chamber failing. The formation of excessive creosote is not an appliance issue, it is a fuel and operational issue. Failure of flue pipe or firebox due to creosote build up is not covered under warranty as excessive creosote build up is only possible from either unseasoned fuel or incorrect operation.

The Metro is noisy as it heats up and cools down

There will always be some expansion and contraction noise as the Metro heats and cools. This can usually be reduced by loosening three nuts at the rear of the appliance. To remedy, locate the 25mm deep cavity at the rear of your Metro between the 'rear panel' and the 'inner rear heat shield'. You will see a 6mm nut and two 6mm bolt heads in this cavity. Using a 10mm ring or open ended spanner, loosen all three so they are finger tight only.

On all Metro freestanding fires the air channel that allows the combustion air to enter the fire is fitted to the top underneath of the door opening. It is fitted with two M6 bolts. Slightly loosen both of these bolts.

The Metro won't turn down as much as it did

The door itself may need readjusting, the hinge and latch is slotted and allows for movement. Loosening the hinge and moving it back a few mm will make the door seal tighter and stop air leaking into the fire. The door and glass seals may be in need of replacing, which is generally required every 3-4 years.

Familiarise yourself with the instructions on page 10 before proceeding with this maintenance.

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Warranty details for your Metro wood fire

Metro wood fires are manufactured in New Zealand, using the highest quality of materials, workmanship and the latest manufacturing techniques, which is why we offer a full 10 year firebox warranty and a 1 year parts warranty for your peace of mind.

Metro Warranty

(NZ Consumer laws apply to this warranty)

Pioneer Manufacturing Limited (Pioneer) warrants the steel firebox against defective materials and workmanship which would render it unfit for normal domestic use, from the date of purchase by the original consumer, for a period of 10 years.

Components including panel coating, door retainers, door seals, glass, trim, baffle & bricks are warranted for a period of 1 year from the date of original purchase for normal domestic use against defective materials and workmanship.

All associated accessories including, but not limited to, fans, flue systems, flue shields, wetbacks, tool sets, ash pots etc, are covered by a 1 year warranty against defective materials and workmanship.

It is recommended, but not a condition of this warranty, that a full service/ inspection of the Metro fire be carried out at the end of each winter season.

Warranty Conditions

- The Metro fire must be installed, operated and maintained strictly in accordance with the building code and this installation and operation manual
- The Metro fire must be installed and used in a domestic application
- This warranty covers appliance like for like replacement or repair at the manufacturer's discretion but excludes freight, travel, installation, labour and/or any other associated costs
- Pioneer or their agents are not liable for any loss or expense direct or indirect arising from the failure of any part or operation of the appliance
- Operation of this appliance in violation of the warnings in this operation and installation manual will void this warranty
- Your Metro fire must be regularly maintained and we recommended it is also serviced annually. Proof of servicing may be required. If a wood fire is not regularly maintained and serviced, the life span will be reduced. If your Metro wood fire has been neglected, by not being regularly maintained and serviced, warranty may be declined

⚠ CAUTION! Important Information

Note: The following 3 points require regular inspection/maintenance (every time the ash bed is cleaned out, generally 3-5 times a season) and if not maintained will void the firebox warranty. Please ensure you keep your proof of purchase/receipt on any parts you buy.

- It is critical the fire not be operated with over worn, faulty or missing door seals. Door seals will harden over time and become over-worn (3-4 year's) and will cause air to leak into the fire, causing the appliance to 'over fire'. Do not operate the fire with cracked, or broken door glass
- It is critical the fire not be operated with over worn, faulty or missing bricks, baffle plate or baffle extension (white board on or under the baffle plate)
- A claim under this warranty should be directed to the retailer who supplied the Metro fire. If this is not possible write directly to the manufacturer stating details of fault, model, serial number of your Metro, dated proof of purchase and name of retailer purchased from.

Warranty Exclusions

(This manufacturer's warranty does not cover)

- Service calls which are not related to any defect in the product (i.e. operational, installation or fuel issues). The cost of a service call will be charged if the problem is not found to be a product fault
- Defects caused by factors other than normal domestic use or use in accordance with the product's operation manual
- Defects caused through the product being operated in an 'over-fired' manner resulting in sections of the firebox operating excessively hot to the point that sections glow red. (Note – This will result in distortion of the firebox)
- Defects to the product caused by accident, neglect, misuse or act of God
- The cost of repairs carried out by non-authorised repairers or the cost of correcting such unauthorised repairs
- Required maintenance as set out in this manual.

Service under this manufacturer's warranty must be provided by a repairer authorised by Pioneer Manufacturing Ltd. Such service shall be provided during normal business hours.

⚠ IMPORTANT! Complete and retain these details at time of purchase:

Purchase Date	
Serial Number	
Model	
Colour	
Retailer	



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Parts guide for your Metro – Promet, baffles and wetback options

Your Metro wood fire must be regularly maintained and we recommended it is also serviced annually. If a wood fire is not regularly maintained and serviced, the life span will be reduced.

If your Metro wood fire has been neglected, by not being regularly maintained and serviced, with authorised Metro parts replaced as required, your warranty may be declined.

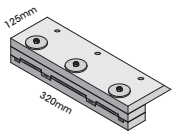
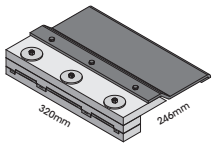
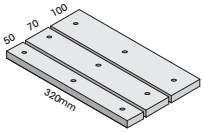
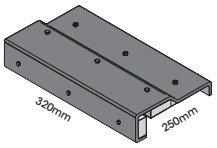
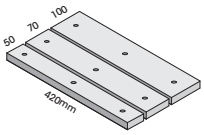
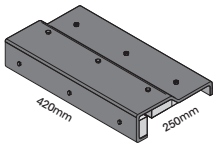
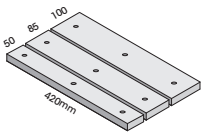
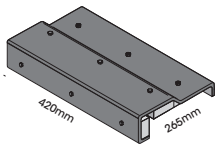
Listed below are the parts and product codes for your Metro wood fire. The promet/baffle should be regularly checked and must always be in place during the operation of your fire.

The baffle should be resting on four support lugs (two on each side of the firebox). It must be hard back against the rear of the firebox with the 'promet extension' (white board) or return front steel edge of the baffle facing forward.

Hairline cracks in the promet extension are not uncommon and will have no adverse effect on the operation and performance of your Metro wood fire. These cracks are the result of intense heat coupled with expansion and contraction and is normal wear and tear.

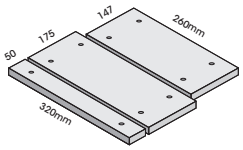
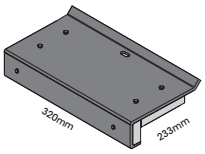
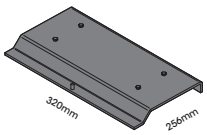
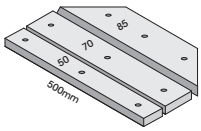
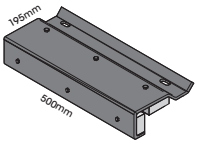
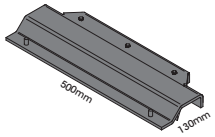
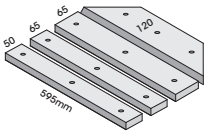
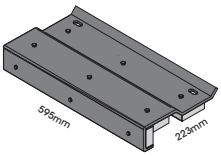
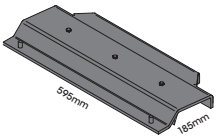
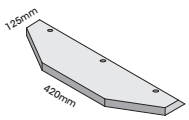
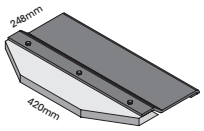
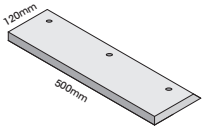
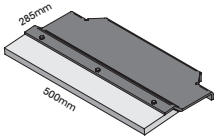
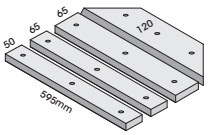
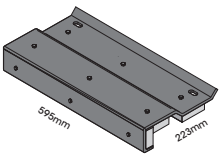
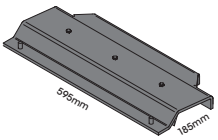
If the promet extension starts to break up and pieces fall into the firebox it must be replaced.

Note: Impact damage when loading wood and burning wood which is not properly seasoned, i.e. 25% moisture content or more, will cause the promet to disintegrate and require replacement. Always burn dry well seasoned wood and take care when loading wood into the firebox.

Model	Type of promet required / Type of steel baffle(s) required		Wetback options
• Tiny Ped • Tiny Rad	Tiny Promet 500-1550 	Tiny Baffle 500-2050 	2kW Wetback 450-0050 
• Tiny Rad Woody	Tiny Woody Promet Set 500-2004 	Tiny Woody Baffle 500-2504 	Side Wetback 450-0275 
• Wee Rad Base • Wee Rad Leg • Wee Rad Woody • Wee Ped	Wee/R1 Promet Set 500-2005 	Wee/R1 Baffle 500-2505 	Side Wetback 450-0275 
• Wee Rad V2 Base	Wee V2 Promet Set 500-2006 	Wee V2 Baffle 500-2506 	No wetback can be fitted to this appliance

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Parts guide for your Metro – Promet, baffles and wetback options

Model	Type of promet required / Type of steel baffle(s) required			Wetback options
• Classic Rad	Classic Rad Promet Set 500-2015 	Classic Rad Front Baffle 500-2520 	Classic Rad Rear Baffle 500-2525 	Side Wetback 450-0275 
• Xtreme Rad Base • Xtreme Rad Leg • Xtreme Rad Woody • Xtreme Ped	Xtreme/R2 Promet Set 500-2010 	Xtreme/R2 Front Baffle 500-2510 	Xtreme/R2 Rear Baffle 500-2515 	3kW Wetback 450-0100 
• Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 
• LTD Wee Rad Base • LTD Wee Rad Leg • LTD Wee Rad Woody		LTD Small Promet 500-1700 	LTD Small Baffle 500-2600 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Xtreme Rad Base • LTD Xtreme Rad Leg • LTD Xtreme Rad Woody		LTD Large Promet 500-1850 	LTD Large Baffle 500-2650 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 
• LTD Mega Rad	Mega Rad Promet Set 500-2020 	Mega Rad Front Baffle 500-2530 	Mega Rad Rear Baffle 500-2535 	3kW Wetback 450-0100 or 4kW Wetback 450-0150 

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Metro - Visit us online today www.metrofires.co.nz

Metro wood fire specifications

Metro have a Specifications Brochure available which details relevant compliance data for every model. This brochure is updated annually and details the minimum clearances and specifications for all models, which is generally required when applying for a building consent. See your Metro retailer to obtain a copy, or visit www.metrofires.co.nz

metrofires.co.nz

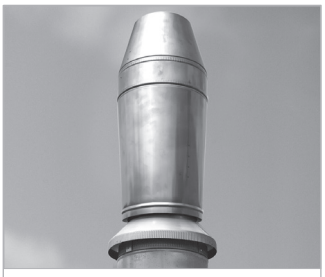
Visit the Metro website: metrofires.co.nz to view Metro's 'video demos' showing the latest in wood fire technology energy saving options. You can view the entire Metro product range, find out where your nearest Metro retailer is located or simply check out the latest specifications, installation requirements and emission and efficiency data for the Metro of your choice.



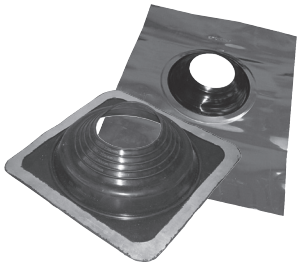
Pioneer heating accessories

Pioneer/Metro Fires offer a wide range of heating accessories designed to complement your Metro wood fire. The range includes ECO flue systems, floor protectors, wetbacks, heat transfer systems, baffles, bricks and more.

For further details talk to your Metro agency or visit www.metrofires.co.nz



ECO Flue Systems



Flashrites and Versatiles



Wetbacks



High Temperature Paint



Corner and Wall Floor Protectors



Heat Transfer Systems



Universal Door Seal Kits



Fire Cement And Silicone



Glass Tape



Door Seal Rope

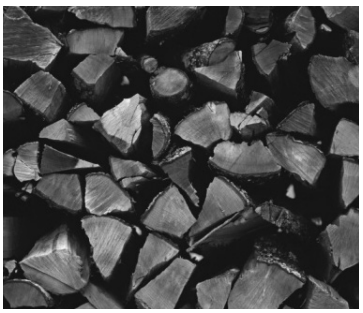


Chubb Smoke Detectors

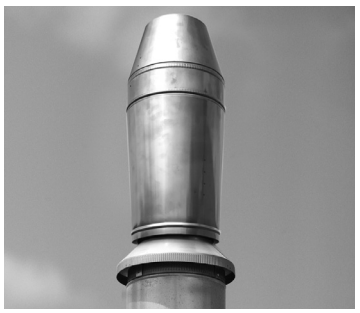
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ECO Flue Kits Installation Manual









metrofires

ECO Flue Kits

Freestanding Flue Systems

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ECO Flue Kit / ECO Option Kit 3
ECO Flue Kit Installation 4-5
ECO Option Kit Installation..... 5-6

Insert Flue Systems

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ECO Flue Kit Minimum Heights 8

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NZHHA
New Zealand Home Heating Association Inc.

NEW ZEALAND MADE

PIONEER
MANUFACTURING LIMITED

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⚠ WARNING! Important Information

- Metro ECO Flue Systems must be installed to allow unrestricted air supply from either the ceiling cavity for an ECO Flue Kit, or above the roof line if the ECO Flue & ECO Option Kits are both installed. Please read these instructions and familiarise yourself with the installation options and various components of the ECO Flue Systems
- Metro ECO Flue Systems have been tested to and complies with AS/NZS 2918 Appendix 'B' and 'F'. Metro ECO Flue Systems shall be installed in accordance with AS/NZS 2918 and the appropriate requirements of the relevant building codes
- The ECO Flue Kit must be installed into a 'vented' flat ceiling cavity, or have an ECO Option Kit added to the flue system to provide an external air supply
- Any modification to this flue system that has not been approved in writing by the testing authority is considered to be in breach of all approvals granted

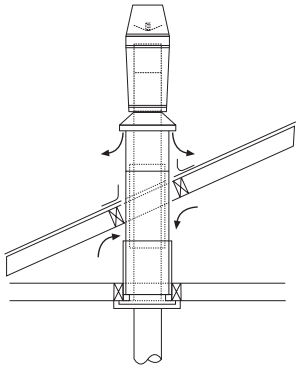
⚠ CAUTION! Important Information

- Mixing of flue system components from different sources or modifying the dimensional specification or components may result in hazardous conditions. Where such action is considered, the manufacturer should be consulted
- Prior to installing the assembled flue pipe into a masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

ECO Flue Systems Installation Options

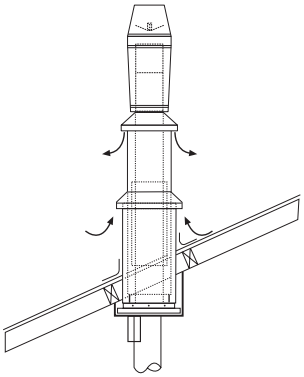
Detailed below are the more common installation methods for installing Metro ECO Flue Systems. To ensure a safe and efficient installation, this flue system must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

Single Storey Installations



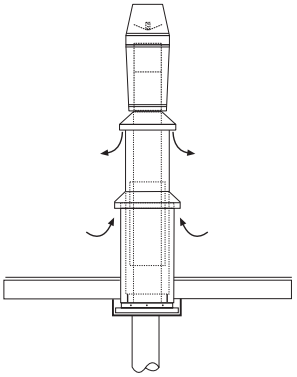
Flat Cavity Ceiling

ECO Flue Kit only required as air is drawn into the flue system direct from the ceiling cavity.



Sloping Ceiling

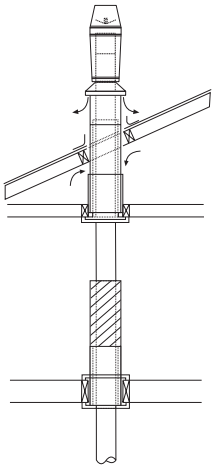
Both the ECO Flue Kit and ECO Option Kit are required to enable air to be drawn from outside the home.



Flat Ceiling/Roof

Requires both ECO Flue Kit and ECO Option Kit as per sloping ceiling unless a vented ceiling cavity exists.

Two Storey Installations



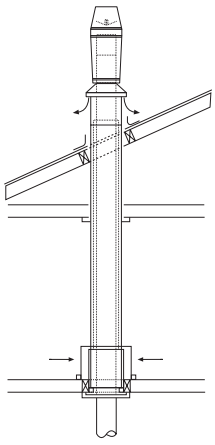
2nd Floor - Exposed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- A floor penetration kit
- 1x 1200mm long mesh/screen

*In accordance with AS/NZS 2918



2nd Floor - Enclosed Flue pipe

Requires an ECO Flue Kit only with additional lengths of flue pipe.

Additional components below are not supplied by Metrofires but are also required for this installation*

- 200mm & 250mm inner/outer combination liners.
- 2nd floor vent cover and an additional ceiling plate with a 250mm diameter hole

*In accordance with AS/NZS 2918

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ECO Flue Kit & ECO Option Kit Component Checklist

ECO Flue Kit

The ECO Flue Kit is designed for installation into a building that has a 'ceiling cavity' with unrestricted air supply as is the case with conventional homes. A vented ceiling cavity is required as the ECO Flue Kit draws its cooling air from within the ceiling cavity.

Metro offers both the ECO Flue Kit, which is designed to be installed on its own and the ECO Option Kit which is designed to be installed in conjunction with the ECO Flue Kit. The specific application for each of these two options is detailed below with installation instructions overleaf.

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

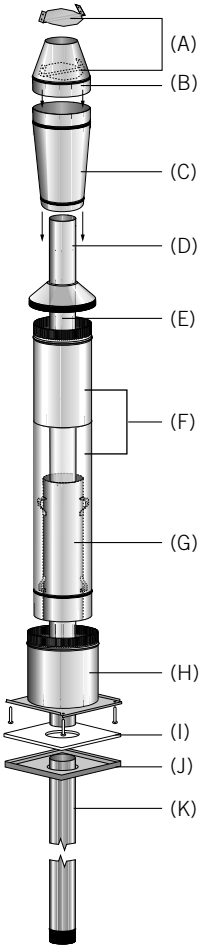
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

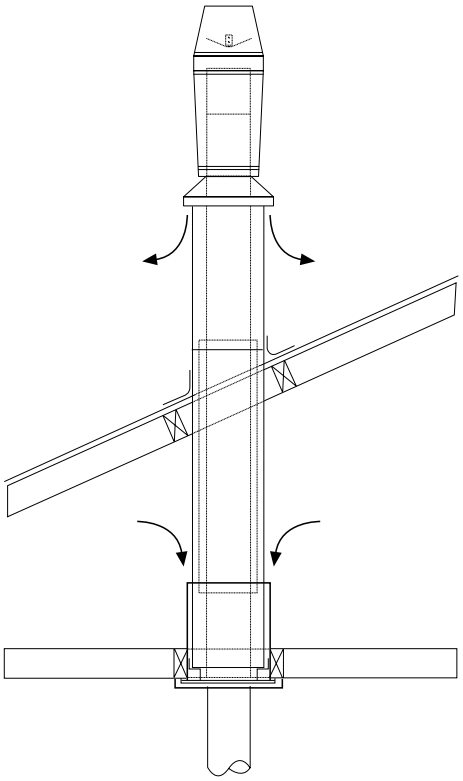
(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



ECO Flue Kit assembled



ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).

ECO Option Kit components

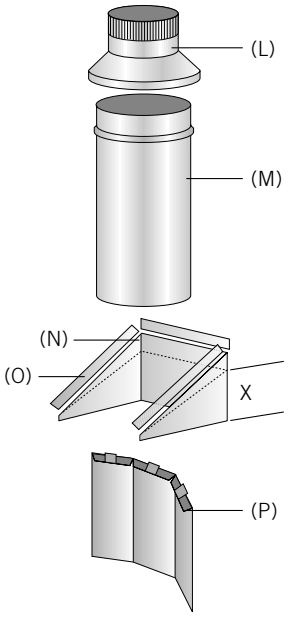
(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

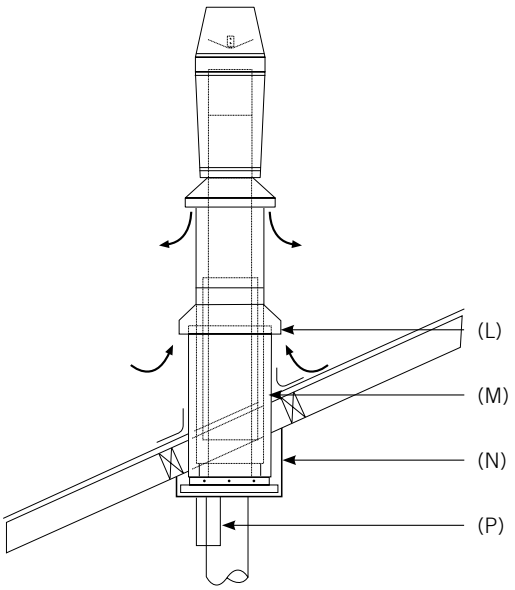
(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield



ECO Flue Kit & ECO Option Kit assembled



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ECO Flue Kit Installation Instructions

ECO Flue Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 1 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 1200mm x 250mm diameter galvanised outer casing with 750mm long slip section

(G) 1 x 800mm x 200mm diameter galvanised inner casing

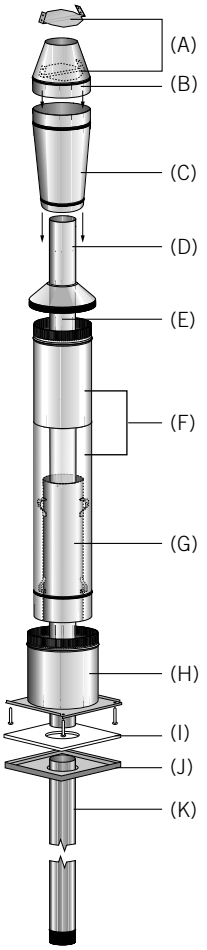
(H) 1 x Galvanised mounting plate with brackets and 300mm long x 300mm diameter casing attached

(I) 1 x insulation gasket

(J) 1 x black clip-on ceiling plate

(K) 2 x 1200mm lengths of 150mm diameter stainless steel flue pipe painted metallic black

(+) 1 x Plastic bag of assembly bolts



Having positioned the wood fire in the desired location, check to ensure the wood fire and floor protector have adequate clearances/projections, and that the flue system is clear of ceiling joists, trusses etc. (refer to the Wood Fire Installation and Operation Manual).

Note: ECO Flue Systems use stainless steel brackets enabling movement due to expansion, while centralising flue pipes and casings. These brackets may require resetting after transport, if they are too loose or tight during assembly;

1. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 250mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 250mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

2. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

3. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets.

   Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

4. Return back onto the roof and using a suitable flashing, weather proof the joint where the 250mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to. Prior to fitting the flashing, by fitting stays securing the outer casing (F) to the roof material will further improve rigidity of the installation.

5. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

   Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ WARNING! Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

6. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

7. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

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ECO Flue Kit Installation Instructions - continued

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

8. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

9. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

10. Making your way back onto the roof, slide the 750mm long slip section of the outer casing (F) until the top of this slip section is level with the top of the 150mm stainless steel flue pipe, then secure this slip section of the outer casing with rivets.

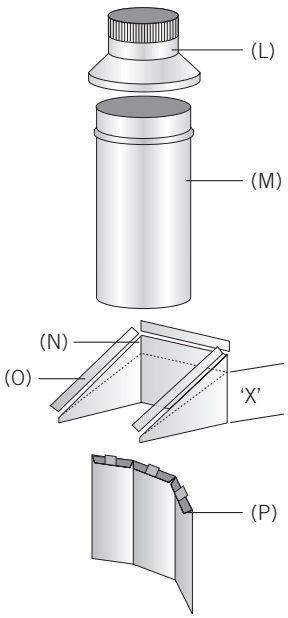
11. Fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom, fit its short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

12. Taking the removable section of the ECO Cowl, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and enables easy removal for future flue cleaning.

Installation Instructions with the ECO Option Kit

ECO Option Kit

The ECO Option Kit is designed to be 'added to' the ECO Flue Kit for installations that do not have a vented ceiling cavity and require the flue systems cooling air to be drawn in from above the roofline (outside the building).



ECO Option Kit components

(L) External intake flashing cone

(M) 1x 780mm x 300mm diameter outer liner extension

(N) Drop box infill panel

(O) Drop box edge covers

(P) Ceiling plate mounted heat shield

Dependent on whether you are installing into a flat roof/ ceiling or sloping ceiling situation as detailed on page 2, will determine if you require all the components of the ECO Option Kit. If installing into a flat ceiling/roof you will not require the drop box or drop box edge covers.

1. Slip the 300mm outer extension liner supplied with the ECO Option Kit over the 300mm outer liner 'stub' attached to the mounting plate (H) supplied with the ECO Flue Kit. Permanently secure these two components together by drilling four evenly spaced holes around the circumference and rivet with stainless steel rivets.

2. At a point directly above the wood fires flue centre, cut a 300mm square hole through the ceiling and a 300mm diameter hole through the outer roof lining providing it is non combustible (iron, tiles etc) otherwise cut a 300mm square hole through the roof lining. 'Trim out' the top face of the ceiling using timber nog's creating a square aperture measuring 300mm internally.

   Note: Certain flashing manufacturers detail specific size and shape of the aperture to be cut for their flashing, which must be adhered to.

3. Fit mounting plate (H) into the ceiling by sliding the 300mm diameter casing attached to the mounting plate up into the ceiling until the two upturned edges rest against the under side of the ceiling. Square the mounting plate to the wall and secure it in location with the four coach screws supplied, into the nogs just fitted. To further improve the rigidity of the installation, nail through the 300mm diameter casing at 4 points into the timber nogs.

- **If the ceiling is angled**, it is critical that the mounting plate is correctly positioned so the drop box in-fill panel can be fitted. Ensure the two 'upturned folds' on the mounting plate are aligned parallel to the roof joists, i.e pointing towards the apex.

  You will only be able to use two of the securing holes provided in the mounting plate. To give additional support to the installation nail through the 300mm diameter outer liner into the timber framing, access is through the 200mm hole in the base of the mounting plate.

4. Moving onto the roof with the 1200mm x 250mm diameter galvanised outer casing (F) with 750mm long slip section fitted, lower the slotted end of this casing (F) into the roof cavity until it locates inside the brackets on the top face of the mounting plate. Return back into the room and using the 3 x 6mm bolts and washers supplied, securely

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bolt the base of the 250mm diameter outer casing into the rivet nuts pre-fitted into the mounting plate brackets. Return back onto the roof and using a suitable flashing, weather proof the joint where the 300mm diameter outer casing penetrates the roof. Ensure the flashing used is compatible with the roofing material, and if fitting instructions are supplied with the flashing, these must be adhered to.

Prior to fitting the flashing, by fitting brackets securing the outer casing (F) to the roof material will further improve rigidity of the installation.

Note: As there are three bolts, the outer casing can be rotated to ensure the lock-form seam is sheltered as much as possible from the prevailing weather direction.

5. Fit the external 'intake' flashing cone supplied with the Option Kit as illustrated, and secure it to the top of the 300mm diameter extension liner through the 4 x brackets which protrude below the base of the external 'intake' flashing cone.

6. While on the roof fit the 800mm x 200mm diameter galvanised inner casing (G).

Note: This inner casing has a top and bottom, the bottom end has both internal and external brackets while the top end has external only. Fit the bottom end of this inner casing (G) down into the 250mm diameter outer casing (F) until the casings lower external brackets locate on the internal swadge of the outer casing.

⚠ WARNING! Important Information

- If there is timber or combustibles within 25mm of the outer casing (F) in a zone 'above the top end of the inner casing (G) and below the roof line' an additional 200mm inner casing must be fitted.

7. Moving back into the home, remove the plastic film from the ceiling plate (J) and place it black side down over the flue outlet of the wood fire. Using a high temperature black aerosol, spray around the hole in the centre of the white insulation gasket, and when dry lay this centrally on the ceiling plate.

8. Unwrap the two painted flue pipes (K) taking care not to mark the painted surface (use a metallic black Pioneer aerosol for touch ups) and proceed to assemble the three flue pipe sections as described below;

- Smear an adequate amount of Pioneer fire cement inside the 'top/un-crimped' end of both painted flue pipes (K).

- Taking the unpainted stainless steel flue pipe (E) insert its top 'un-crimped' end up through the mounting plate (H) and up into the casings until its bottom 'crimped' end is 1250mm above the top of the wood fire.

- Take one of the two painted stainless steel flue pipes (K) and fit its lower 'crimped' end into the Metro wood fires flue outlet. Now lower the unpainted stainless steel flue (E) which is protruding down from the mounting plate so that it fully connects into the lower painted flue pipe (K). Ensure these two flue pipe sections are firmly connected and aligned, then secure with three stainless steel or monel rivets spaced equally around the joint.

- Lift the two assembled flue pipe sections so the bottom of the lower section is 1250mm above the top of the wood fire, and repeat the above procedure to fit the remaining painted flue pipe (K).

- With all three flue pipe sections securely joined, lift this three section assembly out of the wood fires flue outlet, then move it slightly off centre and lower the flue pipe assembly 'on top' of the wood fires flue outlet. Smear an adequate amount of Pioneer fire cement inside the wood fires flue outlet (move the flue pipe assembly as required to ensure the entire flue outlet is coated in fire cement) then lower the flue pipe back into the wood fires flue outlet, with the vertical flue seam facing the rear.

9. Taking the ceiling plate (J) with insulation gasket (I) fitted which are laying on top of the wood fire, with the flue pipe passing through them. Carefully lift them up the flue pipe trying not to mark the painted flue, and clip the ceiling plate onto the mounting plate.

10. While still on the ground, assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

The removable section of the ECO Cowl is now fully assembled.

11. Measure dimension 'X' as shown on page 3 and transfer this measurement to the drop box in-fill panel as shown.

- Cut the in-fill panel to the correct size and fit the 3 x edge covers.

Note: The side edge covers will require trimming on the ends to suit the angle of the ceiling.

- Secure the in-fill panel in position by fitting three rivets to each side through the holes provided.

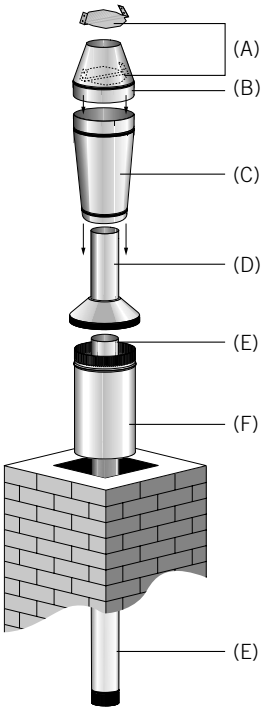
12. Back in the room, lift the ceiling plate then attach the 'ceiling plate mounted heat shield' to the lower face of the ceiling plate so that it acts as a deflector shield between the flue pipe and the lower side of the ceiling (refer assembled diagram on page 3). This heat shield has three tabs on its top face enabling it to be 'clipped' into the 160mm diameter hole in the ceiling plate. Attach the ceiling plate by clipping it onto the mount plate and the installation is now complete.

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ECO Insert Kit Installation Instructions & Component Checklist

Please read these instructions fully prior to installation of the ECO Insert Kit and familiarise yourself with all the various components illustrated right and listed below.

Note: Rivets, fire cement and chimney cap or flashing plate are not included as they are supplied by the installer.



ECO Insert Kit components

(A) 1 x Stainless steel weather butterfly

(B) 1 x Stainless steel ECO Cowl top

(C) 1 x 420mm x 240mm diameter stainless steel ECO Cowl housing

(D) 1 x 480mm long stainless steel flue pipe extension with flashing cone

(E) 3 x 1200mm x 150mm diameter stainless steel flue pipe

(F) 1 x 600mm x 250mm diameter galvanised outer casing

This flue kit has been manufactured and complies with AS/NZS 2918. To ensure a safe and efficient installation, this flue kit must be installed as detailed below by either a registered installer, or someone competent in installing solid fuel appliances.

1. Check the masonry chimney for structural soundness and make any repairs that are necessary.

   Note: Most councils require the masonry chimney to be inspected prior to installation. The masonry chimney cavity must also be swept prior to installation.

2. Once the fireplace insert has been installed correctly as per the manufacturers instructions, look directly down the chimney to ensure the wood fire flue spigot is in line with the masonry chimney. (A torch will be required).

3. If you cannot see the flue spigot, a flue pipe offset will be required. If so, install the flue pipe offset so the top of it can be clearly seen from the top of the masonry chimney.

4. If an offset is required, an adjustable telescopic type is recommended. Measure the amount of offset required and adjust the telescopic offset to suit, after smearing an adequate amount of Pioneer fire cement onto the slip section of the offset to ensure a good seal, then rivet the offset in three locations around its circumference. (If the offset is used in its fully compressed form, it will be necessary to modify the end of the female slip section otherwise it will restrict the internal diameter) Apply a liberal amount of Pioneer fire cement into the flue outlet of the fireplace insert, and fit the lower crimped end of the offset into position inside the flue outlet, and bolt into position.

   Note: In some installations where it is not possible to fit offsets or rigid flue pipe due to the shape of the masonry chimney cavity, 'Flexi flue' may be used.

5. Secure the flue pipes together and ensure the flue seams are in line. Flue pipe joints must be fully compressed with a considerable amount of fire cement to ensure a good seal, and then riveted together at three even points around the flue join. Prior to installing the assembled flue pipe into the masonry chimney cavity, take careful note to ensure there are no overhead power lines in close proximity.

6. Lower the flue pipe into the masonry chimney, with the crimped end fitting into the fireplace insert flue outlet/offset, and securely attach with three rivets (offset/bend must be riveted to the flue pipe). For installations where extra lengths of flue pipe are required, or when the weather is poor, it will be easier to assemble the flue pipe lengths as they are lowered into the masonry chimney.

7. Secure the outer casing to the masonry chimney with suitable fasteners. A masonry chimney flashing plate will be required to weatherproof/seal the masonry chimney top. Note: The top of the outer casing must be finished level with the top of the 150mm stainless steel flue pipe.

8. Assemble the ECO Cowl as follows;

- Take the stainless steel weather butterfly (A) so the angled sections are facing up.

- With both arms and angled sections of the stainless steel weather butterfly (A) facing up, fit it into the stainless steel ECO Cowl top (B), and secure in position through the holes provided with stainless steel rivets.

  NOTE – Once fitted the weather butterfly will be slightly angled within the cowl housing.

- Fit the ECO Cowl top (B) into the ECO Cowl housing (C). Push both sections together until the swage ring on (B) rests completely on the open end of the cowl housing (C). Drill through the two pre-punched holes in the ECO Cowl housing and secure these two sections together with stainless steel rivets.

  The removable section of the ECO Cowl is now fully assembled.

9. Making your way back onto the roof, fit the 480mm long flue pipe extension/flashing cone (D), with the flashing cone at the bottom. Fit the short flue section inside the top of the already installed 150mm diameter flue pipe. Ensure the three brackets extended below the flashing cone fit 'outside' the outer casing slip section. Drill through the pre-punched hole in all three brackets into the outer casing slip and secure with rivets.

10. Taking the 'removable section of the ECO Cowl' assembled in section (8) above, position it over the top of the stainless steel flue pipe extension, and slide it down fully. This removable section does not require riveting and therefore enables easy removal for future flue cleaning.

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Minimum Heights for all Metro Flue Systems In compliance with AS/NZS 2918

The Metro ECO Flue Systems comply with AS/NZS 2918 and its 4.6 metre height requirement (4.6 metre minimum from the top of the floor protector to the top of the flue pipe). However as external structures and the proximity of other buildings will differ for every installation, some situations will require additional flue height to comply with the standard. Refer to Diagrams 3 and 4 below. (All measurements in mm).

Note: AS/NZS 2918 Section 4, details flue system installation requirements in full.

Diagram 3

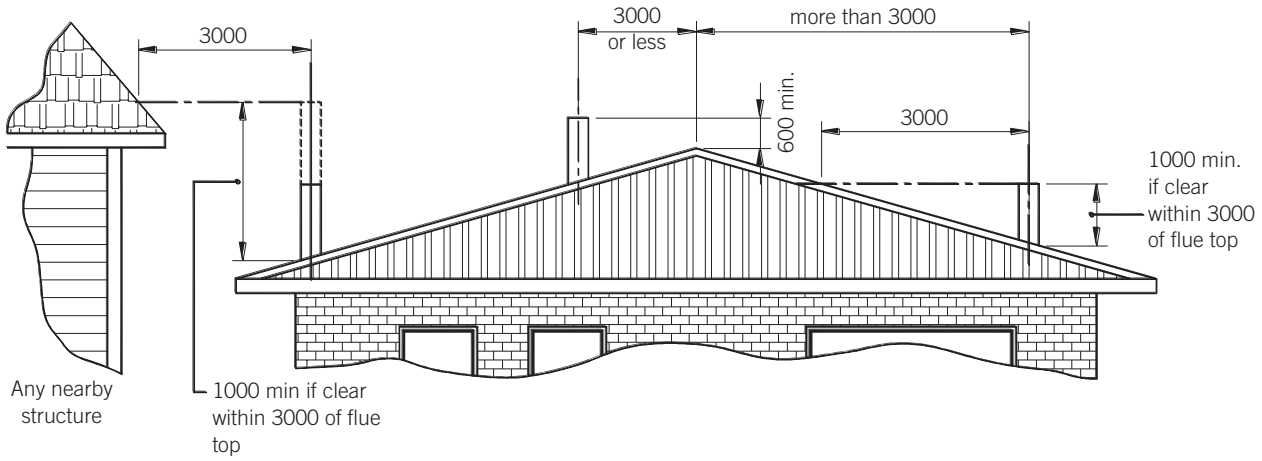
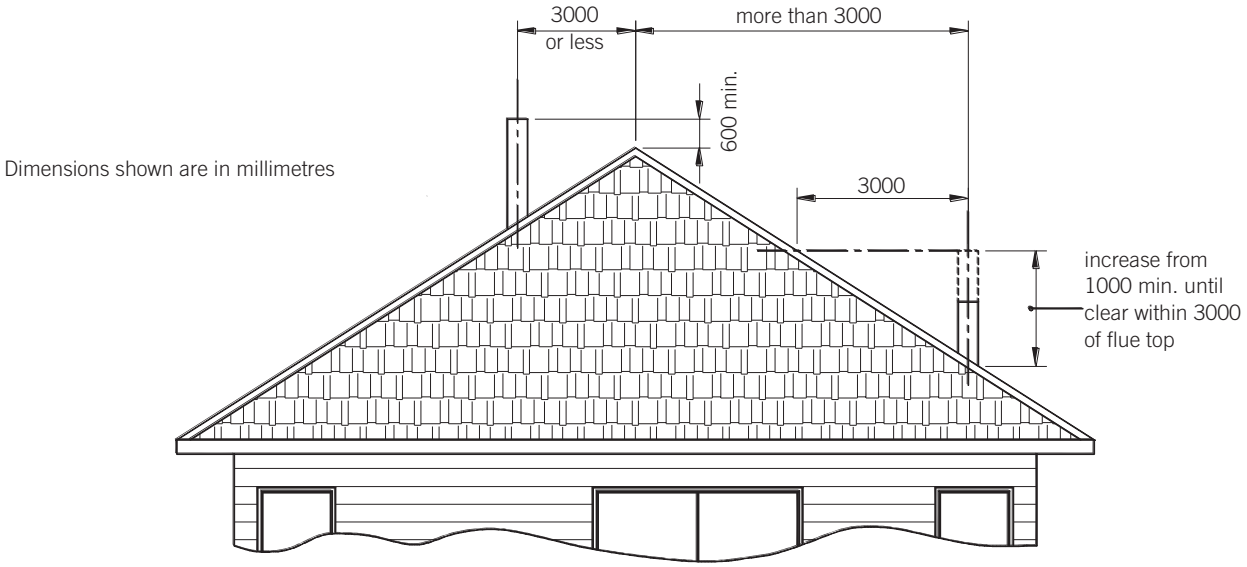


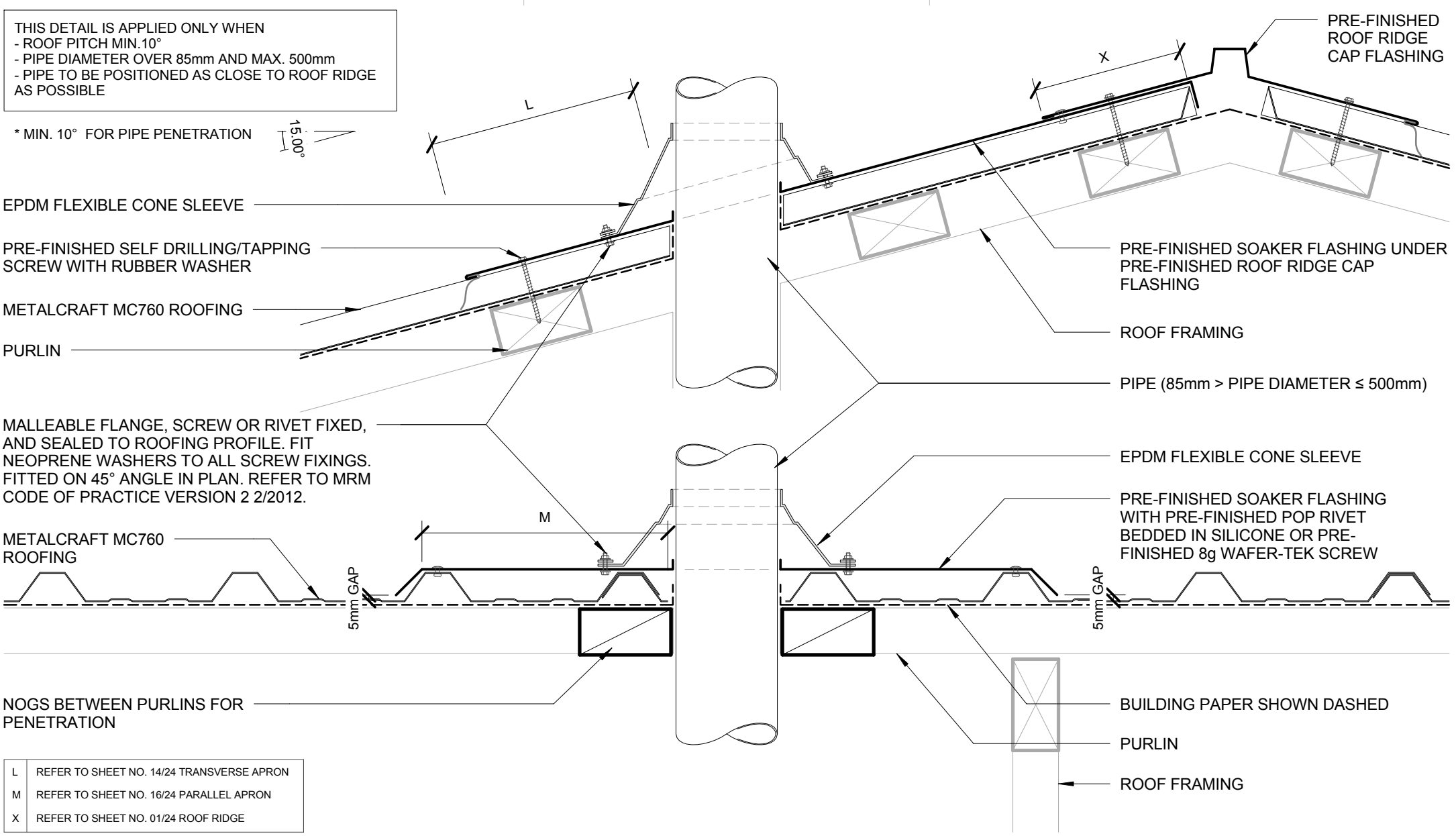
Diagram 4



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THIS DETAIL IS APPLIED ONLY WHEN
- ROOF PITCH MIN.10°
- PIPE DIAMETER OVER 85mm AND MAX. 500mm
- PIPE TO BE POSITIONED AS CLOSE TO ROOF RIDGE AS POSSIBLE

* MIN. 10° FOR PIPE PENETRATION



L	REFER TO SHEET NO. 14/24 TRANSVERSE APRON
M	REFER TO SHEET NO. 16/24 PARALLEL APRON
X	REFER TO SHEET NO. 01/24 ROOF RIDGE

- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

* - PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2 /2012 AS MINIMUM PITCH WILL INCREASE DEPENDING ON SHEET LENGTH.

Metalcraft Roofing

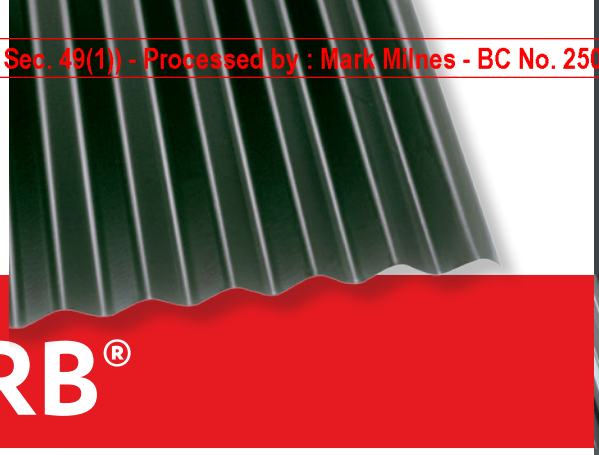
DISCLAIMER:
All details are to be used for indicative purposes only and the designer should consult both the MRM code of practice version 2.2 /2012, E2 and all other relevant building codes
Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary for wall cladding. 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.

OVER 85mm DIAMETER PIPE PENETRATION

MC760 RESIDENTIAL ROOFING

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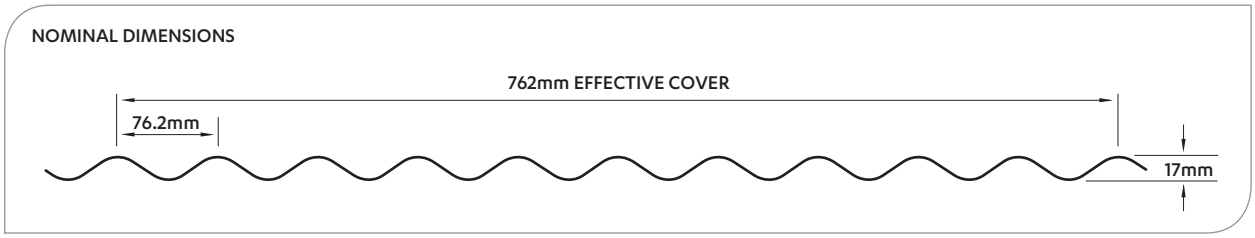
steel&tube
STRONGER IN EVERYWAY



PRODUCT TECHNICAL STATEMENT

CUSTOM ORB®

Profiled Metal Roofing and Cladding



DESCRIPTION

Custom Orb® is a premium quality corrugated profile manufactured under licence to BHP.

APPLICATIONS

- **Residential Roofing & Cladding**
- **Industrial/Commercial Roofing & Cladding**
- **Curving**
- **Specialty Cladding**
- **Ceilings and Linings**

FEATURES

Corrugated steel is a timeless classic. **Custom Orb** is manufactured to controlled tolerances, allowing it to be used with confidence in a great variety of applications.

Custom Orb can be roll curved (bullnosed) to 400mm radius, or spring curved to radii greater than 9 metres depending on grade, thickness and material used (see *Spring Curved Custom Orb Design Guide* for details). It is also popular in perforated patterns for decorative or sound control situations. Matching translucent sheeting is available in G.R.P. (fibreglass) and Polycarbonate.

MATERIALS

Available in metallic coated and pre-painted steel in .40mm and .55mm B.M.T. (base metal thickness), aluminium plain and prepainted in .70mm and .90mm, and other non-ferrous metals.

FASTENERS

Typically: Steelfix 12g x 45mm, Timberfix 12g x 55mm, Class 4 minimum, of material compatible with that being fastened and durability no less than the sheet material. Class 5 or non-ferrous fasteners are recommended for severe or very severe marine environments.

DURABILITY

All material selections must be compatible with prevailing environmental conditions and adjacent materials, see *Roofing Solutions Product Guide* or *Specifiers Guide* for details. Areas not exposed to rain washing will require programmed maintenance.

WARRANTY PLUS

Steel & Tube **Warranty*Plus*** is the most comprehensive warranty available in the industry. **Warranty*Plus*** covers an extended range of performance criteria, is supported back-to back by our suppliers, includes site-specific maintenance requirements and is transferable to subsequent owners.

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PERFORMANCE DATA

MASS (KG/M²)

.40mm B.M.T.	4.08	.55mm B.M.T.	5.54

MAXIMUM SPANS

Base Metal Thickness (mm)	Maximum Spans (mm)	
	Roof	Walls
0.40	1200	1800
0.55	1600	2400

FASTENING REQUIREMENTS

Base Metal Thickness (mm)	Fixings per sheet per support	Roof Span (mm)		
		900	1200	1500
0.40	3	•	•	N/R
	4	•	•	N/R
	5	•	•	N/R
0.55	3	••	•	•
	4	••	•	•
	5	••	•	•

** Suitable for Controlled Traffic ** Suitable for Heavy Traffic N/R Not Recommended*

Wind Zone	High	Very High	Extra High	SED
Design Wind Speed (m/s)	<44m/s	<50 m/s	<55 m/s	<60m/s
Load ULS (kPa)	2.32	3.00	3.63	4.32

Notes:

- *End spans should be not more than 2/3 of maximum internal spans.*
- *Sheet ends should be fastened through every second crest.*
- *To correlate Wind Zone figures to kPa a local pressure factor of 2 has been applied to the entire roof. Specific design is required for roofs designed in accordance with NZS1170 where a local pressure factor of 3 occurs over areas greater than one sheet width or end purlin spacing.*
- *The above tables are governed by seviceability load factors applicable to normal buildings (importance level 2) for all geographic areas.*

MINIMUM PITCH

In accordance with Acceptable Solution E2, the minimum pitch for **Custom Orb** for roofing dwellings is 8˚.
Roof runs in excess of 12 metres should be checked for water runoff capacity.

FOOT TRAFFIC

Foot traffic up the roof must take place with load spread equally across two crests, or over purlin lines. Traffic across the roof must take place along purlin lines.

SPECIFICATIONS

Recommended specifications are available in the branded sections of MasterSpec *BASIC* or MasterSpec *STANDARD*, or from your local Steel & Tube branch or visit www.steeland tube.co.nz.

DESIGN DETAILS

Design details covering many applications are available on our website in CAD and PDF under each product section. Visit www.steelandtube.co.nz.

IMPORTANT PUBLICATIONS

For your installation to perform to its potential, it is essential that it is designed, installed and maintained in accordance with good trade practice. Please refer to:

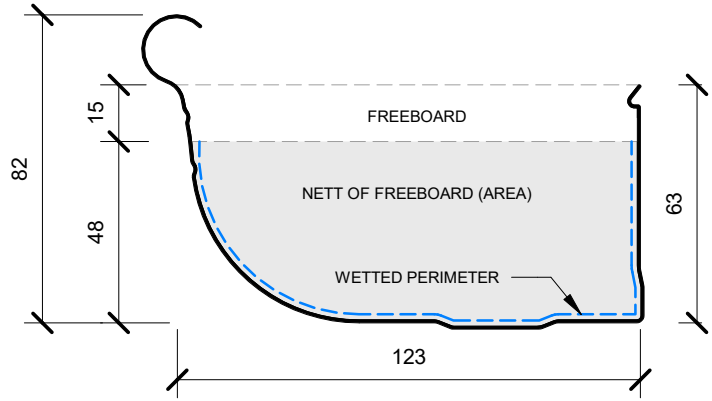
- Steel & Tube: Roofing Solutions Product Guide
- Steel & Tube Roofing Products: Spring Curved Custom Orb Design Guide
- New Zealand Steel: Installation Guide
- New Zealand Steel: Builders and Specifiers Guide
- BRANZ: Good Profiled Metal Roofing Practice
- MRM: New Zealand Metal Roofing and Wall Cladding Code of Practice
- E2/AS1

INSTALLERS

A list of local installers for your area and contract type is available from your local Steel & Tube branch or visit www.steelandtube.co.nz.

Trademark Note:
Masterspec is a registered trademark of Construction Information Limited.
CUSTOM ORB is a registered trademark of BlueScope Steel Limited.

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TOTAL CROSS SECTIONAL AREA	6967mm²
NETT OF FREEBOARD	5186mm²
WETTED PERIMETER	191mm

TOTAL CROSS SECTIONAL AREA OF GUTTER ONLY TO BE USED WHEN INSTALLED WITH OVERFLOW (SEE TABLE)

MANUFACTURED IN PALMERSTON NORTH, HAMILTON, CROMWELL, CHRISTCHURCH, NEW PLYMOUTH

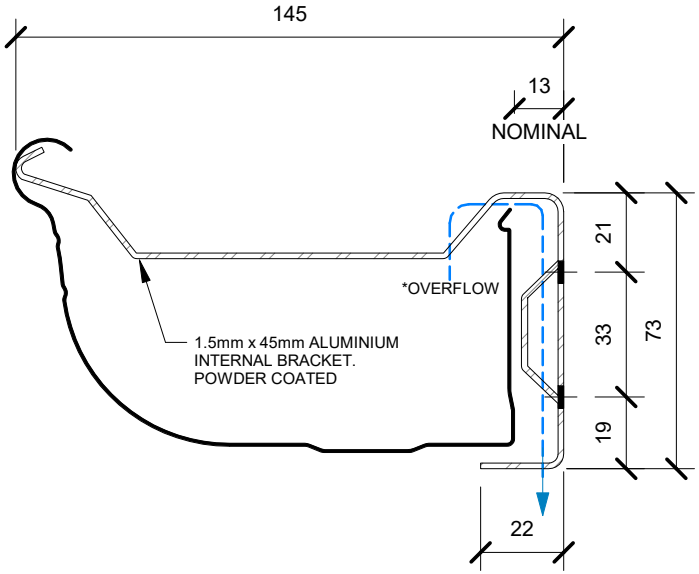
OVERFLOW WITH SOFFIT =

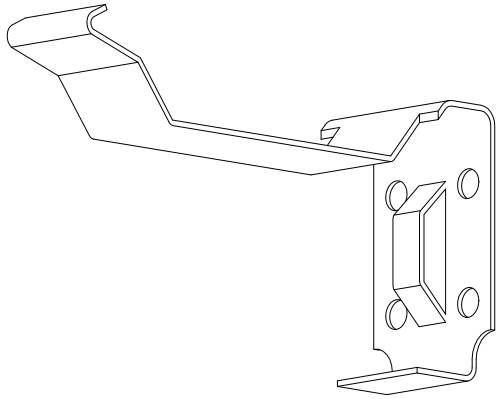
BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 3mm.

OVERFLOW WITH NO SOFFIT OVERHANG =

BACK OF EXTERNAL GUTTER NEEDS TO BE POSITIONED 10mm BELOW TOP OF FASCIA HEIGHT AND HAVE A GAP OF AT LEAST 10mm.

AS PER SECTION 5.3.2.3B OF THE NZ MRM COP.





3D GUTTER BRACKET

BRACKET SPACINGS 750MM MAX EXCEPT FOR SNOW LOAD AREAS = 600MM MAX.

NOTES:
- ALL DIMENSIONS ARE NOMINAL AND MAY VARY WITH MATERIAL
- *THE OVERFLOW SHOULD HAVE ADEQUATE CAPACITY. THE OVERFLOW OF THE GUTTER NEEDS TO BE CONSIDERED WHEN DESIGNING AND INSTALLING THE METALCRAFT ROOFING GUTTER*

Metalcraft Roofing
www.metalcraftgroup.co.nz

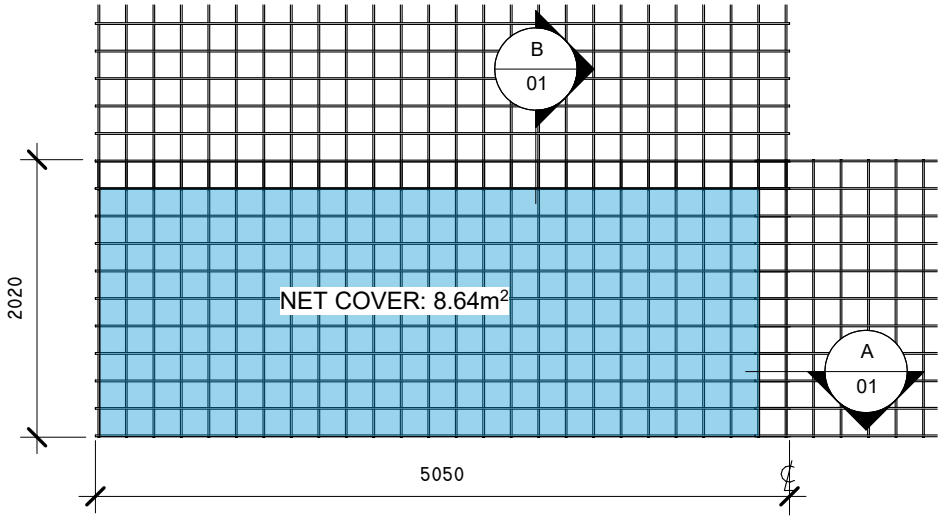
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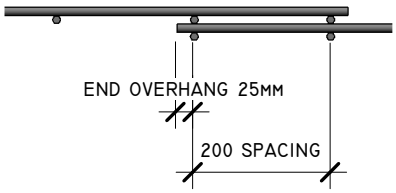
Colonial Quad Gutter

Reference MC Gutters | Date MAY 2024 | Scale 1 : 2 @ A4 | Sheet 02

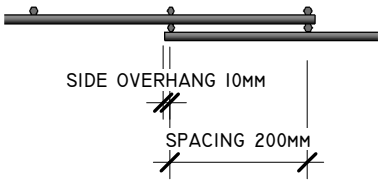
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UNITED STEEL
Stay strong.





A Section A
1 : 10



B Section B
1 : 10

MAIN WIRE DIAMETER	6.10mm
LONG WIRE LENGTH	5050mm
SHORT WIRE LENGTH	2020mm
SHEET GROSS	10.201m²
SHEET NET	8.64m²
SPACING	200mm
SIDE OVERHANG	10mm
END OVERHANG	25mm
LAP	200mm*

*This lap has been determined by extensive test programme to validate it's physical performance and verified by a certified engineer

STRENGTH (KN/METER WIDTH)	73.0617
WIRE GRADE	500E
TOTAL WEIGHT (KG)	24.78
KG'S PER m²	2.29385m²

YIELD STRENGTH	≥500Mpa & ≤600MPa
CROSS SECTION	146.12
UNIFORM ELONGATION	≥10%

United Steel Ductile SE62 Standard Mesh

M62

Reference Designer

Manufactured in accordance with ASNZS4671:2019 Steel Reinforcing Materials. Batch test certificates available on request. Lap diagrams in accordance with NZS3103:2006 Concrete Structures Standard. Please consult your engineer for your project specific lap splice.

Drawn by. United Steel

Date MAR 2023

Scale As indicated

Sheet 01

United Steel

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BRANZ Appraised
Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY



Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.

Kingspan Insulation NZ Limited
11 Turin Place
Otara
Auckland 2013
Tel: 09 273 3727
Free phone: 0800 806 595
Email: info@kingspaninsulation.co.nz
www.thermakraft.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

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Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Watergate Plus, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

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Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

7.2 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

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Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

9.1 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b) 15 years for wall underlays used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

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Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

14.6 Any damaged areas of Watergate Plus, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

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Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Watergate Plus Wall Underlay is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Kingspan Insulation NZ Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Kingspan Insulation NZ Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Kingspan Insulation NZ Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

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innova™ INNOVATIVE BUILDING SYSTEMS

BGC FIBRE CEMENT - NZ

1 - IDENTIFICATION OF THE MATERIAL AND SUPPLIER

PRODUCT NAME	BGC Fibre Cement Sheets
OTHER NAMES	Duraliner Plus / Durasheet / Duratex / Duralattice / Duralux Plus / Duraplank / Ultraform / Compressed / Ceramic & Tile Underlay / Vinyl and Cork Underlay / Nuline Plus / Duracom / Duragrid / Durascape / Duragroove / Stonesheet / Stratum / Stratum Duo / Stratum Duo Offset / Stratum Trio / Stratum Contour / Durafloor / Durabarrier / Intergroove / Duracom Greystone Charcoal / Duracom Greystone Natural / Duracom Greystone Basalt / Durascape Greystone / Durapanel / Duracom Earthstone Quartzite / Duracom Earthstone Anthracite / Duracom Eartstone Ochre
UN NUMBER	None Allocated
DANGEROUS GOODS CLASS & SUBSIDARY RISK	None Allocated
HAZCHEM CODE	None Allocated
POISONS SCHEDULE NUMBER	None Scheduled
USE(S)	Fibre cement sheets for use on internal/external wall linings and soffits and internal/external flooring. Refer to product manual for installation.
COMPANY	BGC (Australia) Pty Ltd T/A BGC Fibre Cement
ADDRESS	77 Cryers Rd, East Tamaki, Auckland 2013
WEBSITE	www.bgcinnovadesign.co.nz
TELEPHONE	09 273 1457
FAX	09 273 1461
EMERGENCY PHONE NUMBER	111 Fire Brigade, Police and Ambulance
POISON INFORMATION CENTRE	0800 764 766

2 - HAZARDS IDENTIFICATION

The potential health hazards are related to dust generated from these materials during cutting, sanding and the use of power tools.

The intact BGC Fibre cement products do not give off dust or fume during installation or when installed. However, cutting, breaking, drilling, sanding, rebating or sawing the boards may generate dust. Inhaling dust liberated from BGC Fibre cement may aggravate pre-existing respiratory conditions and may cause cancer.

Smoking and inhalation of airborne particulates from other sources may increase the risk of lung disease.

Work areas and storage areas should be deemed smoke-free zones.

GHS CATEGORY	PICTOGRAM	SIGNAL WORD	HAZARD CODE	HAZARD STATEMENTS
Carcinogenicity, Cat 1A		Danger	H350	May cause cancer through inhalation of dust
Specific target organ toxicity (repeated exposure), Cat 1		Danger	H372	Causes damage to respiratory system through prolonged or repeated exposure

OTHER CLASSIFICATIONS	Contact with dust and fibres from this product may cause skin and eye irritation due to physical reaction (e.g. rubbing or scratching).
PRECAUTIONARY STATEMENTS	Observe the following precautionary measures when handling, installing or processing the product.

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BGC FIBRE CEMENT - NZ

Prevention Precautionary Statement Codes

CODE	PRECAUTIONARY STATEMENT
P201	Obtain special instruction before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe in dust.
P264	Wash hands and face thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P281	Use personal protective equipment as required.

Response

P308+P313	If exposed or concerned: get medical advice.
P314	Get medical advise if you feel unwell.

Disposal

P501	Dispose products in accordance with local/region/national/international regulations.

3 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	PROPORTION	EXPOSURE LIMITS
Calcium silicate hydrate	66997-15-1	40%-60%	10.0 mg/m³ measured as inspirable dust
Crystalline silica	14808-60-7	20%-60%	0.05 mg/m³ measured as inspirable dust
Paper pulp (cellulose)	9004-34-6	< 10%	10 mg/m³ measured as inspirable dust
Calcium silicate aluminate	21645-51-2	< 5%	10 mg/m3 measured as inspirable dust
Water		< 15%	
Other non-hazardous ingredients (pigments, sealers, coatings)		< 5%	

4 - FIRST AID MEASURES

SWALLOWED	Give copious amounts of water to drink to dilute stomach contents. Wash mouth and lips with water. Do not induce vomiting. If symptoms persist, seek medical attention.
EYE	Remove contact lens or eyeglasses. Flush thoroughly with flowing water for at least 10 minutes. If redness persists, seek medical attention.
SKIN	Wash thoroughly with soap and water. Contact physician if irritation persists or later develops.
INHALED	Remove to fresh air.
ADVICE TO DOCTOR	Treat symptomatically.

5 - FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS	BGC Fibre Cement products are non-flammable and non-combustible.
SUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
UNSUITABLE EXTINGUISHING SUBSTANCES	Not applicable.
PRODUCT OF COMBUSTION	BGC Fibre Cement products are non-combustible and non-flammable.

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BGC FIBRE CEMENT - NZ

6 - ACCIDENTAL RELEASE MEASURES

SPILL AND DISPOSAL	Use wet sweeping and/or vacuuming to clean up dust and waste. Dry sweeping should not be attempted. Vacuuming with an M or H class industrial vacuum is recommended. Do not wash material down storm water drains. Bagged waste should be placed in containers and disposed of with other construction waste in accordance with local authority guidelines.

7 - STORAGE AND HANDLING

STORAGE	Fibre cement sheets should be stored flat and level in a covered dry area. Avoid contact with strong acids and strong oxidizing agents.
HANDLING	Crystalline silica dust may be generated during processing and handling. Use appropriate personal protective equipment to reduce exposure to respirable silica dust. Keep dust generation to a minimum using proper tools. Wear protective equipment to prevent skin and eye contamination. Manual handling should be in accordance with Manual Handling Regulations and Codes. Maintain the work area clean by using wet sweeping or vacuuming with an M or H class filter. Keep fibre cement from incompatible materials. Read and understand all safety precautions before handling fibre cement.

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE STANDARDS	BGC Fibre Cement has adopted the following maximum exposure limits, corresponding to the limits set out by the CoA, NOHSC; Exposure Standards for Atmospheric Contaminants in the Occupational Environment:- • Calcium silicates: 10 mg/m³ time-weighted average (TWA) as inspirable dust • Cellulose: 10 mg/ m³ TWA as respirable dust • Crystalline silica (quartz): 0.05 mg/ m³ TWA as respirable dust BGC Fibre Cement recommends keeping exposures to dust as low as practicable and work in a well-ventilated space.
ENGINEERING CONTROLS	Keep exposures to dust as low as practicable, preferably below 5 mg/m3 TWA (time-weighted average) of inspirable dust, to prevent respiratory discomfort. Cutting, sanding, rebating, drilling, grinding and other machining activities will generate dust. Power tools should be fitted with a local dust extraction device with a HEPA M or H class filter. Hand tools (unpowered) generate less dust when cutting or sanding. If generated dust cannot be avoided, follow recommendations for protective equipment. Work in the open air or near external openings in the building, for adequate ventilation. Where dust is generated, in confined spaces, local mechanical ventilation should be used, to direct the dust away from the work areas. Personal protective equipment should be used in confined spaces and where dust levels exceed the maximum levels. Use safe work practices to minimize dust release and exposure. Clean work areas regularly by wet sweeping or vacuuming with a HEPA class M or H filtered vacuum. Never attempt dry sweeping as it excites silica dust into the workers' breathing zone.
VENTILATION	Where safe work practices, adequate engineering and material handling controls are in place, ventilation is not normally required. Use local mechanical ventilation and or dust extraction in confined areas and where dust could escape into the working environment.

TOOLS AND EQUIPMENT-

REPAIR AND MAINTENANCE	Vacuum and or wipe down all tools and equipment prior to maintenance and repair work. Avoid compressed air cleaning where possible, follow recommended exposure controls and protective equipment as listed below.
SKIN PROTECTION	Avoid direct skin contact with fibre cement products. Wear loose appropriate clothing, such as long sleeved shirts and long trousers, head protection and standard duty leather or equivalent gloves, which comply with Australian Standard AS 2161: Industrial Safety Gloves and Mittens. Wash work clothes regularly and do not shake out dust.
EYE PROTECTION	Wear dust resistant non-fogging safety goggles or glasses, which comply with Australian and New Zealand Standard AS/NZS 1336: Recommended Practices for Eye Protection.

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BGC FIBRE CEMENT - NZ

8 - EXPOSURE CONTROLS / PERSONAL PROTECTION cont.

RESPIRATORY PROTECTION	BGC Fibre Cement recommends particulate respirator , which comply with Australian and New Zealand Standard AS/NZS 1715: Selection, Use and Maintenance of Respiratory Protective Devices, and Australian and New Zealand Standard AS/NZS 1716: Respiratory Protective Devices when Exposed to Dust), be used at all times. The type of respirator to be used will depend on the level of exposure determined through sampling. If in doubt about the exposure level, use a respirator that offers the highest protection from respirable silica.
PERSONAL HYGEINE	Do not eat, drink, or smoke whilst handling and working with fibre cement. Wash dust from skin with mild soap and water after working with fibre cement.
FLAMMABILITY	Fibre cement products are non-combustible and non-flammable.

9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Factory applied blue tint on face of the Duratex™, and a white tint to the face of 4.5, 6.0, 9.0 and 12mm Compressed while all other products are cement grey finish.	BOILING POINT (°C)	Not Applicable
VAPOUR PRESSURE	Not Applicable	SPECIFIC GRAVITY (H_2O = 1)	Not Relevant
FLASH POINT	Not Applicable	FLAMMABILITY LIMITS	Not Flammable
SOLUBILITY IN WATER	Not Relevant	REACTIVITY (I.E. WITH WATER OR AIR)	Not Reactive
AUTO-IGNITION TEMPERATURE (°C)	-	ODOUR THRESHOLD	Slight cement odour
LOWER EXPLOSION LIMIT	-	UPPER EXPLOSION LIMIT	-
SELF ACCELERATING DECOMPOSITION	-		

10 - STABILITY AND REACTIVITY

CHEMICAL STABILITY	Stable and non-reactive.
HAZARDOUS REACTIONS	None
CONDITIONS TO AVOID	Dust generation during handling, processing and inhalation.
INCOMPATIBLE MATERIALS	Strong acids and strong oxidizing agents.
HAZARDOUS DECOMPOSITION PRODUCTS	None

11 - TOXICOLOGICAL INFORMATION

Health Effects: Acute (short term)

SWALLOWED	Unlikely to occur, however may result in symptoms of acute indigestion.
EYES	Excessive dust may cause eye irritation.
SKIN	The dust, particularly in association with heat and sweat, can cause irritation, but it is not absorbed through skin.
INHALED	Inhaled dust may cause nasal, throat and lung irritation, symptomatic through excess mucus and coughing.

Health Effects: Chronic (long term)

INHALED	If respirable crystalline silica levels are not controlled, repeated exposure to excessive dusts of fibre cement products could result in chronic lung disease silicosis. However, if the practices noted in this SDS are followed during cutting and sanding, exposure to airborne dusts should be within recommended occupational exposure standards and no long-term effects are expected.

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BGC FIBRE CEMENT - NZ

12 - ECOLOGICAL INFORMATION

ECO-TOXICITY	BGC Fibre Cement products are not toxic to aquatic and terrestrial organisms.
PERSISTENCE AND DEGRADABILITY	No data
BIOACCUMULATIVE POTENTIAL	No data
MOBILITY IN SOIL	A low mobility would be expected in a landfill situation.

13 - DISPOSAL CONSIDERATION

DISPOSAL	BGC Fibre Cement products must be disposed into a landfill site in accordance with local authority guidelines. Measures should be taken to prevent dust generation during disposal, and exposure and personal precautions should be observed (see above).

14 - TRANSPORT INFORMATION

TRANSPORT	No special transport requirements are necessary.

15 - REGULATORY INFORMATION

Not scheduled.

16 - OTHER INFORMATION

For further information on this product, please contact:
BGC (Australia) Pty Ltd (ABN 6200 5736 005 008) T/A BGC Fibre Cement
77 Cryers Rd, East Tamaki, Auckland 2013
Phone: 09 273 1457
Fax: 09 273 1461

ADDITIONAL INFORMATION

Australian Standards References

AS/NZ 1336	Recommend Practices for Occupational Eye Protection
AS/NZ 1715	Selection, Use and Maintenance of Respiratory Protective Devices
AS/NZ 1716	Respiratory Protection Devices
AS 2161	Industrial Safety Gloves and Mittens (excluding electrical and medical gloves)

Other References

NOHSC:1008 (2004)	Approved Criteria for Classifying Hazardous Substances
MODEL CODE OF PRACTICE	Preparation of Safety

AUTHORISATION

REASON FOR ISSUE	Add new product names in Section 1. Updated Section 2, 3 and 8.
DATE OF ISSUE	May 2023

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INSTALLATION GUIDE

Thermakraft™
ALUBAND
Window Flashing Tape



Thermakraft™ ALUBAND

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Bituminous adhesive flexible window flashing tape.

Kingspan Aluband is designed specifically as a premium window flashing tape and forms part of the Thermakraft One Wrap System. Made with a heavy bituminous adhesive, the product provides high strength bond and excellent abrasion resistance.

Product usage

Aluband Window Flashing Tape is installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier. It can also be installed at joinery heads to seal flashing upstands to the wall underlay.

