

Approved Building Consent Documents

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

Inspection booking timeframes

Call received	before 3pm inspection will be done	after 3pm inspection will be done
Monday	Wednesday	Thursday
Tuesday	Thursday	Friday
Wednesday	Friday	Monday
Thursday	Monday	Tuesday
Friday	Tuesday	Wednesday

Building inspections and enquiries phone: 03 347 2839

Please ensure all work for inspection is ready the day before. Incomplete work requiring re-inspection will incur an additional inspection fee.



RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy




R.W. Muir
Registrar-General
of Land

SDC - Approved Building Consent Document - BC240357 - Pg 2 of 402 - 19/03/2024 - warreg

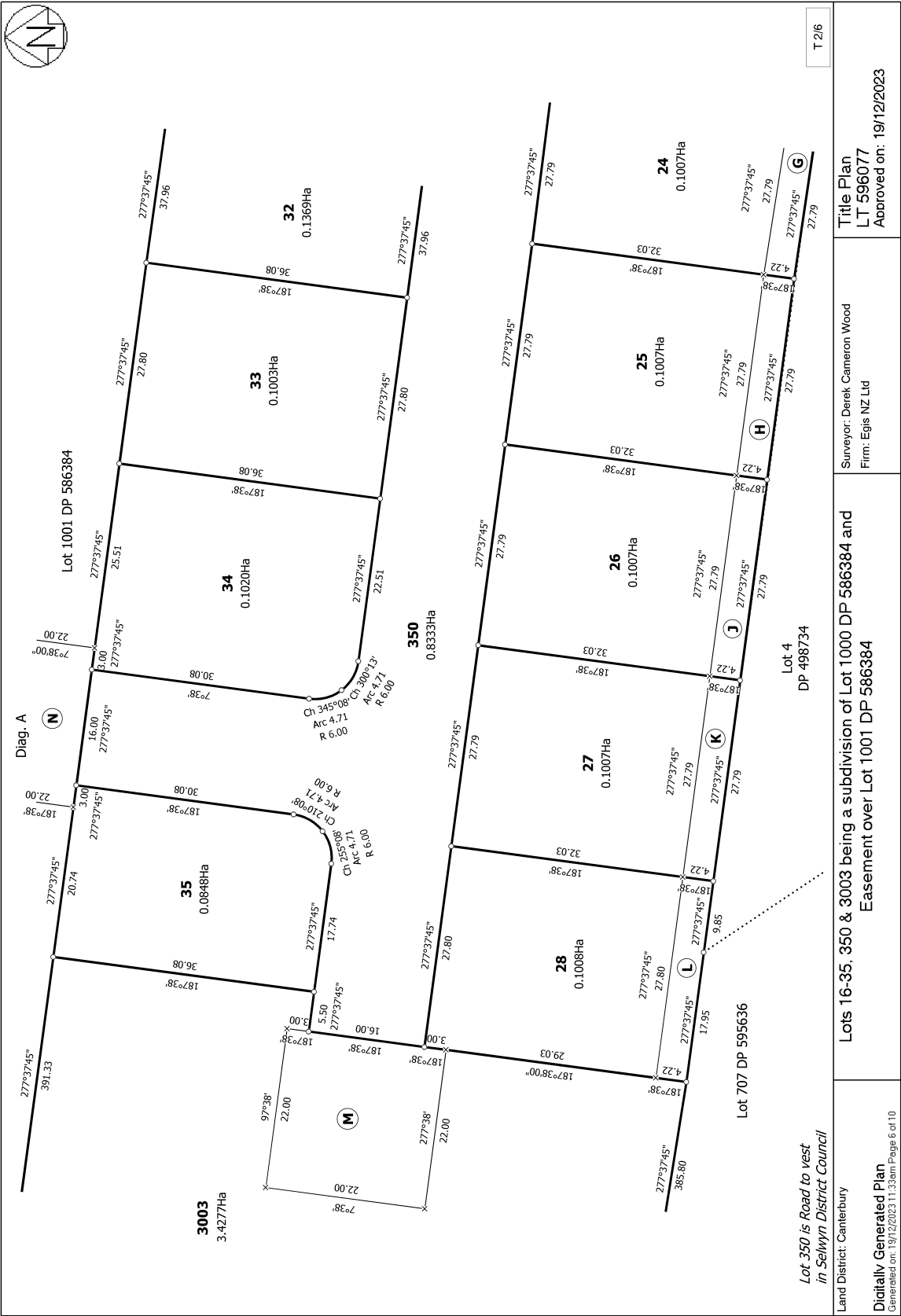
Identifier 1151336
Land Registration District Canterbury
Date Issued 07 December 2023

Prior References
1109262

Estate Fee Simple
Area 1007 square metres more or less
Legal Description Lot 27 Deposited Plan 596077

Registered Owners
Today Homes Limited

Interests
Land Covenant in Covenant Instrument 12670834.3 - 28.2.2023 at 3:42 pm
- 12884414.5 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 7.12.2023 at 3:12 pm
Subject to a right (in gross) to convey water over part marked K on DP 596077 in favour of Selwyn District Council
created by Easement Instrument 12884414.15 - 7.12.2023 at 3:12 pm
The easements created by Easement Instrument 12884414.15 are subject to Section 243 (a) Resource Management Act
1991
Land Covenant in Covenant Instrument 12884414.16 - 7.12.2023 at 3:12 pm (Limited in duration)





IN THE MATTER of the Resource Management
Act 1991

AND

IN THE MATTER of Resource Consents
RC225602, RC235555 &
RC235553 and Deposited Plan
596077

CONSENT NOTICE PURSUANT TO S. 221 RESOURCE MANAGEMENT ACT 1991

To: The District Land Registrar
Canterbury Land Registration District

TAKE NOTICE that the land hereinafter described is subject to conditions in relation to a subdivision

"Prior to the occupation of any dwelling, the realignment of the Greyke Road/West Coast Road (SH73) intersection has begun, with approved temporary management measures operating."

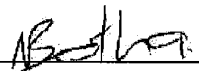
AND THAT you are hereby requested to register the same pursuant to Section 221 of the Resource Management Act 1991.

DESCRIPTION OF LAND

All those pieces of land being Lots 16 to 35 and 3003 DP 596077 as held in Records of Title 1151325 to 1151344, 1151345.

DATED this 29th day of November 2023

SIGNED for and on behalf of Selwyn District Council

 Authorised Officer

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

This form is approved by the Real Estate Institute of New Zealand Incorporated and by Auckland District Law Society Incorporated.

DATE: 16/11/23

VENDOR:

Today Homes LTD

PURCHASER: James Talauega, Mara Melanie Talauega, Dae'Juan Sinapati Ausage-Bailey and/or nomineeThe vendor is registered under the GST Act in respect of the transaction and/or will be so registered at settlement: Yes/No
If "Yes", Schedule 1 must be completed by the parties.Purchase price allocation (PPA) is relevant to the parties for income tax and/or GST purposes: Vendor Yes/No
If both parties answer "Yes", use of the PPA addendum for this agreement is recommended. Purchaser/Purchaser's Nominee Yes/No**PROPERTY**

Address: Lot 27 Kersey Park, Darfield, Canterbury

Estate: FREEHOLD LEASEHOLD STRATUM IN FREEHOLD
STRATUM IN LEASEHOLD CROSS-LEASE (FREEHOLD) CROSS-LEASE (LEASEHOLD)

If none of the above are deleted, the estate being sold is the first option of freehold.

Legal Description:

Area (more or less): 1000m²

Lot: 27

DP:

Record of Title (unique identifier): 1109262

Proposed Lot 27 being an area of 1000m² (more or less) as marked on the attached plan, being a subdivision of LOT 1000 DP 586384, CT 1109262**PAYMENT OF PURCHASE PRICE** Purchase price: \$810,000.00

Eight hundred ten thousand dollars only

Due GST (if any) OR Inclusive of GST (if any)
If neither is deleted, the purchase price includes GST (if any).

GST date (refer clause 13.0):

M Talauega

22

Deposit (refer clause 2.0): 10 % payable upon clause 21 being satisfied, deposit to be held by vendors solicitor as stakeholder

Balance of purchase price to be paid or satisfied as follows:

(1) By payment in cleared funds on the settlement date which is:

OR

(2) In the manner described in the Further Terms of Sale.

Interest rate for late settlement: 10 14 % p.a.

CONDITIONS (refer clause 9.0)

Finance required (clause 9.1):

Yes/No

OIA consent required (clause 9.6):

Yes/No

Finance date:

OIA date (clause 9.8):

LIM required (clause 9.3):

Yes/No

Land Act consent required (clause 9.7):

Yes/No

Building report required (clause 9.4):

Yes/No

Land Act date (clause 9.8):

Toxicology report required (clause 9.5):

Yes/No

TENANCIES

Yes/No

Particulars of any tenancies are set out in Schedule 3 or another schedule attached to this agreement by the parties.

It is agreed that the vendor sells and the purchaser purchases the property, and any chattels listed, on the terms and conditions of this agreement.

Release date: 19 July 2022

© AUCKLAND DISTRICT LAW SOCIETY INC. & REAL ESTATE INSTITUTE OF NEW ZEALAND INC. All Rights Reserved. See full terms of copyright on the back page.

M Talauega

J Talauega

WARNING AND DISCLAIMER

- This agreement is a standard form document. It is therefore likely that amendments and additions may need to be made in order to suit the circumstances of each of the vendor and the purchaser, and to suit the particular property involved. It is also important that you are certain that any amendments made correctly reflect your understanding of what has been agreed. **You should always get legal advice before you sign the agreement and throughout the buying and selling process.**
- ADLS and REINZ accept no liability whatsoever in respect of this document and any agreement which may arise from it.
- The vendor should check the correctness of all warranties made under clause 7, clause 8, and elsewhere in this agreement.
- In the case of a unit title, before the purchaser enters into the agreement, the vendor must provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act.
- The transaction may have tax implications for the parties and it is recommended that both parties seek their own professional advice regarding the tax implications of the transaction before signing, including:
 - the GST treatment of the transaction, which depends upon the GST information supplied by the parties and could change before settlement if that information changes; and
 - the income tax treatment of the transaction, including any income tax implications of purchase price allocation.

PROFESSIONAL ADVICE SHOULD BE SOUGHT REGARDING THE EFFECT AND CONSEQUENCES OF ANY AGREEMENT ENTERED INTO BETWEEN THE PARTIES.

Acknowledgements

Where this agreement relates to the sale of a residential property and this agreement was provided to the parties by a real estate agent, or by a licensee on behalf of the agent, the parties acknowledge that they have been given the guide about the sale of residential property approved by the Real Estate Authority and a copy of the agency's in-house complaints and dispute resolution process.

The person or persons signing this agreement acknowledge that either:

- they are signing in a personal capacity as the 'vendor' or 'purchaser' named on the front page, or
- they have authority to bind the party named as 'vendor' or 'purchaser' on the front page.

WARNING *(This warning does not form part of this agreement)*

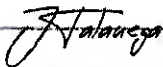
Before signing, each party should read this entire contract and should obtain all relevant professional advice.

This is a binding contract. Once signed, you will be bound by the terms of it and there may be no, or only limited, rights to terminate it.

Signature of Purchaser(s):


JAMES TALAUEGA

Name:



JAMES TALAUEGA

Director / Trustee / Authorised Signatory / Agent / Attorney*

Delete the options that do not apply

Signature of Vendor(s):


Name:

SIMON SANOCKI

Director / Trustee / Authorised Signatory / Agent / Attorney*

Delete the options that do not apply

Name:

Director / Trustee / Authorised Signatory / Agent / Attorney*

Delete the options that do not apply

Name:

Director / Trustee / Authorised Signatory / Agent / Attorney*

Delete the options that do not apply

*If this agreement is signed under:

- a Power of Attorney – please attach a Certificate of non-revocation (available from ADLS: 4098WFP or REINZ); or
- an Enduring Power of Attorney – please attach a Certificate of non-revocation and non-suspension of the enduring power of attorney (available from ADLS: 4997WFP or REINZ).

Also insert the following wording for the Attorney's Signature above:

Signed for [full name of the donor] by his or her Attorney [attorney's signature].

SELWYN DISTRICT COUNCIL CONSENT APPLICATION FOR

**Today Homes Limited
Lot 27 Kersey Park, Darfield**

SUPPORTING DOCUMENTS

- PROFESSIONAL PARTNERSHIP CONSENT CHECKLIST (PPP)
- STATEMENT OF THERMAL PERFORMANCE FOR WINDOWS & DOORS
- FLOOD ASSESSMENT CERTIFICATE
- H1 CALCULATIONS
- ELIMENT INSULATION
- PROPOSED INSPECTION REGIME
- SOIL REPORT
- ALLIED SUPERSLAB FOUNDATIONS
- TRUSS DESIGN
- MASONS WALL WRAP
- MASONS WINDOW FLASHING TAPE
- MOISTOP 250 CONCRETE UNDERLAY
- SMOKE DETECTOR WITH HUSH DETAILS
- GUTTER DETAILS
- PAINT SPECIFICATION FOR WET AREAS
- ROOFING UNDERLAY DETAILS
- RANGEHOOD TO KITCHEN SPECIFICATION
- DOWNLIGHT DETAIL
- BATHROOM AND ENSUITE VENT DETAILS
- GIB EZIBRACE SYSTEM
- MAPESIL AC SPECIFICATIONS
- DYNAFLASH FLASHINGS SPECIFICATIONS
- GIB WET AREAS SYSTEMS MANUAL
- E3 REQUIREMENTS
- ROOFING SPECIFICATIONS
- TRUBOLT STUD ANCHORS

PROFESSIONAL PARTNERSHIP CONSENT CHECKLIST (PPP)

SDC - Approved Building Consent Document - BC240357 - Pg 8 of 402 - 19/03/2024 - warreg

Professional partnership consent checklist

(to be completed by the designer)

Note: SDC reserves the right to accept or deny an application made under the professional partnership programme on review of the application.

Site details

Address of site	
Address/legal description	Kersey Park Darfield Lot 27 DP 596077

Application criteria

Click each relevant box to verify that you've met the criteria			
Build criteria	Yes	No	n/a
Is a new build of R2 complexity ('or less') * 'or less' means R1 complexity buildings – eg - unlined garages with no services, - rural pole/portal sheds with no services, and - solid fuel burners	New build (R2 complexity) ☒	☐	
A single detached dwelling (used only as a single household unit)	☒	☐	☐
Located on fully serviced site within subdivision (ie is on unrestricted mains water supply, and gravity based sewerage system)	☒	☐	☐
Fully meets all district plan requirements, with no resource consent approvals needed from the territorial authority	☒	☐	
Does not need any approvals from the regional authority	☒	☐	
Application criteria	Yes	No	n/a
Application is for a BC only	☒	☐	
"PPP" has been added in the description of application to allow easy identification of the application to fast track eg PPP – New detached dwelling with 3 bedrooms and attached garage	☒	☐	

Application criteria	Yes	No	n/a
Application is complete and project specific	☒	☐	
Fully completed LBP Design Memorandum specific to the project provided	☒	☐	
Documents submitted are complete and provided in the correct order and locations in our online consenting system	☒	☐	
Any fire appliances fully comply with Environmental Protection Agency (EPA) National Emissions Standards	☒	☐	☐
If no to any of the above – attach email confirming that the exception has been confirmed by us before submitting your application	☐	☐	☒

Confirmation

Licensed building practitioner signoff			
I confirm that this application is: • within the scope of the professional partnership programme, • submitted with all relevant information included, and • meets all the required criteria.			
Full name	Shaun Halpine	Business name	Today homes Ltd
Phone	03 341 6460	Licence/ registration number	BP111154
Email	shaun@todayhomes.co.nz		

Next step – save this form and **submit with your building consent application.**

STATEMENT OF THERMAL PERFORMANCE FOR WINDOWS & DOORS

07/12/2023

To our Valued Customers,

The second stage of the new H1 regulations is now in place and was introduced on the 1st of May 2023.

For us in Zone 5 of the country, in order to comply with the new insulation levels our windows and doors need to meet an R-Value of R0.50.

Our previous solution for the first stage of the H1 changes was to use a thermally improved aluminium spacer in the double-glazed unit along with Argon Gas and a high performance Low E Glass which reached an R-Value level of R0.37.

In order to increase again, we are now supplying Thermally Broken Aluminium Frame joinery on top of the glazing increase mentioned above. This total solution reaches the required R-Value of R0.50.

This new solution will be rolled out as standard to all jobs that have a council consent stamp dated from the 1st of May 2023 onwards.

We appreciate that visibly it is difficult to identify these specifications of an improved window on site, so I would like to use this notification to clarify that it will indeed be provided as declared above.

Should further clarity on this be required we are able to arrange a contractor to test glass once installed to show its individual properties, however this will of course incur a cost which will need to be passed where it has been requested.

If you have any questions on this, please don't hesitate to contact us.

Thank you and regards,

Matt McLelland
General Manager
Hagley Windows and Doors



Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: **LOT 27**

Suburb: **KERSEY PARK**

Town/City **DARFIELD**

Postcode:

THE OWNER

Name(s): **TODAY HOMES LTD**

Mailing address: **251 BLENHEIM ROAD**

Suburb: **RICCARTON**

PO Box/Private Bag:

Town/City: **CHRISTCHURCH**

Postcode:

Phone number: **03 341 64 60**

Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (✓)

☐	sole designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design 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 Shaun Halpine 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 specification
Tick (✓) if included Cross (X) if excluded	<i>[If appropriate, provide details of the restricted building work]</i>	<i>[Specify whether you carried out this design work or supervised someone else carrying out this design work]</i>	<i>[If appropriate, specify references]</i>

Primary structure

All RBW Design work relating to B1	()		() Carried out () Supervised	
Foundations and subfloor framing	(√)	Allied code mark Designed floor and Foundation.	(√) Carried out () Supervised	See plans and Allied Specification Details and Soil Report
Walls	(√)	Timber frame to manufacturers requirements, NZBC	() Carried out (√) Supervised	See plans, truss cert and manufacturers documentation
Roof	(√)	Timber trusses to Manufacturers requirements, NZBC	() Carried out (√) Supervised	See plans and truss cert and manufacturers documentation
Columns and beams	(√)	As per NZBC and NZS 3604 and truss design	() Carried out (√) Supervised	As per NZBC and NZS 3604 and truss design
Braising	(√)	As per NZS 3604 and NZBC	(√) Carried out () Supervised	See plans, and manufacturers documentation
Other	()		() Carried out () Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	()		() Carried out () Supervised	
Damp proofing	(√)	DPC, vapour barrier flashings & building wraps to manufacturers requirements, NZBC	(√) Carried out () Supervised	See plans and manufacturers documentation
Roof cladding or roof cladding system	(√)	Roof cladding and flashings to manufacturers requirements, NZBC	(√) Carried out () Supervised	See plans and manufacturers documentation
Ventilation system (for example, subfloor or cavity)	(√)	Vented cavity space behind cladding to manufacturers requirements, NZBC	(√) Carried out () Supervised	See plans and manufacturers documentation
Wall cladding or wall cladding system	(√)	Exterior cladding system to manufacturers requirements, NZBC	(√) Carried out () Supervised	See plans and manufacturers documentation
Waterproofing	(√)	DPC, vapor barrier flashings & building wraps to manufacturers requirements, NZBC	(√) Carried out () Supervised	See plans and manufacturers documentation
Other	()		() 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]

Note: continue on another page if necessary.

SDC - Approved Building Consent Document - BC240357 - Pg 15 of 402 - 19/03/2024

ISSUED BY

Name: Shaun Halpine	LBP or Registration number: BP111154
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: 251 Blenheim Road	
Suburb: Riccarton	Town/City: Christchurch
PO Box/Private Bag: PO Box 8043	Postcode:
Phone number: 03 341 6460	Mobile:
After Hours:	Fax: 03 341 6462
Email address: shaun@todayhomes.co.nz	Website: www.todayhomes.co.nz

DECLARATION

I **Shaun Halpine** *[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
- ☐ NA Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature:

S. Halpine

Date: 13-03-2024

FLOOD ASSESSMENT CERTIFICATE

SDC - Approved Building Consent Document - BC240357 - Pg 17 of 402 - 19/03/2024 - warreg

Flood Assessment Certificate

FC230242

Issued pursuant to NH-SCHED1 of the Partially Operative Selwyn District Plan.



Property Address:	Kersey Park, Stage 3 only, Darfield
Legal Description:	Lots 16-35 DP 596077
Date of Issue:	05/12/2023
This certificate is valid until:	05/12/2025

The sites are not located on land within a high hazard area.

The sites are likely to be subject to inundation in a 200-year Average Recurrence Interval (ARI) flood event.

Minimum finished floor level shall be the **highest** of either:

Lots 16-35 only:

New Zealand Building Code Acceptable Solutions;

OR

at least 225mm above the ground level immediately adjacent to the building platform.

Disclaimers:

Whether the site is likely to be subject to inundation in a 200-year ARI flood event, and the minimum finished floor level have been determined with reference to:

- (a) The most up to date models and maps held by Selwyn District Council or Canterbury Regional Council;
- (b) Any relevant field information; and
- (c) Any site specific flood assessment prepared by a suitably qualified and experienced person, including a site specific Flood Hazard Assessment prepared by Canterbury Regional Council.

This certificate is based on the best information available to Selwyn District Council at the time the certificate was issued. This information is subject to change and may be updated at any time, including during the valid period of this certificate. Selwyn District Council accepts no liability for changes in this information.

This certificate relies on flood modelling. Flood modelling is a tool that predicts what might happen in a flood event of a given magnitude. A flood model uses hypothetical scenarios and makes assumptions about how a flood event might unfold however there are many more variables that can influence how a site is affected in an actual flood event. The minimum finished floor level does not infer that no damage will occur to a structure built above the minimum finished floor level in a flood event.

The Building Act 2004 also manages flood risk. The minimum floor level certified under the Partially Operative District Plan may be different to the floor level required by the Building Act 2004, which must be met in order to obtain a building consent.

5. Any activity or construction carried out on a site where a Flood Assessment Certificate is issued is carried out at your own risk, and Council recommend that you carefully consider the impact of any flooding risk associated with this site.

Advice notes:

- a) For a new residential unit or principal building or the alteration of, or addition to any residential unit or principal building to be a permitted activity under the Selwyn District Plan as a whole, all other relevant rules must be complied with.
- b) If the certified level is for a particular location on the site, the certified level is the minimum floor level for the proposed building location shown on the attached plan. If you wish to build elsewhere on the site the minimum floor level may be different, and you will need to request another certificate for the new location.

For the purposes of this certificate, ground level means:

- a. The actual finished surface level of the ground after the most recent subdivision that created at least one additional allotment was completed (when the record of title is created);
- b. If the ground level cannot be identified under paragraph (a), the existing surface level of the ground;
- c. If, in any case under paragraph (a) or (b), a retaining wall or retaining structure is located on the boundary, the level of the exterior surface of the retaining wall or retaining structure where it intersects the boundary.

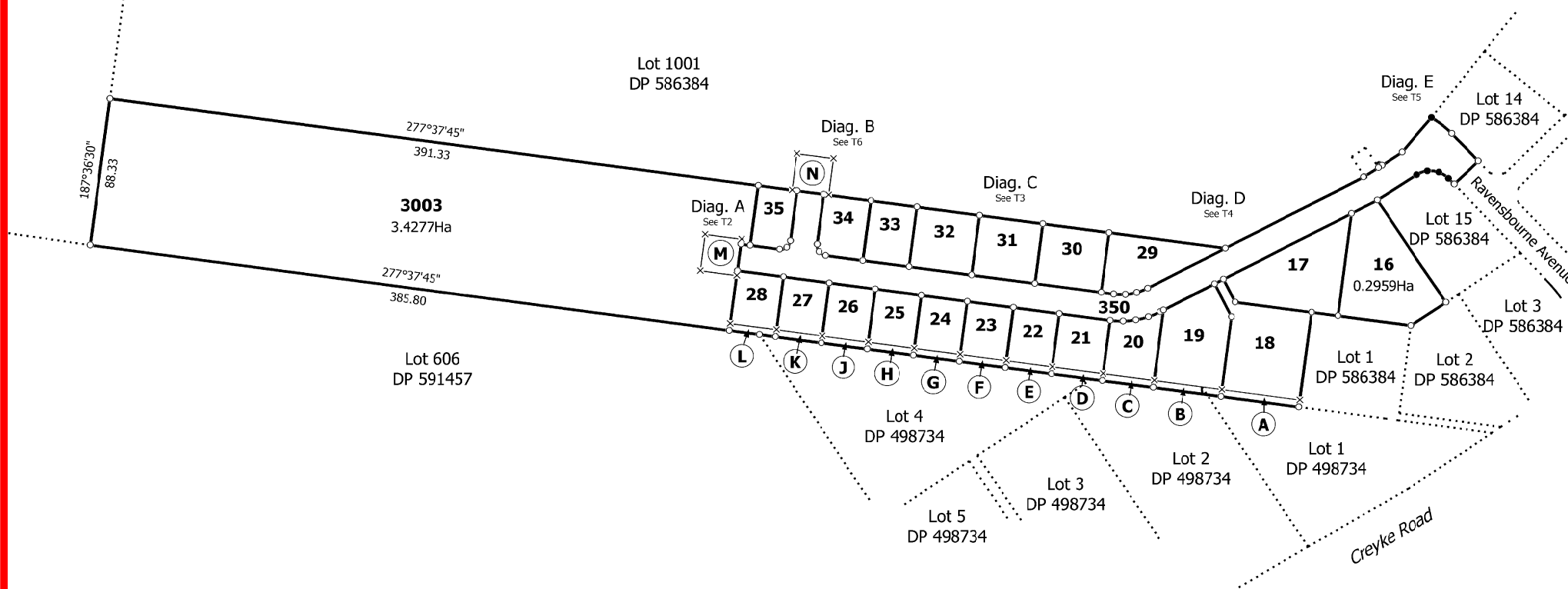
- d) You must reference this certificate when applying for a building consent or the building consent will not be accepted.

Signed for and on behalf of the Selwyn District Council:



Emma Larsen

Head of Resource Consents

Part Section 19
urfield VILL SETT

Lot 350 is to be vest as Road in the Selwyn District Council

Flood Assessment Certificate
FC230242
5/12/2023 - yasmine.binnie

T 1/6

Land District: Canterbury

Lots 16-35, 350 & 3003 being a subdivision of Lot 1000 DP 586384 and
Easement over Lot 1001 DP 58638464

Surveyor: Derek Cameron Wood
Firm: Egis NZ Ltd

Title Plan
LT 596077

Digitally Generated Plan

Generated on: 05/12/2023 11:25am Page 4 of 9

PROPOSED INSPECTION REGIME FOR PROJECT

- PREPOUR
- FLOOR SLAB
- POST WRAP / CAVITY
- PRELINE
- DRAINAGE
- WASTEPIPES
- FRAMING / PRE WRAP
- HALF HIGH BRICK
- FINAL

SOIL REPORT

16 January 2024

Today Homes Ltd
brendon@todayhomes.co.nz

HFC Job No. 23-308

RE: Shallow Soil Investigation – Lot 27 Kersey Park, Darfield

1.0 Introduction

HFC Civil & Structural (South) Ltd was requested by Today Homes Ltd to undertake a shallow soil investigation at the above address. We understand the client proposes to build a single storey residential dwelling constructed in accordance with NZS3604:2011 on the subject site.

The scope of our investigation consisted of:

- A desktop study of available geotechnical and geological data.
- Completion of four hand auger boreholes with Scala Penetrometer (SPT) testing to a target depth of 3.0m to evaluate the subsurface material types and strength characteristics.
- Preparation of report outlining finding on subsurface soil profile, bearing capacity & suitable foundation options.

2.0 Site Description

The site is located within Kersey Park subdivision in Darfield being Lot 27 having an approximate area of 1000 square meters. The site is generally flat & currently covered with grass vegetation.

The geology of the site is shown on the Institute of Geological and Nuclear Sciences 1:250 000 scale geological map 16 – Geology of the Christchurch Area (Forsyth, Barrell and Jongens, 2008) as Q2a – brownish-grey river alluvium of at least 11,500 years of age.

3.0 Technical Category

The site is currently zoned as being 'N/A - Rural & Unmapped' under the MBIE Technical Land Categories. LandTech Consulting Limited has undertaken an area wide geotechnical assessment and the geotechnical assessment report (Geotechnical Investigation Report for Proposed Land Use Change – Corner of Creyke & West Coast Roads (Section 1 SO 1227), Darfield – dated 22nd December 2017 - Ref. LTCL17312) concludes that the proposed subdivision is expected to meet the performance criteria of MBIE technical category 1 land classification, meaning future land damage from liquefaction is unlikely.

4.0 Field Investigation

Our onsite investigation was completed on the 20th of December 2023 and consisted of four hand auger boreholes with Scala Penetrometer (SPT) testing.

Hand auger samples, hand dug holes and scala penetrometer tests from the site investigation revealed 0.3m to 0.4m of gravelly Topsoil over an alluvial Gravel layer at 0.3m to 0.4m depth over the four test locations. These results confirm the published information. Borehole locations are presented in the appended site plan as well as complete bore logs.

The water table was not encountered during the hand auger investigation.

5.0 Soil Profile

The subsurface soil profiles described below are based on the conditions encountered within the hand auger holes.

Table 1: Summary of the soil profile

Depth (m)	Material Type	Density/ Plasticity
0 – 0.4	TOPSOIL with Gravel	
0.4 – 0.6	Silty GRAVEL	Loosely Packed/Non-Plastic

6.0 Bearing Capacity

Scala Penetrometer tests were undertaken to determine the subsurface strength profile and confirm the site meets the requirements of 'good ground' as defined in NZS3604:2011. NZS3604:2011 requires the underside of foundations to have an ultimate bearing pressure of not less than 300kPa.

The soil below the underside of the foundations shall be assumed to have an ultimate bearing pressure of not less than 300kPa when:

- Scala penetrometer test conducted in accordance with 3.3.2(a) where the number of blows per 100mm depth of penetration below the underside of the proposed footing at each test site exceeds:
 - 5 down to a depth equal to twice the width of the widest footing below the underside of the proposed footing;
 - 3 at greater depths

In addition to the above, the definition of 'good ground' within NZS3604 excludes organic topsoil, peat, soft or very soft clay, and uncertified fill below the depth of footing at any test location. Sites subject to liquefaction and/or lateral spread are also excluded from complying with the definition of 'good ground'.

The Ministry of Business, Innovation, and Employment (MBIE) guidance document 'Repairing and rebuilding houses affected by the Canterbury earthquakes' section 3.4.1 Shallow subsurface investigation for TC1 and TC2 confirms 200kPa geotechnical ultimate bearing capacity is achieved with a minimum of 2 blows per 100mm.

Table 2: Depths to achieve adequate Ultimate bearing capacity in accordance with NZS3604:2011 & MBIE Guidelines

SPT No.	Geotechnical UBC > 300kPa (m bgl)	Geotechnical UBC >200kPa (m bgl)
1	0.3	0.3
2	0.4	0.4
3	0.3	0.3
4	0.3	0.3



7.0 Discussions

As discussed in section 6.0 the definition of 'good ground' within NZS3604:2011 excludes sites subject to liquefaction and/ or lateral spread therefore the site does meet the requirements of 'good ground'.

The Ministry of Business, Innovation, and Employment (MBIE) guidance document 'Repairing and rebuilding houses affected by the Canterbury earthquake's dated December 2012 provides guidance on foundation options suitable for TC1 sites.

8.0 Recommendations

Option 1:

A non-specific foundation design complying with the NZS3604:2011 can be used for the site, at a depth of 400mm below EGL subject to the correct use of the bearing areas and embedment as specified by NZS3604:2011.

As these foundations are non-specific, it is envisaged that the local council will perform any inspections of the foundations. A council approved ductile mesh must be used for slab reinforcement.

Option 2:

Alternatively, a TC1 waffle slab could be designed for the ultimate bearing capacity of 300kPa at a depth of 300mm below EGL. Localized topsoil identified around borehole location no.2 may require to be excavated up to 400mm below existing ground level. HFC should be engaged to carry out a cut platform inspection prior to placing of hardfill.

Site preparation shall ensure that all grass, vegetation & organic topsoil / uncertified fill material is removed prior to the placement of foundations or gravel fill in accordance with MBIE document section 5.3 & NZS3604:2011 clause 7.5.9.2. Compacted hard fill (AP65 or AP40) may be required to backfill up to the founding level, compacted in 150mm layers.

We trust the above provides sufficient information, however, we are happy to provide further advice if necessary. Please do not hesitate to contact the office or undersigned.

Yours sincerely

per: HFC Civil and Structural (south) Ltd

Report prepared by



Sithum Jayatilleke BEngTech, MEngNZ
Graduate Engineer

Reviewed by



Tom Watanabe BE, ME, CMEngNZ, CPEng
Associate – Technical Team Leader

Revision	Date issued	By	Issued to
0	16 January 2024	Tom Watanabe	Today Homes Ltd



References:

1. Ministry of Business, Innovation & Employment (MBIE), December 2012: Guidance Document 'Repairing and rebuilding houses affected by the Canterbury Earthquakes'.
2. New Zealand Standard for Timber-framed buildings NZS3604:2011
3. Canterbury earthquake Recovery Authority (CERA) website www.cera.govt.nz
4. Christchurch City Council City Plan Flood Management Area (FMA) GIS website <http://maps.cera.govt.nz/advanced-viewer/?Viewer=Ccc-Floor-Levels>
5. Christchurch City Council Coastal Hazard GIS website <http://www.ccc.govt.nz/environment/land/coast/coastal-hazards/is-my-property-affected/coastal-hazard-zone-property-search/>
6. Environment Canterbury Regional Council technical report No. R12/83 'Review of liquefaction hazard information in eastern Canterbury, including Christchurch City and parts of Selwyn, Waimakariri and Hurunui Districts'
7. NZS 4402 Supplement 1:1988 – Methods of testing soils for civil engineering purposes.

Limitations:

We have prepared this report in accordance with the brief as provided. The report has been prepared for our client & relevant Territorial Authorities use only in relation to the specified project brief described within this report. HFC will not accept responsibility or liability for the use of any part of the report for any other purpose by any other person or entity.

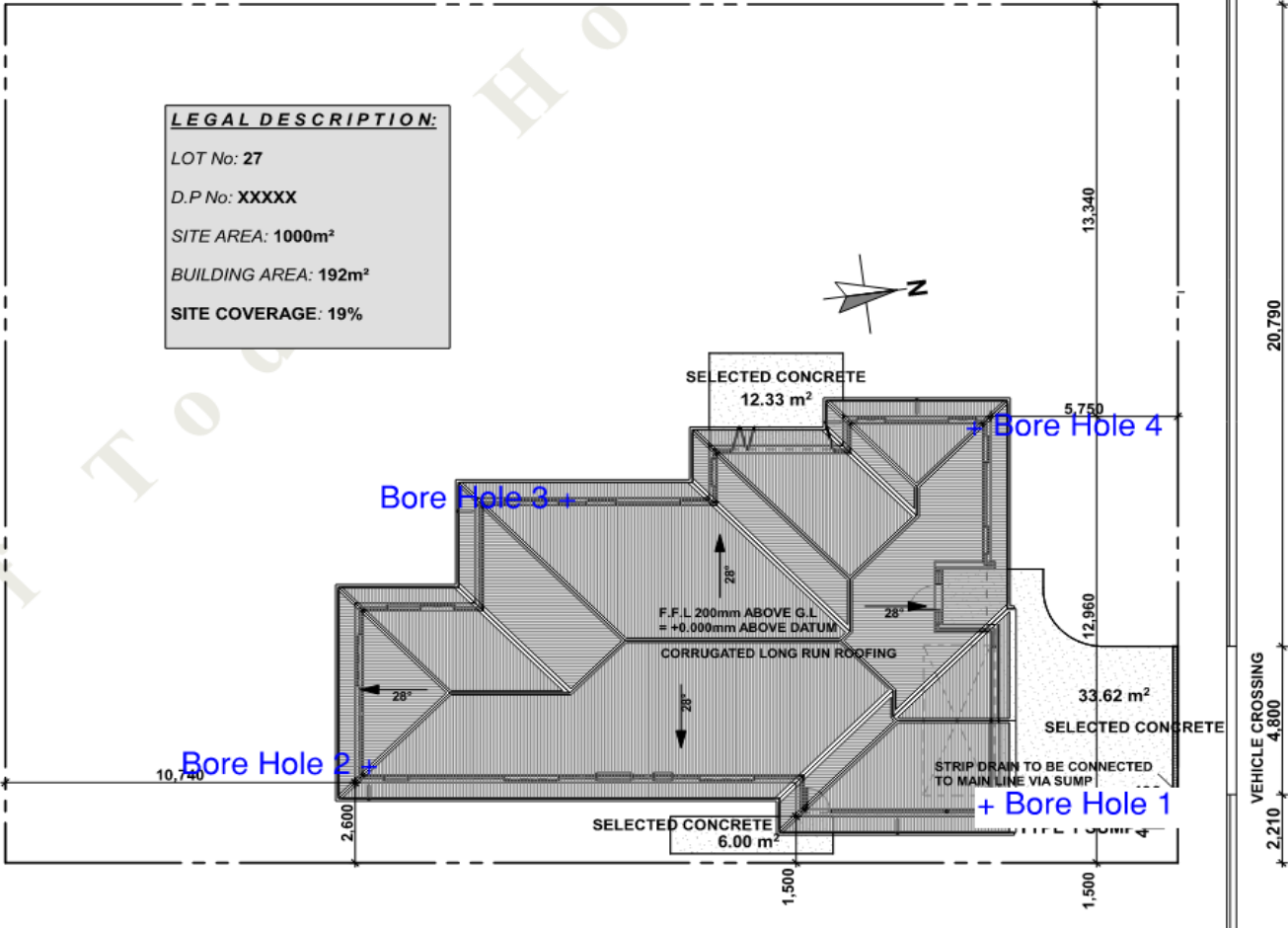
The recommendations within this report are based on the data collected from published sources, site inspection & subsurface investigations carried out at specific locations by using appropriate investigation methods. Variations in ground conditions may exist between test locations & therefore have not been taken into account in the report.



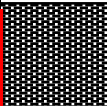
HFC GROUP CIVIL & STRUCTURAL ENGINEERS P.O. BOX 28 006, BECKENHAM, CHRISTCHURCH			Borehole Location Plan	
Date:		Client:		Today Homes Ltd
20/12/2023		Address:		Lot 27 Kersey Park, Darfield
Weather:		Job Number:		23-308
Logged by:				
SB				

SITE SETBACKS AND BOUNDARIES
TO BE CONFIRMED WITH SURVEYED SITE

LEGAL DESCRIPTION:
 LOT No: 27
 D.P No: XXXXX
 SITE AREA: 1000m²
 BUILDING AREA: 192m²
 SITE COVERAGE: 19%

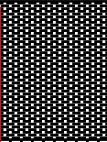
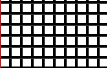


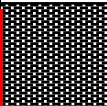
Bore Hole Log No.1

Graphic Log	Soil Description	Depth (m)	Formation	Scala Penetrometer Blows/100mm	Piezometer/ Water Level				
	TOP SOIL with some gravel. Brown, moist. Gravel is fine to cobble sized, sub-rounded to rounded, poorly graded.	0.1	Top Soil	9	No Groundwater Observed				
		0.2		27					
		0.3		50+					
	Hand auger refusal @ 0.3 m on gravel layer. Scala penetrometer refusal @ 0.3 m on gravel layer.	0.4							
		0.5							
		0.6							
		0.7							
		0.8							
		0.9							
		1							
		1.1							
		1.2							
		1.3							
		1.4							
		1.5							
		1.6							
		1.7							
		1.8							
		1.9							
		2							
		2.1							
		2.2							
		2.3							
		2.4							
		2.5							
		2.6							
		2.7							
		2.8							
		2.9							
		3							
		3.1							
		3.2							
		3.3							
		3.4							
		3.5							
		3.6							
		3.7							
		3.8							
		3.9							
		4							
		4.1							
Note: Transition between stratification lines may be gradual.									
Job Name: Proposed House, Lot 27 Kersey Park Job Location: Lot 27 Kersey Park, Darfield Job Number: 23-308		Drill Method: Hand Auger Logged By: SB Drilled By: SB							
BORE HOLE LOG completed for HFC GROUP Civil and Structural Engineers		Bore Hole No. 1 Fig. No.1 Sheet 1 of 1 Date: 20 December 2023							

Note: Transition between stratification lines may be gradual.

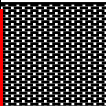
Bore Hole Log No.2

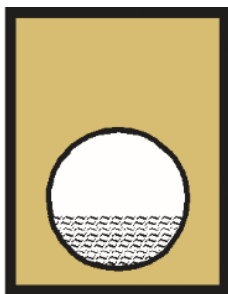
Graphic Log	Soil Description	Depth (m)	Formation	Scala Penetrometer Blows/100mm	Piezometer/ Water Level
	TOP SOIL with some gravel. Brown, moist. Gravel is fine to cobble sized, sub-rounded to rounded, poorly graded.	0.1 0.2 0.3 0.4	Top Soil	5 9 6 9	No Groundwater Observed
	Silty GRAVEL. Greyish brown, loosely packed, moist. Gravel is fine to course, sub-rounded to rounded, poorly graded. Minor fine sand @ 0.5 m	0.5 0.6	Windwhistle Formation	50+	
	Hand dug to 0.6 m. Scala penetrometer refusal @ 0.5 m in gravel layer.	0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4 4.1			
	Note: Transition between stratification lines may be gradual.				
	Job Name: Proposed House, Lot 27 Kersey Park Job Location: Lot 27 Kersey Park, Darfield Job Number: 23-308	Drill Method: Hand Dug Logged By: SB Drilled By: SB			
	BORE HOLE LOG completed for HFC GROUP Civil and Structural Engineers	Bore Hole No.2 Fig. No. 2 Sheet 1 of 1 Date: 20 December 2023			

Bore Hole Log No.3									
Graphic Log	Soil Description	Depth (m)	Formation	Scala Penetrometer Blows/100mm	Piezometer/ Water Level				
	TOP SOIL with some gravel. Brown, moist. Gravel is fine to cobble sized, sub-rounded to rounded, poorly graded.	0.1	Top Soil	7	No Groundwater Observed				
		0.2		6					
		0.3		8					
		0.4		50+					
	Hand auger refusal @ 0.3 m on gravel layer. Scala penetrometer refusal @ 0.4 m in gravel layer.	0.5							
		0.6							
		0.7							
		0.8							
		0.9							
		1							
		1.1							
		1.2							
		1.3							
		1.4							
		1.5							
		1.6							
		1.7							
		1.8							
		1.9							
		2							
		2.1							
		2.2							
		2.3							
		2.4							
		2.5							
		2.6							
		2.7							
		2.8							
		2.9							
		3							
		3.1							
		3.2							
		3.3							
		3.4							
		3.5							
		3.6							
		3.7							
		3.8							
		3.9							
		4							
		4.1							
Job Name: Proposed House, Lot 27 Kersey Park Job Location: Lot 27 Kersey Park, Darfield Job Number: 23-308		Drill Method: Hand Auger Logged By: SB Drilled By: SB							
BORE HOLE LOG completed for HFC GROUP Civil and Structural Engineers		Bore Hole No. 3 Fig. No.3 Sheet 1 of 1 Date: 20 December 2023							

Note: Transition between stratification lines may be gradual.

Bore Hole Log No.4

Graphic Log	Soil Description	Depth (m)	Formation	Scala Penetrometer Blows/100mm	Piezometer/ Water Level
	Gravelly TOP SOIL. Brown, moist. Gravel is fine to cobble sized, sub-rounded to rounded, poorly graded.	0.1	Top Soil	13	No Groundwater Observed
		0.2		13	
		0.3		9	
	Hand auger refusal @ 0.3 m on gravel layer. Scala penetrometer refusal @ 0.4 m in gravel layer.	0.4		50+	
		0.5			
		0.6			
		0.7			
		0.8			
		0.9			
		1			
		1.1			
		1.2			
		1.3			
		1.4			
		1.5			
		1.6			
		1.7			
		1.8			
		1.9			
		2			
		2.1			
		2.2			
		2.3			
		2.4			
		2.5			
		2.6			
		2.7			
		2.8			
		2.9			
		3			
		3.1			
		3.2			
		3.3			
		3.4			
		3.5			
		3.6			
		3.7			
		3.8			
		3.9			
		4			
		4.1			
Note: Transition between stratification lines may be gradual.					
Job Name: Proposed House, Lot 27 Kersey Park Job Location: Lot 27 Kersey Park, Darfield Job Number: 23-308		Drill Method: Hand Auger Logged By: SB Drilled By: SB			
BORE HOLE LOG completed for HFC GROUP Civil and Structural Engineers		Bore Hole No. 4 Fig. No.4 Sheet 1 of 1 Date: 20 December 2023			



newfield drainage ltd
regd. drainlayers

13th March 2024

Selwyn District Council

PO Box 90

Rolleston 7643

Re: Soakage testing at Lot 27 Kersey Park, Darfield

Soakage testing at this site is required to show compliance with the Building Code E1: Surface Water for the discharge of stormwater to land.

In this case the subdivision is still under construction and access is restricted, it is proposed that the soakage testing is carried out and soak hole sized appropriately and in accordance with the Building Code whilst on site completing the house drains. A letter outlining the soakage testing results, calculations and a PS3 will be provided to council once completed.

Yours Faithfully

Theo Newfield

Certifying Drainlayer Reg 08059 Newfield Drainage Ltd

MiTek New Zealand Limited

Job: 201433
Description: New House
Building Consent No.:
MiTek 20/20 Engineering 4.7.346.0

Client: Today Homes
Phone:

Site: New House
Lot 27 Kersey Park
Darfield

Phone:

Printed: 09/04/15 20 Dec 2023

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

Roof Truss

Member Group: ~MSGx45 H1.2

Material: Galv Iron 0.55mm

Dead Load: 0.220 kPa

Restraints: 900 mm centres

Live Load: Qur = 0.250 kPa

Qc = 1.100 kN

Importance Level : 2

Pitch: 28.000 deg

Ceiling

Material: Rondo on clips

Dead Load: 0.200 kPa

Restraints: 600 mm centres

Live Load: Qc = 1.400 kN

Design Working Life : 50 years

Nominal Overhang: 600 mm

Wind

Area: High (44.0 m/s)

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

Snow

Location: Darfield (N4) at 210 m

Open Ground Load: 1.400 kPa

Basic Roof Load: 0.627 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)
*FR1	1	7180	28.000	900	M4	1	4290	28.000	900	S18	1	4290	28.000	900
GE	1D	5980	28.000	900	M5	1	4290	28.000	900	T1	1	8970	28.000	900
*H1	1	2505	20.605	900	*R1	1	1801	28.000	900	V1	1	1555	28.000	900
*H2	1	7137	20.605	900	*R2	1	1768	28.000	900	V2	1	2295	28.000	900
*H3	2	4733	20.605	900	*R3	1	1475	28.000	900	V3	1	1395	28.000	900
*H4	1	5023	20.605	900	*R4	5	913	28.000	900	V4	1	2929	28.000	900
*H5	1	1158	20.605	900	*R5	5	913	28.000	900	V5	1	1756	28.000	900
*H6	1	6734	20.605	900	*R6	1	1575	28.000	900	V6	1	2656	28.000	900
*H7	1	3358	20.605	900	*R7	1	1575	28.000	900	V7	1	909	28.000	900
*H8	2	3828	20.605	900	*R8	1	1180	28.000	900	V8	1	3456	28.000	900
J1	1	2662	28.000	900	*R9	1	2426	20.605	900	V9	1	2566	28.000	900
J2	1	2662	28.000	900	*R11	10	1455	0.000	736	V10	1	1675	28.000	900
J4	1	1762	28.000	900	*R12	1	805	0.000	900	V11	1	1159	28.000	900
J5	1	1762	28.000	900	*R13	1	1455	0.000	900	V12	1	2265	28.000	900
J6	1	2762	28.000	900	*R14	1	1190	28.000	900	V13	1	1365	28.000	900
J8	1	1862	28.000	900	*R15	1	617	28.000	900	J3	1	2662	28.000	900
J9	1	1862	28.000	900	*R16	1	895	20.605	900	J7	1	2762	28.000	900
J11	1	1862	28.000	900	*R17	1	1800	28.000	900	J10	1	2762	28.000	900
J12	1	1862	28.000	900	*R18	1	914	28.000	900	J14	1	2967	28.000	900
J13	1	2967	28.000	900	*R19	1	935	28.000	900	J21	1	2377	28.000	900
J15	1	2067	28.000	900	*R20	1	935	28.000	900	J25	1	2122	28.000	900
J16	1	2067	28.000	900	*R21	1	572	28.000	900	J28	1	2122	28.000	900
J18	1	3277	28.000	900	S2	1	8970	28.000	900	J19	1	3277	28.000	900
J20	1	2377	28.000	900	S4	1	5570	28.000	900	S1	1	8970	28.000	900
J22	1	1477	28.000	900	S5	2	5363	28.000	900	S3	1	5570	28.000	900
J23	1	1477	28.000	900	S7	2	4880	28.000	891	S6	1	4880	28.000	891
J24	1	2122	28.000	900	S8	2	8970	28.000	891	S10	1	5980	28.000	900
J26	1	1222	28.000	900	S9	1	8970	28.000	900	S17	1	4290	28.000	900
J27	1	1222	28.000	900	S11	1	2967	28.000	900	J17	1	4177	28.000	900 LB
J29	1	1222	28.000	900	S12	1	5980	28.000	900	M3	1	4177	28.000	900
J30	1	1222	28.000	900	S13	2	5980	28.000	689	S14	1	8400	28.000	900 LB
M1	1	2967	28.000	900	S15	1	8400	28.000	662					
M2	1	2967	28.000	900	S16	1	8400	28.000	662					

Total quantity : 120

The computer design input has been carried out by:

Signed:

Date: ...Wednesday, 20 December 2023....

Name of Detailer:

Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 201433
Description: New House
Building Consent No.:
MiTek 2020 Engineering 4.7.346.0

Client: Today Homes
Phone:

Site: New House
Lot 27 Kersey Park
Darfield

Phone:

Printed: 09/04/08 20 Dec 2023

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 Selected	
*FR01	1	7180						Refer NZS3604:2011 Tables 15.6
GE	1D	5980	A	0.647	0.344	Wide	No fixing selected	
			K	0.461	0.322	Wide	No fixing selected	
			O	1.410	0.853	Wide	No fixing selected	
			N	1.255	0.787	Wide	No fixing selected	
			M	1.428	0.801	Wide	No fixing selected	
			L	1.467	0.737	Wide	No fixing selected	
			P	0.917	0.000	Wide	No fixing selected	
			Q	1.410	0.853	Wide	No fixing selected	
			R	1.255	0.787	Wide	No fixing selected	
			S	1.428	0.801	Wide	No fixing selected	
			T	1.467	0.737	Wide	No fixing selected	
*H1	1	2505						Refer NZS3604:2011 Tables 15.6
*H2	1	7137						Refer NZS3604:2011 Tables 15.6
*H3	2	4733						Refer NZS3604:2011 Tables 15.6
*H4	1	5023						Refer NZS3604:2011 Tables 15.6
*H5	1	1158						Refer NZS3604:2011 Tables 15.6
*H6	1	6734						Refer NZS3604:2011 Tables 15.6
*H7	1	3358						Refer NZS3604:2011 Tables 15.6
*H8	2	3828						Refer NZS3604:2011 Tables 15.6
J1	1	2662	B	5.421	0.921	Cross	1 Pair of Wire Dog Staples	
			F	2.374	1.167	Butt	1 JH 47x90	
			D	1.218	0.572	Butt	1 JH 47x90	
J2	1	2662	A	3.661	0.529	Cross	1 Pair of Wire Dog Staples	
			D	0.776	0.398	Butt	1 Pair of 3.15d Nails	
			C	5.243	2.492	Cross	1 Pair of Wire Dog Staples	
J4	1	1762	B	4.236	0.635	Cross	1 Pair of Wire Dog Staples	
			E	1.116	0.579	Butt	1 JH 47x90	
			D	1.181	0.563	Butt	1 JH 47x90	
J5	1	1762	B	3.773	0.780	Cross	1 Pair of Wire Dog Staples	
			E	0.920	0.580	Butt	1 JH 47x90	
J6	1	2762	B	5.556	0.953	Cross	1 Pair of Wire Dog Staples	
			D	3.739	1.805	Butt	1 JH 47x90	
J8	1	1862	B	4.363	0.666	Cross	1 Pair of Wire Dog Staples	
			E	1.219	0.655	Butt	1 JH 47x90	
			D	1.171	0.554	Butt	1 JH 47x90	
J9	1	1862	B	3.925	0.812	Cross	1 Pair of Wire Dog Staples	
			E	1.000	0.647	Butt	1 JH 47x90	
J11	1	1862	B	4.363	0.666	Cross	1 Pair of Wire Dog Staples	
			E	1.219	0.655	Butt	1 JH 47x90	
			D	1.171	0.554	Butt	1 JH 47x90	
J12	1	1862	B	3.925	0.812	Cross	1 Pair of Wire Dog Staples	
			E	1.000	0.647	Butt	1 JH 47x90	
J13	1	2967	A	4.191	0.965	Butt	1 JH 47x90	
			C	4.191	1.951	Butt	1 JH 47x90	
J15	1	2067	B	4.629	0.731	Cross	1 Pair of Wire Dog Staples	
			F	1.632	0.854	Butt	1 JH 47x90	
			D	1.071	0.491	Butt	1 JH 47x90	
J16	1	2067	B	4.235	0.877	Cross	1 Pair of Wire Dog Staples	
			F	1.182	0.783	Butt	1 JH 47x90	
J18	1	3277	A	4.629	1.065	Cross	1 Pair of Wire Dog Staples	
			G	3.600	1.635	Butt	1 JH 47x90	
			D	1.029	0.520	Butt	1 JH 47x90	
J20	1	2377	B	5.039	0.830	Cross	1 Pair of Wire Dog Staples	
			F	2.070	1.044	Butt	1 JH 47x90	
			D	1.099	0.506	Butt	1 JH 47x90	
J22	1	1477	B	3.882	0.545	Cross	1 Pair of Wire Dog Staples	
			D	0.439	0.043	Butt	1 Pair of 3.15d Nails	
			C	1.534	0.907	Butt	1 JH 47x90	
J23	1	1477	B	3.330	0.690	Cross	1 Pair of Wire Dog Staples	
			E	0.720	0.391	Butt	1 Pair of 3.15d Nails	
J24	1	2122	B	4.701	0.749	Cross	1 Pair of Wire Dog Staples	
			D	2.786	1.381	Butt	1 JH 47x90	
J26	1	1222	A	1.726	0.397	Butt	1 JH 47x90	
			C	0.363	0.036	Butt	1 Pair of 3.15d Nails	
			B	1.520	0.768	Butt	1 JH 47x90	
J27	1	1222	B	2.911	0.592	Cross	1 Pair of Wire Dog Staples	
			D	0.566	0.214	Butt	1 Pair of 3.15d Nails	
J29	1	1222	B	3.585	0.466	Cross	1 Pair of Wire Dog Staples	
			D	0.363	0.036	Butt	1 Pair of 3.15d Nails	
			C	1.154	0.743	Butt	1 JH 47x90	

SDC - Approved Building Consent Document - BC240357 - Pg 36 of 402 - 19/03/2024 - warreg

VIP Frames & Trusses

Job:	201433	Client:	Today Homes	Site:	New House
		Phone:			Lot 27 Kersey Park
					Darfield
Description:	New House			Phone:	
Building Consent No.:					
MiTek 2020 Engineering 4.7.346.0			MiTek New Zealand Limited		Printed: 09/04/08 20 Dec 2023

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing ----- Qty Selected	
J30	1	1222	B	2.911	0.592	Cross	1	Pair of Wire Dog Staples
			D	0.566	0.214	Butt	1	Pair of 3.15d Nails
M1	1	2967	E	3.330	0.770	Butt	1	JH 47x90
			H	3.494	2.183	Butt	1	JH 47x90
M2	1	2967	E	3.184	1.244	Butt	1	JH 47x90
			H	3.380	1.672	Butt	1	JH 47x90
M4	1	4290	B	6.096	1.793	Cross	1	Pair of Wire Dog Staples
			J	4.493	2.503	Butt	1	JH 47x90
M5	1	4290	B	5.947	1.973	Cross	1	Pair of Wire Dog Staples
			J	4.622	2.288	Butt	1	JH 47x90
*R1	1	1801						Refer NZS3604:2011 Tables 15.6
*R2	1	1768						Refer NZS3604:2011 Tables 15.6
*R3	1	1475						Refer NZS3604:2011 Tables 15.6
*R4	5	913						Refer NZS3604:2011 Tables 15.6
*R5	5	913						Refer NZS3604:2011 Tables 15.6
*R6	1	1575						Refer NZS3604:2011 Tables 15.6
*R7	1	1575						Refer NZS3604:2011 Tables 15.6
*R8	1	1180						Refer NZS3604:2011 Tables 15.6
*R9	1	2426						Refer NZS3604:2011 Tables 15.6
*R1	10	1455						Refer NZS3604:2011 Tables 15.6
*R1	1	805						Refer NZS3604:2011 Tables 15.6
*R1	1	1455						Refer NZS3604:2011 Tables 15.6
*R1	1	1190						Refer NZS3604:2011 Tables 15.6
*R1	1	617						Refer NZS3604:2011 Tables 15.6
*R1	1	895						Refer NZS3604:2011 Tables 15.6
*R1	1	1800						Refer NZS3604:2011 Tables 15.6
*R1	1	914						Refer NZS3604:2011 Tables 15.6
*R1	1	935						Refer NZS3604:2011 Tables 15.6
*R2	1	935						Refer NZS3604:2011 Tables 15.6
*R2	1	572						Refer NZS3604:2011 Tables 15.6
S2	1	8970	B	7.136	2.330	Cross	1	Pair of Wire Dog Staples
			N	8.695	4.615	Cross	1	CT400
			I	6.676	1.959	Cross	1	Pair of Wire Dog Staples
S4	1	5570	B	7.323	2.787	Cross	1	Pair of Wire Dog Staples
			F	6.051	2.731	Cross	1	Pair of Wire Dog Staples
S5	2	5363	B	6.533	2.434	Cross	2	Pair of Wire Dog Staples
			K	6.431	2.306	Cross	2	Pair of Wire Dog Staples
S7	2	4880	B	6.893	2.423	Cross	2	Pair of Wire Dog Staples
			J	5.896	1.886	Cross	2	Pair of Wire Dog Staples
S8	2	8970	B	7.060	2.305	Cross	2	Pair of Wire Dog Staples
			N	8.603	4.567	Cross	2	CT400
			I	6.606	1.938	Cross	2	Pair of Wire Dog Staples
S9	1	8970	B	7.111	2.319	Cross	1	Pair of Wire Dog Staples
			I	5.297	1.895	Cross	1	Pair of Wire Dog Staples
			M	8.828	4.646	Cross	1	CT400
S11	1	2967	A	4.142	0.953	Butt	1	JH 47x90
			G	4.142	1.928	Butt	1	JH 47x90
S12	1	5980	B	7.768	2.988	Cross	1	Pair of Wire Dog Staples
			F	6.504	2.933	Cross	1	Pair of Wire Dog Staples
S13	2	5980	B	5.949	2.288	Cross	2	Pair of Wire Dog Staples
			F	4.982	2.247	Cross	2	Pair of Wire Dog Staples
S15	1	8400	A	4.192	1.742	Cross	1	Pair of Wire Dog Staples
			G	1.194	0.342	Cross	1	Pair of Wire Dog Staples
			K	6.378	3.143	Cross	1	Pair of Wire Dog Staples
			M	2.162	0.845	Cross	1	Pair of Wire Dog Staples
S16	1	8400	A	4.194	1.750	Cross	1	Pair of Wire Dog Staples
			L	6.388	3.128	Cross	1	Pair of Wire Dog Staples
			N	1.787	0.818	Cross	1	Pair of Wire Dog Staples
			G	2.405	0.409	Cross	1	Pair of Wire Dog Staples
S18	1	4290	A	4.630	2.101	Butt	1	JH 47x90
			E	5.938	2.160	Cross	1	Pair of Wire Dog Staples
T1	1	8970	B	6.238	2.196	Cross	1	Pair of Wire Dog Staples
			N	10.475	4.897	Cross	1	CT400
			G	5.484	1.812	Cross	1	Pair of Wire Dog Staples
V1	1	1555	A			Wide		No fixing selected
V2	1	2295	A			Wide		No fixing selected
V3	1	1395	A			Wide		No fixing selected
V4	1	2929	A			Wide		No fixing selected
V5	1	1756	A			Wide		No fixing selected
V6	1	2656	A			Wide		No fixing selected
V7	1	909	A			Wide		No fixing selected
V8	1	3456	A			Wide		No fixing selected
V9	1	2566	A			Wide		No fixing selected
V10	1	1675	A			Wide		No fixing selected
V11	1	1159	A			Wide		No fixing selected
V12	1	2265	A			Wide		No fixing selected
V13	1	1365	A			Wide		No fixing selected
J3	1	2662	B	6.115	1.770	Cross	1	Pair of Wire Dog Staples
			F	3.330	1.740	Butt	1	JH 47x90

SDC - Approved Building Consent Document - BC240357 - Pg 37 of 402 - 19/03/2024 - warreg

VIP Frames & Trusses

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing -----	
							Qty	Selected
J7	1	2762	B	6.352	1.846	Cross	1	Pair of Wire Dog Staples
			F	3.651	1.896	Butt	1	JH 47x90
J10	1	2762	B	6.352	1.846	Cross	1	Pair of Wire Dog Staples
			F	3.651	1.896	Butt	1	JH 47x90
J14	1	2967	A	5.174	1.938	Butt	1	JH 47x90
			G	4.479	2.234	Butt	1	JH 47x90
J21	1	2377	B	5.398	1.534	Cross	1	Pair of Wire Dog Staples
			F	2.453	1.316	Butt	1	JH 47x90
J25	1	2122	B	4.830	1.293	Cross	1	Pair of Wire Dog Staples
			F	1.945	0.983	Butt	1	JH 47x90
J28	1	2122	B	4.677	1.283	Cross	1	Pair of Wire Dog Staples
			F	1.732	0.969	Butt	1	JH 47x90
J19	1	3277	A	6.390	2.318	Cross	1	Pair of Wire Dog Staples
			G	5.981	2.896	Butt	1	JH 47x90
S1	1	8970	B	4.838	1.513	Cross	1	Pair of Wire Dog Staples
			Q	19.317	9.466	Cross	1	CT400
			K	7.096	2.656	Cross	1	Pair of Wire Dog Staples
S3	1	5570	B	12.240	5.339	Cross	1	CT400
			F	12.240	5.339	Cross	1	CT400
S6	1	4880	A	13.772	5.261	Cross	1	CT400
			I	14.155	5.512	Cross	1	CT400
S10	1	5980	B	14.310	6.035	Cross	1	CT400
			H	16.319	6.620	Cross	1	CT400
S17	1	4290	A	7.364	3.529	Butt	1	Pair of MultiGrips
			E	8.576	3.582	Cross	1	CT400
J17	1	4177	B	10.689	3.256	Cross	1	CT400
			H	10.704	5.073	Butt	1	Pair of MultiGrips
M3	1	4177	A	14.615	5.740	Cross	1	CT400
			I	12.867	6.906	Butt	1	JH 47x120
S14	1	8400	A	11.721	5.391	Cross	1	CT400
			L	27.398	13.916	Cross	1	16kN Truss to Top Plate
			N	2.617	0.245	Cross	1	Pair of Wire Dog Staples
			G	2.683	0.243	Cross	1	Pair of Wire Dog Staples

Fixing List

Qty	Selected Fixing
68	Pair of Wire Dog Staples
44	JH 47x90
7	Pair of 3.15d Nails
16	CT400
2	Pair of MultiGrips
1	JH 47x120
1	16kN Truss to Top Plate
24	N 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.



Date: 20 December 2023
Fabricator: VIP Frames & Trusses
Job Name: Today Homes
New House
Lot 27 Kersey Park, Darfield

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

Attn: City/District Council

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

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

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

Wind Zone	<u>High</u>	Altitude	<u>210m</u>
		Snow (Open Ground Load)	<u>1.400 kPa</u>
Roof Material	<u>Longrun</u>	Snow (Basic Roof Load)	<u>0.627 kPa</u>

Treatment Definition:

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

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

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

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

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

Council Contacts:

Consents Officer: _____
Fax #: _____
Phone: _____

Please forward to:

VIP Frames & Trusses
65-67 Wickham Street
Ph (03) 389 8200

PROLAM SUMMARY

20 December 2023

Today Homes

Lot 27 Kersey Park, Darfield

1. Lintel Roof and Ceiling

a) Garage

PL12H1-300100

(Prolam Non-visual Beam)

Lintel Span	4.8 m	Building Type	House
Roof Span	1.5 m	Importance Level	IL2
Eaves Width	0.6 m	Wind Zone	High
Stud Height	2.4 m	Snow Zone	N4
Lintel Head Height	2.1 m	Site Elevation	210
Roof Pitch	28.0 °	Wet in Service	No
		Roof Type	Heavy (0.75 kPa)
		Ceiling Type	Standard (0.15 kPa)
Member Depth	290 mm	Capacity Ratio	2.2
Member Width	90 mm	Rigidity Ratio	2
Max. Movement	7.8 mm	Support Reaction	7.6 kN
Deflection	2.9 mm	Uplift Restraint Required	0.2 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.

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/NZS1170:2002, NZS3603:1993 and with reference to NZS3604:2011. 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) through reliance on B1/VM1.

Substitution of any of the Prowood products listed is not provided for and if substitution occurs then this statement is nullified.