BRANZ Appraised
Appraisal No.878 [2019]

Kingspan®

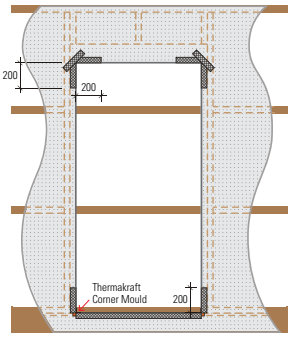
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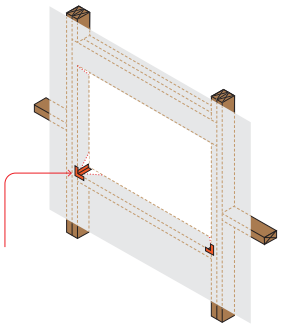
Aluband

Bituminous adhesive flexible window flashing tape

Application Method

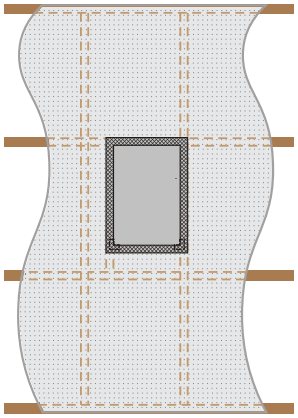
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes. Note the following: 150mm wide tape is used for 100mm wide window or door framing, and the 200mm wide tape is used for 140mm to 150mm wide reveals. (With steel framed houses use Double Sided Tape to attach the Corner Moulded Piece to metal framing).
- Measure 200mm up both jambs, add 400mm to the length of the window sill and cut to suit that measurement.
- First remove the release film from the tape; align the back edge of the tape with the inside edge of the sill.
- Using an appropriate tool, firmly press the tape onto the wall underlay to ensure good adhesion and ensure the tape is fitted tightly into the jamb to sill corners.
- At the sill/jamb corners cut the tape from the external edge of the frame outwards. Fold flaps back onto the wall underlay/air barrier and press tape firmly for good adhesion.
- Proceed to fit the Window Flashing Tape to the top corners of the frame (200mm across lintel x 200mm down jamb).
- For window or door lintel to jamb junction, apply a butterfly using the 75mm wide x 100mm long Aluband. Fix at a 45° angle to the jamb with an overlap at the corner of 3mm.
- Door frames are to be treated similarly to window openings. The sill may be either a timber or a concrete floor.
- Window Flashing Tape is used to seal the up stand of the window head flashing to the building underlay. (Refer to the cladding manufacturer's details).
- Aluband must NOT be left exposed to the weather or UV for more than 42 days.

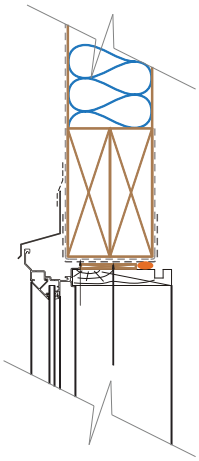




Window and door frames

- Staple orange corner piece to the bottom corner sill. Place tape 200mm up the jambs and across the full width of the sill opening. Align tape with the back of the frame opening.
- At the top corner place tape 200mm down the jamb and 200mm across the lintel. Place a strip of 75mm tape across the top corner.





Application Tips

- Always use an appropriate tool to apply firm pressure onto the tape during installation. This will ensure proper adhesion of the tape to the building underlay or other substrates.
- Install the Aluband Window Flashing above 5°C.
- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

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Aluband

Bituminous adhesive flexible window flashing tape

Important Information

To assist the adhesion of Aluband window flashing tape, Kingspan suggests the following two options. This is particularly relevant in the following conditions:

- In temperatures below 5°C.
- When adhering to difficult to bond substrates such as rough/uneven surfaces.
- When the tape has been lifted or moved after initial application.

Application of Heat:

- Press the window sill tape into position in the usual manner.
- Apply a gentle heat, using a heat gun on low heat to the top of the window sill tape.
- Once the adhesive starts to soften use an appropriate tool or a roller to firmly press the tape into the wall underlay ensuring good adhesion.
- Take care not to damage the foil face lining.

Difficult to Bond Substrates Surface Preparation:

- Always ensure that Aluband is applied to surfaces that are clean and free of dust, contaminates, solvents, oils or waxes.
- Application of Scotch® Super 77™ Spray Adhesive: When installing Aluband Flashing Tapes on difficult to bond substrates, Scotch® Super 77™ Spray Adhesive may be used. Ensure that the substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch apply the flashing tape in the normal manner.

Adhesives and Sealants:

- After the installation of Aluband window flashing tape, ensure that the edges do NOT come into contact with solvent based sealants or adhesives. Solvents in these products can adversely affect the adhesion or dissolve the bituminous adhesive and cause it to run.
- If the application of solvent based adhesives or sealants are necessary, cover the edges with Thermakraft joining tape or a true aluminium foil tape to form a barrier. With a true aluminium foil tape, the installer must test the bonding strength.
- The installer must check the compatibility of the Aluband window flashing tape with the sealant or adhesive product to ensure the components are fully compatible.

Handling and Storage

Aluband window flashing tape must be handled with care to prevent damage such as tearing, excessive puncture and roll deformation.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

BRANZ Appraised
Appraisal No.878 [2019]

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www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

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Issue 5.0, September 2022



INSTALLATION GUIDE

Thermakraft™
THERMAKRAFT
215

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Thermakraft™

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as 'Building Paper' Thermakraft 215 is a self-supporting, kraft paper based, bituminous building underlay that is suitable for use on roofs and walls in residential buildings. It is vapour permeable, meaning that liquid water from the outside is prevented from penetrating but water vapour from the inside can pass through and escape the building envelope. Thermakraft 215 is easy to install.

Kingspan®

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

Application Method (Roofing)

Thermakraft 215 is a bituminous building underlay used on roofs in residential buildings.

- Thermakraft 215 can be used for roof construction.
- Run NO longer than 10m.

Long-run metal roofing/vertical or horizontal installation method

- Fix using stainless steel 8-12mm staples or 20mm flat head clouts, or appropriate proprietary fastenings on timber framed structure. Fixing at 300mm centres. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Refer to table below to determine underlay support requirements.

Roof Pitch	Span	Underlay Support Required	
		Horizontally Installed	Vertically Installed
≥ 10°	> 1200mm	Yes	Yes
	≤ 1200mm	No	No
< 10° (Min 3°)	> 1200mm	Yes	Yes
	≤ 1200mm	No	Yes

- Thermakraft 215 upper sheet lapped over lower sheets (shiplap) to ensure water is shed to the outer face.
  Note: Thermakraft 215 can move downwards. To prevent this, it must be 'Captured' by the fastenings at each purlin. Horizontal fix must not be used on purlin distance greater than 1100mm to allow for 150mm laps.
- Must be laid firmly (tight/taut) without creases. All laps either vertical or horizontal must be a minimum of 150mm lap.
- When underlay support is required, Kingspan recommend using Ausmesh Roof Safety Mesh, Ausnet hexagonal netting or Thermastrap 201.
- Thermakraft 215 can be installed above the battens or purlins for profiled metal roof claddings and otherwise in accordance with NZBC E2/AS1.
- If required to achieve a lap seal (refer to NZ Metal Roofing Code of Practice), use Thermakraft Aluband window sealing tape or Thermakraft White General Purpose Tape.
- Thermakraft 215 will provide temporary weather protection during construction, same day coverage recommended. DO NOT over expose the product to the weather or UV for more than 7 days in any roof applications.
- Thermakraft 215 may be unwound to the full length from the gutter to the ridge. However, when ridge ventilation is required Thermakraft 215 may be terminated or slit at the ridge purlin to allow a free passage of air.
- Thermakraft 215 must NOT overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing. More details can be found in the NZ Metal Roof and Wall Cladding Code of Practice.
- Flue penetrations must have a minimum distance of 50mm from Thermakraft 215 (refer to NZ Metal Roof and Wall Cladding Code of Practice 10.11.5).
- Thermakraft 215 must be free of tears and punctures, fit tightly and be lap taped around all penetrations (except flue penetrations), to provide drainage for any condensation, or surface water from leaks.

Note: Do not use Aluband on penetrations where Polybutene water pipes have been installed. Refer Pipe Manufacturers for instructions on sealing penetrations.

Concrete/Metal tile roofing

- Thermakraft 215 must be laid over rafters prior to fixing the tile battens. The maximum span between rafters for Thermakraft 215 is 1200mm. Masonry tile roofs must have antiponding boards in accordance with NZBC E2/AS1 Paragraph 8.2.5.
- Installed Thermakraft 215 may be laid over the top of the antiponding boards and draped into the gutter by no more than 20mm. Antiponding boards must be treated in accordance with E2/AS1 8.2.5.
- Do NOT Run Thermakraft 215 longer than 10m in length.

Application Method (Wall)

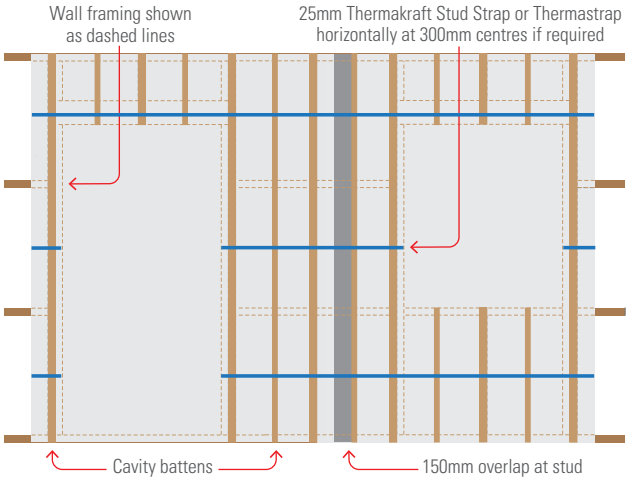
- Fix Thermakraft 215 underlay with the lap line printed side facing the exterior.
- Fix to all exterior walls from below bearers to the top plate. Pull the Thermakraft 215 underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically. Additional fasteners should be used around each opening to be cut out. Fixing types and requirements for steel framed structure can be found in the NZ Metal Roof and Wall Cladding Code of Practice.

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

- When fixing Thermakraft 215 underlay to Steel framing the same procedures applies, use adhesive spray or tape or flat head screws to fasten to the framing or thermal break, the exterior cladding fastenings will act as the permanent fixings.
- Cover all windows and door openings with Thermakraft 215 underlay.
- It is recommended that the Thermakraft 215 underlay is not cut and prepared for window installation until the arrival of the windows. Minimum of 150mm lap is required at joins, all vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of the membrane.
- When windows and doors are ready for installation, the Thermakraft 215 underlay covering the openings should cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.
  Note: In accordance with NZBC Acceptable Solution E2/AS1, wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm Thermakraft Stud Strap run horizontal at 300 centres is an acceptable means of prevention.
- Once installed, Thermakraft 215 must not be left exposed to the weather or UV for a maximum of 7 days. Thermakraft 215 underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZS 3604.
- Make good any forced tears with Thermakraft window flashing tapes. Any large areas which require repair may be covered with a second layer of underlay, a lap of 150mm is required.
- Thermakraft 215 underlay must be installed by a licensed building practitioner.



Application Tips

- Unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent chemical to flash off in a well ventilated area. Recommended minimum 7 days.

Handling and Storage

Thermakraft 215 underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

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Issue 2.0, September 2022

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INSTALLATION GUIDE

Thermakraft™ WATERGATE Plus



Thermakraft ONE WRAP SYSTEM

10 Products - One system
One warranty

Thermakraft™ WATERGATE PLUS

New Zealand's premium all-purpose, fire retardant wall wrap.

Watergate Plus is specifically designed as a wall underlay for use behind exterior wall cladding. Made from synthetic materials Watergate Plus is fire retardant, water resistant and vapour permeable. The water vapour transfer rate of the product has been optimised to minimise condensation risk in homes without compromising its primary water barrier properties.

Watergate Plus is part of the Thermakraft One Wrap System. Its unique construction allows for easier installation while maintaining best in class performance qualities.

CodeMark BRANZ-CM-1002-Rev 2

BRANZ Appraised Appraisal No.695 [2017]

Kingspan®

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Watergate Plus

Premium Synthetic Wall Wrap

Application Method

- Fix Watergate Plus underlay with printed side facing the exterior and run horizontally.
- Fix to all exterior walls from below bearers to the top plate. Watergate Plus underlay is available in widths of 2740mm and 1370mm. The 2740mm width product is generally wide enough to cover from below the bottom plate to the top plate.
- **Timber Framing:** Pull the Watergate Plus underlay tight and fix securely to the frame with fasteners such as galvanized Little Grippers, 6mm-8mm staples or 20mm large head galvanized clouts at 300mm centres horizontally and vertically.
- **Steel Framing:** Ensure frame is free from oil, dust and dirt. Fix securely using construction grade double-sided tape or adhesive or galvanized flat head screws that are appropriate for external framing and roofing use, at 300mm centres.

  Note: Check adhesive compatibility with Watergate Plus and the steel framing materials before use.

  If using a tape: Apply double-sided tape onto steel frame studs and only peel off the forward-facing liner once Watergate Plus is ready to be installed. When ready, peel off approximately 2m of tape liner at a time and press Watergate Plus firmly onto tape, ensuring it is taut.

  Note: The double-sided tape is to temporarily hold the Watergate Plus in place until the batten and/or cladding is installed. The screws used to fix these are the permanent fixings for Watergate Plus.
- Minimum of 150mm lap is required at joins. All vertical laps must be made over studs. Horizontal laps to be laid ship lap style allowing water to be shed to the outer face of Watergate Plus.
- Cover all windows and door openings with Watergate Plus underlay. It is recommended that the Watergate Plus underlay is not cut and prepared for window installation until the arrival of the windows.
- When windows and doors are ready for installation, the Watergate Plus underlay covering the openings should be cut at 45° and folded into the opening and securely fastened. Thermakraft window flashing tapes are recommended as the window flashing system.

  Note: In accordance with NZBC Acceptable Solution E2/AS1 and NASH Building Envelope Solutions: 2019 (E2/AS4), wall underlay must be prevented from bulging into the drained cavity. Where stud spacing is greater than 450mm, Thermakraft Stud Strap or Thermastrap run horizontally at 300 centres is an acceptable means of prevention.
- Once installed, Watergate Plus must not be left exposed to the weather or UV for a maximum of 90 days. Watergate Plus underlays will provide temporary weather protection during construction allowing work to continue. Internal linings and insulation must not be installed until the exterior cladding is completed.
- Fastenings behind Brick Veneer Cladding must have an equivalent service life to that of Brick Veneer (50 years). Refer to NZBC B2 Durability.
- Repair small damaged areas with any Thermakraft window flashing tape or Thermakraft Premium Joining Tape. Any large areas which require repair may be covered with a second layer of underlay with a lap of 150mm and then taping.
- Watergate Plus underlay must be installed by, or under the guidance of a licensed building practitioner.



Fix Watergate Plus securely to the frame.

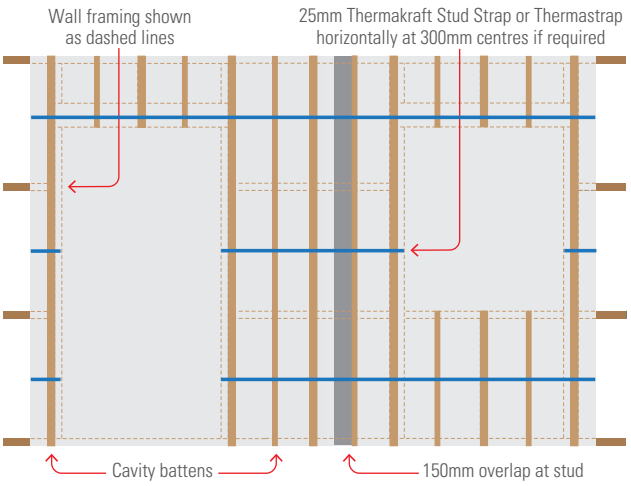




On arrival of doors and windows, cut Watergate at each opening on a 45° angle away from each corner. Pull the Watergate flaps inside and fasten to the inside of frame.

Application Tips

Watergate Plus is unaffected by LOSP or other solvent based treated timber. However, LOSP or other solvent based treated timber must have sufficient time for the solvent to flash off in a well-ventilated area. Recommended minimum 7 days.



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Watergate Plus

Premium Synthetic Wall Wrap

Handling and Storage

Watergate Plus underlay must be handled with care to prevent damage such as tearing and roll deformation. Due to the width of the product, care should be taken when installing in windy conditions.

The product must be stored under cover well away from direct moisture, rainfall contact and sunlight (UV). Care should be taken not stack other materials on top of the product.

CodeMark BRANZ-CM-1002-Rev 2

BRANZ Appraised
Appraisal No.695 [2017]

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Issue 5.0, September 2022

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BRANZ Appraised
Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY



Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Porirua 5240,
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branz.co.nz

Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Watergate Plus, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

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Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

7.2 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

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Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

9.1 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years for wall underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b) 15 years for wall underlays used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

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Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

14.6 Any damaged areas of Watergate Plus, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

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Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, Watergate Plus Wall Underlay is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Kingspan Insulation NZ Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Kingspan Insulation NZ Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Kingspan Insulation NZ Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

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Technical Data

IN-LINE FAN KITS - SF Shower Fan Models

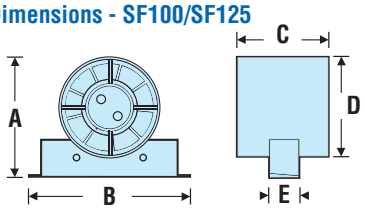
GENERAL INFORMATION

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)

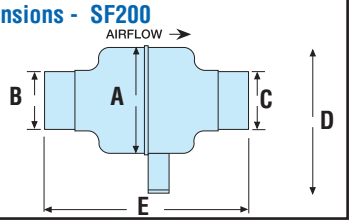
DIMENSION INFORMATION

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	-

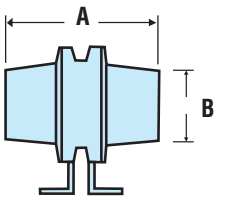
Dimensions - SF100/SF125



Dimensions - SF200



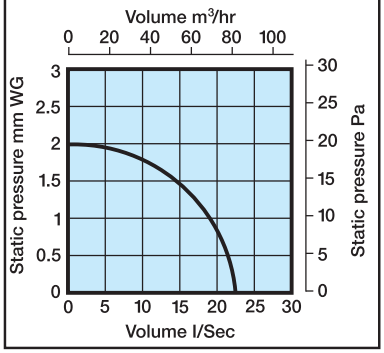
Dimension - SF150



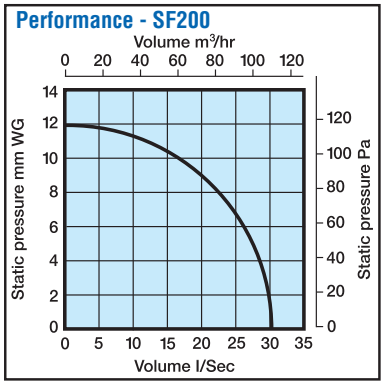
TECHNICAL SPECIFICATION

Models	SF100	SF200	SF125	SF150
Fan	ID100	CFD200	ID125	Hyper
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan Performance	23l/s, 85m³/hr	31l/s, 110m³/hr	36l/s, 130m³/hr	89l/s, 320m³/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

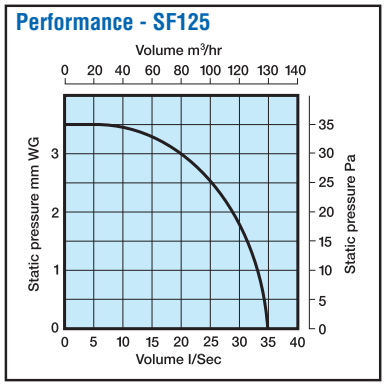
Performance - SF100



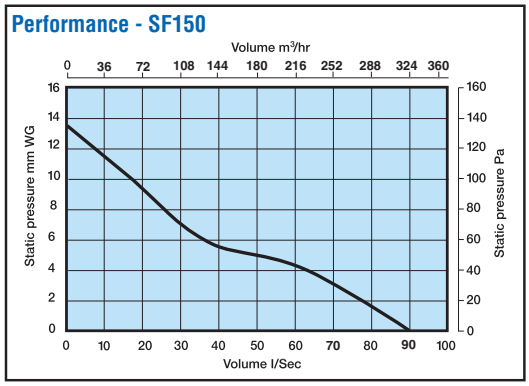
Performance - SF200



Performance - SF125



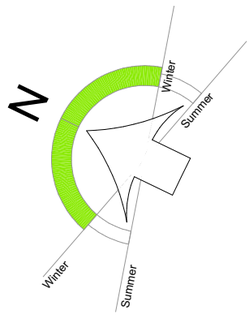
Performance - SF150

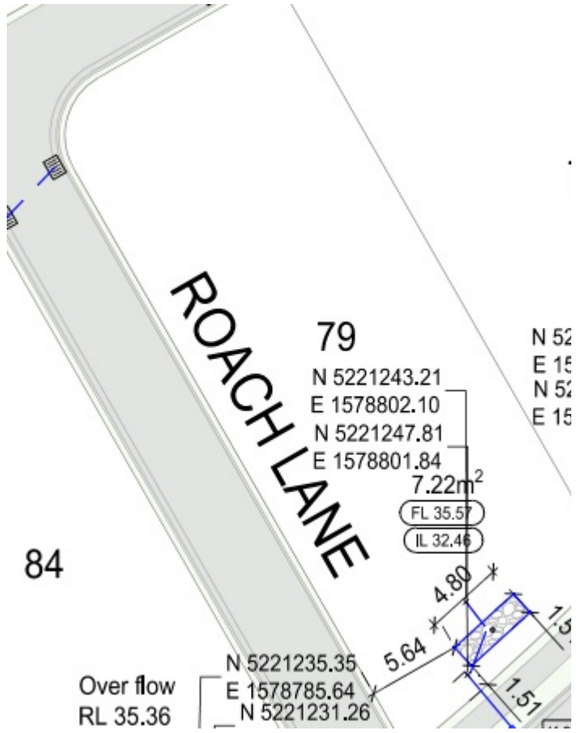


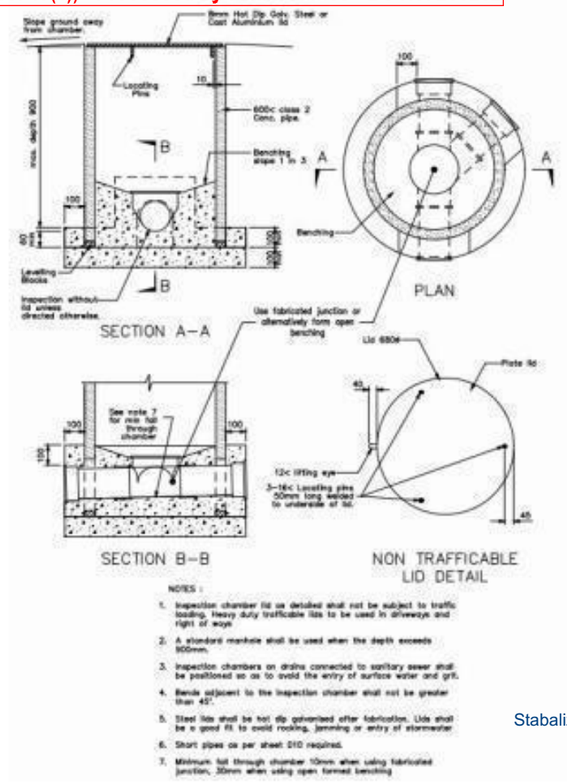
Note: PERFORMANCE - ID Fans maximum fan performance stated, this can vary depending on the length of ducting used.

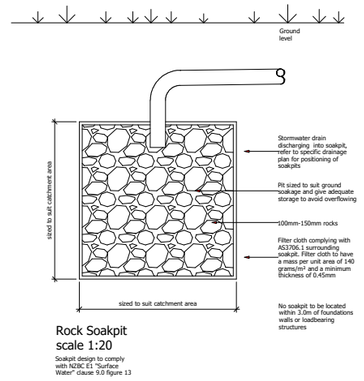
Fax: (09) 259 1661 • Email: sales@securimax.co.nz • Website: www.securimax.co.nz

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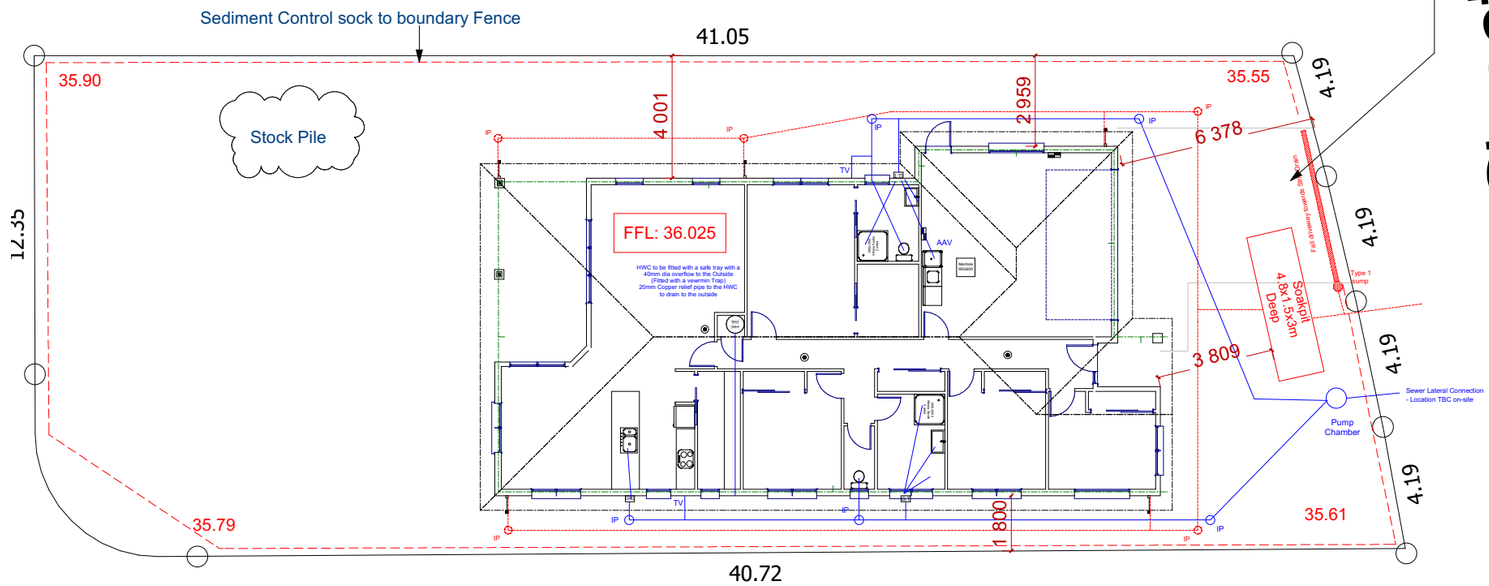


Rock Soakpit
scale 1:20

Soakpit design to comply with NZBC E1 "Surface Water" clause 9.0 figure 13

REVISED During Processing 12/08/2025

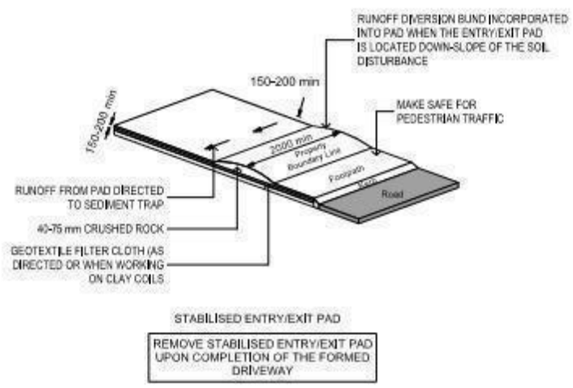
Stabalized entry pad to the site

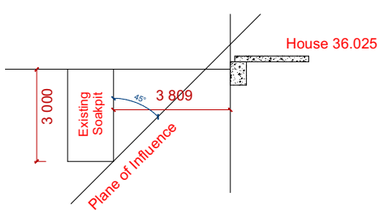


Benn Street

Crown of Road 35.50

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.





FL 35.57
IL 32.46

Roach Lane

LEGEND

LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES

Refer to Drainage Plan for specific drainage information

Refer to sediment control plan in specification and implement where required.

Convey surface water from sealed drive areas to an appropriate approved outfall.

Dimensions are shown to cladding face

SITE INFORMATION

Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE

Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 1
Scale: 1:1000
Date: 7/08/2025
OF: 15

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Key To Elevations

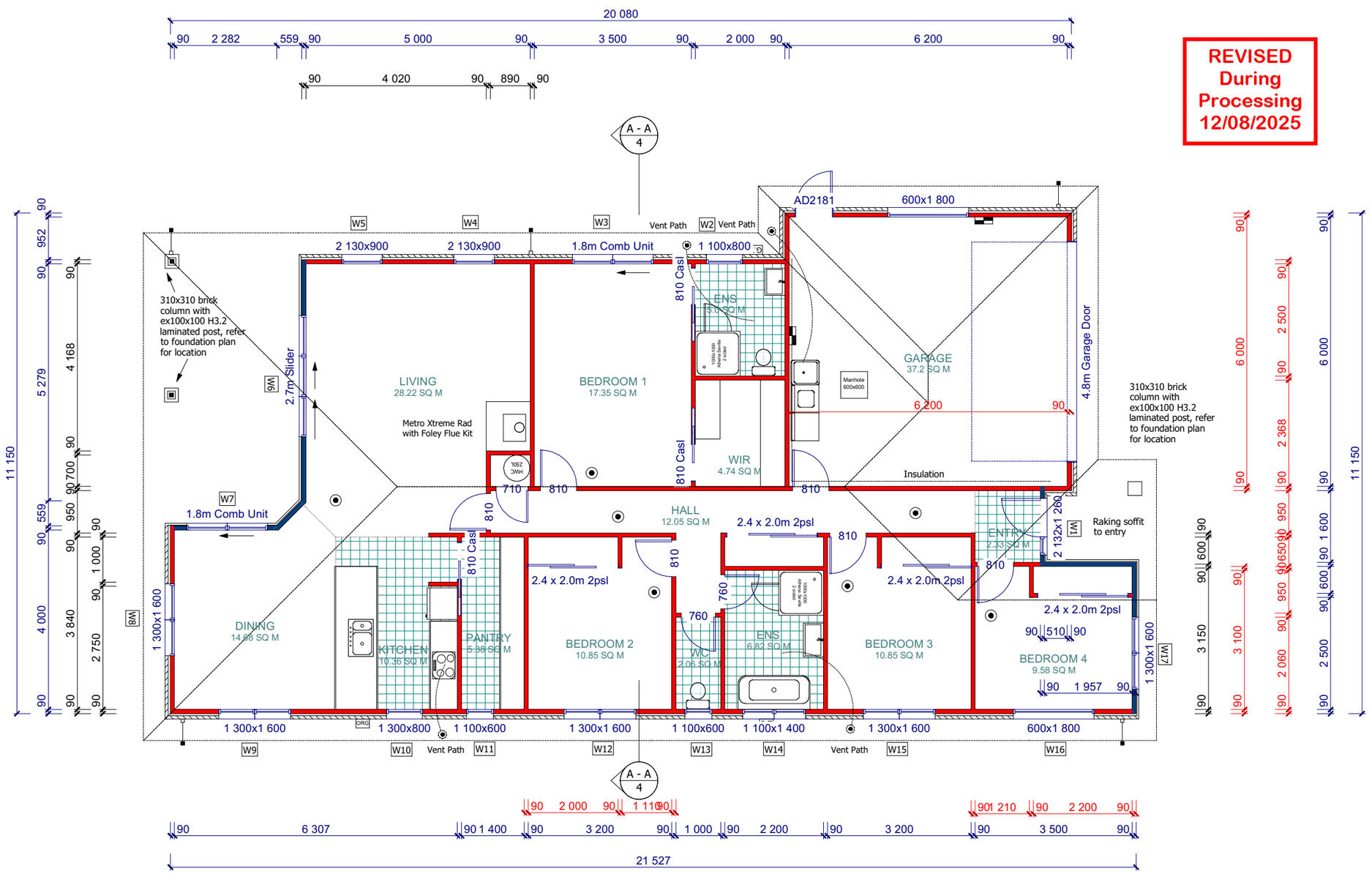
ROOF & WALL CLADDING

Roof -	25° Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame

REVISED During Processing 12/08/2025



GENERAL FLOOR PLAN NOTES

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be Interconnected and Located in each bedroom, Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A) and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

MISCELLANEOUS:
Dimensions shown are to the frame, GIB thickness not shown.
Refer to Construction Schedule (Page 2 & 3 of Specification) for additional construction information.
Entry through external doors
Mechanical ventilation
Air Seals to have PEF rod & low expansion foam
All windows and doors centered in room unless shown otherwise

FOUNDATION SYSTEM
Ribraft Foundation Design

WALL FRAMING -designed to high wind zone

Stud Height:	2420 mm
Exterior Walls:	90x45mm studs @ 600 mm crs
Interior Loadbearing wall:	90x45mm studs @ 600 mm crs
Dwangs Ext:	90x45 @ 800 crs
Non loadbearing:	90x45mm studs @ 600 mm crs
Dwangs Int:	90x45mm @ 800mm Crs

LINTELS AND BEAMS
Lintels and beams can be found on the Truss Design

BUILDING WRAP
Watergate Building Wrap, refer to manufacturers specifications attached

DOORS
Internal Height: 2000mm

INSULATION

Wall -	Pink Batts R2.6 Wall Batts
Ceiling -	Pink Batts R6.6 Ceiling Batts

WALL AND CEILING LININGS

Wall -	Standard 10mm GIB (unless required for bracing)
Ceiling -	Standard 13mm GIB 13mm GIB Aqualine (bathrooms)
Bathroom -	10mm GIB Aqualine
Corner Finish -	Square

FLOOR FINISHES
Carpet, Vinyl Plank , Tiles

EXTERIOR JOINERY

All Windows to be Thermally broken Aluminium frame
Double glazed with Ug of 1.10
with a thermally improved spacer
as per ISO 10077 Annex G
Glass: Low E4/Clear, argon filled , to achieve R0.5.
Air Seals to have PEF rod and low expansion foam

Interior -	Shelf and rail to wardrobes

Electric Hot water system

KITCHEN COOKTOP
Electric Hobb

ROOF CLADDING AND STRUCTURE
Purlins - 70x45 SG8 H1.2 @ 900crs

GUTTER/FASCIA/DOWNPIPES/SOFFITS

Gutter -	Metalcraft Metalline Quad Gutter
Fascia -	Metalcraft Metalline 185 Fascia
Downpipes -	Marley 80mm Dia PVC
Soffits -	Hardiflex 4.5mm

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
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Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Floor Plan

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	2500	2
Scale: 1:100	Date: 7/08/2025	OF: 15

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ROOF & WALL CLADDING	
Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

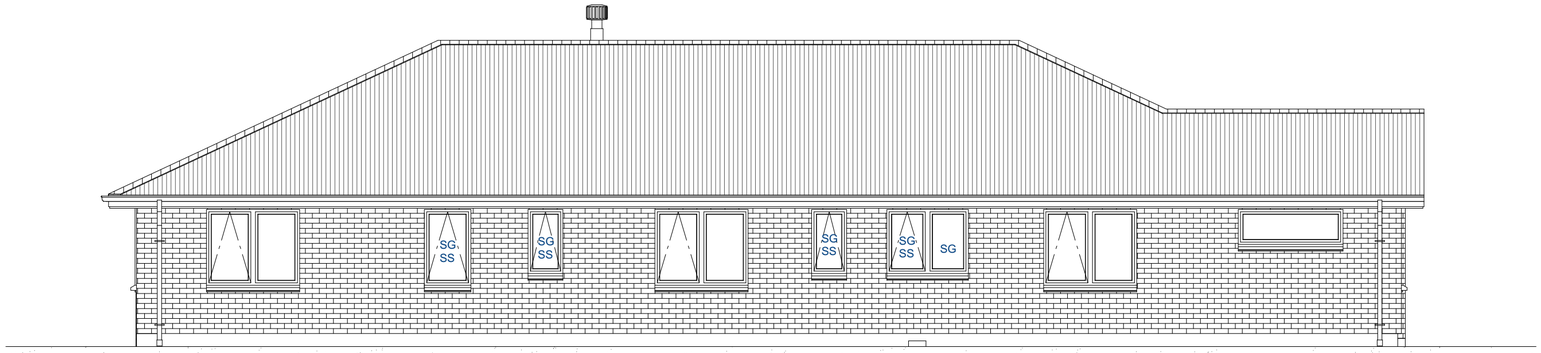
GENERAL ELEVATION NOTES

Air Barrier to unlined wall and gables, refer to the Construction Schedule in the Specification for type.

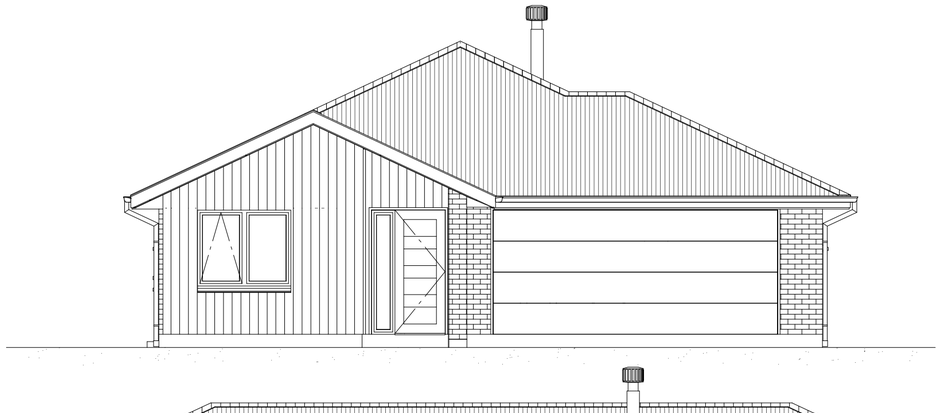
This sheet to be read in conjunction with the Risk Matrix in specification.

Driveway to fall from 20mm max below garage rebates (By Others).

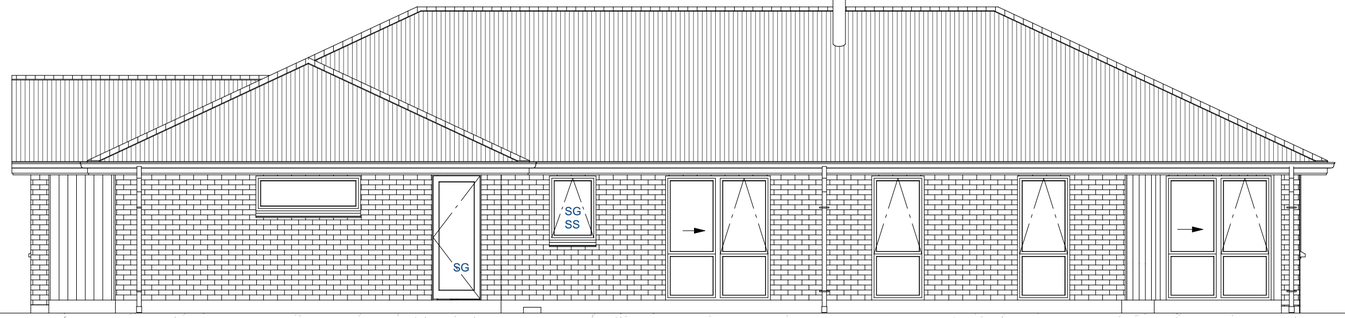
Key
SS: Security Stay
SG: Safety Glass



Elevation A



Elevation B



Elevation C



Elevation D

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Elevations

Consent Plans

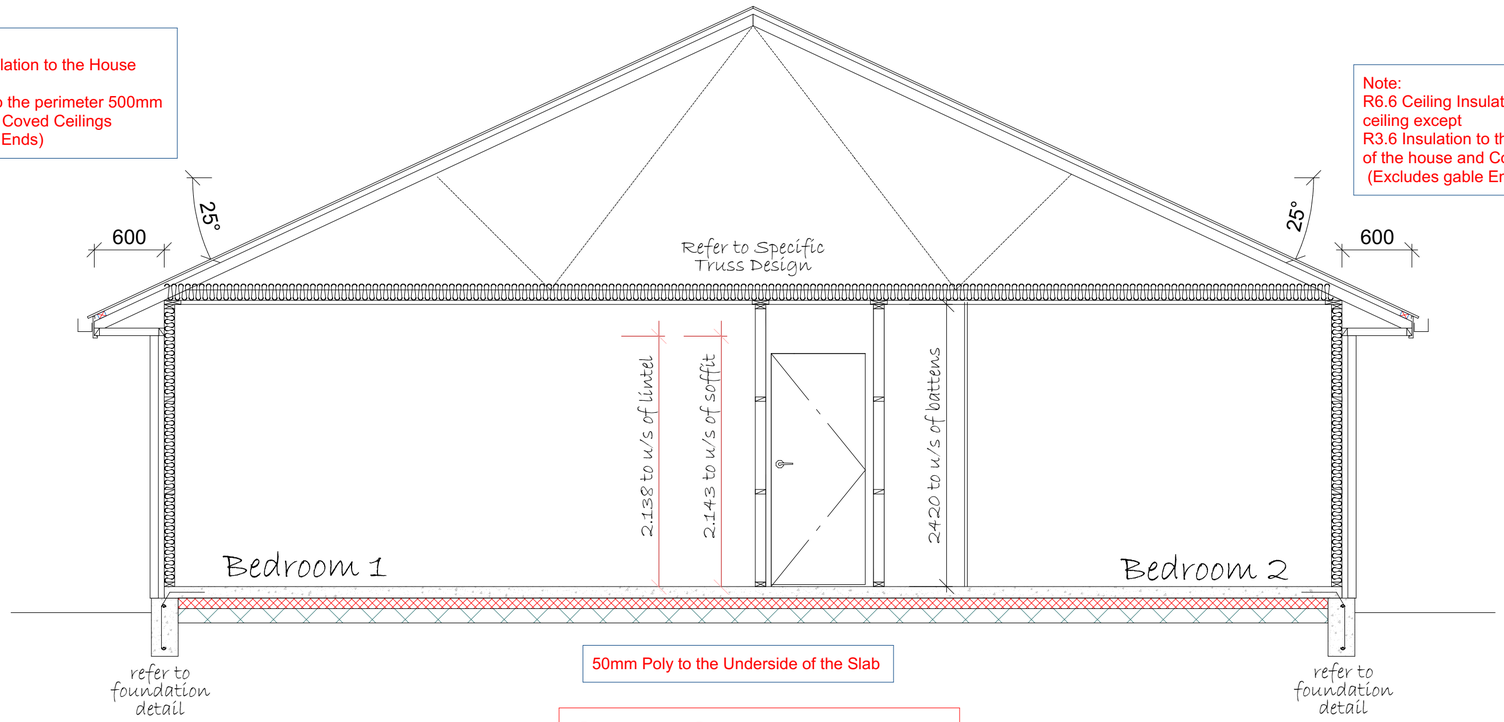
Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	**2500**	**3**
Scale: 1:100	Date: 24/07/2025	OF: **15**

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Note:
Min 35mm cover from the underside of the roof underlay to the top of the Insulation.

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)



50mm Poly to the Underside of the Slab

Cross Section A - A

LEGEND

Refer to the Construction Schedule (Page 2 & 3) in the Specification for sizing of Building Elements.
General Notes:

1 - Corrugated Colorsteel roofing by Metalcraft on self supporting ThermaKraft 215 roof underlay on 70x45mm SG8 H1.2 Purlins @ 900crs fixings 1/10g self-drilling screw, 80mm long

2 - Metalcraft fascia & quad gutter system with 4.5mm Hardies soffit lining on 70x35mm H1.2 eaves bearers on edge fixed to ribbon board.

3 - 4.5mm Hardies Soffit lining

4 - 13mm Standard GIB ceiling lining to underside of Rondo metal ceiling battens @ 600 crs with R6.6 Pink Batts insulation.

5 - 70 Series Brick Veneer on a 50mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).

5 - BGC Duo Cladding on a 20mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).
(Dwangs @ 480mm crs)

6 - Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

7 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. (exterior walls) unless otherwise stated

9 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. 2 min. (interior loadbearing & non-loadbearing walls) unless otherwise stated

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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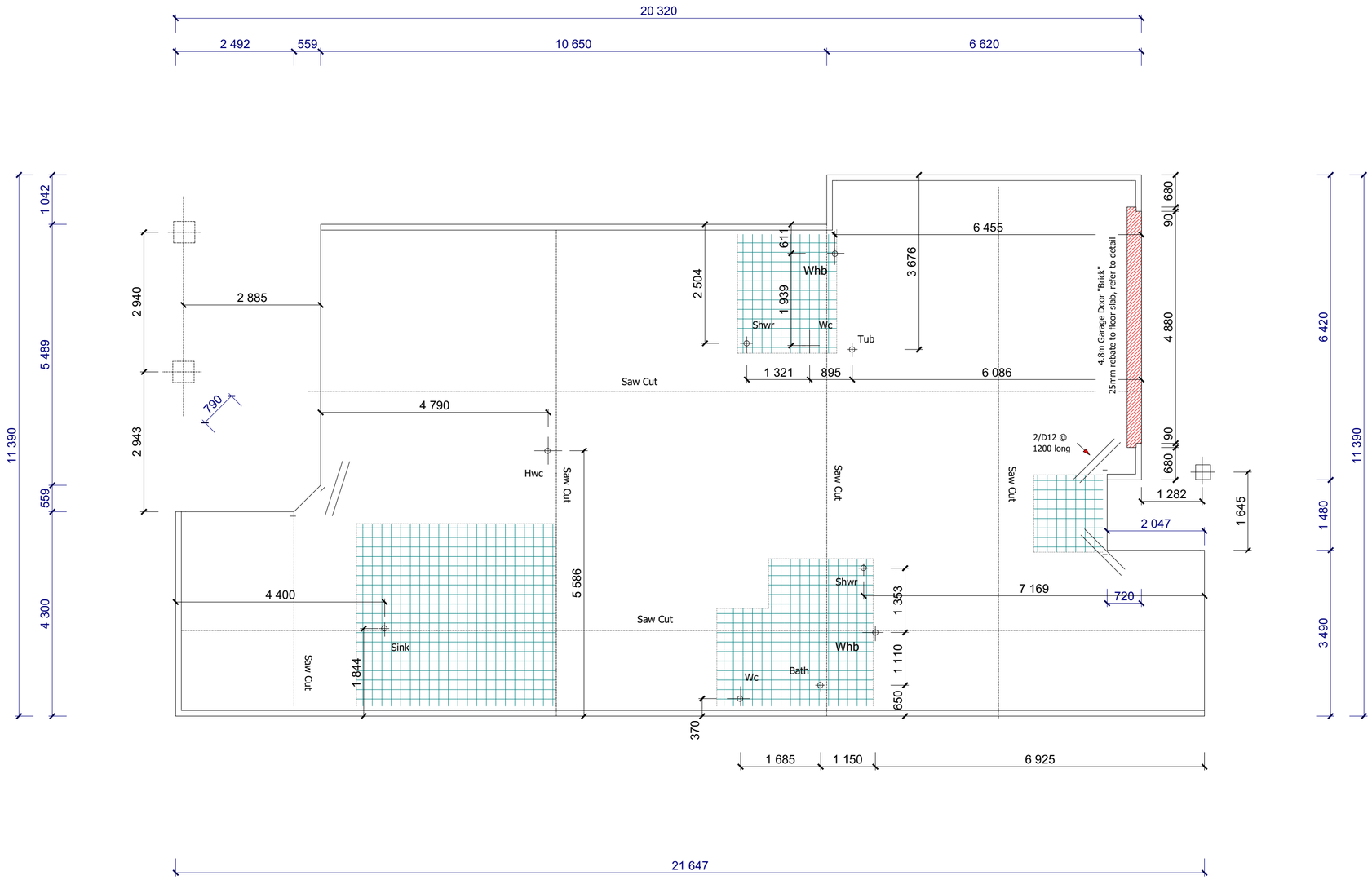
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Cross Section

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: 1:50
Job Number: 2500
Date: 24/07/2025
SHEET: 4
OF: 15

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GENERAL FOUNDATION NOTES

1) All dimensions over foundation face. Allow (120mm rebate) 70mm veneer & 50mm cavity.
2) No construction joints / shrinkage control joints under marked tile areas where possible.
3) The maximum plan dimension of concrete between shrinkage control joints is 6m with mesh to slab. (Standard joint to be formed with 25mm min sawcut & free joint to be at 24m crs max & as per detail CON001AFL).
4) No saw cuts under length of load bearing and bracing walls. (As fixing may not achieve full strength if embedded in sawcuts).
5) Supplementary reinforcing to internal corners to comply with NZS 3604:2011 clause 7.5.8.6.4.
6) W/C location indicated on plan has assumed a 160mm offset from internal frame line, please consult manufacturer's documentation to confirm offset. Contractor to consult manufacturer's documentation to determine the correct location for all wastes positioned through floor slabs.
7) Gully trap positions indicated on ground floor plan.
8) Earth bar to be bonded to the reinforcing mesh
9) Refer to Truss design for exact location of slab thickenings
10) Flexible silicone bondage sealer to fill the saw cuts through vinyl floor areas.

BOTTOM PLATE FIXING

Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

REINFORCING

All reinforcing is to be Ductility Class E, in accordance with NZS 4671

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3

CONCRETE STRENGTH

All concrete to comply with NZS3604:2011 Section 4 Durability Clause 4.5.2

50mm Poly to the Underside of the Slab

Note:
Slab Mesh : SE62-500
320mm Min Cover
Concrete cover to Mesh 30mm min top cover
Against ground 75mm
Against formwork 50mm

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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Foundation Plan

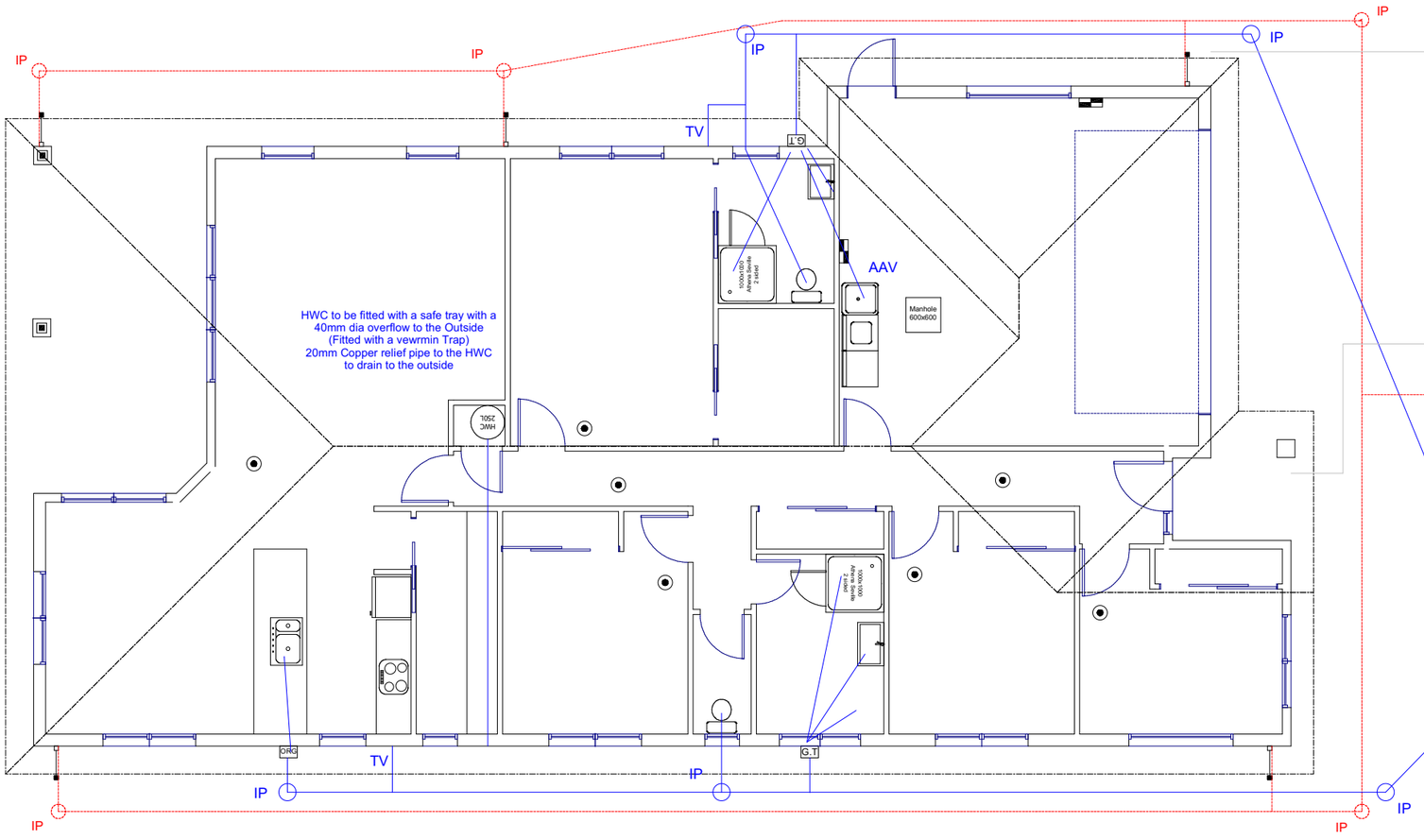
Consent Plans

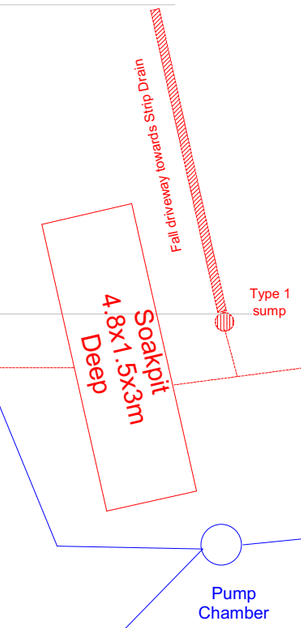
Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 5
Scale: 1:100
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Drainage Schedule	NZBC G13	
(Drainage as per Schedule unless specified otherwise)		
Kitchen		
Sink:	Ø65mm @1:40	(3 discharge units)
Bathrooms		
Vanity:	Ø40mm @ 1:40	(1 discharge units per basin)
Shower:	Ø40mm @1:40	(2 discharge units)
Bath:	Ø40mm @1:40	(4 discharge units)
WC:	Ø100mm @1:40	(4 discharge units)
Laundry		
Sink:	Ø65mm @1:40 min	(5 discharge units)
Main Foulwater Drain	Ø100mm @1:60	
Stormwater Drain	Ø100mm @1:60 (1:120min)	
Terminal Vent	Ø80mm	
Vent	Ø50mm	

LEGEND.	
Sewer Pipe	————
S/W Pipe	– – – – – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV
Vent	V
Inspection Point	IP
Air Admittance Valve	AAV





REVISED During Processing 12/08/2025

Figure 8: Type-one Surface Water Sump
Paragraph 3.6.2

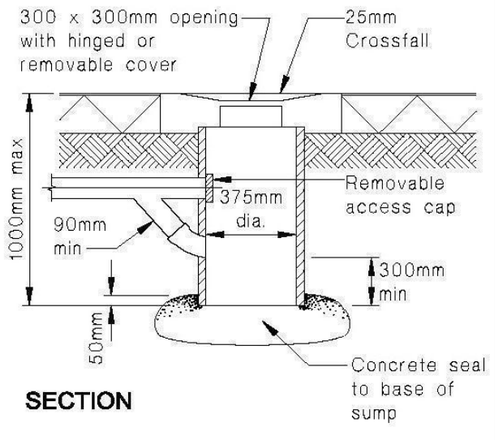
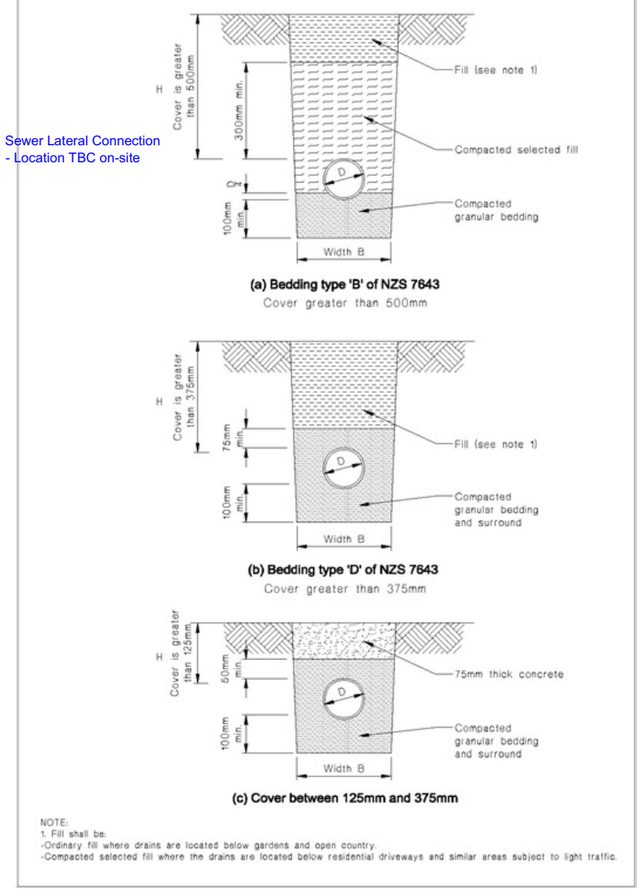


Figure 7: Bedding and backfilling
Paragraphs 5.2.1, 5.3.1 and 5.4.1



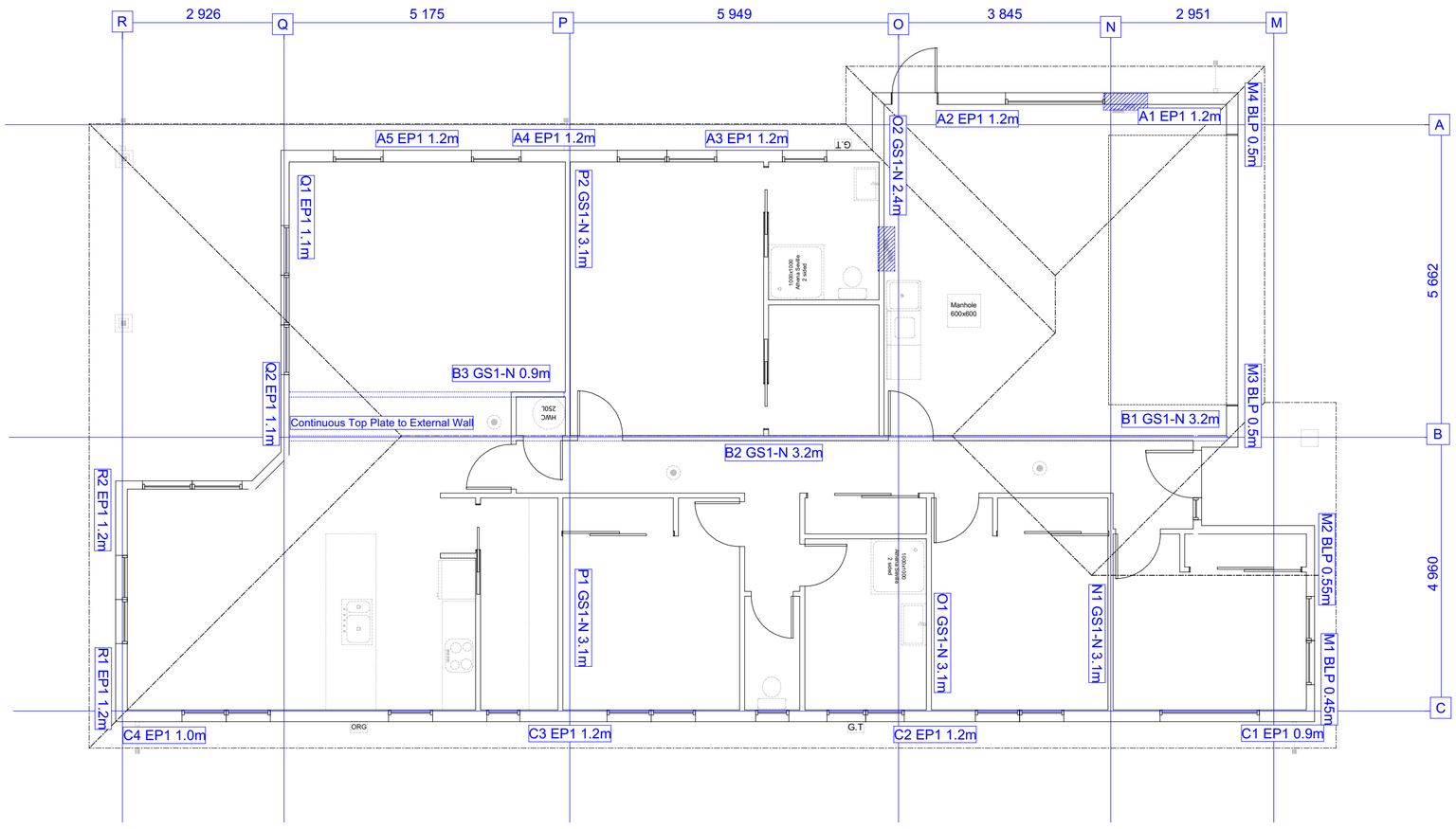
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Drainage Plan
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Scale: 1:100
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GENERAL BRACING NOTES

Bracing plan to be read in conjunction with supplementary bracing calculations

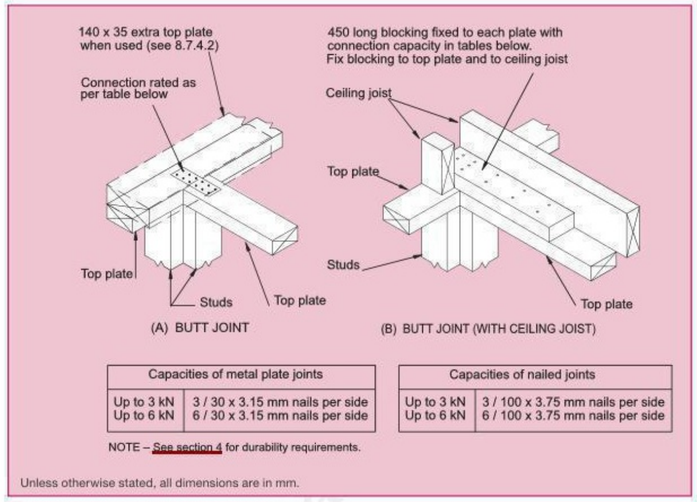
Refer to the supporting documents in the specification for purlin/batten fixing, truss fixing, stud to top plate fixing & lintel fixing schedules.

To be read in conjunction with minimal length bracing detail TAJ002AWA

BRACING SYSTEM

Wall bracing designed in accordance with NZS 3604:2011 & GIB Ezybrace system

Designed to:
Wind: High
Earthquake: 3



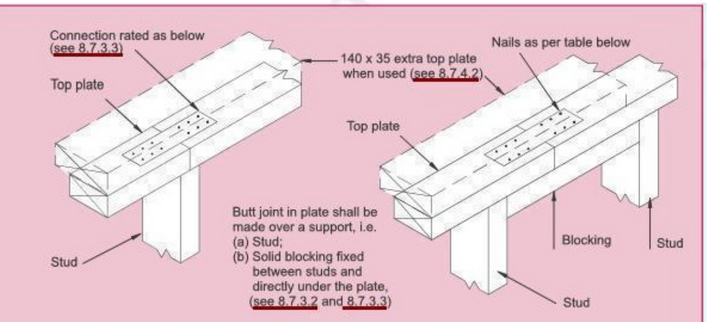
Capacities of metal plate joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

Figure 8.16 – Connecting top plates to external walls at right angles – Walls containing bracing (see 8.7.3.4)



Capacities of metal plate joints(2)	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints(2)	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE –
(1) See section 4 for durability requirements.
(2) Not required when extra top plate is used.

Unless otherwise stated, all dimensions are in mm.

Figure 8.15 – Connecting top plates in line – Walls containing bracing (see 8.7.3.3)

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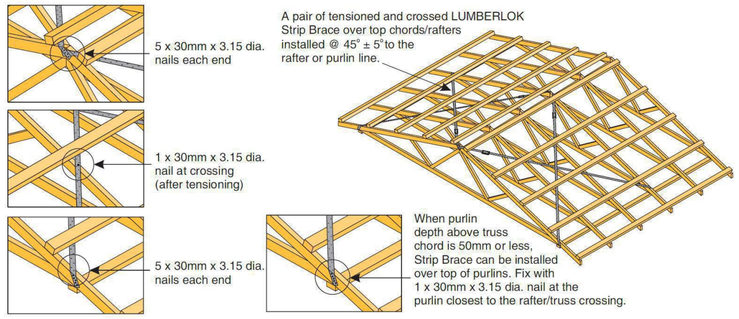
Bracing Plan

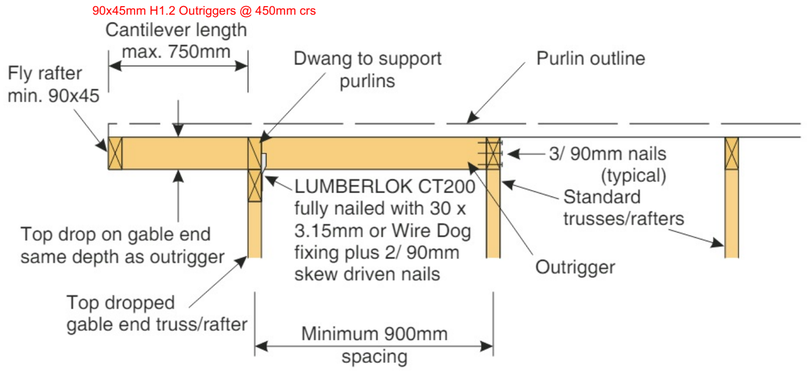
Consent Plans

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Scale: 1:100
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SHEET: 7
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- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.





CROSS SECTION

GENERAL ROOF PLAN NOTES

Refer to the Construction Schedule (Page 2 & 3) in the Specification and the manufacturer's specification attached for the gutter and down pipe rainfall catchment area calculations.

RPB - Roof Plane Bracing as per NZS:3604 (Figure: 10.22)

LSB - Lumberlok Strip bracing as per Lumberlok Roof Bracing Specification

ROOF CLADDING

Roof - 25º Corrugated Colorsteel Profile on Thermakraft 215 roof underlay

TRUSS FIXINGS

Refer to the Truss design for truss fixings

PURLINS OR BATTENS

Purlins: 70x45 SG8 H1.2 @ 900crs, fixings 1/10g self-drilling screw, 80mm long
End span of purlins to be 600 crs as per E2 Table 11

TOP PLATE FIXING

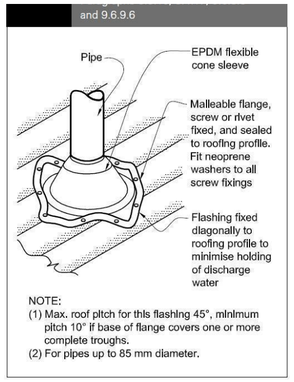
Use Lumberlock top plate fixing chart attached to the main specifications to determine top plate fixings

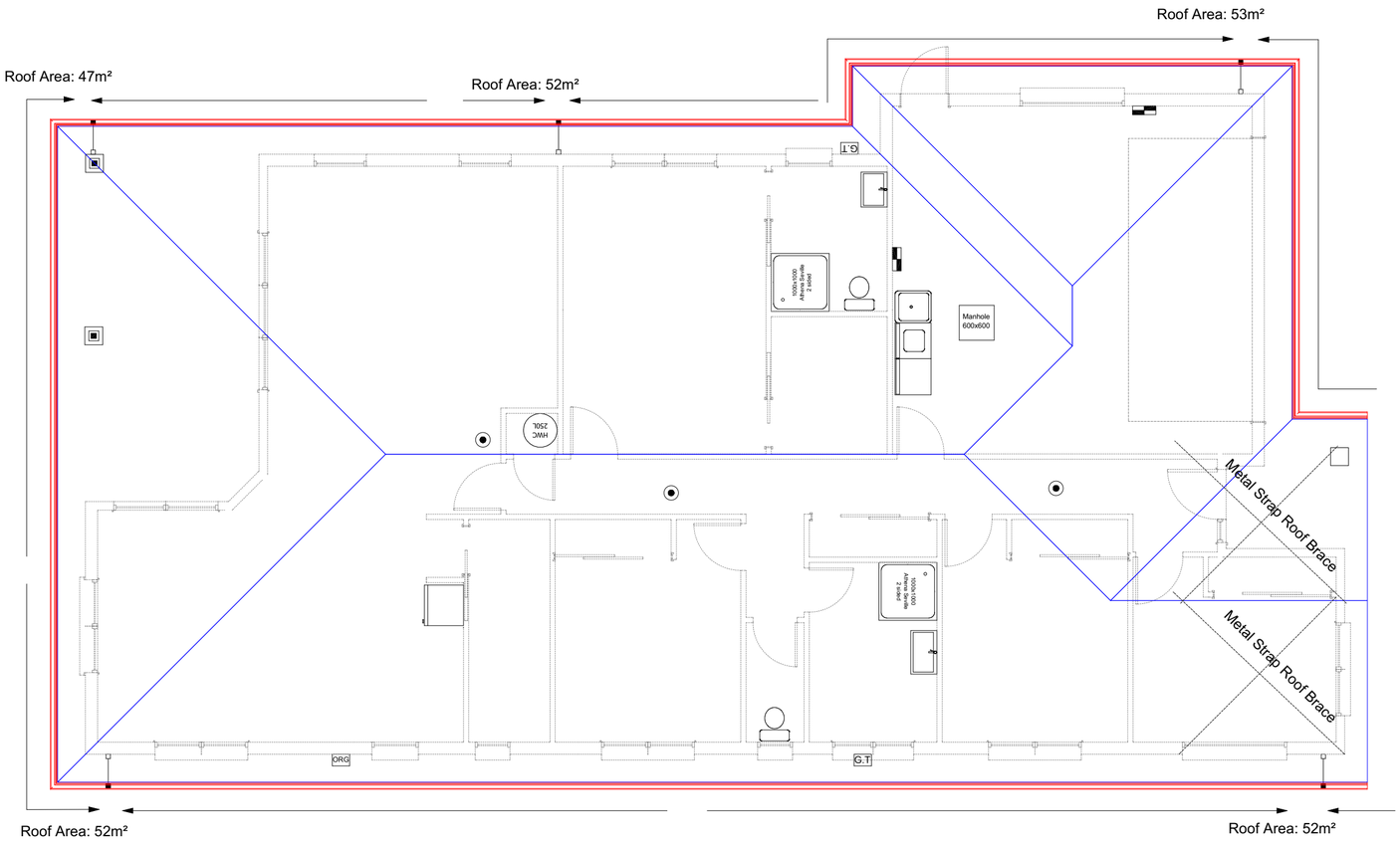
TIMBER GRADE

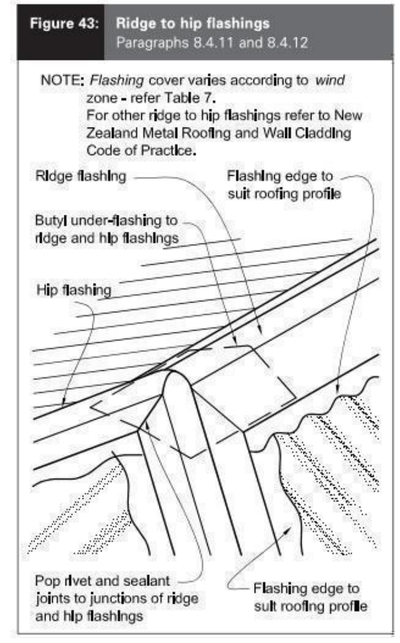
Timber members specified on these drawings are to be a minimum of strength of SG8 graded as per NZS3604:2011

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3







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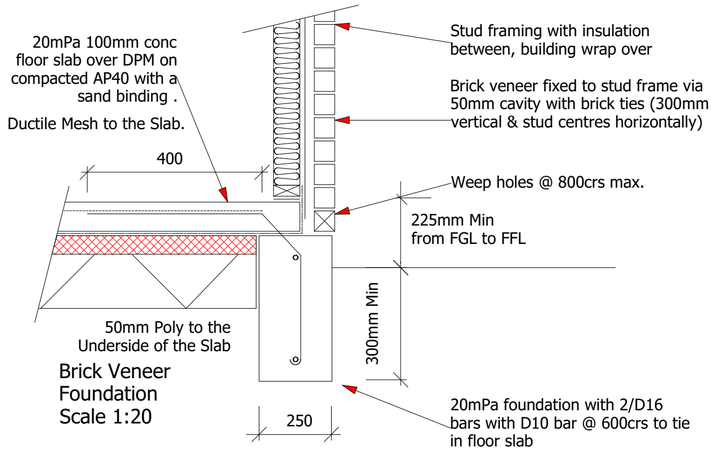
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Roof Plan

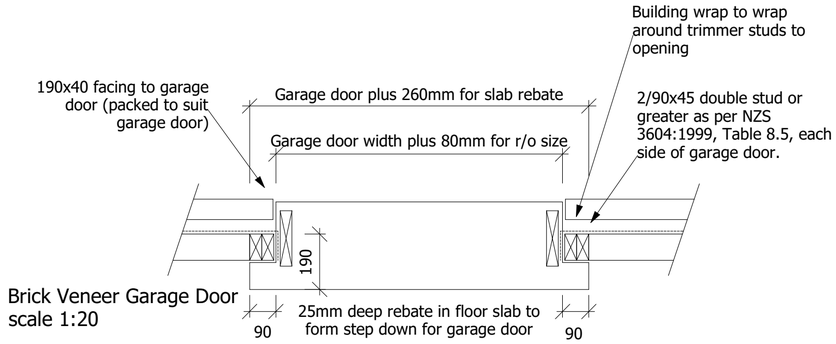
Consent Plans

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Scale: 1:100
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OF: 15

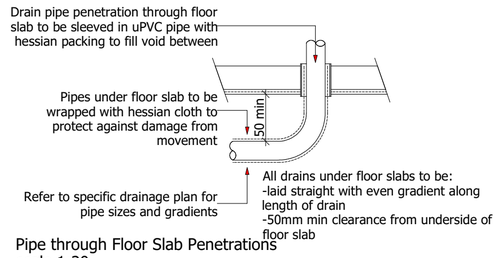
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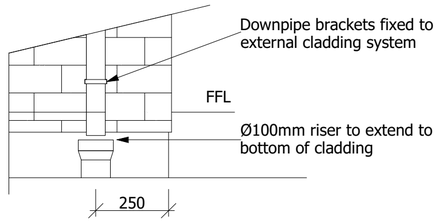
Brick Veneer Foundation
Scale 1:20



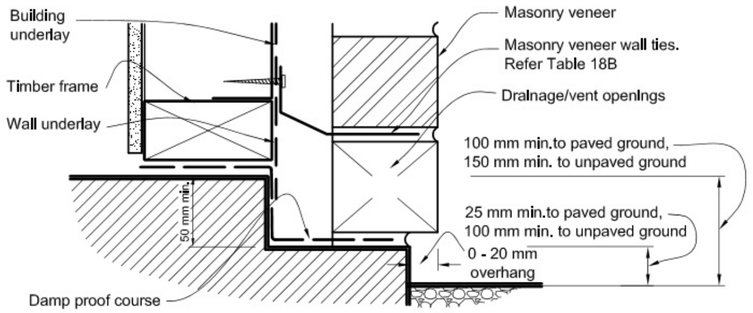
Brick Veneer Garage Door
scale 1:20



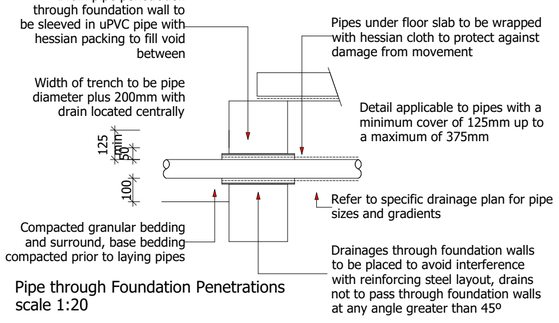
Pipe through Floor Slab Penetrations
scale 1:20



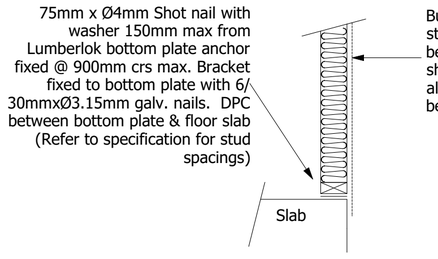
Downpipe Corner Offsets
(Brick)
Scale 1:20



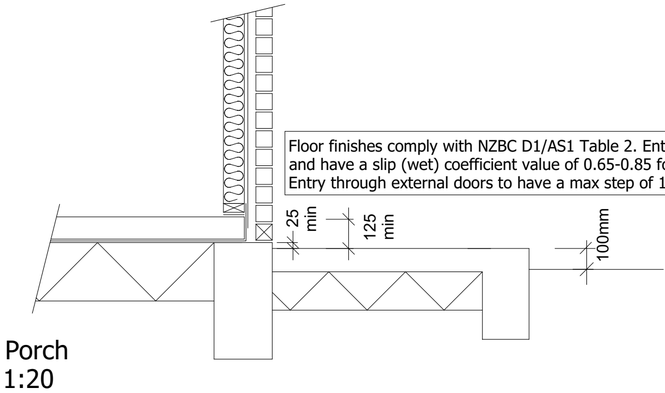
(I) MASONRY VENEER - FLOOR REBATE DETAIL



Pipe through Foundation Penetrations
scale 1:20



Exterior stud framing to slab
Scale 1:20



Entry Porch
scale 1:20

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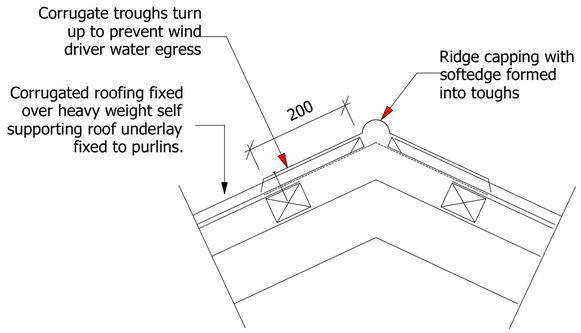
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Details

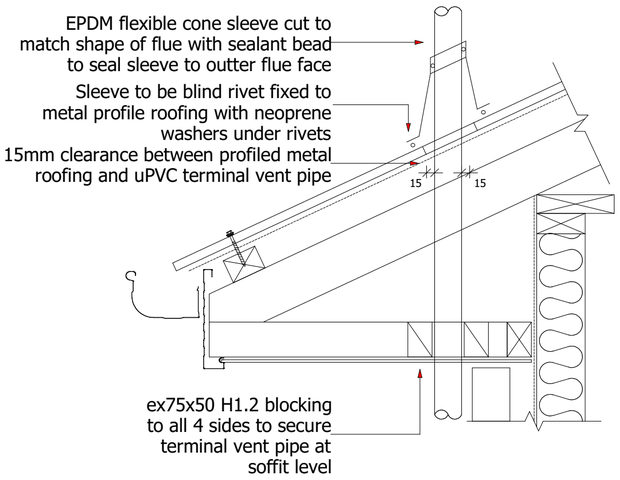
Consent Plans

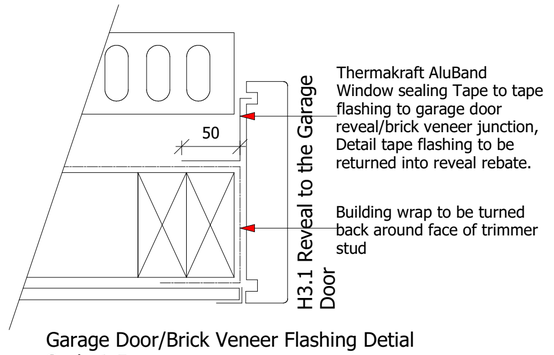
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Scale: varies
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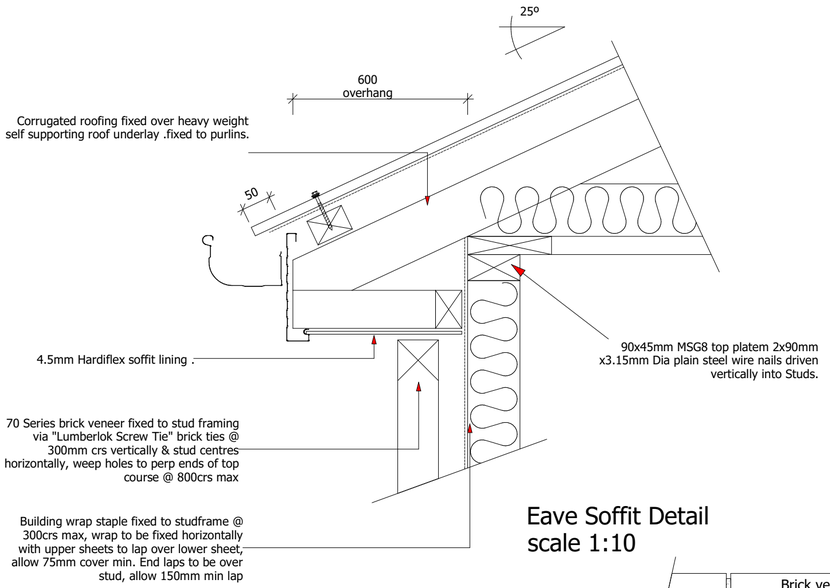


Metal Ridge Capping Detail
scale 1:10





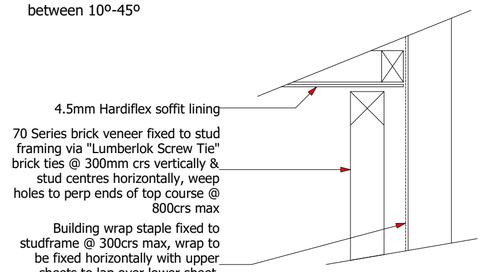
Garage Door/Brick Veneer Flashing Detial
Scale 1:5



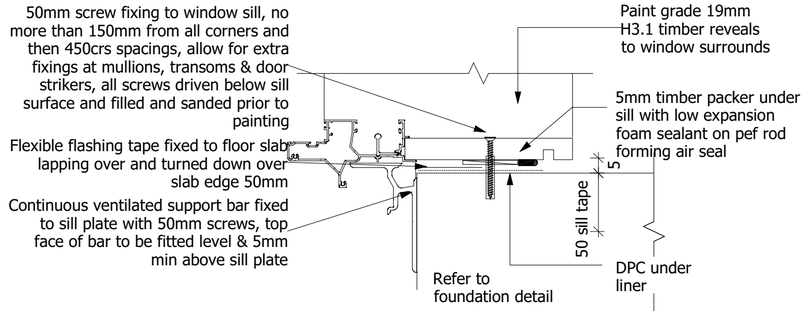
Eave Soffit Detail
scale 1:10

Terminal Vent to Roofing Penetration Detail "Section"
scale 1:10

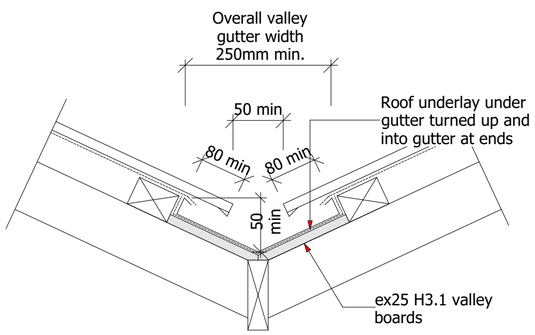
Suitable for Roof Pitches between 10º-45º



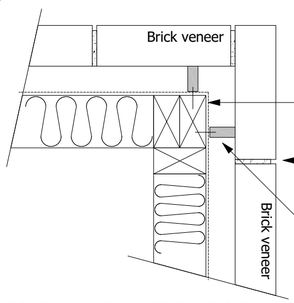
Brick Eave Soffit Detail
Scale 1:10



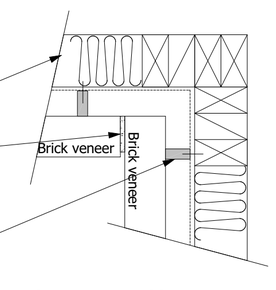
Sliding Door Sill to Slab Detail
scale 1:5



Longrun Valley Gutter Detail
scale 1:10



BRICK EXTERNAL CORNER DETAIL
Scale 1:5



BRICK INTERNAL CORNER DETAIL
Scale 1:5

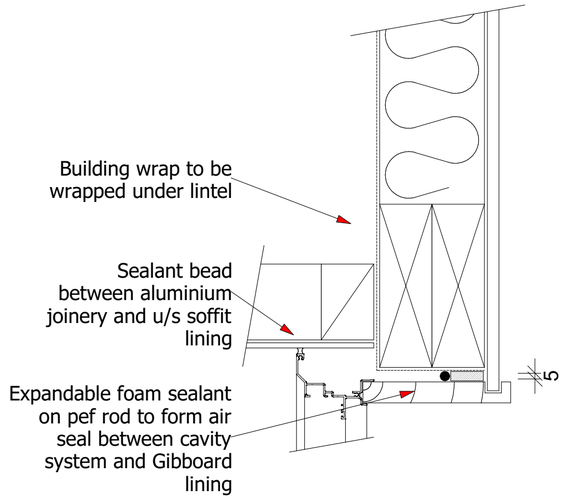
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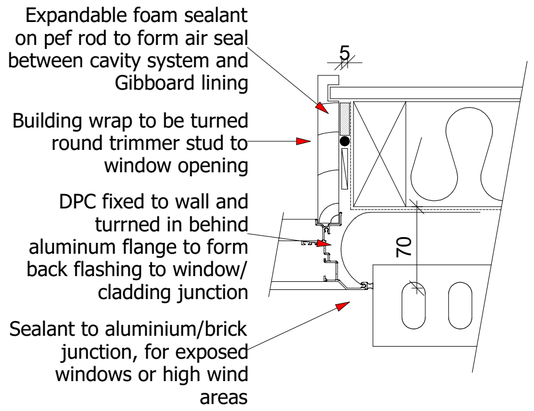
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Date: 24/07/2025
OF: 15

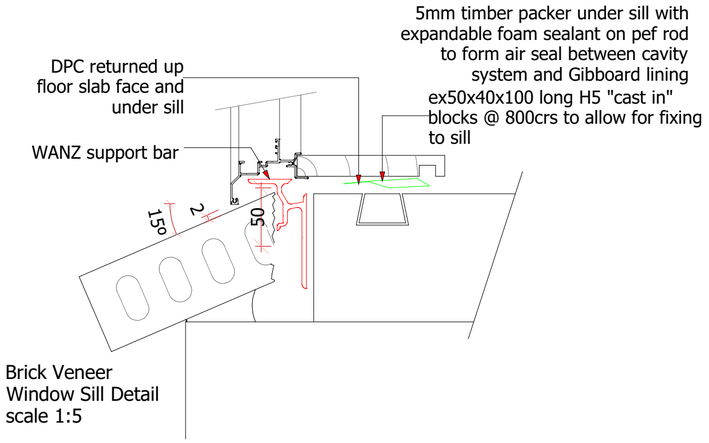
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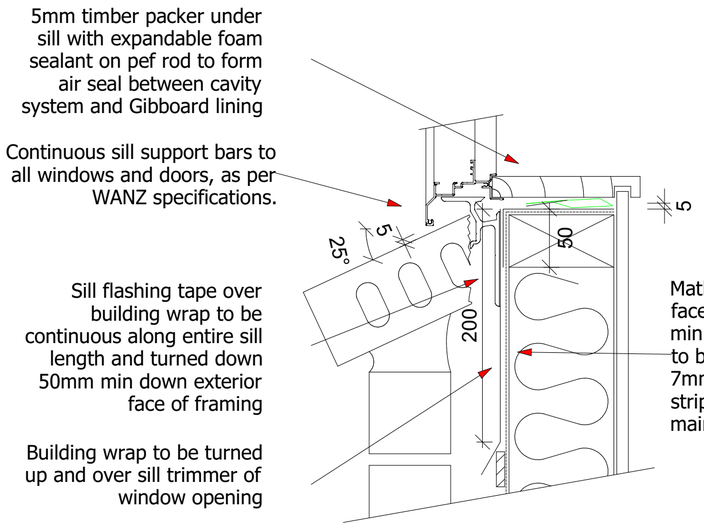
Brick Veneer Window Head to Soffit Detail
scale 1:5



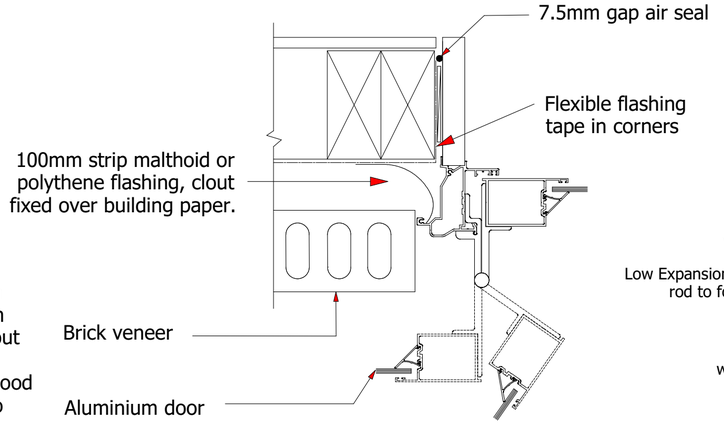
Brick Veneer Window Jamb Detail
scale 1:5



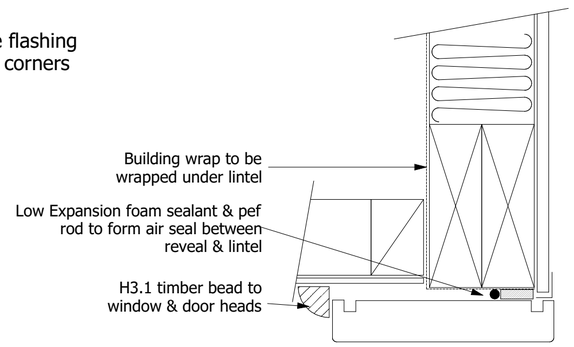
Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Door Jamb Detail (Aluminium)
scale 1:5



Garage Door Head to Soffit Detail
scale 1:5

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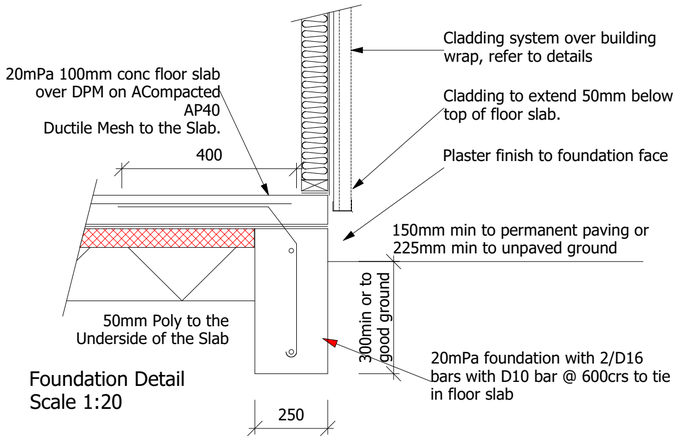
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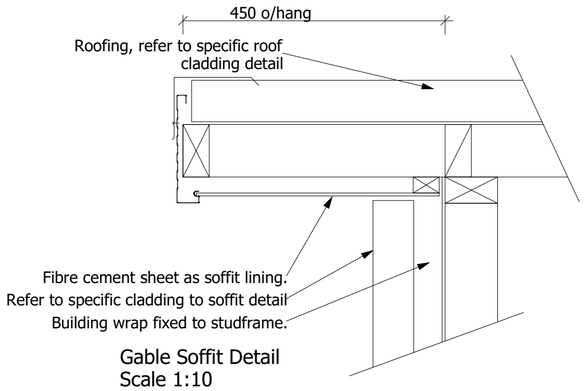
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Job Number: 2500
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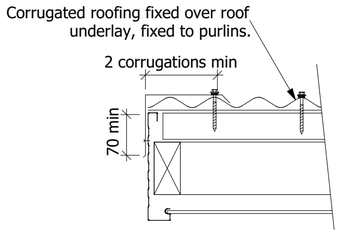
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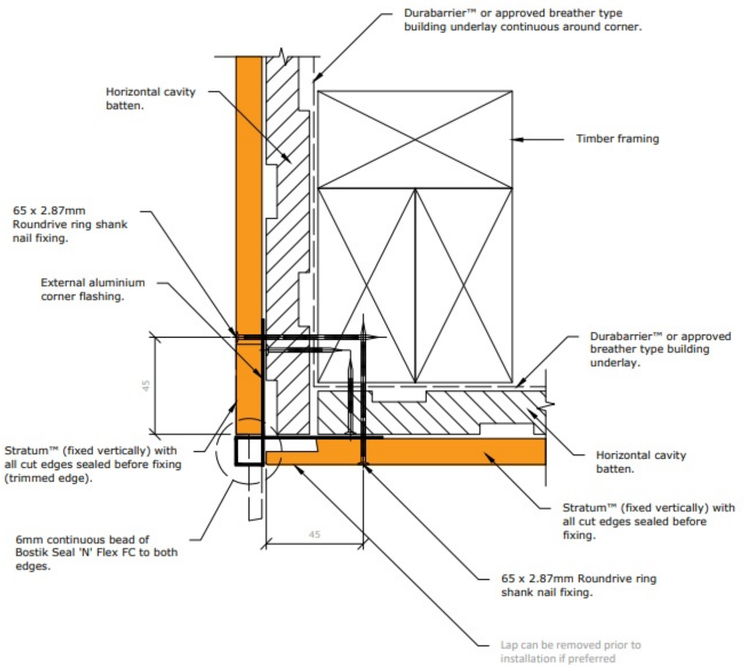
Foundation Detail
Scale 1:20



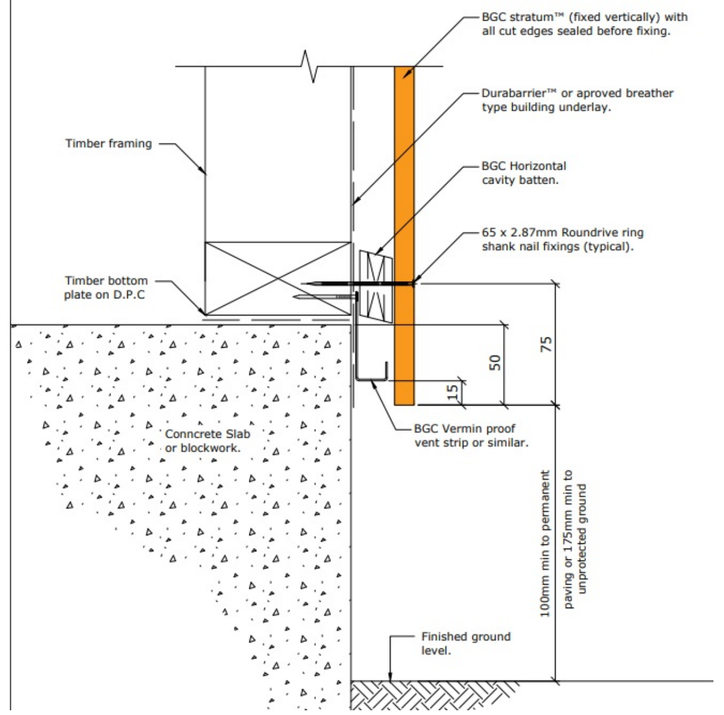
Gable Soffit Detail
Scale 1:10



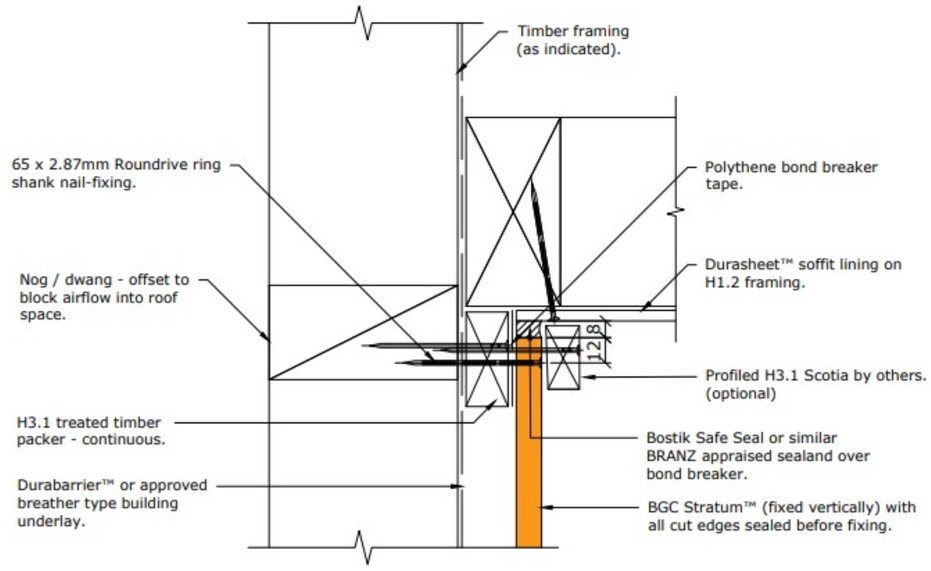
Gable Soffit Detail
Scale 1:10



External Corner Detail



Cladding Base Detail



Soffit Junction Detail

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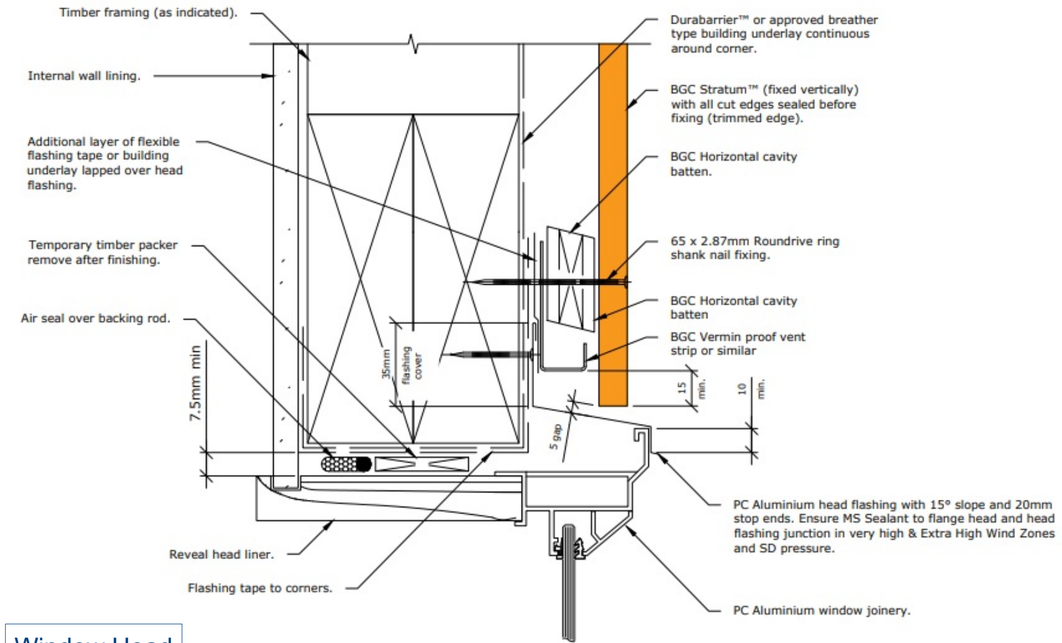
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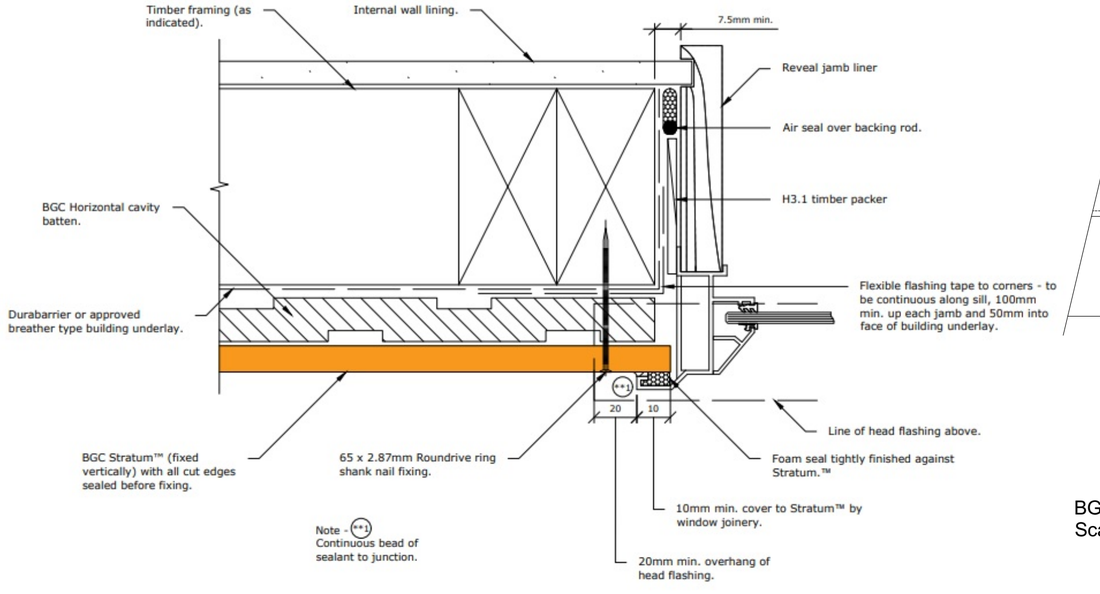
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SHEET: 12
OF: 15

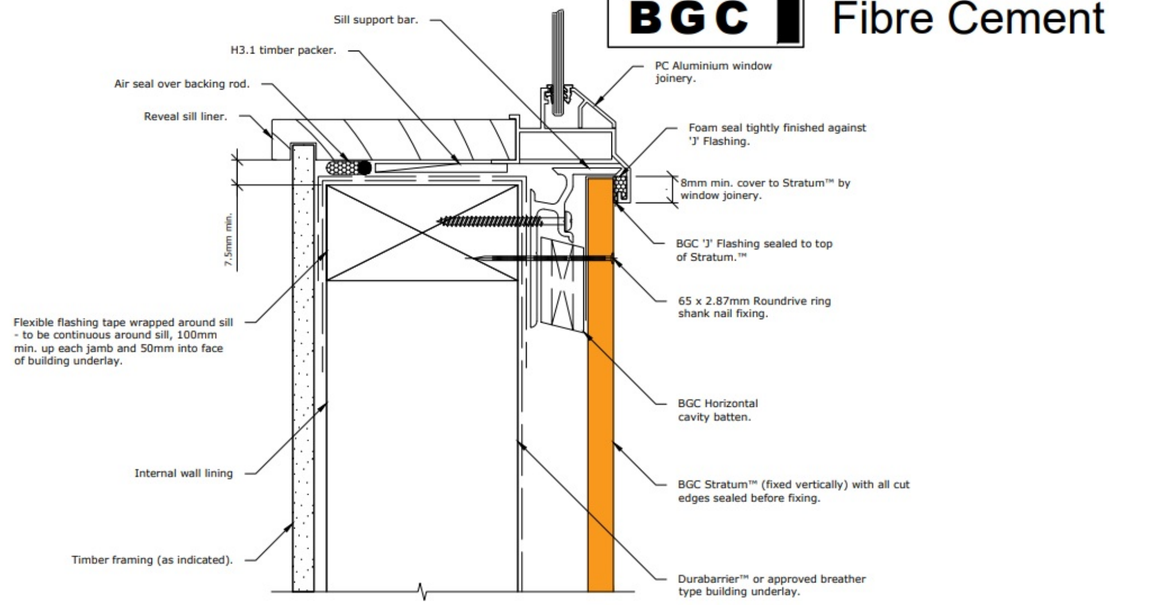
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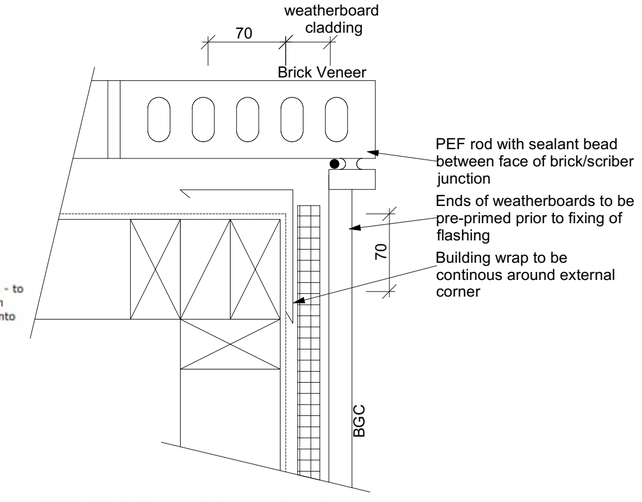
Window Head



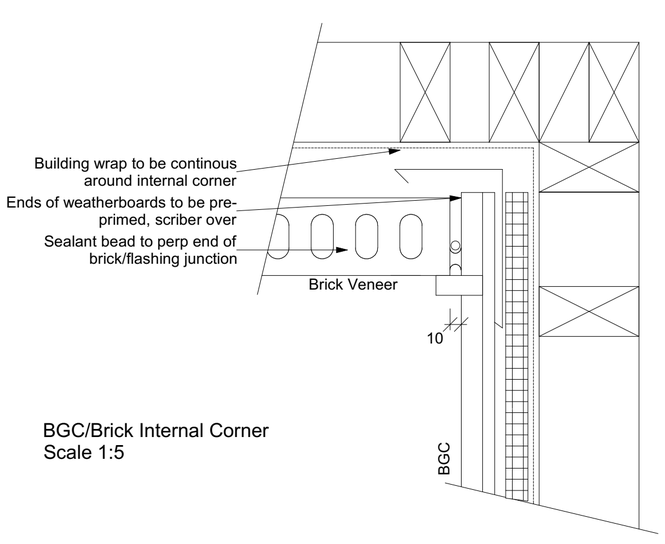
Window Jamb



Window Sill



BGC/Brick External Corner Detail
Scale 1:5



BGC/Brick Internal Corner
Scale 1:5

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Drawn: Jeremy Harrison LBP # 105491

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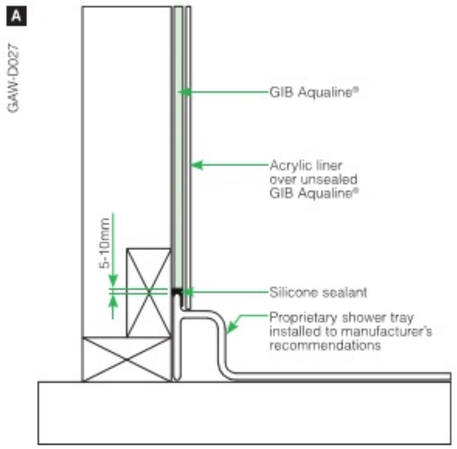
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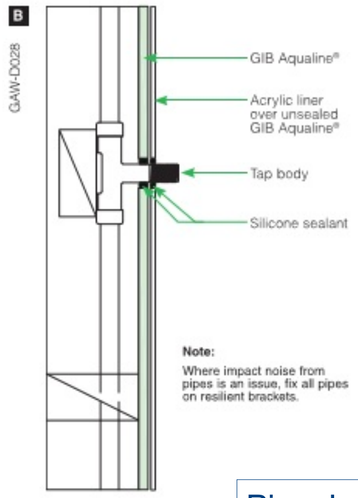
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OF: **15**

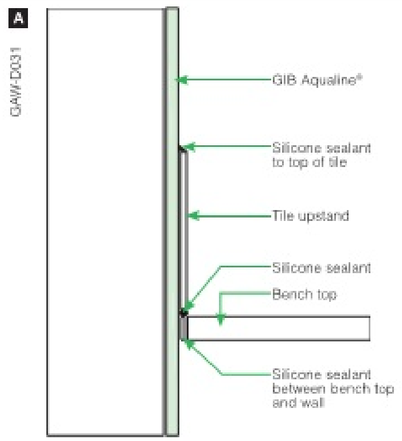
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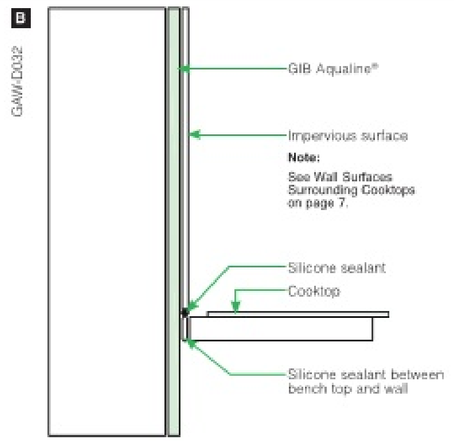
Shower Base



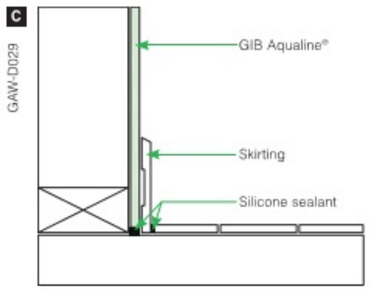
Pipe Junction



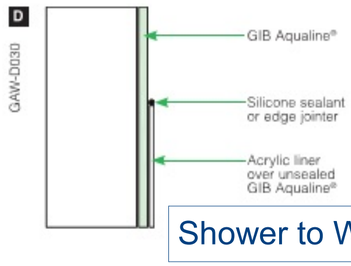
Bench top to wall



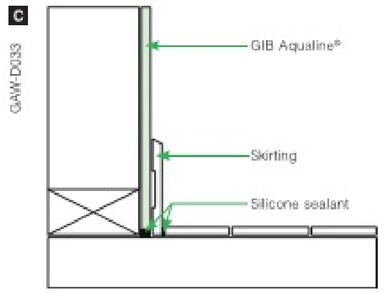
Bench top/ Cooktop to wall



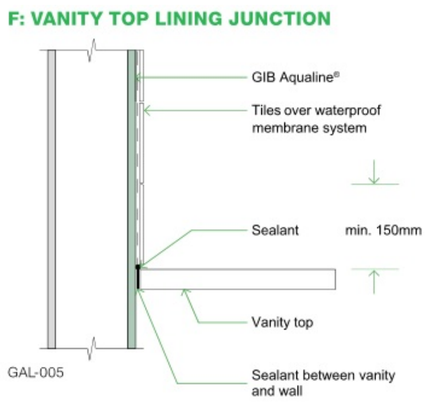
Skirting Detail



Shower to Wall



Skirting Detail









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Scale: varies

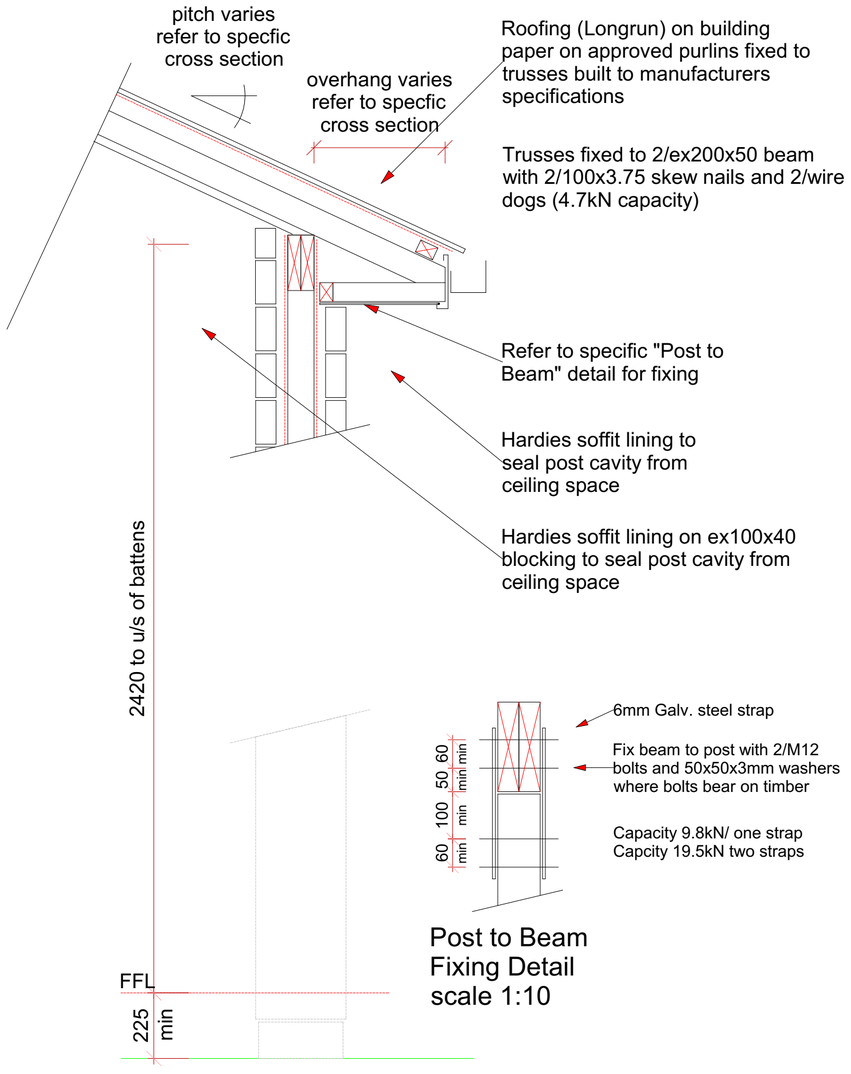
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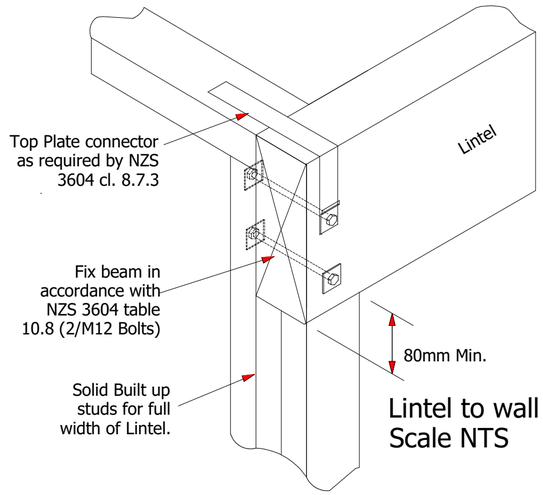
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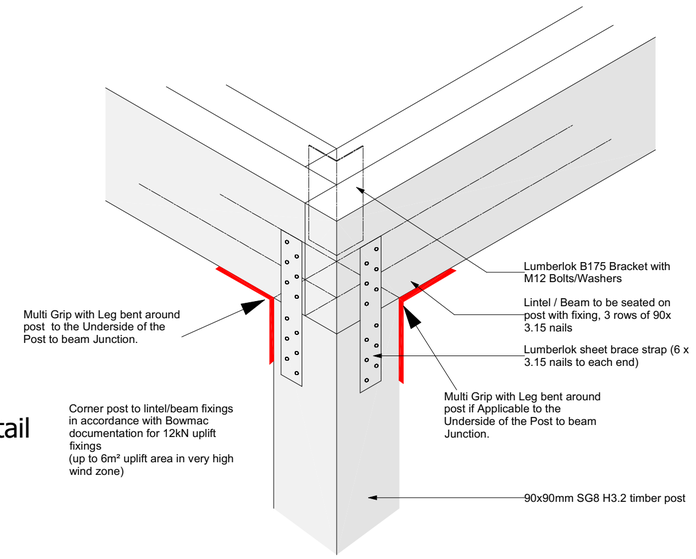
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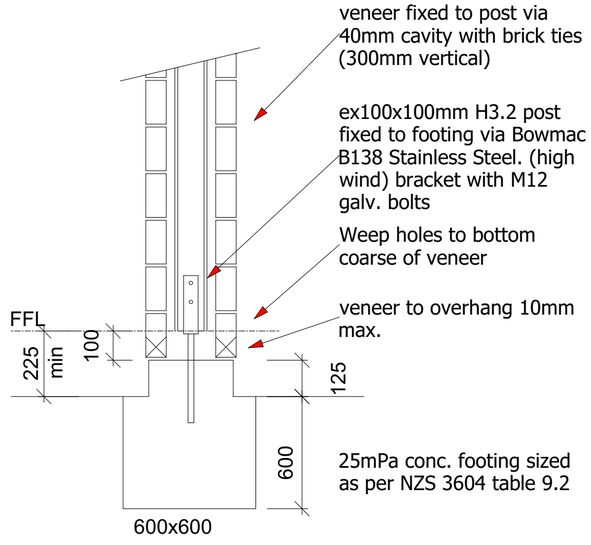


Post to Beam
Fixing Detail
scale 1:10



Lintel to wall detail
Scale NTS





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SPECIFICATION

of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

UWC Ltd

52 Benn St
Amberley

Date: 2 April 2025

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CONSTRUCTION SCHEDULE

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:
Waffle Slab Foundation

SG8
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: Lumberlok Bottom Plate Fixing Anchors as per manufacturer’s specifications @ 900mm crs on all external walls and within 150mm of each end of the plate. 75mmx4mmØ shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:
Exterior & Interior Loadbearing wall: 90x45mm studs @ 600 crs
Dwangs Ext: 90x45 @ 800crs
Non loadbearing: 90x45mm studs @ 600 crs
Dwangs Int: 90x45mm @ 800mm crs

Lintels: Lintels are shown on the Truss design. (All Lintels SG8 unless stated otherwise).

Building Wrap: Watergate building wrap with Aluband flexible flashing tape
Building wrap to be strapped @ 300crs between dwangs.

INSULATION, ENERGY EFFICIENCY:
Refer to H1 Schedule, Energy Efficiency Calculations
Exterior Walls: Batts – R 2.6 Wall
Ceilings: Batts – R6.6 Ceiling
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)
Purlins: 70x45 SG8 H1.2 @ 900crs (Fixings in specification)

Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated)
Fascia & Gutter system:
Refer to manufacturers specification attached,
Down pipes: 75x55mm Colorsteel
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 of loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.
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
Aqualine Gib with Enamel paint finish, refer to details attached.

KITCHEN JOINERY
Bench top –Melamine (High Pressure laminate), 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, Manrose SF 150)

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be
Interconnected and Located in each bedroom,
Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A)
and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

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
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

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Roof Pitch: As noted in the project information on the plan.
Maximum Catchment Area: 0º-25º =60m² as per NZBC E1/AS1 Table 5

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PRELIMINARIES AND GENERAL

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.

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PREPARATION AND GROUNDWORK

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.

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 (CONCTRETE AS PER ENGINEERS DESIGNS)

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

Bar Diameter	Lap
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.

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.

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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.

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CARPENTRY

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
Battens: Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip).
TIMBER TRUSSES
Moisture content at supply: 18%.

DAMPPROOF COURSE
2-ply/3-ply Kraft felt strip saturated and coated with bitumen.

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.

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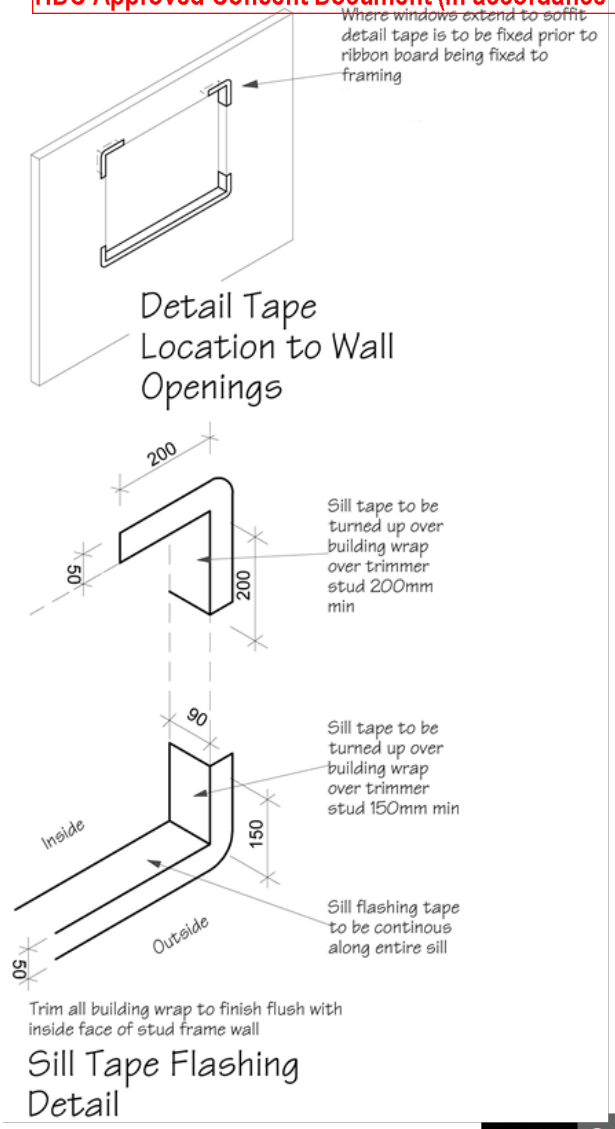
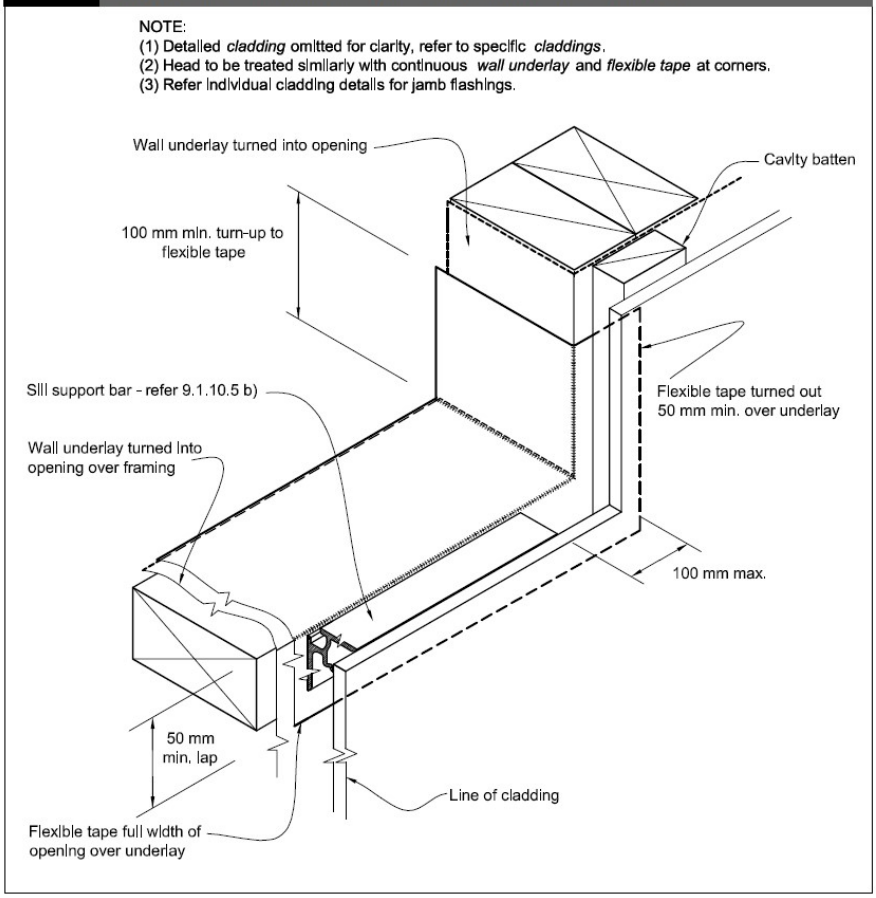


Figure 72B: **General window and door opening with drainage cavity**
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128



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BRICK VENEER CLADDING

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 5º 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 *damp-proof course* Bottom of veneer panel supported on steel angle lintel	Within 300 mm or two courses (whichever is the smaller) from bottom of veneer
Bottom of veneer panel in masonry rebate with *membrane damp-proof course*	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) Horizontal	Vertical	Tie type (4)(5)	Maximum spacings (1) 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.

METAL PROFILED ROOFING

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
NZ Metal Roof and Wall Cladding Code of Practice

QUALIFICATIONS
Roofers to be Approved Installers.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

PERFORMANCE
Install roofing material and associated flashings and accessories to form a weather tight and durable system.

SET-OUT
Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.

MARKING AND CUTTING PROFILED METAL ROOFING
Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

INSTALLING PROFILED METAL ROOFING
Install and fix 0.40 gauge roofing in accordance with NZ Steel's Installers Guide and to the Manufacturer Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.
Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

FLASHINGS GENERALLY
Formable grade 0.55 BMT for galvanised, aluminium/zinc and pre-coated steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to the Manufacturers standard flashing details.

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

NZBC E2/AS1 clause 4.5.2 Metal flashing joints
Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joins of metal flashings shall have the following features:
a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
i) compatible with the flashing material as per NZBC E2 Table 21 and Table 22, and ii) sealed against moisture, or iii) of a sealing type or blind rivet,
b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel, ii) 8 metres for copper, & iii) 8 metres for aluminium.
c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
d) Where necessary, expansion joints shall be formed as shown in Figure 6, with: i) minimum 200 mm laps, and ii) sliding clips at both sides of the lap.

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.

FASTENERS GENERALLY
Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

FIXING SCREWS
Screws appropriate to the roofing material and the supporting member, as recommended by the Manufacturer.

RIVETS
Sealed aluminium, minimum diameter 4 mm.

SEALANT
Neutral curing silicone or polymer sealant as required by the Manufacturer and used as directed.

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

CLOSURE STRIPS
Compressible, profiled, closed cell foam strips to fit the sheet profile.

LAP SEALING TAPE
Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

END LAPS
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

AVOID DAMAGE
Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

ENSURE COMPLETE
Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

Remove metal filings from roofing surfaces at least daily.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

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Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting's, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

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ALUMINIUM WINDOWS AND DOORS

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

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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INSULATION

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

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 Aqualine® 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
Battens:Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip
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

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.

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.

MOVEMENT CONTROL JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.

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CARPETING

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

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

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PAINT SYSTEMS TO EXTERIOR AREAS
Undercoat: Resene SpaceCote “Flat white”
Top coat: Resene SpaceCote “Flat white”

RAINWATER SYSTEMS

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/m^2) 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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HOT AND COLD WATER SYSTEM

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 50º) The storage water heater control thermostat shall be set at a temperature of not less than 50º 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.

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.

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 onsite supply 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:
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.

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

ELECTRIC HOT WATER CYLINDER

Brand/model number:	Rheem
Capacity:	250 litres

NZBC G12/AS1

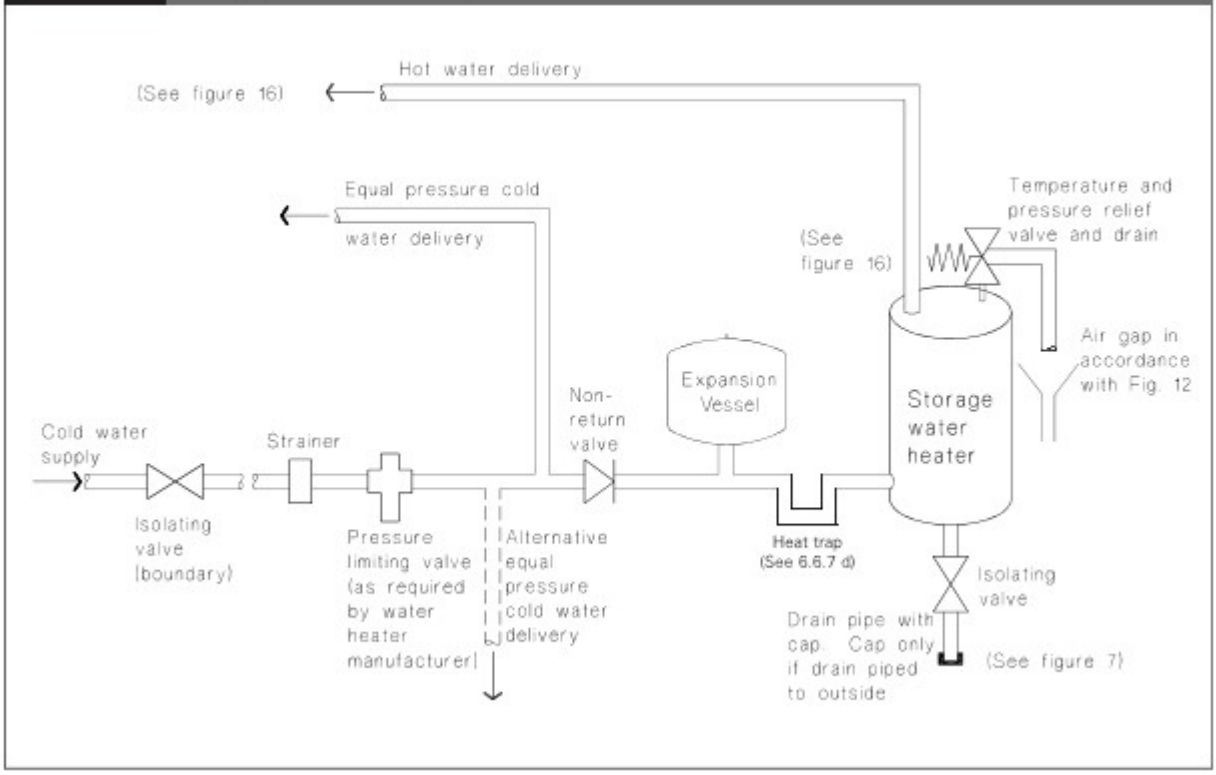
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Table 7: Water Supply Pipework Support Spacing
Paragraph 7.1.3

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

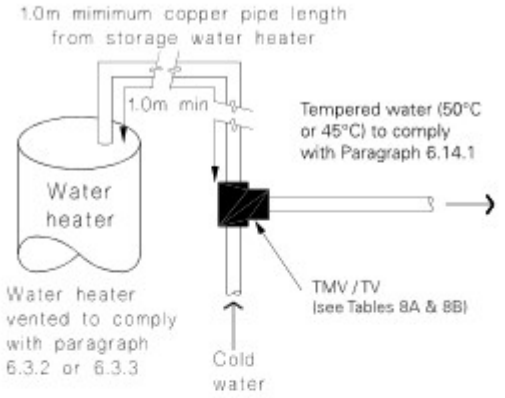
Note:
The spacing for these pipe materials is based on the pipes being located within the *building* structure.

Figure 8(a): Mains Pressure Storage Water Heater System (unvented) - Expansion Vessel
Paragraphs 6.1.2 and 6.2.1 c)

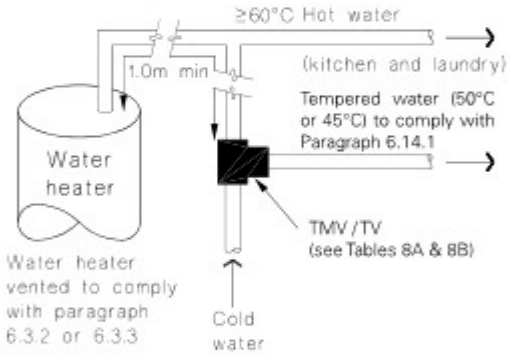


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Figure 16: Tempering Valve or Thermostatic mixing Valve Installation
Tables 8A and 8B



(a) Where all hot water is tempered



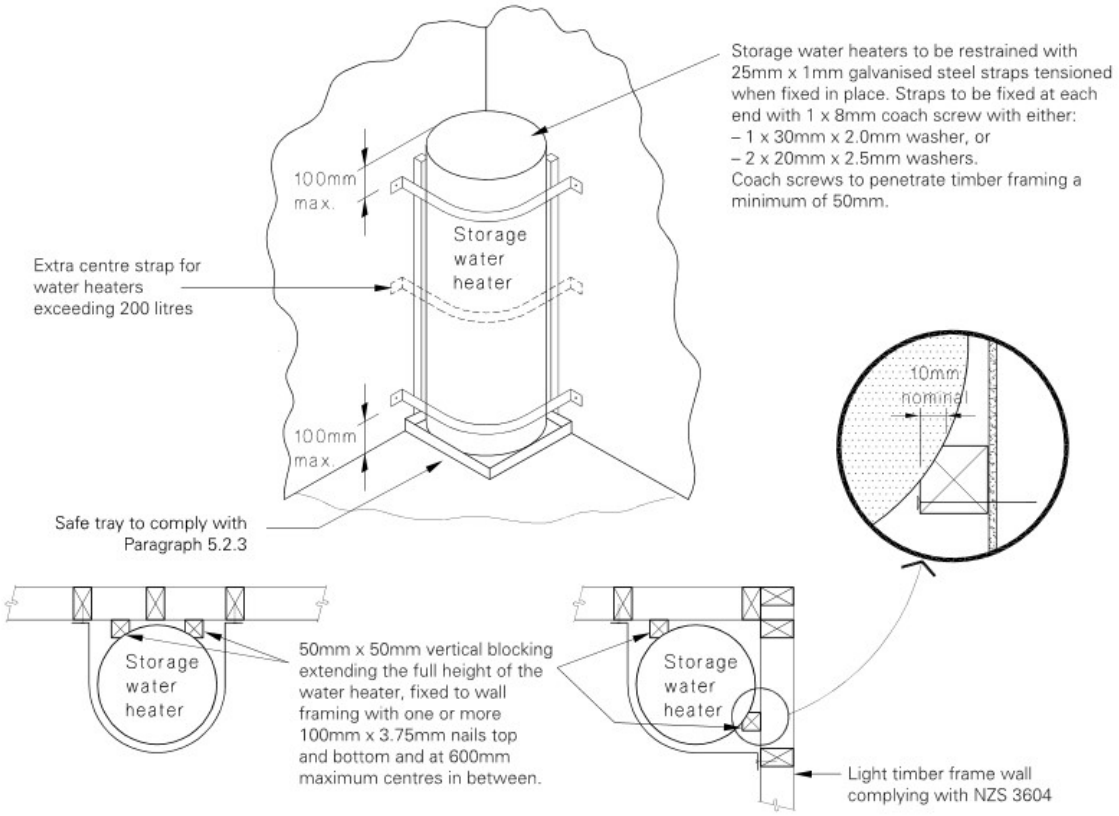
(b) With untempered hot water to laundry and kitchen fixtures and appliances

Notes:

1. For optimum system efficiency the temperature control device, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the temperature control device.
2. 1.0 m minimum copper pipe length from storage water heater to temperature control device.
3. Untempered hot water must not be provided to fixtures or appliances from a storage water heater that is connected to an uncontrolled heat source, such as a wet-back or solar water heater.

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Figure 14: Seismic Restraint of Storage Water Heaters 90 – 360 litres
Paragraph 6.11.4



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SANITARY PLUMBING

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.
Corrugated metal 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

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
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.

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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

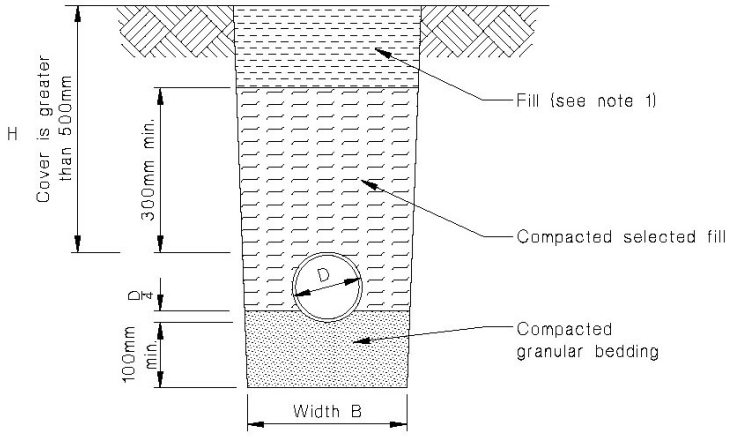
NZS 7643 Section 11 gives an acceptable method for ensuring watertightness of below ground uPVC drainage pipework.

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.

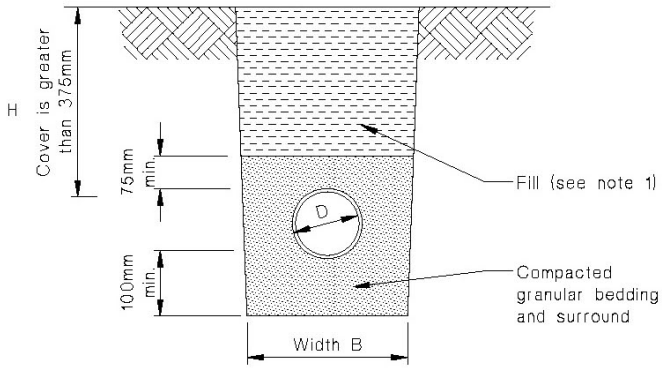
NZBC G13/AS2

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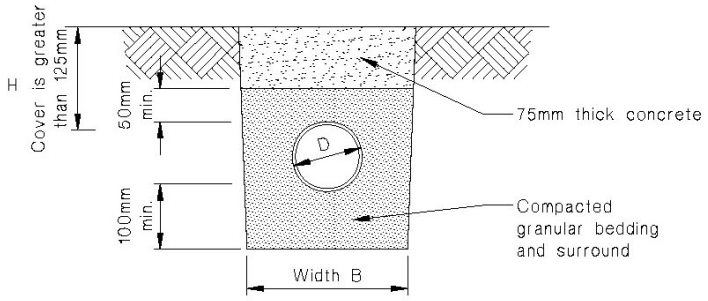
Figure 7: **Bedding and backfilling**
Paragraphs 5.2.1, 5.3.1 and 5.4.1



(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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ELECTRICAL

Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundering – 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
NZECP 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)

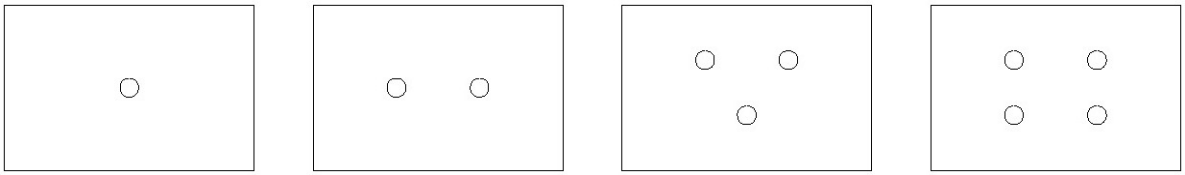
LIGHTING SCHEDULE (Minimum per area/room)

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 10m² 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 5m² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Single (1LF) Double (2 LF) Triple (LF) Quad (4 LF)

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 mm^2, 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.

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

HDC Approved Consent Document (In accordance with BA 2004, Sec. 49(1)) - Processed by : Mark Milnes - BC No. 250252

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 mm^2 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

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 personel. 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

(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

Date: **16 April 2025**

Fabricator: **VIP Frames & Trusses**

Job Name: **Brendon Esler Builders**
New House
Lot 79 52 Benn Street
Amberley

Building Consent No:_____
(Provided by relevant Consenting Authority at time of Consent application)

We have been engaged to provide the trusses and frames for the above project.
To allow completion of the consent application we have supplied the following information.

(a) Truss Layout and Producer Statement.
(b) Any slab thickening requirements detailed.
(c) All truss loaded lintels that are either inside or outside the requirements of NZS3604:2011.
(d) All roof bracing details as required by NZS3604:2011.

On advice from the building project owner, the structure will be designed under the following parameters:

Wind Zone	**Altitude**	**100m**
	Snow (Open Ground Load)	**0.900kPa**
Roof Material	**Snow (Basic Roof Load)**	**0.441kPa**

Treatment Definition:

External Walls -	H1.2 Treated
Internals Walls -	H1.2 Treated
Trusses -	H1.2 Treated

We can advise that the following will be provided at the time of truss manufacture to both the building owner and your office:

(1) A full 'as-built' layout and Producer Statement.
(2) Specific Truss/Truss fixings done as per NZS3604:2011,Clause 10.2.2.6.1
(3) Specific top plate to stud fixings that comply with NZS3604:2011, Table 8.18
(4) Specific lintel Fixings outside NZS3604:2011.

It should be noted that the details provided have been designed to comply with the Building Code and the relevant standards. Any increase above these standards is only at the preference and request of the building owner.

Acknowledgement of this letter, along with the Building Consent number, is required by our company as soon as possible.

Council Contacts:

Consents Officer: _____
Email #: _____
Phone: _____

Please forward to:

VIP Frames & Trusses
65-67 Wickham Street
Ph (03) 389-8200

Pre-consent Truss Design Agreement

By accepting this truss design from VIP Frames and Trusses you agree to the following

1) Truss designs are null and void if production is being completed by parties other than VIP Frame and Trusses

2) Truss design must be reviewed by the Architect and Engineer engaged on the project to ensure any crucial details are translated to the architectural and structural plans

3) Architect and Engineer review should also confirm plans have been interpreted correctly and the design is fit for purpose

4) Any bracing specified is indicative of location only and must be installed as per the manufacturers guidelines

MiTek New Zealand Limited

Correspondence from : **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Botany 2163
Phone: 09 274 7109
Fax: 09 274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03 348 8691
Fax: 03 348 0314

www.miteknz.co.nz

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.7

ISSUED BY: **MiTek New Zealand Limited**

TO: **VIP Frames & Trusses**

IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **400623** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20® truss design program has been developed by MiTek New Zealand Limited for the design of MiTek® timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20 ® are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution, to satisfy the requirements of Clause B1 of the New Zealand Building Code.

On behalf of MiTek New Zealand Limited, and subject to:

i) All proprietary products meeting their performance specification requirements
ii) The provision of adequate roof bracing and overall building stability
iii) Correct selection and placement of GANG-NAIL connector plates
iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
v) The design being undertaken by the accredited fabricator under the terms of the software licence
vi) Timber is graded to the requirements of NZS 3603:1993
vii) Minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003

I believe on reasonable grounds that the trusses, if constructed in accordance with the MiTek 20/20® truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than $500,000.

On behalf of MiTek New Zealand Limited, **Date: Wednesday, 16 April 2025**



In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **VIP Frames & Trusses**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	~MSGx45 H1.2	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron .5mm	Material:	Gib Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.210 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

The minimum timber treatment for these MiTek® trusses shall be in accordance with B2/AS1 Table 1A and the relevant sections of NZS 3602:2003. The timber for these MiTek® trusses shall be graded to the requirements of NZS 3603:1993. Proprietary fixings and timber connectors shall be selected in accordance with NZS3604:2011 Section 4 - Durability.

MiTek® Truss List

Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required
GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
GE1	1D	3370	25.000	900	J12	1	2331	25.000	900	*R2	4	913	25.000	900	S2	2	7385	25.000	900	J21	1	2267	25.000	900
*H1	2	7942	18.249	900	J14	1	1431	25.000	900	*R3	4	913	25.000	900	S5	1	3370	25.000	900	J26	1	2267	25.000	900
*H2	1	3635	18.249	900	J15	1	1431	25.000	900	*R4	1	1144	25.000	900	S6	1	3370	25.000	900	T3	1	7385	25.000	900
*H3	1	3242	18.249	900	J16	1	3231	25.000	900	*R5	1	913	25.000	900	S7	1	5060	25.000	900	J6	1	3231	25.000	900
*H4	2	5306	18.249	900	J17	1	3231	25.000	900	*R6	1	1080	25.000	900	S8	2	5060	25.000	900	J11	1	3231	25.000	900
J1	1	3231	25.000	900	J18	1	3167	25.000	900	*R7	1	1080	25.000	900	T2	1	10108	25.000	900	J19	1	3167	25.000	900
J2	2	3231	25.000	900	J20	1	2267	25.000	900	*R8	1	6260	25.000	900	T4	1	7385	25.000	900	J24	1	3167	25.000	900
J3	1	3231	25.000	900	J22	1	1367	25.000	900	*R9	5	1305	0.000	760	V1	1	2275	25.000	900	S4	1	6380	25.000	553
J4	1	3231	25.000	900	J23	1	1367	25.000	900	*R10	2	1305	0.000	760	V2	1	1375	25.000	900	S3	1	6380	25.000	900
J5	1	3231	25.000	900	J25	1	2267	25.000	900	*R11	1D	1305	0.000	900	V3	1	1402	25.000	900	T1	1	10108	25.000	900
J7	1	2331	25.000	900	J27	1	1367	25.000	900	*R12	1	2350	25.000	900	V4	1	2302	25.000	900					
J9	1	1431	25.000	900	J28	1	1367	25.000	900	*R13	1D	2350	25.000	900	J8	1	2331	25.000	900					
J10	1	1431	25.000	900	*R1	1	1144	25.000	900	S1	11	10108	25.000	900	J13	1	2331	25.000	900					

Total quantity : 88

The computer design input has been carried out by:

Signed: ..... Date: ...Wednesday, 16 April 2025....