David King

30 November 2023 (2.2.0)

David King

ME(civil) CMEngNZ CPEng(no 145511) IntPE(NZ)

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

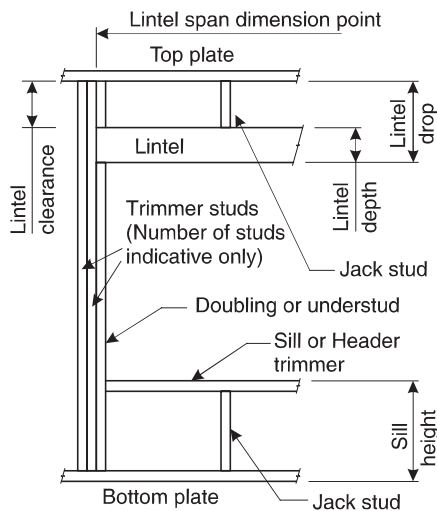


LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

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
8.6m ²	G	G	H	G	G	H
11.6m ²	G	H	H	G	G	H
12.1m ²	G	H	H	G	H	H
15.3m ²	H	H	-	G	H	H
19.1m ²	H	-	-	G	H	-
20.9m ²	H	-	-	H	H	-
21.8m ²	H	-	-	H	-	-
34.3m ²	-	-	-	H	-	-

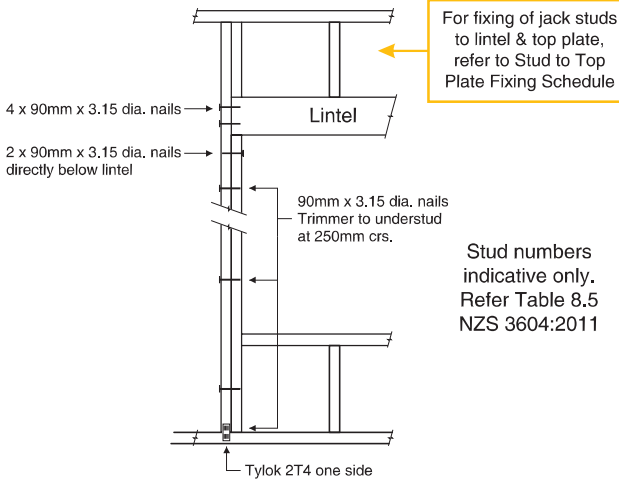
NOTES:

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

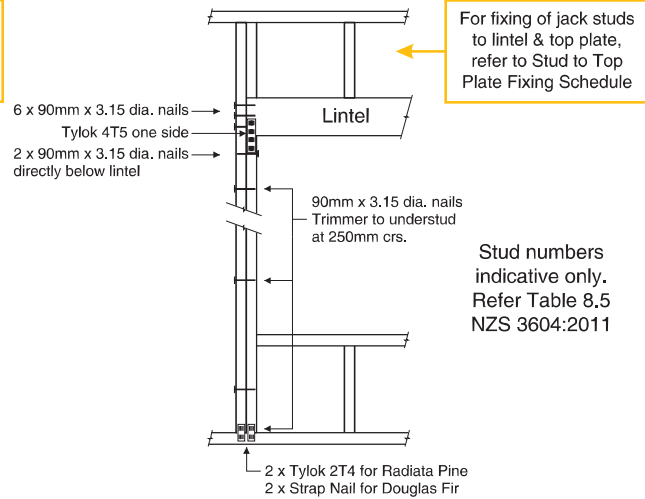
Lintel Span (m)	Loaded Dimension (m) (See Fig. 1.3 NZS 3604:2011)	Light Roof Wind Zone					Heavy Roof Wind Zone				
		L	M	H	VH	EH	L	M	H	VH	EH
1.0	2.0	E	E	E	F	F	E	E	E	E	F
	3.0	E	E	F	F	F	E	E	E	F	F
	4.0	E	F	F	F	G	E	E	F	F	F
	5.0	E	F	F	G	G	E	E	F	F	G
	6.0	E	F	F	G	G	E	E	F	F	G
1.2	2.0	E	E	F	F	F	E	E	E	F	F
	3.0	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	G	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	-	-
4.8	2.0	F	F	G	G	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	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.1	2.0	F	F	G	G	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	-	-
	5.0	G	H	-	-	-	E	F	H	-	-
5.4	2.0	F	F	G	G	H	E	E	F	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	2.0	F	F	G	G	H	E	E	F	G	H
	6.0	G	H	-	-	-	E	G	H	-	-

LINTEL FIXING OPTIONS

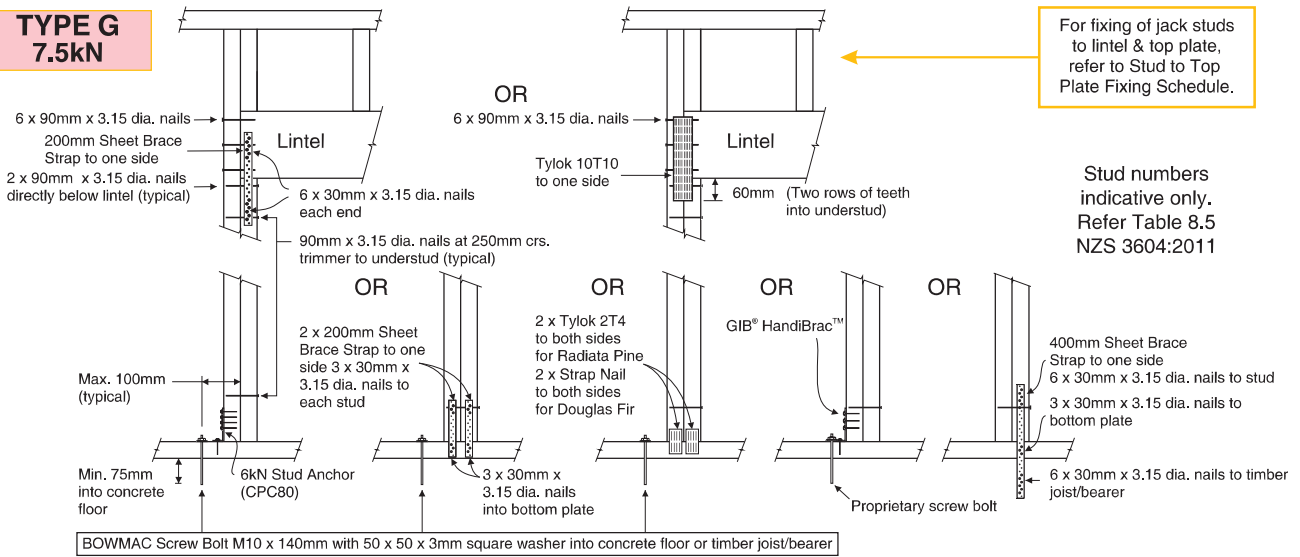
TYPE E 1.4kN



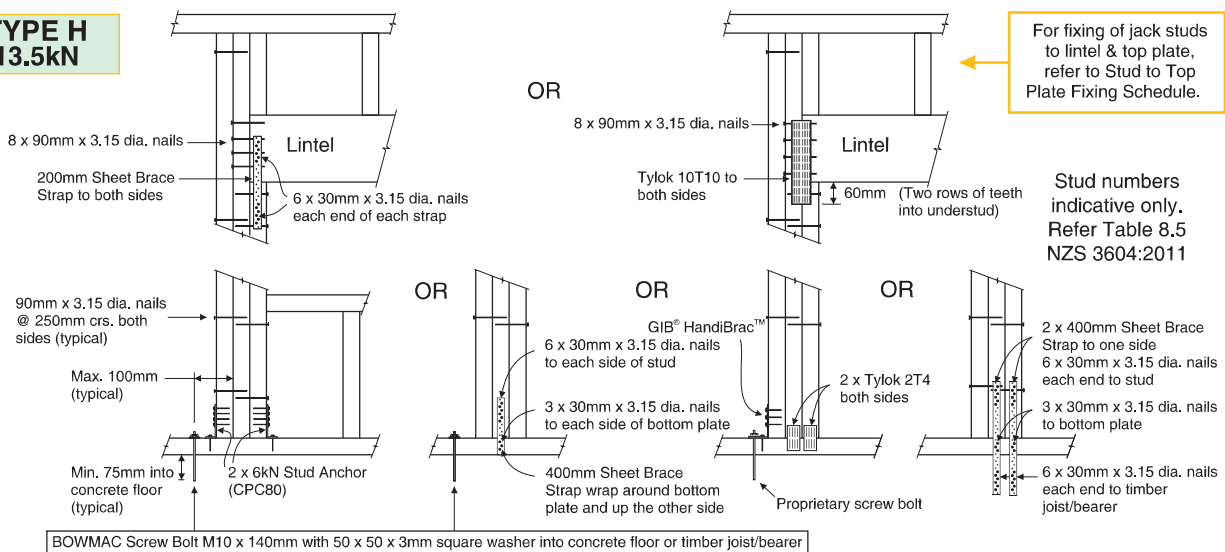
TYPE F 4.0kN

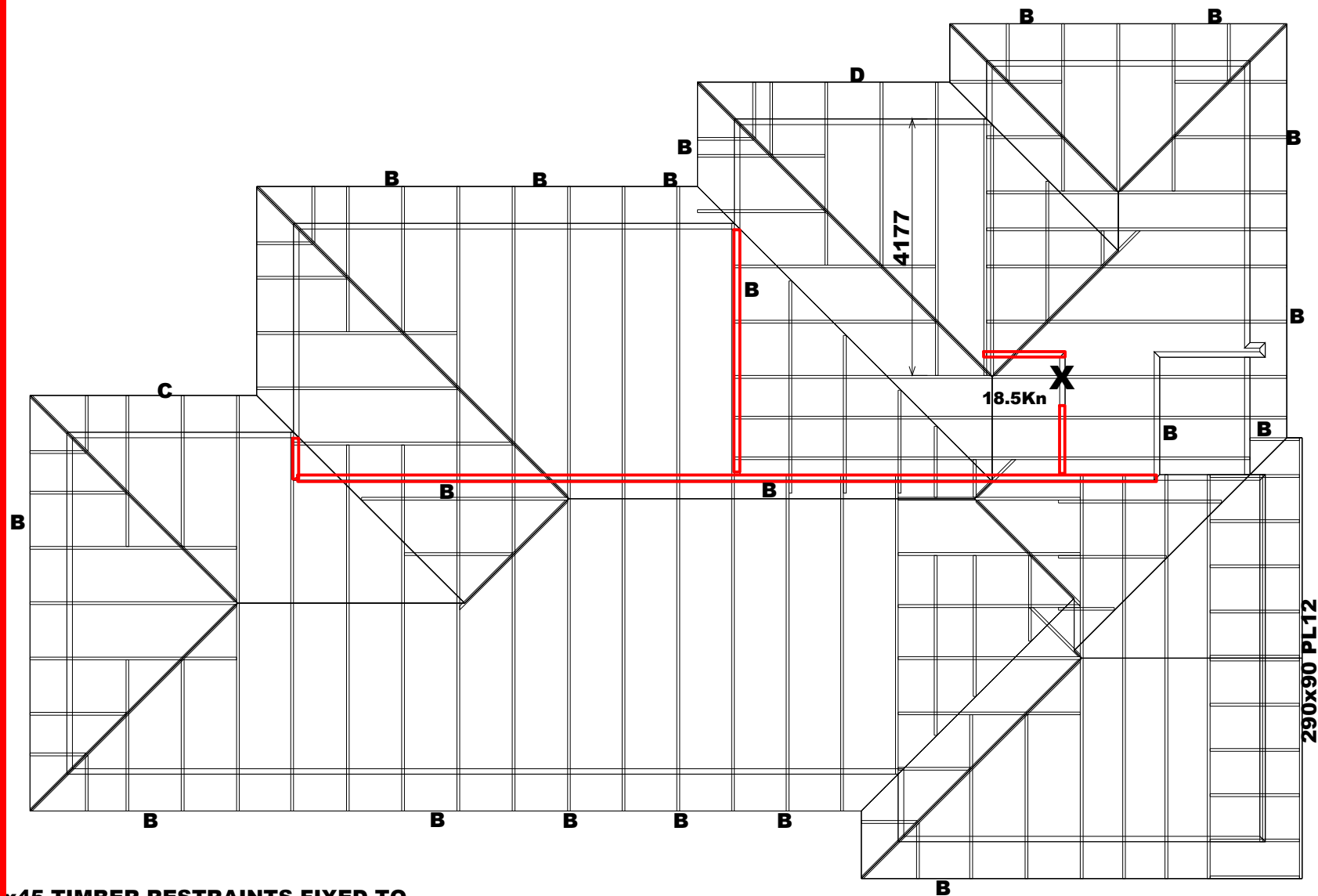


TYPE G 7.5kN



TYPE H 13.5kN





**90x45 TIMBER RESTRAINTS FIXED TO
BOTTOM CHORD @1800CTRS MAX**

X = 10.00 - 19.99 kN Download. Type FP1 Slab Thickening Req'd

All Other lintels / beams by architect / engineer

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

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 201433

Client: Today Homes
Job Name: New House
Address: Lot 27 Kersey Park
Darfield

Pitch: 28.000
Roof Material: Galv Iron 0.55mm
Soffit Overhang: 600mm
Wind Area: High
Snow Load: 0.627

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Josh Thompson

DATE 20 Dec,2023 PAGE 1 of

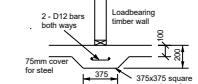
These lintels have been sized as per
the GANGLAM and FLITCH BEAM
selection manuals as provided by
MiTek NZ Ltd.

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

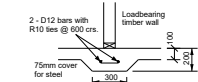
Unless otherwise stated all lintels are
as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	MSG8
B	150x90	Hy90
C	200x90	Hy90
D	240x90	Hy90
E		
F		

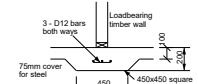
Slab Thickening Details



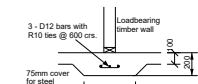
TYPE FP1 - 375x375mm Pad



TYPE FS1 - 300mm Strip footing



TYPE FP2 - 450x450mm Pad



TYPE FS2 - 450mm Strip footing

SuperSlab | SuperSlab+

TECHNICAL MANUAL

SDC - Approved Building Consent Document - BC2406657 - Pg 45 of 402 - 19/03/2024 - warreg



CONTENTS

1.0 GENERAL	3
2.0 SUPERSLAB COMPONENTS	3
2.1 Pod void formers	3
2.2 Topping slab and rib reinforcement	3
2.3 Typical Superslab layout and details	4
2.4 Concrete	4
3.0 SCOPE OF USE	5
3.1 Building types and loading suitable for the SuperSlab system	5
3.2 Ground conditions	8
3.3 Lateral resistance under wind and earthquake	10
3.4 Weights and loadings	15
4.0 INSTALLATION INFORMATION	16
4.1 Site preparation and Earthworks	16
4.2 Damp proof membrane (DPM)	16
4.3 Set out & boxing	16
4.4 Pod set out	17
4.5 Perimeter foundations	17
4.6 Internal ribs, Load bearing thickenings and Pads	17
4.7 Mesh and Topping thickness	18
4.8 Reentrant corners	18
4.9 Concrete placing, finishing and curing	18
4.10 Saw cutting (control joints) and free joints	19
4.11 Plumbing and pipe penetrations	19
4.12 Shower Rebates	20
4.13 Wing walls	20
4.14 Polished Concrete floors	20
5.0 LANDSCAPING AND ONGOING MAINTENANCE	20
5.1 Paving and landscaping heights	21
5.2 Excavation and retaining walls	21
5.3 Drainage of the site	21
5.4 Gardens, trees and shrubs	21
6.0 STANDARD DETAILING	22
6.1 Qpod substitutions detailing	26
7.0 INSULATED SLABS	32
7.1 SuperSlab+	32
7.2 QuickSet standard detailing	35
8.0 CHECK LIST	41

DISCLAIMER

This document provides design and installation information for the SuperSlab systems as per Codemark and Branz appraisal to comply with the New Zealand building code. Providing the conditions of the Codemark are adhered too rigidly, the foundation will not require specific design or a producer statements from an engineer to gain building consent. If the conditions are not able to be met, the system will require Specific Engineering Design (SED)

1.0 - GENERAL

This document outlines the specifications, construction requirements and Codemark conditions and limitations for the SuperSlab systems.

The document covers the components, site requirements, details and construction of a standard SuperSlab system. For more advice, please contact your local Allied Concrete supplier.

SuperSlab+ provides a fully insulated foundation which includes QuickSet's pre-finished insulated side wall panel and full blanket ground insulation providing a fully thermally broken slab. QuickSet's form (side wall) is pre-finished in grey with a protective wrap to be removed before building is finished.

SuperSlab+ comprises QuickSet which is made in New Zealand, with the plastic components being made from 100% NZ recycled plastics.

2.0 - SUPERSLAB COMPONENTS

The SuperSlab floor system consists of a reinforced insitu concrete perimeter footing, internal square polystyrene void formers (pods) spaced at 1200mm centers to form 100mm wide voids which are filled with concrete. Concrete is poured on top and within the 100mm wide gap between the pods (ribs) to form a 'waffle raft'. The polystyrene pods act as a formwork to minimize the concrete consumption and achieve the depth. The depth and alternate spacing of the reinforced concrete ribs create a stiff and robust foundation solution which is suitable on most soil conditions.

2.1 Pod Void Formers

SuperSlab uses 1100mm x 1100mm square and 220mm deep polystyrene pods. 1100mmx1100mm square and 300mm deep polystyrene pods can also be used where extra height is needed.

Often sites with deep topsoil or flood risks require compacted hard fill or certified fill to build up the site to achieve the required finished ground level. Adopting a SuperSlab system can save you time and cost. A deeper pod can be selected to reduce the cost of fill as well as increasing the strength and stiffness of your foundation.

Where the geometry of the slab dictates the polystyrene pods to be smaller than 1100mm x 1100mm these can be easily cut on site to fit. The 100mm internal rib and perimeter footing width (300mm) need to be maintained at all times.

Qpod's can be used with SuperSlab systems as a greener alternative to polystyrene pods. Qpod is a recycled plastic dome system which clips together to form a 1100mmx1100mm and 220

deep void former which can be substituted for the polystyrene pods. Refer to section 6.1 for the alternative detailing using the Qpod void fillers.

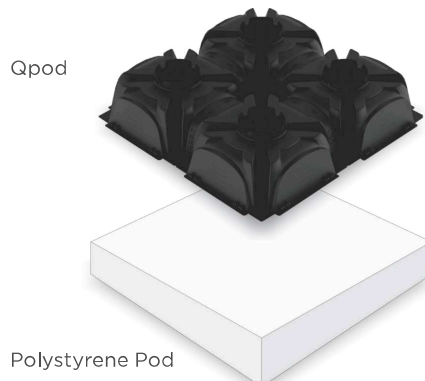
2.2 Topping Slab and Rib Reinforcement

SuperSlab requires 85mm (minimum) and 100mm (maximum) thick topping slab as outlined in section 4.7. The topping slab shall be reinforced with ductile steel mesh (SE62 - minimum weight of 2.29kg/m²). The mesh must comply with the minimum requirements of the New Zealand Building Code. The mesh is to have a tensile strength of 500 MPa and needs to be ductile, achieving 10% elongation when tested to NZS4671 and the building code testing requirements. As an alternative topping reinforcement, SE62 mesh can be substituted with 10mm diameter, grade 300, class E reinforcing bars placed at 300 centers each way. Loose bars shall be chaired and tied as per NZS3109, cover shall be as outlined per section 4.7.

The 100mm wide ribs are reinforced with 12mm diameter steel reinforcing rods grade 500, class E (HD12 seismic grade). These HD12 bars are located at the bottom of the ribs with 50mm minimum bottom cover and extending across the slab in two orthogonal directions. HD12 "hockey stick" bars are located in the top of the ribs. The hockey stick bars are tied to the underside of the mesh at the top of ribs intersecting at right angles to the perimeter footing. These bars are 1350mm long and have a 150mm hook to anchor the perimeter footing to the floor slab.

Perimeter reinforcement typically consists of 2 x HD12 bottom bars and a single HD12 top bar. Additional perimeter or rib reinforcement can also be adopted for specific design cases to accommodate higher loads or spanning capabilities such as: expansive soils, liquefiable soils or piled foundations. These cases are outside the scope of this document and require specific engineering design.

Bar chairs and spacers are used to ensure the correct cover to all the reinforcement and to keep the pods in place while the slab is poured.



2.3 Typical SuperSlab layout and details

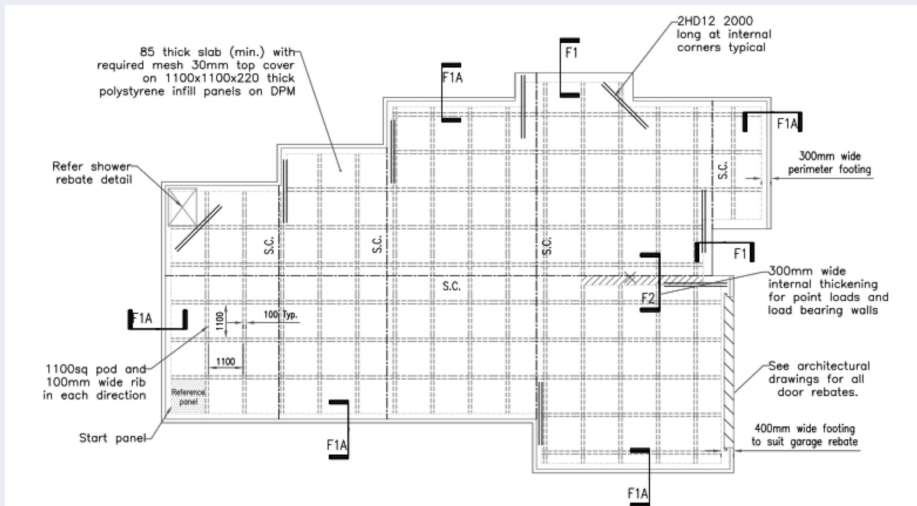


FIGURE 1 - SuperSlab layout (slab area: = 197 m²)

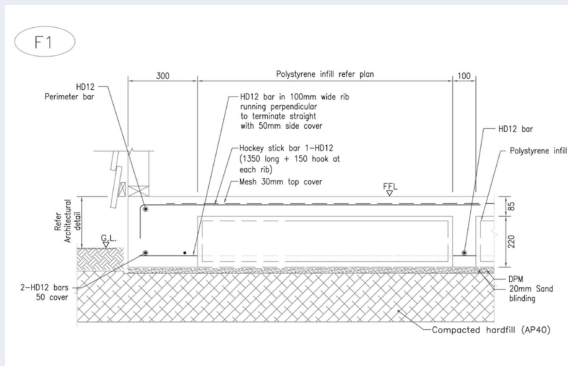


FIGURE 2 - Light clad perimeter footing detail

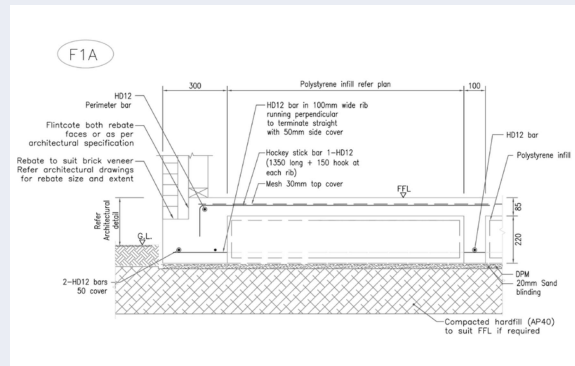


FIGURE 3 - Brick clad perimeter footing detail

2.4 Concrete

SuperSlab mixes shall be used for all SuperSlab systems. The strength of the concrete is dependent on the exposure category of the proposed foundation.

Sites located near coastal areas may be subject to windblown sea salt deposits resulting in a greater risk of corrosion. As such a higher concrete strength is required to satisfy the NZBC durability requirements of the foundation. NZS3604 clause 4.2.3.3 defines such areas as Zone D (all outer islands and coastal areas within 500m from the sea or within 100m from tidal estuaries and sheltered inlets). Foundations proposed in Zone D are to be 25 MPa minimum. For sites located away from corrosive environments (greater than 500m from the sea – Zone B or C) 20 MPa concrete can be used. The designer shall select one of the appropriate concrete mixes as per the following:

- Mix code 252CSS is used for 25 MPa applications for foundations within 500m to

the sea or 100m to fresh water.

- Mix code 202CSS is used for 20 MPa applications for foundations beyond sea spray and corrosive environments.

Note: foundations located in tidal slash zones within 50m of the beach frontage may require higher strength concrete and are subject to specific advice. So too are contaminated sites or soils within 500m of geothermal bores, mud pools, steam vents or other such sources which pose a chemical or corrosive environments. Such conditions are beyond the scope of this document.

The builder and designer shall also discuss the desired finish and the placement method with the Allied Concrete when ordering the concrete to ensure the best mix for the specific application can be delivered.

3.0 - SCOPE OF USE

Designers need to understand and adhere to the conditions and limitations as outlined below. If in doubt, please check with Allied Concrete for advice on your SuperSlab project.

3.1 Building types and loading suitable for SuperSlab Systems

SuperSlab systems has been designed to support timber framed residential houses generally satisfying the requirements of NZS3604 and as detailed below. The verification of the compliance of the design with this document is the responsibility of the designer and shall be confirmed by the building control authority issuing the building consent. Items 1-6 shall be verified by the designer. Refer to check list procedure in section 7 for further guidance.

1. **SOIL CONDITIONS** – Buildings founded on 'good ground' as defined by the New Zealand Building Code (B1) and NZS3604. This is summarised in section 3.2 below
2. **BUILDING TYPE** – Importance level 1 and 2 structures as per NZS1170 and NZS3604 – Standard residential house
3. **HOUSE SIZE** – No more than two storey timber framed buildings with max height of 10m (to apex). Maximum length of 30m unless detailed with free joints in accordance with this manual as per figure

21 and 33. The foundation needs to be a regular shape with a minimum area (m²) to perimeter (m) ratio of 1. Irregular shaped foundations need specific engineering input and are beyond the scope of this document. Refer Table 2 below for guidance on shape requirements.

4. **WEIGHTS** – Permanent (gravity) and imposed (live) loads as defined in section 3.4 – The foundation system is designed to accommodate a standard residential house generally as defined in NZS3604:2011 and defined in section 3.4
5. **MAXIMUM SPAN AND HEIGHTS** – Maximum Roof span of 12m, first floor joist span of 5m, and maximum storey height of 3m (Cladding combinations as per table 1 and building types A-E)
6. **WIND AND SEISMIC LOADING** – Maximum wind loading of Extra High as per NZS3604:2011 and maximum seismic hazard factor (Z) of 0.45 and soil classes A-E as per NZS1170. Also, refer section 3.4

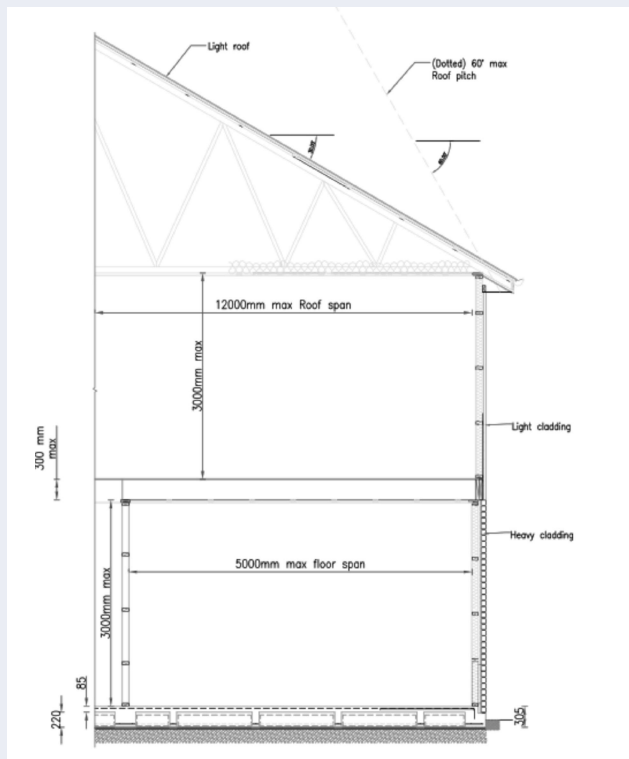


FIGURE 4 – Typical house layout

Table 1

Building type	Number of levels ¹	Level 1 Wall cladding ²	Upper storey cladding	Roof Type ³	Minimum bearing capacities and penetrometer blows ⁴	Within scope of this document
A	Single	Light	—	Light	150 kPa	Yes
B	Single	Heavy	—	Light	200 kPa	Yes
C	Single	Heavy	—	Heavy	200 kPa	Yes
D	Two Storey	Light	Light	Light	200 kPa	Yes
E	Two Storey	Heavy	Light	Light	300 kPa	Yes
F	Two Storey	Heavy	Light	Heavy	300 kPa	No, Specific Design
G	Two Storey	Heavy	Heavy	Heavy	300 kPa	No, Specific Design

Notes as referenced in table 1 above

- Two Storey external wall supporting a timber floor with maximum floor joist span of 5.0m.
- Maximum brick wall cladding height of 3.0m to lower level of two-storey building. 4.5m on a single storey building.
- External wall supporting a maximum 12m clear span of roof trusses.
- The designer shall confirm minimum bearing capacities as required for building type as per table 1. The building platform is to have consistent bearing capacity across the house floor plan. Specific design or geotechnical input is required if bearing capacities vary significantly across the building platform. Penetrometer testing and soil investigations are to be completed as per NZS4402, NZBC (B1) and NZS3604. If the designer adopts a less conservative testing criteria to determine the bearing capacity from penetrometer testing such as Stockwell 1977 or MBIE guidance document for repairing and rebuilding houses affected by the Canterbury earthquakes (section A 3.4.1), they shall be suitably qualified to interpret the “index” bearing strengths as described in the document. Suitably qualified as defined in the MBIE document includes soil technicians or other suitably trained and supervised people. Refer table 2 for penetrometer blow count criteria. Cohesive soils could also be tested using shear vanes as penetrometer testing often underestimates the strength of cohesive soils. A geotechnical engineer can provide the bearing strength to be adopted in

the design. Generally, the geotechnical ultimate bearing strength can be taken as 5 times the undrained shear strength of the cohesive soil. E.g. Undrained shear (Su) = 60 kPa would equate to 300 kPa geotechnical ultimate bearing or 100 kPa allowable bearing – “good bearing” as per NZS3604.

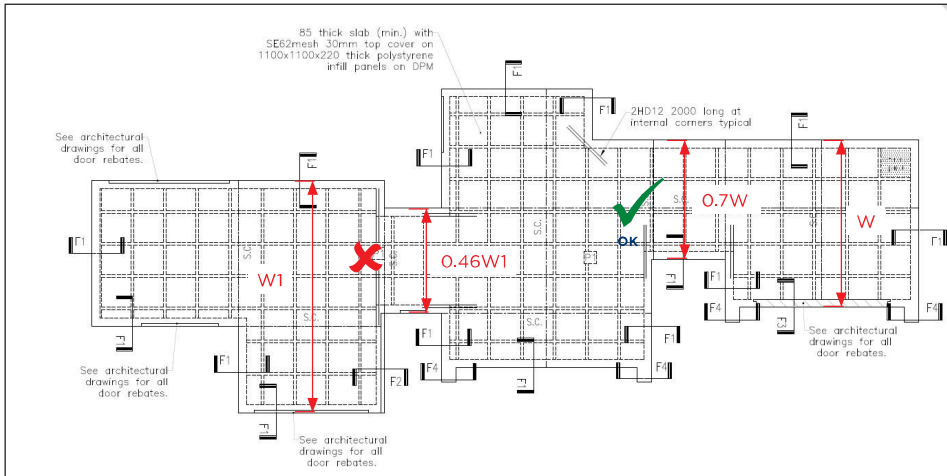
Buildings deviating from the limitations listed are outside the scope of this document. However, an economical SuperSlab solution can still be adopted with specific engineering design. Contact Allied Concrete for further information and advice.

Table 2

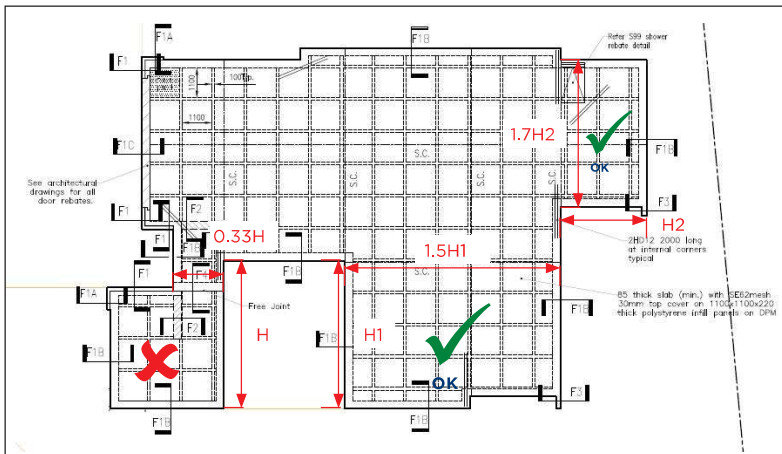
NZS3604/B1 penetrometer testing criteria for Geotechnical ultimate bearing	Number of blows per 100mm – upper 600mm subgrade	Number of blows per 100mm – below 600mm subgrade
300 kPa (good ground)	5	3
200 kPa	3.33	2
150 kPa	2.5	1.5
MBIE/Stockwell penetrometer Criteria testing criteria for Geotechnical ultimate bearing	Number of blows per 100mm – upper 600mm subgrade	Number of blows per 100mm – below 600mm subgrade
300 kPa	3	3
200 kPa	2	2
150 kPa	1.5	1.5

Foundations shape requirements

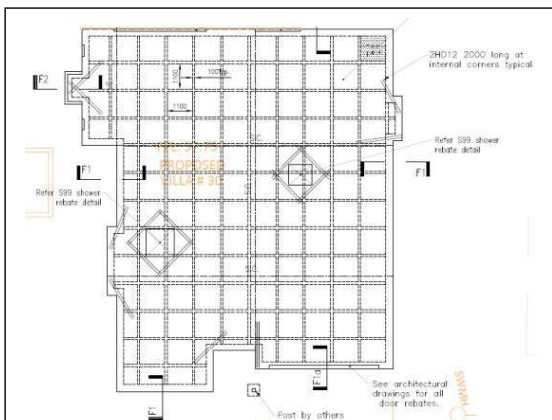
Two foundations connected by a narrow corridor will require specific engineering design (SED) and appropriate free joint detailing. Narrow corridors can be defined as a width less than 50% of the width of the smaller of the adjacent slab (W) areas as per example below. Foundations of this layout are beyond the scope of this document.



Projections which extend out from the slab by H need to be maintain a minimum width of 0.5H to fall within the scope of this manual. Projections smaller than 6m² need not comply with this requirement



Projections are permitted providing they are regular and a minimum area to perimeter ratio of 1 is maintained for the foundation has a whole. Detailing of control joints (saw cuts) and re-entrant corners is important to minimize the risk of shrinkage cracking for buildings with projections.



3.2 Ground conditions

SuperSlab systems have been developed for 'good ground' in accordance with NZS3604 (and the definition from the New Zealand Building Code B1) with custom bearing requirements as per Table 1 for the different building types A-E.

The New Zealand Building Code places the responsibility on the designer to confirm the soil conditions or to nominate a representative to undertake site verification of the of the soil conditions prior to construction. Refer B1/VM4 - 2.0.8. The conditions of SuperSlab require confirmation of "good ground" by the designer and local building authority prior to construction. The designer shall discuss with the local building authority and obtain their geotechnical reporting requirements for the building consent process. Often local building authorities will have hazard maps for liquefaction, expansive soils, instability and low bearing strengths that can be utilized to aid the designer with establishing "good ground". It is highly recommended the designer obtain a project specific geotechnical report prior

to building consent to establish the site soil conditions and confirm the site is suitable for a SuperSlab.

"Good ground" is defined by NZS3604 and items 1-4:

1. Consistent bearing capacities of the building platform and underlying soils as per NZS3604 and per Table 1 for given building types A-E.
2. Stable platform, free from any instability or settlement from any scenario where vertical movement greater than 25mm over the 50-year design life is expected. Refer NZS3604 - site requirements for further information.
3. Slightly expansive soils, with a maximum characteristic movement (Y_s) of 20mm as per AS2870.
4. Filled platform - Confirm Items 1-3 on the cut platform. Imported fill (well graded compacted hard fill or suitable fill material approved by a geotechnical engineer) less than 600mm deep placed as per NZS4431 and NZS3604. Cut and fill batters to be completed in accordance with NZS3604 and figure 5 and 6.

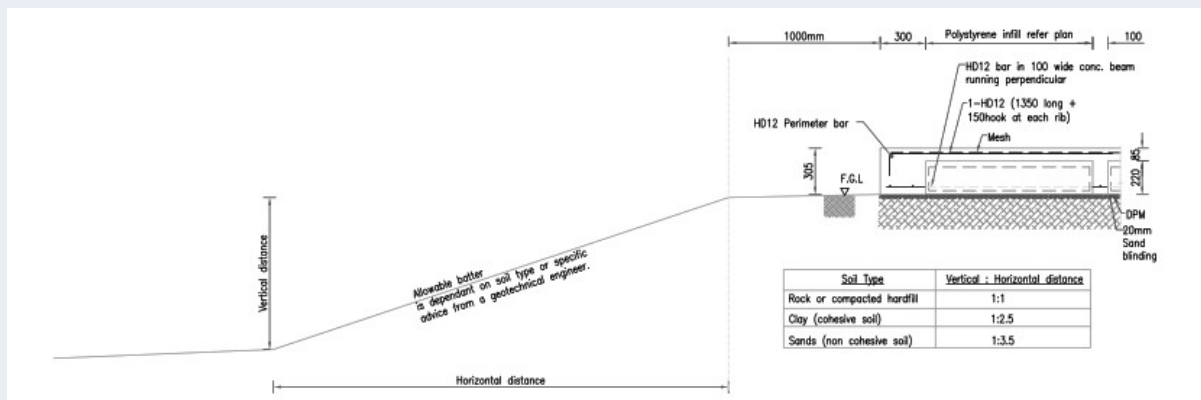


FIGURE 5 – Safe batters for raised building platform

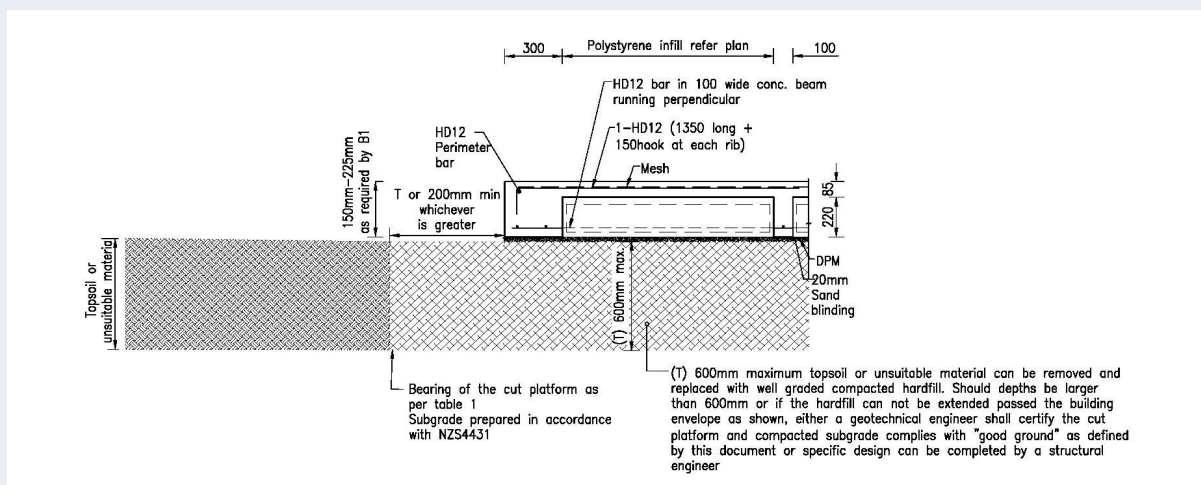


FIGURE 6 – Deep top soil subgrade limitations (Updated)

The following are conditions excluded from the definition of “good ground” and are beyond the scope of the SuperSlab Technical Manual.