Name of Detailer: Anton Musson Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

TRUSS FIXING SELECTION REPORT - Characteristic Loads

Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data)

MiTek® Truss List
Legend: * = detail only, ? = input only, ~~Txx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
GE1	1D	3370	K	0.995	0.572	Wide		No fixing selected
			A	0.645	0.153	Wide		No fixing selected
			I	1.057	0.847	Wide		No fixing selected
			H	0.865	0.671	Wide		No fixing selected
			G	1.438	0.983	Wide		No fixing selected
			J	1.131	0.000	Wide		No fixing selected
*H1	2	7942						Refer NZS3604:2011 Tables 15.6
*H2	1	3635						Refer NZS3604:2011 Tables 15.6
*H3	1	3242						Refer NZS3604:2011 Tables 15.6
*H4	2	5306						Refer NZS3604:2011 Tables 15.6
J1	1	3231	B	4.322	0.739	Cross	1	Pair of Wire Dog Staples
			G	0.607	0.416	Butt	1	Pair of 3.15d Nails
			D	3.662	2.462	Cross	1	Pair of Wire Dog Staples
			I	0.760	0.266	Cross	1	Pair of Wire Dog Staples
			E	1.527	1.100	Cross	1	Pair of Wire Dog Staples
J2	2	3231	B	4.452	1.267	Cross	2	Pair of Wire Dog Staples
			F	2.225	1.357	Butt	2	JH 47x90
			D	1.003	0.664	Butt	2	JH 47x90
J3	1	3231	B	4.253	0.944	Cross	1	Pair of Wire Dog Staples
			E	0.447	0.341	Butt	1	Pair of 3.15d Nails
			D	4.017	2.628	Cross	1	Pair of Wire Dog Staples
			G	0.460	0.201	Cross	1	Pair of Wire Dog Staples
J4	1	3231	B	4.397	1.244	Cross	1	Pair of Wire Dog Staples
			D	2.598	1.745	Butt	1	JH 47x90
			F	0.787	0.299	Cross	1	Pair of Wire Dog Staples
J5	1	3231	B	4.318	0.973	Cross	1	Pair of Wire Dog Staples
			E	0.446	0.342	Butt	1	Pair of 3.15d Nails
			D	3.757	2.526	Cross	1	Pair of Wire Dog Staples
			G	0.756	0.274	Cross	1	Pair of Wire Dog Staples
J7	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J9	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J10	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J12	1	2331	B	3.553	0.938	Cross	1	Pair of Wire Dog Staples
			F	1.618	1.006	Butt	1	JH 47x90
			D	0.672	0.414	Butt	1	Pair of 3.15d Nails
J14	1	1431	B	2.703	0.605	Cross	1	Pair of Wire Dog Staples
			F	0.785	0.337	Butt	1	Pair of 3.15d Nails
			D	0.768	0.515	Butt	1	Pair of 3.15d Nails
J15	1	1431	B	2.403	0.772	Cross	1	Pair of Wire Dog Staples
			E	0.644	0.291	Butt	1	Pair of 3.15d Nails
J16	1	3231	A	2.914	0.599	Cross	1	Pair of Wire Dog Staples
			E	0.599	0.416	Butt	1	Pair of 3.15d Nails
			C	4.235	2.688	Cross	1	Pair of Wire Dog Staples
			F	0.548	0.122	Cross	1	Pair of Wire Dog Staples
			D	1.571	1.103	Cross	1	Pair of Wire Dog Staples
J17	1	3231	B	4.369	0.995	Cross	1	Pair of Wire Dog Staples
			E	0.444	0.344	Butt	1	Pair of 3.15d Nails
			D	4.364	2.779	Cross	1	Pair of Wire Dog Staples
J18	1	3167	B	4.388	1.244	Cross	1	Pair of Wire Dog Staples
			D	3.160	1.980	Butt	1	JH 47x90
J20	1	2267	A	2.323	0.846	Cross	1	Pair of Wire Dog Staples
			E	1.701	0.988	Butt	1	JH 47x90
			C	0.591	0.403	Butt	1	Pair of 3.15d Nails
J22	1	1367	B	2.639	0.575	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.916	0.777	Butt	1	JH 47x90
J23	1	1367	B	3.056	0.240	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.148	0.964	Cross	1	Pair of Wire Dog Staples
J25	1	2267	B	3.491	0.914	Cross	1	Pair of Wire Dog Staples
			F	1.588	0.967	Butt	1	JH 47x90
			D	0.670	0.411	Butt	1	Pair of 3.15d Nails
J27	1	1367	B	2.650	0.585	Cross	1	Pair of Wire Dog Staples
			F	1.134	0.464	Butt	1	JH 47x90
			D	0.583	0.343	Butt	1	Pair of 3.15d Nails
J28	1	1367	B	3.092	0.245	Cross	1	Pair of Wire Dog Staples
			D	0.399	0.040	Butt	1	Pair of 3.15d Nails
			C	0.144	1.000	Cross	1	Pair of Wire Dog Staples
*R1	1	1144						Refer NZS3604:2011 Tables 15.6
*R2	4	913						Refer NZS3604:2011 Tables 15.6
*R3	4	913						Refer NZS3604:2011 Tables 15.6
*R4	1	1144						Refer NZS3604:2011 Tables 15.6
*R5	1	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1080						Refer NZS3604:2011 Tables 15.6
*R7	1	1080						Refer NZS3604:2011 Tables 15.6
*R8	1	6260						Refer NZS3604:2011 Tables 15.6
*R9	5	1305						Refer NZS3604:2011 Tables 15.6
*R10	2	1305						Refer NZS3604:2011 Tables 15.6
*R11	1D	1305						Refer NZS3604:2011 Tables 15.6
*R12	1	2350						Refer NZS3604:2011 Tables 15.6
*R13	1D	2350						Refer NZS3604:2011 Tables 15.6
S1	11	10108	B	9.159	5.111	Cross	11	CT400
			J	9.159	5.111	Cross	11	CT400
S2	2	7385	B	4.523	1.775	Cross	2	Pair of Wire Dog Staples
			N	0.925	0.970	Butt	2	JH 47x90
			K	8.575	5.861	Cross	2	CT400
S5	1	3370	B	3.699	1.904	Cross	1	Pair of Wire Dog Staples
			J	4.068	2.028	Cross	1	Pair of Wire Dog Staples
			F	2.250	0.956	Cross	1	Pair of Wire Dog Staples
S6	1	3370	B	3.665	1.870	Cross	1	Pair of Wire Dog Staples
			I	4.324	2.159	Cross	1	Pair of Wire Dog Staples
			F	1.064	0.818	Cross	1	Pair of Wire Dog Staples
S7	1	5060	B	3.498	1.534	Cross	1	Pair of Wire Dog Staples
			F	1.122	0.492	Wide		No fixing selected
			H	4.757	3.090	Wide		No fixing selected
S8	2	5060	B	5.039	2.592	Cross	2	Pair of Wire Dog Staples
			F	4.133	2.525	Cross	2	Pair of Wire Dog Staples
T2	1	10108	B	9.035	5.136	Cross	1	CT400
			I	9.035	5.136	Cross	1	CT400
T4	1	7385	B	4.986	2.271	Cross	1	Pair of Wire Dog Staples
			N	2.297	0.899	Butt	1	JH 47x90
			K	6.526	4.324	Cross	1	CT400
V1	1	2275	A			Wide		No fixing selected
V2	1	1375	A			Wide		No fixing selected
V3	1	1402	A			Wide		No fixing selected
V4	1	2302	A			Wide		No fixing selected
J8	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J13	1	2331	B	3.745	1.475	Cross	1	Pair of Wire Dog Staples
			F	1.719	1.167	Butt	1	JH 47x90
J21	1	2267	A	2.480	1.183	Cross	1	Pair of Wire Dog Staples
			E	1.725	1.054	Butt	1	JH 47x90
J26	1	2267	B	3.652	1.245	Cross	1	Pair of Wire Dog Staples
			F	1.597	1.037	Butt	1	JH 47x90
T3	1	7385	B	4.403	1.916	Cross	1	Pair of Wire Dog Staples
			M	13.702	8.722	Cross	1	CT400
			Q	3.704	2.686	Butt	1	JH 47x90
J6	1	3231	B	5.668	2.358	Cross	1	Pair of Wire Dog Staples
			H	4.122	2.637	Butt	1	JH 47x90

VIP Frames & Trusses

Job: 400623
Client: Brendon Esler Builders
Phone:
Site: New House
Lot 79 52 Benn Street
Amberley
Description: Truss Layout and Producer Stat
Building Consent No.:
Phone:

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J11	1	3231	B	4.017	2.220	Cross	1	Pair of Wire Dog Staples
			F	3.910	2.915	Cross	1	Pair of Wire Dog Staples
J19	1	3167	B	5.652	2.278	Cross	1	Pair of Wire Dog Staples
			F	4.084	2.503	Butt	1	JH 47x90
J24	1	3167	B	5.541	2.265	Cross	1	Pair of Wire Dog Staples
			F	3.926	2.487	Butt	1	JH 47x90
S4	1	6380	A	5.659	5.127	Cross	1	CT400
			E	5.979	3.859	Cross	1	CT400
S3	1	6380	A	10.408	6.430	Cross	1	CT400
			E	11.250	6.490	Cross	1	CT400
T1	1	10108	B	17.770	10.733	Cross	1	CT400
			G	14.701	8.763	Cross	1	CT400

Fixing List

Qty	Selected Fixing
59	Pair of Wire Dog Staples
19	Pair of 3.15d Nails
23	JH 47x90
34	CT400
12	No fixing selected

Note:
1) Fixings have been selected based on loading only. Please check that selected fixings are practical for each situation and that appropriate nailing can be applied on site.
2) Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data) with down and uplift characteristic loads of at least the values shown for each joint.

Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

Design Certificate

PROJECT

Project Name	**Brendon Esler Builders**
Project Address	Lot 79 52 Benn Street , Amberley

CALCULATION SUMMARY

Calculation Name	Product Code	Description	Product Length*
Garage Door	PL12H1-350100	Prolam 315x90 Non-Visual PL12 H1.2	5.0 m
VERANDA	PL10H1-200100	Prolam 190x90 Non-Visual PL10 H1.2	3.2 m

*Confirm required length with architectural drawings and/or on site prior to ordering. Non-bracing post lengths noted exclude footing embedment (if any).

1) GARAGE DOOR

Product Code	**PL12H1-350100**	Calculator	Lintel Supporting Multiple Girder Trusses
Product Description	Prolam 315x90 Non-Visual PL12 H1.2	Product Length	5.0 m

Lintel Span	**4.8 m**
Loaded Dimension	**3.2 m**
Supported Roof Width	**6.2 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Wet in Service	**No**

Snow Zone	**N4**
Site Elevation	**100**
Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**315 mm**
Member Width	**90 mm**
Max. Movement	**10.8 mm**
Deflection	**5.1 mm**
Capacity Ratio	**1.1**
Rigidity Ratio	**1.1**
Support Reaction	**12.3 kN**
Uplift Restraint Required	**6.5 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

2) VERANDA

Product Code	**PL10H1-200100**	Calculator	Lintel Roof and Ceiling
Product Description	Prolam 190x90 Non-Visual PL10 H1.2	Product Length	3.2 m

Lintel Span	**3.0 m**
Loaded Dimension	**2.4 m**
Eaves Width	**0.60 m**
Stud Height	**2.4 m**
Lintel Head Height	**2.1 m**
Roof Pitch	**25.0 °**
Building Type	**House**
Importance Level	**IL2**
Wind Zone	**High**
Snow Zone	**N4**
Site Elevation	**100**
Wet in Service	**No**

Roof Type	**Light (0.25 kPa)**
Ceiling Type	**Standard (0.15 kPa)**

Member Depth	**190 mm**
Member Width	**90 mm**
Max. Movement	**4.9 mm**
Deflection	**2.7 mm**
Capacity Ratio	**1.8**
Rigidity Ratio	**2.4**
Support Reaction	**5.4 kN**
Uplift Restraint Required	**2.9 kN**

Notes

Deflection is long-term deflection measured below horizontal after the upward pre-camber has been taken out under load. Maximum movement is absolute member deflection excluding pre-camber.

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Certificate Number	Certificate Date	Project Reference
jshCNTb39q	16 April 2025	400623

PRODUCER STATEMENT

Tasman Consulting Engineers Limited has been engaged by Prowood Limited to provide the design services that are as used for the Prolam on-line calculator (the Prolam Specifier). The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS 1170, NZS AS 1720.1:2022 and with reference to NZS 3604:2011. This producer statement covers that design work.

Provided that the Prolam Specifier has been used correctly and that all entered values are correct I believe, on reasonable grounds, that the resulting design will meet the requirements of NZBC clause B1 (structure) as an alternative means of verification.

Substitution of the Prowood products listed is not provided for and if substitution occurs then this statement is nullified.

28 March 2025 (3.1.0)

David King
ME(civil) CMEngNZ CPEng(no 145511) IntPE(NZ)
For Tasman Consulting Engineers, PO Box 3631, Richmond, NELSON 7050

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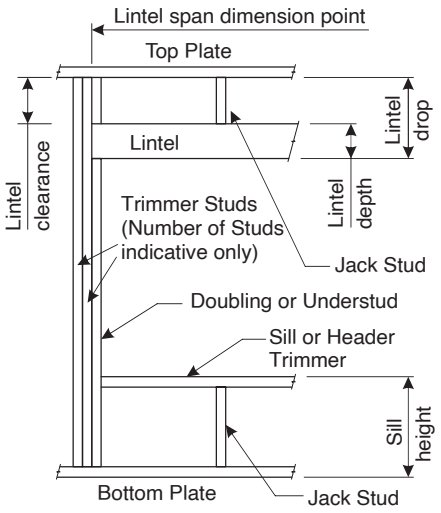
LINTEL FIXING SCHEDULE

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 0.20kPa
- 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
8.6m²	G	G	H	G	G	H
11.6m²	G	H	H	G	G	H
12.1m²	G	H	H	G	H	H
15.3m²	H	H	-	G	H	H
19.1m²	H	-	-	G	H	-
20.9m²	H	-	-	H	H	-
21.8m²	H	-	-	H	-	-
34.3m²	-	-	-	H	-	-

NOTES:

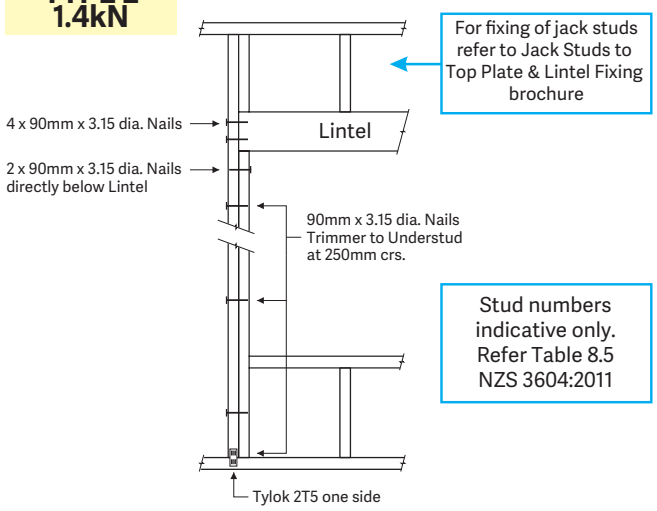
1. Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
2. Assumed girder truss is at mid-span or middle third span of lintel
3. Use similar fixings for both ends of lintel
4. All other cases require specific engineering design

Selection Chart for Lintel Fixing											
Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	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	H
	4.0	F	G	H	-	-	E	F	G	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	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	-	E	F	G	H	H
	4.0	F	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	H	H	E	F	G	G	H
	3.0	F	G	H	H	-	E	F	G	H	H
	3.5	F	G	H	-	-	E	F	G	H	-
	4.0	G	G	H	-	-	E	F	H	H	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-
5.4	2.0	F	F	G	H	H	E	F	G	G	H
	2.8	F	G	H	H	-	E	F	G	H	H
	3.0	F	G	H	-	-	E	F	G	H	-
	4.0	G	H	H	-	-	E	F	H	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
	6.0	G	H	-	-	-	E	G	H	-	-

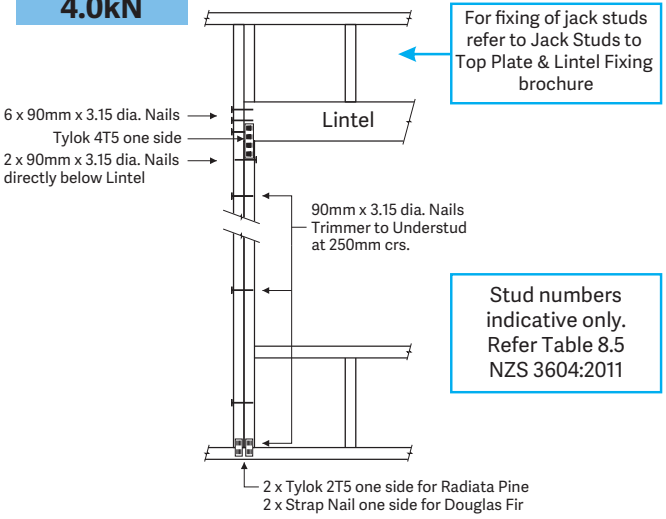
LINTEL FIXING OPTIONS

(Characteristic Uplift)

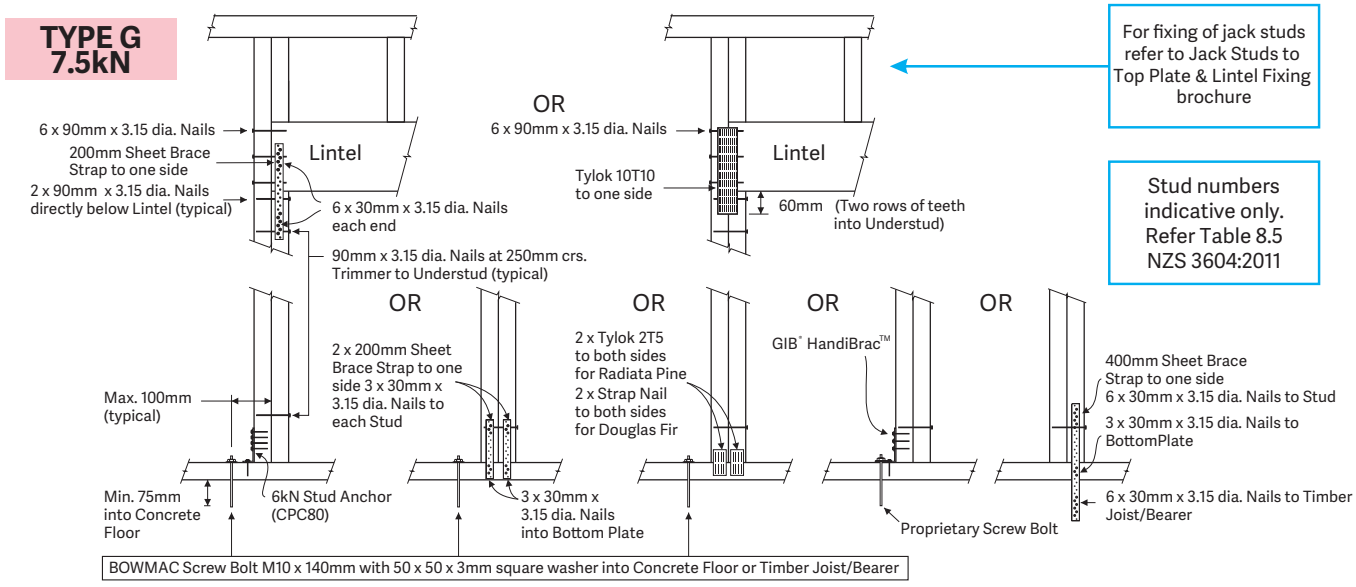
TYPE E 1.4kN



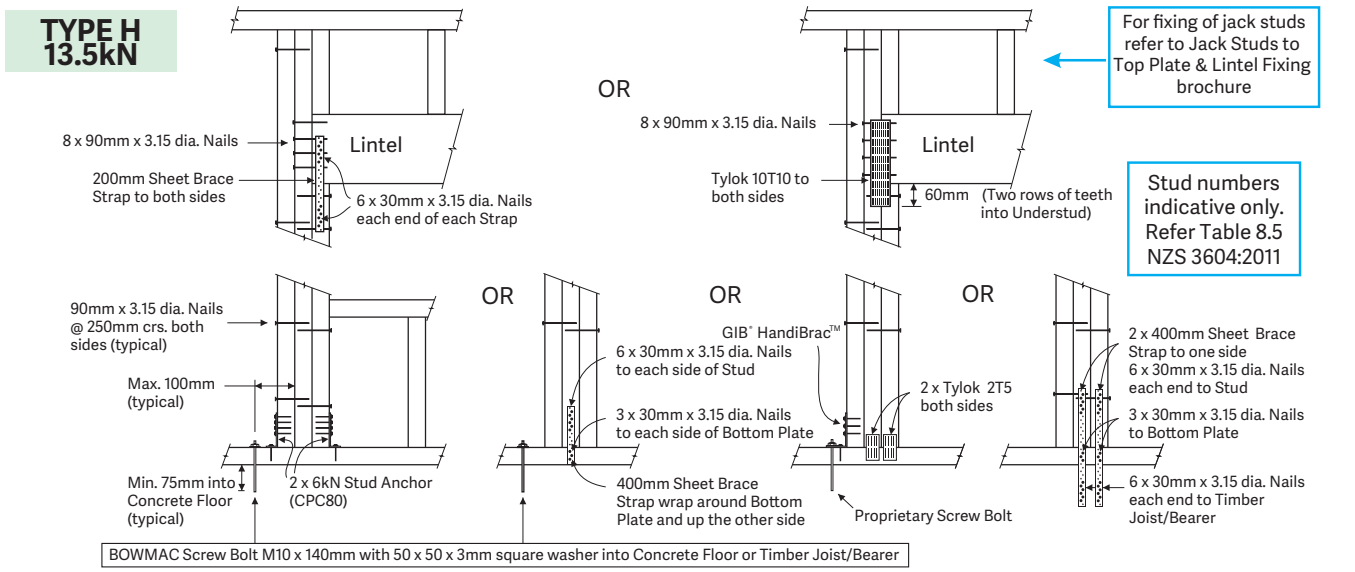
TYPE F 4.0kN



TYPE G 7.5kN



TYPE H 13.5kN



MiTek® Truss: S1

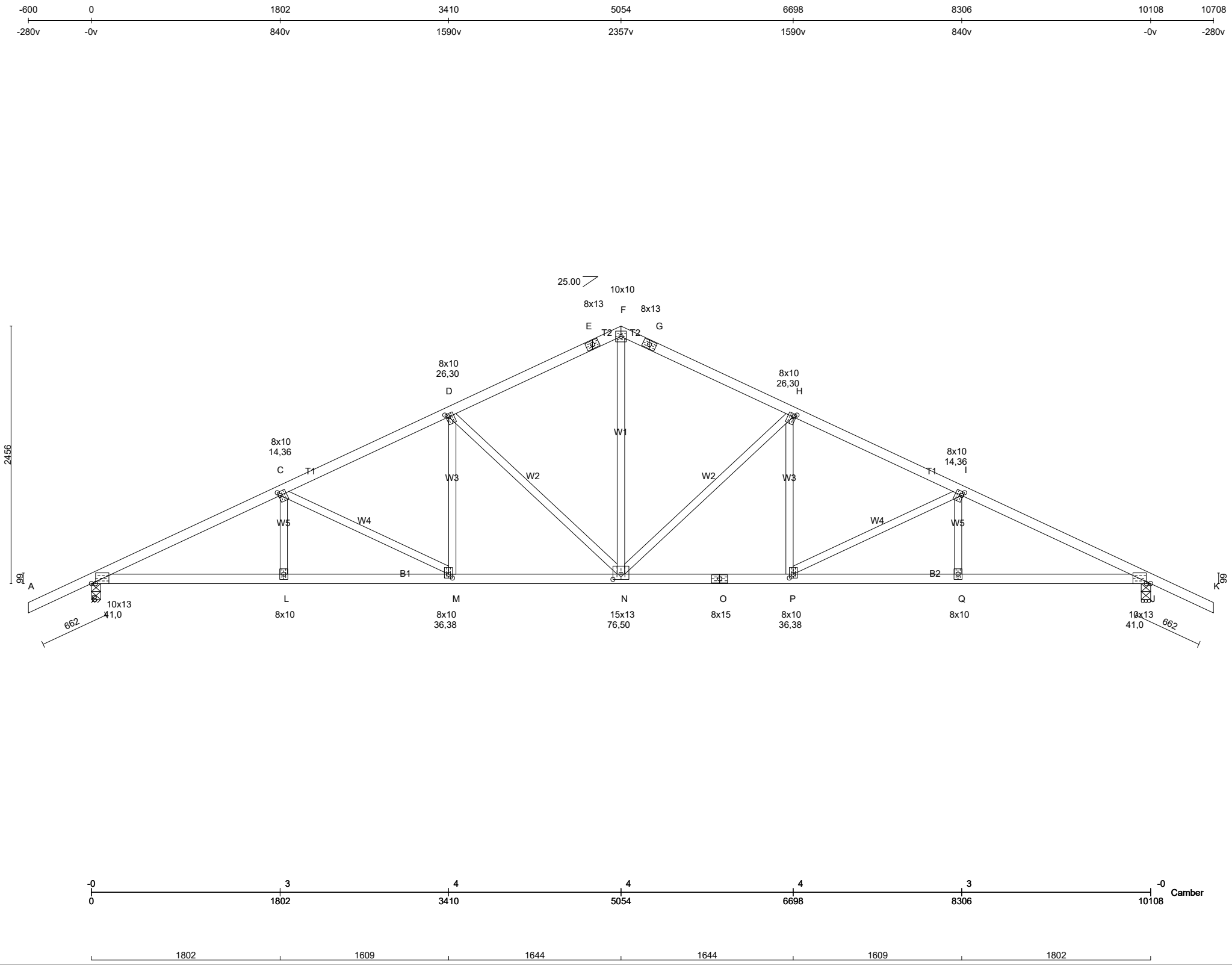
VIP Frames & Trusses

Qty: 11 of 11 **Ply: 1** **Bundle: None**
Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

Client: Brendon Esler Builders
Phone:

Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:



*** Designed with warnings ***

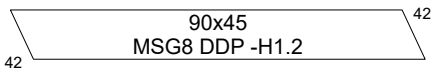
Uplift at joint(s) B and J exceeds the capacity of two wire dogs. Please ensure that adequate fixing is provided
All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2736 mm

CHORDS
All: 90x45 DDP MSG8 H1.2

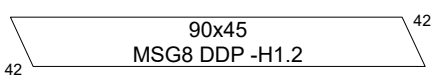
WEBS
All: 70x45 DDP MSG6 H1.2

CONNECTORS
176 of 176/GNQ-8x10
22 of 22/GNQ-10x10
44 of 44/GNQ-8x13
22 of 22/GNQ-8x15
44 of 44/GNQ-10x13
22 of 22/GNQ-15x13

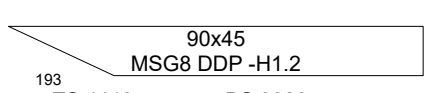
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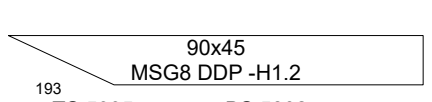
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Piece: T1 — 22/22 Off


OL:5980 TS:5939 BS:5939

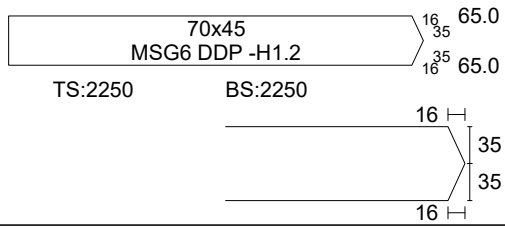
Piece: B2 — 11/11 Off


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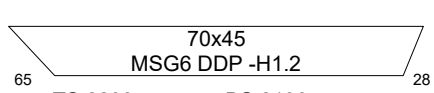
Piece: B1 — 11/11 Off


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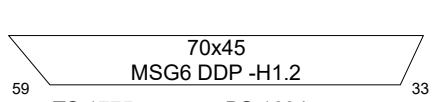
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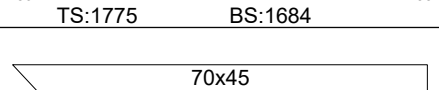
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Piece: W2 — 22/22 Off


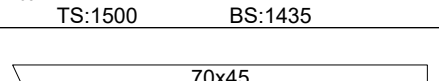
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Piece: W4 — 22/22 Off


OL:1775 TS:1775 BS:1684

Piece: W3 — 22/22 Off


OL:1500 TS:1500 BS:1435

Piece: W5 — 22/22 Off


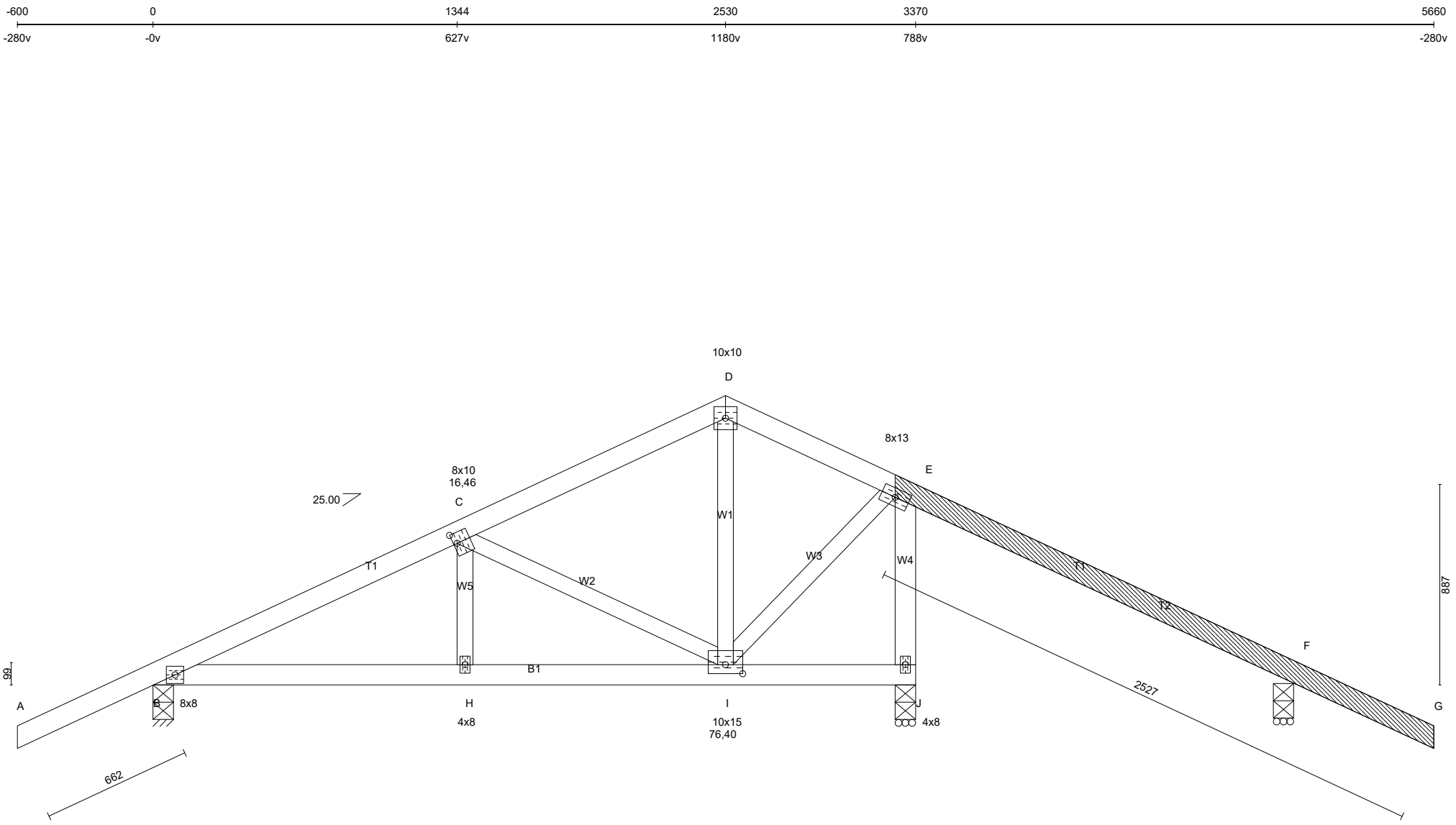
OL:750 TS:750 BS:717

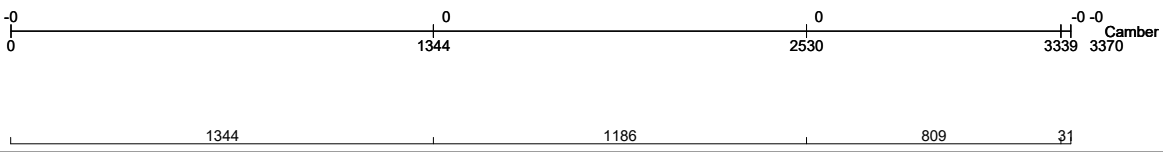
Qty: 1 of 1 **Ply: 1** **Bundle: None**
Job: 400623
Description: Truss Layout and Producer Stat
Building Consent No.:

Client: Brendon Esler Builders
Phone:

Site: New House
Lot 79 52 Benn Street
Amberley

Job: 400623
Phone:





Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1559 mm

CHORDS		**WEBS**	
All:	90x45 DDP MSG8 H1.2	**All:**	70x45 DDP MSG6 H1.2
CONNECTORS			
4 of 4/GNQ-4x8	2 of 2/GNQ-8x8	2 of 2/GNQ-8x10	2 of 2/GNQ-8x13
2 of 2/GNQ-10x10	2 of 2/GNQ-10x15		
SCAB NAILING			
T2	2 rows of 90 x 2.8 dia. nails at 80 mm		

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 1/1 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:2668 TS:2626 BS:2626

Piece: T1 — 2/2 Off
90x45 MSG8 DDP -H1.2
65.0 | 42 | 42 | 65.0
OL:3495 TS:3453 BS:3453

Piece: B1 — 1/1 Off
90x45 MSG8 DDP -H1.2
25.0 | 193 | 90.0
OL:3370 TS:3370 BS:3177

===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 1/1 Off
70x45 MSG6 DDP -H1.2
50.0 | 59 | 33 | 65.0
OL:1270 TS:1270 BS:1178

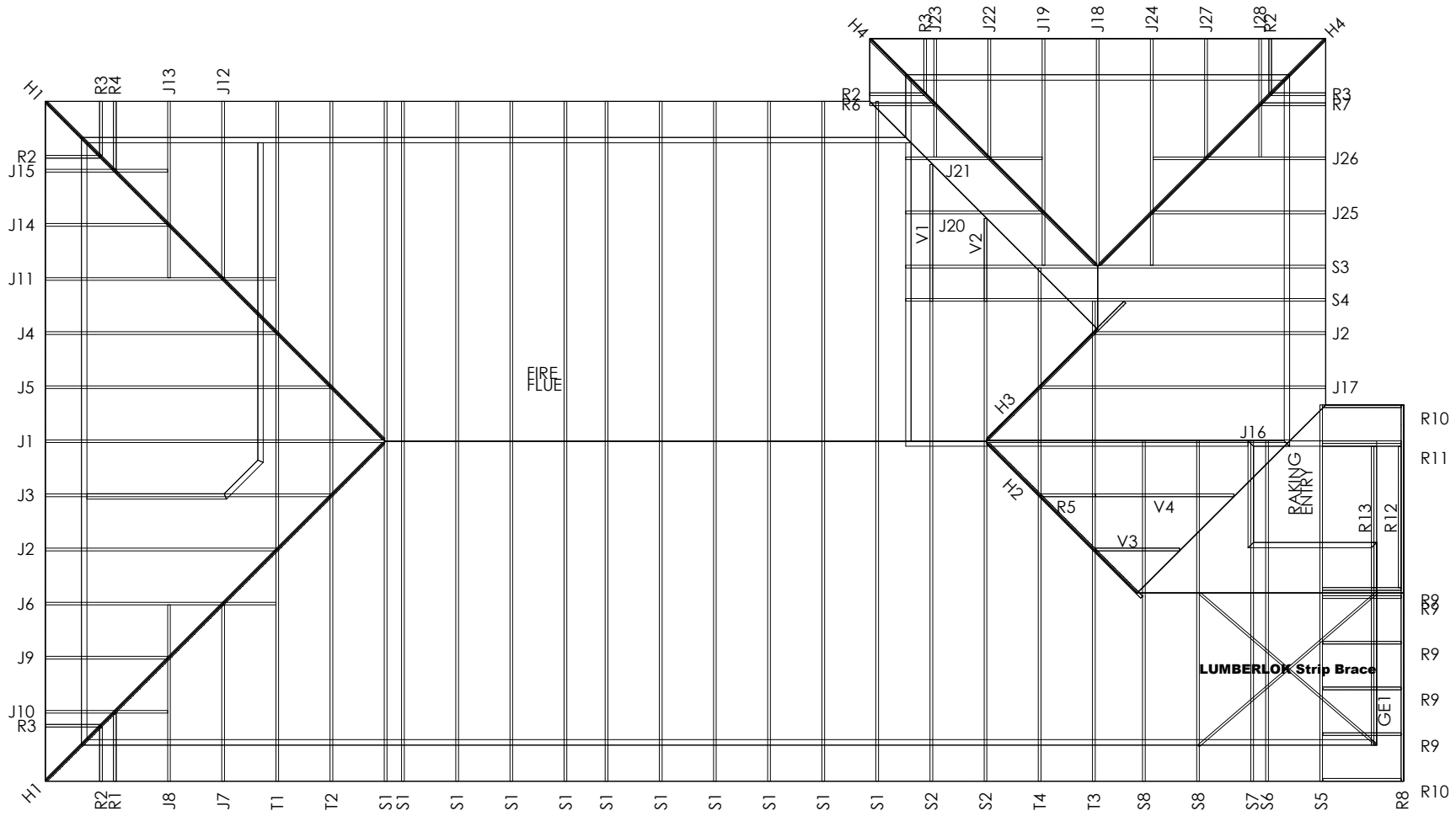
Piece: W1 — 1/1 Off
90.0
70x45 MSG6 DDP -H1.2
16 | 35 | 65.0
16 | 35 | 65.0
OL:1090 TS:1073 BS:1073
16
35
35
16

Piece: W3 — 1/1 Off
70x45 MSG6 DDP -H1.2
44.0 | 72 | 24 | 71.0
OL:1029 TS:1029 BS:932

Piece: W5 — 1/1 Off
70x45 MSG6 DDP -H1.2
65.0 | 33 | 90.0
OL:537 TS:537 BS:504

Piece: W4 — 1/1 Off
90.0
90x45 MSG8 DDP -H1.2
42 | 65.0
OL:740 TS:698 BS:740

Roof Bracing



VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

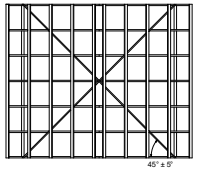
Client: Brendon Esler Builders
Job Name: New House
Address: Lot 79 52 Benn Street
Amberley

Pitch: 25.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.441

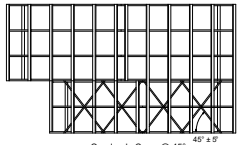
Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson
DATE 16 Apr,2025 PAGE 1 of

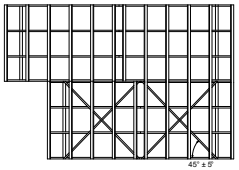
Roof Bracing Details



Single Cross @ 45°



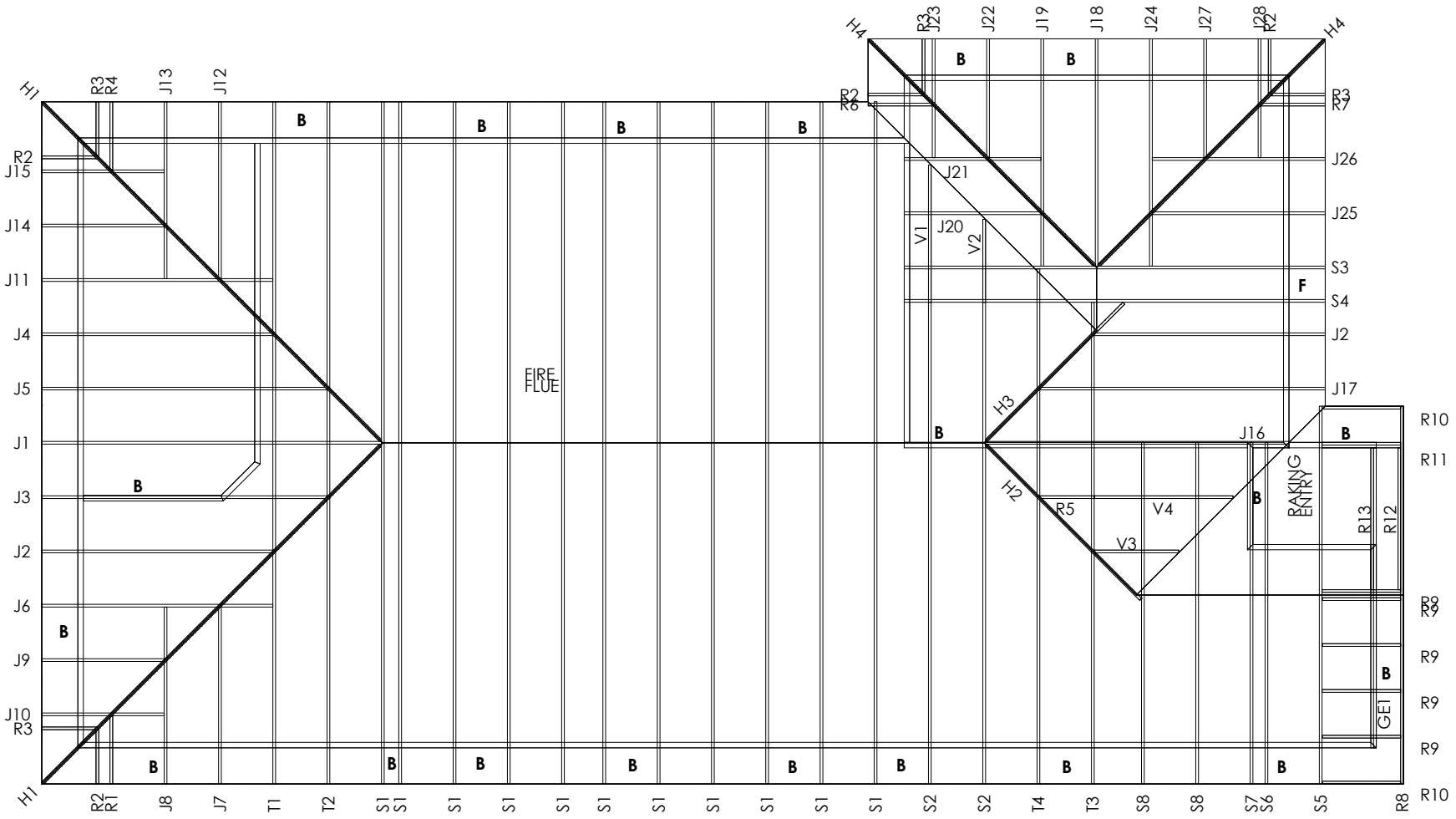
Quadruple Cross @ 45°



Double Cross @ 45°
(as diagram above)

NOTES:
Refer to:
Lumberlok roof bracing brouchure
07/2006

All internal wall shown on this layout are considered to be Load Bearing(loads not exceeding 10 kN)
No slab thickening required



VIP Frames & Trusses
AUCKLAND | PALMY | CHRISTCHURCH

65 Wickham St.
PO Box 19-765,
Christchurch

91 Adams Drive,
Pukekohe,
Auckland

64 Malden Street
Palmerston North

0800 PRENAIL
(0800 7736245)

JOB No **400623**

Client: Brendon Esler Builders
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Address: Lot 79 52 Benn Street
Amberley

Pitch:	25.000
Roof Material:	Galv Iron .5mm
Soffit Overhang:	600
Wind Area:	High
Snow Load:	0.441

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Anton Musson

DATE 16 Apr,2025 PAGE 1 of

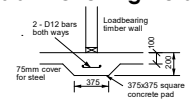
These lintels have been sized as per the GANGLAM and FLITCH BEAM selection manuals as provided by MiTek NZ Ltd.

HYSPAN lintels have been sized as per the HYSPAN selection charts.

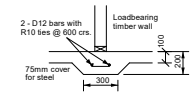
Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	SG8
B	140x90	PL10
C	190x90	PL10
D	240x90	PL10
E	290x90	PL10
F	315x90	PL12

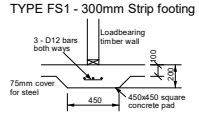
Slab Thickening Details



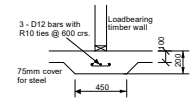
TYPE FP1 - 375x375mm Pad



TYPE FS1 - 300mm Strip footing



TYPE FP2 - 450x450mm Pad



TYPE FS2 - 450mm Strip footing

GoGet Consent Processing Summary Report

Consent No: 250252

Site Address: 52 Benn Street, Amberley

Description: New 4 bedroom dwelling with Wood Burner

Checklist/Elements	Status	Notes	Processed By
Pre-consent	Pass		Madeline Blacktopp
MagiQ Items to Set	Pass		MRB
Confirm Formally Received Status has been set	Pass		MRB
Confirm Formally Received Date field is completed	Pass		MRB
Owner/agent details	Pass		MRB
Fixed fee category	Pass		MRB
Are PIM checks required?	Pass		MRB
PIM & Processing Locations required	Pass		MRB
Do you think Trade Waste is required?	N/A		MRB
Building	Pass		MRB
Planning	Pass		MRB
Utilities	Pass		MRB
Roading	N/A		MRB
Health / Tradewaste	N/A		MRB
Simpli Vetting Checklist	Pass		MRB
Update LF Form Vetting Checklist	Pass		MRB
Record of Title to invoice?	N/A		MRB
Contacts removed in GoGet (CoA only)	N/A		MRB
1 Storey Dwelling	Pass		Mark Milnes
General	Pass		MSM
Property File Information Considered	Pass	Considered - no issues noted	MSM
New building work	Pass	Building work has not been started - Confirmed	MSM
Building Complexity	Pass	R1 - Residential outbuilding & ancillary building; Single storey detached dwelling (SH) designed to a common standard (NZS 3604, NZS 4229) risk matrix score less than or equal to 6	MSM
PIM Information Considered	Pass	Considered - PIM complete and PIM notes added to consent	MSM
Service Plan Review	Pass	Services locations & type correct as per plans provided	MSM
Earthquake zone	Pass	Earthquake zone 3	MSM
Altitude	Pass	Altitude 35-36m	MSM
Snow zone & load	Pass	Snow zone 4	MSM
Wind zone	Pass	Wind zone A	MSM
Exposure zone	Pass	Exposure zone C medium	MSM
Ground	Pass	Liquefaction very low potential Zone 3	MSM
Wind speed	Pass	Wind speed High	MSM
Importance level	Pass	Importance level 2	MSM
Building use - Schedule 2 Building Regulation 2005	Pass	Building use SH	MSM
Procedure for inspections included	Pass	Yes - HDC inspections scheduled as required	MSM
Are record/s of works completed correctly	Pass	Designer - all aspects of their design included correctly	MSM
Modular components BuiltReady	N/A		MSM
Registered Product Certificates	N/A	All well known products used in building industry in local area	MSM
Alternative plans/specifications for pre-	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
approval			
Alternative product certificates provided for pre-approval	N/A		MSM
Exisiting drainage	N/A		MSM
Building Act 2004 Sections	Pass		MSM
Sec 28 - Cases Involving Bans	Pass	None identified in documents	MSM
Sec 30 A -H - National multiple-use approval	N/A		MSM
Sec 50 - Refusal of application for building consent	N/A		MSM
Sec 99A - Refusal of application for Certificate of Acceptance	N/A		MSM
Sec 67 - Waivers or Modifications	Pass	None requested in application	MSM
Sec 71-74 - Building on Land Subject to Natural Hazards	N/A		MSM
Sec 75 - Building on 2 or More Allotments	N/A		MSM
Sec 102 - When compliance schedule must be issued	N/A		MSM
Sec 112 - Alterations to Existing Buildings	N/A		MSM
Sec 133AT - Alterations to buildings subject to EPB notice	N/A		MSM
Sec 113 - Specified Intended Life	Pass	Specified as Indefinite but not less than 50 years;	MSM
Sec 114 - Change of use	Pass	New building - no requirement	MSM
Sec 116A - Subdivision	Pass	N/A - no subdivision required as part of this application	MSM
NZ Building Code Handbook	Pass		MSM
A1 Classified Use	Pass	Housing - Detached dwelling	MSM
B1 Structure	Pass		MSM
Foundations	Pass	Means of compliance - AS1 Standard NZS 3604:2011 - Fig 7.13 (b) - in-situ concrete	MSM
Good Ground	Pass	Means of compliance - AS1 300mm min foundation depth (top soil) Excavation inspection to be carried out to confirm good ground.	MSM
Floor Slab and mesh	Pass	Means of compliance - AS1 100mm 500E mesh reinforced concrete	MSM
DPM	Pass	Means of compliance - AS1 250 micron 1 ply polyethylene sheet	MSM
Steel concrete cover	Pass	Means of compliance - AS1 Adequate support, min 30mm to concrete top surface	MSM
Supplementary bars	Pass	Means of compliance - AS1 Positions comply (Fig. 7.18)	MSM
Shrinkage control	Pass	Means of compliance - AS1 Saw-cuts - positions comply (Fig 7.19) Crack inducer - positions comply (Fig 7.19) see sht 5	MSM
Slab thickenings (see truss design data)	N/A		MSM
Piles (incl. bracing)	N/A		MSM
Bearers	N/A		MSM
Floor joists	N/A		MSM
Load-bearing walls	Pass	Means of compliance - AS1 All loads transferred to exterior walls/footings	MSM
Stud centres (ground level)	Pass	Means of compliance - AS1 SG8 90 x 45mm @ 600mm crs	MSM
Long studs	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
Lintels	Pass	Means of compliance - AS1 By truss manufacturer - see drawings and PS1	MSM
Bracing (ground level)	Pass	Means of compliance - AS1 GIB "Ezybrace" system	MSM
Brace calculations	Pass	Means of compliance - AS1 See specification - calculations all OK	MSM
Bracing distribution	Pass	Means of compliance - AS1 Sufficiently even bracing distribution - complies	MSM
Ceiling Diaphragms	N/A		MSM
Support beams	N/A		MSM
Trusses	Pass	Means of compliance - VM1 Proprietary timber trusses - refer manufacturer's details and PS1	MSM
Trusses - Truss point loads	Pass	Means of compliance - VM1 All truss types loading to exterior walls/foundations	MSM
Trusses - Truss fixings	Pass	Means of compliance - VM1 Proprietary manufacturer's fixings - see dwgs and PS1	MSM
Timber rafters	Pass	Means of compliance - AS1 Top chord of truss for verandah 90 x 45 as per Truss design	MSM
Rafter fixings	N/A	Top chord of truss for verandah	MSM
Purlins/tile battens	Pass	Means of compliance - AS1 SG8 70 x 45mm on flat @ 900mm crs less than or equal to 900mm span	MSM
Purlin/batten fixings	Pass	Means of compliance - AS1 1/10g self-drilling screw, min 80mm long	MSM
Roof bracing	Pass	Means of compliance - AS1 Lumberlok "Multi-brace" cross bracing (complies with Sec. 10.4)	MSM
Gable braces	Pass	Means of compliance - AS1 Lumberlok "Multi-brace" cross bracing (complies with Sec. 10.4)	MSM
Ceiling battens/restraints	Pass	Means of compliance - AS1 70 x 35mm timber @ less than or equal to 600mm crs less than or equal to 900mm span	MSM
Entry columns/beams	Pass	Means of compliance - AS1 100 x 100mm timber Entry beam: 140 x 90 PL10	MSM
Verandah Posts	Pass	Means of compliance - AS1 100 x 100mm timber	MSM
Footing sizes (uplift)	Pass	Means of compliance - AS1 600 x 600 x 600 sized as per NZS 3604 table 9.2 Bowmac B138 Stainless Steel	MSM
Verandah beams	Pass	Means of compliance - AS1 verandah beam 315 x 90 PL12	MSM
Timber rafters	N/A		MSM
Deck piles	N/A		MSM
Deck Bearers	N/A		MSM
Deck joists	N/A		MSM
Decking	N/A		MSM
Retaining walls	N/A		MSM
Siting/surcharge	N/A		MSM
Stair construction	N/A		MSM
Footings and construction	N/A		MSM
Solid fuel heater compliance	Pass	Means of compliance - NZS2918:2001	MSM
Non Clean-Air-approved burner model	N/A		MSM

Checklist/Elements	Status	Notes	Processed By
Clean-air approved burner model	Pass	Means of compliance - AS/NZS 2918:2001 Metro Xtreme Rad freestanding (dry)	MSM
Clean air approved number	Pass	Clean air approved number #200998	MSM
Hearth/Slab	Pass	Means of compliance - AS/NZS 2918:2001 Steel floor protector	MSM
Chimney/flue	Pass	Means of compliance - AS/NZS 2918:2001 Foley 150mm dia. S/S flue kit	MSM
Fire/Flue Durability applications	Pass	Means of compliance - AS1 Grade 304 S/S flue system - 15 years	MSM
B2 Durability	Pass		MSM
Fixings	Pass	Quality Means of compliance - AS1 materials from reputable manufacturers specified as required	MSM
Durability evaluation	Pass	Means of compliance - AS1 Quality materials from reputable manufacturers	MSM
Durability; materials suitable for application	Pass	Means of compliance - AS1 Durability of all materials specified suitable for proposed applications - OK	MSM
Timber treatments - In ground	N/A		MSM
Timber treatments - Sub-floor	N/A		MSM
Timber treatments - Floor	N/A		MSM
Timber treatments - Ext. trims	Pass	Means of compliance - AS1 H3.2	MSM
Timber treatments - Cavities	Pass	Means of compliance - AS1 H3.1	MSM
Timber treatments - Plywood	Pass	Means of compliance - AS1 H3.2	MSM
Timber treatments - Interior wall framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Exterior wall framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Roof framing	Pass	Means of compliance - AS1 H1.2	MSM
Timber treatments - Exterior deck piling	N/A		MSM
Timber treatments - Exterior deck framing	N/A		MSM
C1 - C6 Protection from Fire	Pass		MSM
Solid Fuel heater (heat transfer)	Pass	Means of compliance - AS/NZS 2918:2001 Manufacturer's test approved clearances provided	MSM
Woodburner make and model	Pass	Means of compliance - AS/NZS 2918:2001 Make: Metro Model: Xtreme Rad	MSM
Risk group assessed	Pass	Means of compliance - AS2 SH	MSM
Fire protection system	Pass	Means of compliance - AS2 Suitable fire protection system not shown as required Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms required --- RFI Details --- C1-C6 Protection from Fire Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms as required C/AS1 --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:11pm ---	MSM

Checklist/Elements	Status	Notes	Processed By
		complies - wireless inter-connected domestic smoke alarms as required	
Consent RFI			
Request: C1-C6 Protection from Fire Please amend sheet 2 to specify a suitable Type 1 wireless inter-connected domestic smoke alarms as required C/AS1			MSM
Response: Sheet 2 revised			MSM
Escape path lengths	Pass	Means of compliance - AS2 Match protection system Yes	MSM
Distance to boundary (1m min)	Pass	Means of compliance - AS2 Greater than 1m, 30 min life rating achieved	MSM
Life/Property rating system	Pass	Means of compliance - AS2 Allowable unprotected areas correct	MSM
D1 Access Routes	Pass		MSM
Slip resistance to external access	Pass	Means of compliance - AS1 Broomed/wood floated conc. compliant with Table 2 see sht 9	MSM
Stair	N/A		MSM
Tread and risers	N/A		MSM
Handrails	N/A		MSM
D2 Mechanical Access	N/A	No mechanical installations for access detailed as part of this building consent application.	MSM
E1 Surface Water	Pass		MSM
Acceptable Solution Suitable	Pass	Ecan Flood Assessment not required	MSM
Protection from flooding	Pass	Adequate contours to direct surface water away - OK	MSM
Minimum FFLs	Pass	Adequate FFL height above road crown(150mm min) +475mm	MSM
Gutters	Pass	Quad/box ext gutters - comply with E1 Fig. 15	MSM
Down pipes	Pass	Standard downpipes - comply with E1, Table 5	MSM
Discharge pipe size	Pass	100mm diameter	MSM
Pipe gradients: mains	Pass	1:120 minimum	MSM
Soak pit/other	Pass	Standard soak pit - comply with E1, Para. 9 and Fig. 13 Donnie confirmed ok	MSM
ECAN Ctby land and water rule 5.96	N/A		MSM
Driveway drainage	Pass	FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to overflow drain from soak pit to kerb --- RFI Details --- E1 Surface water: FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to overflow drain from soak pit to kerb --- Customer Response --- Sheets 1 and 6 revised Sheet 6 will be in Donnies reply --- Council Response - Accepted - MSM - 7 Aug 2025 4:13pm --- sheet 1 & 6 revised comply E1/AS1	MSM
Consent RFI			
Request: E1 Surface water: FYI driveway channel sump not feed soak pit, rather place sump opposite side of driveway and feed to			MSM

overflow drain from soak pit to kerb			
Response: Sheets 1 and 6 revised Sheet 6 will be in Donnies reply			MSM
Retaining wall drainage	N/A		MSM
E2 External Moisture	Pass		MSM
Floors	Pass	Means of compliance - AS1 Crown of road +35.550 FFL +36.025	MSM
Weathertightness risk factors	Pass	Means of compliance - AS1 See Risk Matrix calcs - all complies	MSM
Building Wrap type / Sill tape	Pass	Means of compliance - AS1 Thermakraft "Watergate Plus"	MSM
Cladding systems	Pass	Means of compliance - AS1 70 series clay brick veneer on nom. 40mm cavity BGC Duo board vertical - fixed on cavity	MSM
Brick tie spacings - SED	N/A		MSM
Cladding on frame - bare GL	Pass	Means of compliance - AS1 Greater than or equal to 225mm	MSM
Clad on frame - paved GL	Pass	Means of compliance - AS1 Greater than or equal to 150mm	MSM
Cav. veneer clad - bare GL	Pass	Means of compliance - AS1 Greater than or equal to 125mm	MSM
Cav. Veneer clad - paved GL	Pass	Means of compliance - AS1 Greater than or equal to 25mm	MSM
Flashings	Pass	Means of compliance - AS1 Standard flashings - Comply with E2 Table 7	MSM
Roofing systems	Pass	Means of compliance - AS1 Longrun coated metal - corrugated	MSM
Roof pitch	Pass	Means of compliance - AS1 Greater than or equal to 0°less than or equal to 25°	MSM
Roofing underlay type	Pass	Means of compliance - AS1 Thermakraft 215 bituminous self supporting	MSM
E3 Internal Moisture	Pass		MSM
Surface finishes	Pass	Means of compliance - AS1 Refer drawings sheet 14 and spec	MSM
Fungal growth prevention	Pass	Means of compliance - AS1 Appropriate surfaces/finishes installed/applied	MSM
Wet area shower	Pass	Means of compliance - AS1 Proprietary shower cubicle - refer spec for manuf. Data --- RFI Details --- E3 Internal moisture: Please amend sheet 2 to show position of showerdoors for the shower cubicles --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:15pm --- sheet 2 amended show doors	MSM
<u>Consent RFI</u>			
Request: E3 Internal moisture: Please amend sheet 2 to show position of showerdoors for the shower cubicles			MSM
Response: Sheet 2 revised			MSM
F1 Hazardous Agents	Pass		MSM
F1 Hazardous Agents	Pass	Means of compliance - AS1 No report or mitigation measures required	MSM

Checklist/Elements	Status	Notes	Processed By
F2 Hazardous Building Materials	Pass		MSM
Hazardous building materials	Pass	Glazing only to consider; Please amend elevations to complete safety glazing indication. --- RFI Details --- F2 Hazardous building materials: Please amend elevations to complete safety glazing indication. --- Customer Response --- Sheet 3 shows SG and SS to windows? --- Council Response - Not Accepted - MSM - 7 Aug 2025 4:47pm --- Not compliant with NZS4223.3.2016 transom at sill height OK --- RFI Details --- F2 Hazardous building materials: Please amend elevations to complete safety glazing indication. --- The safety glazing is not complete;: Please refer to NZS4223.3.2016 regarding fig 1A and amend elevations accordingly. --- Customer Response --- Im unsure where else we need it, I spoke to a window supplier and they said the sliders dont need safety glass, the rail to the sliders is at the same height as the sill in the bedroom Windows also , also these sliders are the same I use on all my Jobs and never a problem. if you could advise would be great cheers --- Council Response - Accepted - MSM - 13 Aug 2025 9:06am --- complies	MSM
Consent RFI			
Request:	F2 Hazardous building materials: Please amend elevations to complete safety glazing indication.		MSM
Response:	Sheet 3 shows SG and SS to windows?		MSM
Consent RFI			
Request:	F2 Hazardous building materials: Please amend elevations to complete safety glazing indication. --- The safety glazing is not complete;: Please refer to NZS4223.3.2016 regarding fig 1A and amend elevations accordingly.		MSM
Response:	Im unsure where else we need it, I spoke to a window supplier and they said the sliders dont need safety glass, the rail to the sliders is at the same height as the sill in the bedroom Windows also , also these sliders are the same I use on all my Jobs and never a problem. if you could advise would be great cheers		MSM
F3 Hazardous Substances	N/A	No hazardous substances to be stored as part of this consent application.	MSM
F4 Safety from Falling	Pass		MSM
Opening windows	Pass	Means of compliance - AS1 FFL - GL <1m - protection not required	MSM
Barriers	N/A		MSM
F5 Construction Hazards	Pass		MSM
F5 Construction Hazards	Pass	Means of compliance - AS1 Protection provided 2m high security fence with lockable gate shown on site plan	MSM
F6 Visibility in Escape Routes	N/A	Does not apply to Detached Dwellings, household units within Multi-unit Dwellings,	MSM

Checklist/Elements	Status	Notes	Processed By
		Outbuildings, or Ancillary buildings.	
F7 Warning Systems	Pass		MSM
Locations	Pass	F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms --- RFI Details --- F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms --- Customer Response --- Sheet 2 revised --- Council Response - Accepted - MSM - 7 Aug 2025 4:53pm --- correct location of smoke alarms provided	MSM
Consent RFI			
Request: F7 Warning systems: Please amend sheet 2 floor plan to show correct location of smoke alarms			MSM
Response: Sheet 2 revised			MSM
F9 Means of restricting access to residential pools	N/A	No pools detailed within this consent application.	MSM
G1 Personal Hygiene	Pass		MSM
No. of sanitary fixtures	Pass	Means of compliance - AS1 2 x WC's provided	MSM
Basin in WC space	Pass	Means of compliance - AS1 Wash basin in ensuite & immediate adjacent bathroom to WC	MSM
G2 Laundering	Pass		MSM
Laundering facilities	Pass	Means of compliance - AS1 Wash tub; washing machine connection provided	MSM
G3 Food Prep and Prevention of Contamination	Pass		MSM
Appliances and Facilities	Pass	Means of compliance - AS1 Appliances and facilities including prep sink, cooktop, storage, refrigerator/ freezer are provided	MSM
G4 Ventilation	Pass		MSM
Ventilation	Pass	Means of compliance - AS1 Natural openings + extract to Bathrooms and Kitchen	MSM
Ventilation rate	Pass	Means of compliance - AS1 Mechanical - Refer designer's calculations	MSM
G5 Interior Environment	N/A	Shall apply only to habitable spaces, bathrooms and recreation rooms in old	MSM
G6 Airborne and Impact Sound	N/A	No building elements between common occupancies.	MSM
G7 Natural Light	Pass		MSM
Vertical windows in external walls	Pass	Means of compliance - AS1 Greater than or equal to 10% of floor area for window area to all habitable spaces	MSM
Outside environment awareness	Pass	Means of compliance - AS1 Sufficient natural light levels and outside env. awareness	MSM
G8 Artificial Light	Pass		MSM
Illuminance	Pass	Means of compliance - AS1 Illuminance at floor level will meet 20 lux minimum see electrical layout	MSM
G9 Electricity	Pass		MSM

Checklist/Elements	Status	Notes	Processed By
Electrical installation	Pass	Means of compliance - AS1 Refer dwgs for fitting locations and spec for details	MSM
G10 Piped Services	N/A	No piped services to be installed as part of this consent application.	MSM
G11 Gas as an Energy Source	N/A	No gas installation within consent application.	MSM
G12 Water Supply	Pass		MSM
Water supply - source	Pass	Means of compliance - AS1 Connected to Local Authority supply	MSM
Water supply - quantity	Pass	Means of compliance - AS1 Adequate council supply - OK	MSM
Water supply - quality	Pass	Means of compliance - AS1 Adequate council supply quality - OK	MSM
Safe tray installed	Pass	Means of compliance - AS1 Yes	MSM
HW Tempering	Pass	Means of compliance - AS1 Output max 50°C	MSM
Seismic restraints/ tank supports	Pass	Means of compliance - AS1 Standard restraints - Fig.14	MSM
Drain/relief vent material	Pass	Means of compliance - AS1 Suitably sized copper pipe to outside building	MSM
Solar heating system	N/A		MSM
Solar support/fixing	N/A		MSM
G13 Foul Water	Pass		MSM
Effluent disposal system (EDS)	Pass	Means of compliance - AS2 Connected to local authority services	MSM
ECAN rule 5.8	Pass	Means of compliance - AS2 Checksheet against Rule 5.8 completed	MSM
Bedroom numbers	N/A		MSM
EDS tank size	N/A		MSM
EDS daily flow	N/A		MSM
Inspection Points	Pass	Means of compliance - AS2	MSM
Gully traps	Pass	Means of compliance - AS2 See drainage plan for locations	MSM
Support and thermal movement	Pass	Means of compliance - AS2 Adequate support and thermal movement allowed for - OK	MSM
Discharge pipe size	Pass	Means of compliance - AS2 100mm diameter	MSM
Drain ventilation	Pass	Means of compliance - AS2 80mm TV/MV at head of drain	MSM
Pipe/joint materials	Pass	Means of compliance - AS2 PVC	MSM
Pipe gradients: mains	Pass	Means of compliance - AS2 1:60 minimum	MSM
Pipe gradients: fittings	Pass	Means of compliance - AS2 40mm@1:40	MSM
Sanitary plumbing	Pass	Means of compliance - AS2 Refer fitting layout on designer's drawings	MSM
Bedding and backfill	Pass	Means of compliance - AS2 Bedded in adequate fill, to Fig. 7 - OK	MSM
Drains under buildings	N/A		MSM
Inspection chamber (see PIM notes)	Pass	Means of compliance - AS2 Inspection chamber detailed on drawings in accordance with PIM requirements.	MSM
H1 Energy Efficiency	Pass		MSM
Means of Compliance	Pass	Means of compliance - AS1	MSM

Checklist/Elements	Status	Notes	Processed By
		Calculation method	
Thermal Envelope	Pass	Means of compliance - AS1 Construction R values calculations provided:	MSM
Hot water system	Pass	Means of compliance - AS1 HWC and pipework suitably insulated	MSM
Changes made during processing	N/A		MSM
Phone to resolve	N/A		MSM
Processing Sign Off Checklist	Pass		MSM
Reminder to start checklist	Pass		MSM
SWPermit	Pass		Donnie Choi
Discharge into ground - soakpit	Pass		DXC2
Application form (GoGet/Simpli)	Pass		DXC2
Soil profile & photos (recommended)	N/A		DXC2
Soakage test result (Form W1 or W2)	N/A		DXC2
Soakpit design documents	N/A		DXC2
Soakpit layout	Pass		DXC2
Drainage plan for stormwater including connections and overflow.	Pass		DXC2
Stormwater device management & maintenance plan	Pass		DXC2
Discharge to surface - tank	N/A		DXC2
Discharge to other	N/A		DXC2
Erosion and Sediment Control Plan	Pass		DXC2
Sediment Fence	Pass		DXC2
Material Storage Area	Pass		DXC2
Stabilised entry/exit pad	Pass		DXC2
Diversion of runoff and/or catch pit	N/A		DXC2
Producer Statement Assessment 1	Pass		Mark Milnes
Producer statement category	Pass		MSM
Category	Pass	PS 1	MSM
Producer statement content	Pass		MSM
Heading	Pass	Headed with Producer Statement	MSM
Address details	Pass	The Producer Statement is generic addressed for the attention of all Councils	MSM
Author details	Pass	Clear identification of the person who has completed the design work: yes The author's name and signature: In Ling Ng Qualifications suitable for work undertaken: BE (Hons) Address of author: MiTek New Zealand LTD Registration number: #146585 Membership of professional organisation: MIPENZ	MSM
Written statement	Pass	That clearly identifies the building consent work covered by the Producer Statement: Truss design The product name and specifications for application of products used: MiTek 20/20, GANG-NAIL connectors The parts/clauses of the Building Code that the work relates to: B1/VM1, B2/AS1 The appropriateness of the Producer Statement for site specific conditions: Fabricator statement checked	MSM
Date	Pass	Date the PS1 was produced 16 - 04 - 25	MSM
Professional indemnity insurance	Pass	The sum of Professional Indemnity Insurance held is	MSM

Checklist/Elements	Status	Notes	Processed By
		identified $500,000	
Decisions and outcome	Pass		MSM
Acceptance	Pass	I have accepted this Producer Statement because the documentation is COMPLETE	MSM
Validation BC Checklist	Pass		Henry Stikkelman,Mark Milnes
Validation	Pass		HCS,MSM
Validation	Pass	Information loaded onto GoGet reviewed: Restricted Building work - Yes Purpose Group - SH Complexity confirmed - R1	HCS
Review of PIM requirements	Pass	PIM complete and PIM notes added to GoGet Proposal confirmed as requiring RC	HCS
Supervision	Pass	N/A, supervision not required as within competency	HCS
Review of processing correspondence	Pass	All relevant code clauses considered by processing officer	HCS
Phone to resolve carried out.	N/A		HCS
Processing decisions justified	Pass	Validation RFI items added to consent and referred to processing officer: - Filled site (up to 900mm fill) Geotech report required. - Gib Ezy brace calcs - EQ zone 2, should be 3 - H1 spread sheet not in tech data ? - EcoPly tech Barrier in techdata - Not noted on plans/specs - Entry column footing distance to soak pit ? - Means of compliance for foundation - alternative solution. - LBP - foundations to be checked. --- RFI Details --- Henry Stikkelman - Principal Building officer validation RFI item: 1. Please amend site plan to show distance from entry column footing to edge of soak pit- Entry column footing distance to soak pit. 2. Please exchange tech data for EcoPly tech Barrier in tech data to standard EcoPly (Building wrap as noted on plans/specs) --- Customer Response --- Sheet 1 and Ecoply Spec revised --- Council Response - Accepted - MSM - 14 Aug 2025 3:05pm --- 1. site plan amended to show distance from entry column footing to edge of soak pit 2. standard EcoPly noted on plans --- RFI Details --- Validation RFI items added to consent and referred to processing officer: - Filled site (up to 900mm fill) Geotech report required. - Gib Ezy brace calcs - EQ zone 2, should be 3 - H1 spread sheet not in tech data ? - EcoPly tech Barrier in techdata - Not noted on plans/specs - Entry column footing distance to soak pit ? - Means of compliance for foundation - alternative solution. - LBP - foundations to be checked. ---------- ----- 1. RFI sent 2. RFI sent	HCS,MSM

Checklist/Elements	Status	Notes	Processed By
		3. H1 spread sheet added to Tech data 4. RFI sent 5. RFI sent 6. Means of compliance changed to alternative solution 7. LBP for foundations added --- Response - Accepted - HCS - 14 Aug 2025 4:24pm --- Validations RFI's - information provided & completed	

Consent RFI

Request: Validation RFI items added to consent and referred to processing officer: HCS
- Filled site (up to 900mm fill) Geotech report required.
- Gib Ezy brace calcs - EQ zone 2, should be 3
- H1 spread sheet not in tech data ?
- EcoPly tech Barrier in techdata - Not noted on plans/specs
- Entry column footing distance to soak pit ?
- Means of compliance for foundation - alternative solution.
- LBP - foundations to be checked.

---

1. RFI sent
2. RFI sent
3. H1 spread sheet added to Tech data
4. RFI sent
5. RFI sent
6. Means of compliance changed to alternative solution
7. LBP for foundations added

Consent RFI

Request: Henry Stikkelman - Principal Building officer validation RFI item: MSM
1. Please amend site plan to show distance from entry column footing to edge of soak pit- Entry column footing distance to soak pit.
2. Please exchange tech data for EcoPly tech Barrier in tech data to standard EcoPly (Building wrap as noted on plans/specs)

Response: Sheet 1 and Ecoply Spec revised MSM

High risk - often missed	Pass	Finished floor level in relation to road Shower screens Weathertightness risk areas	HCS
Alternative solutions reviewed	Pass	Alternative solutions reviewed : Foundations	HCS
Client copy correct	Pass	Approved documents stamped and added to consent doc folder in GoGet	HCS
Environment risk assessment	Pass	--- RFI Details --- Henry Stikkelman - Principal Building officer validation RFI items 1. Site factors considered by processor - No: Please provide Geotech report as subdivision plan shows filled site (up to 900mm fill). SED foundation may be required. 2. Design assumptions by designer correct - No: Please amend Gib Ezy brace calcs - EQ zone 2, should be 3 --- Customer Response --- Bracing Calcs revised --- Council Response - Accepted - MSM - 14 Aug 2025 3:03pm --- 1. GeoTech report received: conclusion 400mm topsoil removed to obtain 'Good Ground' 2. Brace calculation sheet amended EQ zone 3	HCS,MSM

Consent RFI

Request: Henry Stikkelman - Principal Building officer validation RFI items MSM
1. Site factors considered by processor - No:

Checklist/Elements	Status	Notes	Processed By
		Please provide Geotech report as subdivision plan shows filled site (up to 900mm fill). SED foundation may be required. 2. Design assumptions by designer correct - No: Please amend Gib Ezy brace calcs - EQ zone 2, should be 3	
Response: Bracing Calcs revised			MSM
Design and environment risk assessment	Pass	Design appropriate for site factors: Site hazards considered - natural , HAIL CT checked for easements, clearance to boundaries	HCS
Construction risk assessment	Pass	Construction risks identified and assessed by processing officer: Structural risks: NZS Standard Weather tightness detailing:	HCS
Inspection	Pass	Inspections loaded to consent record	HCS
Annotations made permanent	Pass		HCS
Timesheet completed	Pass	Fixed Fee - confirmed on working file	HCS
Naming conventions	Pass	Naming conventions correct	HCS
consent granted as satisfied on reasonable grounds that the Building Code will be met - S49	Pass		HCS
Consent refused	N/A		HCS
Processing Summary saved to Processing Summaries folder.	Pass		HCS
Add issuing location to tracking tab	Pass		HCS
Processing Sign Off Checklist	Pass		Mark Milnes
All consents	Pass		MSM
Alternative solutions	N/A		MSM
Location of construction	Pass	Building work carried out on site	MSM
Required inspections	Yes	Required inspections identified and added	MSM
Required documents	Yes	Required documents identified and added	MSM
Advice notes	Yes	Advice notes correctly identified and added	MSM
Conditions	N/A		MSM
Engineer inspections	N/A		MSM
Sec 72	N/A		MSM
Sec 75	N/A		MSM
The S75 cert has been forwarded to LINZ (if applicable)	N/A		MSM
Sec 37 Is a resource consent required for this building work	N/A		MSM
Waiver or modification	N/A		MSM
Specified intended life	Yes	A specified intended life is applicable to this consent 50 years	MSM
Additional charges	N/A		MSM
Current lawfully established use	Yes	Classified use is recorded in consent	MSM
Multi-unit project	N/A		MSM
Consent files	Yes	Documents stamped Documents filed in correct order Approved documents copied to "Consent Documents" folder (PDF format)	MSM
Processing summary	Yes	Processing summary has been saved	MSM
Run Time Report	Y	Time report has been saved to Processing Summaries Folder	MSM
Timesheet	Yes	Time recorded in MagiQ Job Costing against consent number	MSM

Checklist/Elements	Status	Notes	Processed By
Recommendation to Refuse	N/A		MSM
Recommendation to Grant (self-validation only)	N/A		MSM
Add Validation Processing Location	Y		MSM
Stormwater approval	Pass		MSM
Fixed or variable fee considered	Pass		MSM
Commercial only	N/A		MSM

Consent RFI

Request: Hi, DXC2

1. Please make Type 1 sump drain to be connected after the soakpit.

Regards,

Donnie

Response: Sheet 6 revised DXC2

I am satisfied on reasonable grounds that the provisions of the Building Code will be met if the building work in relation to the attached application is properly completed in accordance with the attached plans and specifications.

Signed: _____ Date: 14 August 2025 4:25 pm

Henry Stikkelman

GoGet Consent Time Report

Consent No: 250252

Date	Processing/Inspection Type	Status	Processor/Inspector	Time
Processing BLDG				
30 Jul 2025	Processing		Mark Milnes	36
30 Jul 2025	Processing		Mark Milnes	210
6 Aug 2025	Processing	On	Mark Milnes	
7 Aug 2025	Processing	Off	Madeline Blacktopp	
7 Aug 2025	Processing		Mark Milnes	57
7 Aug 2025	Processing	On	Mark Milnes	
8 Aug 2025	Processing	Off	Madeline Blacktopp	
13 Aug 2025	Processing		Mark Milnes	45
	Time Subtotal:			5:48
Processing ISS				
25 Jul 2025	Processing		Madeline Blacktopp	5
	Time Subtotal:			0:05
Processing PLAN				
31 Jul 2025	Processing		Aidan Chrystal	75
12 Aug 2025	Processing		Aidan Chrystal	2
	Time Subtotal:			1:17
Processing UTILS				
25 Jul 2025	Processing		Sharlene Jayne	6
29 Jul 2025	Processing		Cynthia Otto	9
29 Jul 2025	Processing		Cynthia Otto	5
6 Aug 2025	Processing		Donnie Choi	1
	Time Subtotal:			0:21
	Time Totals:			7:31

GoGet Consent Time Report

Consent No: 250252

Date	Processing/Inspection Type	Status	Processor/Inspector	Time
Processing BLDG				
30 Jul 2025	Processing		Mark Milnes	36
30 Jul 2025	Processing		Mark Milnes	210
6 Aug 2025	Processing	On	Mark Milnes	
7 Aug 2025	Processing	Off	Madeline Blacktopp	
7 Aug 2025	Processing		Mark Milnes	57
7 Aug 2025	Processing	On	Mark Milnes	
8 Aug 2025	Processing	Off	Madeline Blacktopp	
13 Aug 2025	Processing		Mark Milnes	45
13 Aug 2025	Processing		Henry Stikkelman	30
14 Aug 2025	Processing	On	Mark Milnes	
14 Aug 2025	Processing	Off	Adele Frye	
14 Aug 2025	Processing		Mark Milnes	60
14 Aug 2025	Processing		Henry Stikkelman	15
	Time Subtotal:			7:33
Processing ISS				
25 Jul 2025	Processing		Madeline Blacktopp	5
	Time Subtotal:			0:05
Processing PLAN				
31 Jul 2025	Processing		Aidan Chrystal	75
12 Aug 2025	Processing		Aidan Chrystal	2
	Time Subtotal:			1:17
Processing UTILS				
25 Jul 2025	Processing		Sharlene Jayne	6
29 Jul 2025	Processing		Cynthia Otto	9
29 Jul 2025	Processing		Cynthia Otto	5
6 Aug 2025	Processing		Donnie Choi	1
	Time Subtotal:			0:21
	Time Totals:			9:16

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **1112975**
Land Registration District **Canterbury**
Date Issued 09 November 2023

Prior References
983584

Estate Fee Simple
Area 700 square metres more or less
Legal Description Lot 79 Deposited Plan 587128
Registered Owners
UWC Limited

Interests

Appurtenant hereto is a water easement created by Transfer 386795.1 - 14.6.1982 at 10:03 am

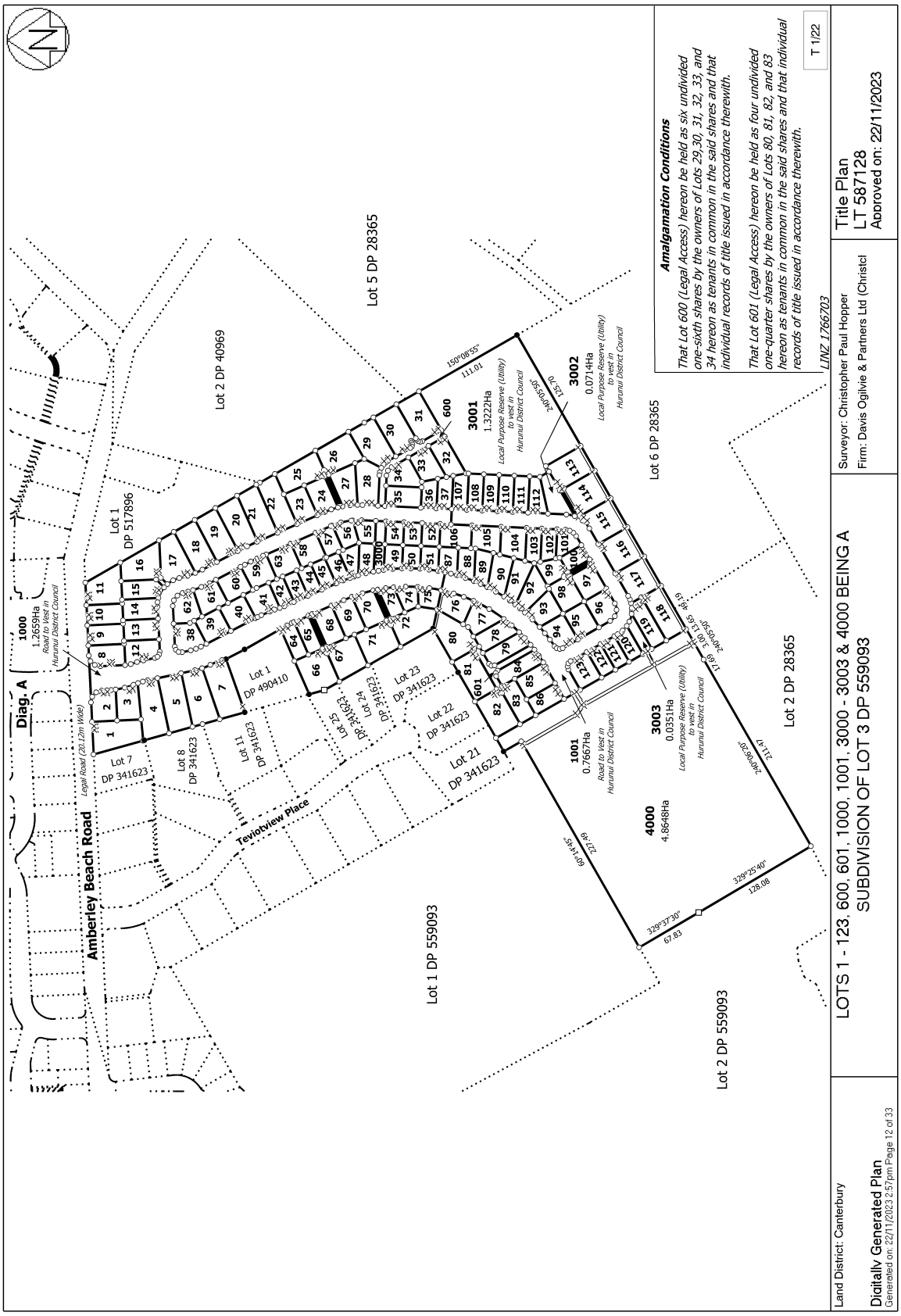
Land Covenant in Easement Instrument 10311979.3 - 22.2.2016 at 4:00 pm

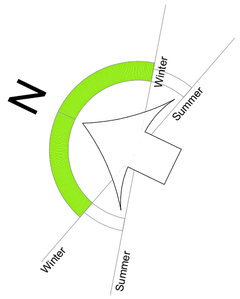
Land Covenant (in gross) in favour of Hurunui District Council created by Covenant Instrument 12727469.11 - 9.11.2023 at 4:44 pm

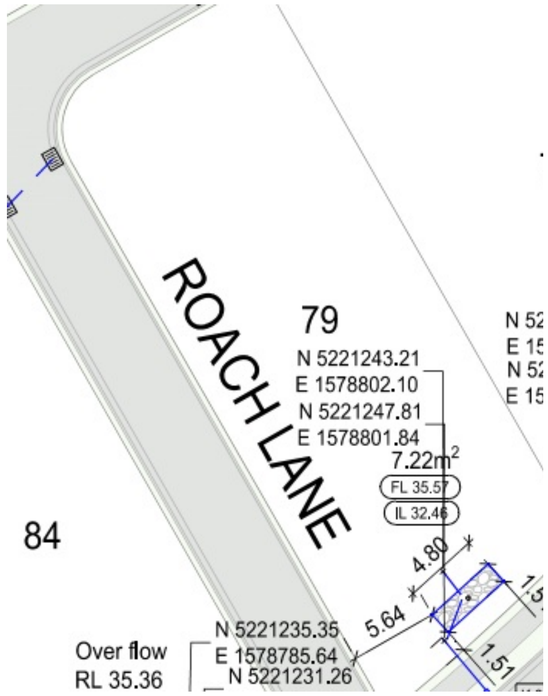
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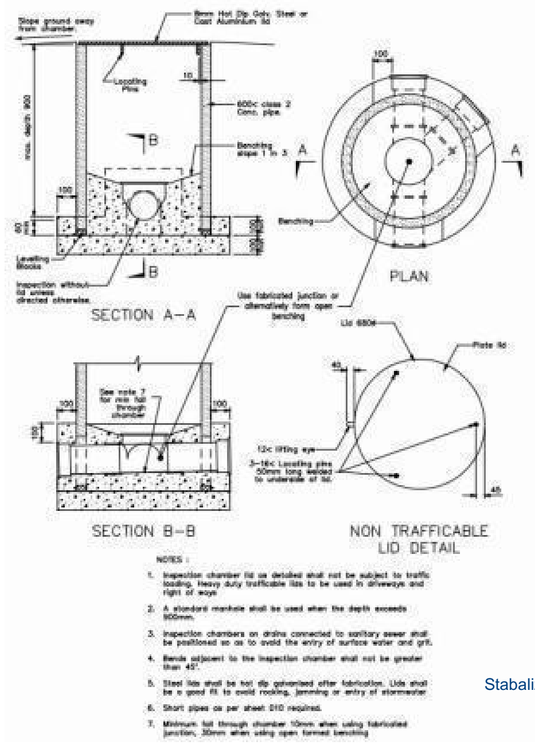
Land Covenant in Covenant Instrument 12727469.13 - 9.11.2023 at 4:44 pm

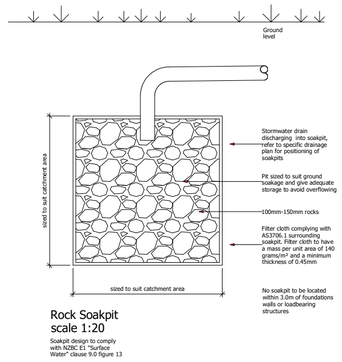
Land Covenant (in gross) in favour of UWC Limited created by Covenant Instrument 12727469.14 - 9.11.2023 at 4:44 pm


Lot 5 DP 28365
Lot 2 DP 40969
Lot 1 DP 517896
Lot 6 DP 28365
Lot 2 DP 28365
Lot 1 DP 559093
Lot 2 DP 559093
Amberley Beach Road
Legal Road (20.12m Wide)
Tevlotview Place
Lot 1 DP 490410
Lot 7 DP 341623
Lot 8 DP 341623
Lot 11 DP 341623
Lot 25 DP 341623
Lot 24 DP 341623
Lot 23 DP 341623
Lot 22 DP 341623
Lot 21 DP 341623
Diag. A
1000 1.2659Ha Road to Vest in Hurunui District Council
3001 1.3222Ha Local Purpose Reserve (Utility) to vest in Hurunui District Council
3002 0.0714Ha Local Purpose Reserve (Utility) to vest in Hurunui District Council
3003 0.0351Ha Local Purpose Reserve (Utility) to vest in Hurunui District Council
1001 0.7667Ha Road to Vest in Hurunui District Council
4000 4.8648Ha
150°08'55" 111.01
240°05'50" 135.70
240°05'50" 3.50
240°05'50" 17.69
240°06'10" 211.47
329°25'40" 128.08
329°37'30" 67.83
60°14'45" 227.49
Amalgamation Conditions
That Lot 600 (Legal Access) hereon be held as six undivided one-sixth shares by the owners of Lots 29,30, 31, 32, 33, and 34 hereon as tenants in common in the said shares and that individual records of title issued in accordance therewith.
That Lot 601 (Legal Access) hereon be held as four undivided one-quarter shares by the owners of Lots 80, 81, 82, and 83 hereon as tenants in common in the said shares and that individual records of title issued in accordance therewith.
T 1/22
LINZ 1766703
Land District: Canterbury
Digitally Generated Plan
Generated on: 22/11/2023 2:57pm Page 12 of 33
LOTS 1 - 123, 600, 601, 1000, 1001, 3000 - 3003 & 4000 BEING A SUBDIVISION OF LOT 3 DP 559093
Surveyor: Christopher Paul Hopper
Firm: Davis Ogilvie & Partners Ltd (Christcl
Title Plan
LT 587128
Approved on: 22/11/2023









Rock Soakpit
scale 1:20

Soakpit design to comply with NZSC E1 "Surface Water" clause 9.0 figure 13

LEGEND

LEGEND.	
Sewer Pipe	———
S/W Pipe	– – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV

SITE PLAN NOTES

Refer to Drainage Plan for specific drainage information

Refer to sediment control plan in specification and implement where required.

Convey surface water from sealed drive areas to an appropriate approved outfall.

Dimensions are shown to cladding face

SITE INFORMATION

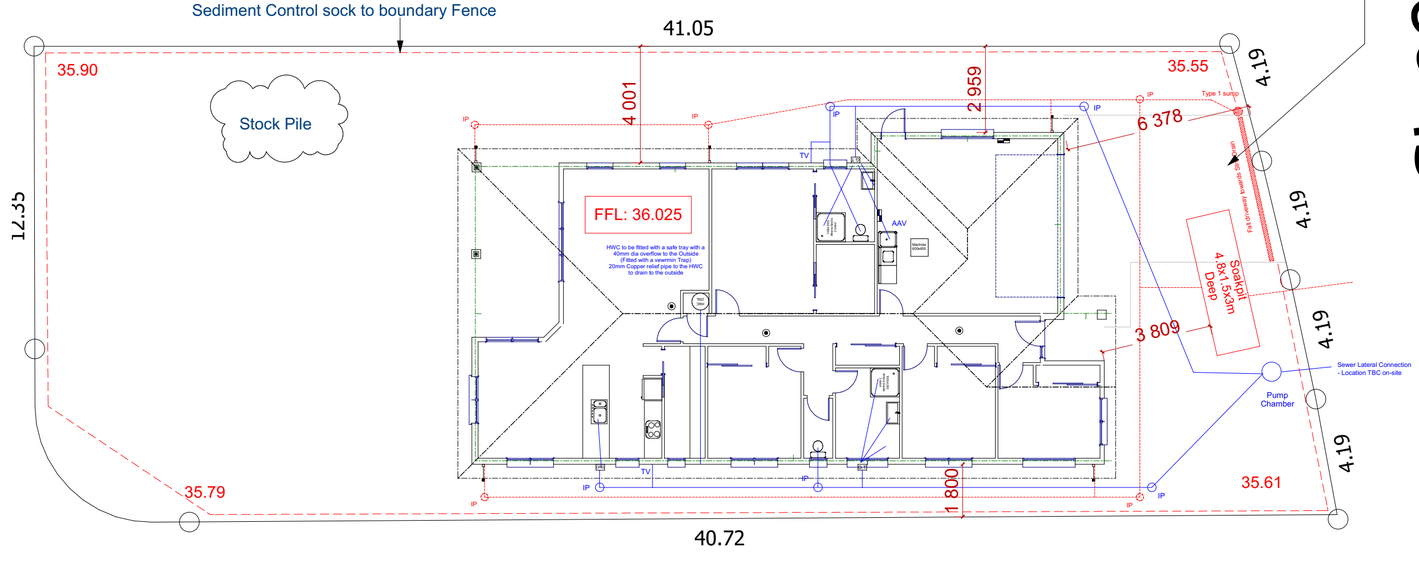
Zone	5
Wind	High
Earthquake	3
Durability	C
Snow	As per truss design

BUILDING AREA AND SITE COVERAGE

Net Site Area =	700m²
Building Area (O/V) =	206.6m²
Actual Site Coverage=	29.5%

Stabalized entry pad to the site

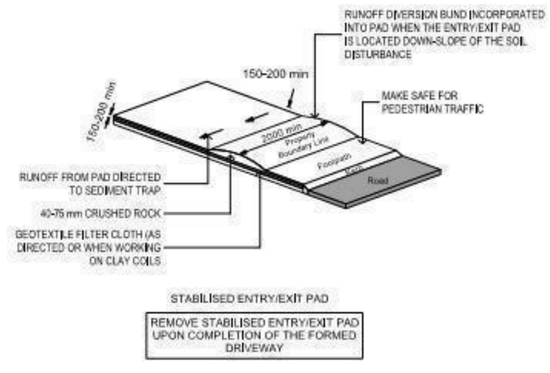
Sediment Control sock to boundary Fence

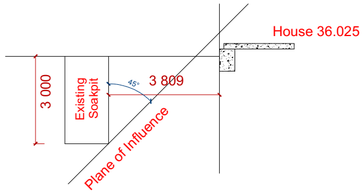


Benn Street

Crown of Road 35.50

Note:
2m High Security fences to the road boundaries during the construction of the house , with a lockable gate.
All other boundaries to be paling fences.
All Dimensions and Floor levels to be confirmed before work commences.





Roach Lane

J and A Design Ltd
12 Murfitt St
Pegasus 7612
Ph: 027 7715816
Email : admin@jandadesign.co.nz

Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Site Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Job Number: 2500

SHEET: 1

Scale: 1:1000

Date: 24/07/2025

OF: 15

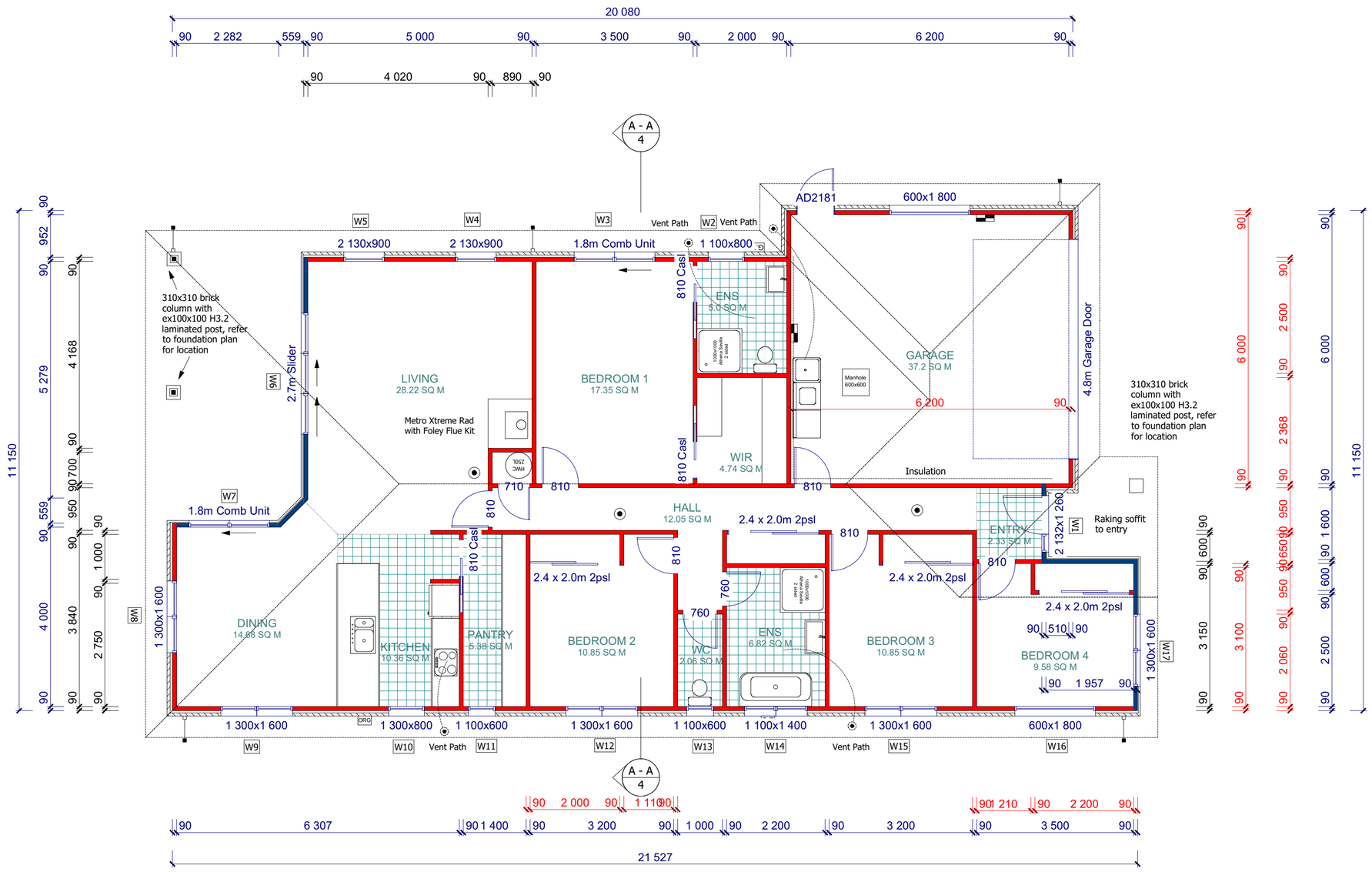
Key To Elevations

ROOF & WALL CLADDING

Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

BUILDING AREA

AREA: 203.4m² O/Veneer
AREA: 196.32m² O/Frame



GENERAL FLOOR PLAN NOTES

SMOKE ALARMS
Smoke Alarms to be fitted within 3.0m of sleeping areas and on Escape routes, as indicated on plan. Refer to Construction Schedule (Page 2 & 3) in the Specification for more information.

MISCELLANEOUS:
Dimensions shown are to the frame,
GIB thickness not shown.
Refer to Construction Schedule (Page 2 & 3 of Specification) for additional construction information.
Entry through external doors
Mechanical ventilation
Air Seals to have PEF rod & low expansion foam
All windows and doors centered in room unless shown otherwise

FOUNDATION SYSTEM
Ribraft Foundation Design

WALL FRAMING -designed to high wind zone
Stud Height: 2420 mm
Exterior Walls: 90x45mm studs @ 600 mm crs
Interior Loadbearing wall:
90x45mm studs @ 600 mm crs
Dwangs Ext: 90x45 @ 800 crs
Non loadbearing: 90x45mm studs @ 600 mm crs
Dwangs Int: 90x45mm @ 800mm Crs

LINTELS AND BEAMS
Lintels and beams can be found on the Truss Design

BUILDING WRAP
Watergate Building Wrap, refer to manufacturers specifications attached

DOORS
Internal Height: 2000mm

INSULATION
Wall - Pink Batts R2.6 Wall Batts
Ceiling - Pink Batts R6.6 Ceiling Batts

WALL AND CEILING LININGS
Wall - Standard 10mm GIB (unless required for bracing)
Ceiling - Standard 13mm GIB
13mm GIB Aqualine (bathrooms)
Bathroom - 10mm GIB Aqualine
Corner Finish - Square

FLOOR FINISHES
Carpet, Vinyl Plank , Tiles

EXTERIOR JOINERY

All Windows to be Thermally broken Aluminium frame
Double glazed with Ug of 1.10
with a thermally improved spacer
as per ISO 10077 Annex G
Glass: Low E4/Clear, argon filled , to achieve R0.5.
Air Seals to have PEF rod and low expansion foam

Interior - Shelf and rail to wardrobes

Electric Hot water system

KITCHEN COOKTOP
Electric Hobb

ROOF CLADDING AND STRUCTURE
Purlins - 70x45 SG8 H1.2 @ 900crs

GUTTER/FASCIA/DOWNPIPES/SOFFITS
Gutter - Metalcraft Metalline Quad Gutter
Fascia - Metalcraft Metalline 185 Fascia
Downpipes - Marley 80mm Dia PVC
Soffits - Hardiflex 4.5mm

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Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Floor Plan
Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Job Number: 2500
SHEET: 2
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ROOF & WALL CLADDING	
Roof -	25º Corrugated Coloursteel Roof
Walls -	70 Series Bricks on a 50mm Cavity
	BGC Duo Board(vertical) on a 20mm Cavity

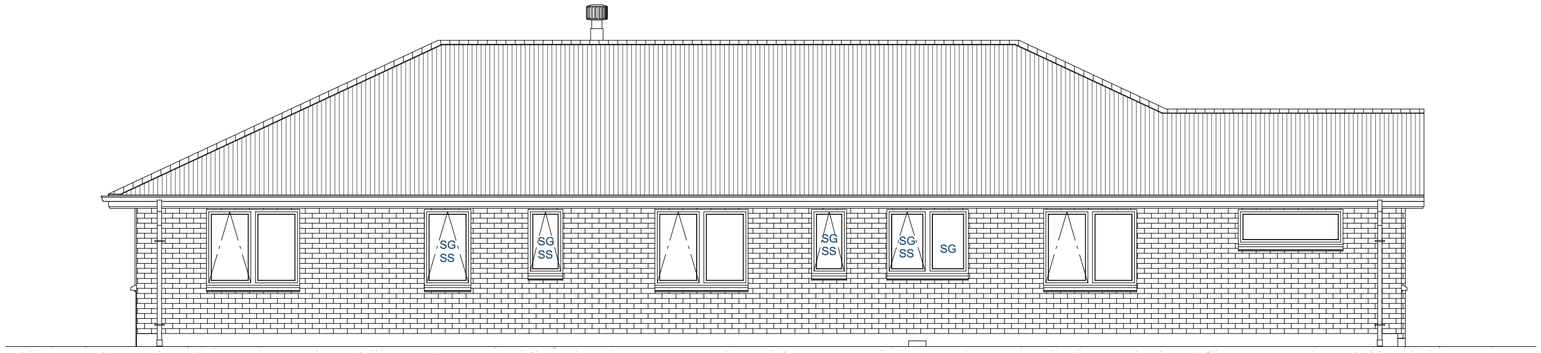
GENERAL ELEVATION NOTES

Air Barrier to unlined wall and gables, refer to the Construction Schedule in the Specification for type.

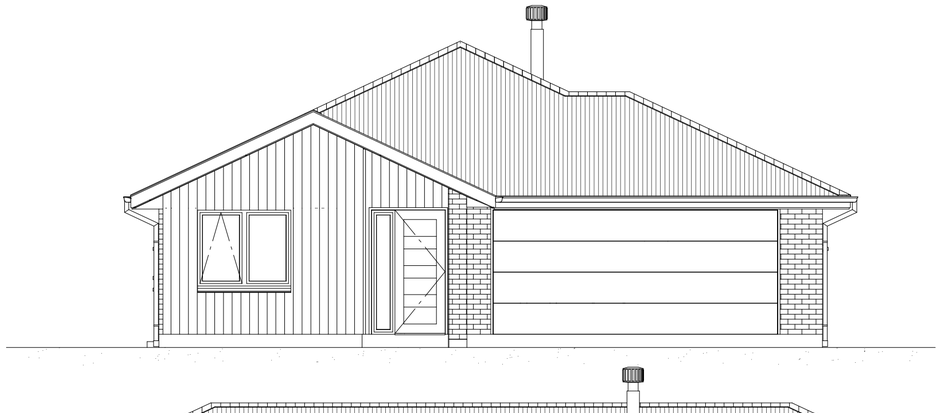
This sheet to be read in conjunction with the Risk Matrix in specification.

Driveway to fall from 20mm max below garage rebates (By Others).

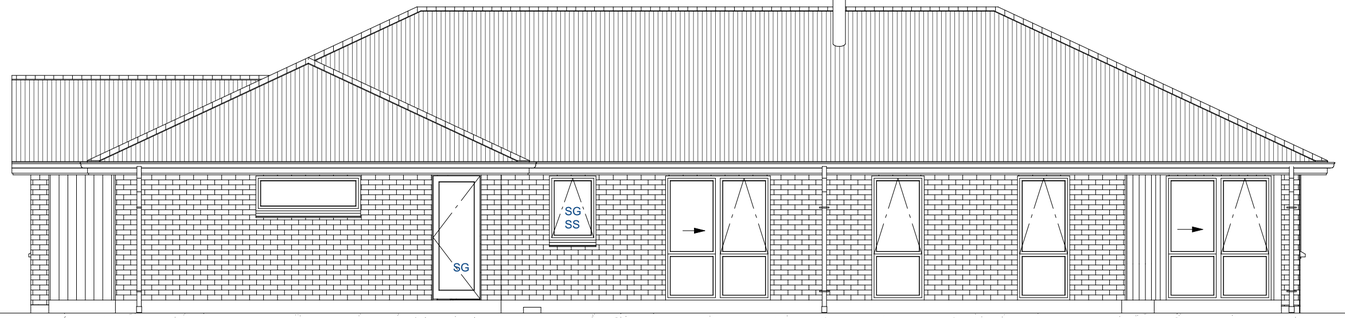
Key
SS: Security Stay
SG: Safety Glass



Elevation A



Elevation B



Elevation C



Elevation D

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LICENCED BUILDING PRACTITIONERS BUILDING CONFIDENCE

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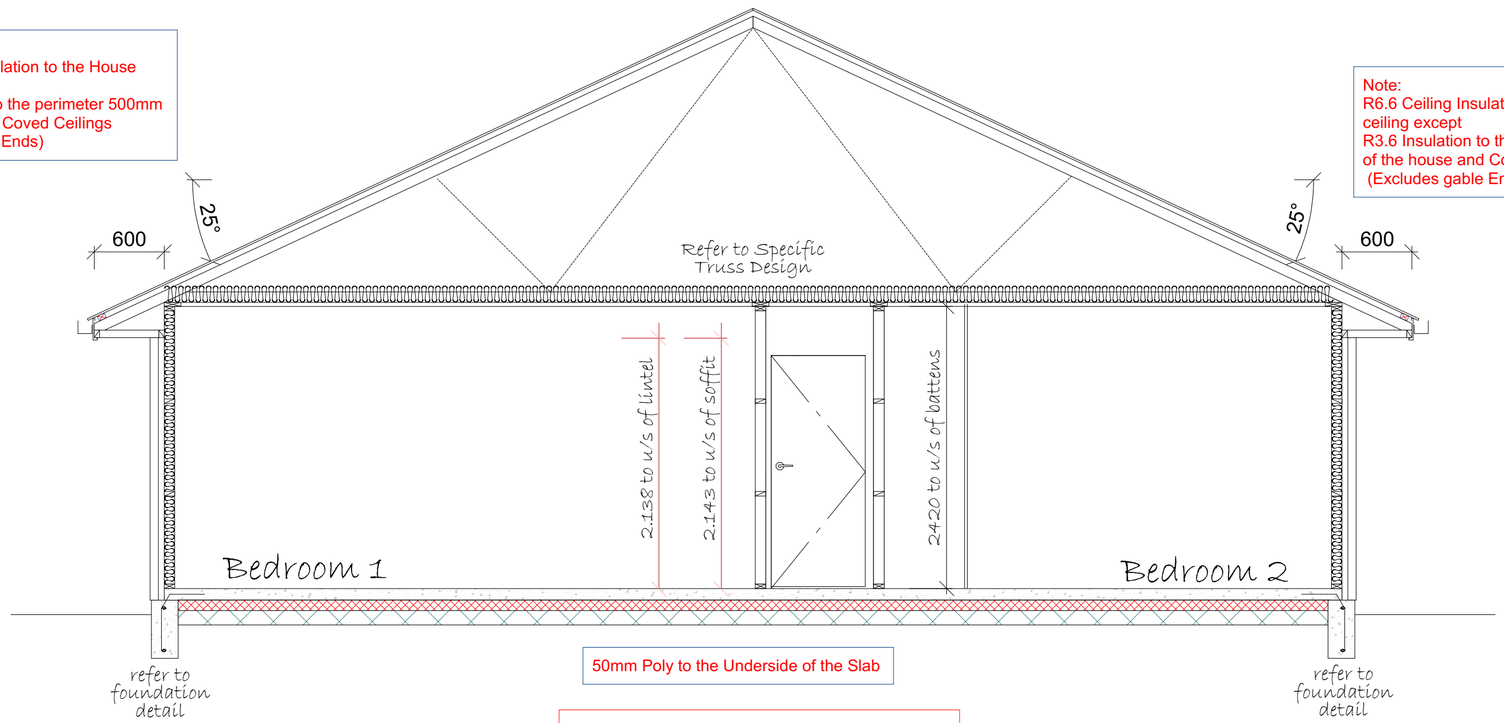
Elevations

Consent Plans

Drawn:	Job Number:	SHEET:
Jeremy Harrison LBP # 105491	**2500**	**3**
Scale: 1:100	Date: 24/07/2025	OF: **15**

Note:
Min 35mm cover from the underside of the roof underlay to the top of the Insulation.

Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)



Note:
R6.6 Ceiling Insulation to the House ceiling except
R3.6 Insulation to the perimeter 500mm of the house and Coved Ceilings
(Excludes gable Ends)

50mm Poly to the Underside of the Slab

Cross Section A - A

LEGEND

Refer to the Construction Schedule (Page 2 & 3) in the Specification for sizing of Building Elements.
General Notes:

1 - Corrugated Colorsteel roofing by Metalcraft on self supporting ThermaKraft 215 roof underlay on 70x45mm SG8 H1.2 Purlins @ 900crs fixings 1/10g self-drilling screw, 80mm long

2 - Metalcraft fascia & quad gutter system with 4.5mm Hardies soffit lining on 70x35mm H1.2 eaves bearers on edge fixed to ribbon board.

3 - 4.5mm Hardies Soffit lining

4 - 13mm Standard GIB ceiling lining to underside of Rondo metal ceiling battens @ 600 crs with R6.6 Pink Batts insulation.

5 - 70 Series Brick Veneer on a 50mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).

5 - BGC Duo Cladding on a 20mm cavity (refer to specification) Watergate Plus building wrap on stud framing with R2.6 Pink Batts insulation & 10mm Std. GIB wall lining (Aqualine to wet areas).
(Dwangs @ 480mm crs)

6 - Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

7 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. (exterior walls) unless otherwise stated

9 - Studs 90x45 @ 600crs SG8, Dwangs @ 800crs. 2 min. (interior loadbearing & non-loadbearing walls) unless otherwise stated

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

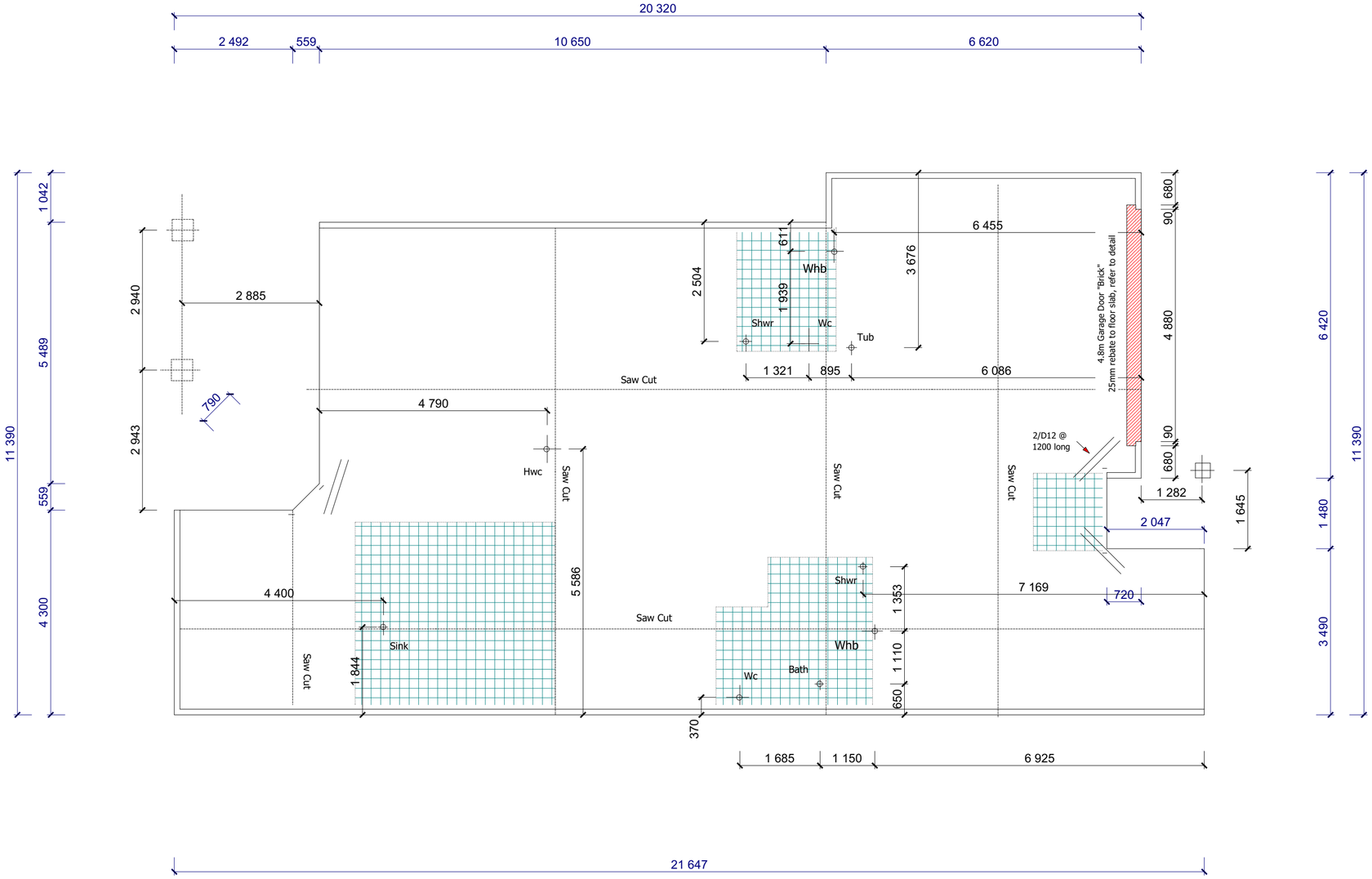
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Cross Section

Consent Plans

Drawn: Jeremy Harrison LBP # 105491
Scale: 1:50
Job Number: 2500
Date: 24/07/2025
SHEET: 4
OF: 15



GENERAL FOUNDATION NOTES

1) All dimensions over foundation face. Allow (120mm rebate) 70mm veneer & 50mm cavity.
2) No construction joints / shrinkage control joints under marked tile areas where possible.
3) The maximum plan dimension of concrete between shrinkage control joints is 6m with mesh to slab. (Standard joint to be formed with 25mm min sawcut & free joint to be at 24m crs max & as per detail CON001AFL).
4) No saw cuts under length of load bearing and bracing walls. (As fixing may not achieve full strength if embedded in sawcuts).
5) Supplementary reinforcing to internal corners to comply with NZS 3604:2011 clause 7.5.8.6.4.
6) W/C location indicated on plan has assumed a 160mm offset from internal frame line, please consult manufacturer's documentation to confirm offset. Contractor to consult manufacturer's documentation to determine the correct location for all wastes positioned through floor slabs.
7) Gully trap positions indicated on ground floor plan.
8) Earth bar to be bonded to the reinforcing mesh
9) Refer to Truss design for exact location of slab thickenings
10) Flexible silicone bondage sealer to fill the saw cuts through vinyl floor areas.

BOTTOM PLATE FIXING

Bottom Plate fixings: Lumberlok bottom plate fixing anchors as per manufacturers spec's @ 900mm crs on all external walls and within 150mm of each end of the plate.
75mmx4mm dia shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls.
DPC between bottom plate & floor slab (Refer to Mi Tek spec's attached for specific bottom plate fixing details required for bracing lintels)

REINFORCING

All reinforcing is to be Ductility Class E, in accordance with NZS 4671

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3

CONCRETE STRENGTH

All concrete to comply with NZS3604:2011 Section 4 Durability Clause 4.5.2

50mm Poly to the Underside of the Slab

Note:
Slab Mesh : SE62-500
320mm Min Cover
Concrete cover to Mesh 30mm min top cover
Against ground 75mm
Against formwork 50mm

Note:
Foundation proposed will be supported on good ground with an ultimate bearing capacity of 300kPa
Builder to excavate foundations to good bearing ground

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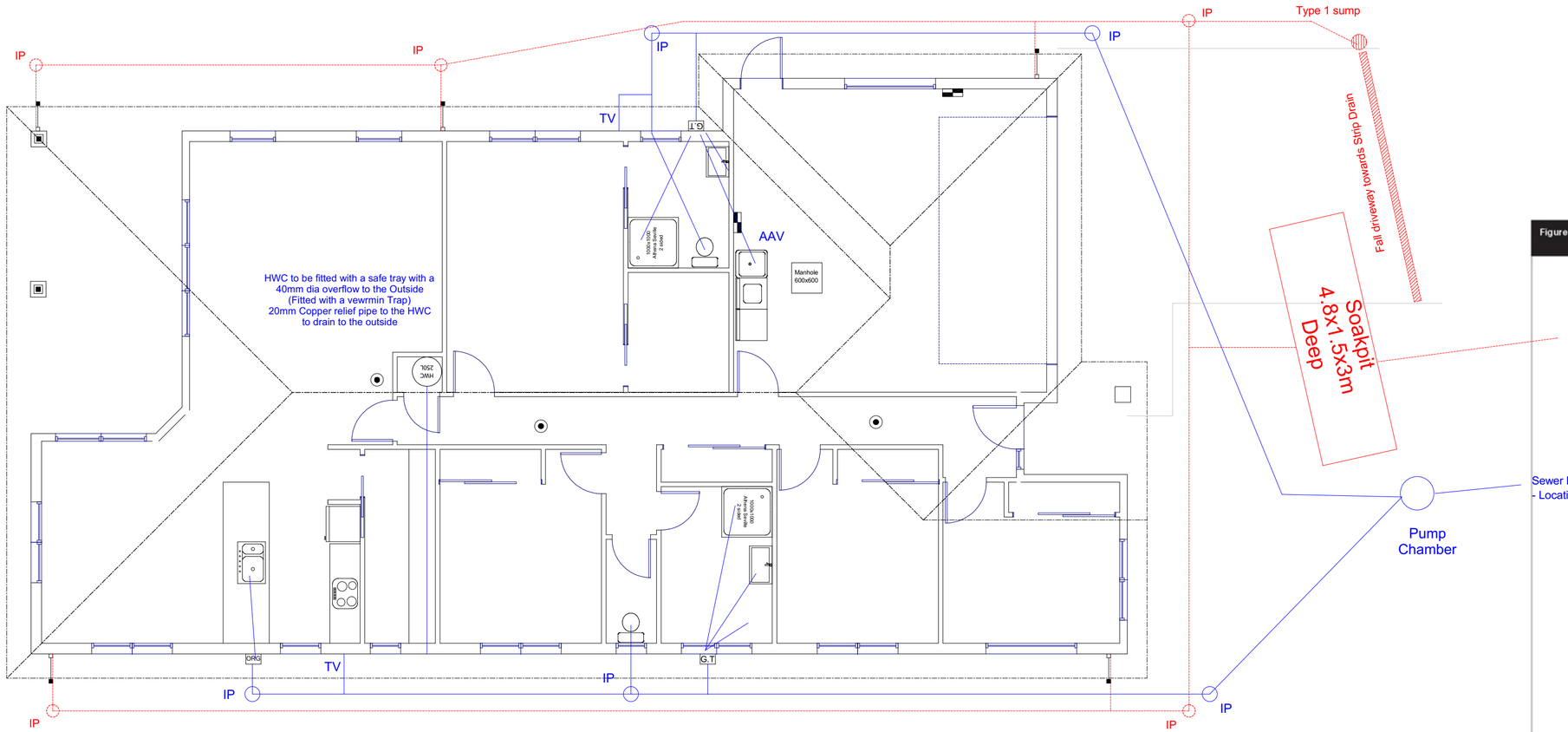
Foundation Plan

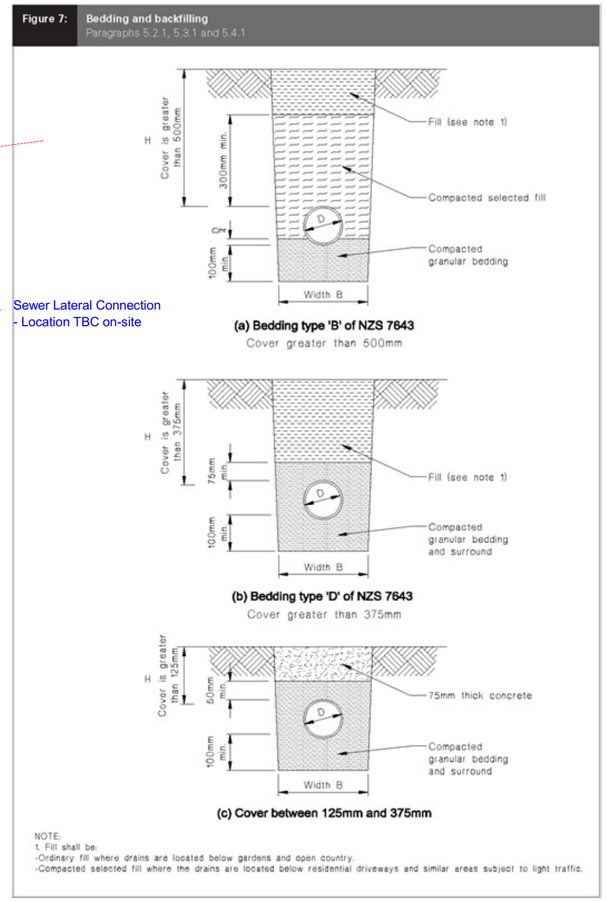
Consent Plans

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SHEET: 5
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Drainage Schedule	NZBC G13	
(Drainage as per Schedule unless specified otherwise)		
Kitchen		
Sink:	Ø65mm @1:40	(3 discharge units)
Bathrooms		
Vanity:	Ø40mm @ 1:40	(1 discharge units per basin)
Shower:	Ø40mm @1:40	(2 discharge units)
Bath:	Ø40mm @1:40	(4 discharge units)
WC:	Ø100mm @1:40	(4 discharge units)
Laundry		
Sink:	Ø65mm @1:40 min	(5 discharge units)
Main Foulwater Drain	Ø100mm @1:60	
Stormwater Drain	Ø100mm @1:60 (1:120min)	
Terminal Vent	Ø80mm	
Vent	Ø50mm	

LEGEND.	
Sewer Pipe	————
S/W Pipe	– – – – – –
Down Pipe	DP
Gully Trap	GT
Terminal Vent	TV
Vent	V
Inspection Point	IP
Air Admittance Valve	AAV





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Drainage Plan

Consent Plans

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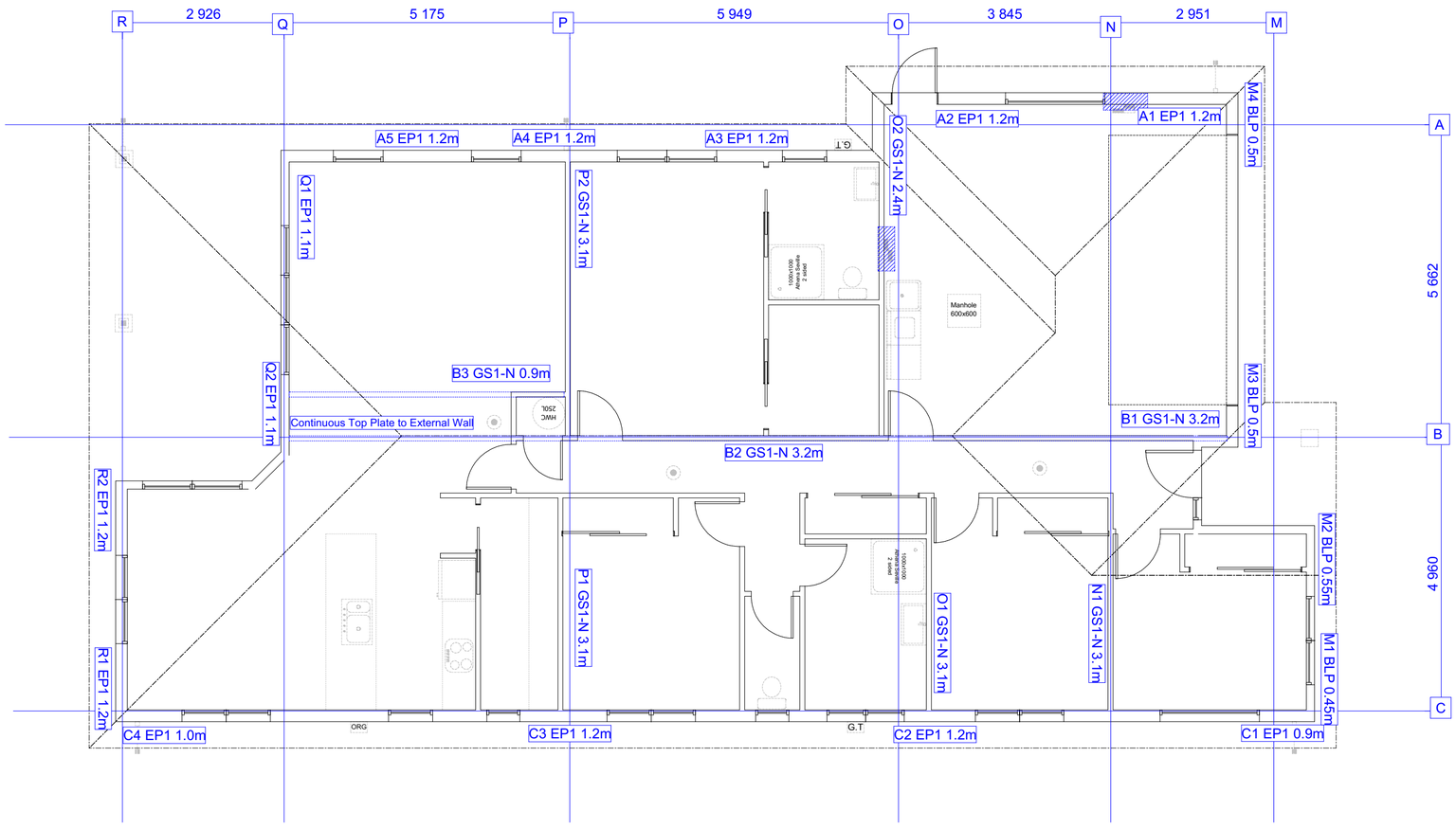
Job Number: 2500

SHEET: 6

Scale: 1:100

Date: 24/07/2025

OF: 15



GENERAL BRACING NOTES

Bracing plan to be read in conjunction with supplementary bracing calculations

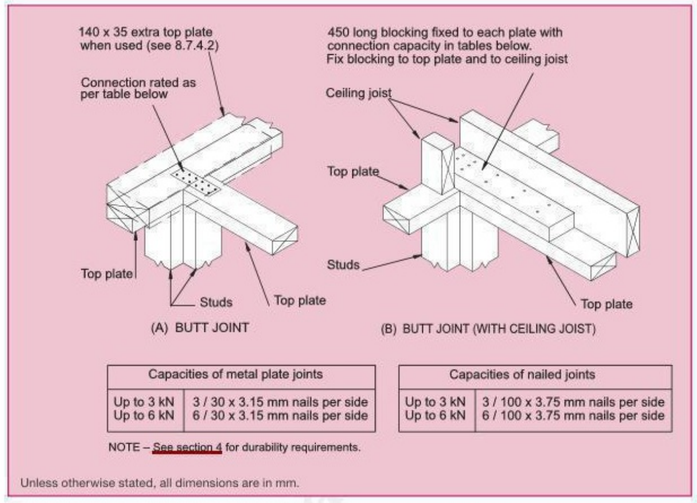
Refer to the supporting documents in the specification for purlin/batten fixing, truss fixing, stud to top plate fixing & lintel fixing schedules.

To be read in conjunction with minimal length bracing detail TAJ002AWA

BRACING SYSTEM

Wall bracing designed in accordance with NZS 3604:2011 & GIB Ezybrace system

Designed to:
Wind: High
Earthquake: 3



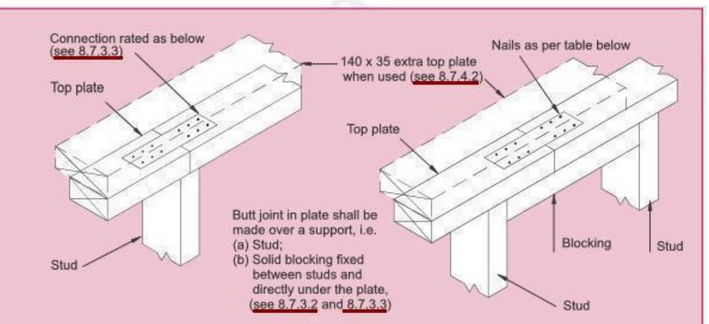
Capacities of metal plate joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

Figure 8.16 – Connecting top plates to external walls at right angles – Walls containing bracing (see 8.7.3.4)



Capacities of metal plate joints(2)	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints(2)	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE –
(1) See section 4 for durability requirements.
(2) Not required when extra top plate is used.

Unless otherwise stated, all dimensions are in mm.

Figure 8.15 – Connecting top plates in line – Walls containing bracing (see 8.7.3.3)

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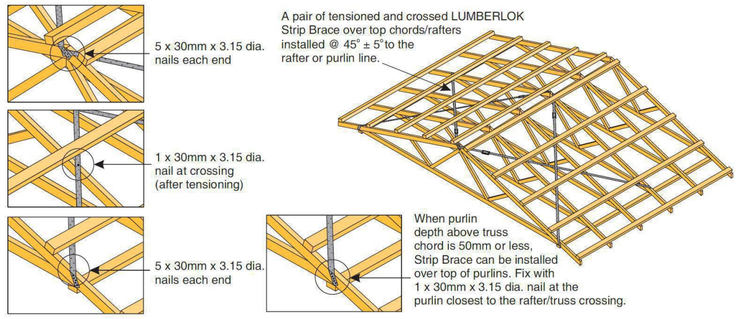
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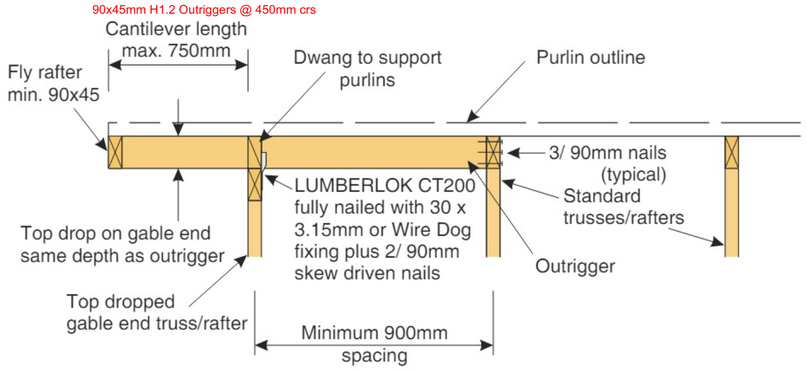
Bracing Plan

Consent Plans

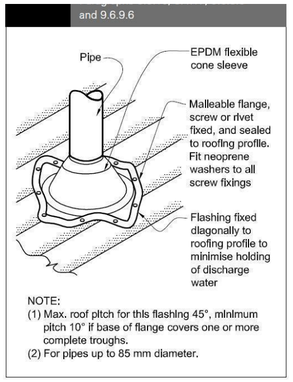
Drawn: Jeremy Harrison LBP # 105491
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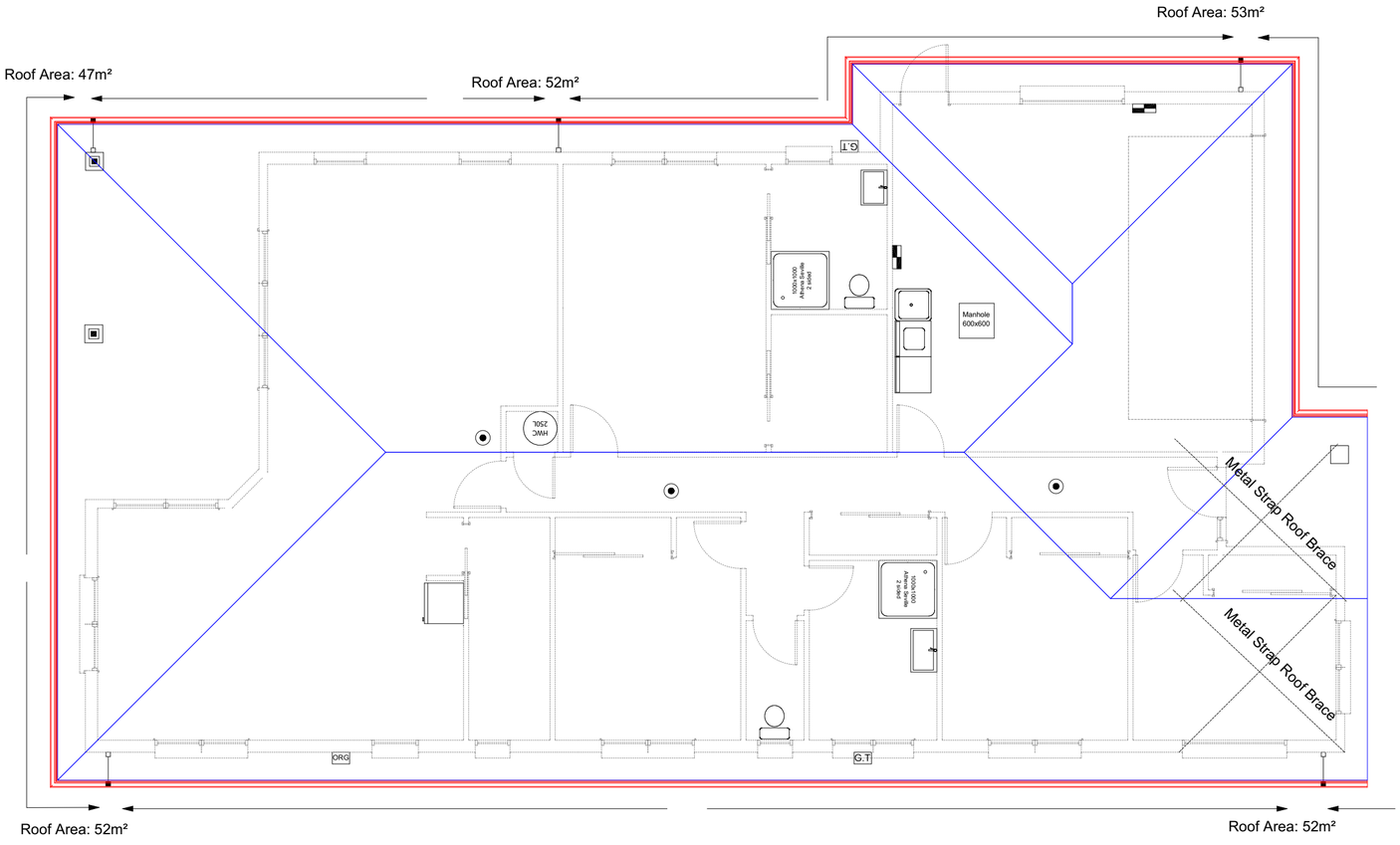
- A pair of tensioned and crossed LUMBERLOK Strip Brace running continuously from ridge to top plate installed as detailed below.





CROSS SECTION





GENERAL ROOF PLAN NOTES

Refer to the Construction Schedule (Page 2 & 3) in the Specification and the manufacturer's specification attached for the gutter and down pipe rainfall catchment area calculations.

RPB - Roof Plane Bracing as per NZS:3604 (Figure: 10.22)

LSB - Lumberlok Strip bracing as per Lumberlok Roof Bracing Specification

ROOF CLADDING

Roof - 25º Corrugated Colorsteel Profile on Thermakraft 215 roof underlay

TRUSS FIXINGS

Refer to the Truss design for truss fixings

PURLINS OR BATTENS

Purlins: 70x45 SG8 H1.2 @ 900crs, fixings 1/10g self-drilling screw, 80mm long
End span of purlins to be 600 crs as per E2 Table 11

TOP PLATE FIXING

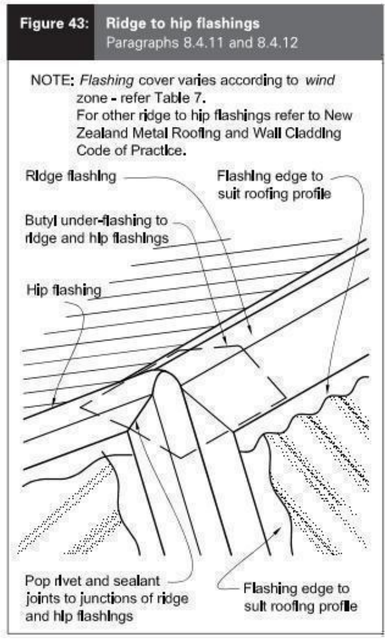
Use Lumberlock top plate fixing chart attached to the main specifications to determine top plate fixings

TIMBER GRADE

Timber members specified on these drawings are to be a minimum of strength of SG8 graded as per NZS3604:2011

PROTECTION OF FIXINGS

Fixings shall comply with NZS 3604:2011 Section 4 Durability Tables 4.1-4.3



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Roof Plan

Consent Plans

Drawn: Jeremy Harrison LBP # 105491

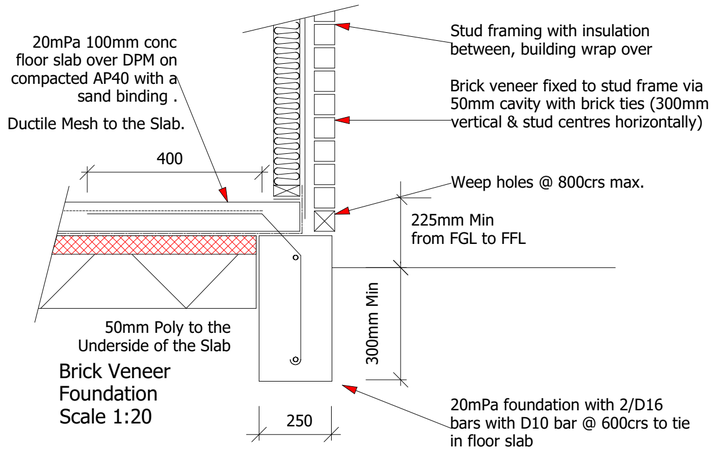
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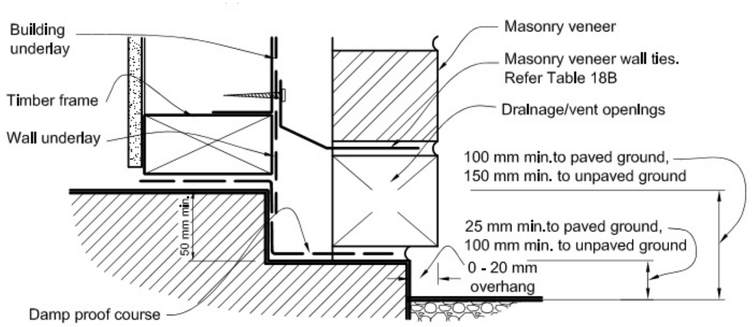
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Date: 24/07/2025

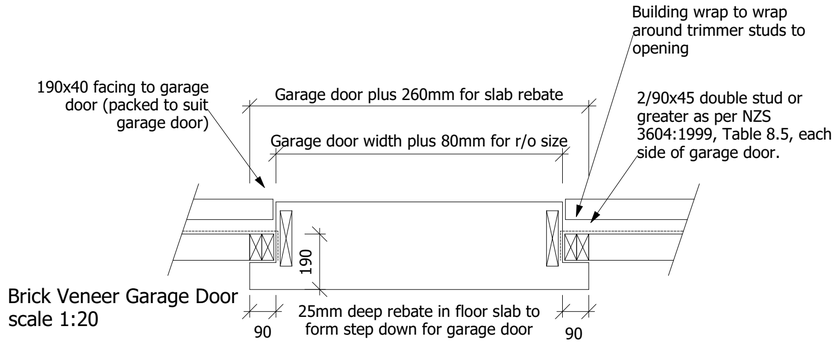
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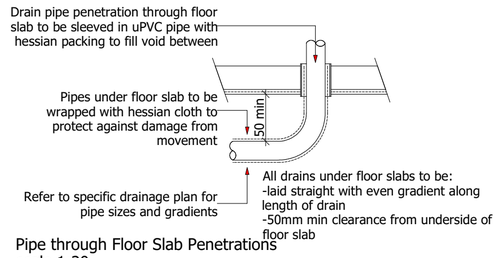
Brick Veneer Foundation
Scale 1:20



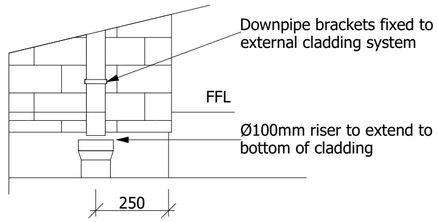
(I) MASONRY VENEER - FLOOR REBATE DETAIL



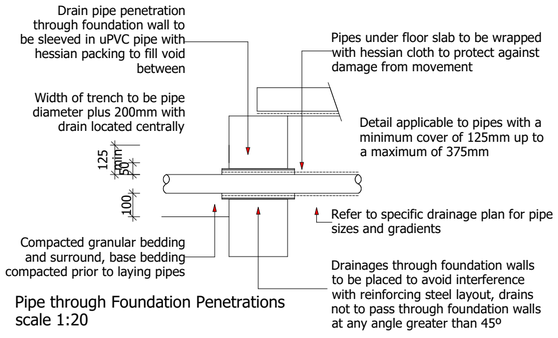
Brick Veneer Garage Door
scale 1:20



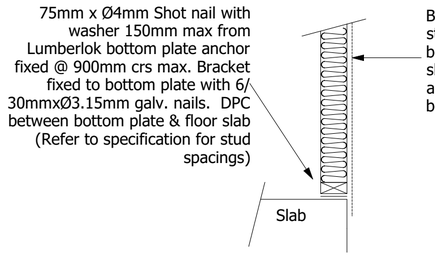
Pipe through Floor Slab Penetrations
scale 1:20



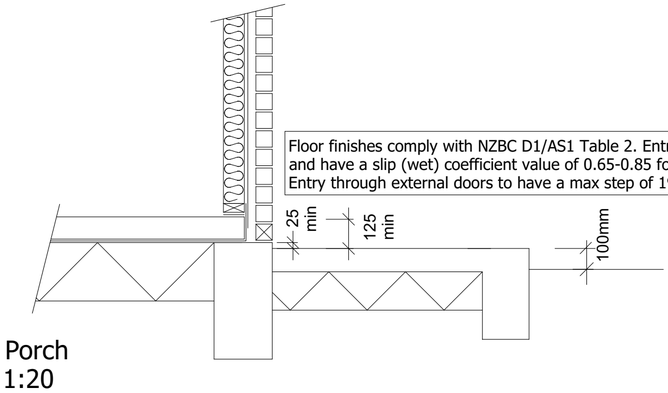
Downpipe Corner Offsets
(Brick)
Scale 1:20



Pipe through Foundation Penetrations
scale 1:20



Exterior stud framing to slab
Scale 1:20



Entry Porch
scale 1:20

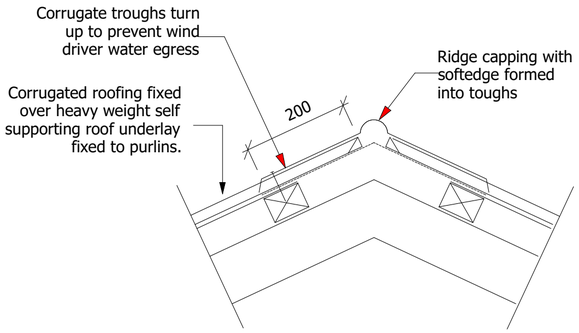
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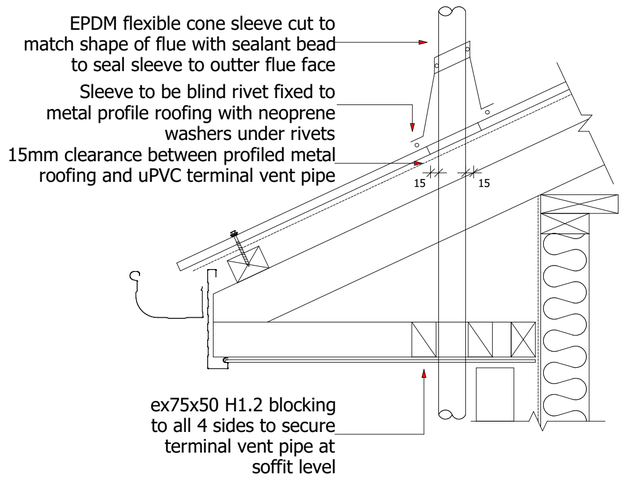
Details

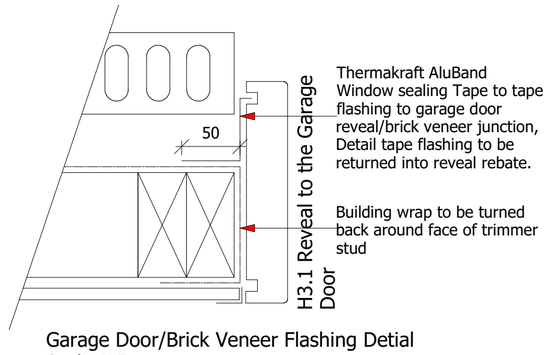
Consent Plans

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Job Number: 2500
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Scale: varies
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OF: 15

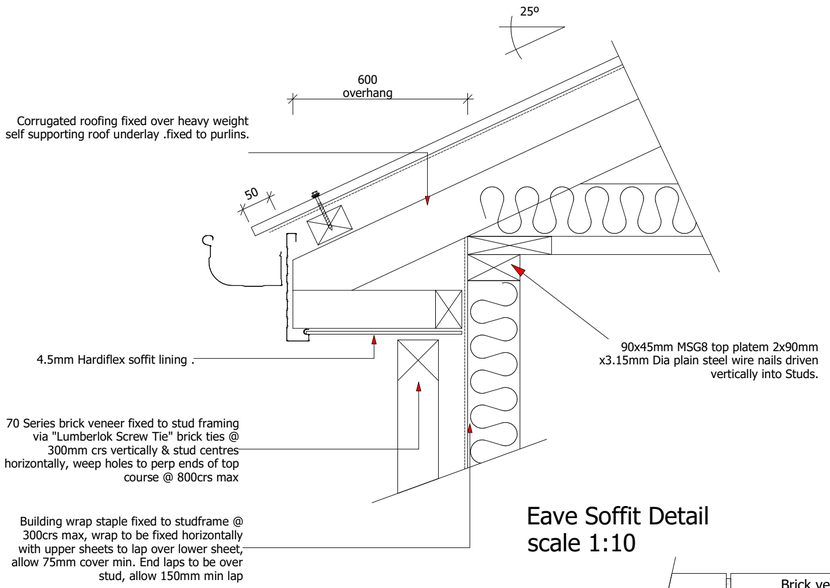


Metal Ridge Capping Detail
scale 1:10





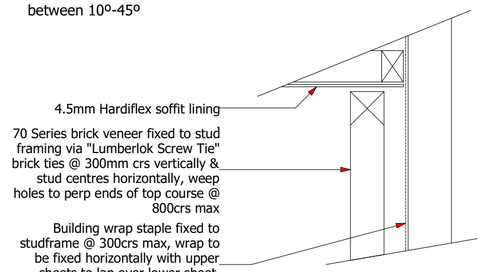
Garage Door/Brick Veneer Flashing Detial
Scale 1:5