5. EXPANSIVE SOILS - Cohesive clays may be prone to drying out and shrinking or expanding and heaving with seasonal moisture changes. Clay or cohesive soil with liquid limits of more than 50% or linear shrinkage of more than 15% as per NZS4402 (test 2.2 & 2.6) shall be classified as expansive soil, prone to seasonal shrink swell movement. Any movement greater than 25mm is beyond the scope of NZS3604 and the definition of good ground. For example, class M (moderately expansive, $Y_s = 40\text{mm}$) or class H1/H2 (Highly expansive, $Y_s = 60, 75\text{mm}$). The soil class as per B1 NZBC shall be determined before building on any cohesive soils.

6. TOPSOIL AND PEAT - Construction on organic topsoil or buried organic material (peat). Peat and any organic material can be prone to decay and settlement over time and when loaded. Buried top soil is common in swampy areas or sites with uncertified fill such as landfills or re-contoured sites (Uncertified earthworks).

7. BUILDING PLATFORM AND BEARING STRENGTH - Soft or weak soils with bearing strengths below 50-67 kPa allowable bearing as required for given building type as per table 1. Soil can be soft for a number of reasons however the most common reason is due to poor compaction and consolidation. Fluctuating ground water can also cause soils to lose bearing strengths. Consistent bearing capacity across the building platform is also very important. If there is significant variability of the bearing strength across the building platform this can result in differential settlement which needs to be considered with specific engineering design of the foundations.

8. SITE INSTABILITY - whether global or local.

- Construction within “close proximity” (1:2, vertical to horizontal) of any retaining walls, existing or proposed
- Construction on sites within slopes steeper than 5 degrees and as defined by NZS3604. If there are any signs or historical instability a full investigation by a chartered geotechnical engineer is required to determine the conditions and recommend foundation design parameters

9. UNCERTIFIED FILL AND BRIDGING.

Construction on any uncertified fill of any depth is prohibited. Uncertified fill can be defined as disturbed soil which has not been placed and properly compacted and as such is prone to settle under self or imposed load. Construction near any buried services, detention tanks or soakage trenches also requires specific design. Construction above or near services or soakage trenches can often encounter uncertified trench back fill or ground that is unstable. Where public services are identified near the foundations, the local building authorities shall be consulted as there are often minimum design standards required to protect their assets. If piling and bridging is required, piling parameters shall be provided in the geotechnical report and will need to be designed by a structural engineer and are beyond the scope of this document.

10. LIQUEFACTION - Construction on sites with liquefaction risks (resulting in settlement beyond B1 limits as defined in item 2 above). Loose sand and silts soils (non-cohesive) in combination with high ground water. Sites with significant risk are usually located around river deltas or reclaimed land with extensive silt and or sand deposits. Most local councils have hazard risk maps to aid in identifying these sites as Liquefiable soils are excluded by the building code

NOTE:

Foundations constructed or proposed on sites with any of the above soil conditions (items 5-10) may still be accommodated by a SuperSlab system however will require specific engineering design from a structural engineer. The structural engineer will most likely require design parameters covering the items 1-10 and these shall be addressed by a geotechnical engineer carrying out the investigation. A geotechnical engineer is able to certify ground improvements (cut and fill) to confirm the building platform achieves “good ground” and satisfies the requirements of this manual to allow the designer to proceed with an SuperSlab system. It is recommended the designer obtain a statement and inspection schedule from a chartered geotechnical engineer confirming the conditions of this manual are achieved by their subgrade design which shall be submitted to the building consent authority.

3.3 Lateral resistance under wind and earthquake

Lateral resistance to sliding under wind or seismic actions is generally resisted by friction between the slab and the ground surface. Seismic action generally governs the design for sliding rather than wind loading.

SuperSlab systems have been designed for seismic loading allowing for a maximum hazard factor of 0.45 and class E soils as per NZS1170. Refer figure 7 and 8 below for seismic hazard map of New Zealand.

The design criteria set by NZS1170.5 allows for a serviceability limit state earthquake (SLS) and an ultimate limit state earthquake (ULS). The severity, probability and required performance for these two events are very different.

A SLS event is a relatively small earthquake which has a higher probability of occurring over the design life of the building (50 years). As such the required performance of the foundation is to withstand the earthquake with no structural damage and minimal cosmetic damage. The building is to remain useable following the earthquake. The frictional resistance provided by the slab against the ground will be sufficient to resist that SLS sliding force of the earthquake. Any movement is very unlikely in an SLS event.

An ULS event is a large earthquake which has a lower probability of occurring over the design life of the building. Given the lower probability of such an event the required performance is to preserve life safety. Structural and major cosmetic damage is expected. In higher seismic areas with Z factors of 0.15 and above, it is likely the acceleration of the earthquake will be large enough to overcome the frictional resistance provided by slab against the ground surface. Thus, the slab would be expected to slide. The foundation is designed to withstand the sliding forces generated (based on a co-efficient of friction of 0.6).

Protection of services (refer figures 9, 10,11 &12)

Following the Canterbury earthquakes MBIE released a guidance document that recommends specific detailing of the plumbing services either within the foundation depth or beneath the slab. Both options require flexible connections outside the building perimeter and flexible lagging around the pipe where the pipes penetrate up through the slab. This is to avoid critical damage to the services under the slab in the event of an ULS earthquake. There is no requirement for this detail, as major structural and cosmetic damage is permitted in a large earthquake, however the services are a critical element in maintaining the economical repair of the house following a large earthquake.

SuperSlab systems require all plumbing pipes to be installed as per Figure 9 for any sites with Z factors larger than 0.15. It is also recommended that the pipe penetration details are adopted on all other foundations.

Shear Keys (refer Figures 13 &14)

An alternate option which is more robust would be install shear keys. Shear keys consist of drilled piles (900mm deep) and are spread around the perimeter of the slab. These piles are designed to lock the slab into the ground and prevent the foundation from sliding. The number of shear keys required is dependent on the seismic zone, building type and the area of the floor slab. Shear keys are not to be used in areas where there is a risk of lateral spreading from liquefiable soils. If shear keys are desired they shall be specifically designed and are outside the scope of this document.

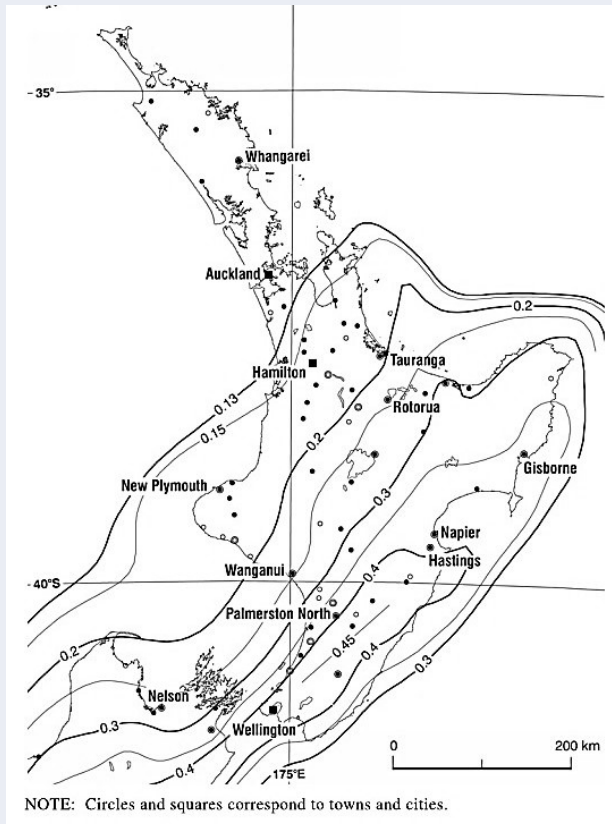


FIGURE 7 - Seismic hazard factors North Island © Standards NZ NZS1170

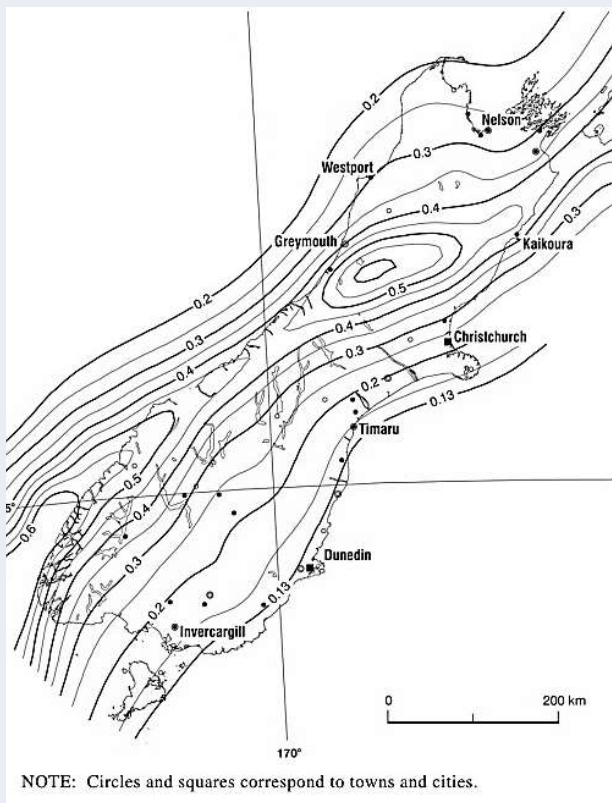


FIGURE 8 - Seismic hazard factors South Island © Standards NZ NZS1170

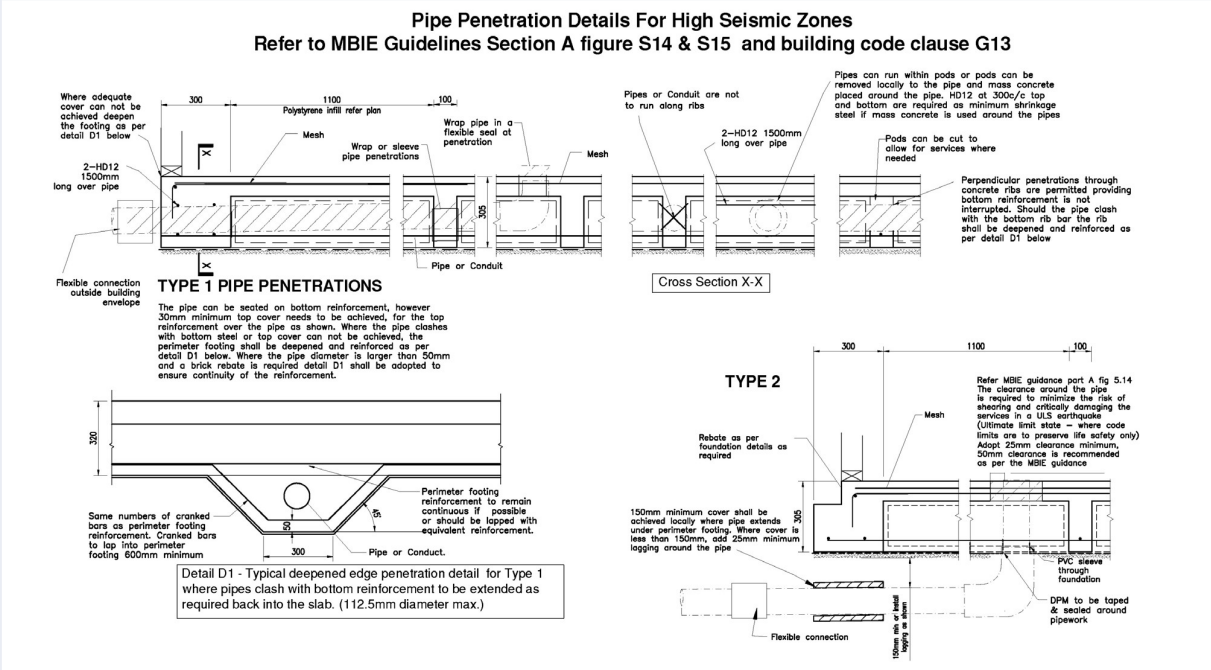


FIGURE 9 - Pipe penetration details

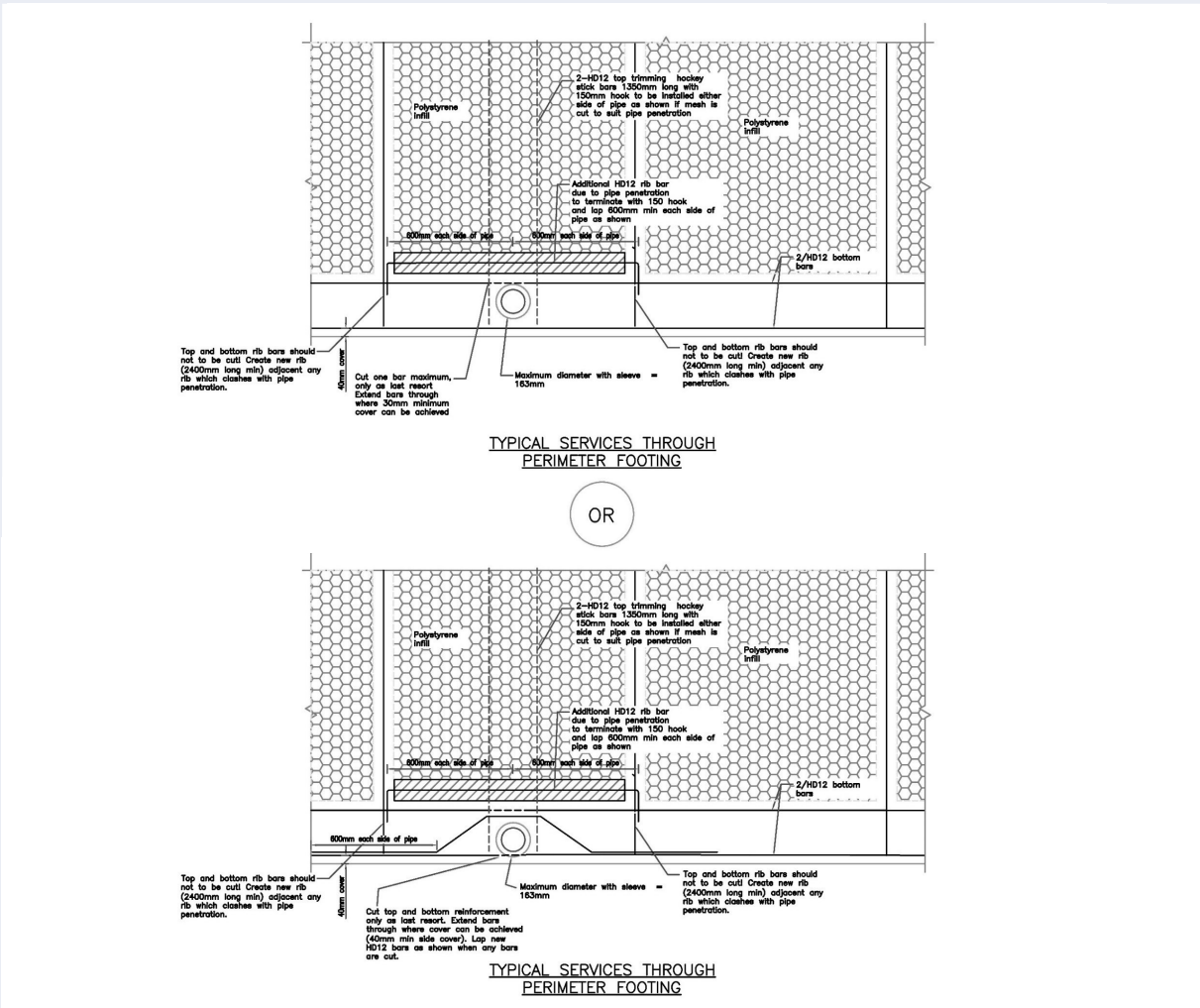


FIGURE 10 - Pipe penetration in perimeter footing

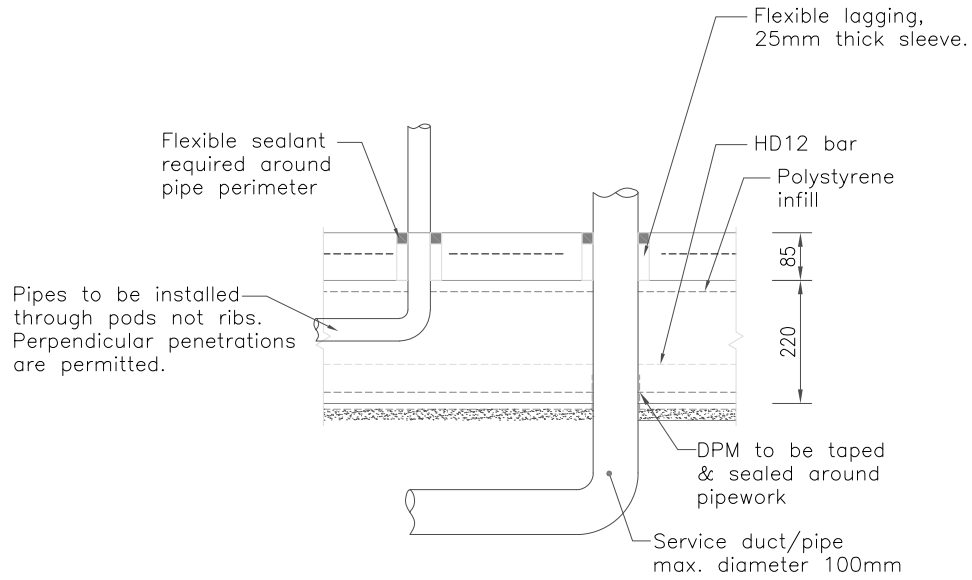


FIGURE 11 - vertical penetrations

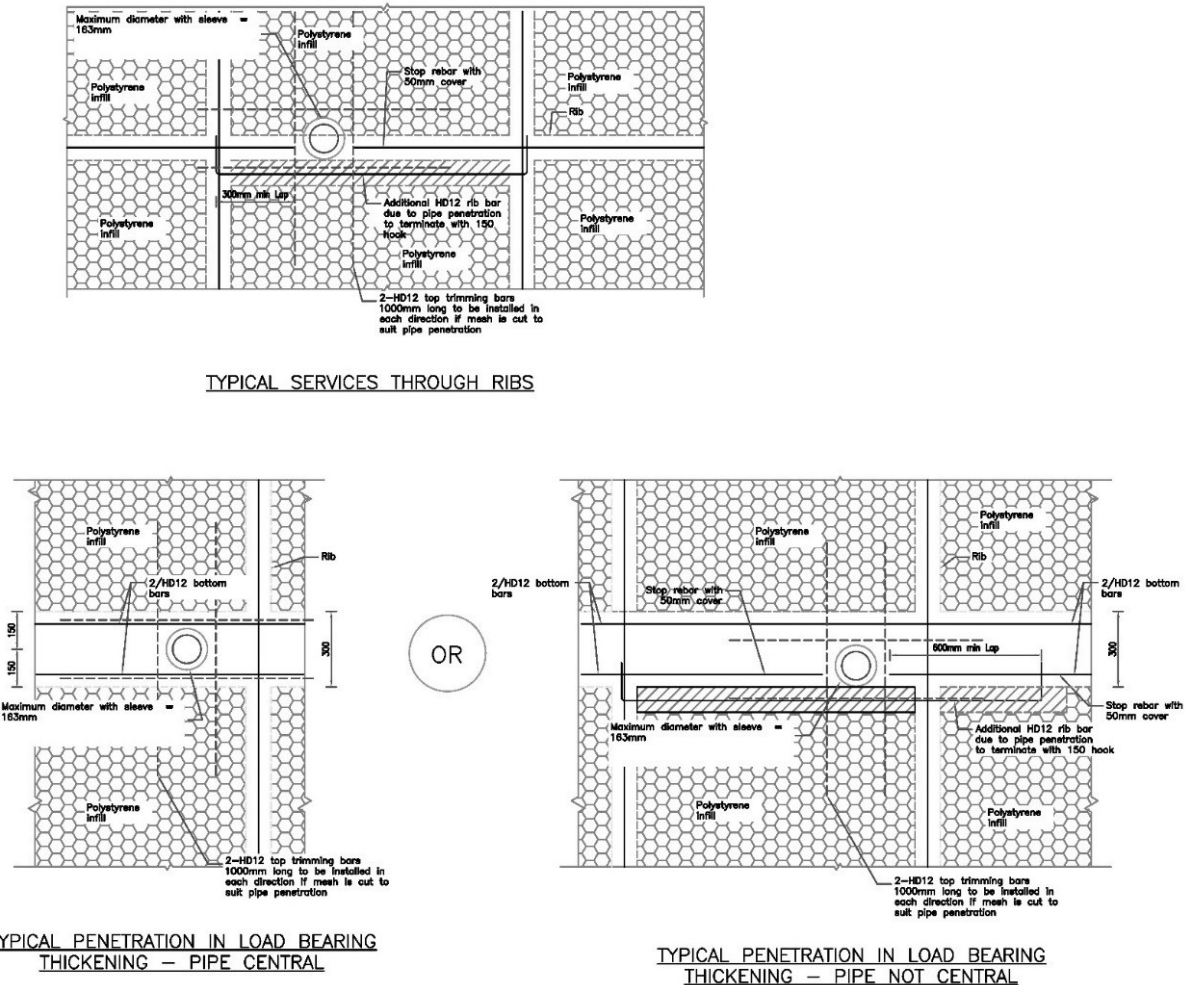


FIGURE 12 - vertical penetration through external footing or rib

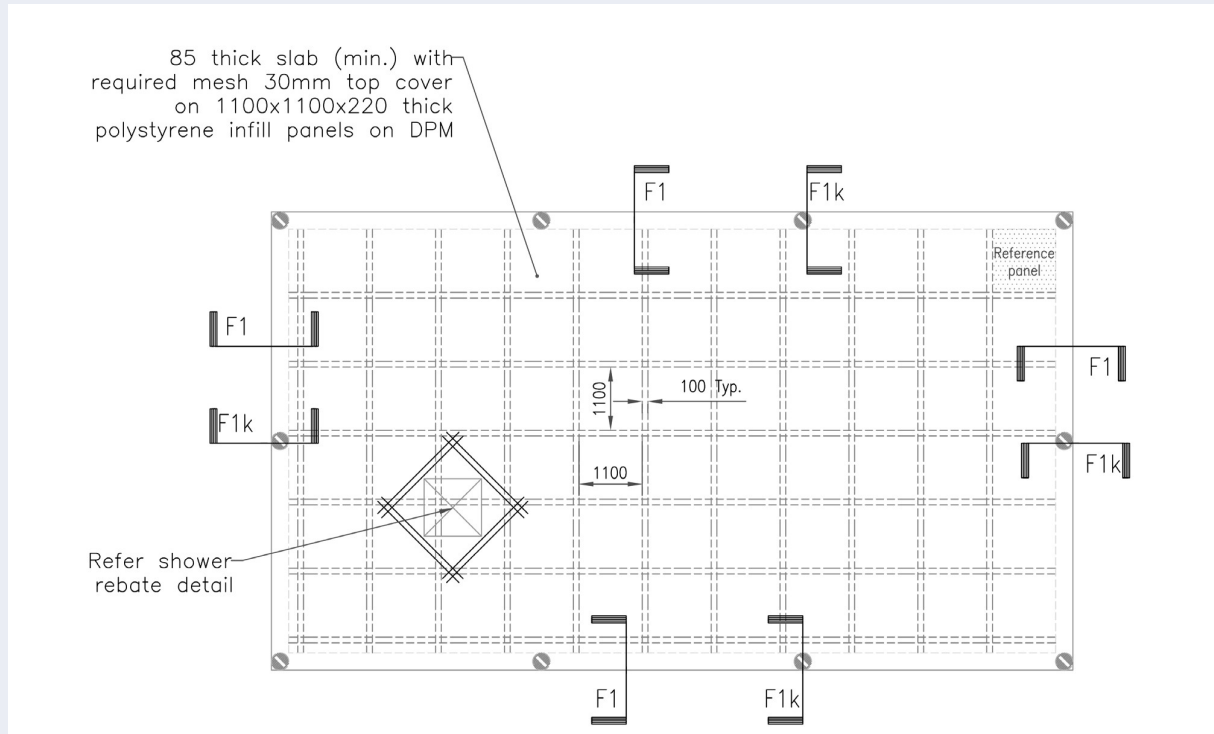


FIGURE 13 - Shear key layout

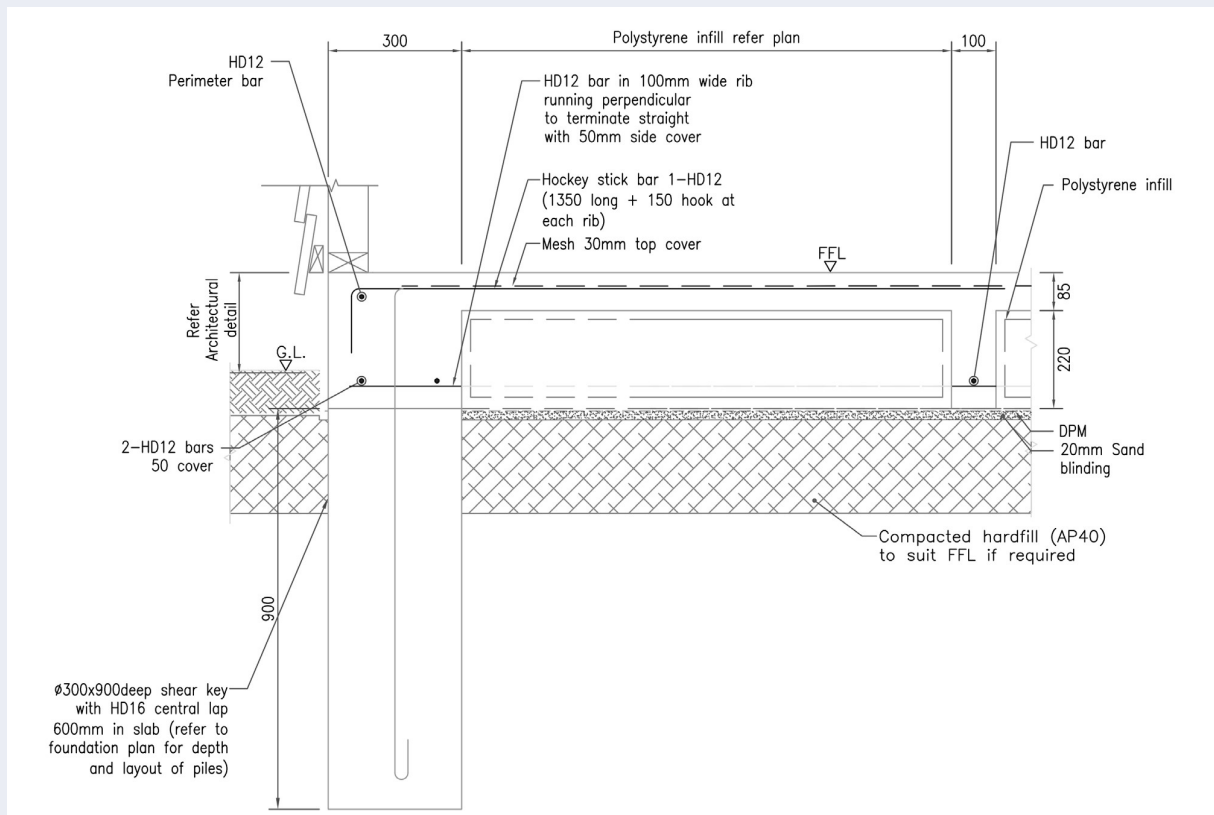


FIGURE 14 - Typical shear key detail

3.4 Weights and loadings

SuperSlab systems allows for standard residential and garage loading as per NZS3604, NZS1170 and maximum loading as per the below.

Dead or permanent loads

- Heavy roof loading 1.0 kPa - including cladding, roof framing, insulation and ceiling
- Light roof loading 0.5 kPa - including cladding, roof framing, insulation and ceiling
- First floor (timber) – 0.6 kPa - Including joists, nogs and services, flooring and lower level ceiling
- Lower level heavy cladding - 2.2 kPa (220 kg/m²)
- Upper/lower level light cladding - 0.6 kPa (60 kg/m²)

Live or imposed loading

- First floor loading 2 kPa
- Slab loading 3 kPa with 2.7 kN point load
- Slab loading of 2.5 kPa with 13 kN point load applied over an area of 300mm x 300mm
- Max vehicle weight of 25 kN or 2500 kg
- Max Snow loading as per sections 15 of NZS3604 – (2kPa, refer figure 15.1 of NZS3604)

Load bearing walls and point loading from beams, lintels and girder trusses.

Where line loads from load bearing walls exceed 10kN/m, internal thickenings shall be installed as per figure 18. Where thickenings are used the designer shall also confirm loadings do not exceed limitations as defined in 3.1 and 3.4 above.

Internal point loads (larger than 13kN) from posts or studs supporting beams, lintels or girder trusses will require a pad or thickening (1.2m long minimum and 300mm wide, located centrally to the load) as per figure 19. Point loading shall not exceed 30kN (ultimate limit state, 1.2G+1.5Q). Larger point loads are beyond the scope of this document however could be detailed by specific design such as by the truss designer.

Point loading on the perimeter footing exceeding 20kN shall require a pad as per figure 20. Point loading exceeding 30kN are beyond the scope of this document.

4.0 - INSTALLATION INFORMATION

The following section outlines the standard installation details for SuperSlab systems designed in accordance with this technical literature. Nonstandard or specially designed projects may require site specific specifications. The consented drawings, NZ Building Code and current best practice shall be adhered to at all times.

If Specific engineered design (SED), all construction shall be inspected by an engineer, the council and/or an approved representative of Allied Concrete who has been specifically trained prior to pouring any concrete.

Codemark compliant SuperSlab systems must be supervised by suitably qualified LBP with relevant carpentry or foundation qualification.

All bending of bars shall be carried out in accordance with NZS 3101. Minimum bend diameters for main reinforcing bars (between 6-20mm dia.) bar shall be 5 x diameter of the bar (db) measured to the inside face of the bend.

All bar laps shall be 50 x db or greater.

4.1 Site preparation and Earthworks

All topsoil, organic material and any soft soil (below design bearing strength) shall be removed from the building platform (refer figure 6) and in accordance with the building consent specification and as per section 3.0 above. Any isolated soft spots shall be excavated to a depth where adequate bearing is achieved.

Compacted hard fill (well graded AP40) or geotechnically approved fill material may be required to achieve the finished floor levels.

It is very important to achieve adequate compaction of a filled subgrade. The earthworks contractor shall compact granular fill in 150mm maximum layers in accordance with NZS4431 and NZS3604 (section 7.5.3). Fill depths exceeding 600mm thick, will need to be certified by a geotechnical engineer to achieve a minimum of 95% compaction of the maximum dry density as determined by test 4.1.1 per NZS4402. The geotechnical engineer shall also confirm the building platform meets all the requirements of section 3.2 of this document.

Clay or cohesive fill shall be compacted to achieve the below as per NZS4431. Clay or cohesive fill shall be certified by a geotechnical engineer:

Minimum Shear Strength and Maximum Air Voids Method

AIR VOIDS PERCENTAGE

(As defined in NZS 4402)

Average value less than	8%
Maximum single value	10%

UNDRAINED SHEAR STRENGTH

(Measured by Pilcon shear vane - calibrated using NZGS 2001 method)

Average value not less than	150 kPa
Minimum single value	120 kPa

The average value shall be determined over any ten consecutive tests

The cut platform shall not be left exposed to dry out, this is particularly important in areas where expansive soils (clay soil) have been identified. Where a platform has been left exposed and there are prevalent cracks (10mm or greater) through the building platform it is important to consult with a geotechnical engineer to confirm remedial action prior to constructing the floor slab.

A clean sand blinding layer (10mm minimum, 20mm maximum) shall be installed on the cut ground level or on top of the certified subgrade layer. The blinding layer will create a level platform, reduce shrinkage forces in the floor slab and protect the DPM from being punctured by shape aggregates.

4.2 Damp proof membrane (DPM)

A continuous damp proof membrane shall be placed on top of the sand blinding layer over the entire slab area in accordance with NZS3604 section 7.5.4 – 7.5.6

Where polyethylene (polythene) sheet damp proof membrane is to be used, the material shall be not less than 0.25mm thick, have lapped joints not less than 150mm wide which are sealed with pressure sensitive plastic tape not less than 50mm wide. The DPM shall be protected from damage during construction. Refer section 4.14 for polished concrete

4.3 Set out & boxing

Site profiles, levels and positions on site shall be determined by the builder and/or surveyor. Any discrepancies in the dimensions shall be discussed with the architect as soon as possible.

Boxing of correct height and levels shall be erected around the perimeter of the slab

ensuring that any boxing supports do not penetrate the DPM layer.

All rebates whether for brickwork, garage door thresholds or joinery shall be allowed for in the boxing as per the architectural drawings.

4.4 Pod set out

The polystyrene pods shall be placed on the DPM layer within the perimeter boxing generally as per the set-out drawings provided.

Proprietary spacers can be supplied with the SuperSlab pods by Allied Concrete.

The set out of the pods shall ensure that the perimeter footing width (300mm wide) and rib width (100mm) is always maintained. The drawings and details shall be carefully checked to ensure the construction matches the consented design drawings.

Internal load bearing walls will be marked on the drawings and these also need to be accommodated in the pod set out (or cut into the pods if preferred).

A new reference point can be created providing the footing and rib thicknesses are maintained, ribs are kept continuous and all internal point loads or load bearing walls are supported.

Where pods require cutting to suit the dimensions and set out of the floor, care shall be taken to ensure that the remaining pods are no less than 200mm wide. Where narrow pods occur (less than 200mm width) then the pod shall be removed or the set out merged with an adjacent full width pod to create two narrower pods of 600-800mm wide with a standard 100mm wide rib between. Where footings or ribs are to be wider than detailed an extra HD12 bar shall be installed in the bottom of the footing or rib per 100mm increase in width.

The maximum pod size in all cases shall not exceed 1100mm x 1100mm square. Either depth of 220 or 300 deep polystyrene pods are acceptable providing they are detailed and installed in accordance with this document.

Qpods can be used as an alternative to polystyrene pods. The 1100mm x 1100mm square (maximum) void former is created by clipping four 550mm square Qpods together. Qpods can easily be omitted to allow for pipe service penetrations or pads to be installed. 100mm wide extension pods can also be clipped onto the side of the pod where the spacing is less than 550mm wide to reduce concrete consumption. Refer section 6.1 for detailing.