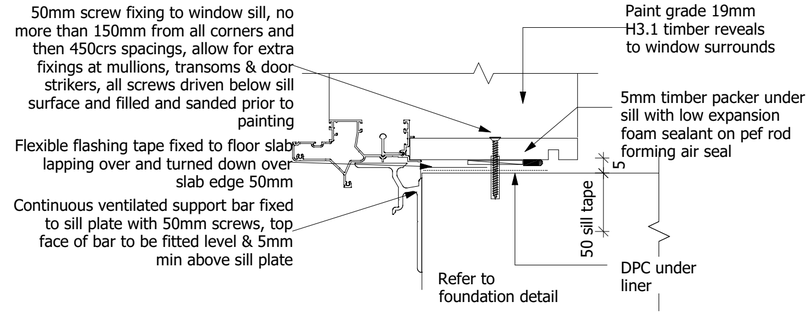
Eave Soffit Detail
scale 1:10

Terminal Vent to Roofing Penetration Detail "Section"
scale 1:10

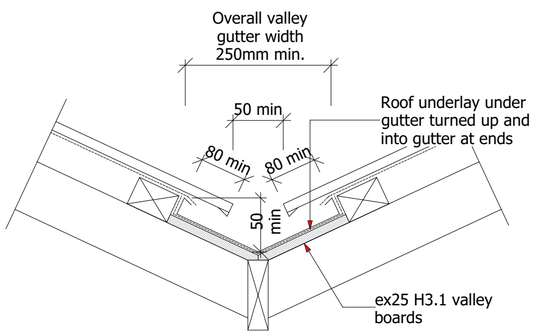
Suitable for Roof Pitches between 10º-45º



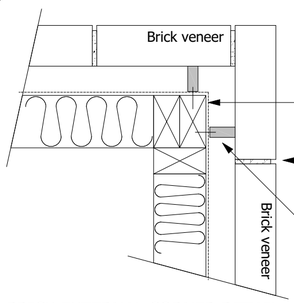
Brick Eave Soffit Detail
Scale 1:10



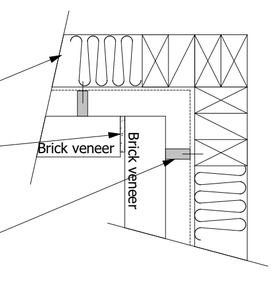
Sliding Door Sill to Slab Detail
scale 1:5



Longrun Valley Gutter Detail
scale 1:10



BRICK EXTERNAL CORNER DETAIL
Scale 1:5



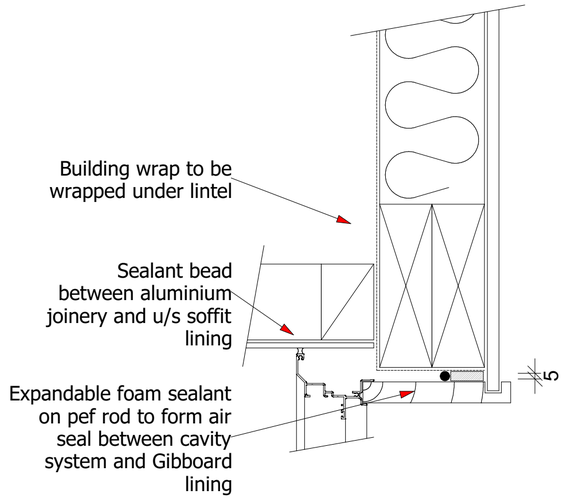
BRICK INTERNAL CORNER DETAIL
Scale 1:5

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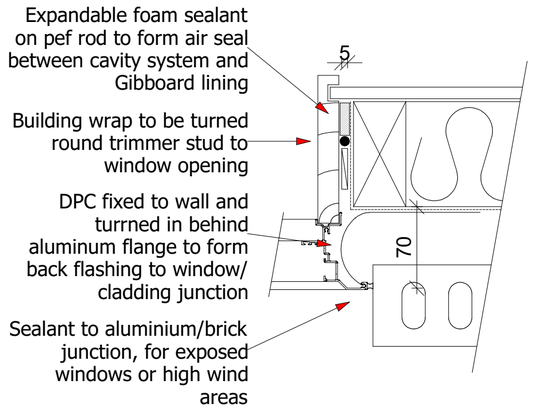
Project:
UWC Ltd
Proposed Dwelling At:
Lot 79 Dp 587128
52 Benn St , Amberley

Details
Consent Plans

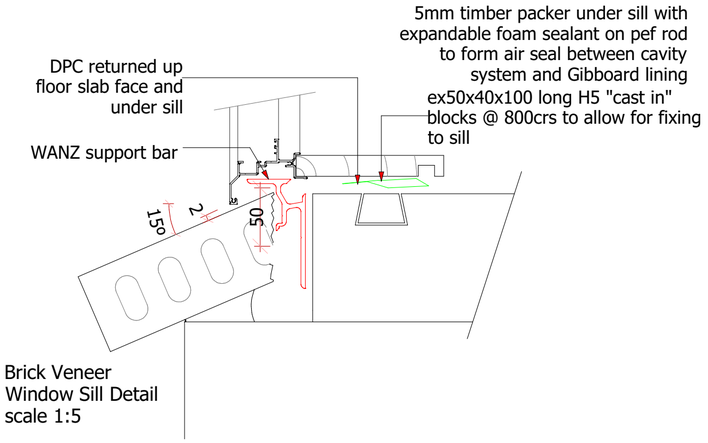
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SHEET: 10
Scale: varies
Date: 24/07/2025
OF: 15



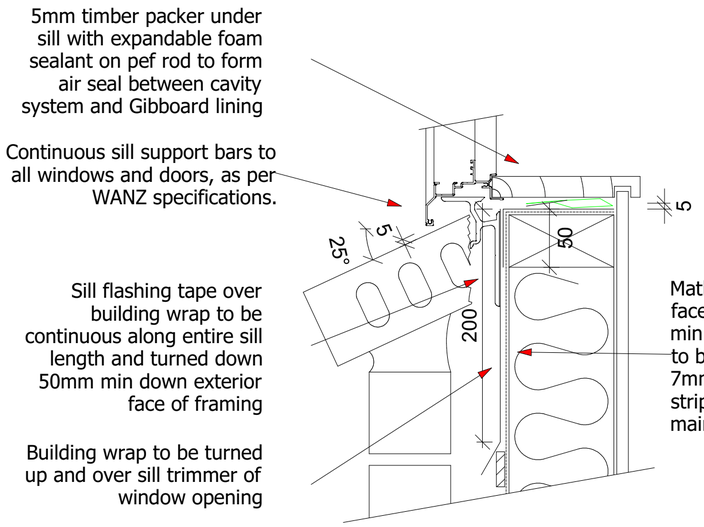
Brick Veneer Window Head to Soffit Detail
scale 1:5



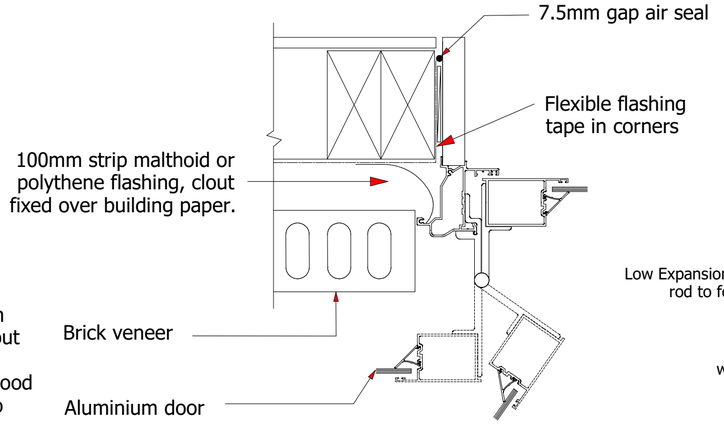
Brick Veneer Window Jamb Detail
scale 1:5



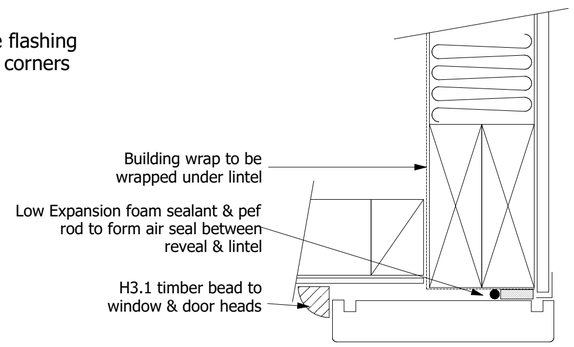
Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Window Sill Detail
scale 1:5



Brick Veneer Door Jamb Detail (Aluminium)
scale 1:5



Garage Door Head to Soffit Detail
scale 1:5

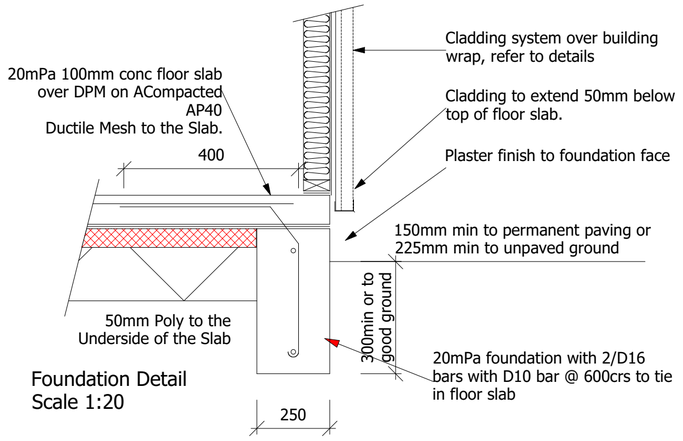
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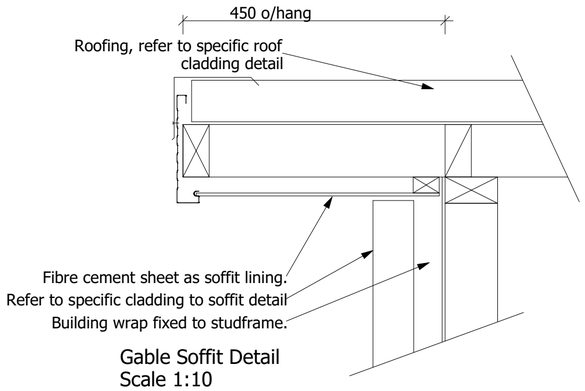
Details

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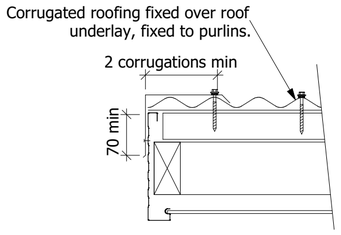
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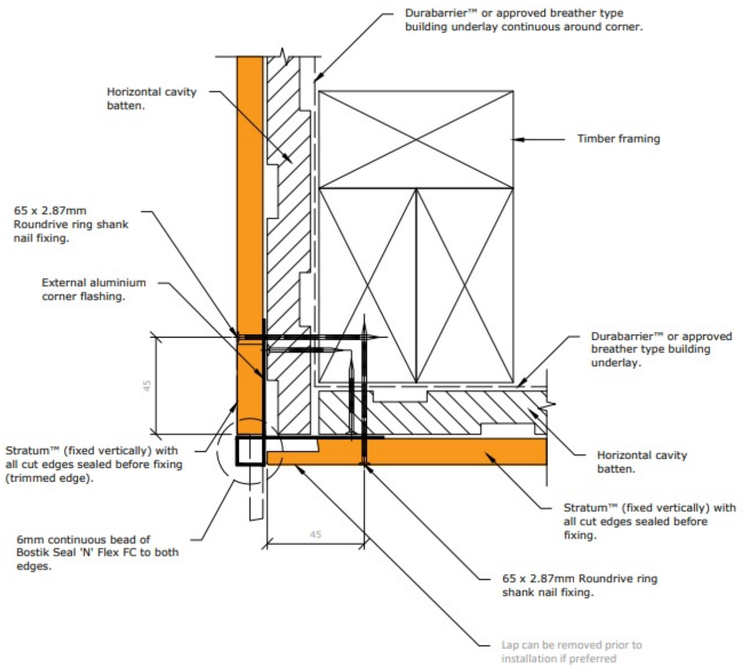
Foundation Detail
Scale 1:20



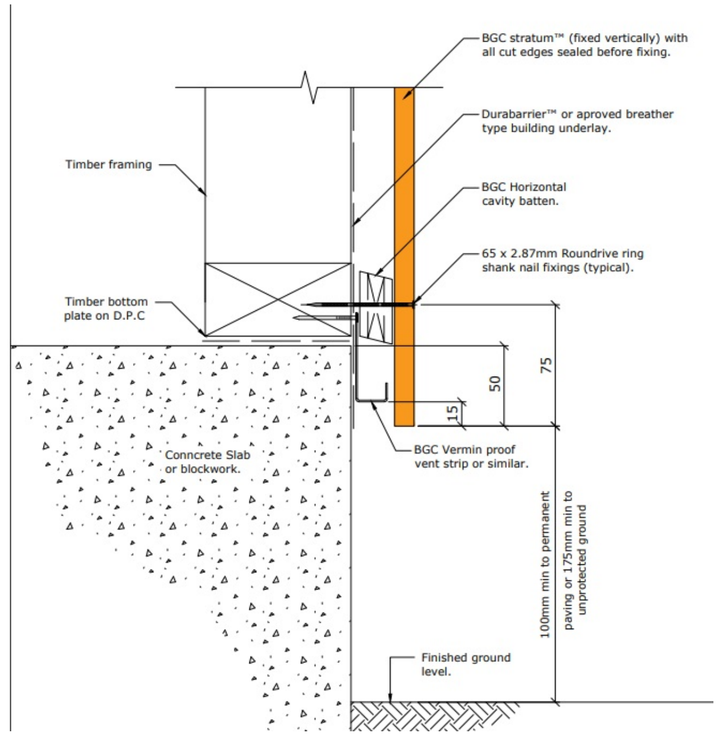
Gable Soffit Detail
Scale 1:10



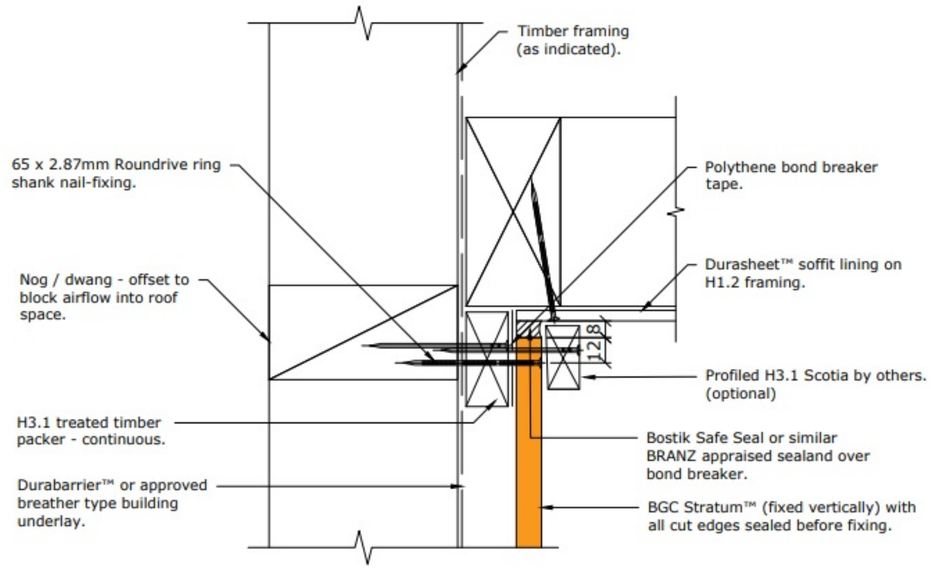
Gable Soffit Detail
Scale 1:10



External Corner Detail



Cladding Base Detail



Soffit Junction Detail

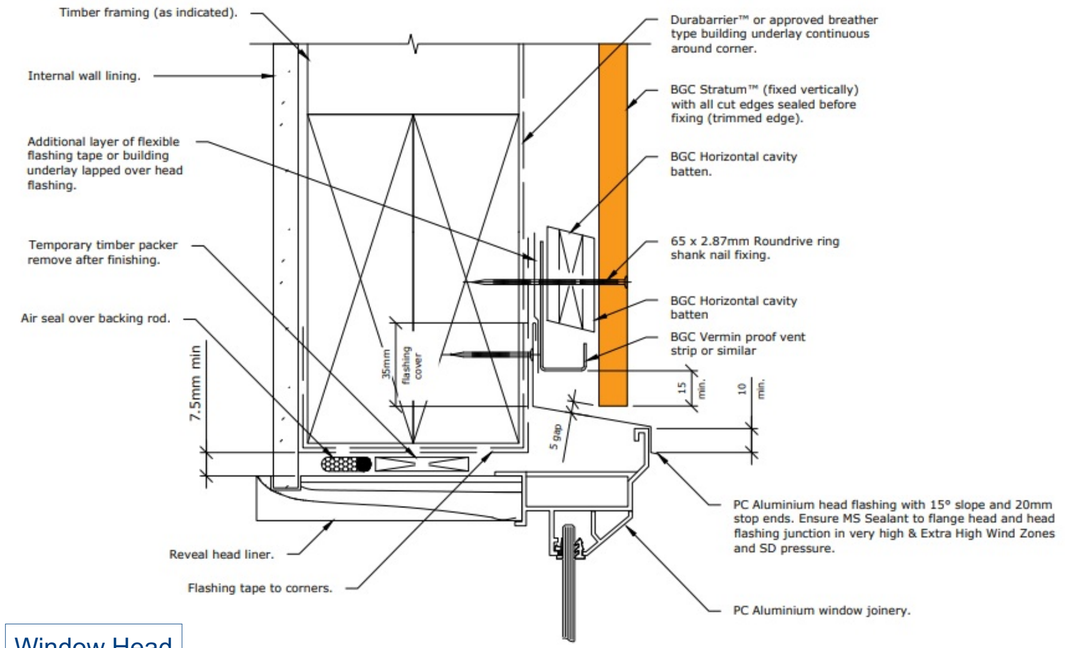
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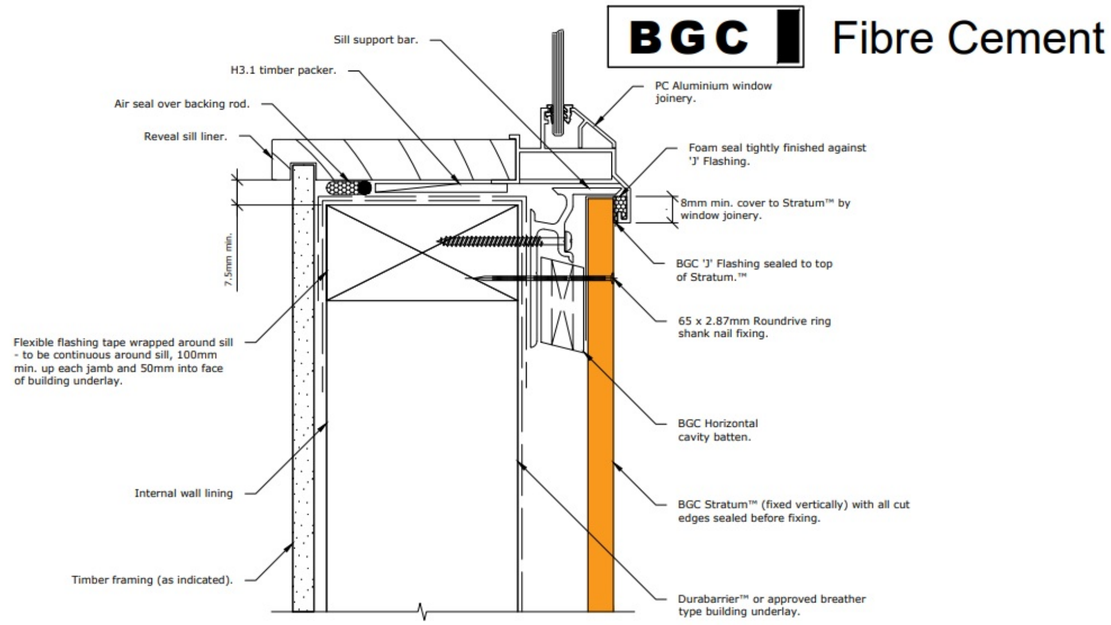
Details

Consent Plans

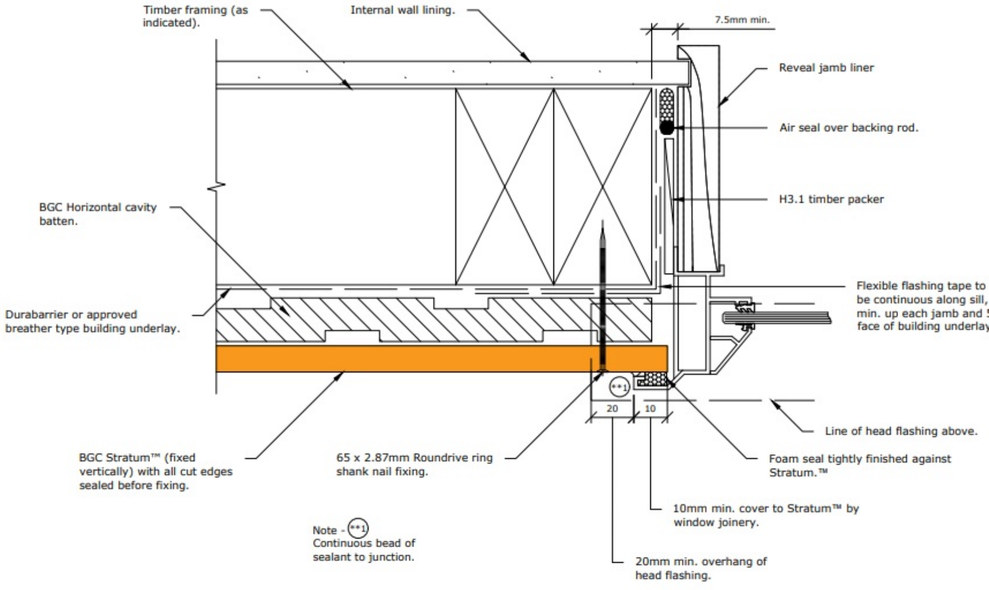
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Job Number: 2500
SHEET: 12
Scale: varies
Date: 24/07/2025
OF: 15

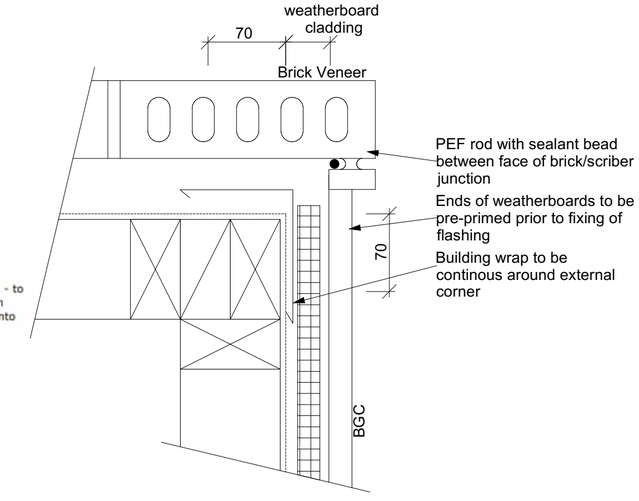


Window Head

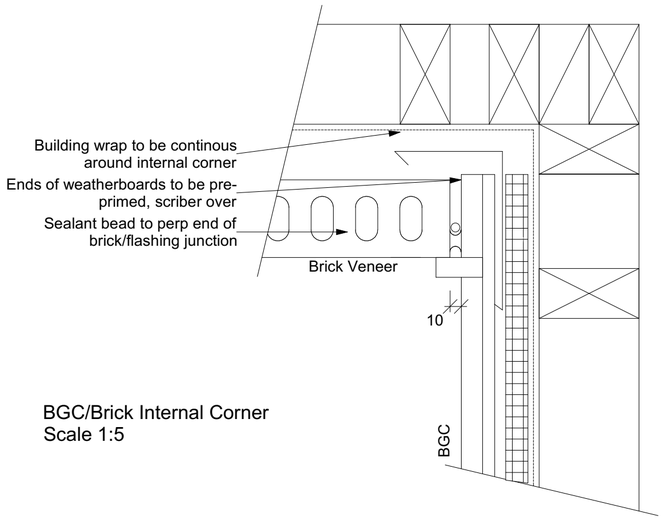


Window Sill





BGC/Brick External Corner Detail
Scale 1:5



BGC/Brick Internal Corner
Scale 1:5

Window Jamb

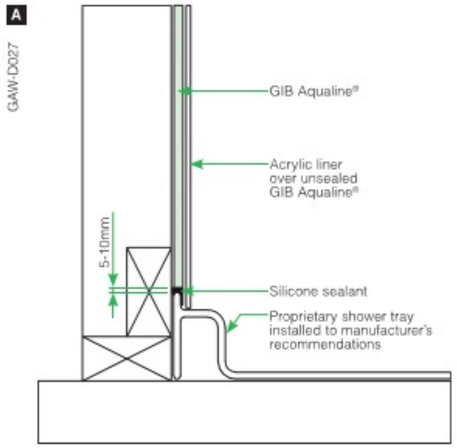
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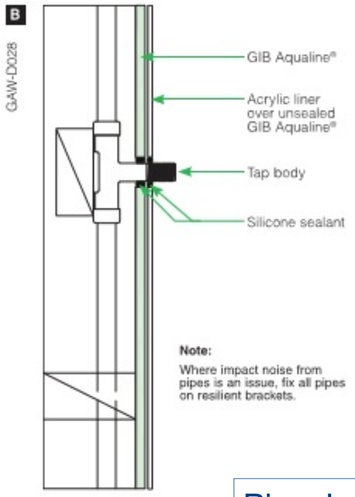
Details

Consent Plans

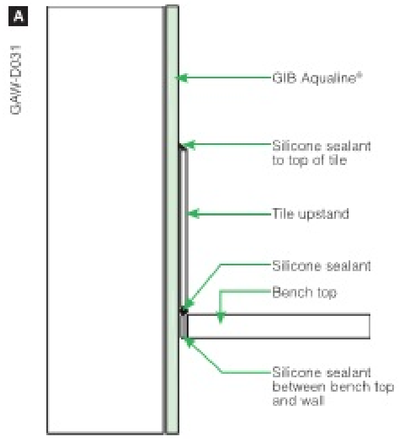
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Scale: varies
Job Number: **2500**
Date: 24/07/2025
SHEET: **13**
OF: **15**



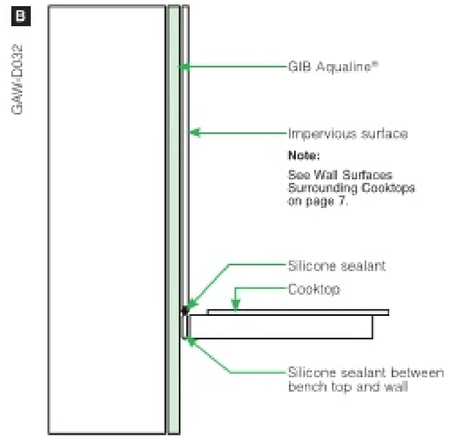
Shower Base



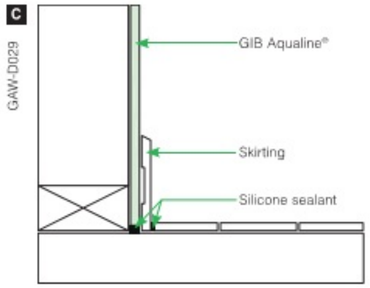
Pipe Junction



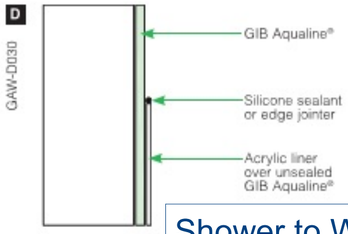
Bench top to wall



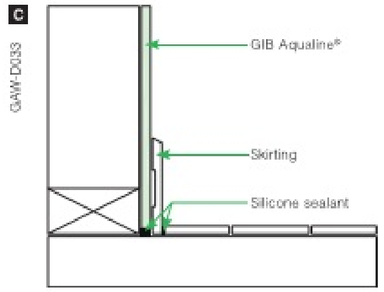
Bench top/ Cooktop to wall



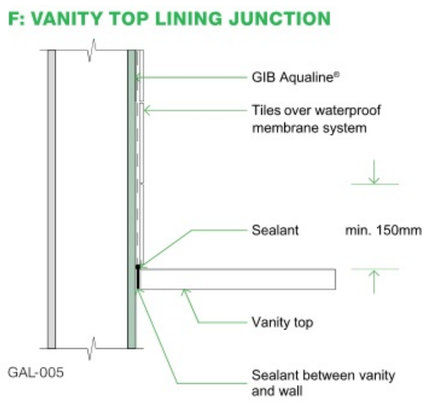
Skirting Detail



Shower to Wall



Skirting Detail









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Consent Plans

Drawn: Jeremy Harrison LBP # 105491

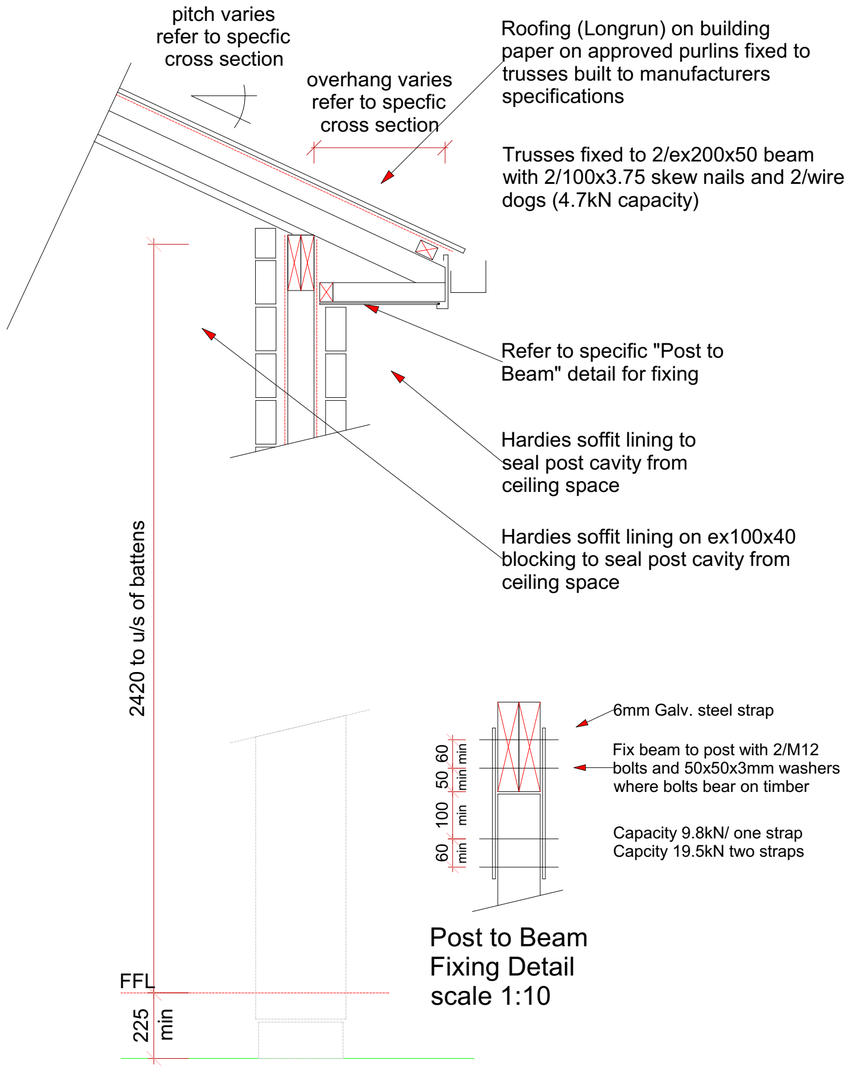
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Job Number: **2500**

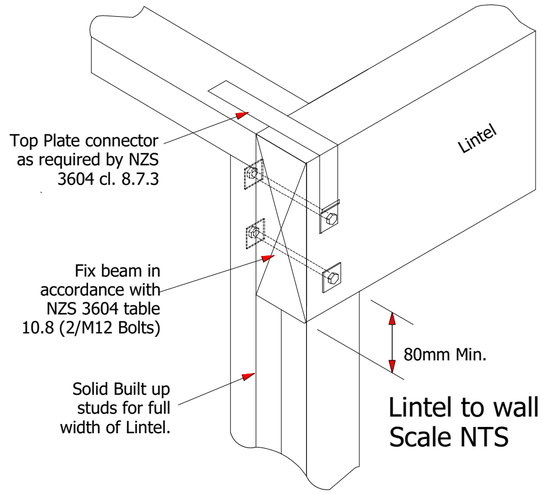
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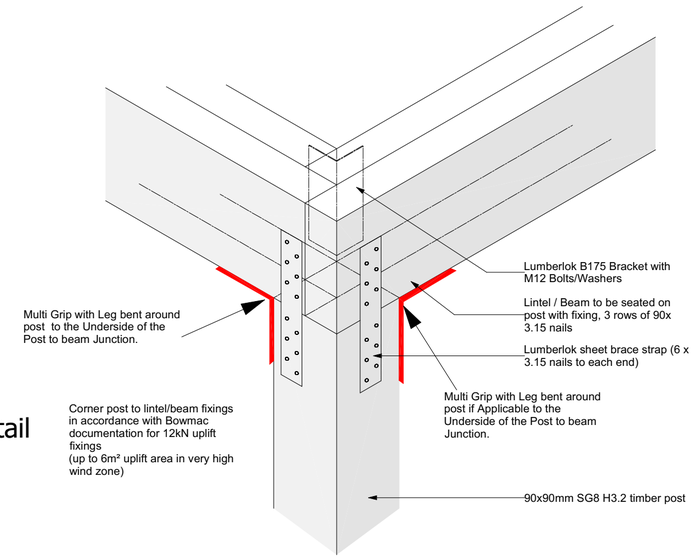
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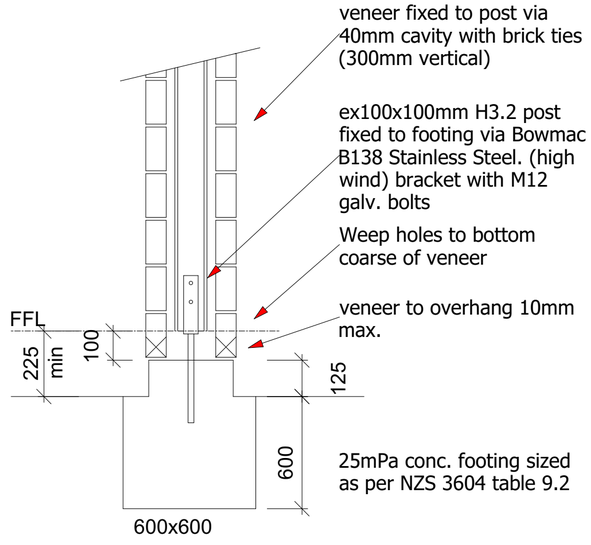


Post to Beam
Fixing Detail
scale 1:10



Lintel to wall detail
Scale NTS





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Consent Plans

Drawn: Jeremy Harrison LBP # 105491

Scale: varies

Job Number: **2500**

Date: 24/07/2025

SHEET: **15**

OF: **15**

SPECIFICATION

of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

UWC Ltd

52 Benn St
Amberley

Date: 2 April 2025

CONSTRUCTION SCHEDULE

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:
Waffle Slab Foundation

SG8
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: Lumberlok Bottom Plate Fixing Anchors as per manufacturer’s specifications @ 900mm crs on all external walls and within 150mm of each end of the plate. 75mmx4mmØ shot fired fasteners @ 600mm crs and within 150mm of each end of the bottom plate to interior load bearing walls. DPC between bottom plate & floor slab (Refer to MiTek specification attached for specific bottom plate fixing details required for bracing & lintels).

WALL FRAMING:
Exterior & Interior Loadbearing wall: 90x45mm studs @ 600 crs
Dwangs Ext: 90x45 @ 800crs
Non loadbearing: 90x45mm studs @ 600 crs
Dwangs Int: 90x45mm @ 800mm crs

Lintels: Lintels are shown on the Truss design. (All Lintels SG8 unless stated otherwise).

Building Wrap: Watergate building wrap with Aluband flexible flashing tape
Building wrap to be strapped @ 300crs between dwangs.

INSULATION, ENERGY EFFICIENCY:
Refer to H1 Schedule, Energy Efficiency Calculations
Exterior Walls: Batts – R 2.6 Wall
Ceilings: Batts – R6.6 Ceiling
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)
Purlins: 70x45 SG8 H1.2 @ 900crs (Fixings in specification)

Trusses: @ 900crs, refer to truss design (H1.2 unless otherwise stated)
Fascia & Gutter system:
Refer to manufacturers specification attached,
Down pipes: 75x55mm Colorsteel
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 of loop pile. (NZBC D1/AS1 Table 2) Floors to be carpet unless stated otherwise on plan, not including the garage.
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
Aqualine Gib with Enamel paint finish, refer to details attached.

KITCHEN JOINERY
Bench top –Melamine (High Pressure laminate), 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, Manrose SF 150)

SMOKE ALARMS:
Domestic Smoke Alarms(Hush Type) to be
Interconnected and Located in each bedroom,
Hallway and Living Room Sapce.
To Comply with:NZS4514
Alarms to be Not Less than 75dB(A)
and Not more than 110dB(A)
Battery Operated Alarms to have a 10 Year Life.

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
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: 0º-25º =60m² as per NZBC E1/AS1 Table 5

PRELIMINARIES AND GENERAL

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

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.

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.

CONCRETE (CONCTRETE AS PER ENGINEERS DESIGNS)

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

Bar Diameter	Lap
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.

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.

CARPENTRY

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
Battens: Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip).
TIMBER TRUSSES
Moisture content at supply: 18%.

DAMPPROOF COURSE
2-ply/3-ply Kraft felt strip saturated and coated with bitumen.

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.

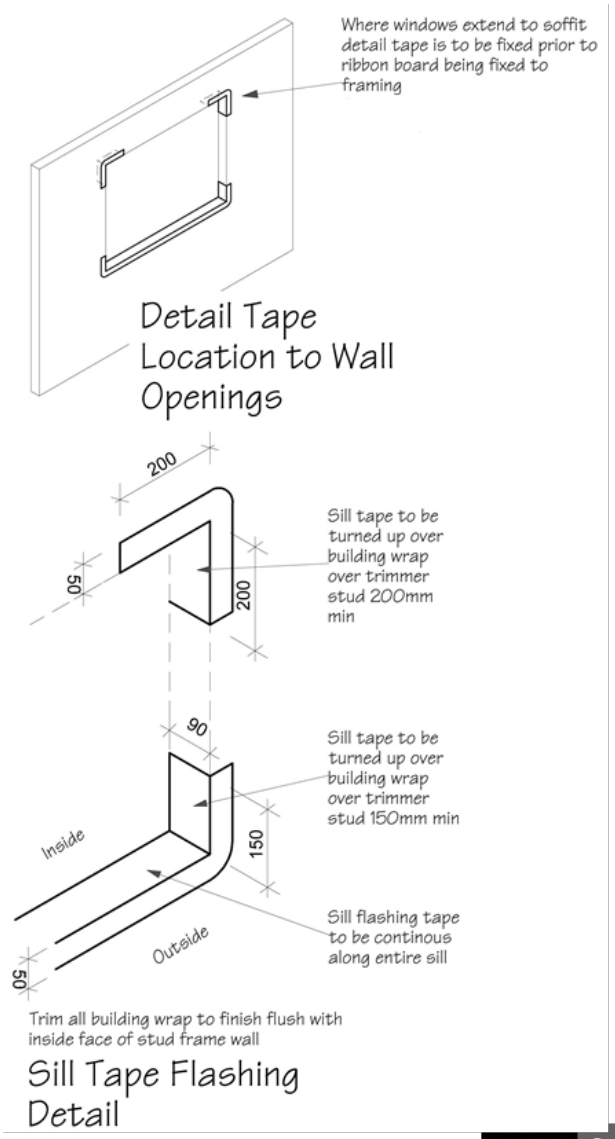
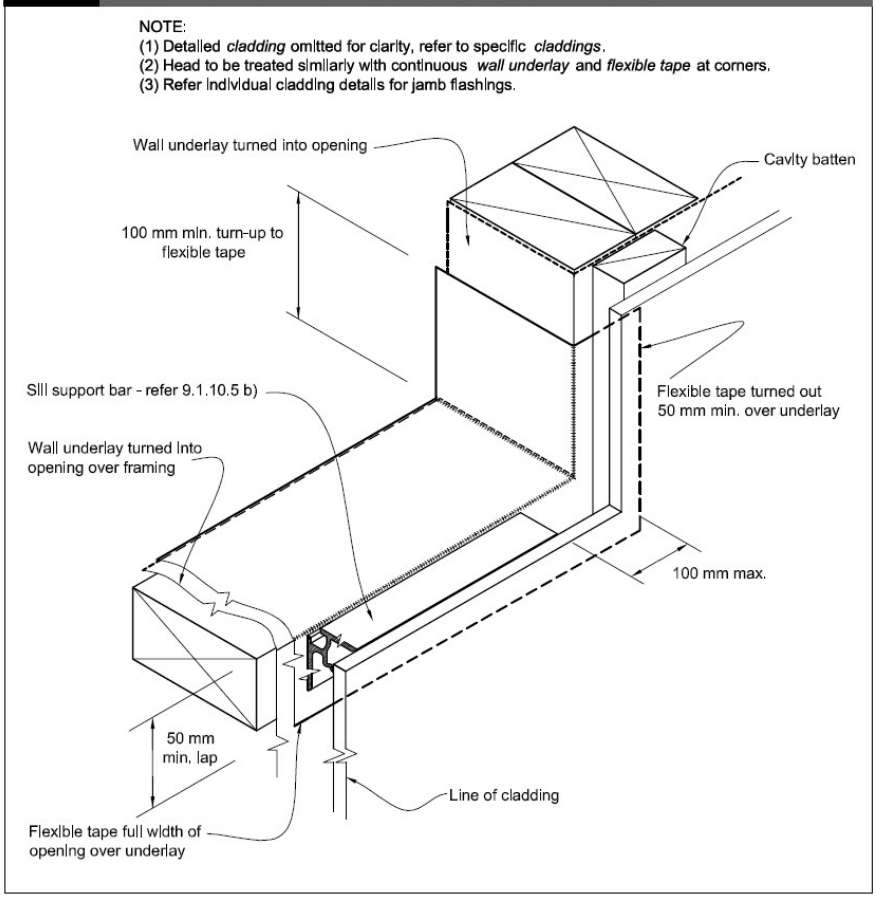


Figure 72B: **General window and door opening with drainage cavity**
Paragraphs 9.1.5, 9.1.9.3, 9.1.10.2, Figures 73C, 76, 85, 86, 91, 99, 116 and 128



BRICK VENEER CLADDING

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 5º 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	-

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 *damp-proof course* Bottom of veneer panel supported on steel angle lintel	Within 300 mm or two courses (whichever is the smaller) from bottom of veneer
Bottom of veneer panel in masonry rebate with *membrane damp-proof course*	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) Horizontal	Vertical	Tie type (4)(5)	Maximum spacings (1) 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.

METAL PROFILED ROOFING

MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:
NZ Metal Roof and Wall Cladding Code of Practice

QUALIFICATIONS
Roofers to be Approved Installers.

FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification of this site and building height. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply.

PERFORMANCE
Install roofing material and associated flashings and accessories to form a weather tight and durable system.

SET-OUT
Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features.

MARKING AND CUTTING PROFILED METAL ROOFING
Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use black lead pencil for marking aluminium/zinc-based products. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof as soon as possible, ensuring that it does not contaminate gutters or lower surfaces.

INSTALLING PROFILED METAL ROOFING
Install and fix 0.40 gauge roofing in accordance with NZ Steel's Installers Guide and to the Manufacturer Product Guide. Use only screws as required by the roofing manufacturer. Colour matched fixings and accessories to be painted before installation.
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.
Confine foot traffic over the roof to within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

FLASHINGS GENERALLY
Formable grade 0.55 BMT for galvanised, aluminium/zinc and pre-coated steel, and 0.90 for aluminium to the same standards as the profiled sheets, notched where across profile or provided with a soft edge. Where flashings are required but are not detailed, design to the Manufacturers standard flashing details.

Fasten ridges and all roof flashings at both edges through to the primary structure at centres required by the roofing manufacturer, allowing for localised wind forces. Close flashings neatly at the ends to provide a weatherproof and vermin proof appearance.

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

NZBC E2/AS1 clause 4.5.2 Metal flashing joints
Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joins of metal flashings shall have the following features:
a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
i) compatible with the flashing material as per NZBC E2 Table 21 and Table 22, and ii) sealed against moisture, or iii) of a sealing type or blind rivet,
b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel, ii) 8 metres for copper, & iii) 8 metres for aluminium.
c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
d) Where necessary, expansion joints shall be formed as shown in Figure 6, with: i) minimum 200 mm laps, and ii) sliding clips at both sides of the lap.

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.

FASTENERS GENERALLY
Ensure durability of all fasteners is at least Class 4 and not less than the roofing material being fixed. Where applicable all fasteners factory colour matched prior to installation

FIXING SCREWS
Screws appropriate to the roofing material and the supporting member, as recommended by the Manufacturer.

RIVETS
Sealed aluminium, minimum diameter 4 mm.

SEALANT
Neutral curing silicone or polymer sealant as required by the Manufacturer and used as directed.

Select and use sealants only as recommended for the materials being used. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

CLOSURE STRIPS
Compressible, profiled, closed cell foam strips to fit the sheet profile.

LAP SEALING TAPE
Closed cell, 3 mm x 16 mm self adhesive Trimseal tape.

END LAPS
Install in continuous lengths without end laps. Where end laps are necessary, seal both ends of the lap with lap sealing tape or sealant.

AVOID DAMAGE
Take care to avoid damaging pre-finished roofing both during and after fixing. Wear only soft-soled shoes on the finished surface. Allow foot traffic over the roof only within 300 mm of purlins or with foot placement in the pan of the profile. Where this is not possible, walk across two adjacent ribs.

ENSURE COMPLETE
Ensure the work is complete with all flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.

Remove metal filings from roofing surfaces at least daily.

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

Remove trade rubbish and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting's, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

ALUMINIUM WINDOWS AND DOORS

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

GLAZING

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.

INSULATION

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

GIB® PLASTERBOARD LININGS

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 Aqualine® 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
Battens:Rondo" metal ceiling battens @ 600 crs (#6 Gib Grabber Scavenger Head self tapping screws, no fixing clip
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.

TILING

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.

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.

MOVEMENT CONTROL JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.

CARPETING

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.

PAINTING

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”

RAINWATER SYSTEMS

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/m^2) 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: Colorsteel
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: Colorsteel
Paint coating type: Endura/Max

ALUMINIUM/ZINC ALLOY COATED PRE-PAINTED STEEL DOWNPIPES
Shape/size: Refer to construction schedule
Paint coating type: Endura/Max

HOT AND COLD WATER SYSTEM

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 50º) The storage water heater control thermostat shall be set at a temperature of not less than 50º 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.

ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
To NZS 4606.3, ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.10. Valve-vented systems to NZS 4607.

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 onsite supply 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:
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.

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

ELECTRIC HOT WATER CYLINDER

Brand/model number:	Rheem
Capacity:	250 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 *building* structure.

Figure 8(a): **Mains Pressure Storage Water Heater System (unvented) - Expansion Vessel**
Paragraphs 6.1.2 and 6.2.1 c)

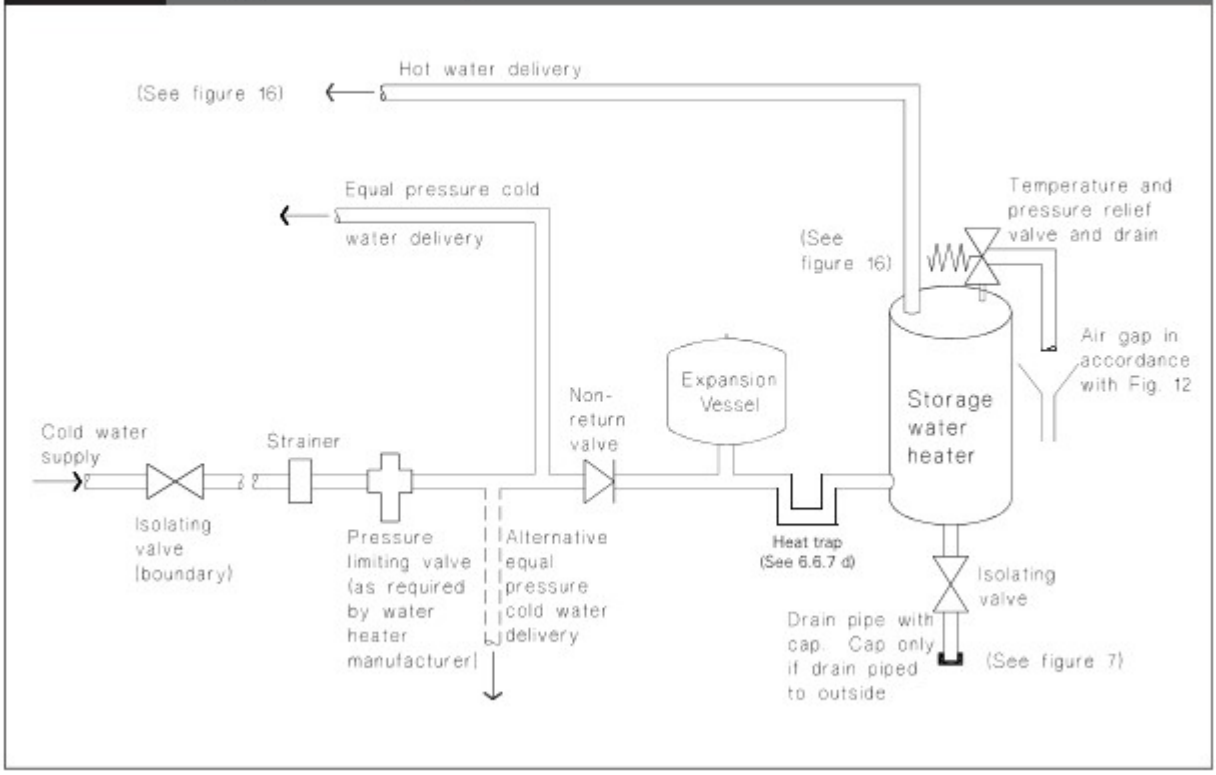
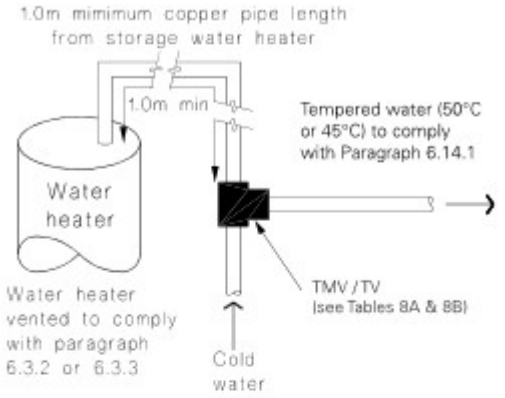
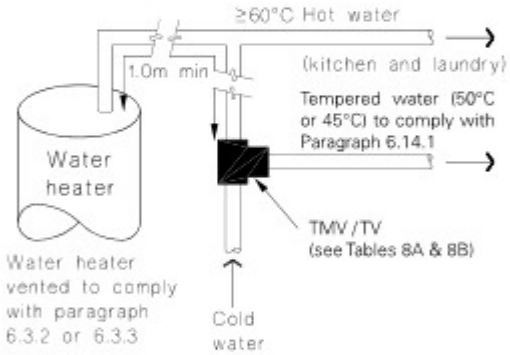


Figure 16: Tempering Valve or Thermostatic mixing Valve Installation
Tables 8A and 8B



(a) Where all hot water is tempered

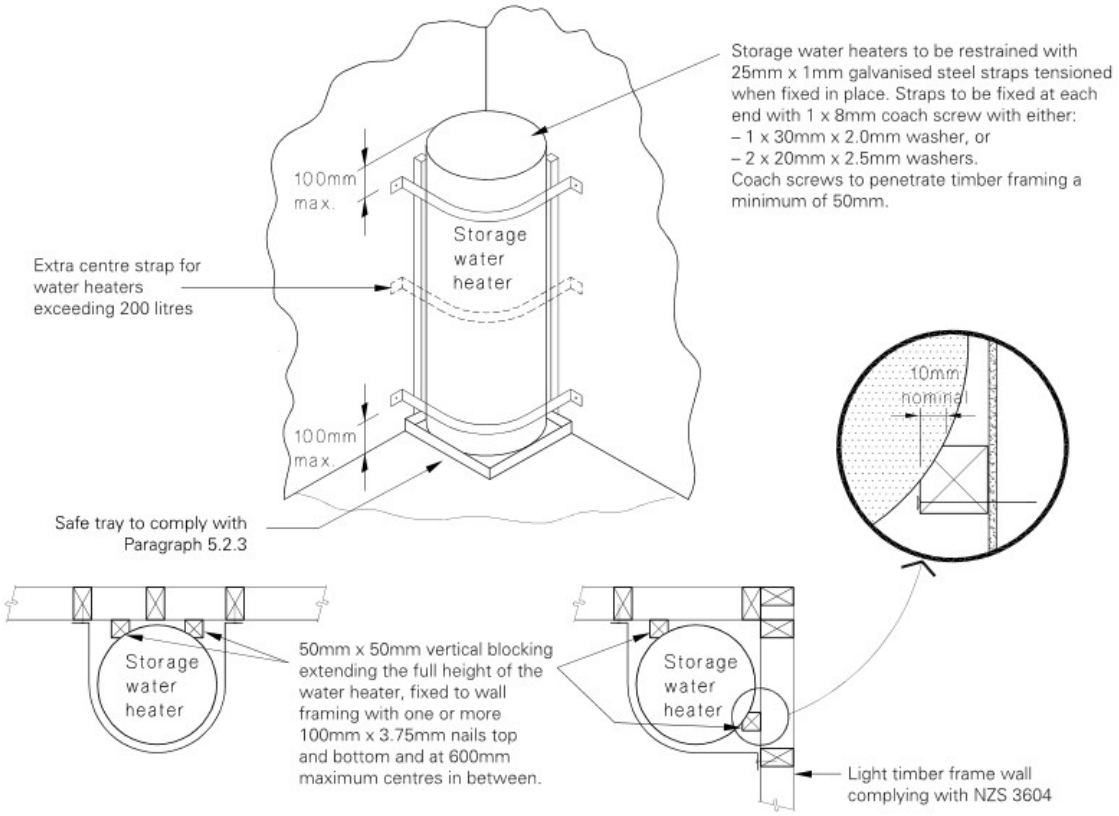


(b) With untempered hot water to laundry and kitchen fixtures and appliances

Notes:

1. For optimum system efficiency the temperature control device, for other than a mains pressure system, may be located as low as practicable to achieve the manufacturer's recommended head, at the temperature control device.
2. 1.0 m minimum copper pipe length from storage water heater to temperature control device.
3. Untempered hot water must not be provided to fixtures or appliances from a storage water heater that is connected to an uncontrolled heat source, such as a wet-back or solar water heater.

Figure 14: **Seismic Restraint of Storage Water Heaters 90 – 360 litres**
Paragraph 6.11.4



SANITARY PLUMBING

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.
Corrugated metal 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

DRAINAGE

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
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.

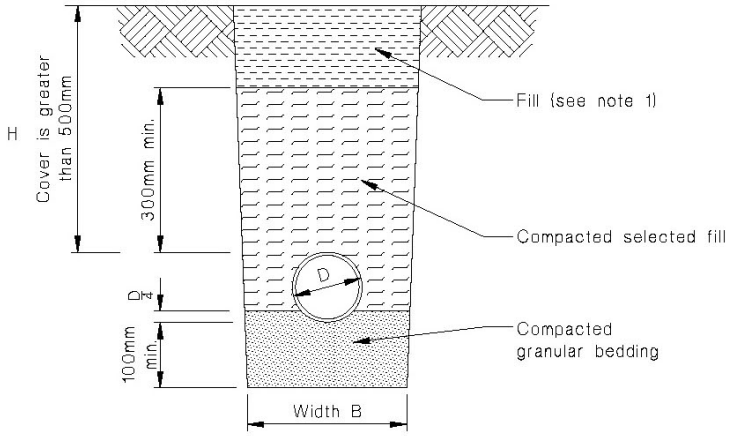
6.1.2 Water test

NZS 7643 Section 11 gives an acceptable method for ensuring watertightness of below ground uPVC drainage pipework.

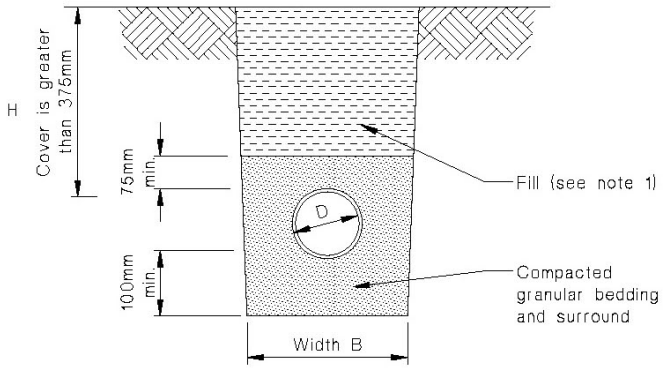
6.1.3 Air tests may be carried out in accordance with either clause 12.3.2 of AS/NZS 3500.2.2 or Paragraph 8.3 of E1/VM1.

NZBC G13/AS2

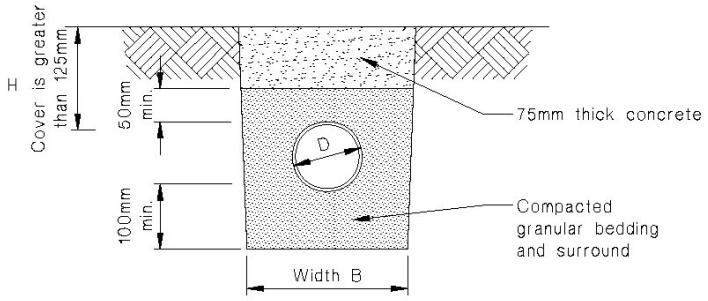
Figure 7: **Bedding and backfilling**
Paragraphs 5.2.1, 5.3.1 and 5.4.1



(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.

ELECTRICAL

Documents referred to in this section are:

NZBC F7/AS1	Warning systems, 3.1 Domestic smoke alarms
NZBC G2	Laundering – 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
NZECP 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)

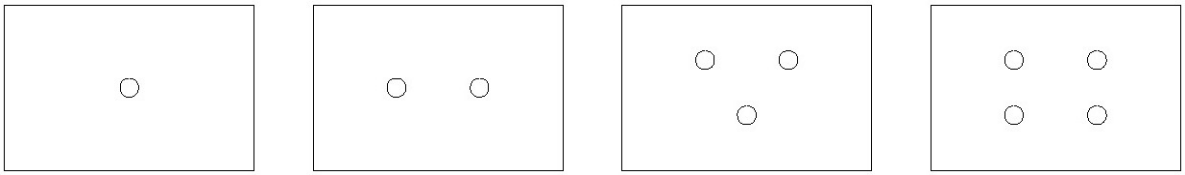
LIGHTING SCHEDULE (Minimum per area/room)

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 10m² 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 5m² min. or 1 H per 2.2 lineal metres)

LIGHTING LAYOUT EXAMPLES



Single (1LF) Double (2 LF) Triple (LF) Quad (4 LF)

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 mm^2, 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.

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

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 mm^2 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.

Management of Site Safety

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 personel. 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.

EROSION AND SEDIMENT CONTROL PLAN

(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

Building Consent - Form 2 - 250252

Submission Details

Submission Ref	HURUN200634
Status	Lodged
Project Description	New 4 bedroom dwelling with attached garage
Building Complexity	R1
Date Submitted	Thu 24 Jul 2025, 9:47 AM
Building Consent Authority	Hurunui District Council
Site Address	52 Benn Street, Amberley
Consent Number	250252
Submitter	J and A Design Ltd (Jeremy Harrison)
Legal Description	Lot 79 DP 587128

Building Consent - Form 2

Application for project information memorandum and/or building consent
Section 33 or section 45, Building Act 2004

How to complete this form:

1. Completed sections turn green
2. The submit button become available after all sections has been completed
3. Required fields are marked with an asterisk (*)
4. You can save and close the application if you need to complete it later
5. The review and submit buttons takes you to the final step before you submit the application.

HURUN

What Are You Applying For

What are you applying for. Select all that apply. *

☑ Building Consent	☐ Project Information Memorandum (PIM)
☐ National Multiproof Building Consent	☐ Staged Building Consent

What Building Work Are You Doing

What type of building work are you doing *

◉ Residential	○ Multi-Residential	○ Commercial / Industrial

Residential *

☑ New detached dwelling	☐ Plumbing works	☐ Major alterations / additions - any work that includes altering or attaching to the exterior of a building
☐ Minor alterations - any internal work that does not include altering the exterior of the building	☐ Garage / detached carport	☐ Seismic strengthening
☐ Other		

Select all applicable boxes. If your building work is not listed, select Other and provide details.

Does the design feature a modular component by an accredited manufacturer as per the BuiltReady scheme?

○ Yes	◉ No

Where Is The Building Work

What is the street address *

52 Benn Street, Amberley

Legal Description *

LOT 79

Deposited Plan

DP 587128

Building Name

Location of building within site/block including near street access

Are you building in a zone that requires a land-use Resource Consent *

○ Yes	◉ No

Is the subdivision of an existing site involved *

○ Yes	◉ No

Does the building or site have any cultural or heritage significance, or is it a marae? *

○ Yes	◉ No

Who Owns The Building Or Land

Owner name *

UWC Ltd

Owner title

If the property is owned by an organisation, capture the organisation's name.

Owner's contact person

Earl Hope

Owner email address *

ehopepearson@propertygroup.co.nz

Required if the owner is an organisation

Owner contact number *

0275073118

Owner mobile number

0275073118

Owner's street address *

c/o 70 Reserve Terrace
Amberley

Owner mailing address *

c/o 70 Reserve Terrace
Amberley

Proof of Ownership

The Building (Forms) Regulations 2004 requires evidence of ownership to be provided, proof of ownership less than 3 months old ensures the ownership is current.

Proof of ownership *

- ◉ Record of Title (RT)
- ○ Other

Click here to request a RT from from Land Information New Zealand.

Check you have a Record of Title for the property and that the legal description entered on the application form matches that on the on the Record of Title (RT)
Other things to note when obtaining a Record of Title (RT)
- The RT must be no more than Three Months Old
- The RT must be provided by LINZ and have the Registrar of Land Stamp, the Legal Description, the Owner name and the date of access stated on it. Titles can be ordered through the LINZ website for $15 each.
- If the RT is not up to date due to a recent purchase then a Sale and Purchase agreement can be provided in tandem with the RT but only if the agreement is no more than three months old
- If the application is being made by a tenant, then the lease agreement can be provided as proof of ownership in tandem with an RT that is less than three months old and has the name of the owner on it.
- If the building work is for a building subdivided into unit titles and the building work is to take place in the common area, eg. The owner is the BodyCorp, either the title for the underlying land needs to be provided (if available) or a Unit Title RT with an owner on and the Supplementary Record Sheet which will have the legal description for the underlying land and the list of Unit Titles on it.

Request a Record of Title (RT) from the Building Consent Authority (BCA) or Council *

- ◉ Yes
- ○ No

Check with the Building Consent Authority (BCA) before requesting a RT directly from them.

Who Is The Applicant

Is the application being made on behalf of the owner *

- ◉ Yes
- ○ No

Agent Contact Information

Please note that the nominated first point of contact must be in New Zealand.

Who should the invoice be sent to? *

○ Owner	○ Agent	◉ Other

Who is the first point of contact for further correspondence *

○ Owner	◉ Agent	○ Other

Who should invoices be made out to? *

○ Owner	○ Agent	◉ Other

Agent name *

Jeremy Harrison

Agent title

If the agent is an organisation, capture the organisation's name

Agent's contact person

Agent's relationship to owner *

Designer

Required if the agent is an organisation

Agent email address *

jeremy@jandadesign.co.nz

Agent contact number *

0277715816

Agent mobile number

0277715816

Agent's street address *

12 Murfitt St Pegasus,
Pegasus 7612,
New Zealand

Agent mailing address *

12 Murfitt St Pegasus,
Pegasus 7612,
New Zealand

Invoice Other Contact Information

If someone else other than the agent or the owner is the contact please provide their contact details below.

Name *

Brendon Esler

Title

Email address *

brendon@bebuilders.co.nz

Contact number *

0276247630

Mobile number

0276247630

Street address *

70 Reserve Terrace
Amberley

Mailing address

70 Reserve Terrace
Amberley

Payee Other Contact Information

Please provide Payee details

Payee Name *

Brendon Esler Builders

PO Number

Email address

brendon@bebuilders.co.nz

Contact number

0276247630

Mailing address

70 Reserve Terrace
Amberley

Who's Involved In The Build

Please supply names, registration and contact details of the designer, architect, structural engineer and other key individuals involved in your project (such as carpenter, plumber, gasfitter).

For commercial applications, the details of the fire safety designer who produced the ‘fire report’ must be provided.

Select who's involved *

☑ Licensed Building Practitioner	☐ Other

Are non licenced building practitioners involved in the project? Select Other and provide their details.

Licensed Building Practitioner/s (LBP)

Name *
Jeremy Harrison

Company
J and A Design Ltd

Email address *
jeremy@jandadesign.co.nz

Contact number *
0277715816

Street address
12 Murfitt St Pegasus,
Pegasus 7612,
New Zealand

Mailing address
12 Murfitt St Pegasus,
Pegasus 7612,
New Zealand

Licensed Building Practitioner *
Designer

Other

License class *
Brick and Block Laying
Carpentry
Design 1
Design 2
Design 3
External Plastering
Foundations
Roofing
Site 1
Site 2

Select one or more licence classes in the list

LBP registration number *
105491

What Are The Specifics Of The Site

What is the wind zone *

○ Low	○ Medium	◉ High	○ Very High	○ Extra High	○ Specific Design

What is the exposure zone *

○ Low(B)	◉ Medium(C)	○ High/Sea spray(D)

Does the proposed building work cover two or more allotments *

○ Yes	◉ No

Are there public drains on the site *

◉ Yes	○ No

Is the site subject to natural or created hazards such as erosion, subsidence, flooding, slips, cut and fill or contamination *

○ Yes	◉ No

Are there any alterations to land contours (e.g. earthworks) *

○ Yes	◉ No

Are there new or altered connections to public utilities *

◉ Yes	○ No

Are there new or altered locations and/or external dimensions of buildings *

◉ Yes	○ No

Is there new or altered access for vehicles *

◉ Yes	○ No

Is the building work over or adjacent to any road or public place *

○ Yes	◉ No

Does the building work involve the disposal of storm-water or wastewater *

◉ Yes	○ No

Is the building work over any existing drains or sewers or in close proximity to wells or water mains *

○ Yes	◉ No

Are there any other matters known to the applicant that may require authorisation from the territorial authority *

○ Yes	◉ No

What Are The Details Of The Building Work

Provide a full description of the building work *

New 4 bedroom dwelling with attached garage

Estimated value of the building work (including GST) *

$ 548000

Please note: *You may be required to provide supporting documentation for the value of your building work, including but not limited to quotes, contracts and invoices.*

What is the intended life of the building *

◉ 50+ years ○ Limited Life

Proposed Use

You must select at least one of the following seven proposed use 'types'. Where you select Housing, Communal residential or Communal non-residential, you must also specify a proposed use 'sub type'

☑ **Housing**

Housing selections *

☑ Detached dwellings ☐ Multi-unit dwelling ☐ Group dwelling

☐ **Outbuildings**

☐ **Ancillary**

Will the building work affect an existing building and/or parts of an existing building *

○ Yes ◉ No

Total number of floor levels *

1

Levels below ground (if applicable)

Total floor area (all levels) *

203.4 m2

Is the building used for anything other than a single household unit? *

○ Yes ◉ No

If this consent includes any residential units. How many new residential units will be created? *

0

Does the project include Restricted Building Work *

◉ Yes ○ No

Are you applying for Owner/Builder exemption to complete the Restricted Building Work *

○ Yes ◉ No

CERTIFICATE OF DESIGN WORK

Your building consent application needs to include a Certificate of Design Work.

These forms can be completed online by:

- Complete and submit this application
- Navigate to the forms section in the submitted consent application
- Select “New Submission”
- Complete all additional submissions.

Have you discussed this project with the Building Consent Authority prior to applying?

○ Yes ◉ No

Does the building work involve a swimming pool?

○ Yes ◉ No

Does the building work involve any Recladding?

○ Yes ◉ No

What Clauses Of The Building Code Does Your Work Comply With

NOTE:

- Unless otherwise noted below, your application will be assessed under Acceptable Solutions.
- You are required to indicate what code clause(s) your building work complies with.
- If you are using another means of compliance, please provide details of the standard(s) that your building work complies with and the means of compliance in the space provided.

You can view building related standards on the Standards New Zealand website.

☑ * **I understand that this application is to be assessed against Acceptable Solutions, unless otherwise stated in this section.**

☑ **B - Stability**

☑ **B1 - STRUCTURE**

☑ **B2 - DURABILITY**

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ **C - Protection from fire**

☑ **C1 - OUTBREAK OF FIRE**

☑ **C2 - PREVENTION OF FIRE OCCURRING**

☑ **C3 - FIRE AFFECTING AREAS BEYOND THE SOURCE**

☑ **C4 - MOVEMENT TO A PLACE OF SAFETY**

☑ **C5 - ACCESS AND SAFETY FOR FIREFIGHTING OPERATIONS**

☑ **C6 - STRUCTURAL STABILITY**

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ **D - Access**

☑ **D1 - ACCESS ROUTES**

☐ **D2 - MECHANICAL INSTALLATION FOR ACCESS**

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ **E - Moisture**

☑ **E1 - SURFACE WATER**

☑ **E2 - EXTERNAL MOISTURE**

☑ **E3 - INTERNAL MOISTURE**

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ F - Safety of users

- ☑ F1 - HAZARDOUS AGENTS ON SITE
- ☑ F2 - HAZARDOUS BUILDING MATERIALS
- ☐ F3 - HAZARDOUS SUBSTANCES AND PROCESSES
- ☑ F4 - SAFETY FROM FALLING
- ☑ F5 - CONSTRUCTION AND DEMOLITION HAZARDS
- ☐ F6 - VISIBILITY IN ESCAPE ROUTES
- ☑ F7 - WARNING SYSTEMS
- ☐ F8 - SIGNS
- ☐ F9 - RESTRICTING ACCESS TO RESIDENTIAL POOLS

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ G - Services and facilities

- ☑ G1 - PERSONAL HYGIENE
- ☑ G2 - LAUNDERING
- ☑ G3 - FOOD PREPARATION AND PREVENTION OF CONTAMINATION
- ☑ G4 - VENTILATION
- ☑ G5 - INTERIOR ENVIRONMENT
- ☐ G6 - AIRBORNE AND IMPACT SOUND
- ☑ G7 - NATURAL LIGHT
- ☑ G8 - ARTIFICIAL LIGHT
- ☑ G9 - ELECTRICITY
- ☑ G10 - PIPED SERVICES
- ☐ G11 - GAS AS AN ENERGY SOURCE
- ☑ G12 - WATER SUPPLIES
- ☑ G13 - FOUL WATER
- ☐ G14 - INDUSTRIAL LIQUID WASTE
- ☐ G15 - SOLID WASTE

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☑ H - Energy efficiency

- ☑ H1 - ENERGY EFFICIENCY

Verification Methods	Alternative Solutions	Additional information
Include relevant code clauses and means of compliance	*Include relevant code clauses and means of compliance or details of any waiver and modifications (including applicable code clauses)*	

☐ **Specific Buildings**

What Specified Systems Are In The Building?

Does your building work involve or affect any Specified Systems (SS)? *

○ Yes ◉ No

Have You Attached All Required Documentation

Document Upload Process

Only one document can be uploaded against each document category. You need to merge all documents into a single PDF per category (e.g. all architectural plans must be merged into a single document).

Several free online PDF merger tools are available on the internet one such tool is Smallpdf. With Smallpdf, you can merge documents into a single file.

For a full list of the document categories and what should be included in each category click **here.**

Click **here** for help and frequently asked questions.

Document Categories for Residential Applications

The following document categories are associated with a residential application:

- **Architectural Plans**
- **Architectural Specifications**

If you have selected structural requirement/s for the application, the following document categories will also be available.

- **Structural Plans**
- **Structural Specifications**

Do you have structural engineering documents? *

○ Yes ◉ No

☑ ***I have the documentation ready and combined into the appropriate categories**

Do you have any other documents not related to the above categories? *

◉ Yes ○ No

Declaration

Privacy Information

The information you have provided on this form and supporting documentation is required so that your application can be processed under the Building Act 2004 and in accordance with the Building (Forms), Regulations 2004. All information and documents provided as part of your building consent application can be requested by the public under the Building Act 2004, the Official Information Act 1982, and the Local Government Official Information and Meetings Act 1987. Information can be requested by individuals or companies who may use the information for marketing purposes.

In certain circumstances, some information can be withheld from release. Please raise any privacy concerns directly with your Building Consent Authority.

You can view the Simpli Privacy Statement here

In providing this information, you agree to your details being used for customer surveys carried out by the Council, BCA or TA.

Terms of Use

By making this submission you agree to the Simpli portal terms and conditions.

Your application fees

The Council, BCA or TA may charge fees for your application. These will include statutory levies to BRANZ and the Ministry of Business, Innovation & Employment.

A fee schedule can be found on the BCA's website, refer to the link in the details panel on the right. Your fees will be advised when the BCA accepts your submission.

You must not commence the building work until the consent has been issued and uplifted.

☑ * **I acknowledge and agree with the above statements.**

Name *	**Date** *	
Jeremy Harrison	24/07/2025	

Submitter Declaration

Submitter Name	Jeremy Harrison
Date	24/07/2025

I understand that by ticking the following boxes, I am agreeing to the following statements:

☑ * **As the agent I confirm that I am submitting this application on behalf of and with the authority of the owner and confirm that all the information within the application is, to the best of my knowledge, true and correct.**

☑ * **I request that you issue a building consent for the building work described in this application.**

HURUN200634 - Request For More Information

Submission RFI - 1

Created in form section:

Have You Attached All Required Documentation

Request Details

Your Plans show the Risk Matrix is in the Specs, but I can't find it in the Specs. Please advise where it is or update the Plans/Specs and reupload

Response

Sheet 3 revised

Raised By
Madeline Blacktopp

Submitted
Thu 24 Jul 2025, 1:50 PM

Responded
Thu 24 Jul 2025, 4:16 PM

Acknowledged
Fri 25 Jul 2025, 9:43 AM

LUMBERLOK®

STUD TO TOP PLATE FIXING SCHEDULE
ALTERNATIVE TO TABLE 8.18 NZS 3604:2011

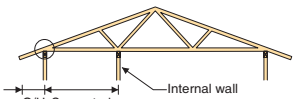
NOTE:

- ★ All fixings are designed to resist vertical loads only. Dead loads include the roof weight and standard ceiling weight of 0.20 kPa.
- ★ Refer to Table 8.19 NZS 3604:2011 for nailing schedule to resist lateral loads.
- ★ These fixings assume the correct choice of rafter/truss to top plate connections have been made.
- ★ Gable end wall top plate/stud connections where the adjacent rafter/truss is located within 1200mm of gable end wall with a maximum verge overhang of 750mm, requires fixing type A as shown below.
- ★ All fixings assume top plate thickness of 45mm maximum.
- ★ Wall framing arrangements under girder trusses are not covered in this schedule.
- ★ All timber selections are as per NZS 3604:2011.

LOADED DIMENSION DEFINITION



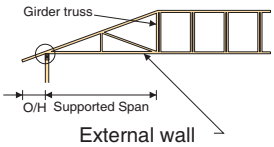
External wall
Standard truss



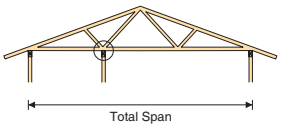
External wall
Internally supported truss



External wall
Rafter roof



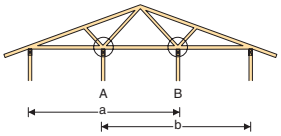
External wall
Jack truss



Internal wall
Internally supported truss
(overhang dimension does not apply)

EXTERNAL WALL
LOADED DIMENSION =
$\frac{\text{SUPPORTED SPAN}}{2}$ + O/H

INTERNAL WALL
LOADED DIMENSION =
$\frac{\text{TOTAL SPAN}}{2}$



Multiple internal walls
(overhang dimension does not apply)

MULTIPLE INTERNAL WALL
LOADED DIMENSION FOR
WALL A = $\frac{a}{2}$
WALL B = $\frac{b}{2}$

FIXING SELECTION CHART

(Suitable for walls supporting roof members at 600, 900 or 1200mm crs.)

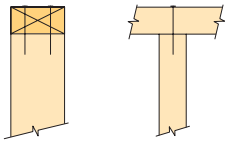
Wind Zones L, M, H, VH, EH, as per NZS 3604:2011

Loaded Dimension (m) Stud Centres			Light Roof Wind Zone					Heavy Roof Wind Zone				
300mm	400mm	600mm	L	M	H	VH	EH	L	M	H	VH	EH
3.0	2.3	1.5	A	A	B	B	B	A	A	B	B	B
4.0	3.0	2.0	A	A	B	B	B	A	A	B	B	B
5.0	3.8	2.5	A	B	B	B	B	A	A	B	B	B
6.0	4.5	3.0	A	B	B	B	B	A	A	B	B	B
7.0	5.3	3.5	A	B	B	B	B	A	A	B	B	B
8.0	6.0	4.0	A	B	B	B	B	A	A	B	B	B
9.0	6.8	4.5	B	B	B	B	B	A	A	B	B	B
10.0	7.5	5.0	B	B	B	B	B	A	A	B	B	B
11.0	8.3	5.5	B	B	B	B	B	A	A	B	B	B
12.0	9.0	6.0	B	B	B	B	B	A	A	B	B	B

FIXING OPTIONS

FIXING TYPE A
0.7 kN

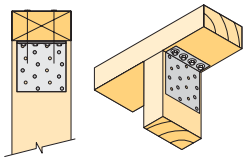
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



FIXING TYPE B
4.7 kN

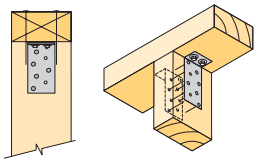
CHOOSE ANY OF THE 3 OPTIONS BELOW

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
LUMBERLOK
6kN Stud Anchor
(CPC80)

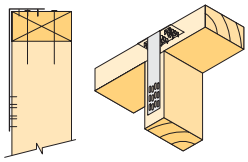
2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
2 x LUMBERLOK
CPC40

Recommended for internal wall options to avoid lining issues

2 x 90mm x 3.15 dia. plain steel wire nails driven vertically into stud.



Plus
LUMBERLOK
Stud Strap
(one face only)

Note:
To calculate the number of B type fixings required, divide the wall length by the stud centres, add 1 to this figure and locate this number of fixings as evenly as possible along the wall length. This figure includes the start and end studs in each wall length.

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BRANZ Appraised
Appraisal No. 847 [2019]

BGC STRATUM ™ AND STRATUM ™ DUO CAVITY CLADDING SYSTEMS

Appraisal No. 847 (2019)

This Appraisal replaces BRANZ Appraisal No. 848 (2013)



BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are designed to be used as cavity-based, external wall cladding systems for residential and light commercial type buildings where domestic construction techniques are used.

1.2 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems consist of Stratum™ and Stratum™ Duo fibre cement planks adhesive and brad fixed over structural timber battens to form a cavity. The fibre cement planks are finished with an acrylic paint system.

1.3 The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity.

Scope

2.1 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems have been appraised as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 The BGC Stratum™ and Stratum™ Duo Cavity Cladding System have also been appraised for weathertightness and structural wind loading when used as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

2.3 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems must only be installed horizontally on vertical surfaces.

2.4 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems have been appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(The Appraisal of the BGC Stratum™ and Stratum™ Duo Cavity Facade Systems will rely on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)*

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2, and B1.3.4. BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 9.1 - 9.4.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems meet these requirements. See Paragraphs 10.1 - 10.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems meet this requirement. See Paragraphs 14.1 - 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems meet this requirement and will not present a health hazard to people..

Technical Specification

4.1 System components and accessories for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems supplied by BGC (Australia) Pty Ltd T/A BGC Fibre Cement are:

BGC Stratum™ and Stratum™ Duo Planks

- BGC Stratum™ and Stratum™ Duo are 12 mm thick fibre cement planks, manufactured from BGC standard fibre cement formulation. The planks are formed, cut to length, and then cured by high pressure autoclaving. The planks are profiled with a lap joint on the top and bottom edges. The BGC Stratum™ Duo planks also incorporate a 6 mm deep by 16 mm wide groove at mid plank width. The plank is coated on the front face and four edges with a sealer and a primer. BGC Stratum™ and Stratum™ Duo planks are available in a width of 300 mm and 4200 mm long. The planks are manufactured to conform to the requirements of AS/NZS 2908.2.

Accessories

- **BGC Edge Sealer** - acrylic sealer supplied in a 400 g can to seal cut edges of BGC Stratum™ and Stratum™ Duo planks prior to installation.
- **External and internal corners** - aluminium external box corner and 90° internal 'W' corner. The corners are available in 3000 mm lengths.
- **'J' flashing** - aluminium 'J' flashing, available in 2400 mm lengths.

4.2 System components and accessories for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems, which are supplied by the building contractor are:

- **Structural cavity battens** - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) SG8 framing grade pinus radiata, treated to Hazard Class H3.1.
- **Flexible wall underlay** - building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as a wall underlay.
- **Flexible wall underlay support** - polypropylene strap at 300 mm centres fixed horizontally and drawn taut for securing the building wrap in place and preventing bulging of the bulk insulation into the drainage cavity where cavity battens are installed at greater than 450 mm centres. *(Note: additional vertical battens may also be installed to provide support.)*
- **Rigid wall underlays** - minimum 7 mm thick H3 treated plywood or 6 mm thick fibre cement complying with NZBC Acceptable Solution E2/AS1 Table 23, or rigid air barrier systems covered by a valid BRANZ Appraisal such as BGC Durabarrier, which is covered by BRANZ Appraisal No. 721 (2019).
- **Flexible sill and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.

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- **Cavity vent strip** - PVC, aluminium or stainless steel, punched with 3-5 mm holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- **Window and door trim cavity air seal** - air seals and PEF rod complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal for use around window, door and other wall penetration openings.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Gap filler** - Bostik MS Safe Seal, coloured white where vertical gaps are to be painted, or sealant/gap filler covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Aluminium joinery head flashing** - as supplied by the joinery manufacturer or the contractor.
- **Flashings** - balustrade and parapet cap flashings, and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Cavity batten fixings** - 65 x 2.8 mm Paslode RounDrive®, ring-shank galvanised nails.

Plank fixing

- **Plank nail fixings** - 30 x 1.6 mm or 40 x 2.0 mm stainless steel brad-nails. *[Note: stainless steel must be Grade 304 or 316.]*
- **Adhesive Sealant** - Bostik Seal'n'Flex FC, for fixing BGC Stratum™ and Stratum™ Duo planks to the cavity battens.

Paint System Specification

4.3 Paint systems are not supplied by BGC (Australia) Pty Ltd T/A BGC Fibre Cement and have not been assessed by BRANZ and are therefore outside the scope of this Appraisal.

4.4 All exposed faces and edges of BGC Stratum™ and Stratum™ Duo planks and cavity battens must be finished with at least two coats of an exterior grade latex acrylic paint system complying with any of Parts 7, 8, 9 or 10 of AS 3730.

Handling and Storage

5.1 Handling and storage of all materials supplied by BGC (Australia) Pty Ltd T/A BGC Fibre Cement or the building contractor, whether on site or off site, is under the control of the building contractor. BGC Stratum™ and Stratum™ Duo planks must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or by providing waterproof covers to the stack. Care must be taken to avoid damage to edges and surfaces. The planks must always be carried on edge.

5.2 Cavity battens and other accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and within the scope of this Appraisal must be followed.

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Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 800 mm centres.

7.3 Timber framing must have a maximum moisture content of 20% at the time of the application of BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems. *[Note: If the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are fixed to framing with a moisture content of greater than 20%, problems may occur at a later date due to excessive timber shrinkage.]*

Cavity Battens

7.4 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems incorporates vertical cavity battens which form the nominal 20 mm cavity behind the BGC Stratum™ and Stratum™ Duo planks.

BGC Stratum™ and Stratum™ Duo Plank Set Out

7.5 All BGC Stratum™ and Stratum™ Duo plank end joints must be made over a stud. At the base of the wall, the planks must hang 50 mm below the supporting framing.

7.6 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of plank ends.

General

8.1 When the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are used for specifically designed buildings up to 2.5 kPa (ULS) wind pressure, only the weathertightness aspects of the cladding and BGC Stratum™ and Stratum™ Duo plank fixing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip must provide a minimum ventilation opening area of at least 1000 mm^2 per lineal metre of wall in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 (b).

8.3 At ground level, the bottom edge of the BGC Stratum™ and Stratum™ Duo planks must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.

8.4 At balcony, deck or low pitched roof/wall junctions, the bottom edge of the BGC Stratum™ and Stratum™ Duo planks must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.6.

8.5 All external walls of buildings must have barriers to airflow in the form of flexible wall underlays and interior linings with all joints stopped for wind zones up to and including Very High, and rigid wall underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier (e.g. BGC Durabarrier) which meets the requirements of NZBC Acceptable Solution

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E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where penetrations through the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities. A minimum 10 mm gap must be left between the bottom of the vertical cavity batten and the flashing to the opening.

8.7 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included in the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

8.8 Inter-storey junctions must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 (b).

Structure

Mass

9.1 The mass of the BGC Stratum™ planks when installed on the wall is 15 kg/m^2 at equilibrium moisture content (EMC) and BGC Stratum™ Duo is 14.7 kg/m^2. The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are therefore considered as light wall claddings in terms of NZS 3604.

Impact Resistance

9.2 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems have good resistance to impacts likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

9.3 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are suitable for use in all Wind Zones of NZS 3604, up to and including Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa design differential ULS wind pressure where buildings are specifically designed.

Plank Fixing

9.4 The planks must be mechanically fixed with 30 mm long stainless steel brads in conjunction with the adhesive sealant (see Paragraph 17.7). The planks are fastened at each stud to the cavity batten with a brad positioned 50 mm up from the bottom of the plank and a brad positioned 20 mm down from the top of the plank. The adhesive sealant is placed as a continuous bead to the batten.

Durability

Serviceable Life

10.1 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems installations are expected to have a serviceable life of at least 30 years provided the paint coating to the BGC Stratum™ and Stratum™ Duo planks is maintained in accordance with this Appraisal, and the BGC Stratum™ and Stratum™ Duo planks and fixings are continuously protected by a weathertight coating and remain dry in service. BGC Stratum™ and Stratum™ Duo planks must be painted and the exposed sections of the cavity battens at expressed joints must be sealed with a minimum 2 mm deep bead of gap filler within three months of installation.

10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604 Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve an extended serviceable life in Zone D, structural battens must be fixed with

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stainless steel or protected hot-dip galvanised steel fasteners. Batten fixings outside Zone D may be hot-dip galvanised steel. BGC Stratum™ and Stratum™ Duo planks must always be fixed with stainless steel brads.

10.3 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of structural battens and BGC Stratum™ and Stratum™ Duo planks in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.

11.2 Regular cleaning (at least annually) of the paint coating is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent.

11.3 Paint systems must be recoated at approximately 5-10 year intervals in accordance with the paint manufacturer's instructions.

11.4 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. The planks must be checked to ensure the fixings and adhesive bond are sound. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the relevant manufacturer's instructions.

11.5 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the cladding. *(Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems.)*

Control of External Fire Spread

12.1 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems have a peak heat release rate of less than 100 kw/m^2 and a total heat released of less than 25 MJ/m^2. Testing was carried out as per Paragraph 5.8.1 of NZBC Acceptable Solutions C/AS1-C/AS6 and limited to the exterior surface finishes.

12.2 Refer to NZBC Acceptable Solutions and Verification Methods C/AS1-C/AS7 and C/VM2 for Requirements for fire rating and exterior surface finish requirements of external walls.

Prevention of Fire Occurring

13.1 When Stratum™sheets are finished with a paint coating of not more than 1.0mm in thickness, clearance separations from heat sources such as fire places, heating appliances, flues and chimneys are not required. However when used in conjunction with, or attached to heat sensitive materials the heat sensitive materials must be seperated from heat sources such as fire places, heating appliances, flues and chimneys in accordance with Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1.

External Moisture

14.1 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems, when installed and maintained in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor spaces to meet compliance with NZBC Clause E2.3.5.

14.3 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet compliance with NZBC Clause E2.3.6.

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14.4 The details given in the Technical Literature for weather sealing are based on the principles of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

14.5 The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for joints, penetrations etc to remain weather resistant.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirements

16.1 Installation of BGC Stratum™ and Stratum™ Duo Installation of BGC Duragrid™ Sheets and accessories supplied by BGC (Australia) Pty Ltd and the building contractor must always be carried out in accordance with the BGC Stratum™ and Stratum™ Duo Technical Literature and this Appraisal by, or under the supervision of a Licensed Building Practitioner (LBP) with the relevant Licence Class.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems (e.g. BGC Durabarrier) shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

17.2 Where studs are at greater than 450 mm centres and a flexible wall underlay is being used, a building underlay support must be installed over the underlay at maximum 300 mm centres horizontally.

Cavity Battens

17.3 Cavity battens must be installed vertically over the building underlay to the wall studs at maximum 600 mm centres where the studs are at 600 mm centres, or at 400 mm centres when studs are at 400 mm centres. The battens must be fixed in place with 65 x 2.8 mm Paslode RounDrive®, ring-shank galvanised nails, at maximum 300 mm centres alternately offset from the centre line by 12 mm. Where a rigid underlay is used, the length of the nail must be increased by a minimum of the thickness of the underlay.

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Aluminium Joinery Installation

17.4 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A nominal 10 mm gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

BGC Stratum™ and Stratum™ Duo Plank Installation

17.5 BGC Stratum™ and Stratum™ Duo planks may be cut using either hand or power tools. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

17.6 BGC Stratum™ and Stratum™ Duo planks must be dry prior to installation. Cut edges must be sealed with BGC Edge Sealer, prior to sheet installation.

BGC Stratum™ and Stratum™ Duo Plank Fixing

17.7 BGC Stratum™ and Stratum™ Duo planks and cavity battens must be dry and free of dust, prior to application of the Bostik Seal'n'Flex FC. The adhesive sealant must not be applied at temperatures below 5°C. Bostik Seal'n'Flex FC is applied in a continuous 6 mm bead to the cavity battens as described in the Technical Literature. In addition, BGC Stratum™ and Stratum™ Duo planks must be fixed to the cavity battens with brads. Each plank is fixed with a brad 50 mm up from the bottom of the plank and a second brad in the lap of the plank. The brads must be positioned a minimum of 10 mm from all plank ends.

Finishing

17.8 Brad holes must be filled with a suitable epoxy filler and sanded flush.

17.9 Vertical express joints must be filled with 2-3 mm of gap filler.

17.10 The BGC Stratum™ and Stratum™ Duo planks must be finished with a paint coating system that will protect it from moisture. A latex exterior paint system complying with any of parts 7, 8, 9 or 10 of AS 3730 is suitable.

17.11 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. BGC Stratum™ and Stratum™ Duo planks must be dry before commencing painting.

Inspection

17.12 The Technical Literature must be referred to during the inspection of BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems installations.

Health and Safety

18.1 Safe use and handling procedures for the components that make up the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems are provided in the manufacturer's Technical Literature.

18.2 Cutting of BGC Stratum™ and Stratum™ Duo planks must be carried out in well ventilated areas, and a dust mask and eye protection must be worn. When power tools are used for cutting, grinding or forming holes, safety measures as set out in the Technical Literature must be undertaken because of the amount of dust generated.

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Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

19.1 Wind face load testing for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems was completed by BRANZ. BRANZ determined design wind suction pressures, and by comparing these with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

19.2 BRANZ expert opinion on NZBC E2 code compliance for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems was based on testing and evaluation of all details within the scope and as stated within this Appraisal. The BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems were tested to the version of E2/VM1 contained within the NZBC Clause E2 Amendment 5. The testing assessed the performance of the foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, vertical and horizontal joints, internal and external corners. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for drained cavity claddings.

19.3 Cone calorimeter testing to determine the peak rate of heat release and total heat release of BGC NuLine weatherboard was completed by BRANZ and the results were used to provide an assessment of the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems. The testing was carried out in accordance with AS/NZS 3837.

Other Investigations

20.1 Structural, durability and fire opinions have been given by BRANZ technical experts.

20.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The Technical Literature for the BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of BGC Stratum™ and Stratum™ Duo planks has been examined by BRANZ, including the methods for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of materials, components and accessories supplied by BGC (Australia) Pty Ltd T/A BGC Fibre Cement is the responsibility of BGC (Australia) Pty Ltd T/A BGC Fibre Cement.

21.3 The quality management system of the manufacturer of BGC Stratum™ and Stratum™ Duo planks, BGC (Australia) Pty Ltd T/A BGC Fibre Cement, has been assessed and registered as meeting the requirements of ISO 9001:2015.

21.4 Quality of installation on site of components and accessories supplied by BGC (Australia) Pty Ltd T/A BGC Fibre Cement and the building contractor is the responsibility of the installer.

21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, wall underlays, flashing tapes, airseals, joinery head flashings, cavity battens and BGC Stratum™ and Stratum™ Duo planks in accordance with the instructions of BGC (Australia) Pty Ltd T/A BGC Fibre Cement.

21.6 Building owners are responsible for the maintenance of BGC Stratum™ and Stratum™ Duo Cavity Cladding Systems in accordance with the instructions of BGC (Australia) Pty Ltd T/A BGC Fibre

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Sources of Information

- AS 3730: Guide to the properties of paints for buildings.
- AS/NZS 1170 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4680: 2006 Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 8, 30 November 2018).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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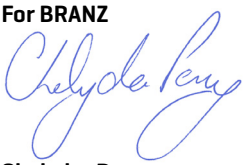
In the opinion of BRANZ, BGC Stratum™ and Stratum™ Duo Cladding Cavity Systems is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to BGC (Australia) Pty Ltd T/A BGC Fibre Cement, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. BGC (Australia) Pty Ltd T/A BGC Fibre Cement:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by BGC (Australia) Pty Ltd T/A BGC Fibre Cement.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to BGC (Australia) Pty Ltd T/A BGC Fibre Cement. or any third party.

For BRANZ



Chelydra Percy
Chief Executive

Date of Issue:
23 May 2019

Readers are advised to check the validity of this Appraisal by referring to the Valid Appraisals listing on the BRANZ website, or by contacting BRANZ.

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	UWC Ltd
Street and Number:	52 Benn St
Lot and DP Number:	Lot 79 Dp 587128
City/Town/District:	Amberley
Designer:	JKH
Company:	
Date:	Saturday, 12 April 2025

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.9
Building Height to Apex (m)	5.2
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	24.6
Building Width (m)	11.2
Building Plan Area (m^2)	196.3

Building Location

Wind Zone = High

Earthquake Zone 2

Soil Type D & E (Deep to Very Soft)

Annual Prob. of Exceedance: 1 in 500 (Default)

Bracing Units required for Wind

	Along	Across
Single Level	**625**	**1500**

Bracing Units required for Earthquake

	Along & Across
Single Level	**1170**

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

Job Name: UWC Ltd

									Wind	EQ
									Demand	
									625	1170
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1687 270%	1771 151%
a	1	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	5	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	External Length =				24.6				720 OK	810 OK
b	1	3.20		2.4	GS1-N	GIB®	221	192		
	2	3.20		2.4	GS1-N	GIB®	221	192		
	3	0.90		2.4	GS1-N	GIB®	57	53		
	External Length =				24.6				498 OK	437 OK
c	1	0.90		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	86	95		
	2	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	3	1.20		2.4	EP1/EPB1-12	EcoPly & EP Barrier	144	162		
	4	1.00		2.4	EP1/EPB1-0.6	EcoPly & EP Barrier	95	105		
	External Length =				24.6				469 OK	524 OK

GIB EzyBrace® Bracing Software

Single Level Across Resistance Sheet

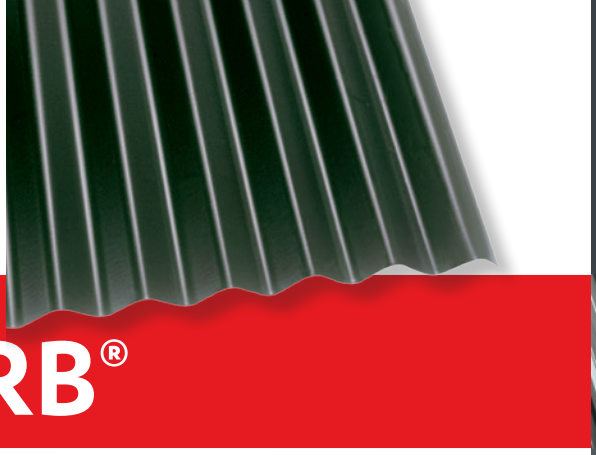
Job Name: UWC Ltd

									Wind	EQ
									Demand	
									1500	1170
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1773 118%	1721 147%
m	1	0.45		2.4	BLP-H	GIB®	56	62		
	2	0.55		2.4	BLP-H	GIB®	72	77		
	3	0.50		2.4	BLP-H	GIB®	64	69		
	4	0.50		2.4	BLP-H	GIB®	64	69		
	External Length =			11.2					255 OK	278 OK
n	1	3.10		2.4	GS1-N	GIB®	214	186		
	External Length =			11.2					214 OK	186 OK
o	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	2.40		2.4	GS1-N	GIB®	166	144		
	External Length =			11.2					380 OK	330 OK
p	1	3.10		2.4	GS1-N	GIB®	214	186		
	2	3.10		2.4	GS1-N	GIB®	214	186		
	External Length =			11.2					428 OK	372 OK
q	1	1.10		2.4	EP1/EPB1-0.5	EcoPly & EP Barrier	105	116		
	2	1.10		2.4	EP1/EPB1-0.5	EcoPly & EP Barrier	105	116		
	External Length =			11.2					209 OK	231 OK
r	1	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	2	1.20		2.4	EP1/EPB1-1.2	EcoPly & EP Barrier	144	162		
	External Length =			4					288 OK	324 OK

Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
EcoPly & EP Barrier	EP1/EPB1-0.4	0.4	80	95
EcoPly & EP Barrier	EP1/EPB1-0.6	0.6	95	105
EcoPly & EP Barrier	EP1/EPB1-1.2	1.2	120	135
OSB	OSB	0.4	90	101
EP Barrier	EPBS-0.4	0.4	60	60
EP Barrier	EPBS-1.2	1.2	65	70
EP Barrier	EPBS-2.4	2.4	80	90
EcoPly & EP Barrier	EPG/EPBG-0.4	0.4	100	115
EcoPly & EP Barrier	EPG/EPBG-1.2	1.2	150	150
EcoPly & EP Barrier	EP2/EPB2-0.6	0.6	105	115
Villa Board	VV	0.6	130	101
GBPF2100S	Gamma Brace	1	20.6	22.8
IBS	S7	0.6	100	100
IBS	S7	0.4	94	104
Home RAB	RAB	0.4	85	91

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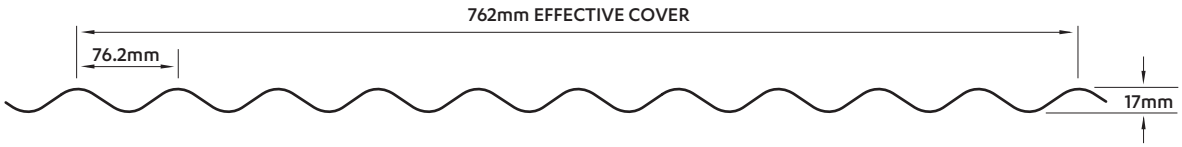


PRODUCT TECHNICAL STATEMENT

CUSTOM ORB®

Profiled Metal Roofing and Cladding

NOMINAL DIMENSIONS



DESCRIPTION

Custom Orb® is a premium quality corrugated profile manufactured under licence to BHP.

APPLICATIONS

- **Residential Roofing & Cladding**
- **Industrial/Commercial Roofing & Cladding**
- **Curving**
- **Specialty Cladding**
- **Ceilings and Linings**

FEATURES

Corrugated steel is a timeless classic. **Custom Orb** is manufactured to controlled tolerances, allowing it to be used with confidence in a great variety of applications.

Custom Orb can be roll curved (bullnosed) to 400mm radius, or spring curved to radii greater than 9 metres depending on grade, thickness and material used (see *Spring Curved Custom Orb Design Guide* for details). It is also popular in perforated patterns for decorative or sound control situations. Matching translucent sheeting is available in G.R.P. (fibreglass) and Polycarbonate.

MATERIALS

Available in metallic coated and pre-painted steel in .40mm and .55mm B.M.T. (base metal thickness), aluminium plain and prepainted in .70mm and .90mm, and other non-ferrous metals.

FASTENERS

Typically: Steelfix 12g x 45mm, Timberfix 12g x 55mm, Class 4 minimum, of material compatible with that being fastened and durability no less than the sheet material. Class 5 or non-ferrous fasteners are recommended for severe or very severe marine environments.

DURABILITY

All material selections must be compatible with prevailing environmental conditions and adjacent materials, see *Roofing Solutions Product Guide* or *Specifiers Guide* for details. Areas not exposed to rain washing will require programmed maintenance.

WARRANTY PLUS

Steel & Tube **Warranty*Plus*** is the most comprehensive warranty available in the industry. **Warranty*Plus*** covers an extended range of performance criteria, is supported back-to back by our suppliers, includes site-specific maintenance requirements and is transferable to subsequent owners.

PERFORMANCE DATA

MASS (KG/M²)

.40mm B.M.T.	4.08	.55mm B.M.T.	5.54

MAXIMUM SPANS

Base Metal Thickness (mm)	Maximum Spans (mm)	
	Roof	Walls
0.40	1200	1800
0.55	1600	2400

FASTENING REQUIREMENTS

Base Metal Thickness (mm)	Fixings per sheet per support	Roof Span (mm)		
		900	1200	1500
0.40	3	•	•	N/R
	4	•	•	N/R
	5	•	•	N/R
0.55	3	••	•	•
	4	••	•	•
	5	••	•	•

** Suitable for Controlled Traffic ** Suitable for Heavy Traffic N/R Not Recommended*

Wind Zone	High	Very High	Extra High	SED
Design Wind Speed (m/s)	<44m/s	<50 m/s	<55 m/s	<60m/s
Load ULS (kPa)	2.32	3.00	3.63	4.32

Notes:

- *End spans should be not more than 2/3 of maximum internal spans.*
- *Sheet ends should be fastened through every second crest.*
- *To correlate Wind Zone figures to kPa a local pressure factor of 2 has been applied to the entire roof. Specific design is required for roofs designed in accordance with NZS1170 where a local pressure factor of 3 occurs over areas greater than one sheet width or end purlin spacing.*
- *The above tables are governed by seviceability load factors applicable to normal buildings (importance level 2) for all geographic areas.*

MINIMUM PITCH

In accordance with Acceptable Solution E2, the minimum pitch for **Custom Orb** for roofing dwellings is 8°.
Roof runs in excess of 12 metres should be checked for water runoff capacity.

FOOT TRAFFIC

Foot traffic up the roof must take place with load spread equally across two crests, or over purlin lines. Traffic across the roof must take place along purlin lines.

SPECIFICATIONS

Recommended specifications are available in the branded sections of MasterSpec *BASIC* or MasterSpec *STANDARD*, or from your local Steel & Tube branch or visit www.steeland tube.co.nz.

DESIGN DETAILS

Design details covering many applications are available on our website in CAD and PDF under each product section. Visit www.steelandtube.co.nz.

IMPORTANT PUBLICATIONS

For your installation to perform to its potential, it is essential that it is designed, installed and maintained in accordance with good trade practice. Please refer to:

- Steel & Tube: Roofing Solutions Product Guide
- Steel & Tube Roofing Products: Spring Curved Custom Orb Design Guide
- New Zealand Steel: Installation Guide
- New Zealand Steel: Builders and Specifiers Guide
- BRANZ: Good Profiled Metal Roofing Practice
- MRM: New Zealand Metal Roofing and Wall Cladding Code of Practice
- E2/AS1

INSTALLERS

A list of local installers for your area and contract type is available from your local Steel & Tube branch or visit www.steelandtube.co.nz.

Trademark Note:
Masterspec is a registered trademark of Construction Information Limited.
CUSTOM ORB is a registered trademark of BlueScope Steel Limited.

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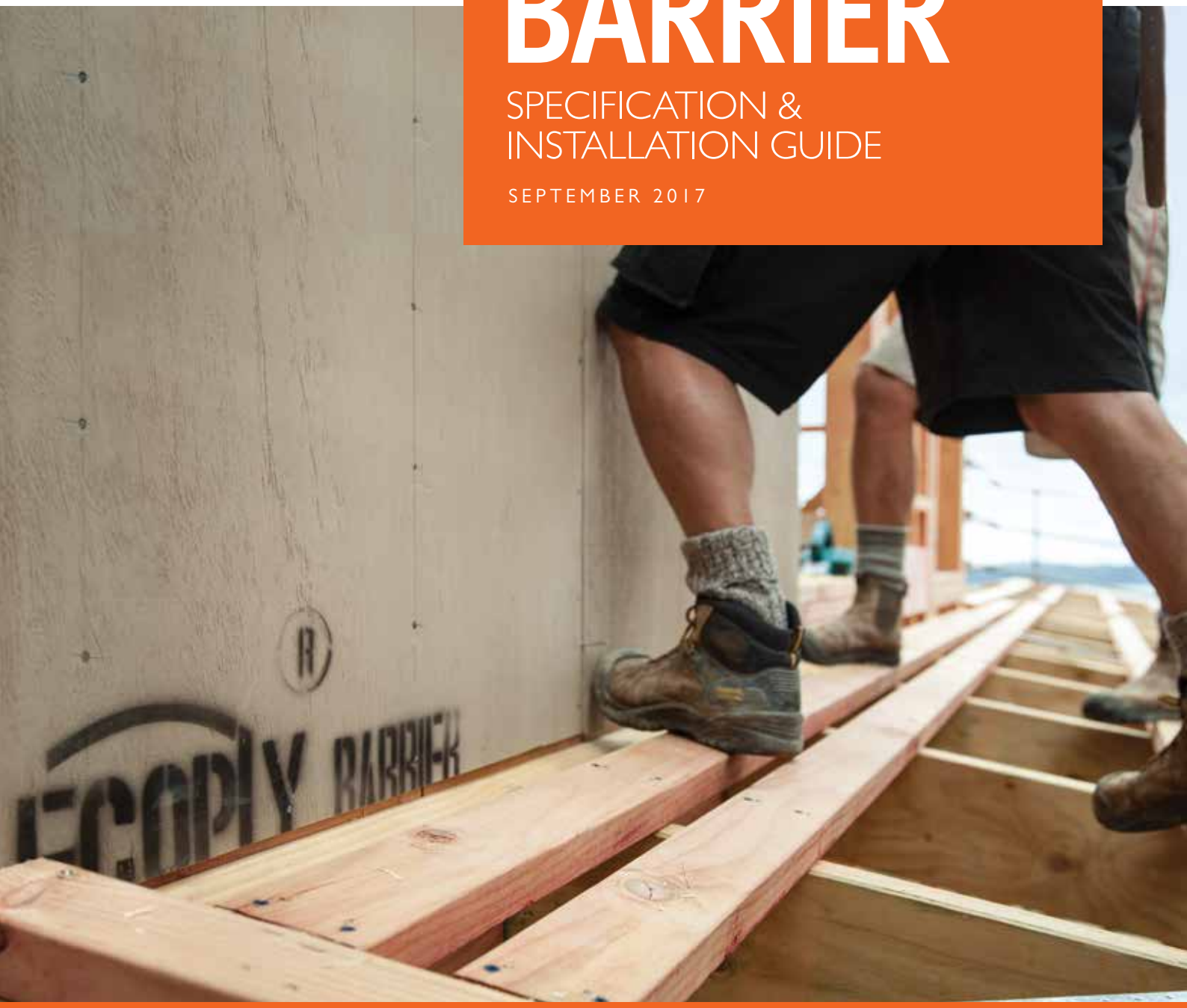
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ECOPLY® STRUCTURAL RIGID AIR BARRIER

BARRIER

SPECIFICATION & INSTALLATION GUIDE

SEPTEMBER 2017

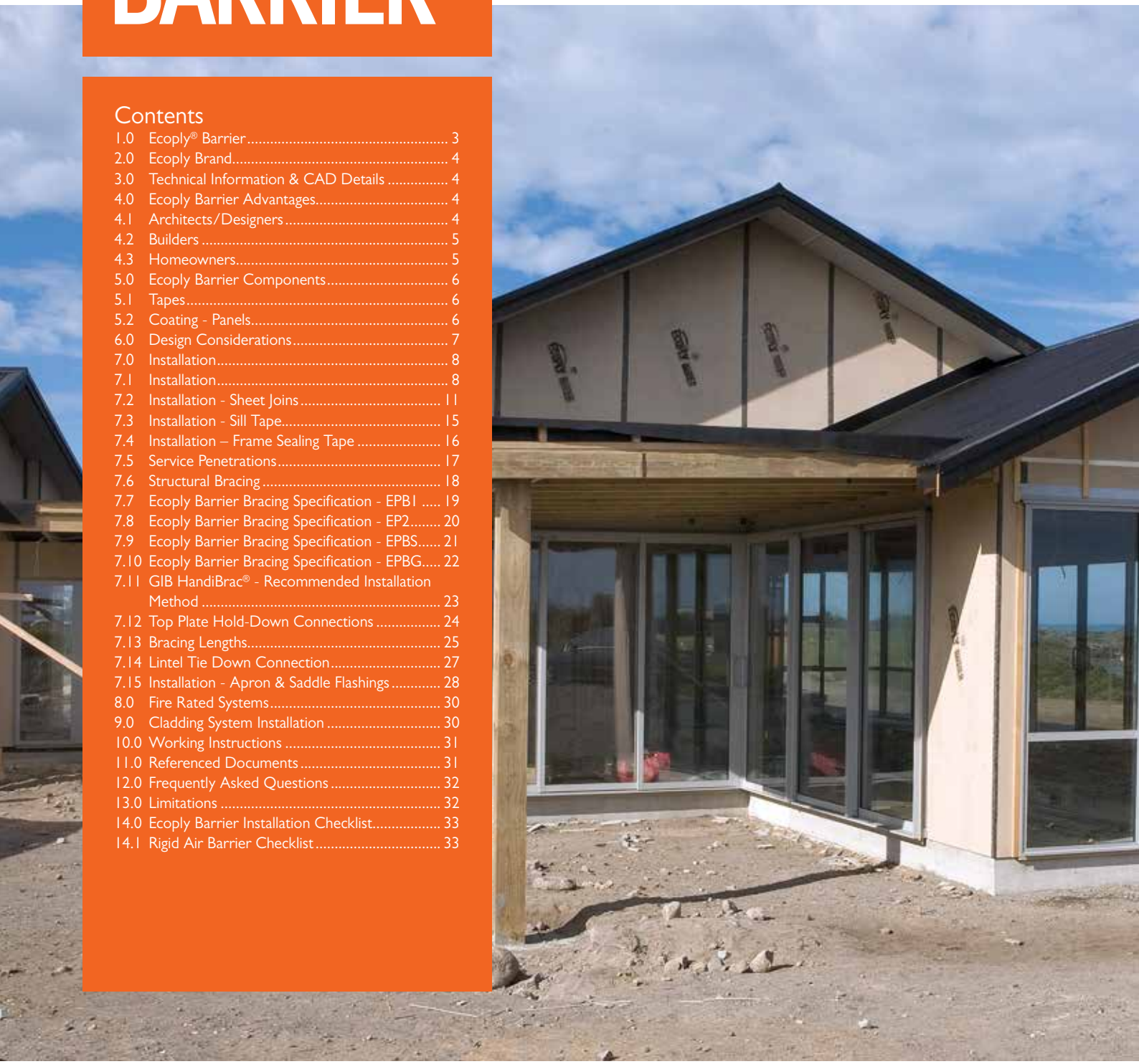


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Information contained within is specific to Ecoply® Barrier structural plywood products and must not be used with any other plywood products, no matter how similar they may appear.

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BARRIER



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1.0 ECOPLY® BARRIER

Ecoply® Barrier provides a weathertight rigid air barrier system for drained and vented cavity systems outside the building frame, effectively replacing traditional building wrap in the cavity while providing 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 7mm thick H3.2 CCA (Copper Chrome Arsenate) water borne treated structural plywood panel which is coated on the face and edges using a polyester powder coating process for increased sheet durability and protection from moisture penetration.

Ecoply Barrier meets the New Zealand Building Code (NZBC) requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of NZBC Clause E2 External Moisture, Acceptable Solution (E2/AS1), and has been tested for wind speeds exceeding Extra High wind zone as defined in Standards New Zealand 3604 Timber Framed Buildings (NZS 3604). Testing has been completed to provide solutions for buildings outside the scope of NZS 3604. For details on this, please contact CHH Woodproducts for further information.

Ecoply Barrier is BRANZ appraised for use as a rigid sheathing and temporary weather-protecting sheathing on timber framed buildings.

Ecoply Barrier must be competently installed in accordance with good building practices and sound design principles to satisfy the requirements of the Building Act 2004, the New Zealand Building Code (NZBC), and applicable New Zealand Standards. This is the responsibility of building owners and the design professionals and builders that they engage.

This document contains information, limitations, and cautions regarding the properties, handling, installation, usage, and the maintenance of Ecoply Barrier. However, to the maximum extent permitted by law, Carter Holt Harvey Woodproducts New Zealand (CHH Woodproducts) assumes no legal liability to you in relation to such information.

Ecoply Barrier panels are engineered to allow the wall system to breathe and dry out, while also preventing the intrusion of exterior moisture. Once the full system has been installed, the system provides a lasting protective barrier.

What is a Rigid Air Barrier?

A rigid air barrier is a barrier against air pressure and water infiltration from the outside to the interior of the building. A rigid air barrier acts as a secondary line of defence against water penetrating into the wall system – the primary defence being the exterior wall cladding.

Definition of an Air Barrier:

- Impermeable to airflow — the system must be continuous (no holes, openings or penetrations) and resistant to air pressure differentials.
- Continuous over the entire building enclosure.
- Able to withstand the forces that may act on them during and after construction.

Ecoply Barrier is a full sheathing system developed to prevent unwanted air movement and replace traditional building wrap.

BRANZ Appraised
Appraisal No.827 [2014]

The information contained in this document is current as at September 2017. It is your responsibility to ensure you have the most up to date information available. The information contained in this publication relates specifically to Ecoply® Barrier manufactured by Carter Holt Harvey Woodproducts New Zealand and must not be used with any other plywood manufacturer's products no matter how similar they may appear. Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply Barrier structural plywood products or Ecoply Barrier Tapes 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 (NZBC).

2.0 ECOPLY® BRAND

Ecoply® Barrier panels are manufactured in New Zealand by CHH Woodproducts under a third party audited quality control programme to monitor compliance with AS/NZS 2269 – Plywood Structural.

3.0 TECHNICAL INFORMATION & CAD DETAILS

Technical data sheets and CAD drawings referenced in this guide are available for download from www.chhwoodproducts.co.nz.

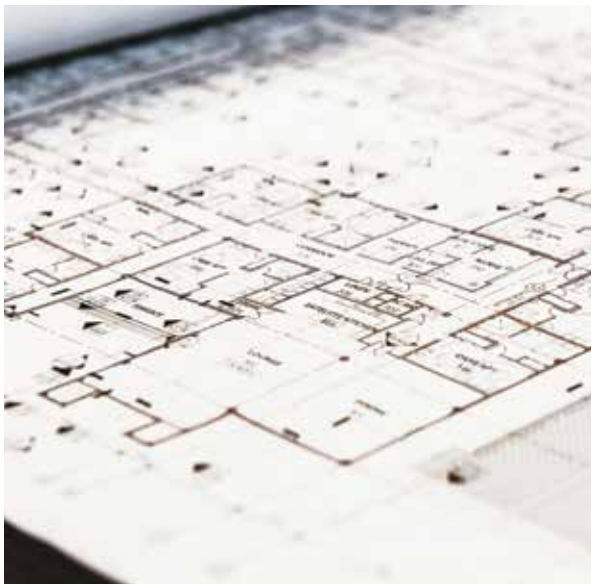
Ecoply Barrier (Rigid Air Barrier) is compliant with NZBC Clause B2.3.1 (a), for not less than 50 years, when used where the cladding durability requirement or serviceable life is not less than 50 years, e.g. structural bracing, and compliant with NZBC Clause B2.3.1 (b), for 15 years where the cladding durability requirement is 15 years when used as a temporary sheathing.

When specifying or installing Ecoply Barrier visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current specification material and any relevant technical notes.

4.0 ECOPLY® BARRIER ADVANTAGES

4.1 ARCHITECTS / DESIGNERS

Modern construction practices are moving toward providing greater energy efficiency and an airtight building envelope. These principles of high performance building are common in nearly all current green building standards and construction codes. Proper sealing between wall assembly components prevents unwanted air movement in and out of conditioned air spaces.



Advantages:

- Ecoply Barrier can form an integral part of a weathertight system including two of the four 'Ds' of weathertightness; drying and drainage.
- A rigid air barrier provides a more robust cavity and prevents the insulation bulging, which would increase the chance of moisture bridging from the cladding to the framing line.
- Provides both structural support and protection from moisture. Structural bracing is achieved when installed in accordance with the Ecoply Barrier bracing specifications. Bracing benefits may result in cost savings by reducing internal lining bracing elements (Refer to section 7.6 on bracing).
- BRANZ appraised system, fully tested and code compliant rigid air barrier system.
- Manufactured from sustainable plantation pine and available FSC certified (SCS-COC-001316) upon request.
- Low formaldehyde emission level (E0).

BRANZ Appraised
Appraisal No.827 [2014]

4.2 BUILDERS

Ecoply® Barrier lets you say goodbye to flexible wall underlays forever. Builders no longer have to worry about installing traditional housewrap or building paper on a windy day or having to return for re-work due to rips, tears or wrap that has blown off the home. Ecoply Barrier can typically save up to 2-4* weeks off the total house build time*, by allowing a faster building close in, for an earlier interior start and a quicker overall build time.

Ecoply Barrier installs quickly with two easy steps – fasten the panels and tape the seams. Once completed, the system provides moisture protection both during and after construction.



Advantages:

- Immediate close-in of structure, allowing interior and exterior work to be completed in parallel.
- Reduced builder liability; strong secondary line of defence and solid material for sealing penetrations.
- Schedule your subcontractors sooner.
- No call backs for rips, tears or wrap that has blown off.
- Easy to work light material, simple and easy to install.
- Up to 180 day exposure during construction cycle. No hold-ups while the cladding has to be installed i.e. brick layers etc.

4.3 HOMEOWNERS

An airtight building envelope means less airflow into and out of the home. Since conditioned air is expensive air, homeowners can take comfort in knowing that Ecoply Barrier will provide a strong secondary line of defence against the elements.



Advantages:

- Get possession faster, builders building with Ecoply Barrier can typically reduce up to 2-4* weeks off a typical house build*.
- Structurally rigid home.

* Timeframes and efficiencies are indicative only. Construction production gains will differ with respect to individual builder's abilities and other contributing circumstances outside the control of CHH Woodproducts.

5.0 ECOPLY® BARRIER COMPONENTS

Table 1: Product Range

Description	Weight (kg/m²)	Thickness	Width	Length
Ecoply® Barrier – structural plywood with factory applied proprietary coating to sheet surface and edges	Approx 4.0	7mm	1197mm	2440mm 2745mm
Sill Tape – one piece stretchable sill tape for window and door sills	-	2 Rolls per Box	150mm, 200mm	20m per roll
Frame Sealing Tape – for a permanent seal of all Ecoply® Barrier openings (Use in conjunction with Sill Tape)	-	2 Rolls per Box 1 Roll per Box	150mm 200mm	30m per roll
Sealing Tape – for a permanent seal of all Ecoply Barrier vertical joints	-	10 Rolls per Box	60mm	30m per roll

COMPONENTS NOT SUPPLIED BY CHH WOODPRODUCTS:

- PVC Horizontal Flashing: use Ecoply® Horizontal Jointer (Product Code RDZF7) supplied by E2 Flashing Solutions.
- Bracing Hold-Down Connectors: GIB HandiBrac® hold-down brackets manufactured by MiTek® complete with mechanical fastener with a minimum 15kN uplift capacity for concrete floors and 150mm x 12mm galvanised coach screw for timber floors.
- Fasteners.

5.1 TAPES

The Ecoply Barrier – Sill Tape, Frame Sealing Tape and Sealing Tape transform our sheathing plywood panels into a seamless protective barrier for your construction project. All tapes are proven to deliver an airtight and watertight seal. The Ecoply Barrier 'rigid air barrier system' tapes save you time and money on the job; and you can leave the site with confidence it will perform.



Table 2: Tapes

Technical Data	Sealing Tape	Sill Tape	Frame Sealing Tape
Description	For a permanent seal of Ecoply Barrier vertical joints	One piece stretchable sill tape, for use on all window / door frame sills	For a permanent seal of all Ecoply Barrier openings (Except window / door frame sill)
Carrier Paper	Special fleece made from PP	Butyl rubber with PE film	Special fleece made from PP
Width / Length	60mm x 30m	150mm x 20m 200mm x 20m	150mm x 30m (box of 2) 200mm x 30m (box of 1)
Release Paper	Siliconized Paper	Siliconized Foil (Split 90mm / 60mm) (Split 140mm / 60mm)	Siliconized Paper (Split 90mm / 60mm) (Split 140mm / 60mm)
Temperature Resistance	Long Term -40°C to +90°C	Long Term -40°C to +90°C	Long Term -40°C to +90°C
Processing Temperature	From -10°C	From -10°C	From -10°C
Colour	Grey	Black	Grey

Storage: All sealing tapes must be stored in clean dry conditions and not in an area with direct sunlight.

5.2 COATING - PANELS

The film formulation provides resistance to the effects of exposure to weathering including sun and moisture, typically experienced during the construction and normal service life of cavity substrate systems. The factory applied powder coat film is specifically formulated for use on Ecoply Barrier plywood panels.

- The film, formed by the powder coating process, helps resist moisture penetration.
- The edges of Ecoply Barrier sheets are coated and sealed.
- High film build (60–80 microns), delivers a smoother and more durable sheet surface allowing easier moisture drainage in cavity construction applications.
- Sealer coating contains low Volatile Organic Compounds (VOC).
- The beige coloured sealer coating can be exposed to the external environment for up to 180 days prior to cladding installation.

6.0 DESIGN CONSIDERATIONS

Responsibility

Design responsibility lies with the building owner and the professionals that they engage. The Specifier for the project must ensure that the products and 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 applications" and periodic moderate wetting.

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 minimise potential moisture ingress into the panel. All other cuts and penetrations must be covered by Ecoply Barrier Sealing Tape and installed in accordance with the Ecoply Barrier literature. When installed as per the above requirements, cut edges and penetrations are not required to be retreated with a brush on preservative treatment however, if desired, CHH Woodproducts recommends the use of Holdfast® Metalex® Concentrated Timber Preservative Green (Holdfast® Metalex® Green).

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 environment. The total expansion both along and across a 2440 x 1197mm panel can be in the order of 1.5mm to 3mm depending on the environment. Detailing and construction practice 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 product's structural performance or weathertightness when installed as per the 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 0.5mg/ litre).

Wind Loadings

Ecoply Barrier meets the NZBC requirements for rigid underlays as outlined in section 9.1.4, the performance requirements of Table 23 of E2/ AS1, and has been tested for wind speed exceeding Extra High wind zone as defined in NZS 3604. Testing has been completed to assist in providing solutions for buildings outside the scope of NZS 3604. Contact CHH Woodproducts for further information.

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 Safety Data Sheet (SDS) for H3.2 CCA treated Ecoply Barrier. 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 panels and tapes must be stored and handled with care to maintain good condition prior to installation:

- The storage area must be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity.
- Support for the sheets must 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 must be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage.
- The sheets must be stacked flat, NOT on edge.

Maintenance

Ecoply Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the Ecoply Barrier or to the Ecoply Barrier itself, repairs or replacement should be carried out to ensure the integrity of the rigid air barrier. Small perforations in the panels can be covered by the Frame Sealing Tape or Sealing Tape (200mm, 150mm or 60mm Width, Grey Colour).

7.0 INSTALLATION

7.1 INSTALLATION

Step 1 Framing:

Install the Ecoply® Barrier sheathing panels positioned with the water resistant powder coat film facing outwards. The panels must be installed with the long side of each panel orientated vertically to the framing members.

All Ecoply Barrier sheet edges must be fully supported by being fastened to framing:

- Studs must not exceed 600mm centres.
- Nogs must be provided at 1350mm centres maximum.
- The minimum framing width for fixing Ecoply Barrier is 45mm at sheet joints.
- Framing must be kept as dry as possible at all times.
- Do NOT glue to frame.

All timber framing sizes and set outs must comply with NZS 3604 (or be specifically designed to NZS 3603:1993 – Timber Structures Standard), with stud and nog centres and timber widths required by this specification. Use kiln dried framing such as Laserframe® in accordance with timber framing manufacturers specification and treated in accordance with NZBC Clause B2 Durability, Acceptable Solution (E2/AS1) or Standards New Zealand 3602:2003 Timber and Wood based products for use in building (NZS 3602).

Step 2 Fastener Durability:

Fasten the panels to the framing members. It is of particular importance in coastal areas, areas subject to salt spray and other corrosive environments that the correct fastener is verified prior to installation.

Fasteners shall be a minimum of hot dip galvanised for all B and C zones excluding sea spray zone D where stainless steel fasteners are required. Where stainless steel is required, annular grooved nails must be used.

Step 3 Fasteners:

Fastener heads should be flush with the panel surface. It is not required to tape over over-driven fasteners unless the fastener head completely penetrates the thickness of the face veneer.

Cladding fasteners must be increased in length by a minimum of 7mm to achieve the required fastener pull out loadings. (Ecoply Barrier is 7mm thicker than building wrap).

Table 3: Fastener Type

Fixing Type	Minimum Nail Length
Hand Driven	50 x 2.8mm nails (flat head or round head), hot dipped galvanised or better
Power Driven – Paslode Pneumatic Cladding Coil Nailer	Paslode Impulse 50 x 2.8mm hot dipped galvanised or better, ring round head drive B20557

NOTE: Please refer to Step 2 Fastener Durability.

Step 4 Sheet Layout:

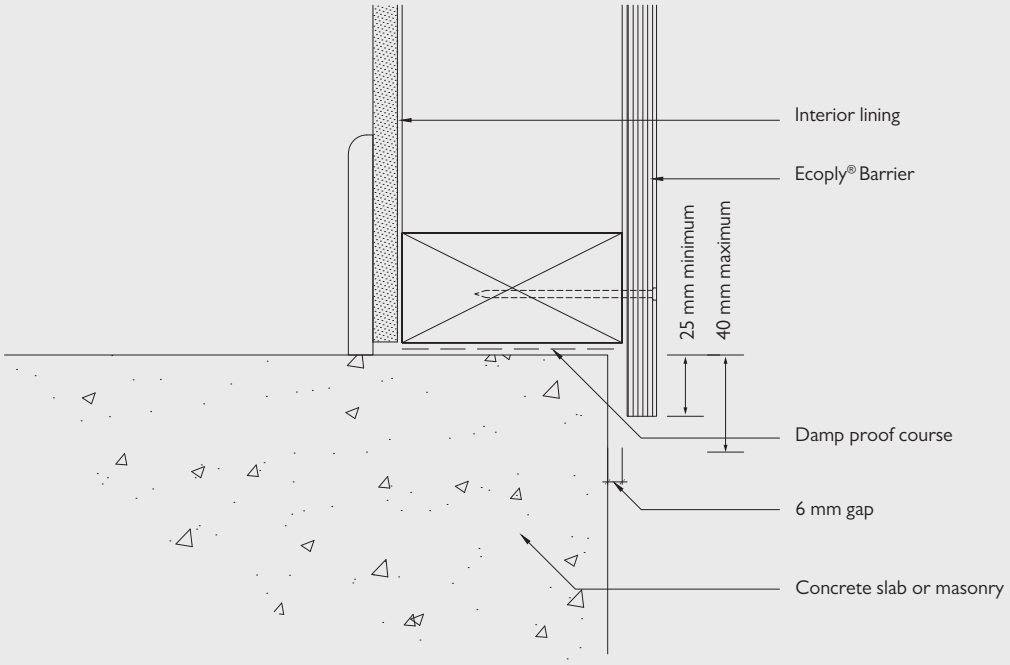
When using Ecoply Barrier, flexible wall underlay is not required. Ecoply Barrier has been BRANZ appraised and tested to demonstrate product performance against the requirements of Table 23 of Clause E2 / AS1 of NZBC. The sheets are jointed keeping an expansion gap of 2-3mm maximum between the plywood panels. Each plywood panel is 1197mm in width to allow for standard 400mm or 600mm stud spacing.

- All sheet edges must be supported by the framing.
- Use fastener pattern unless otherwise specified (refer to the bracing specifications in the Ecoply Specification and Installation Guide).
  - 150mm centres at sheet edges
  - 300mm centres within sheet body up to and including 'Very High' wind zone or;
  - 150mm centres within sheet body in 'Extra High' wind zone
- Sheets must overhang the bottom plate by a minimum of 25mm over timber and concrete foundations (Refer to BAR005: Overhang Clearances For Concrete Slab or Masonry) with a maximum overhang of 40mm.
- For brick cladding rebates, in addition to the 25 – 40mm sheet overhang, 40mm clearance must exist between the face of the Ecoply Barrier sheet and the brick cladding in accordance with E2/AS1 Section 9.2.6 Cavities (Refer to BAR005A: Brick Rebate Overhang Clearance).
- For cantilevered floor joists, sheets must overhang a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005B: Timber Floor Overhang Clearance For Cantilevered Joists).
- For timber sub-floor systems, sheets must overhang the bearer a minimum of 25mm, with claddings to extend a minimum of 50mm below the lowest part of the timber framing in accordance with E2/AS1 Table 18 (Refer BAR005C: Overhang Clearance for Timber Sub-Floors).

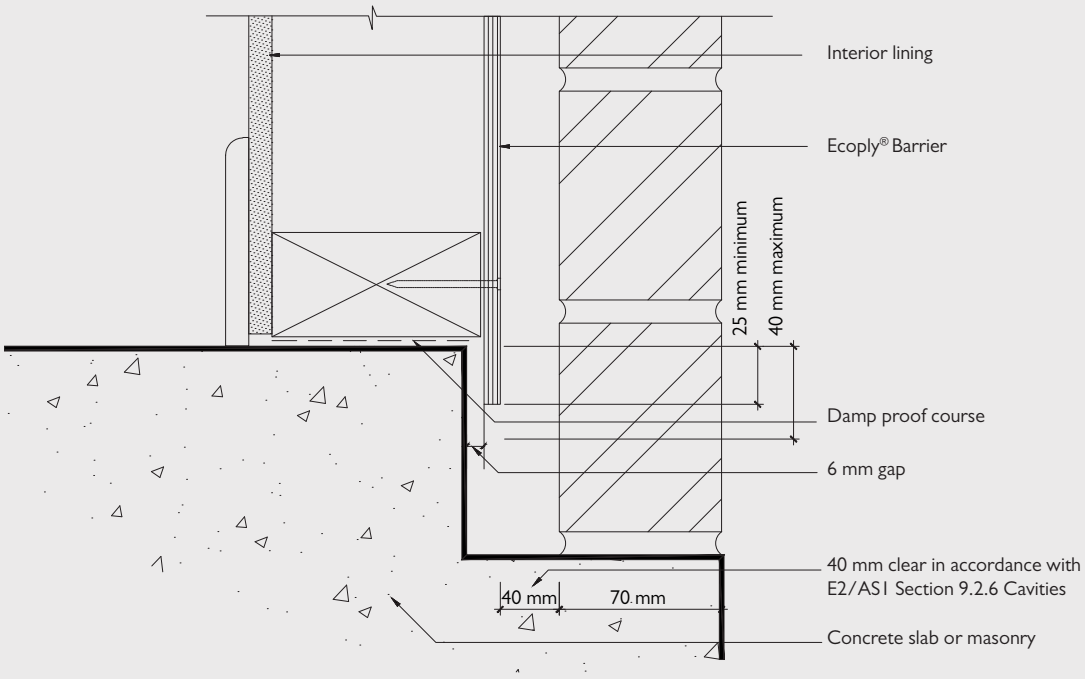
Ground Clearances:

Minimum ground clearances must be maintained for the cladding being installed in accordance with Clause E2/AS1 – Figure 65 and Table 18, and with NZS 3604 for timber floors. The adjacent ground must slope away from the building in accordance with NZBC requirements. Ecoply Barrier must not be installed where product will remain in contact with non-draining water, damp, or soil.

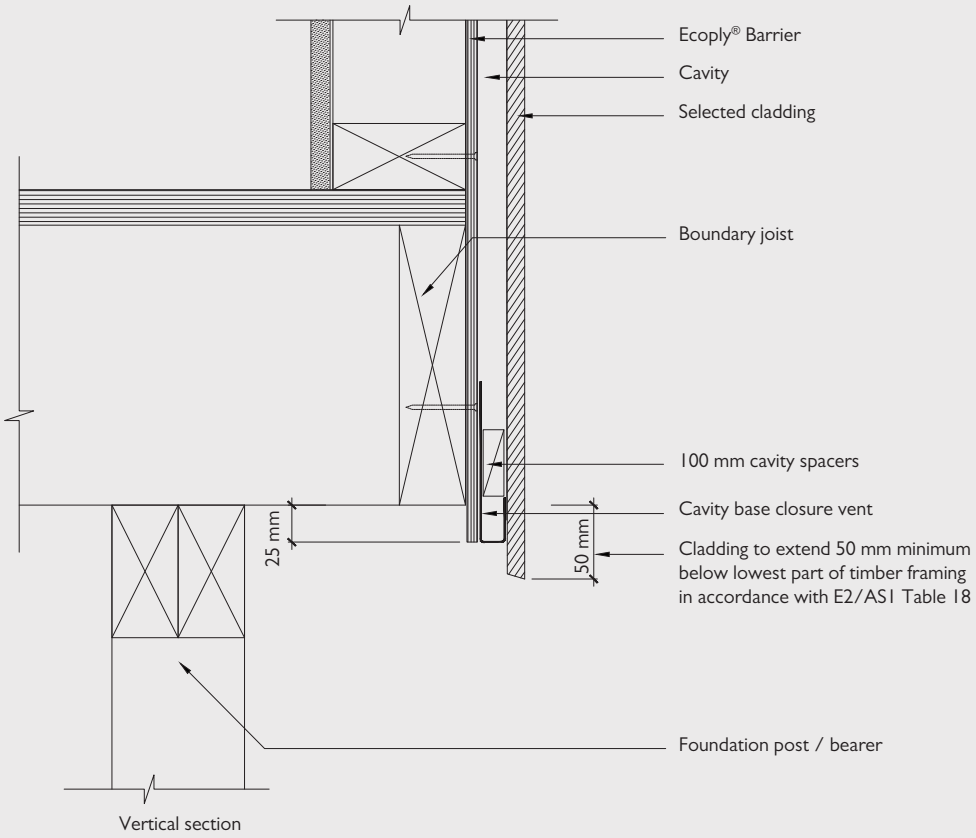
BAR005: Overhang Clearances For Concrete Slab or Masonry



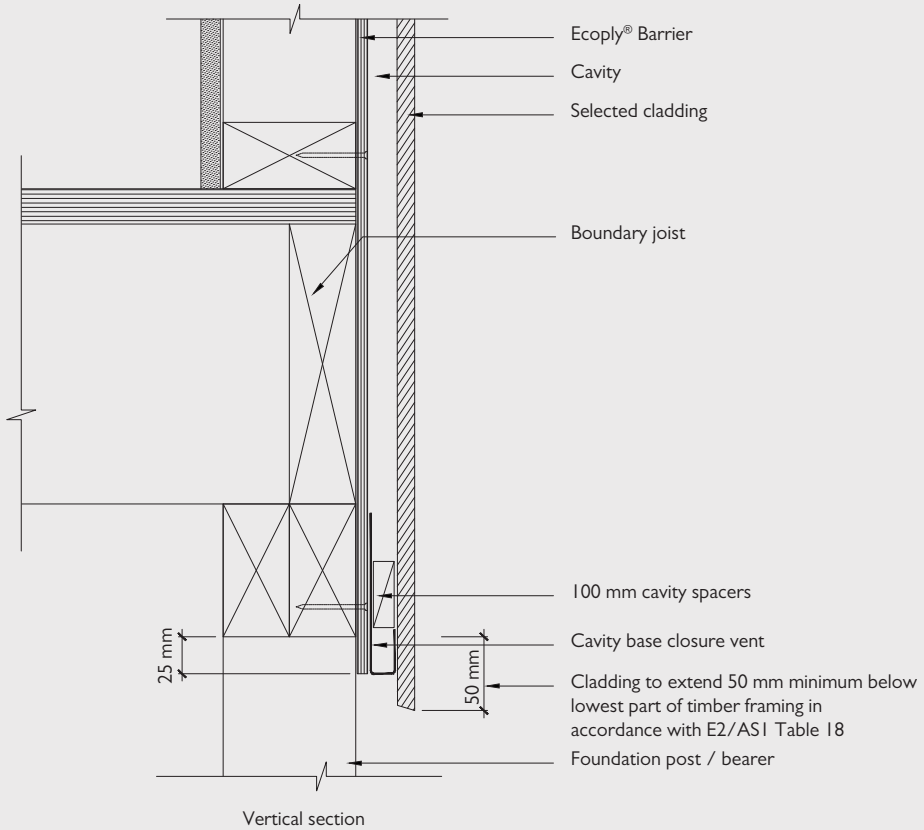
BAR005A: Brick Rebate Overhang Clearance



BAR005B: Timber Floor Overhang Clearance for Cantilevered Joists



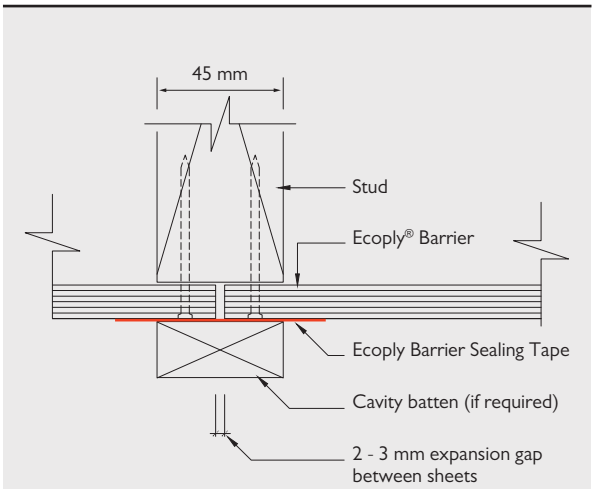
BAR005C: Timber Floor Overhang Clearance for Sub Floors



7.2 INSTALLATION – SHEET JOINS

Apply Ecoply® Barrier Sealing Tape after all sheathing panels are fully fastened to wall framing members. Only designated Ecoply Barrier Sealing Tape should be used. Ensure that each panel is free of sawdust and dirt prior to taping. Ecoply Barrier Sealing Tape requires pressure for a secure seal. Make sure the tape is centred over the seam within +/- 20mm to provide adequate coverage and that wrinkles in tape are minimal.

BAR006: Vertical Sheet Joints



Vertical Sheet Joints:

- Seal vertical joints by running Ecoply Barrier Sealing Tape over the joints (60mm x 30m).
- Ecoply Barrier Sealing Tape must not be exposed to weathering for more than 180 days prior to installation of the exterior cladding system.

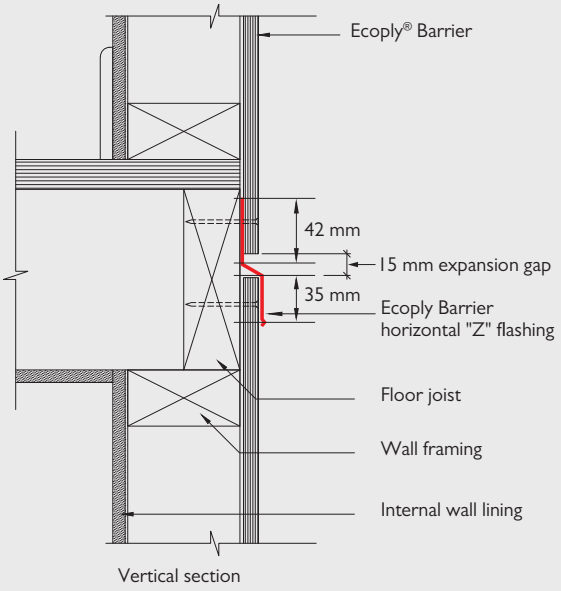
Horizontal Sheet Joins (Three Options):

- Ecoply Barrier PVC horizontal 'Z' Flashing (Product Code RDZF7) for horizontal sheet joints. Refer BAR007: Horizontal Sheet Joints (PVC Z Flashing).
- 'Z' taped joint using Ecoply Barrier 150mm OR 200mm Frame Sealing Tape. Refer BAR007A: Horizontal Sheet Joints (Tape Z Flashing).
- 'Face' seal joint using Ecoply Barrier 150mm OR 200mm Frame Sealing Tape. Refer to BAR007B: Face Sealed Horizontal Sheets Joins at Mid-floor or BAR007C: Face Sealed Horizontal Sheet Joins at Nog.

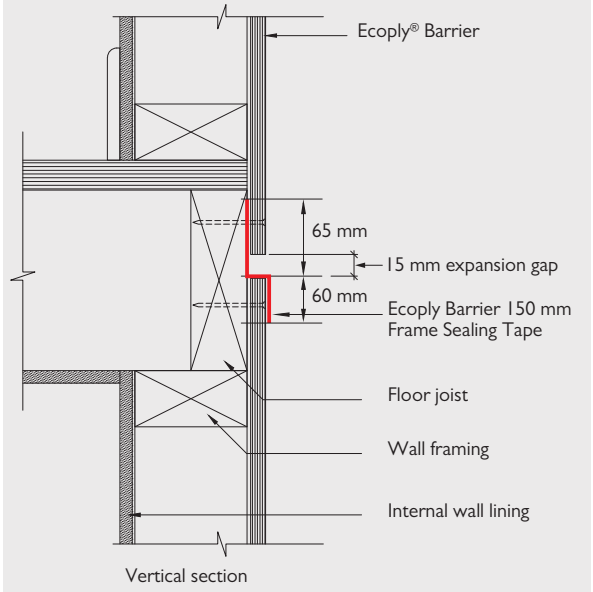
Tape Splices and Joints:

- Whenever tape splices occur at a junction, create an overlapping splice of at least 50mm.
- Make sure to apply adequate pressure for a secure bond between the plywood panel and the tape.
- Take special care to remove any wrinkles or voids at splice areas.

BAR007: Horizontal Sheet Joints (PVC Z Flashing)

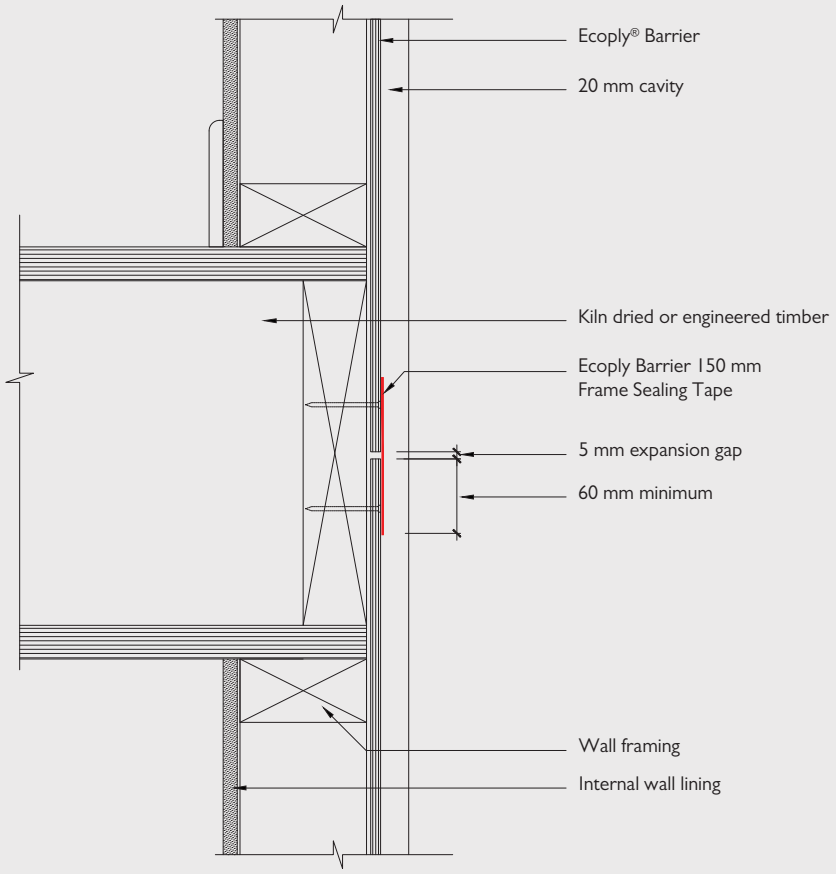


BAR007A: Horizontal Sheet Joints (Tape Z Flashing)



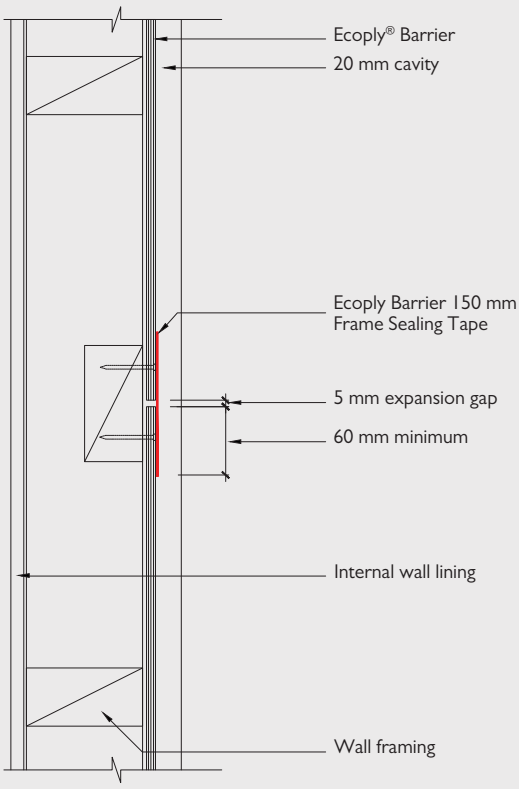
The Ecoply® Barrier PVC Horizontal 'Z' Flashing is manufactured by E2 Flashing Solutions. Contact E2 Flashing Solutions on (03) 358 5775 or visit www.e2flashingsolutions.co.nz for further information.