4.5 Perimeter foundations

The perimeter edge beam is typically 300mm wide however larger widths could be specified when ground conditions or edge detailing of cladding dictate this in the specific design.

Typically, 2 HD12 bars (Grade 500E deformed bars) are used for bottom steel in the footing and 1 HD12 used as top reinforcement where required. The bottom bars shall be placed onto bar chairs to achieve 50mm bottom and side cover.

HD12 starter bars (Hockey stick bars) are used at 1200mm centers (or at the top of each rib). These are 1350mm long with a 150mm hook anchoring the footing to the floor slab. This is particularly important for slabs with large rebates such as brick veneer clad houses. The large rebates prevent the mesh from achieving the required anchorage into the perimeter footing. The Hockey stick bars also give the Superslab the strength it needs to tolerate up to 25mm differential settlement as defined by B1 NZBC. Hockey stick bars of varying lengths are specified in specially designed foundations depending on site conditions and levels of soil expansiveness. Hockey stick bars shall be tied underneath the mesh to ensure 30mm minimum top cover to all the reinforcement. The top HD12 longitudinal bar is tied perpendicular to the underside of the hockey stick bars. All the reinforcement shall be sufficiently chaired so that the mesh maintains 30mm top cover and all reinforcement maintains 50mm side cover.

The perimeter footing may have rebates to accommodate exterior cladding details such as bricks, garage door rebates, and full height joinery rebates. The rebates shall be coordinated and set out in accordance with the architect's drawings. The maximum permitted rebates are 150mm wide by 120mm deep or 200mm wide and 25mm deep.

4.6 Internal ribs, Load bearing thickenings & Pads

A standard internal rib is 100mm wide and has 1 HD12 bar located in the bottom of the rib with 50mm cover to the DPM.

Extra wide ribs or ribs with additional reinforcement including links (shear reinforcement) can be specified to suit site specific design requirements and where required will be detailed on the engineering drawings.

Ribs shall run from one side of the slab to another in a straight line. If an offset is created a 300mm slab thickening is required and terminating rib bars shall be anchored into the 300mm thickening with a 150mm hook and 250mm development length. HD12 rib bars shall be lapped (600mm minimum) where required. See

figure 18 for the internal slab thickening detail.

Load bearing walls, internal and external point loads shall be detailed in accordance with figures 18, 19 and 20.

Proprietary 15kN hold downs for brace walls often require a 100mm minimum slab thickness to achieve the required embedment. The Designer shall either detail thickenings (figure 18) under brace walls or alternatively adopt 100mm topping (if required in the anchor specification). The designer may also seek SED of the anchors to achieve the required rating into 85mm topping.

4.7 Mesh and Topping thickness

The mesh used in the 85mm topping is SE62 (or 2.29kg/m² minimum) grade 500 E as per NZS4671 and NZBC clause B1.

The mesh shall be supported on 40mm chairs for an 85mm topping. Proprietary Castle G25/40 bar chairs are to be used or equivalent bars chairs complying to AS/NZS 2425:2015. Longitudinal rail bar chair chairs without specific testing to confirm there is no reduced performance in shear and flexural capacity of the topping slab are excluded from this document and shall not be used. The chairs shall be located on top of the polystyrene pods and be of sufficient number to ensure the mesh does not sag excessively between support points. Top covering on mesh shall be 45mm maximum and 30mm as a minimum. Qpods have bar chairs built into the pods to support mesh to the appropriate cover and have been load tested to confirm topping performance is not compromised.

Topping thickness shall be a minimum thickness of 85mm in all locations. There is no acceptable construction tolerance for the topping thickness less than 85mm especially in the garage area. Where underfloor heating or polished concrete is specified the topping shall be increased to 100mm. Bar chairs and top cover to mesh to shall be maintained as specified above. Toppings greater than 100mm thick will require increased mesh reinforcement to meet minimum shrinkage requirements of NZS3101 and will require specific engineering input and are beyond the scope of this document.

Where underfloor heating is specified, the pipes shall be no larger than 16mm diameter. It is recommended the underfloor heating pipes are installed below the mesh. This is to avoid increasing the top cover to mesh and to avoid the risk of damaging the heating pipes when saw cuts are installed. Increasing the mesh top cover would increase the risk of shrinkage

cracking and as such shall be avoided.

As outlined in 4.6, 100mm topping may also be selected by the designer to comply with minimum slab thickness which are required by proprietary bracing hold downs

4.8 Reentrant corners

At re-entrant (internal) corners additional steel is required to reduce the risk of cracks propagating from the internal corner into the slab. The additional steel will be indicated on the drawings and consist of 2 HD12 bars, 2000mm long placed diagonally across the corners. Spaced 100mm apart with the first being located with 50mm side cover to the corner. Corner bars shall be installed parallel with a sawcut if there is a sawcut to be installed at the reentrant corner. Should sawcuts be installed in each orthogonal direction of the corner than diagonal bars are not required, refer figure 1.

4.9 Concrete placing, finishing and curing.

PLACING

The design documentation will specify the required mix code for each design.

It is important to explain the placement method to Allied Concrete to ensure the appropriate mix is supplied.

Only Allied Mix code 252CSS shall be used for 25 MPa applications or Mix code 202CSS used for 20 MPa applications. Refer polished concrete section below (4.14 for polished concrete mix code).

Failure to use the correct Allied concrete mix specified will breach the conditions of the Codemark and may prevent the foundation from obtaining a Code Compliance Certificate (CCC).

Concrete placing shall be carried out by experienced personnel and shall be carried out strictly in accordance with NZS3109

No water shall be added to the as delivered concrete unless approved by the design engineer within the restrictions of NZS3104 clause 2.9.3.1

Concrete shall not be placed until all reinforcement has been inspected by the engineer, council and/or an approved engineer's representative. Failure to carry out a pre-pour inspection may result in difficulties in obtaining a CCC.

Care shall be taken during the pouring process to ensure that the polystyrene pods do not

move around. Ideally concrete shall be placed on top of each pod prior to infilling between the ribs to prevent pod flotation or movement during concrete placing.

The concrete shall be placed so that its working face is generally vertical, and normal to the direction of placing. It shall be placed over the width of the slab in such a manner as to minimize segregation.

Concrete shall be thoroughly vibrated around all steel and against all boxing and formed rebates within the perimeter of the slab, as per code and best practice requirements.

Where good access exists around the site and sufficient labor is employed then the concrete can be placed directly from the truck using the chute or wheel barrows. If these methods are used it is important that the mesh reinforcement and pods are protected from wheel barrow traffic and correct covers are maintained.

Alternatively, a slump pump can be used with either 13mm or 19mm aggregate.

FINISHING

The top surface of the slab shall be screeded immediately after placing/vibration has been completed.

Screeding shall be carried out with a level as a reference to ensure the top surface is finished within tolerance.

A trowel and an edging tool shall be used to finish the slab to a U3 finish in accordance with NZS3114. The finish surface shall be blemish free with all slab edges tooled off to form a rounded edge to help prevent cracking.

CURING

Foundations shall be cured for at least 7 days in accordance with NZS3109. If this process is omitted or modified the contractor will need to take responsibility for controlling shrinkage.

When the possibility of heat, wind, rain or low humidity could induce premature drying of the top surface the contractor shall either delay the pour or take appropriate actions to mitigate plastic cracking forming in the surface of the slab. One such option is to apply an anti-evaporation agent over the concrete surface after screeding to mitigate excessive evaporation of water from the concrete surface. Additional curing measures including ponding of water on the surface of the slab, sprinkling the slab surface regularly or the use of wet sacking placed over the slab can also be adopted.

Where a large change in ambient temperature is expected during the first 24 hours such as a very cold night then continuous wet curing via ponding or sprinkling is recommended to

mitigate thermal shock and cracking in the slab.

Mitigating shrinkage cracking shall also be discussed with the concrete supplier to allow for an adequate mix or concrete additives to be utilized where appropriate.

The surface finishes specified in the building consent documentation need to be achieved by the contractor. These may include colored or polished concrete. The concrete mix and curing method shall be selected to achieve the specified finish.

4.10 Saw cutting (control joints) and free joints.

Saw cut joints shall be cut into the slab within the 24 hours or as early as possible, once the slab is sufficiently hard to walk on.

Saw cuts shall be 20-25mm deep (for the standard 85mm topping). For thicker toppings deeper saw cuts will be required of approximately 1/4th of the topping thickness. Saw cuts shall be made where indicated on the drawings.

Re-entrant corners are at higher risk of cracking due to differential stresses developing in the slab with different rates of curing on the exposed edges than compared with the internal slab. Saw cuts shall be installed at re-entrant corners and at 6m x 6m (maximum) spacing or located to create squares where possible. Refer 4.14 below for polished concrete. Creating a square or regular cut patterns will aid in mitigating differential curing in the topping resulting in shrinkage cracking.

Slabs longer than 30m will require a free joint, which shall be installed as per figure 21 and 33 of this manual. It is important that top reinforcement stops either side of the sawcut and the bottom reinforcement extends perpendicular to the free joint. Should the free joint not be perpendicular to the length of the slab it will not work, and this detail will require specific design. The bottom reinforcement is to extend a minimum of 1200mm either side of the joint and be debonded as per figure 21 and 33. Cladding and floor coverings in particular which cross the free joint need to be detailed appropriately to tolerate the horizontal movement which could occur.

4.11 Plumbing and pipe penetrations

There are two options for installing the plumbing services in combination with waffle slabs. The pipes can either be installed within the subgrade beneath the pods and concrete foundation or within the depth of the waffle slab itself.

Where falls allow and for all gas or critical ducting it is recommended the pipes are installed within the depth of the floor slab

(type 1) flexible lagging shall also be included around the pipes. Installing the pipes within the depth of the slab will mitigate the risk of damage occurring underneath the floor (where it would be difficult to repair) in the event of an earthquake.

Where pipes cannot achieve the required fall, or if the diameter is too large, these can be installed within the subgrade (type 2) and penetrate up vertically through the slab. Again, a clearance around the pipe shall be maintained (25mm minimum or recommended 50mm as per the MBIE guidance).

Pipes are not permitted to run along or within ribs and footings or penetrate up through ribs and footings without special detailing. Pipes are permitted to cross perpendicular through a rib or footing providing they can achieve the required cover refer figure 9.

Standard detailing requirements are to be followed for all standard SuperSlab foundation. Detailing beyond the limitations provided are beyond the scope of this document and would require specific engineering design.

4.12 Shower Rebates

SuperSlab systems have been designed to accommodate a 50mm deep shower rebate. Refer standard details as per figure 15. All pods in contact with the shower rebate are cut down by 50mm and mesh is lowered and chaired appropriately with the correct cover and lap. Trimming bars are required around the shower as per Figure 15. It is important the reinforcement of any perimeter footings, ribs or internal slab thickenings extending across or adjacent to a shower rebate are kept continuous. The maximum area of any shower rebate for SuperSlab systems is 4m². Larger or deeper rebates can be accommodated with specific engineering design and are beyond the scope of this document.

4.13 Wing walls

Small wing wall projections are permitted providing they are detailed as per section 6 of this manual and comply with the below:

- Maximum projection or cantilever from the slab envelope is 600mm
- Single storey with light weight cladding and a maximum height of 2700mm
- No point loading from girder trusses or beams on the 600mm cantilever

Any wing walls not complying with the above are beyond the scope of this document and may require specific design or detailing to NZS3604.

4.14 Polished Concrete floors

Where a Polished aesthetic is selected it is important to take extra precautions to mitigate shrinkage cracking. It is not practical to assume any slab will be crack free however the below will mitigate the risk of shrinkage cracking:

- The mix design may be tailored for the conditions and desired finish. As such it is important to discuss the conditions with your local Allied Concrete supplier before the pour.
- Sawcuts shall be reduced to 4x4m. These shall be installed as soon as practical and no later than 24 hours
- The slab shall be cured in accordance with NZS3109. I.e., flooding the slab for 7 days
- A double layer of DPM shall be adopted
- The polisher shall check the compatibility of the surface hardener with the concrete mix supplied prior to the pour and adjust as required
- Polished mix codes for 13mm or 19mm aggregate shall be as per the below
 - » 3013GRN
 - » 3019GRND

5.0 - LANDSCAPING AND ONGOING MAINTENANCE

Foundation maintenance shall be broadly in accordance with AS2870: Appendix B. Care shall be taken on clay sites which are expansive within the limits of section 3.2, as work and planting around the slab perimeter can have a detrimental effect on the slabs performance.

5.1 Paving and landscaping heights

The level of permanent paved, concreted and landscaped surfaces shall be kept within the limits stated in NZS3604 clause 7.5 (Figure 7.11 of NZS3604)

For paved or concreted surfaces the minimum step from the internal finished floor level to the finished exterior level shall be no less than 150mm.

For grassed or permeable surfaces the minimum step from the internal finished floor level to the ground level shall be no less than 225mm.

There may be further requirements by the architect or the local building authority in flood prone areas.

5.2 Excavation and retaining walls

Excavation next to the edge of the SuperSlab system shall be avoided where possible. Under no circumstances shall excavation take place which will undermine the edge of the slab

Excavation or construction of retaining walls (lower than the slab level) within a 1:4 gradient from the underside of the slab to the base of the excavation/wall shall be avoided. A qualified engineer shall design all retaining walls within this zone to ensure that loss of vertical and lateral support (during construction or permanently) does not occur.

5.3 Drainage of the site

Sands, silts and clays shall be protected from becoming extremely wet by adequate attention to site drainage and prompt repair of plumbing leaks.

The site shall be graded or drained so that water cannot pond against or near the building. The ground immediately adjacent to the building shall be graded to a uniform fall of 50mm minimum away from the building over the first meter. The site drainage shall be maintained for the design life of the building (normally 50 years)

The development of the gardens shall not interfere with the site drainage requirements. Garden beds immediately adjacent to the slab edge or undermining the slab edge in anyway are not permitted.

5.4 Gardens, trees and shrubs

Planting of trees shall be avoided near the foundations as they can cause damage due to drying of clay and result in excessive seasonal ground movement.

To reduce, but not eliminate, the possibility of foundation damage, tree planning shall be restricted to a horizontal distance equal to that of the mature height of the tree. Where rows or groups of trees are involved the above distances may need to be increased and specific advice shall be sort. Please note that removal of mature trees from the site can also cause issues with ground movement.