BAR007B: Face Sealed Horizontal Sheet Joints at Mid-Floor



Vertical section

BAR007C: Face Sealed Horizontal Sheet Joints at Nog

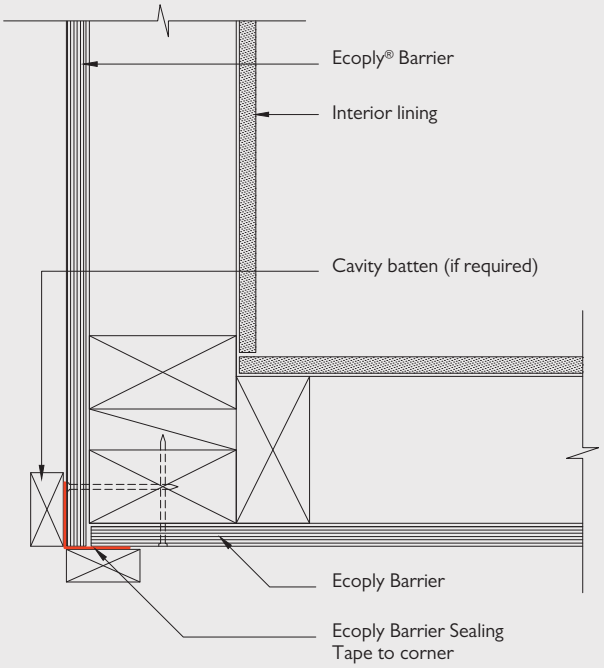


Vertical section

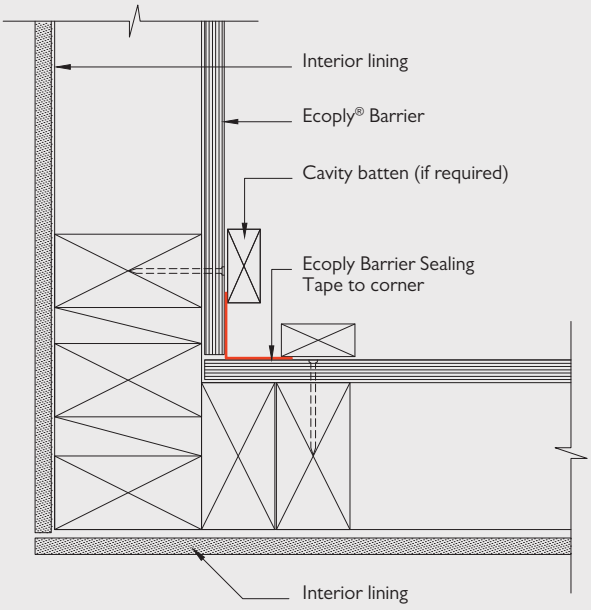
Internal and External Corners:

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour). (Refer to BAR008 and BAR009: External and Internal Corner).

BAR008: External Corner



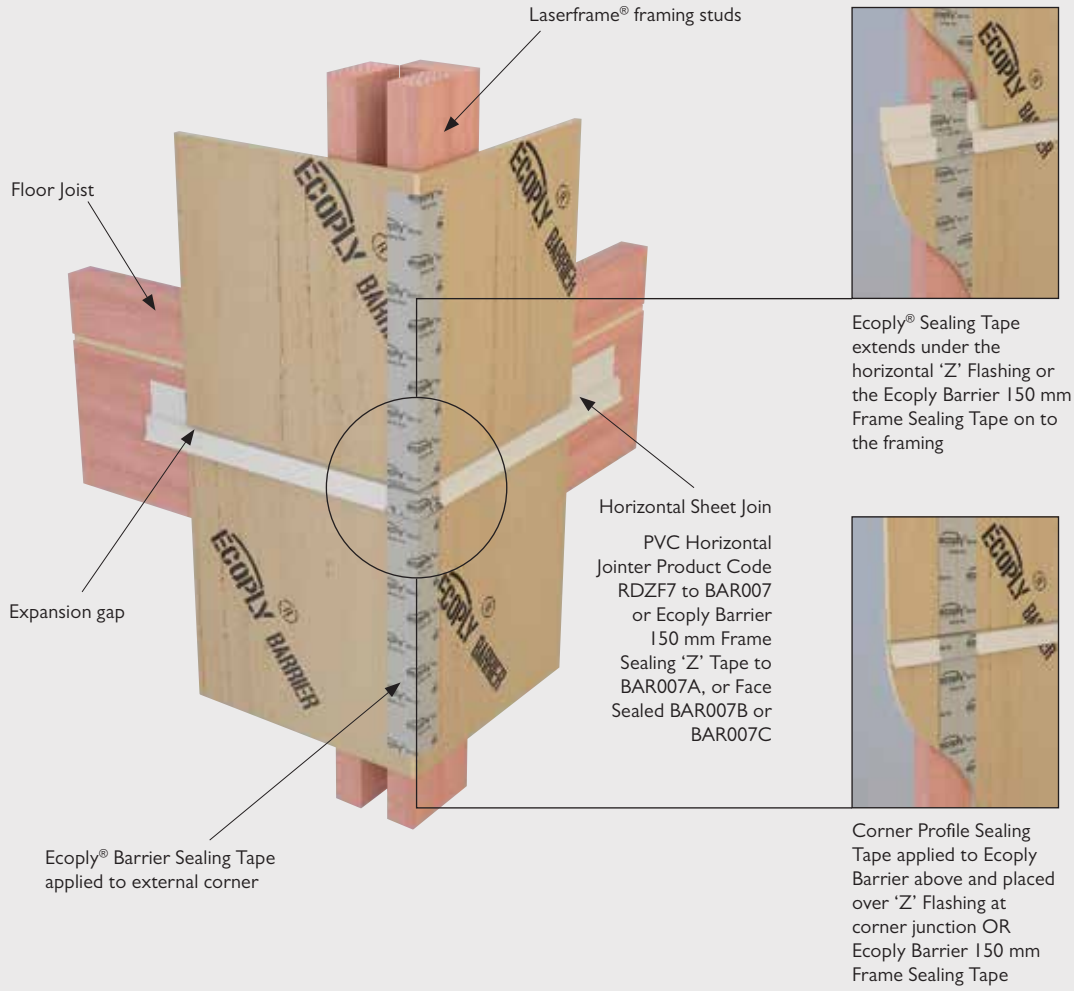
BAR009: Internal Corner



Corner Junctions to Horizontal Joints

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60mm Grey Colour).
- PVC Horizontal Z Flashings must be butted together, 60mm Ecoply Barrier Sealing Tape must overlap the PVC butt join entirely over the face and up stand of the PVC Flashing to form a weathertight joint where horizontal Flashings meet.
- Horizontal joins may also be completed using Ecoply Barrier Frame Sealing Tapes.

BAR010: External Corner to Horizontal Joint



7.3 INSTALLATION - SILL TAPE

Apply Ecoply® Barrier Sill Tape to the horizontal trimmer section of the window or door opening. The exposed timber framing on the sill of the window opening must be totally covered with the Ecoply Barrier Sill Tape (150mm or 200mm Black Colour) – one continuous piece. The tape must be sealed over the face of the Ecoply Barrier.

Take special care to avoid any wrinkles or voids at corner junctions, Ecoply Barrier Sill Tape requires pressure for a secure seal.

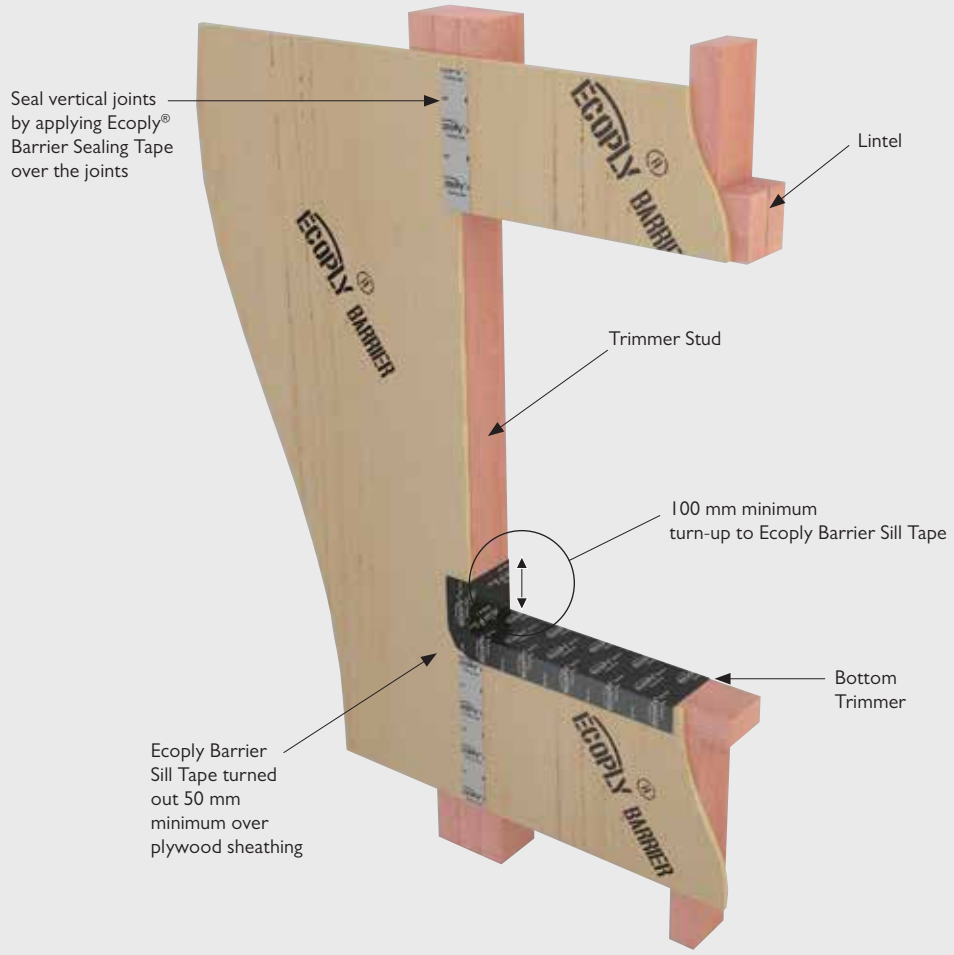
Horizontal Sill Flashing Detail:

- Cut the Ecoply Barrier Sill Tape 200mm longer than the horizontal window/door bottom trimmer.
- Ensure that the framing is free of sawdust and dirt prior to taping.
- Apply the Ecoply Barrier Sill Tape to cover the bottom of the opening, overhanging onto the Ecoply Barrier by at least 50mm and extending 100mm up trimmer stud.
- Carefully bend the Ecoply Barrier Sill Tape to mould into the corners providing a tight seal.



NOTE: Door openings are to be treated similarly to window openings. The bottom trimmer may be either a timber or concrete floor.

BAR012: Window Penetration Sill Tape Installation



7.4 INSTALLATION - FRAME SEALING TAPE

Apply Ecoply® Barrier Frame Sealing Tape to the vertical trimmer stud and lintel of the window or door opening. The exposed timber framing must be covered with the Ecoply Barrier Frame Sealing Tape (150mm / 200mm Grey Colour). The tape is sealed over the face of the Ecoply Barrier panel.

Take special care to remove any wrinkles or voids at corner junctions, Ecoply Barrier Frame Sealing Tape requires pressure for a secure seal.



Vertical Jamb Detail:

- Cut the Ecoply Barrier Frame Sealing Tape 100mm longer than the vertical opening size.
- Ensure that the trimmer stud is free of sawdust and dirt prior to taping.
- Apply the Frame Sealing Tape to cover the entire trimmers' opening. The tape should extend a minimum of 100mm around the corner at the head of the window framing, and over-lap the Sill Tape on the trimmer stud by a minimum of 50mm.
- Carefully slit the tape from the corner to get a smooth adhesion to the plywood sheathing panel. Bend the Ecoply Barrier Frame Sealing Tape to mould into the corners providing a tight seal.
- Cut and apply a small 100mm strip to reinforce the corner using Ecoply Barrier 150mm Frame Sealing Tape.

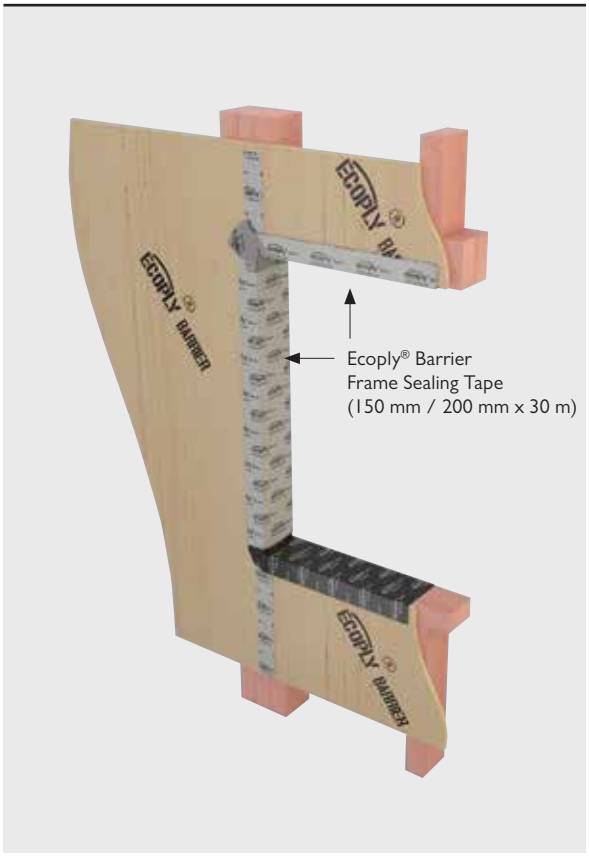
Horizontal Head Detail:

- Once both trimmer studs are installed, cut the Frame Sealing Tape for the horizontal head trimmer and Flashing to suit. Make sure to over-lap the existing tape from the trimmer by at least 50mm (Do not extend tape past the corner).
- Specific installation requirements pertaining to window and door systems should be sought from the joinery manufacturer.

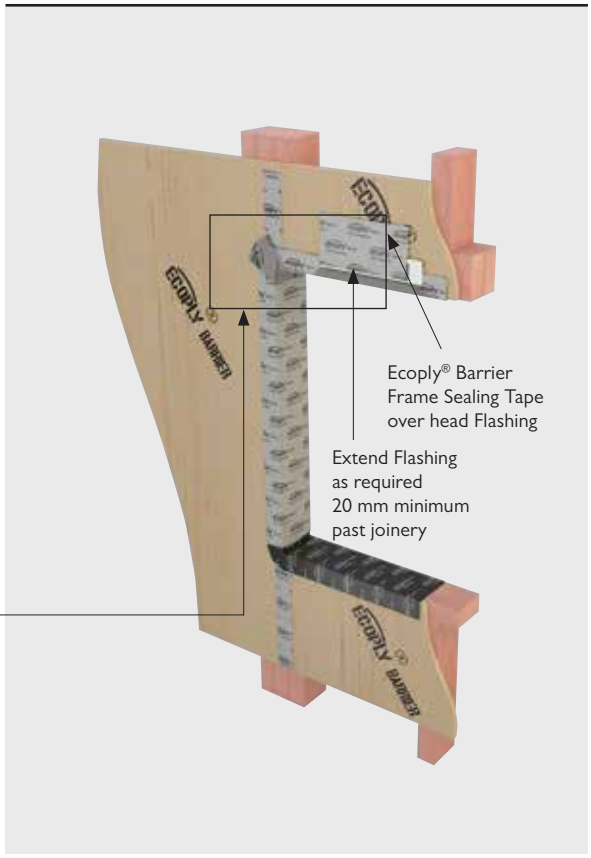
NOTE: Door frames are to be treated similarly to window openings.



BAR013: Window Penetration Sill Tape Installation



BAR014: Window Penetration Frame Sealing Tape Installation with Head Flashing



7.5 SERVICE PENETRATIONS

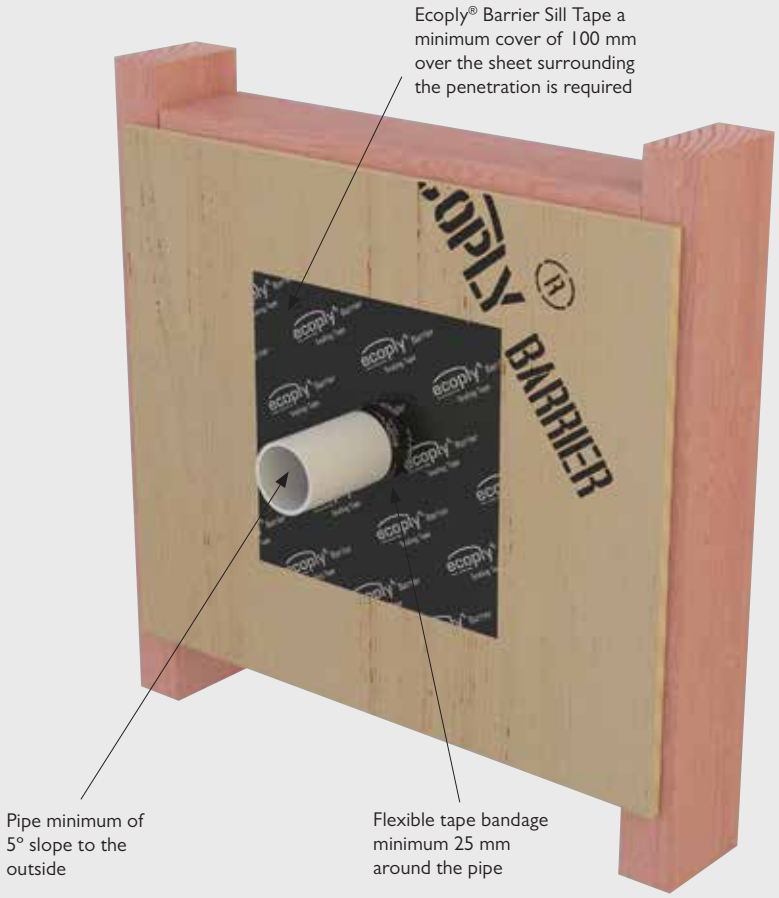
- Service penetrations must be sealed using a flexible Flashing tape. Ecoply® Barrier Sill Tape (150mm or 200mm Black Colour) is recommended for this purpose. (Refer to BAR011: Penetration and Services).
- A minimum cover of 100mm over the sheet surrounding the penetration is required.
- Use Ecoply Barrier Frame Sealing Tape to bandage around the pipe (25mm minimum width).



Service Penetrations in Bracing Elements

Small openings (e.g. power outlets) of 90 x 90mm or less maybe placed no closer than 90mm to the edge of the braced element, or waste pipe outlets of maximum 150mm diameter placed at no closer than 150mm to the edge of the braced element. Maximum one penetration per bracing panel.

BAR011: Penetration & Services



7.6 STRUCTURAL BRACING

Ecoply Barrier is designed to comply with the New Zealand Building Code (NZBC).

Structure

NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution B1/AS1 Structure. CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604.

Demand may be calculated by following section 5, Bracing Design of NZS 3604 or using the GIB EzyBrace® software, downloadable from www.gib.co.nz.

EPB bracing systems properties can be easily loaded into the EzyBrace software by way of a software patch downloadable from www.chhwoodproducts.co.nz together with loading instructions.

Specific Design

Ecoply® Barrier structural plywood panels are manufactured to AS/NZS 2269, and is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand timber design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification Method B1/VM1 under Clause 6.0 Timber for use in buildings over three storeys in height.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120BUs/m.

Durability

Ecoply Barrier plywood panels are manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in Buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability requirements of the NZBC.

Adjustments for Wall Height

Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from table below should be multiplied by 2.4 ÷ element height in metres, except that elements less than 2.4m high shall be rated as if they are 2.4m high.

(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height.

(c) Wall heights <1.5m are to be subject to Specific Engineer Design (SED).

Joining Panels for Walls Higher than Maximum Sheet Length

Ecoply Barrier bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.44m, Ecoply Barrier is available in 2.745m sheet lengths. Alternatively, a part sheet can be installed above a full sheet, in accordance with section 7.2 Installation - Sheet Joins (Three Options for Horizontal Sheet Joins) on a single row of common nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply Barrier bracing specifications (e.g. 2.4m x 1.2m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7m x 1.2m bracing element).

Table 4: Summary P21 Ratings for 2.4m High Ecoply® Barrier Wall Elements

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135
EP2	0.6m	Ecoply Barrier or Ecoply each side	Yes GIB HandiBrac®	105	115
EPBS	0.4m	Ecoply Barrier one side	No additional fastening[1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90
EPBG	0.4m	Ecoply Barrier one side and 10mm GIB® Standard plasterboard other side	Yes GIB HandiBrac®	100	115
	1.2m			150	150

[1] As per NZS 3604: 2011. No specific additional fastening required.

7.7 ECOPLY® BARRIER BRACING SPECIFICATION – EPB1

Table 5: Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPB1	0.4m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6m			95	105
	1.2m			120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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 of minimum SG8, 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 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening Ecoply® Barrier Panels

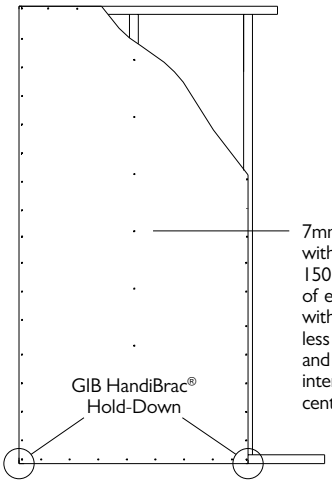
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. 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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

SEPTEMBER 2017

7.8 ECOPLY® BARRIER BRACING SPECIFICATION – EP2

Table 6: Sided Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EP2_0.6	0.6m	Ecoply® Barrier or Ecoply each side	Yes GIB HandiBrac®	105	115

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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® of SG8 stress grade minimum, 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 Each Side

One layer of 7mm, 9mm or 12mm Ecoply® plywood or Ecoply Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening the Ecoply® Barrier

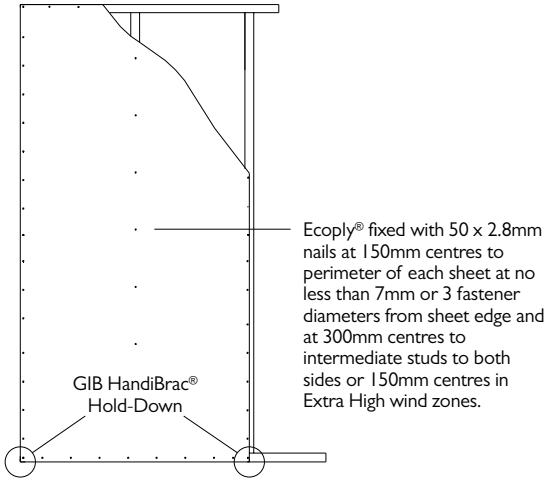
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 of the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. 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 manufactured by CHH Woodproducts and SG8 timber framing, 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.

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7.9 ECOPLY® BARRIER BRACING SPECIFICATION – EPBS

Table 7: Single Sided Structural Plywood Brace No Additional Hold-Down

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPBS	0.4m	Ecoply® Barrier one side	No additional fastening [1]	60	60
	0.6m			60	65
	1.2m			65	70
	2.4m			80	90

[1] As per NZS 3604: 2011. No specific additional fastening required.

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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 of minimum SG8, such as Laserframe®, is recommended.

Bottom Plate Fixing

Bottom plates are fixed in accordance with the requirements of NZS 3604. No specific additional fastening required.

Lining

One layer of 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Fastening the Ecoply® Barrier

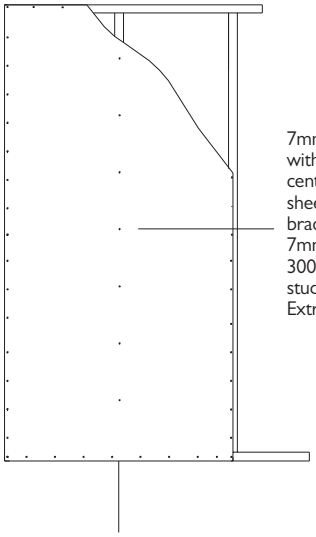
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate studs or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



7mm Ecoply® Barrier fixed with 50 x 2.8mm nails at 150mm centres to perimeter of each sheet or part sheet within the bracing element at no less than 7mm from sheet edge and at 300mm centres to intermediate studs or 150mm centres in Extra High wind zones.

Bottom plate fixed in accordance with the requirements of NZS 3604.

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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

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7.10 ECOPLY® BARRIER BRACING SPECIFICATION – EPBG

Table 8: Ecoply® Barrier Structural Brace To One Side with 10mm GIB® To The Other

Specification No.	Minimum Wall Length	Lining Requirements	Hold-Down	BUs/m Wind	BUs/m Earthquake
EPBG	0.4m	Ecoply® Barrier one side and 10mm GIB® Standard plasterboard other side	Yes	100	115
	1.2m		GIB HandiBrac®	150	150

Framing

Wall framing must comply with:

- NZBC B1 - Structure: AS1 Clause 3 Timber (NZS 3604).
- 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

Side 1: One layer of 7mm Ecoply® Barrier vertically fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3mm expansion gap should be left between sheets.

Side 2: One layer of 10 or 13mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® Barrier

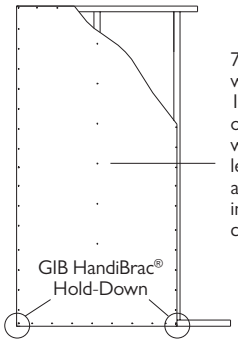
Fasteners

Fasten with 50 x 2.8mm galvanised or stainless steel flat head nails direct fix. Place fasteners no less than 7mm from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 of the Ecoply Barrier 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 150mm centres around the perimeter of each sheet and 300mm centres to intermediate or 150mm centres in Extra High wind zones. Where more than one sheet forms the brace element each sheet must be nailed off independently.



7mm Ecoply® Barrier fixed with 50 x 2.8mm nails at 150mm centres to perimeter of each sheet or part sheet within the bracing element at no less than 7mm from sheet edge and at 300mm centres to intermediate studs or 150mm centres in Extra High wind zones.

Fastening the GIB® Plasterboard

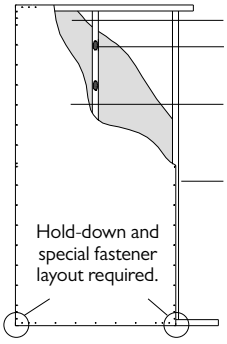
Fasteners

32mm x 6g GIB Grabber® Screws or 35mm GIB® Nails

Fastening centres

Fasten 50, 100, 150, 225 and 300mm from each corner and 150mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12mm from paper bound edges and 18mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.



7mm Ecoply® Barrier.

Daubs of GIBFix® adhesive at 300mm centres to intermediate studs.

GIB® Standard plasterboard.

All four corners of a GIB® plasterboard bracing element must be fastened at 50mm, 100mm, 150mm, 225mm and 300mm from the edge of the sheet.

Bracing element perimeter is then fastened at 150mm centres.

Fasteners must be no closer than 12mm from the paper enclosed edge and no closer than 18mm from sheet ends or cut edges of sheets.

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 Barrier manufactured by CHH Woodproducts and SG8 timber framing 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.

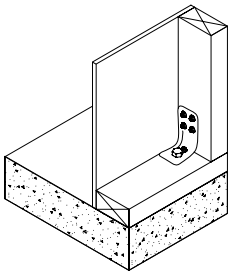
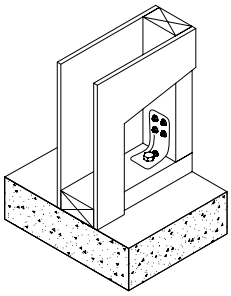
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7.11 GIB HANDIBRAC® - RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek®, the GIB HandiBrac® has been tested for use as a hold-down in all EPB bracing elements.

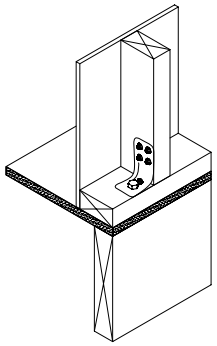
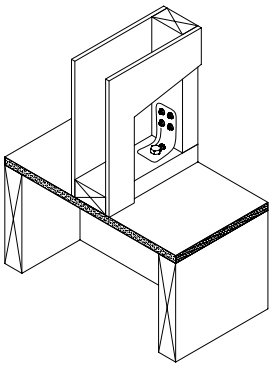
- The GIB HandiBrac® registered design provides for quick and easy installation.
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps.
- The GIB HandiBrac® is suitable for both new and retrofit construction.
- The design also allows for installation and inspection at any stage prior to fitting internal linings.

Concrete Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	Position GIB HandiBrac® at the stud/ plate junction.
Hold-down Fastener Requirements	
A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket.	

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Timber Floor

External Walls	Internal Walls
	
Position GIB HandiBrac® in the centre of the perimeter joist or bearer.	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block.
Hold-down Fastener Requirements	
M12 x 150mm galvanised coach screw or screw bolt supplied with the bracket.	

7.12 TOP PLATE HOLD-DOWN CONNECTIONS

Additional nailing of the Ecoply® Barrier to the top and bottom plates in accordance with the details shown in Figure 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, NZS 3604.

Fastening

Nails must be 50mm x 2.8mm flat head hot dip galvanised or stainless steel as described in the Ecoply Barrier Specification and Installation Guide for Fastener Durability (Section 7.1).

Nailing to the top plate is at 75mm centres and 20mm from the sheet edge.

The remainder of the sheet perimeter is fastened at 150mm centres no less than 7mm from the sheet edge and 300mm at intermediate studs (or 150mm centres for Extra High wind zones) as with standard nailing for Ecoply Barrier.

Standard nailing of the Ecoply Barrier to the top plate in accordance with the Ecoply Barrier 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, NZS 3604.

Horizontal Sheet Joints and Top Plate Hold-Down

Where horizontal sheet jointing is required and top plate hold-down connections are completed using Ecoply Barrier, nailing to the noggin at 75mm centres and 20mm from the sheet edge is also required at the sheet joins. Refer Figure 1B Top Plate Hold-Downs and Horizontal Sheet Joins.

Figure 1: Top Plate Hold-Downs Connections using Ecoply® Barrier

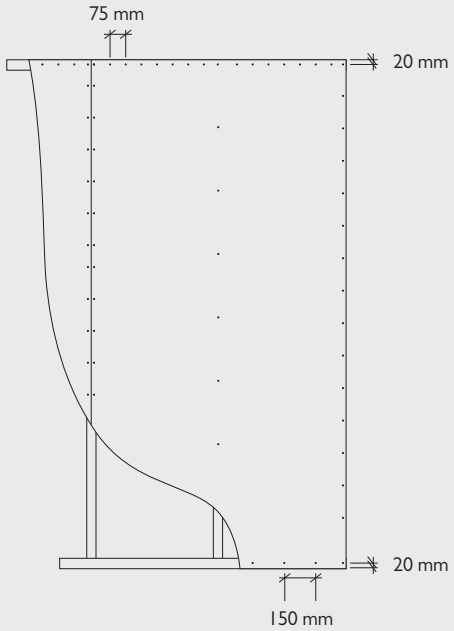
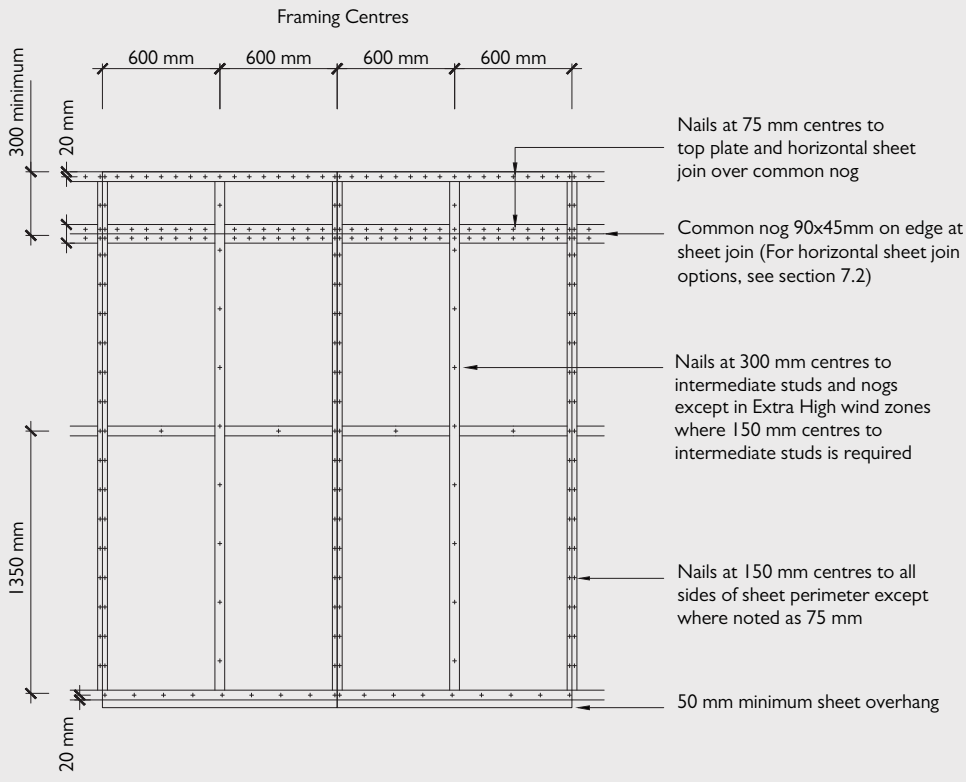


Figure 1B: Top Plate Hold-Downs and Horizontal Sheet Joints



7.13 BRACING LENGTHS

Length of Ecoply® Barrier Bracing Elements (EPB1, EPBG and EP2).

Ecoply® Barrier bracing elements can be used when the overall bracing element length is >400mm.

The length and capacity of an EPB1, EPBG or an EP2 type element is not only determined by the plywood, but also the placement of the GIB HandiBrac® hold-down fixing. The GIB HandiBrac® must be installed to a continuous stud at the perimeter of the bracing element, refer to Figure 1C: Framing/ Handibrac installation, 1D: Bracing Panel Installation, 1E: Bracing Panel Installation – long and 1F: Bracing Panel Installation at Lintel.

Note: If used for Bracing purposes GIB HandiBrac® should not form part of lintel tie down solution.

Bracing Panel and Hold-down Location at Lintels and 90° Wall Junctions such as Garage Door Openings.

Ecoply Barrier bracing panels can be installed up to lintels and 90° wall junctions such as garage door openings where the element length is > 400mm. See Figure 1E: Bracing Panel Installation at Lintel for bracing element length, and correct GIB Handibrac® location.

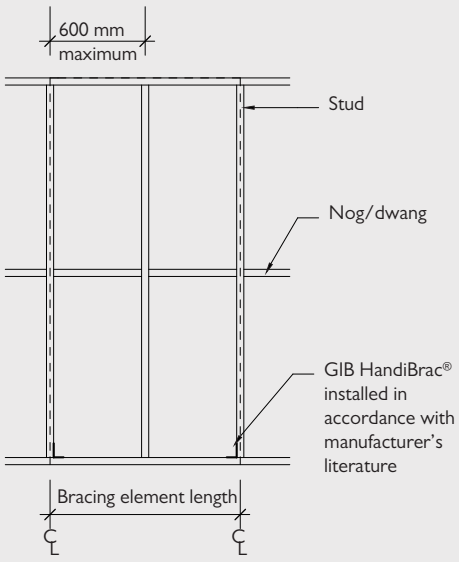
Note: Designers need to be aware of the framing requirements and not try to specify bracing elements based on length only. Framing requirements may mean bracing lengths are not practically achievable as designed and tested and developed due to framing layout.

When lintels share jamb studs with bracing elements, alternate hold-down will be required (the GIB HandiBrac® forming part of the bracing solution must not form part of the lintel hold-down).

Length of EPBS Elements

The length of the EPBS element (requiring standard NZS 3604:2011 bottom plate connections) can be taken as full frame length measure from the outside of the end stud to the opening face as illustrated in Figure 1G: EPBS Bracing panel Installation – Long. The length of the bracing element shall be >400mm.

Figure 1C: Framing/HandiBrac Installation



*Note: Bracing panel not shown for clarity

Figure 1D: Bracing Panel Installation

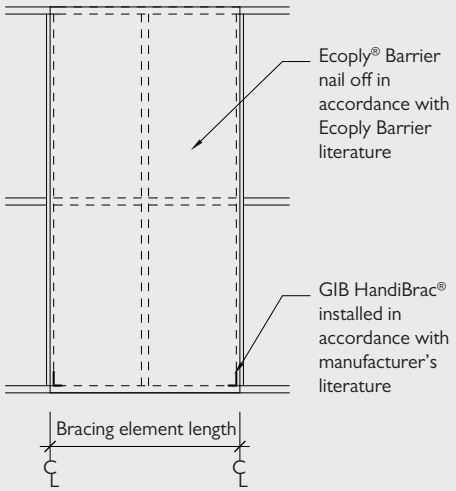


Figure 1E: Bracing Panel Installation - Long

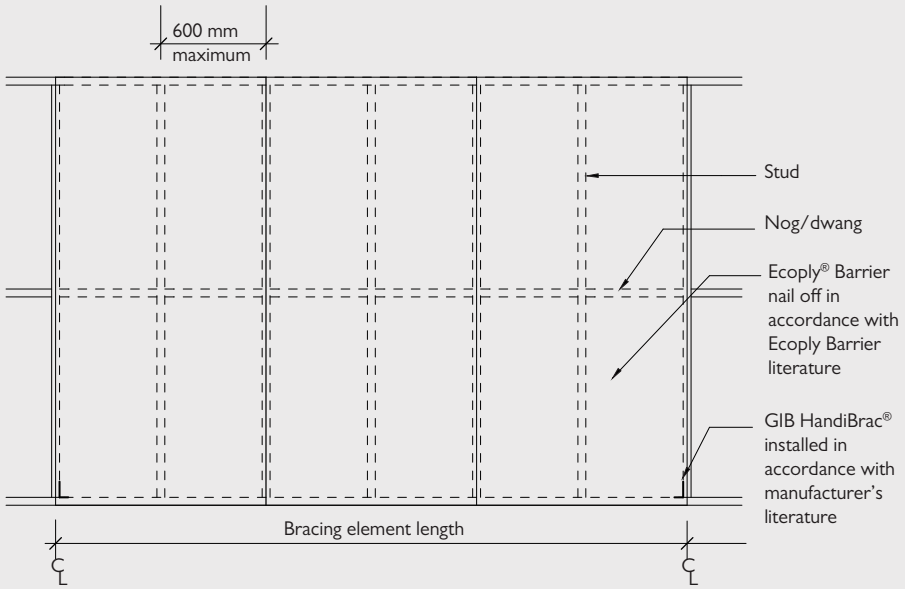


Figure 1F: Bracing Panel Installation at Lintel

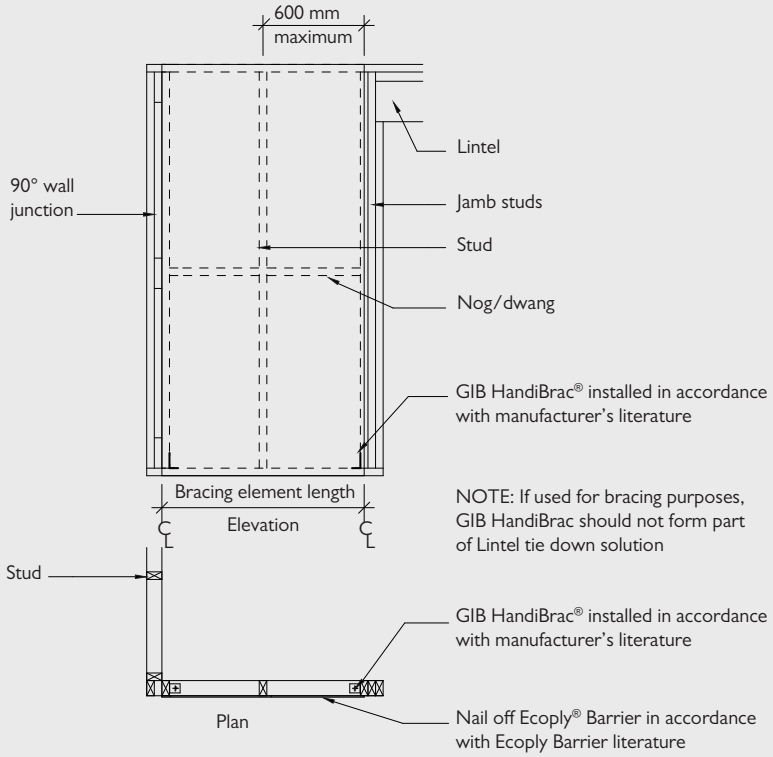
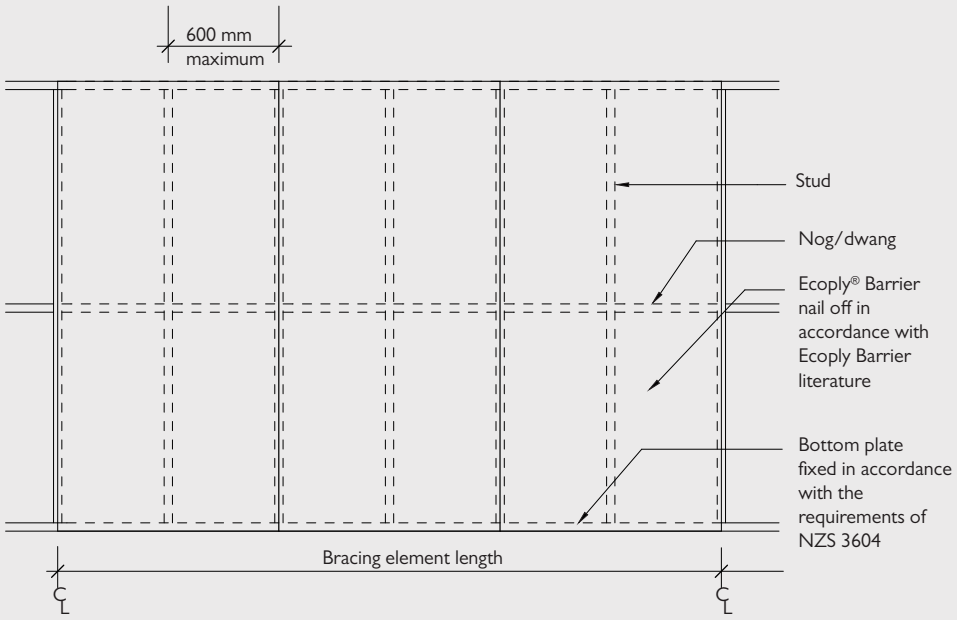
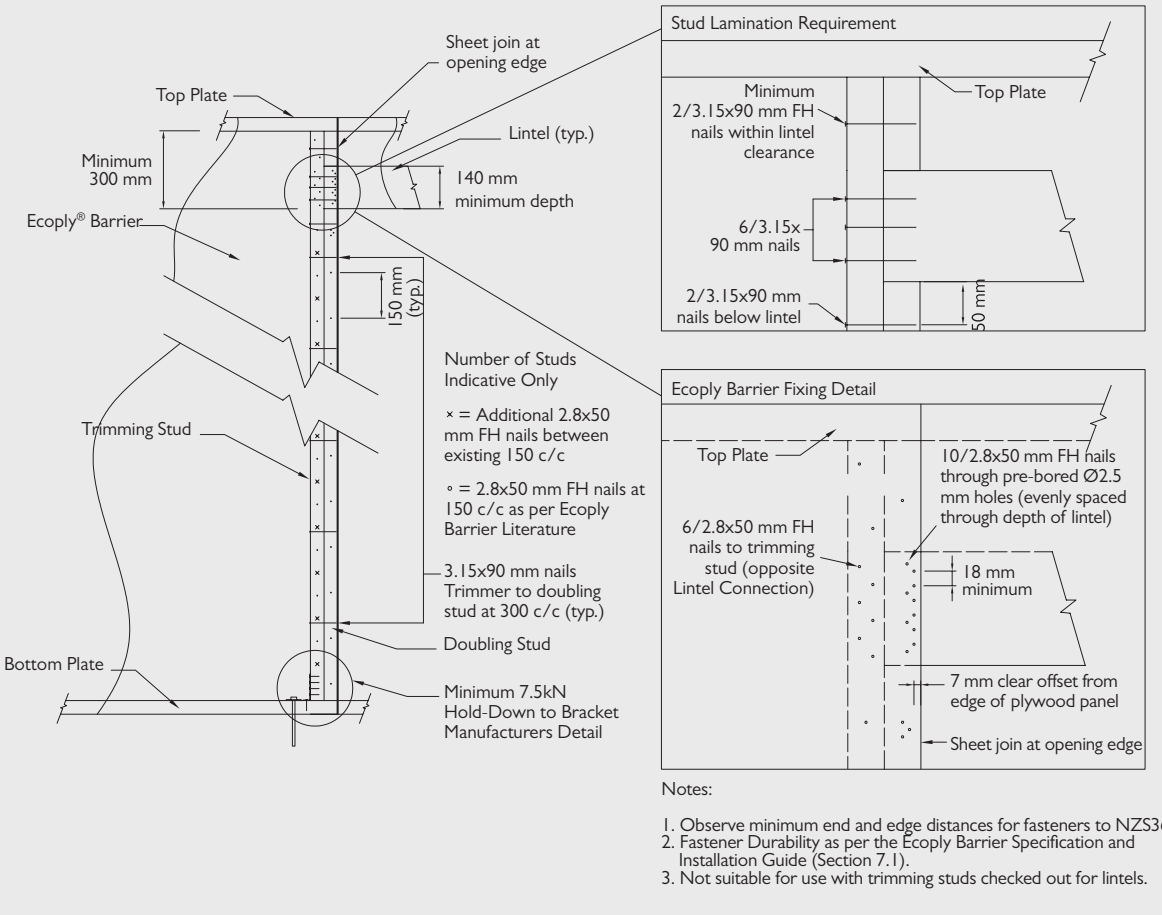


Figure 1G: EPBS Bracing Panel Installation



7.14 LINTEL TIE DOWN CONNECTION

Figure 2: Lintel Connection Detail (For Uplifts Not Exceeding 7.5kN) as Detailed in Clause 8.6.1.8 of NZS 3604



Notes:

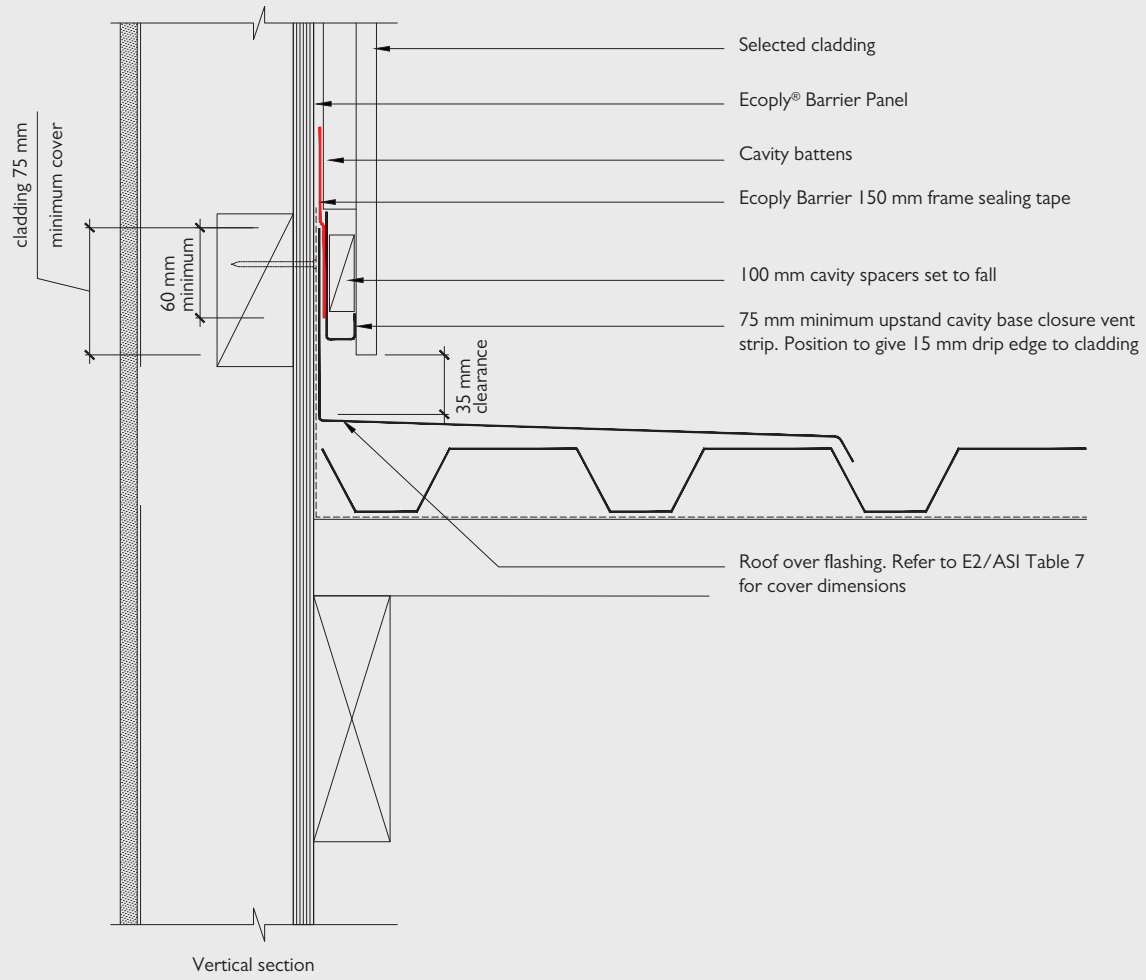
1. Observe minimum end and edge distances for fasteners to NZS3603.
2. Fastener Durability as per the Ecoply Barrier Specification and Installation Guide (Section 7.1).
3. Not suitable for use with trimming studs checked out for lintels.

7.15 INSTALLATION – APRON & SADDLE FLASHINGS

Apron Flashings

Ecoply® Barrier panels must extend past apron Flashing and roofing and have Ecoply Barrier Frame Sealing Tape over an E2/AS1 compliant apron Flashing with minimum 60mm cover as detailed. Refer BAR015 Apron Flashing Junction.

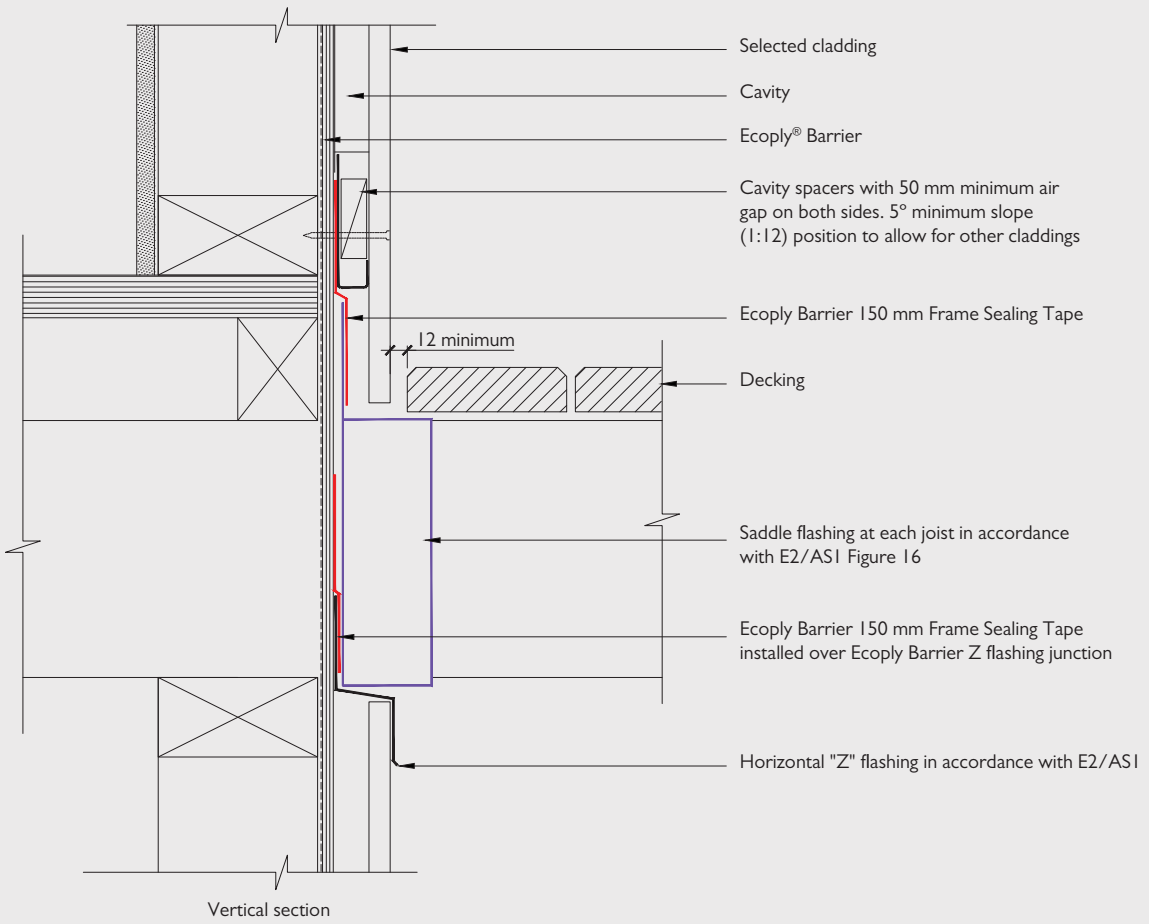
BAR015: Apron Flashing Junction



Saddle Flashings

Apply Ecoply® Barrier Frame Sealing Tape over an E2/AS1 compliant saddle Flashing with minimum 60mm cover as detailed. Where required, Ecoply Barrier Frame Sealing Tape should be applied over the top of horizontal Flashings. Refer BAR016 Ecoply Barrier Saddle Flashing.

BAR016: Ecoply® Barrier Saddle Flashing



8.0 FIRE RATED SYSTEMS

Where compliance with NZBC Clauses C3 – Spread of Fire and Clause C4 – Structural Stability is required CHH Woodproducts recommends the use of GIB® Fire Rated Systems overlaid directly with the Ecoply® Barrier rigid air barrier system.

Refer to the current GIB® Fire Rated System literature for specifications and installation requirements downloadable from www.gib.co.nz.

Where Ecoply Barrier overlays GIB® fire rated panels fastener lengths for the fixing of Ecoply Barrier panels must be increased by the thickness of the GIB® panel to ensure the required fastener pull out loadings are achieved.

9.0 CLADDING SYSTEM INSTALLATION

- Cladding must be installed as soon as possible.
- Claddings must comply and be installed in line with NZBC and cladding supplier specifications.
- Cladding maintenance advice should be sought from the cladding manufacturer.
- Cladding fastener lengths must be increased by a minimum of 7mm to ensure the required fastener pull out loadings are achieved.

10.0 WORKING INSTRUCTIONS

Always use safe working practices when handling and installing Ecoply® Barrier plywood Sheathing. For further information refer to Safety Data Sheets available online from www.chhwoodproducts.co.nz.

Hole Forming - Making Penetrations in Ecoply® Barrier Sheets.

- Mark the centre of the hole on the sheet.
- Pre drill a pilot hole.
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a electric drill.
- For irregular rectangle or circular holes a perforation in the sheet can be made by drilling a series of smaller holes around the perimeter of the hole, then tapping out the waste piece from the plywood sheathing or cut using a jig-saw.

Cutting Sheets - Making Cuts to Ecoply Barrier Sheets.

- Ecoply Barrier can be cut using any circular-saw or hand-saw tool.
- When sawing, clamp a straight edge to the sheet as a guide. Run the saw base along the straight edge to make a precise cut.

11.0 REFERENCED DOCUMENTS

NZBC B1/AS1 Structure

NZBC B2/AS1 Durability

NZBC E2/AS1 External Moisture

AS/NZS 1170.2: 2011 Structural design actions – Wind Actions

NZS 1170.5: 2004 Structural design actions – Earthquake actions – New Zealand

AS/NZS 1604.3: 2012 Specification for preservative treatment – Plywood

AS/NZS 2269: 2012 Plywood Structural Specifications

NZS 3602: 2003 Timber and Wood based products for use in Building

NZS 3603: 1993 Timber Structures Standard

NZS 3604: 2011 Timber Framed Buildings

IBC AC148 Acceptance Criteria for Flexible Flashing Materials

CHH Woodproducts Product Technical Statement – Ecoply Barrier: Rigid Air Barrier

CHH Woodproducts Safety Data Sheet - Ecoply Barrier

12.0 FREQUENTLY ASKED QUESTIONS

Q: Do fastener heads need to be taped over?

A: Fastener heads are not required to be taped over, unless the fastener head completely penetrates the thickness of the face veneer.

Q: Do I need to tape all of the seams between the Ecoply® Barrier plywood panels?

A: Yes. All seams between the panels must be taped with Ecoply® Barrier Sealing Tape (60mm width Grey Colour) to ensure that it functions as a structural rigid air barrier system.

Q: Can Ecoply Barrier Sealing Tape, Sill Tape and Frame Sealing Tape be installed in the rain?

A: Yes. The tapes require pressure for a secure seal, and will require an extra period of time to fully adhere to the surface.

Q: What is permeance, and why is it important?

A: Permeance is a property that defines the ease at which water molecules diffuse through a material, typically measured in "perms." While water resistant barriers are designed to keep liquid water out of the wall system, they are also generally designed to allow moisture vapour to pass through so that the wall system can "breathe" meaning moisture vapour will not accumulate and condense in the wall system.

Q: How long can I leave Ecoply Barrier panels exposed before I install roof and wall coverings?

A: Ecoply Barrier panels can be left exposed for up to 180 days, however it is recommended to install roof and wall coverings as soon as possible.

Q: What is the weight of an Ecoply Barrier panel?

A: 2440mm panel = 11.7kg, 2745mm panel = 13.2kg (guidelines only).

Q: What is the R-value of Ecoply Barrier?

A: The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214. Plywood has a conductivity (K) of 0.13W/mC so a 7mm panel has a thermal resistance R = 0.007/0.13 = 0.05.

Q: How much space should be left for expansion?

A: Allow 2-3mm expansion gap between square edges of Ecoply Barrier Panels. Ecoply Barrier is provided in 1197mm widths to account for this.

Q: Where can I purchase Ecoply Barrier panels and tapes from?

A: Ecoply Barrier is available from all leading building merchants in New Zealand.

Q: Can I use Ecoply Barrier on steel frame?

A: For use on steel framing please use Ecoply Barrier for Steel and the use the Ecoply Barrier for Steel Specification and Installation Guide.

13.0 LIMITATIONS

The information contained in this document is current as at September 2017 and is based on data available to CHH Woodproducts at the time of going to print.

All photographic images are intended to provide a general impression only and should not be relied upon as an accurate example of Ecoply Barrier products installed in accordance with this document or the NZBC compliance documents.

This publication replaces all previous CHH Woodproducts' design information and literature relating to Ecoply Barrier structural plywood products and tapes. CHH Woodproducts reserves the right to change the information contained in this document without prior notice. It is your responsibility to ensure that you have the most up to date information available, including at the time of applying for a building consent. You can call toll free on 0800 326 759 or visit www.chhwoodproducts.co.nz to obtain current information.

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14.0 ECOPLY® BARRIER INSTALLATION CHECKLIST

14.1 RIGID AIR BARRIER CHECKLIST

The below installation areas are considered critical to the successful installation of Ecoply® Barrier when used as a rigid air barrier.

Using this sheet as a checklist during installation will aid in problem free product installation and long term product durability post construction.

Task	Tick when checked
Prior to Specification and Installation	
Read the Ecoply® Barrier Specification and Installation Guide in its entirety	☐
Install	
Position Ecoply Barrier panels with the water resistant powder coat film facing outwards	☐
Sheet edges fully supported by framing	☐
Sheet Cuts	
Cut sheet ends are placed to the top	☐
Fastener Material Type	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones or other corrosive environments – Zone D)	☐
Sheet Fastener Pattern	
Around sheet edge – maximum 150mm centre spacing	☐
At intermediate framing – maximum 300mm centre spacing or 150mm in Extra High wind zone	☐
Expansion Gap Between Sheets (Vertical sheet joints)	
2-3mm gap between vertical edges of sheets	☐
NOTE: Expansion gaps are required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
Ground Clearances	
Ground clearances maintained for claddings in accordance with E2/AS1 and NZS 3604	☐
Sheets overhang the bottom plate by a minimum of 25mm & maximum 40mm over timber and concrete foundations	☐
Vertical Sheet Joints	
Seal all vertical joints including corners with Ecoply Barrier Sealing Tape (60mm x 30m) or Frame Sealing Tape (150mm / 200mm x 30m)	☐
All vertical window and door frames sealed with Ecoply Barrier Frame Sealing Tape	☐
Horizontal Sill Flashing Detail	
Apply Ecoply Barrier Sill Tape to the horizontal sill section of a window or door opening	☐
Make sure the tape extends 100mm up both window / door studs	☐
Horizontal Sheet Joints	
Use Ecoply Barrier PVC horizontal Z Flashing (Product code RDZF7) OR Ecoply Barrier 150mm OR 200mm Frame Sealing Tape.	☐
Service Penetrations	
Waste pipe outlets of maximum 150mm diameter placed at no closer than 150mm to the edge of braced element	☐
Use a flexible sealing tape to seal the service penetration: minimum cover 100mm, 25mm minimum width around the pipe penetration	☐

Refer to the current Ecoply® Barrier Specification and Installation Guide for full installation specifications and suggested details.

ecoply®
Proven. Durable. Strong



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September 2017

JAS-ANZ

PRODUCT CERTIFIED paa ENGINEERED WOOD

NEW ZEALAND MANUFACTURED

Technical Data

IN-LINE FAN KITS - SF Shower Fan Models

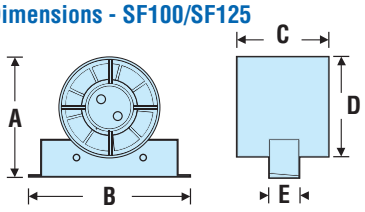
GENERAL INFORMATION

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)

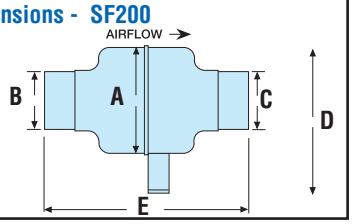
DIMENSION INFORMATION

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	-

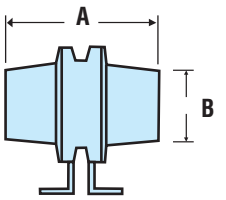
Dimensions - SF100/SF125



Dimensions - SF200



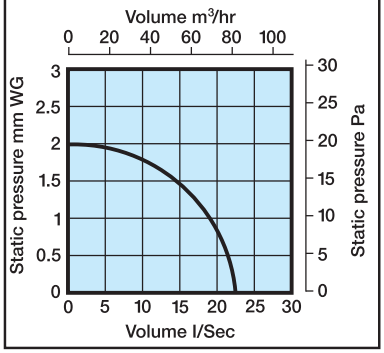
Dimension - SF150



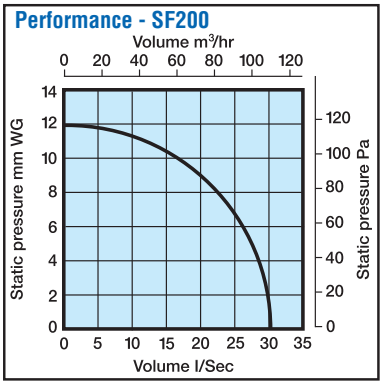
TECHNICAL SPECIFICATION

Models	SF100	SF200	SF125	SF150
Fan	ID100	CFD200	ID125	Hyper
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan Performance	23l/s, 85m³/hr	31l/s, 110m³/hr	36l/s, 130m³/hr	89l/s, 320m³/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

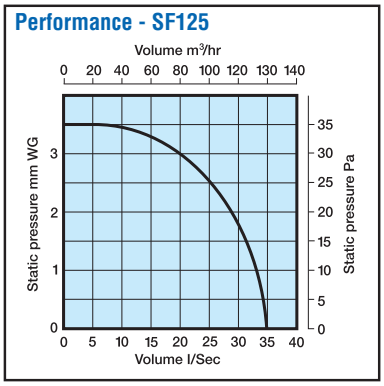
Performance - SF100



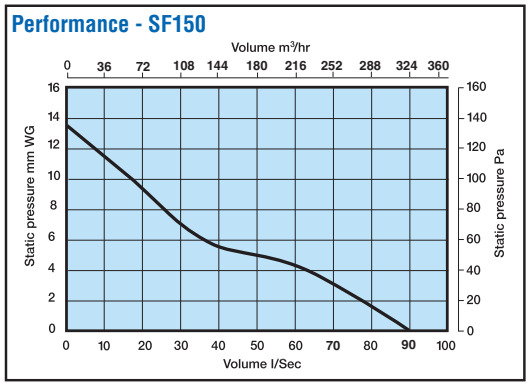
Performance - SF200



Performance - SF125



Performance - SF150

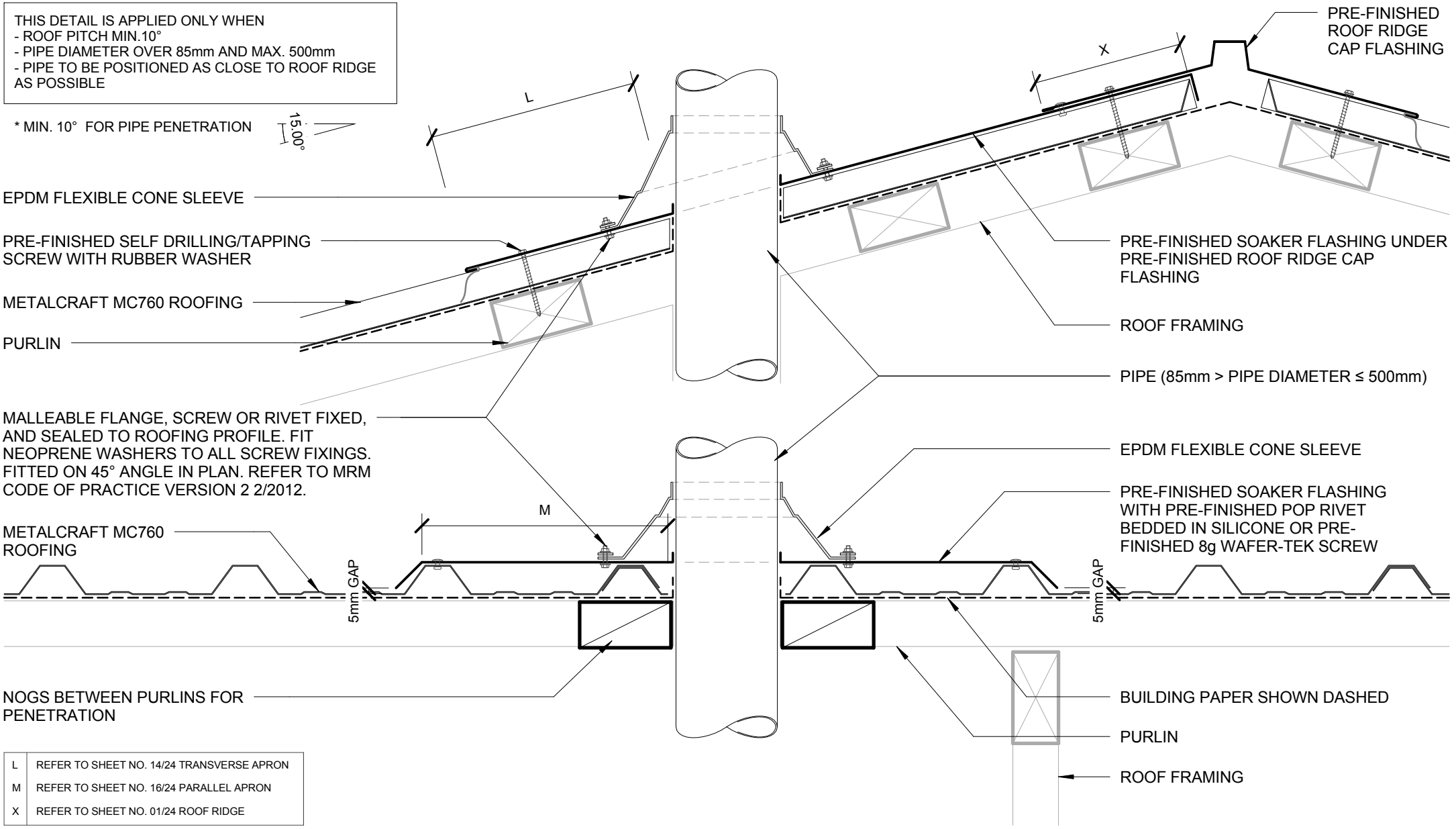


Note: PERFORMANCE - ID Fans maximum fan performance stated, this can vary depending on the length of ducting used.

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THIS DETAIL IS APPLIED ONLY WHEN
- ROOF PITCH MIN.10°
- PIPE DIAMETER OVER 85mm AND MAX. 500mm
- PIPE TO BE POSITIONED AS CLOSE TO ROOF RIDGE AS POSSIBLE

* MIN. 10° FOR PIPE PENETRATION



EPDM FLEXIBLE CONE SLEEVE

PRE-FINISHED SELF DRILLING/TAPPING SCREW WITH RUBBER WASHER

METALCRAFT MC760 ROOFING

PURLIN

MALLEABLE FLANGE, SCREW OR RIVET FIXED, AND SEALED TO ROOFING PROFILE. FIT NEOPRENE WASHERS TO ALL SCREW FIXINGS. FITTED ON 45° ANGLE IN PLAN. REFER TO MRM CODE OF PRACTICE VERSION 2 2/2012.

METALCRAFT MC760 ROOFING

NOGS BETWEEN PURLINS FOR PENETRATION

PRE-FINISHED ROOF RIDGE CAP FLASHING

PRE-FINISHED SOAKER FLASHING UNDER PRE-FINISHED ROOF RIDGE CAP FLASHING

ROOF FRAMING

PIPE (85mm > PIPE DIAMETER ≤ 500mm)

EPDM FLEXIBLE CONE SLEEVE

PRE-FINISHED SOAKER FLASHING WITH PRE-FINISHED POP RIVET BEDDED IN SILICONE OR PRE-FINISHED 8g WAFER-TEK SCREW

BUILDING PAPER SHOWN DASHED

PURLIN

ROOF FRAMING

L	REFER TO SHEET NO. 14/24 TRANSVERSE APRON
M	REFER TO SHEET NO. 16/24 PARALLEL APRON
X	REFER TO SHEET NO. 01/24 ROOF RIDGE

- BUILDING PAPER IS THE COMMON GENERIC NAME FOR PERMEABLE ROOF AND WALL UNDERLAYS. PLEASE REFER TO NZBC E2/AS1 AND MRM CODE OF PRACTICE VERSION 2.2 /2012.

* - PLEASE REFER TO MRM CODE OF PRACTICE VERSION 2.2 /2012 AS MINIMUM PITCH WILL INCREASE DEPENDING ON SHEET LENGTH.

Metalcraft Roofing

DISCLAIMER:
All details are to be used for indicative purposes only and the designer should consult both the MRM code of practice version 2.2 /2012, E2 and all other relevant building codes
Details of the supporting mechanisms are indicative only. Compliance of the supporting mechanisms is the responsibility of the designer. Construction detail can vary for wall cladding. 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.

OVER 85mm DIAMETER PIPE PENETRATION