6.0 - STANDARD DETAILING

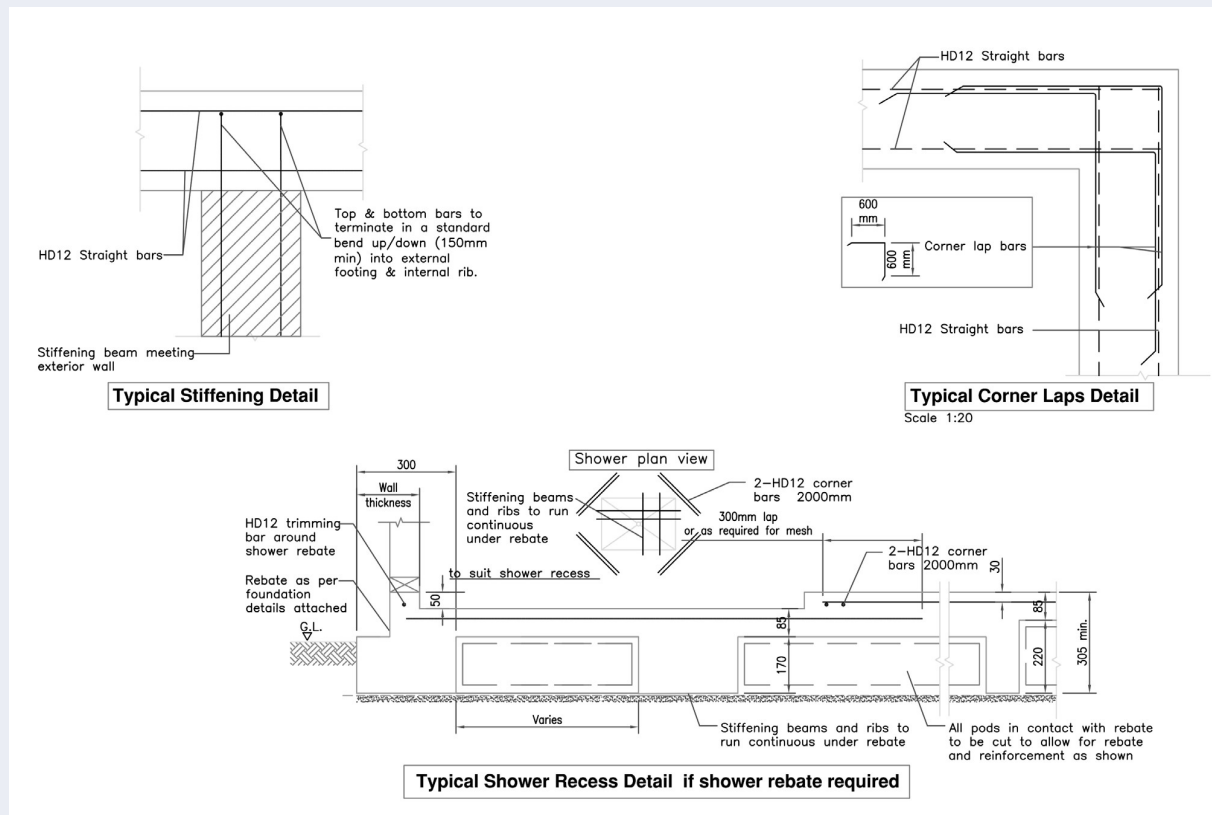


FIGURE 15 - Typical shower rebate details and corner bar lap detail

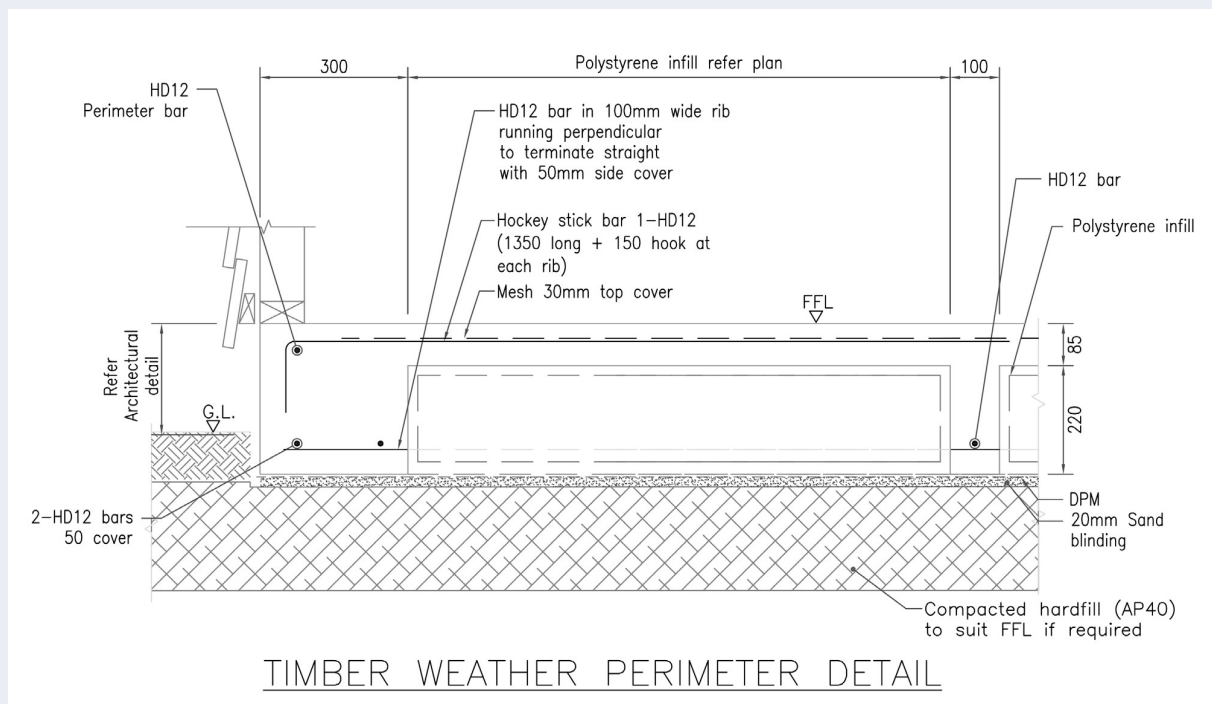


FIGURE 16 - Typical details - Lightweight cladding

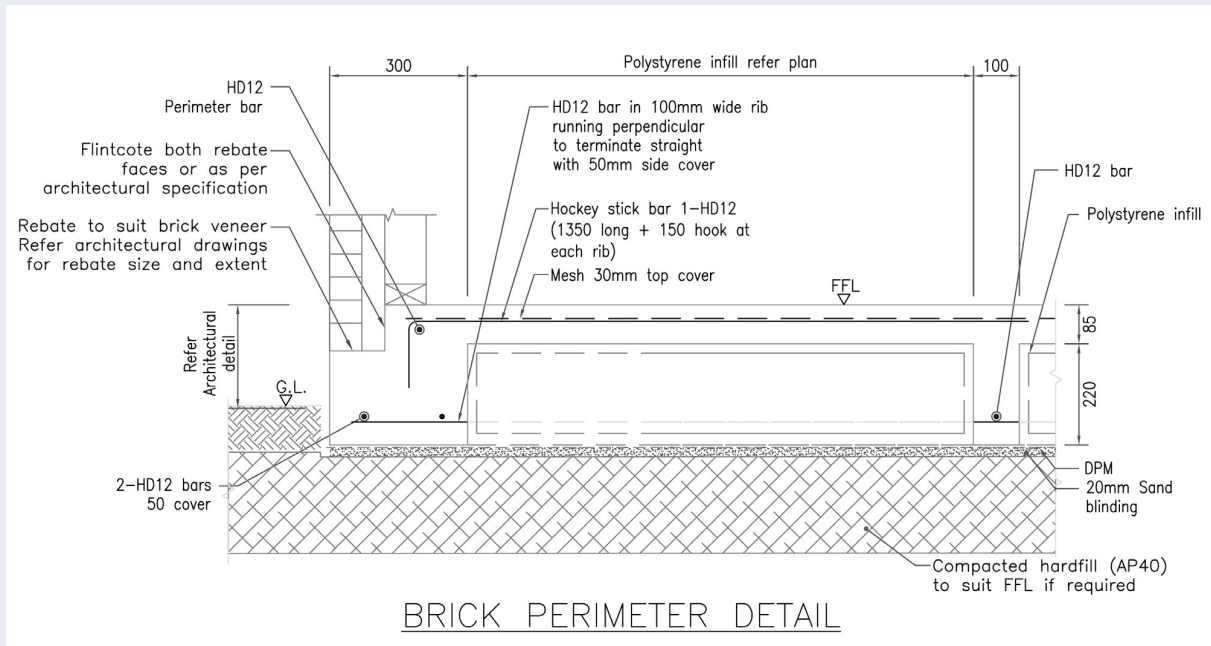


FIGURE 17 - Brick Rebate detail

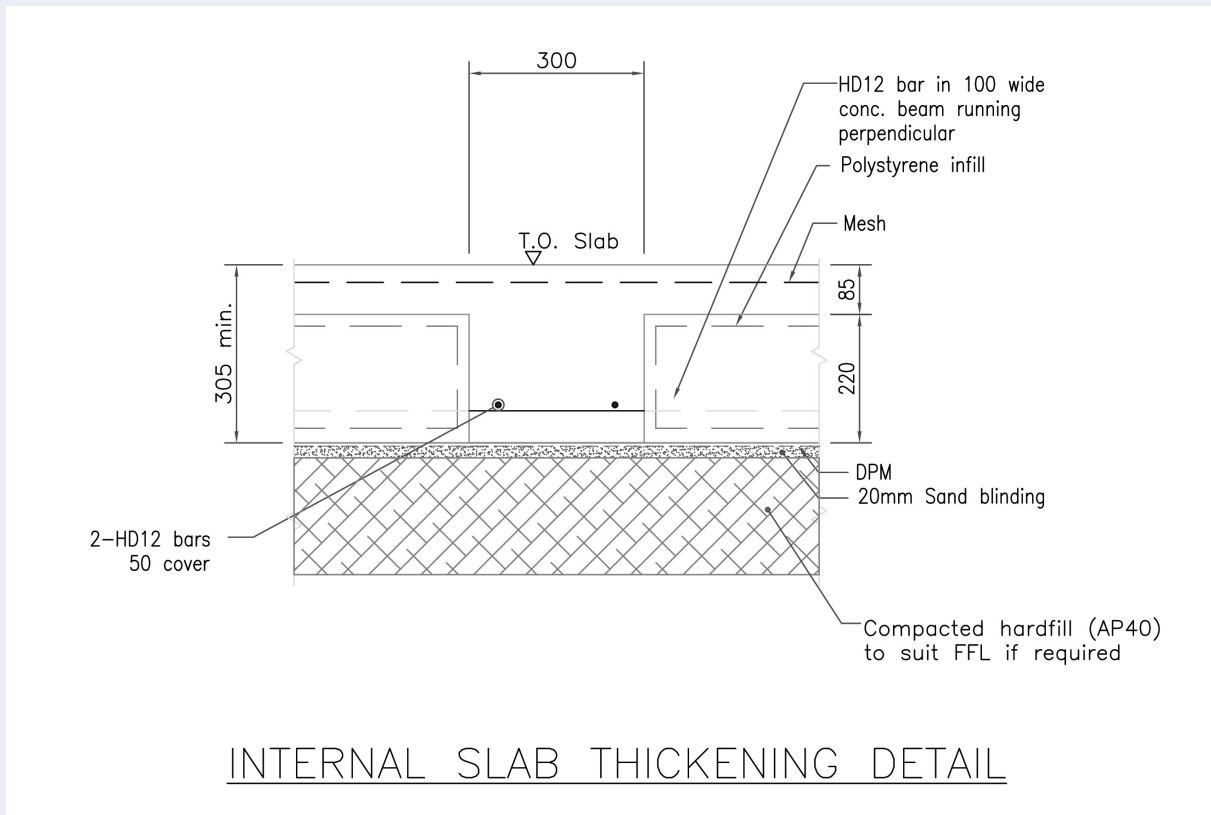


FIGURE 18 - Internal slab thickening

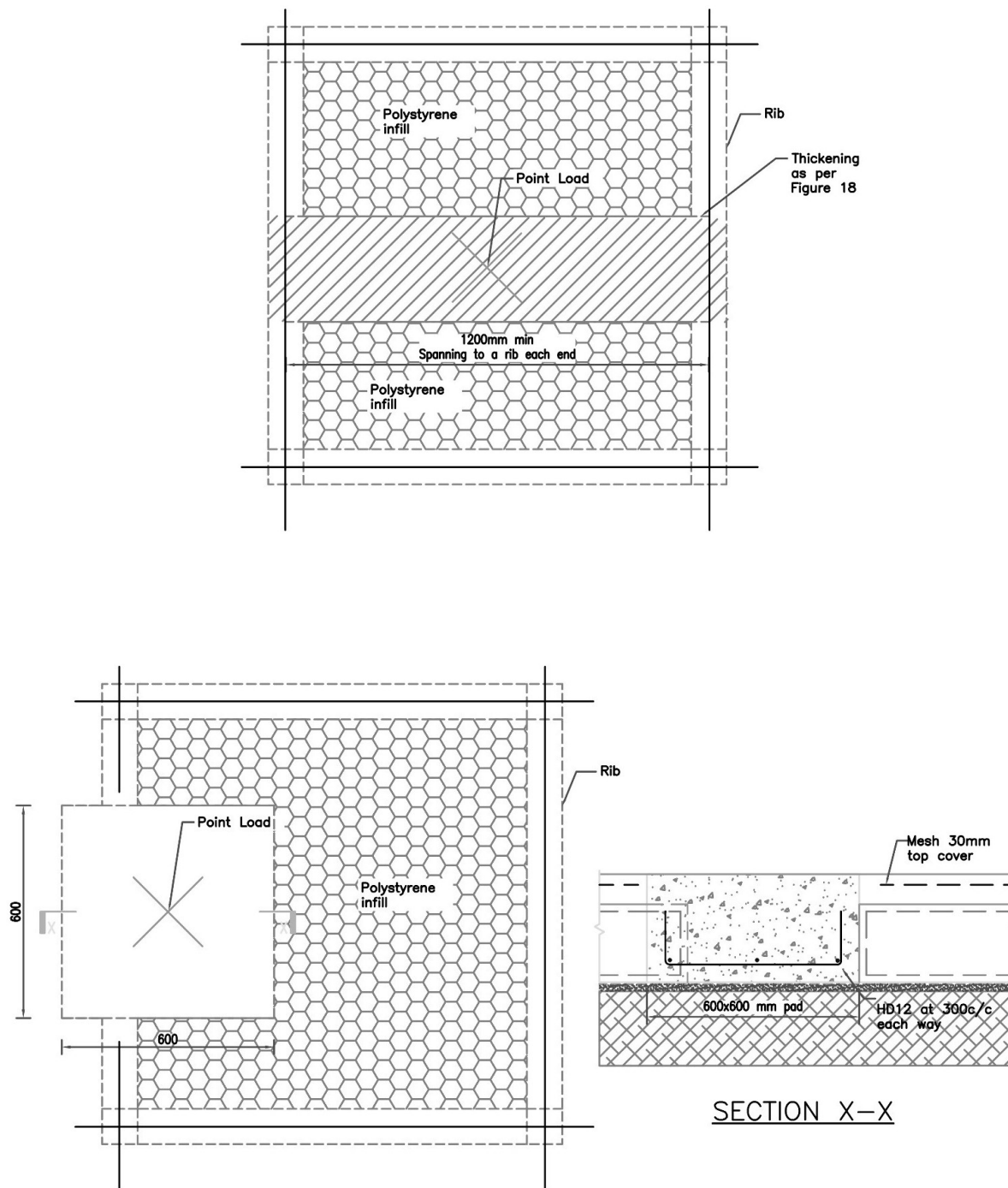


FIGURE 19 - Internal point loads larger than 13kN

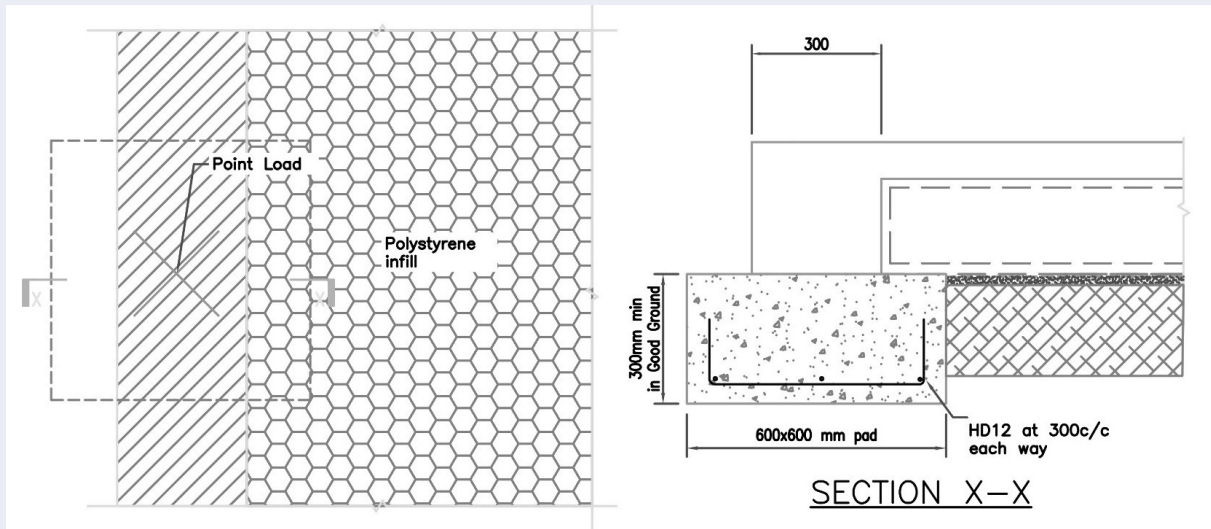


FIGURE 20 - Perimeter point loads larger 20kN

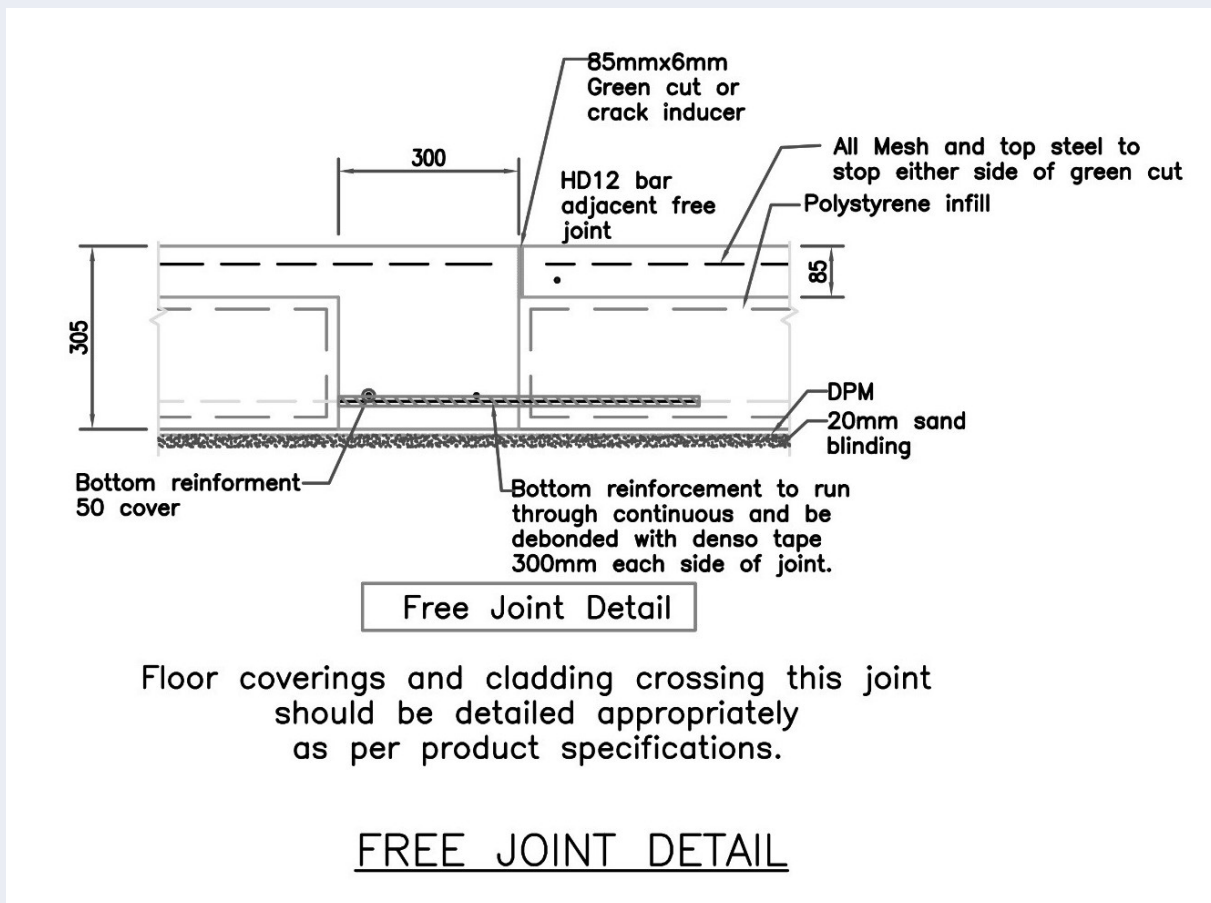


FIGURE 21 - Free Joint

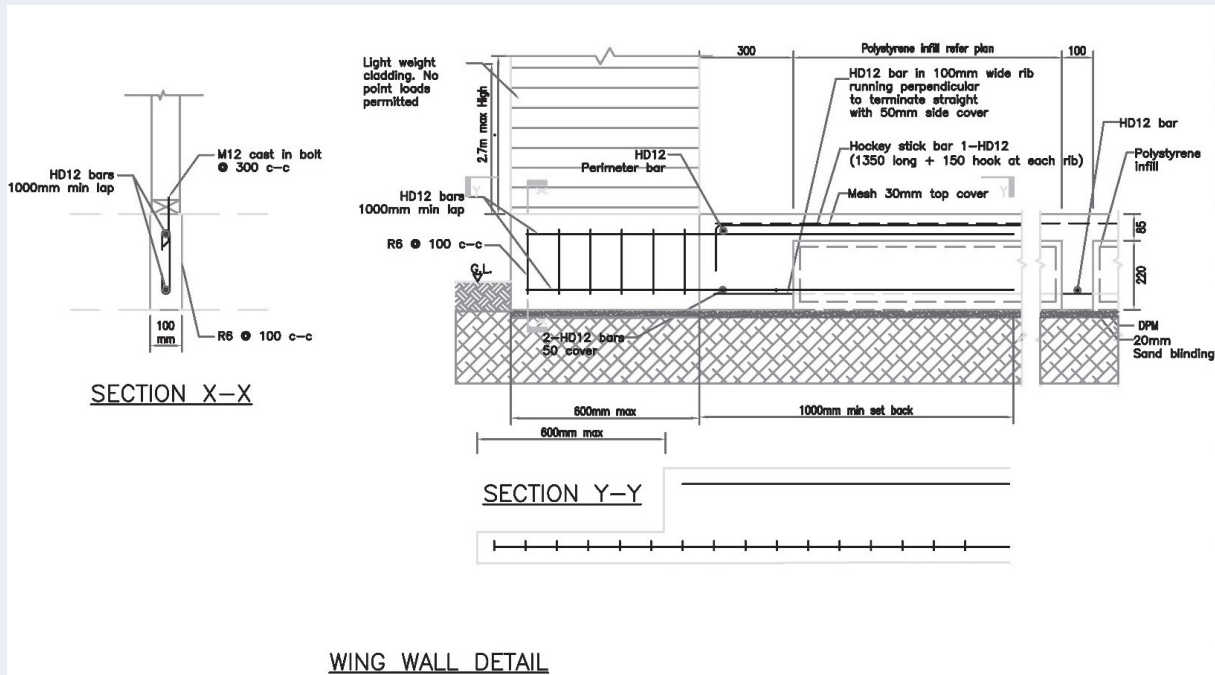


FIGURE 22 - Wingwall detail

6.1 Qpod substitutions detailing

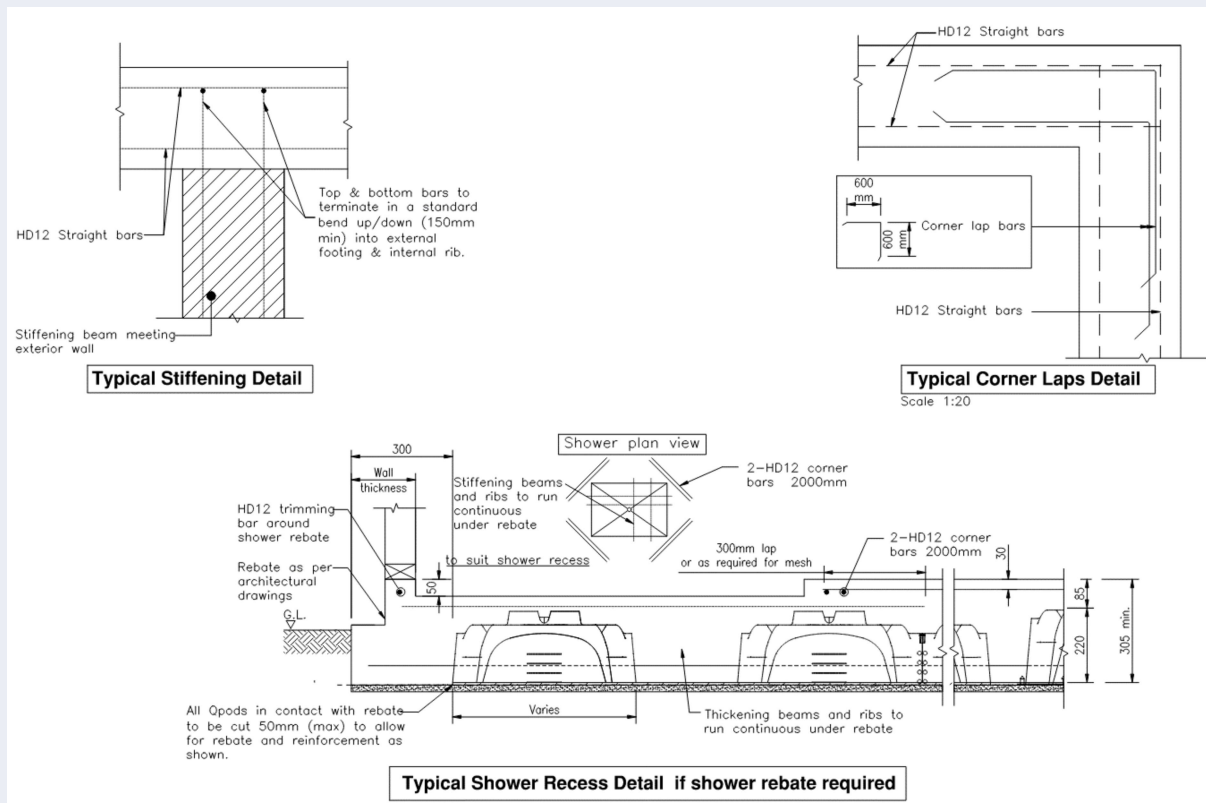


FIGURE 23 - Qpod rebate and corner details

FIGURE 25 – Qpod perimeter footing pipe penetrations

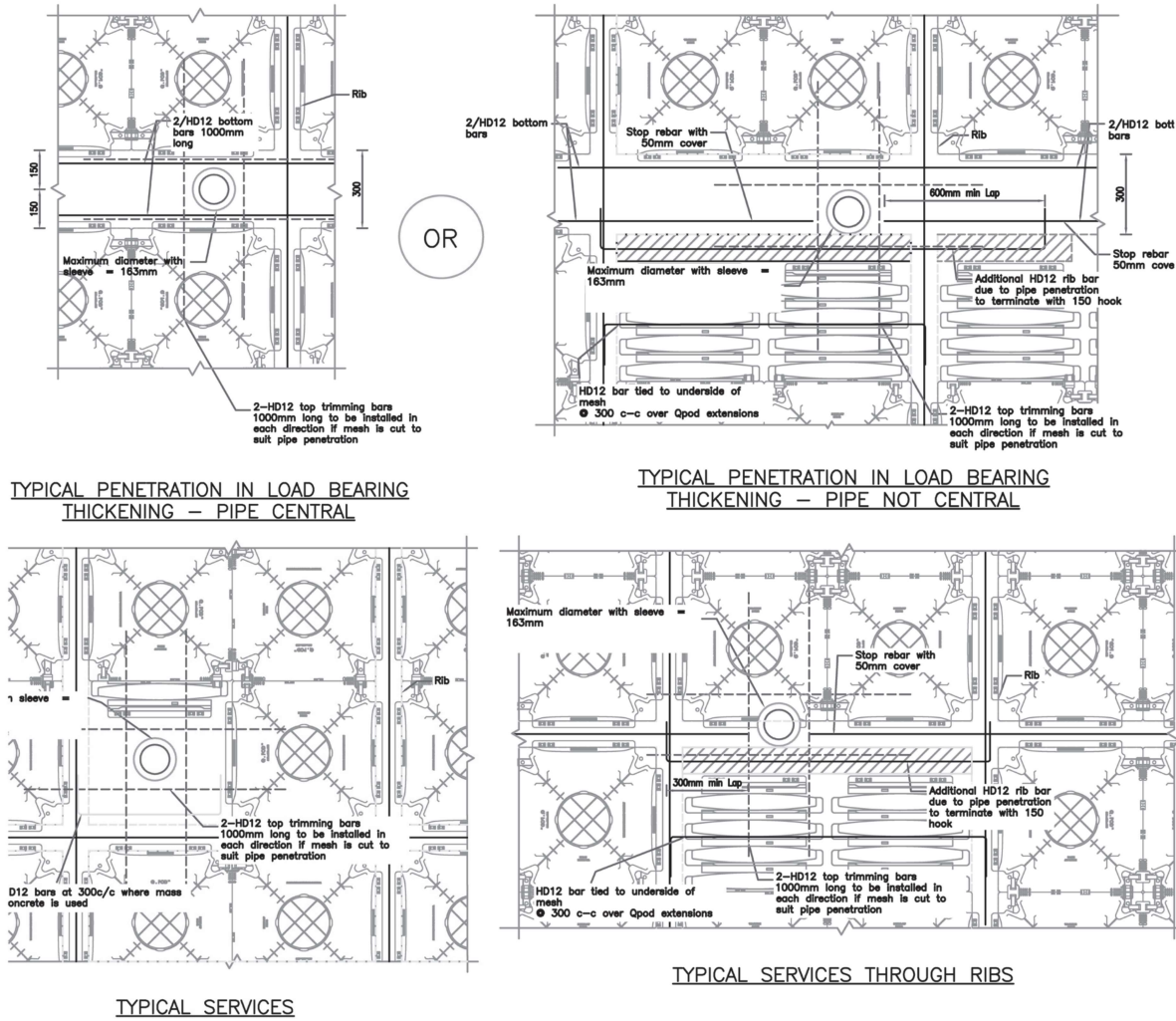


FIGURE 26 - Qpod internal pipe penetrations

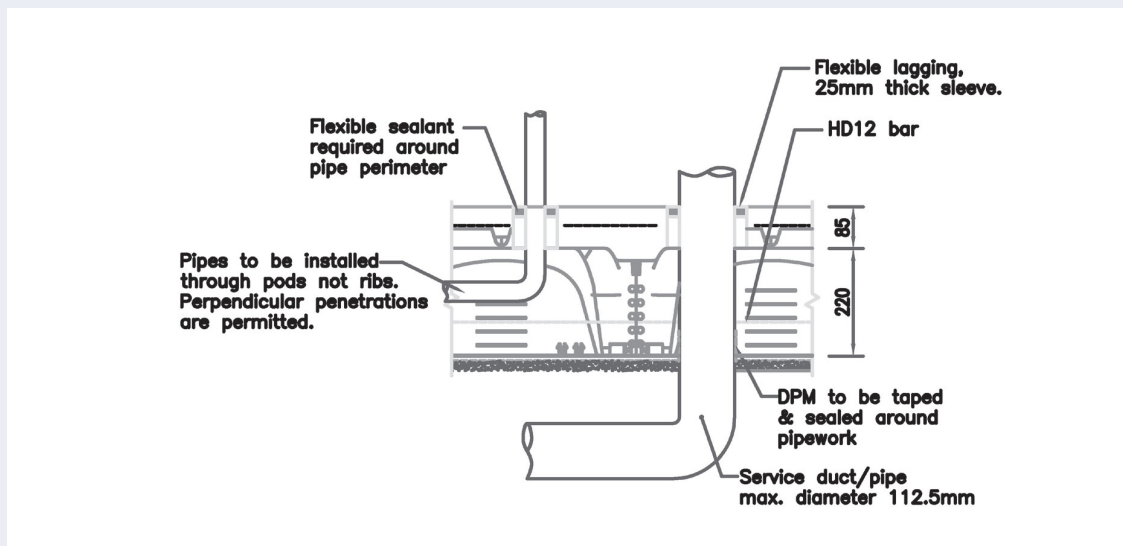


FIGURE 27 - Qpod vertical pipe penetrations

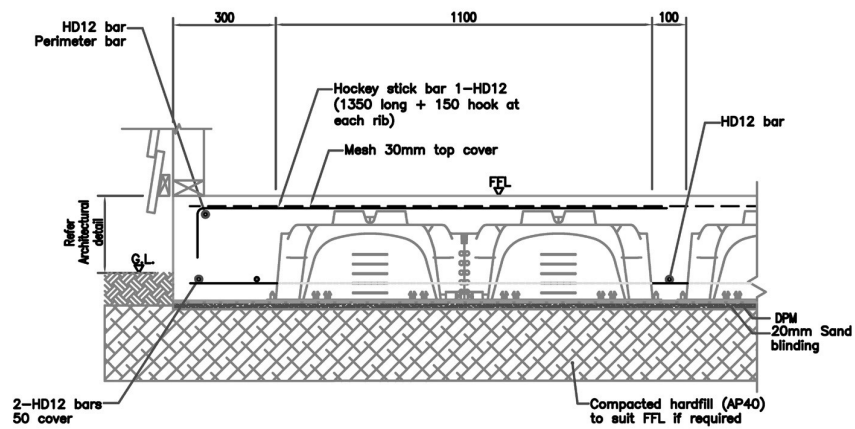


FIGURE 28 - Qpod light cladding perimeter detail

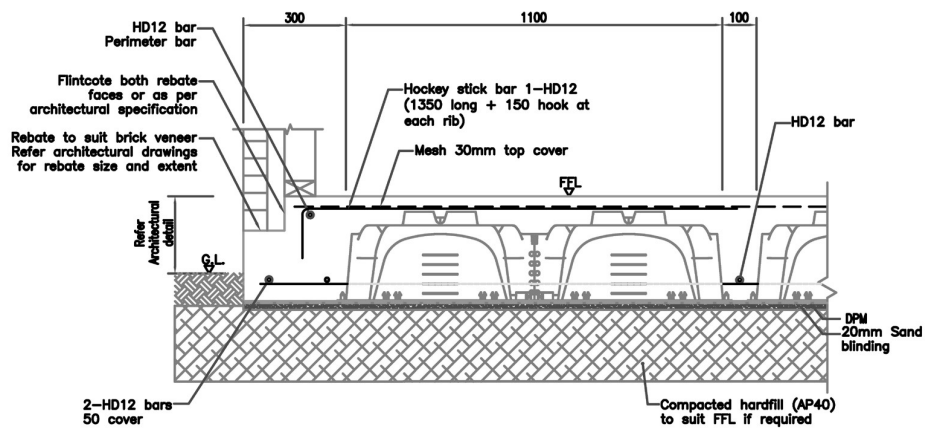


FIGURE 29 - Qpod brick cladding perimeter detail

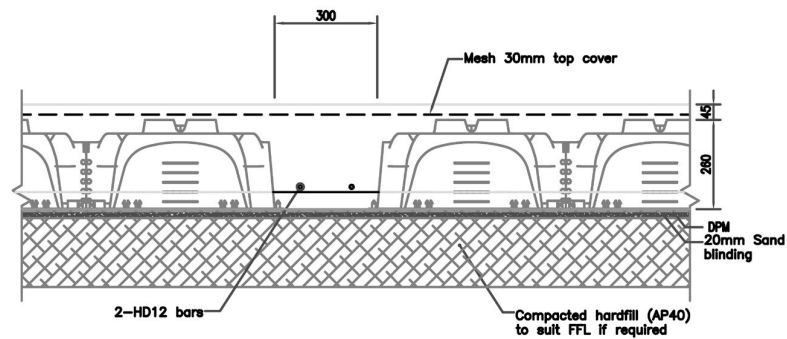


FIGURE 30 - Qpod internal loadbearing wall or slab thickening

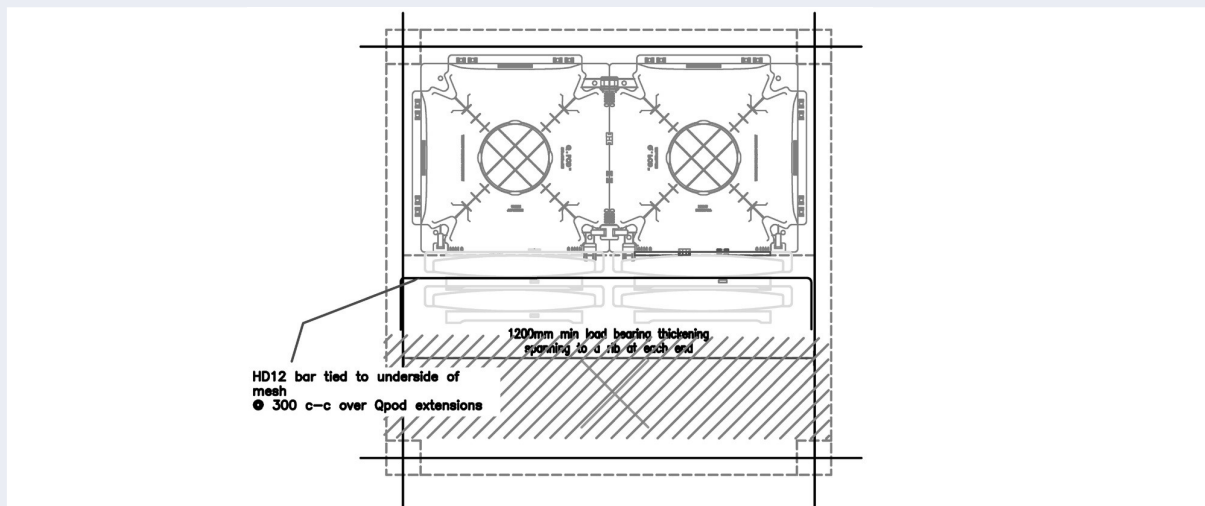


FIGURE 31 - Qpod internal point load - slab thickening

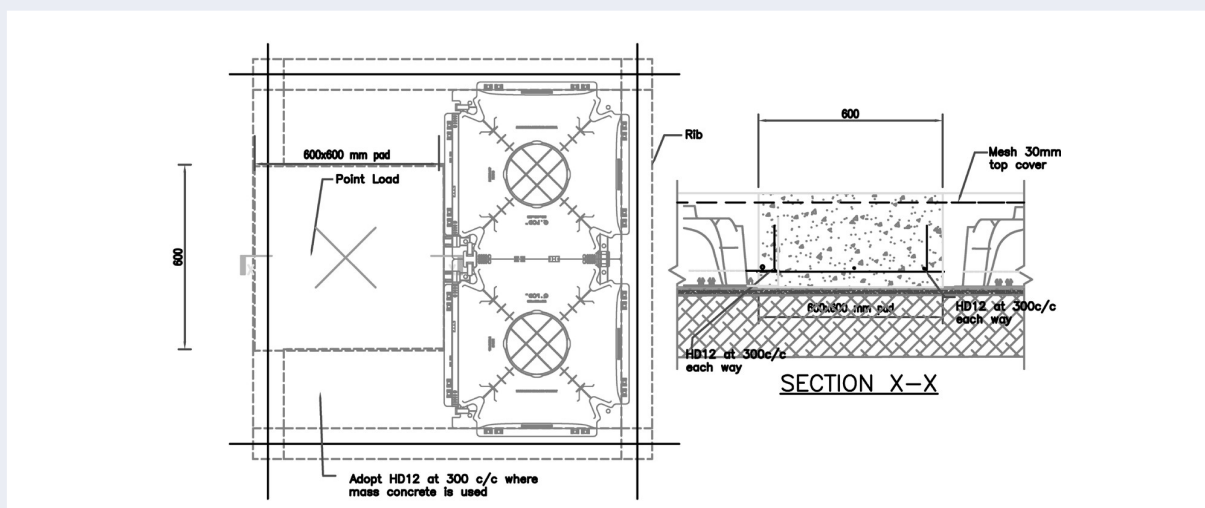


FIGURE 31b - Qpod internal point load - pad footing

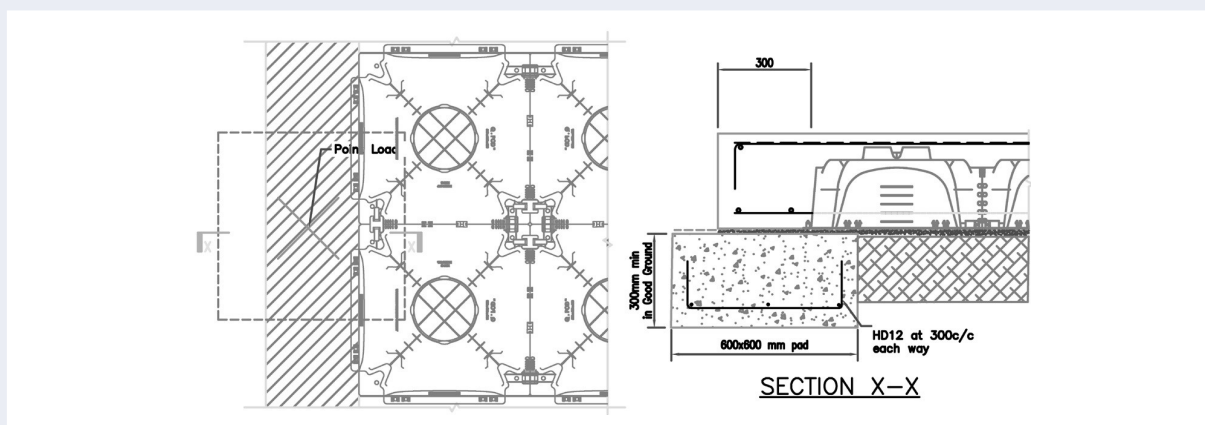
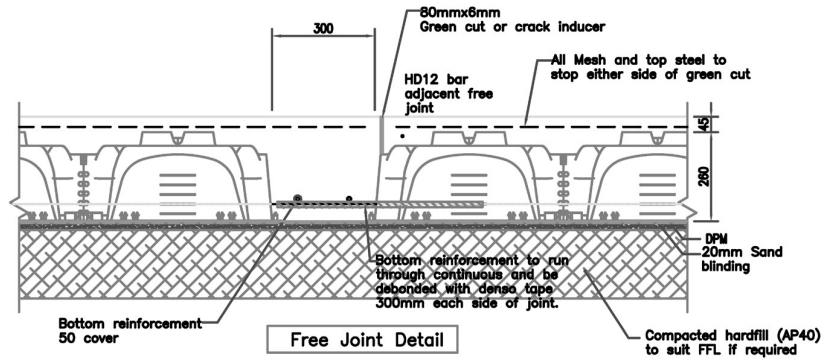


FIGURE 32 - Qpod perimeter point load - pad footing



Floor coverings and cladding crossing this joint
should be detailed appropriately
as per product specifications.

FREE JOINT DETAIL

FIGURE 33 - Qpod free joint detail

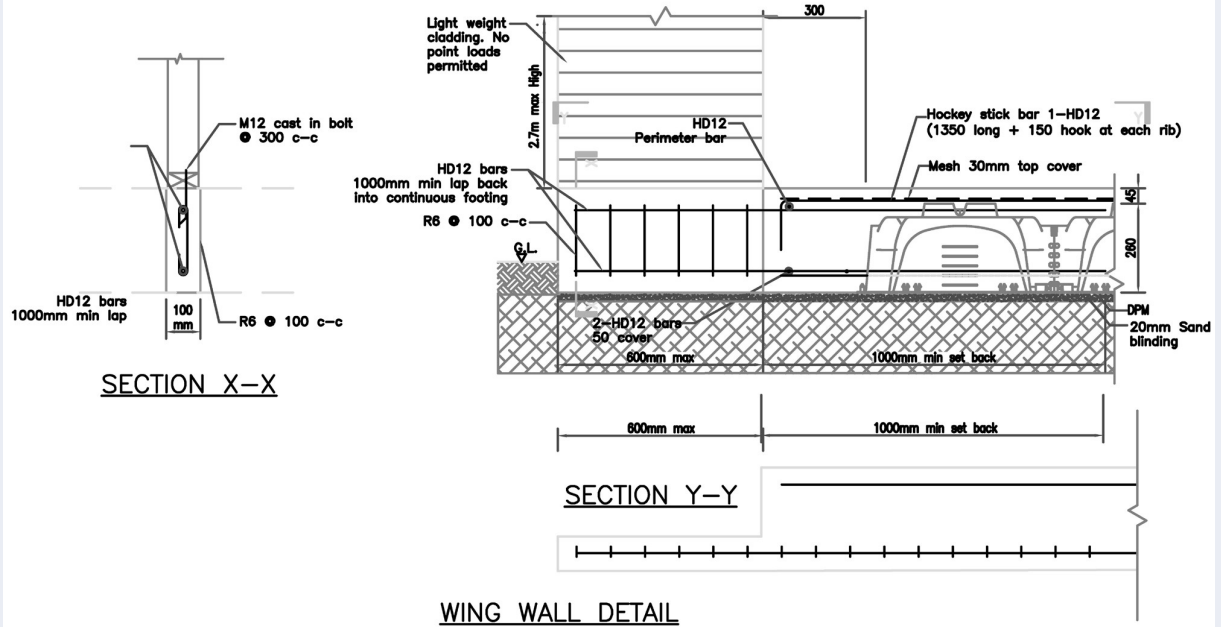


FIGURE 34 - Qpod wingwall detail

7.0 - INSULATED SLABS

The R value required is dependent on the climate zone, whether there is in slab heating built into the foundations and the area to perimeter ratio. The designer shall verify the foundation R value compliance with H1/AS1&AS2.

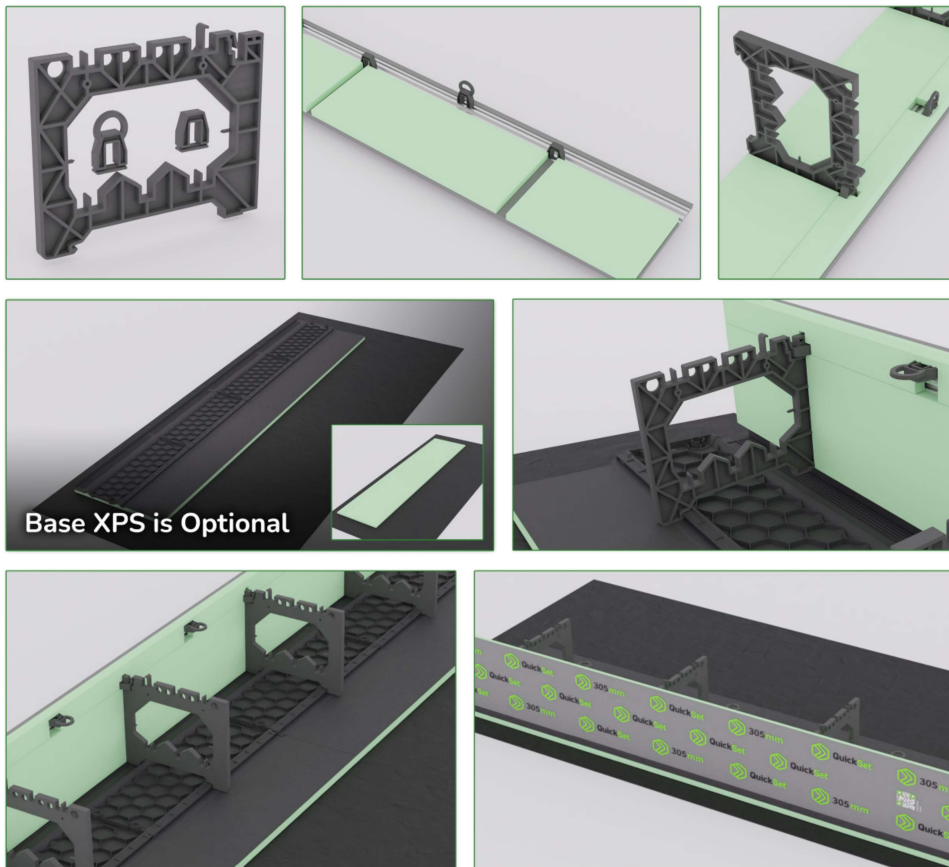
The R-value is mainly dependent on the area to perimeter ratio of the foundation the edge of the foundation around the perimeter of the building is where most of the heat is lost. Insulating the exposed perimeter edge will achieve the best results relative to cost in comparison to underslab insulation. Underslab insulation (without edge insulation) can be used for SuperSlab providing the insulation is VH grade and 50mm thick (max). In colder climates edge and underslab insulation is likely to be required to achieve compliance with H1/AS1&AS2.

SuperSlab+ has been designed using the QuickSet system, refer to tables 3 and 4 below for the building types compatible with SuperSlab+. The designer shall verify the R value of the foundation to ensure it meets the minimum NZBC requirements. Refer to www.QuickSet.co.nz or www.alliedconcrete.co.nz for further information on how to calculate the thermal performance of SuperSlab+.

7.1 SuperSlab+

The QuickSet perimeter edge form work (16mm PVC foam board) is not considered to contribute to the vertical strength of the foundations. 100mm down from the slab surface, 20mm insulation is built into the edge formwork and can also be extended under the slab for a fully insulated slab. The insulation and boxing system creates an overhang, as a result edge loads are limited by the framing size and building cladding type as per the below.

SuperSlab+ can be used when complying with table 3 and 4 below for the selected wall framing (90mm/140mm) respectably. SuperSlab+ shall be installed as per the QuickSet manufacturers installation manual and details as per the below. The wall framing is permitted to overhang the foundations by a maximum of 6mm (measured from the boxing). Brick veneer shall not have any overhang. Hold downs anchors are to be installed with edge distances as indicate by the QuickSet detailing below and shall maintain a minimum edge distance of 56mm from the boxing (40mm from the concrete).



90mm Wall Framing:

The SuperSlab+ system is suitable for perimeter loading for building types A, B and D as per table 1 of the SuperSlab Manual when 90mm wall framing is adopted.

Table 3

Building type	Number of levels ¹	Level 1 Wall cladding ²	Upper storey cladding	Roof Type ³	Minimum bearing capacities and penetrometer blows ⁴	Within scope of this document
A	Single	Light	—	Light	150 kPa	Yes
B	Single	Heavy	—	Light	200 kPa	Yes
C	Single	Heavy	—	Heavy	200 kPa	No, Specific Design
D	Two Storey	Light	Light	Light	200 kPa	Yes
E	Two Storey	Heavy	Light	Light	300 kPa	No, Specific Design
F	Two Storey	Heavy	Light	Heavy	300 kPa	No, Specific Design
G	Two Storey	Heavy	Heavy	Heavy	300 kPa	No, Specific Design

- *Refer section 3 for SuperSlab scope of use
- Point loads larger than 25kN will require specific design.

140mm Wall Framing:

Upgrading the wall framing to 140mm significantly increases the bearing capacity of the timber and edge distance available for the hold down bolts as such heavier building weights are permitted – Types A-E as per the below where 140mm framing is adopted.

Table 4

Building type	Number of levels ¹	Level 1 Wall cladding ²	Upper storey cladding	Roof Type ³	Minimum bearing capacities and penetrometer blows ⁴	Within scope of this document
A	Single	Light	—	Light	150 kPa	Yes
B	Single	Heavy	—	Light	200 kPa	Yes
C	Single	Heavy	—	Heavy	200 kPa	Yes
D	Two Storey	Light	Light	Light	200 kPa	Yes
E	Two Storey	Heavy	Light	Light	300 kPa	Yes
F	Two Storey	Heavy	Light	Heavy	300 kPa	No, Specific Design
G	Two Storey	Heavy	Heavy	Heavy	300 kPa	No, Specific Design

- *Refer section 3 for SuperSlab scope of use
- Point loads larger than 25kN will require specific design.

Hold down fixings

The hold fixings adopted need to meet proprietary requirements as defined by NZS3604 (7.5.12.3 refer below) and the BRANZ technical paper P21 (15kN characteristic uplift) for wall bracing elements where needed. Should specific wall bracing products require higher uplift capacities that foundation is beyond the scope of this document and shall require specific design.

7.5.12.3

For *external walls*, proprietary anchors shall have a minimum *capacity* when tested in accordance with 2.4.7 as follows:

- (a) Horizontal *loads* in the plane of the *wall* 2kN;
- (b) Horizontal *loads* out of the plane of the *wall* 3kN;
- (c) Vertical *loads* in axial tension of the fastener 7kN.

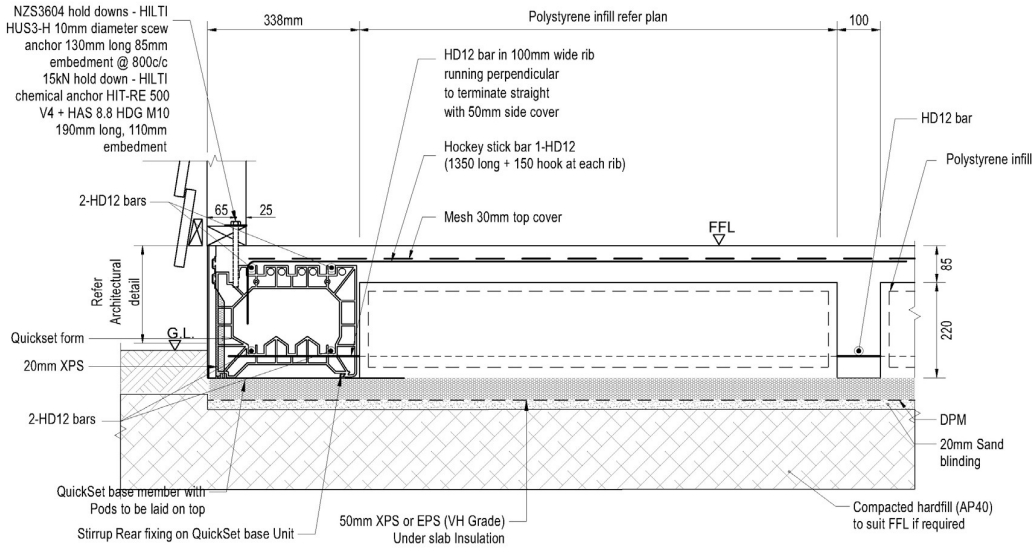
Hilti have carried out verification of the hold downs to meet the NZS3604 loading requirements.

Standard bottom plate fixing: HILTI screw anchor – HUS3-H 10mm diameter (130mm long), 85mm min embedment @ 800c/c – installed as per manufacturers specifications.

15kN brace wall: HILTI chemical anchor – HIT-RE 500 V4 + HAS 8.8HDG M10 (190mm long), 110mm minimum embedment – installed as per manufacturers specifications.

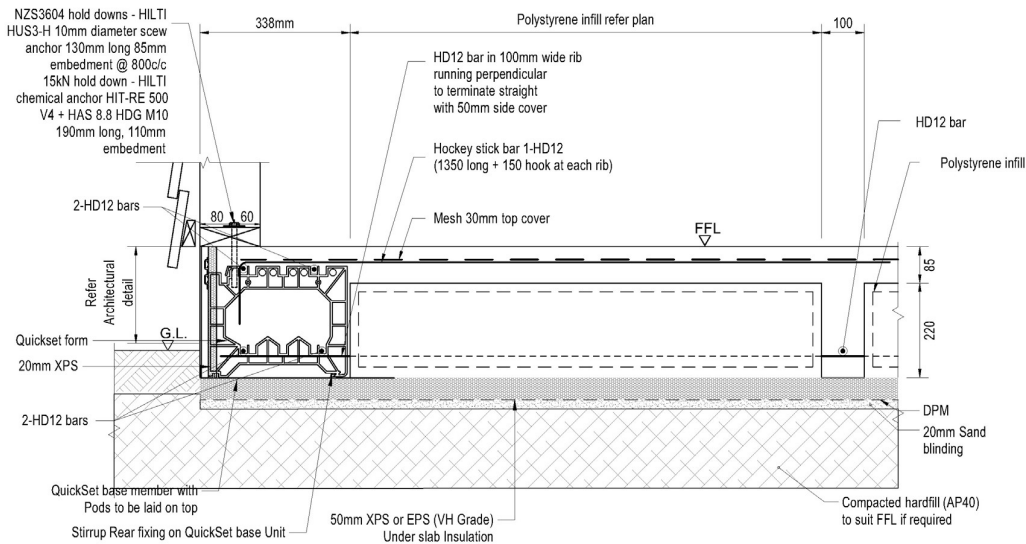
7.2 QuickSet Standard detailing

SuperSlab+ can be specified with QuickSet as edge insulation alone or combined with base insulation for a fully insulated foundation. The SuperSlab CodeMark includes both 25mm and 50mm base insulation options (50mm seen here). Thicker base insulation will require specific design.



**QUICKSET TAPER 305/50
WITH POLY POD**

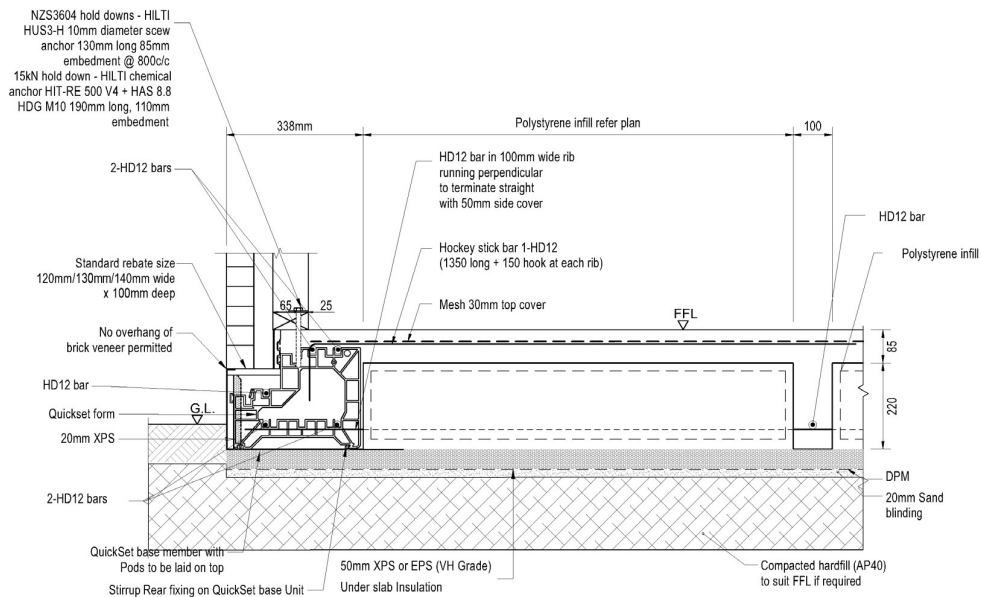
DETAIL 60



**QUICKSET ULTRA 305/50
WITH POLY POD**

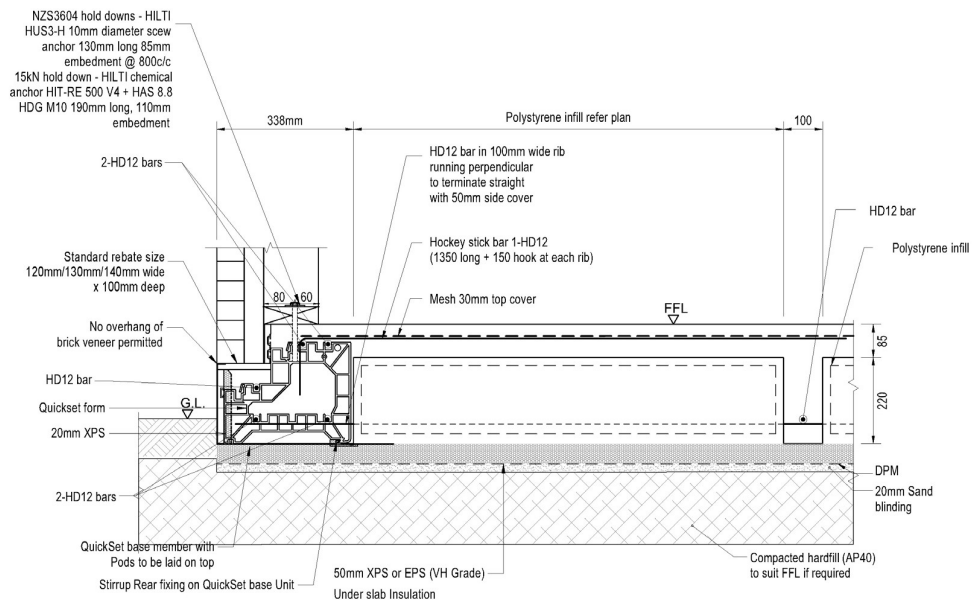
DETAIL 61

FIGURE 35 - QuickSet Taper/Ultra (for standard cladding)



**QUICKSET REBATE 120/305/50
WITH POLYPOD**

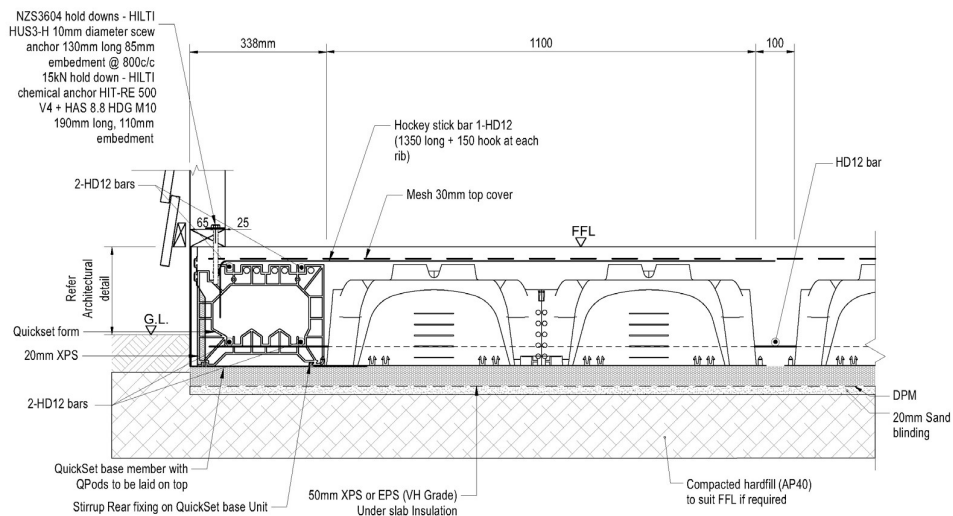
DETAIL 62



**QUICKSET REBATE 120/305/50
WITH POLY POD**

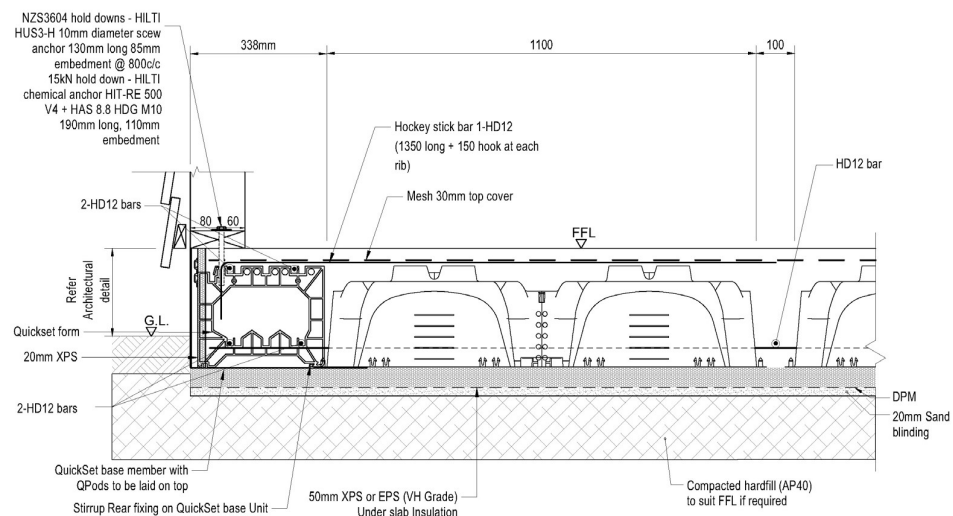
DETAIL 63

FIGURE 36 - QuickSet Rebate (for brick cladding)



**QUICKSET TAPER 305/50
WITH QPOD**

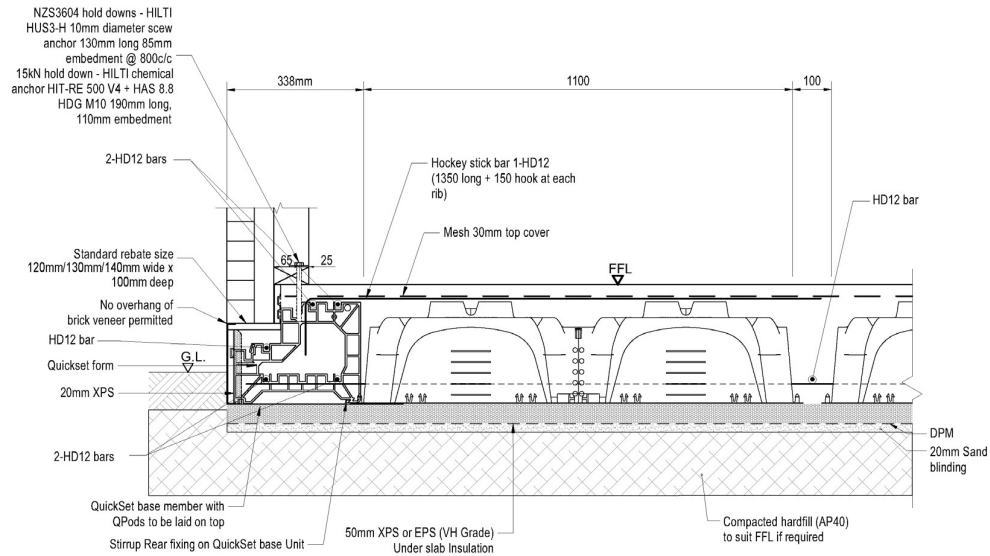
DETAIL 64



**QUICKSET ULTRA 305/50
WITH QPOD**

DETAIL 65

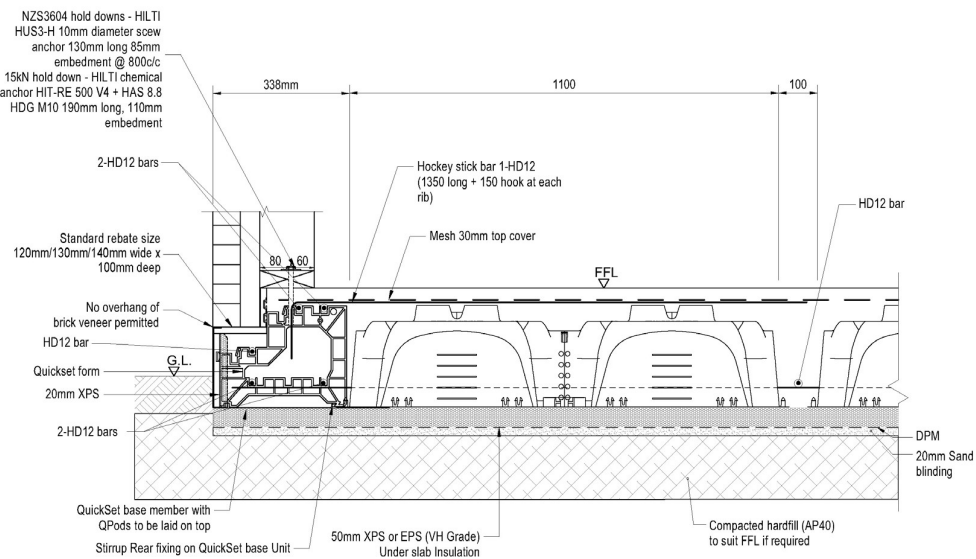
FIGURE 37 - QuickSet Taper/Ultra (for standard cladding)



QUICKSET REBATE 120/305/50

WITH QPOD

DETAIL 67

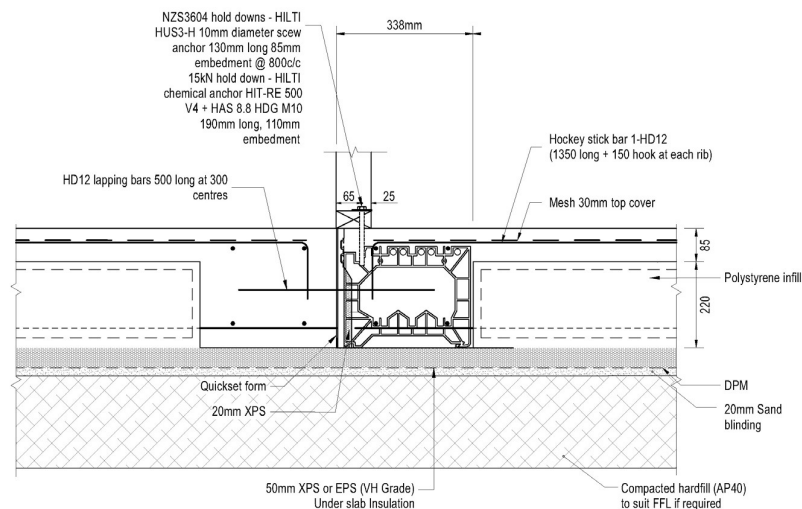


QUICKSET REBATE 120/305/50

WITH QPOD

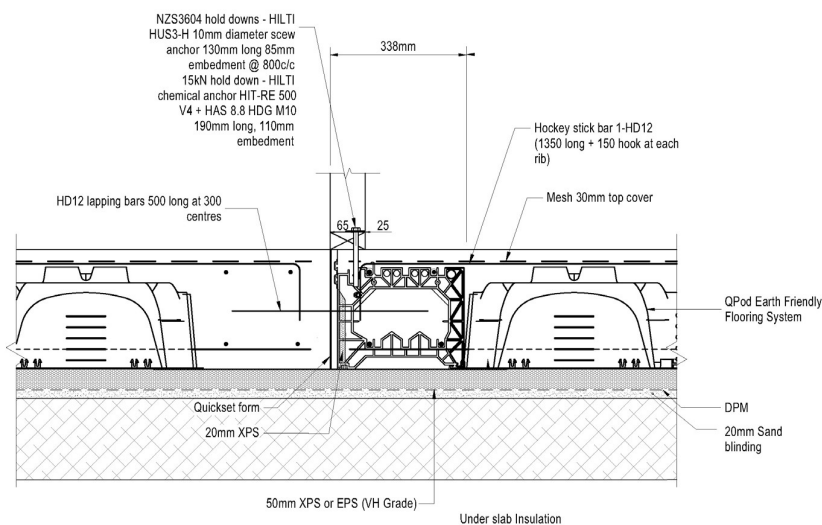
DETAIL 68

FIGURE 38 - QuickSet Rebate (for brick cladding)



QUICKSET TAPER 305/50
THERMAL BREAK
WITH POLY POD

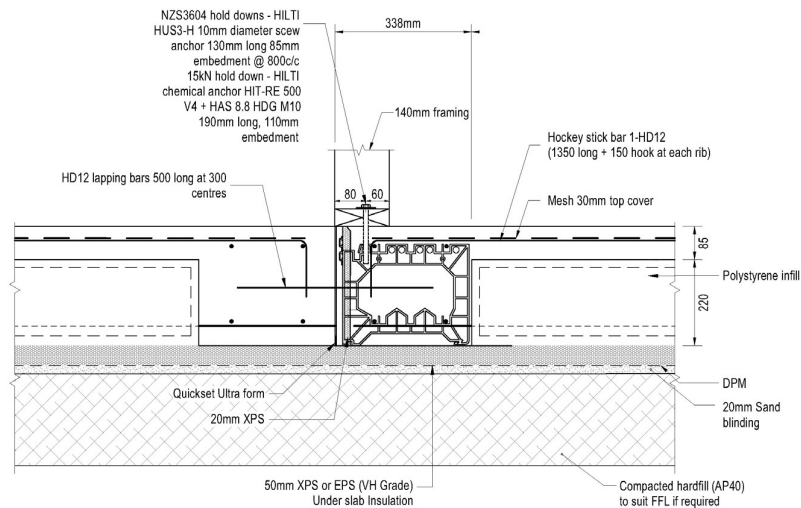
DETAIL 87



QUICKSET TAPER 305/50
THERMAL BREAK
WITH QPOD

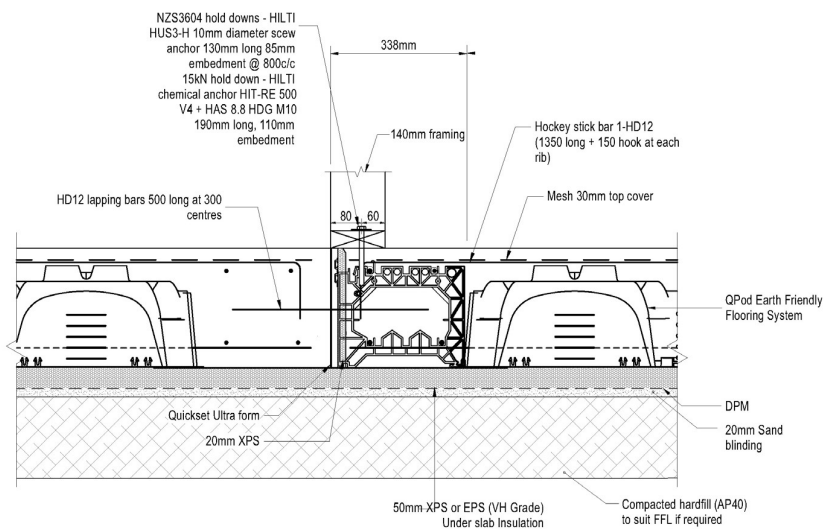
DETAIL 88

FIGURE 39 - QuickSet Taper Thermal Break



QUICKSET ULTRA 305/50
THERMAL BREAK
WITH POLY POD

DETAIL 89



QUICKSET ULTRA 305/50
THERMAL BREAK
WITH QPOD

DETAIL 90

FIGURE 40 - QuickSet Ultra Thermal Break

8.0 - CHECK LIST







BRANZ Appraised

Appraisal No. 964 [2023]

ALLIED SUPERSLAB CONCRETE FLOORS

Appraisal No. 964 [2023]

This Appraisal replaces BRANZ
Appraisal No. 964 [2017]

BRANZ Appraisals

Technical Assessments of
products for building and
construction.

Allied Concrete

Allied Concrete Limited

Tel: 0800 425 5433

Email: [concrete@](mailto:concrete@alliedconcrete.co.nz)

[alliedconcrete.co.nz](mailto:concrete@alliedconcrete.co.nz)

Web: www.alliedconcrete.co.nz



BRANZ

BRANZ

1122 Moonshine Rd,

Rimutika, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

Tel: 04 237 1170

branz.co.nz



Product

- 1.1 Allied Superslab floors are reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods and may also include the QuickSet permanent insulated formwork system.

Scope

- 2.1 Allied Superslab has been appraised for use as reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods for buildings within the following scope:
- timber-framed buildings, up to 2-storeys high, within the scope of NZS 3604; and,
 - with a maximum height of 10 m measured from the ground to the apex; and,
 - supported on "good ground" as defined for Acceptable Solutions and Verification Methods for NZBC Clause B1 Structure; and,
 - with a floor maximum length of 30 m unless detailed with free joints in accordance with the Technical Literature; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Allied Superslab is not suitable for soils that are expansive or prone to liquefaction or differential settlement.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Allied Superslab Concrete Floors, if designed, installed, used 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. Allied Superslab Concrete Floors meet the requirements for loads arising from self-weight, imposed gravity loads, earthquake, wind, differential movements and time dependent effects including creep and shrinkage. [i.e. B1.3.3 (a), (b), (f), (h), (m) and (q)]. See Paragraphs 7.1–7.6.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. Allied Superslab Concrete Floors meet this requirement. See Paragraphs 8.1–8.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Allied Superslab Concrete Floors meet this requirement. See Paragraphs 10.1 and 10.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Allied Superslab Concrete Floors meet this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 and H1.3.2E. Allied Superslab Concrete Floors contribute to meeting this requirement. See Paragraph 11.1



Technical Specification

General

- 4.1 Allied Superslabs are reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods, constructed using the following:

Concrete

- 4.2 The concrete for use with Allied Superslab is either 20 MPa, 25 MPa or 30 MPa, Allied CSS or RSS mixes only. These mixes must be manufactured in accordance with NZS 3104 and in Allied Concrete plants audited by the New Zealand Ready-Mixed Concrete Association Audit Committee.

Reinforcing Steel

- 4.3 Three types of reinforcing steel can be used in Allied Superslab:
- **Steel Mesh** – Allied Superslab top reinforcement is SE62 grade 500E steel mesh which must meet the requirements of Paragraph 14.0 in NZBC Verification Method B1/VM1.
 - **Reinforcing Bar [steel mesh alternative]** – D10 grade 300, class E steel reinforcing bar at 300 mm centres each way.
 - **Reinforcing Bar** – HD12 grade 500, class E steel reinforcing bar.

Polystyrene Pods

- 4.4 Polystyrene pods that have dimensions of 1,100 x 1,100 x 220 mm or 1,100 x 1,100 x 300 mm.

Bar Chairs and Pod Spacers

- 4.5 Generic pod spacers are used to provide the correct spacing for the polystyrene pods and to support the reinforcing steel at the correct location at the bottom of the Allied Superslab ribs. Over the top of the polystyrene pods, 40 mm bar chairs are used for positioning the reinforcement (steel mesh/loose bars) to achieve a minimum of 25 mm cover to the polystyrene pods.

QPODs

- 4.6 QPODs are manufactured from recycled plastic. They have two closed sides and two opened sides for clipping the pods together. Each pod is 550 x 550 x 220 mm and when four are clipped together, they form an 1,100 x 1,100 mm pod. They have a raised section in the center of each pod to hold the reinforcing steel mesh at the correct height. QPOD extensions and end caps are available. Beam spacers 100 mm, 300 mm and 400 mm are used to space pods to form ribs and footings, and to locate and support reinforcing steel.

QuickSet Components

- 4.7 The QuickSet components include:
- **QuickSet Form** – manufactured from PVC foam board, these come in 305, 320 and 340 mm heights x 2,430 mm long.
 - **QuickSet Stirrups and Widgets** – manufactured from 100% recycled NZ plastic, available in standard or brick rebate, these hold reinforcing steel in place as well as internally bracing the form until concrete is placed.
 - **QuickSet Base** – manufactured from 100% recycled plastic, these are available in straight, internal or external corners.
 - **QuickSet Joiner** – manufactured from grade 6060 aluminium and powder-coated, these are used to join shutter sections.
 - **QuickSet Corner Joiner** – manufactured from grade 6060 aluminium and powder-coated, these are used for joining shutter sections at corners.

Damp-Proof Membrane

- 4.8 A damp-proof membrane (DPM) in accordance with NZS 3604, Clauses 7.5.4–7.5.7.

Handling and Storage

- 5.1 The polystyrene pods, QPODs and/or QuickSet components must be stored so that they are secure on-site, and remain free from dirt. Protection from direct ultraviolet (UV) exposure should be provided. Installation of the pods must only be undertaken once the reinforcing steel and mesh is also ready to place, as this is needed to hold the pods in position and prevent them from being blown around.
- 5.2 Reinforcing steel should be stored supported up off the ground and kept clean.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
 - Ready Superslab Technical Manual Revision I, December 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

General

- 7.1 Allied Superslabs designed and constructed in accordance with the Technical Literature will meet the requirements of NZBC Clause B1 Structure. Allied Superslab floors are intended for single and 2-storey, timber-framed buildings.
- 7.2 Allied Superslabs must be supported on "good ground" as described in Paragraph 2.1.
- 7.3 Pipes and services are not permitted to run along or within ribs and footings, or penetrate up through ribs and footings without special detailing. Pipes are permitted to cross perpendicular through a rib or footing if they are located in the middle third depth of the waffle slab and are 50 mm in diameter or less.
- 7.4 Pipes penetrating concrete or under buildings must be in accordance with NZBC Verification Method G12/VM1, NZBC Acceptable Solution G12/AS1, NZBC Acceptable Solution G13/AS2 and NZBC Acceptable Solution G13/AS3, as applicable.
- 7.5 Shrinkage control joints in Allied Superslab floors must be made by saw cuts at maximum 6 m centres. Saw cutting of Allied Superslab should be carried out as soon as the concrete surface can endure the saw cutting process, but not later than 24 hours after placement. It is recommended that shrinkage control joints extend from re-entrant corners.
- 7.6 Where QuickSet permanent insulating formwork is used, hold downs as per the Technical Literature must be installed at the slab edges.

Durability

Serviceable Life

- 8.1 Allied Superslab is expected to have a serviceable life equal to that of standard concrete floors and slabs.
- 8.2 The concrete mix used to construct the Allied Superslabs will be determined by the NZS 3604 Exposure Zone. Allied Superslabs in Zones B and C are constructed using a 20 MPa concrete mix, and in Exposure Zone D a 25 MPa concrete mix.
- 8.3 Cover to steel must meet minimum values set out in NZS 3604, Paragraph 4.5.1.
- 8.4 The exposed QuickSet Insulated Form must be protected from UV with a maintained protective coating or covering, in accordance with the Technical Literature.

Maintenance

- 9.1 Conventional maintenance procedures may be used for floors and slabs constructed using Allied Superslab.

External Moisture

- 10.1 A suitable DPM in accordance with NZS 3604, Clauses 7.5.4–7.5.7 must be used under Allied Superslabs.
- 10.2 Ground clearances in accordance with NZS 3604, Figure 7.11 and NZBC E2/AS1, Paragraph 9.1.3.1 must be maintained throughout the life of the building.

Energy Efficiency

- 11.1 Minimum construction R-values required by NZBC Clause H1 Energy Efficiency for slab-on-ground floors is determined by the climate zone and if there is in-slab heating built into the foundations. Compliance with NZBC Clause H1 Energy Efficiency for slab-on-ground floors is conditional on project-specific details, including floor type, floor area to perimeter ratio, floor insulation type and external wall type. Construction R-values for concrete slab-on-ground floors, including floors of basements that contain certain conditioned spaces, shall be determined using either:
 - the performance tables in Section F1.2 of NZBC Acceptable Solutions H1/AS1 or H1/AS2; or,
 - the calculation methods in NZBC Verification Methods H1/VM1 or H1/VM2 Appendix F.
- 11.2 The Allied Superslab, Quickset foundation insulation system and QPODs can be used to meet the H1 requirements, refer to the relevant manufacturers websites for further information. The system and components have not been assessed for insulation contribution and this aspect is outside the scope of this Appraisal.

Installation Information

- 12.1 Installation of Allied Superslab must be in accordance with the Technical Literature. The main items for consideration are summarised here.
 - **Site preparation** – a flat, level platform must be prepared. Any services that are to be placed under Allied Superslab must be done at this stage.
 - **DPM** – the DPM must be correctly placed on the prepared site.
 - **Boxing** – this must be of the correct height and levels, ensuring that boxing supports do not penetrate the DPM layer. All rebates for brickwork, garage door thresholds or joinery should be allowed for in the boxing. Where the QuickSet formwork is used, this must be installed in accordance with the installation instructions.
 - **Pod set out** – the polystyrene pods or QPODs must be placed on the DPM in accordance with the set-out drawings, ensuring the correct dimensions for all perimeter footings and internal ribs. Polystyrene pod layout and cutting should be arranged so that no pod is less than 200 mm wide.
 - **If QPODs are used with extensions**, the overall dimension of each pod must not exceed 1,100 x 1,100 mm
 - **Reinforcing** – all steel reinforcing must be laid out in accordance with the set-out drawings. Correct covers must be ensured.
- 12.2 The concrete for Allied Superslab must be placed, finished and cured in accordance with the requirements of NZS 3109.

Health and Safety

- 13.1 Wet concrete is a highly alkali substance and all necessary protective clothing should be worn when handling, placing and working with it.

Basis of Appraisal

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

Investigations

- 14.1 The structural engineering for Allied Superslab Technical Literature was undertaken by a Chartered Professional Engineer. This has been reviewed by BRANZ structural engineers and found to be satisfactory.
- 14.2 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 14.3 Inspections of Allied Superslab installations being placed and completed installations have been made by BRANZ.

Quality

- 15.1 Allied Concrete Limited is responsible for the quality of the concrete supplied for Allied Superslab.
- 15.2 Quality on-site is the responsibility of the building contractor.
- 15.3 Designers are responsible for incorporating Allied Superslab into the design of buildings.
- 15.4 Building owners are responsible for the maintenance of Allied Superslab in accordance with the instructions of Allied Concrete Limited.

Sources of Information

- AS/NZS 4671:2019 Steel for the reinforcement of concrete.
- NZS 3104:2003 Specification for concrete production.
- NZS 3109:1997 Concrete construction.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4218:2009 Thermal insulation – Housing and small buildings.
- Ministry of Business, Innovation and Employment Record of Amendments – Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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

The Appraisal is issued only to **Allied Concrete 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. **Allied Concrete 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 **Allied Concrete 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 **Allied Concrete Limited** or any third party.

For BRANZ



Claire Falck

Acting Chief Executive

Date of Issue:

19 May 2023

CodeMark

Certificate no: CMNZ30086

Version: H

Original issue date: 03 September 2020

Version date: 20 September 2023

Renewal date: 03 September 2026

1. Certificate Holder Details

Allied Concrete

Allied Concrete Ltd

35 Inglewood Road, Invercargill 9810.

Email: info@alliedconcrete.co.nz

Tel: 03 2171600 or 0800 4 255433

www.alliedconcrete.co.nz

2. Product Certification Body

Global-Mark Pty Ltd

Trading as Global-Mark

57 Willis Street, Wellington, 6011

Customer.service@global-mark.co.nz

+64 9 889 0622

www.global-mark.co.nz

Complaints: The complaints process for this certificate can be found here:

www.global-mark.co.nz/complaints

Global-Mark Managing Director.



Hervé Michoux



Product Certificate

Allied SuperSlab Concrete Floors System

3. Description of Building Method or Product

Allied SuperSlab Concrete Floors are reinforced concrete, slab-on-ground floors, The method uses polystyrene void formers or QPOD moulded plastic pod void formers.

4. Intended use of Building Method or Product

Allied SuperSlab Concrete Floors has been designed to support timber framed or light steel framed residential houses up to 2 storeys.

5. New Zealand Building Code Provisions

Allied SuperSlab Concrete Floors System if designed, used, installed and maintained in accordance with the conditions of this Certificate will comply with or contribute to compliance with the following performance provisions of the NZ Building Code:

Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2 and B1.3.4 for the relevant physical conditions of B1.3.3 (a), (b), (f) (h), (j), (m) & (q)
Clause B2 DURABILITY:	Performance B2.3.1 (a) and B2.3.2 (a) – not less than 50 years
Clause E2 EXTERNAL MOISTURE:	Performance E2.3.3 and E2.3.7
Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1
Clause H1 ENERGY EFFICIENCY:	Performance H1.3.1 and H1.3.2E for the relevant physical conditions of H1.3.3 (a) & (e)

6. Conditions and Limitations of Use

- Allied SuperSlab Concrete Floors have been certified for use in buildings within the following scope limitations:
 - buildings, up to two storeys high, either:
 - timber framed within the scope of NZS 3604:2011 (paragraph 1.1.2), or
 - steel framed within the scope of NASH standard Residential and low-rise Steel Framing-Part1: design criteria 2005 for steel framed buildings
 - with a maximum height of 10 m measured from the ground to the apex,
 - supported on “good ground” as defined by the Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B1 Ministry of Business, Innovation and Employment, First Edition, July 2005 (Amendment 19, 28 November 2019),



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CodeMark

Certificate no: CMNZ30086

Version: H

Original issue date: 03 September 2020

Version date: 20 September 2023

Renewal date: 03 September 2026

Product Certificate

Allied SuperSlab Concrete Floors System



- d. with a floor maximum length of 30 m unless detailed with free joints in accordance with Allied Concrete SuperSlab Technical Manual Rev I, July 2023; and
 - e. situated in Wind Zones up to and including Extra High
2. Allied SuperSlab Concrete Floors shall be specified, designed, installed and maintained in accordance with the following Technical Documentation:
 - a. BRANZ Appraisal No. 964 [2023] Issued 19 May 2023 Allied SuperSlab Concrete Floors
 - b. Allied Concrete SuperSlab Technical Manual Rev I, July 2023
3. Reinforcing Steel, Polystyrene Pods or QPOD, Bar Chairs, Pod Spacers and Damp Proof Membrane must be selected, used, handled and stored in compliance with the requirement of the Technical Documentation
4. The installation must be either done or supervised by an LPB who holds either a carpentry or a foundation license and have access to the Technical Documentation
5. A minimum of 20 MPa Allied CSS or RSS mixes must be used except in Exposure Zone D where the minimum requirement is 25 MPa concrete. The specified concrete mixes must be manufactured in accordance with NZS 3104:2010 and in Allied Concrete plants.
6. Compliance with H1.3.1(a) and H1.3.2E for buildings incorporating the Allied SuperSlab concrete floor shall be established by specific design using
 - a. the Schedule Method in H1/AS1 Fifth Edition Amendment 1, (4 August 2022) and H1/AS2 First Edition Amendment 1, (4 August 2022), or
 - b. the Calculation Method in H1/AS1 Fifth Edition Amendment 1, (4 August 2022) and H1/AS2 First Edition Amendment 1, (4 August 2022), using construction R-values:
 - i. from the performance tables described in Acceptable Solution H1/AS1 Fifth Edition Amendment 1, (4 August 2022) Section F.1.2 or H1/AS2 First Edition Amendment 1, (4 August 2022) Section F.1.2 or
 - ii. calculated by the method in Verification Method H1/VM1 Fifth Edition Amendment 1, (4 August 2022) Appendix F Section F.1.2 or Verification Method H1/VM2 First Edition Amendment 1, (4 August 2022) Appendix F Section F.1.2.

7. Health and Safety Information

Standard industry safety practices and manufacturer safety requirements as detailed in the technical literature including the applicable SDS must be observed at all times.



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.



Certificate no: CMNZ30086

Version: H

Original issue date: 03 September 2020

Version date: 20 September 2023

Renewal date: 03 September 2026

Product Certificate

Allied SuperSlab Concrete Floors System



8. Basis for Certification

The certification decision is based on independent technical review(s) of test report(s), engineering opinion(s) and other documented evidence(s), factory audit(s) and site review(s)

Code Clause	Compliance pathway	Evidence
B1 STRUCTURE:	Acceptable Solution – Testing and assessment	Items 1, 2, 3 & 4
B2 DURABILITY:	Acceptable Solution – Reference to use of acceptable materials	Items 1 & 2
E2 EXTERNAL MOISTURE	Acceptable Solution – Reference to New Zealand Standard	Items 1 & 2
F2 HAZARDOUS BUILDING MATERIALS	Alternative solution – Expert judgement	Item 5
H1 ENERGY EFFICIENCY	Acceptable solution based on H1/AS1 and H1/AS2	Items 1 & 2

9. Supporting Documentation for Certification

Rev	Author	Description	Date and/or Revision
1.	Allied Concrete Ltd	Allied Concrete SuperSlab Technical Manual	Rev I, July 2023
2.	BRANZ	BRANZ Appraisal No. 964 (2023) – Allied SuperSlab Concrete Floors	19 May 2023
3. *	Allied Concrete Ltd	Quick Set Structural Review	December 2019
4. *	Allied Concrete Ltd	Quick Set Engineering Calculations	December 2019
5.	Allied Concrete	Material Safety Data Sheet for Ready Mixed Concrete (plastic concrete, concrete slurry, concrete bleed water, wet concrete)	20 January 2020

* These documents were provided commercial in confidence and are not publicly available

10. Supporting Information About Description (Optional)

Nil



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.



Certificate no: CMNZ30086

Version: H

Original issue date: 03 September 2020

Version date: 20 September 2023

Renewal date: 03 September 2026

Product Certificate

Allied SuperSlab Concrete Floors System



11. Supporting Information About Intended Use (Optional)

Nil

12. Supporting Information About Conditions and Limitations of Use (Optional)

Nil

All CodeMark certificates that are current must be registered with MBIE. MBIE maintains a register of valid product certificates. [Please find the register here.](#)

If the certificate is not listed on this register or it appears as (SUSPENDED), it is not a valid CodeMark certificate and does not have to be accepted by a building consent authority as establishing compliance with the New Zealand Building Code.



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.



MASONS
Designed Smart, Built Tough.

UNI[®] FAB

Flexible Air Barrier

**NEW
IMPROVED**

SDC - Approved Building Consent Document - BC240357 - Pg 99 of 402 - 19/03/2024 - warreg

**CARRY ON
INSIDE**

**WHILE YOU
WAIT FOR CLADDING
OUTSIDE**



thebuildingbusiness.co.nz/pass



STAY ON TRACK WITH YOUR BUILD

If cladding is delayed

**90
DAYS**

TEMPORARY WEATHER PROTECTION

For up to 90 days



QUICK AND EASY TO INSTALL



MASONS
Designed Smart, Built Tough.

masons.nz 0800 522 533



MASONS
Designed Smart, Built Tough.

UNI® FAB

More than just a building wrap.
It's a game changer!

UNI® FAB is a Flexible Air Barrier giving early enclosure to builds and allowing work to continue on the inside (for up to 90 days), without waiting for the cladding to be complete. The weather protection is due to UNI's UV properties, waterproof features, and unique toughness.

FLEXIBLE AIR BARRIER

No more hold ups due to cladding delays or bad weather. UNI FAB provides temporary protection from UV exposure to timber framing for up to 90 days from installation.

SECONDARY LINE OF DEFENCE

Once installed UNI is a secondary line of defence against moisture over the life of the building. It is highly breathable and passes vapour from inside the building out.

SAVES MONEY

UNI® FAB is much cheaper than Rigid Air Barriers (materials and labour) yet has most of the benefits.

VERY STRONG AND TEAR RESISTANT

UNI has a high vapour permeable, water resistant membrane sandwiched between two tough layers of non woven polyolefin fabric.

FULL TRAINING AND SUPPORT

Masons is committed to supporting builders with their first time use of UNI. An installation video, written instructions and training is available.

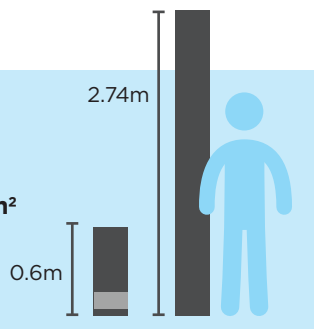
FIRE RETARDANCY

UNI® FAB is non fire retardant.

Available as

UNI® FAB Roll - 2.74m x 18.25m roll = 50m²

UNI® FAB Soffit Roll - 0.6m x 18.25m roll = 10.95m²



Soffit: With a handy 'peel and stick' adhesive strip for easy application.



No more Hold-ups
due to Cladding
Delays or Weather



Work on the Inside
with Confidence
Prior to Cladding



Secondary line of
Defence Against
Moisture



Easy to Install.
Full Training
Given



More Cost
Effective than Rigid
Air Barriers

UNI® FAB Accessories

CN100 UNI Cap Nailer Gun To Fix UNI/UNI FR to the Frame

Best practice for securing UNI. This gun shoots plastic caps with a 25mm ring shanked nail, and increases the holding power of the wrap.

A 90-100 PSI Air Compressor is also required.



UNI® FAB Seam Tape For Seams and Repairs

A 60mm seam and repair tape based on polypropylene non-woven (PP) fabric.

Made specifically for building wraps and underlays.



BrickTies Heavy Duty Earthquake

Masons BrickTies are manufactured to comply with AS/NZS2699.1.2000.

Medium Duty also available.



Corner Guards For Windows

To use with the installation of Masons 40 Below Flashing Tapes.



UNI® Fasteners

Available as:

Galvanised nail and washers for wood frames **for use with a hammer.**

Galvanised nail and washer pack for **wood frames using a UNI Cap Nailer.**

Galvanised screws and washers **for steel frames.**



40 Below Platinum Flashing Tape

Superb adhesion in all weather conditions from -10°C to 40°C.

No primers or heat guns required.

Ultra-thin and pliable.

Use a scraper to assist adhesion.



Penetration Seals For Pipe Penetrations

Air seal flashings designed for cavity construction where pipes or wires penetrate the air barrier.

Available sizes:

1-75mm and 80-170mm.



PEF Backing Rod Joint Filler

A cylindrical flexible closed cell polyethylene material.

Available in multiple diameters from 6mm to 50mm.



Product Description	Masons Code
UNI FAB 2.74m x 18.25m = 50m²	UNI2.74X50
UNI FAB Soffit 0.6m X 18.25m = 10.95m²	UNISOFFIT
UNI Fasteners Galv Nail and Washer 32mm QTY 2500 (for use with hammer)	UNIFASTGN
UNI Cap Nailer Gun	UNICAPNAILER
UNI Nail/Washer Pack for UNI Gun QTY 2000 (for use with UNI Gun)	UNINAILPACK
UNI Nail Washer Pack for Steel Frames QTY 1500	UNIFASTSTLFRAME

Product Description	Masons Code
40 Below Platinum (or Flex) Flashing Tape 150mm x 20Lm, 75mm x 20Lm	40PLBELOW150x20 40PLBELOW75x20
40 Below Super Sticky Flashing Tape can be used instead of 40 Below Platinum or Flex	40BELOW150x20 40BELOW75x20
UNI FAB Seam & Repair Tape 60mm x 25m	UNISEAMTPE60MM
Penetration Seal - 1-75mm Pack of 10	PSEAL75
Penetration Seal - 80-170mm Pack of 10	PSEAL170
BrickTies - various sizes - Galv & Stainless	visit: mpb.co.nz
PEF Rod - various sizes - 6-50mm diameter	visit: mpb.co.nz
Corner Guards - 50 pack	HYDROCG50



MASONS
Designed Smart, Built Tough.

UNI[®]FAB

Meets
requirements of
NZBC E2/AS1
clauses E2, F2, B2

Find out more at
masons.nz



Applications

- Suitable for commercial and residential construction.
- Absorbent and can be used with all cladding systems.
- Strong and durable and suitable for all areas of New Zealand including up to 'Extra High' wind zones of NZS 3604 using a specific fixing method. (See UNI installation instructions on our website).
- Performs well over timber or steel framing.
- Suitable as a non rigid backing for stucco plaster.
- Suitable as an air barrier on walls that are not lined including gable ends.
- Has a fire retardancy to European Standard EN 13501-1 with a Class E rating. Must be covered with a suitable wall lining to any occupied areas.

New Zealand Building Code Standard (NZBC)

UNI[®] FAB is designed, installed and maintained in accordance with our requirements, UNI[®] FAB meets or exceeds the requirements of the NZBC.

UNI[®] FAB also holds a 'Product Assurance Supplier Statement' or PASS. Details are available on our website: **mpb.co.nz**



Physical Properties

- A non-woven breathable synthetic Flexible Air Barrier.
- Highly water resistant and designed to provide temporary protection from weather conditions and UV exposure to timber framing without the installation of the cladding, which allows for the continuation of internal work on the house for up to 90 days after installation.
- UNI[®] FAB comprises three polypropylene layers: two outer layers of non-woven polypropylene with a middle layer of a functional-technical film. It is manufactured to meet the European standard EN 13589-1:2014 as well as the absorbency performance requirement as per NZS 2295:2006.

Installation Training

Masons is committed to supporting builders with their first time use of UNI[®] FAB. An installation video and printable instructions are available on our website. Please read the instructions carefully and contact us through your Masons Rep to book a training session.

For quick access to the installation video, please scan this QR code.

Call your Masons Rep for further information

Waikato, Taranaki, Wanganui, Franklin, Takanini and Papakura: **Arthur 021 772 925**
Gisborne, Hawkes Bay, BOP, Rotorua, Coromandel, Wellington, Wairarapa, Kapiti, Palmerston North: **Graham 021 929 070**
Auckland and the Far North: **Jacqueline 021 414 100**
South Island: **Riki 021 786 898**
masons.nz 0800 522 533

MASONS UNI® FLEXIBLE AIR BARRIER

DESIGN AND INSTALLATION GUIDE



MASONS
Designed Smart, Built Tough.

V1.0 October 2021

General and product information

PURPOSE

This design and installation guide relates to Masons UNI® Flexible Air Barrier (UNI® FAB).

IMPORTANT DOCUMENTS

This guide must be read in conjunction with:

- › Masons UNI® FAB pass™
- › Masons UNI® FAB Warranty
- › Masons UNI® FAB Installation Video.

SEE VIDEO

SKILLS REQUIRED

This guide is suitable for use by a competent designer and person with basic carpentry skills. Where applicable the person specifying, supervising or installing the Masons UNI® FAB must be able to meet all RBW provisions.

FOR MORE HELP

Technical assistance is available at www.mpb.co.nz.

While all reasonable efforts have been made to ensure the accuracy of information provided, this guide is a guide only. It may be subject to change.

FOR OUR WARRANTY

Refer to www.mpb.co.nz.

PRODUCT DESCRIPTION

UNI® FAB is a nonwoven, absorbent, water-resistant, 180 GSM, synthetic wall underlay. It comprises three polypropylene layers: two outer layers of nonwoven polypropylene with a middle layer of a functional-technical film. It is manufactured to meet the European standard EN 13859-2:2014 as well as the absorbency performance requirement as per NZS 2295:2006. It is supplied coloured blue with a black underside unless an alternative colour is requested.

SCOPE AND LIMITATIONS

For scope of use, limitations, conditions and statement of building code compliance, refer to the Masons UNI® FAB pass™.

SEE PASS

Design

STEP 1:	CONFIRM SCOPE Confirm the proposed use is within the scope and limitations of the pass™.
STEP 2:	CONFIRM RELATED BUILDING WORK Masons UNI® FAB is suitable for use with a timber or steel framed structure. For new and existing buildings confirm that the primary structure: › complies with the NZ Building Code and is designed in accordance with NZS 3604:2011 or NASH Design Standard 2019 Parts 1 and 2; or › is specifically designed to NZS 3603:1993 or AS/NZS 1170:2002; or › where existing, is suitable for the intended building work. Masons UNI® FAB can be used with a cladding fixed over a cavity or direct fixed. Confirm whether the design includes a cavity system or not and determine the type and orientation of the battens. Ensure cavity battens specified are timber battens. Ensure that the framing meets, as a minimum the requirements in Table 1. SEE TABLE
STEP 3:	SPECIFY FIXINGS Specify Masons UNI® fastener fixings in accordance with Table 1. Masons UNI® Fasteners are 25 mm galvanised or stainless steel nails with a plastic washer. SEE TABLE
STEP 4:	SPECIFY ANCILLARY PRODUCTS Ensure all required ancillary products are specified in the completed Masons UNI® FAB specification.
STEP 5:	QUALITY CHECK Confirm all relevant design requirements are met. Collate the following documents and include in the building consent application: › Masons UNI® FAB pass™, › Masons UNI® FAB Specification, › Masons UNI® FAB Warranty and › this document.



Pre-installation

HEALTH AND SAFETY

Take all necessary steps to ensure your safety and the safety of others:

- › ensure adequate ventilation or mechanical dust extraction when cutting or drilling
- › take care when fixing the wrap in windy conditions
- › wear appropriate safety equipment, clothing and footwear
- › use all tools in accordance with relevant instruction manuals
- › plan and monitor a safe approach for working at height; select and use the right equipment
- › clear the work area of any obstruction before work starts.

For further information refer to:

- › WorkSafe. [July 2018] Small Construction Sites, the Absolutely Essential Health and Safety Toolkit.
- › WorkSafe. [December 2016] Health and Safety at Work, Quick Reference Guide.

These documents are available at www.worksafe.govt.nz.

HANDLING AND STORAGE

Handling

Care must be taken during loading, unloading, and transporting the materials to prevent pre-installation damage.

Unload the rolls carefully by hand. Do not crush the rolls and ensure they are protected from damage.

Storage

Store the rolls on end under a cover, in a clean and dry area and out of direct sunlight.

TOOLS AND EQUIPMENT REQUIRED

Install Masons UNI® FAB using standard carpentry tools and equipment. Use tools in accordance with good trade practice and supplier's instructions.

CN100 UNI Cap Nailer Gun



UNI Fasteners



UNI FAB Seam Tape



40 Below Flashing Tape



BrickTies



P Seals



Corner Guards



PEF Rod





Installation

STEP 1:

BUILDING CONSENT DOCUMENTATION

Where applicable, access and view building consent documentation.

STEP 2:

CHECK RELATED BUILDING WORK

For new and existing buildings ensure the primary structure is straight and true and within framing tolerances as described in Table 2.1, section 2 of NZS 3604:2011.

Masons UNI® FAB can be used where cladding is installed over a cavity system or direct fixed cladding.

STEP 3:

INSTALL WRAP

For assistance in installing UNI® FAB refer to video.

DIAGRAM 0.1

[SEE VIDEO](#)

Fit Wrap

[SEE VIDEO](#)

Ensure all necessary equipment and ancillary components are available.

Masons UNI® FAB must be installed with the printed side out, typically run horizontally on vertical framing. However, it is non directional and may be run in line with raking soffit lines or gables.

Fixing

[SEE VIDEO](#)

Masons supply Masons UNI® Fasteners for both timber and lightweight steel framing.

Ensure battens are fixed to Table 1 (as a minimum) or to the building consent.

Where cavity battens are to be installed, fix Masons UNI® FAB to frames at the plates and nogs/dwangs using the applicable Masons UNI® Fasteners. Do not fix to the studs. When fixing vertical or horizontal cavity battens ensure batten nails are a minimum of 100 mm away from the UNI® Fastener.

Fasten battens promptly to prevent wind blow out whilst 'UNI® FAB is tacked up' with reduced numbers of cap nails. Where bulging has or is likely to occur secure with Masons Wrap Strap.



DIAGRAM 0.1

Fit UNI® FAB Soffit

[SEE VIDEO](#)

The use of UNI® FAB Soffit is optional.

Run UNI® FAB soffit (self-adhesive strip at the bottom) along the top face and level with the top plate. Ensure that it is taut. Secure in accordance with Table 1.

[SEE TABLE](#)

Do not fasten the bottom of the soffit strip as this needs to overlap the next layer of UNI® FAB.

DIAGRAM 0.1

Fit UNI® FAB

[SEE VIDEO](#)

Where UNI® Soffit has been installed:

- Hold the soffit strip up to allow the horizontal installation of the UNI® FAB. Ensure that the soffit layer overlaps the lower layer by 150 mm.
- Fold the soffit layer down, peel the self-adhesive backing strip down and ensure adhesion by applying pressure with the plastic tape scraper.

Where UNI® Soffit has not been installed:

- Run UNI® FAB along the top face, level with the top plate. Ensure that it is taut. Ensure the wrap extends a minimum of 50 mm below the bottom plate or bearer.

Ensure the wrap is taut and does not belly into the cavity or openings. Fix in accordance with the building consent or Table 1.

[SEE TABLE](#)

Run the wrap over all openings and leave openings covered until windows and doors are ready to be installed.

DIAGRAM 0.1

Where UNI® Soffit has not been installed:

Run UNI® FAB along the top face, level with the top plate. Ensure that it is taut. Ensure the wrap extends a minimum of 50 mm below the bottom plate or bearer. Secure in accordance with Table 1.

- Ensure the wrap is level and is pulled taut so that the wrap does not belly into the cavity.
- Run the wrap over all openings and leave openings covered until windows and doors are ready to be installed



Laps

DIAGRAM 0.1

SEE VIDEO

Masons UNI® FAB must lap a minimum of 150 mm at horizontal joints and over framing wherever possible. Vertical joints must always be over framing and a minimum of 150 mm lap.

Upper wrap sheets must lap over lower wrap sheets to ensure water is shed outside the wrap.

All laps must be taped off with 60 mm Masons UNI® FAB Seam and Repair Tape or Masons 40 Below Flashing Tape (Flex or Platinum). Ensure adhesion by applying pressure using a plastic scraper.

If UNI® FAB is to be used as temporary weather protection, ensure all joins have been sealed using Masons UNI® FAB Seam and Repair Tape, the self-adhesive strip on the reverse of the UNI® Soffit roll, or Masons 40 Below (Flex or Platinum) Flashing Tape. The roof cladding and soffit linings must also have been installed.

Penetrations

DIAGRAM 0.8

SEE VIDEO

Pipe penetrations must be sealed using Masons Penetration seals or similar, ensuring good adhesion by applying pressure with a plastic scraper.

Intersections – Apron Flashings, Interstorey Flashings, Change of pitch

Drape UNI® FAB over the upstand of apron, change of pitch or inter storey flashings. The UNI® FAB length should extend beyond the flashing by 100 – 150 mm at each end. Secure with UNI® Fastenings. Tape all laps with UNI® 40 Below (Flex or Platinum) Flashing Tape.

Tears

SEE VIDEO

Regularly check Masons UNI® FAB for damage, tears, holes and gaps. Any damaged areas must be repaired immediately.

Repair by covering with new wrap lapping the damaged area by at least 150 mm and tape the wrap using Masons UNI® Seam and Repair Tape.

Small tears can be repaired by taping with Masons UNI® Seam and Repair Tape.



STEP 5

PREPARE OPENINGS

DIAGRAM 0.2

Openings

[SEE VIDEO](#)

Remove the wrap by cutting the wrap diagonally from each corner of the opening. Fold the flaps of the cut membrane inside the opening. Staples may be used to fix the wrap to the inside of the window frame. Cut excess wrap flush with the internal face of the framing.

Flashing tape must be installed to all openings. Masons 40 Below (Flex or Platinum) Flashing Tape must be used.

All exposed wall framing in the openings must be protected by the Masons UNI® FAB, and Masons 40 Below Flashing Tape.

To ensure the best possible adhesion make sure the substrate is clean, dry, free from dust or any other contaminants.

DIAGRAM 0.3

Window & Door sills

[SEE VIDEO](#)

Place Masons Corner Guard over the Masons UNI® FAB and into the bottom corners of the window or door sill and staple to the jamb for timber framing or attach with double sided tape for steel framing.

Install Masons 40 Below (Flex or Platinum) Flashing Tape flush with the interior face of the opening along the entire length of the sill and up each jamb to a minimum of 200 mm. Press tape firmly into the corner over the guard first then slit at each corner and fold around onto the frame face. Fold remainder of the tape against the outer face of the frame and press firmly using the plastic scraper.

DIAGRAM 0.3

Window and door heads

[SEE VIDEO](#)

Install lintel pieces at top corners of opening, 200 mm along the lintel and 200 mm down the jamb. Slit Masons UNI® FAB at each corner and fold at least 50 mm onto outer face of building wrap. To create a seal at corner junctions, install butterflies at 45° across the corner of the head/jamb.



STEP 6:

DIAGRAM 0.2

INSTALL JOINERY

SEE VIDEO

Install window and door joinery with head flashings and air seals.

Masons recommends Running Masons Dry Fix Plastic DPC up the side of the window jambs and under the head flashing. Where plastic DPC is installed around joinery as secondary water proofing such as for brick veneer work, fasten the DPC to the frame over the wrap using Masons UNI® Fasteners.

To seal above the head flashing, Masons recommends installing UNI® FAB so that it drapes over the head flashing extending the length of the flashing by 100 – 150 mm at each end. Secure with UNI® Fastenings. Tape all laps with UNI® 40 Below (Flex or Platinum) Flashing Tape. This method of sealing is mandatory at wind zones very high and above.

For wind zones less than very high, the head flashing may be sealed to the UNI® FAB using UNI® Seam and Repair Tape or UNI® 40 Below (Flex or Platinum) Flashing Tape.

STEP 7:

QUALITY CHECK

Ensure that all joins are taped, and all tears have been repaired. Ensure full adhesion around penetrations and openings.

Ensure Mason's warranty is inserted into the client document package.

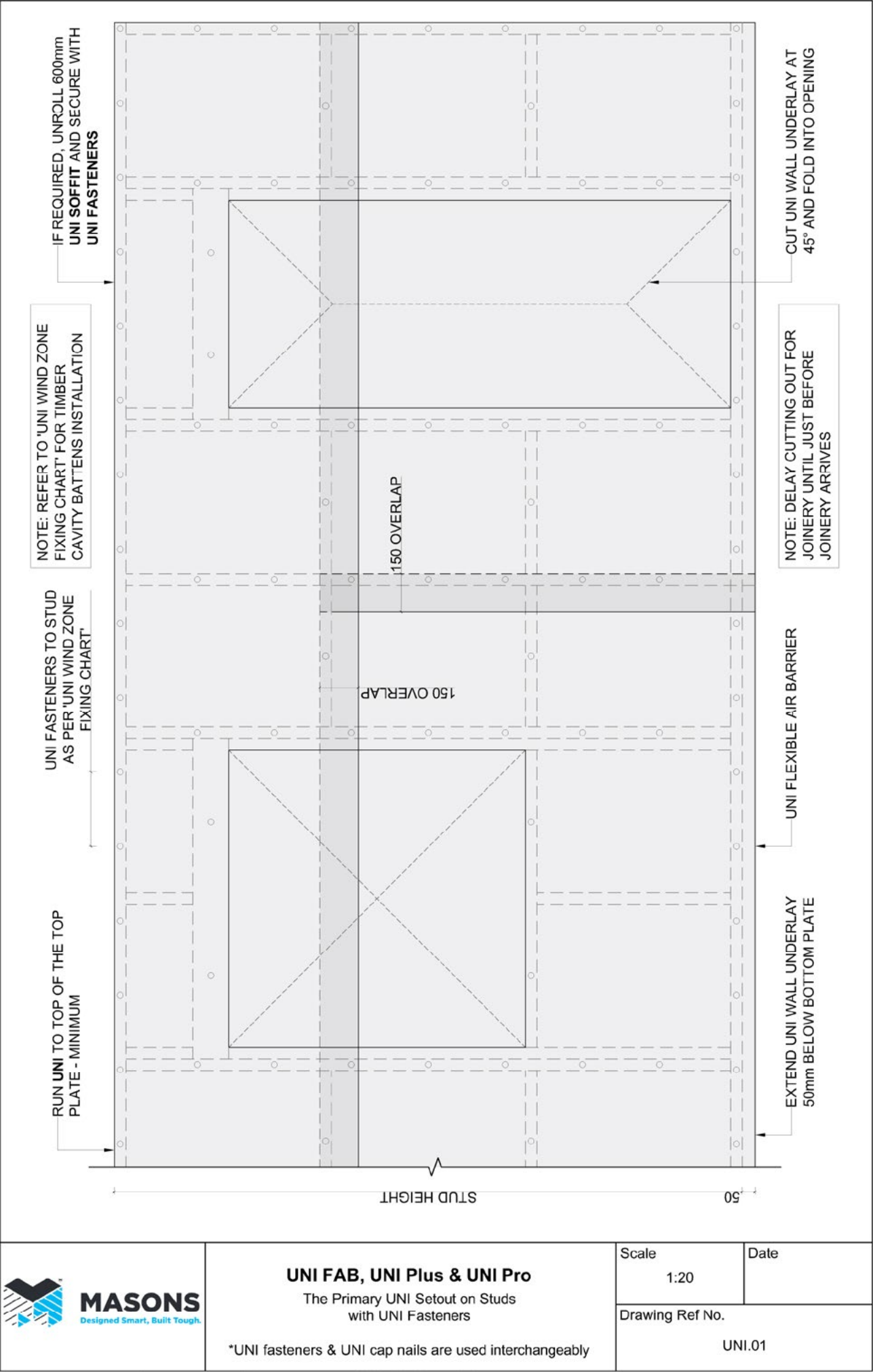


Appendix 1

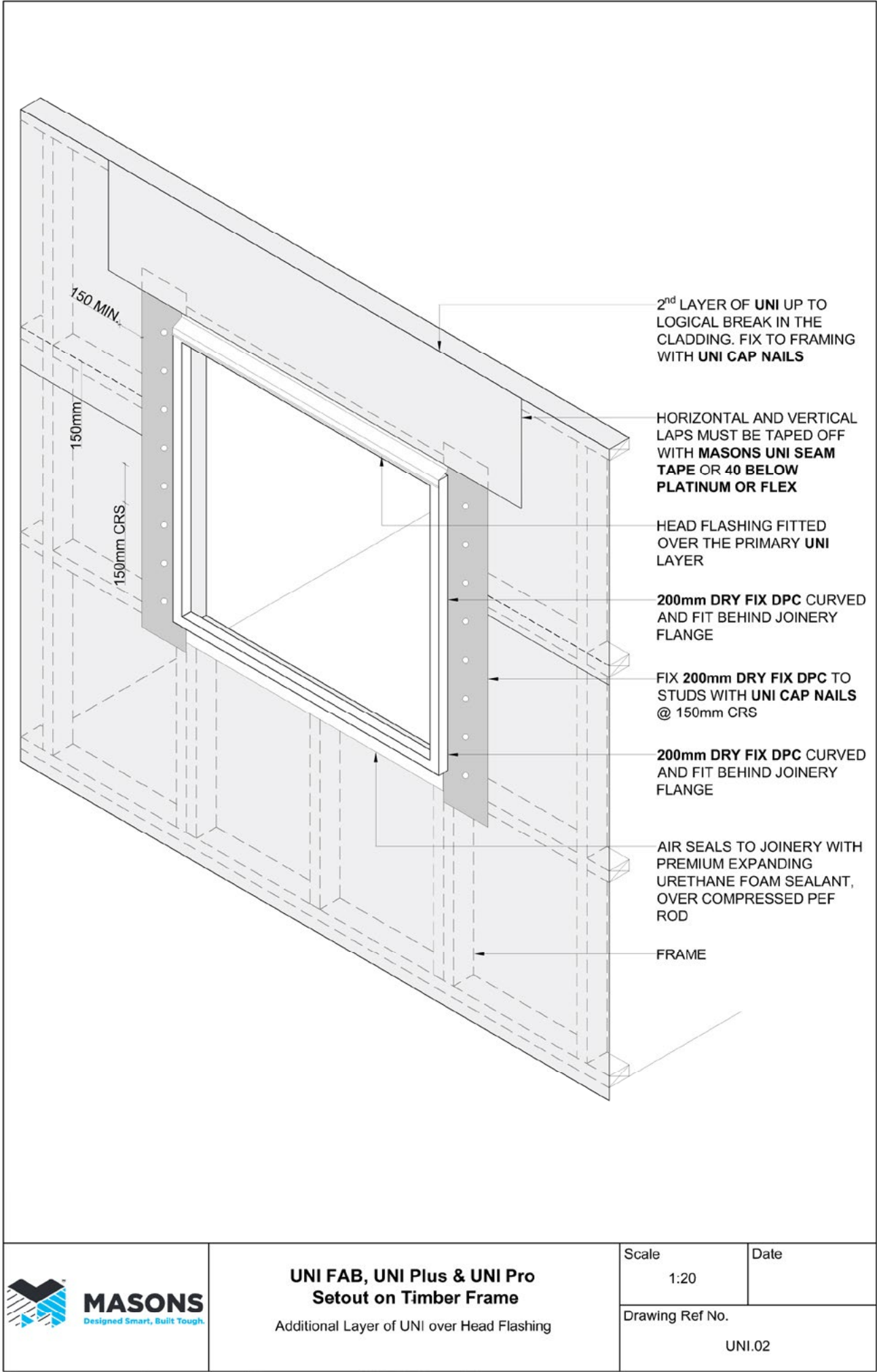
TABLE 1: FIXING TABLE

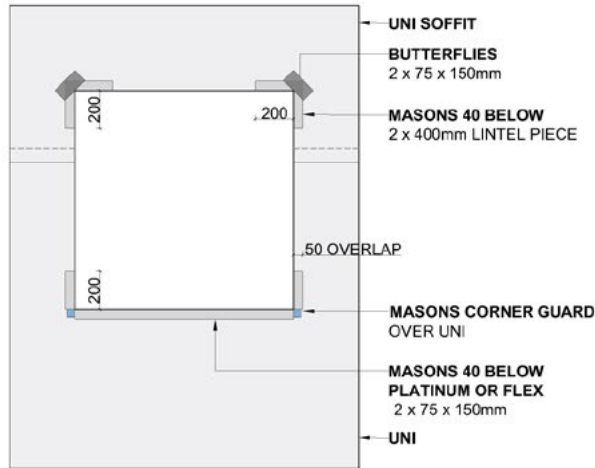
Stud centres (mm)	Fixings on studs (mm)	Minimum nogs centre (mm)	Perimeter fixing all around	Wind Zone	Fixing on	Fixings nogs
600	Nail at 450 mm centres	800	Nail at 300 mm centres	Low/ Medium	Nail at centre	25 mm nails with plastic washer
450	Nail at 500 mm centres	800	Nail at 300 mm centres	Low/ Medium	Nail at centre	25 mm nails with plastic washer
400	Nail at 450 mm centres	800	Nail at 300 mm centres	Low/ Medium	Nail at centre	25 mm nails with plastic washer
600	Nail at 300 mm centres	800	Nail at 300 mm centres	High	Nail at centre	25 mm nails with plastic washer
450	Nail at 350 mm centres	800	Nail at 300 mm centres	High	Nail at centre	25 mm nails with plastic washer
400	Nail at 300 mm centres	800	Nail at 300 mm centres	High	Nail at centre	25 mm nails with plastic washer
400	Nail at 250 mm centres	800	Nail at 300 mm centres	Low/ Medium/ High/ Very High	Nail at centre	25 mm nails with plastic washer
300	Nail at 300 mm centres	800	Nail at 300 mm centres	Low/ Medium/ High/ Very High/ Extra High	Nail at centre	25 mm nails with plastic washer
300	Nail at 250 mm centres	800	Nail at 300 mm centres	Low/ Medium/ High/ Very High/ Extra High	Nail at centre	25 mm nails with plastic washer
300, 400, 450, 600	Battens with nails at 400 mm centres	800	Batten with nails at 300 mm centres	Low/ Medium/ High/ Very High/ Extra High	Battens with nails at 400 mm centres (2 nails min)	Batten – 20 x 45 SG8 Nails – 60 2.8 ring shank galvanised

SDC - Approved Building Consent Document - BC240357 - Pg 112 of 402 - 19/03/2024 - warreg

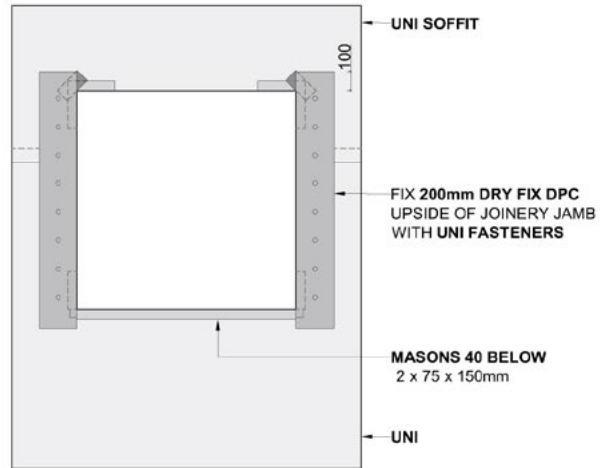


SDC - Approved Building Consent Document - BC240357 - Pg 113 of 402 - 19/03/2024 - warreg

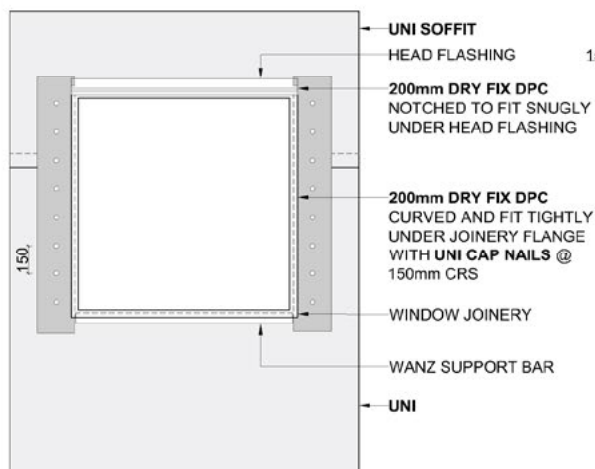




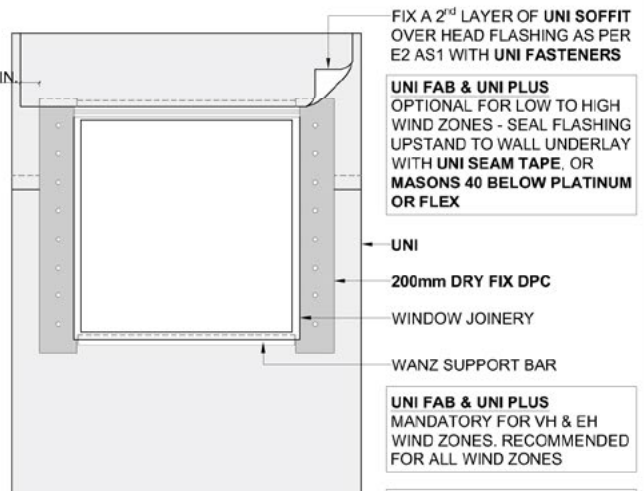
STEP ONE



STEP TWO



STEP THREE



STEP FOUR



Window Installation
UNI FAB, UNI Plus & UNI Pro

Scale

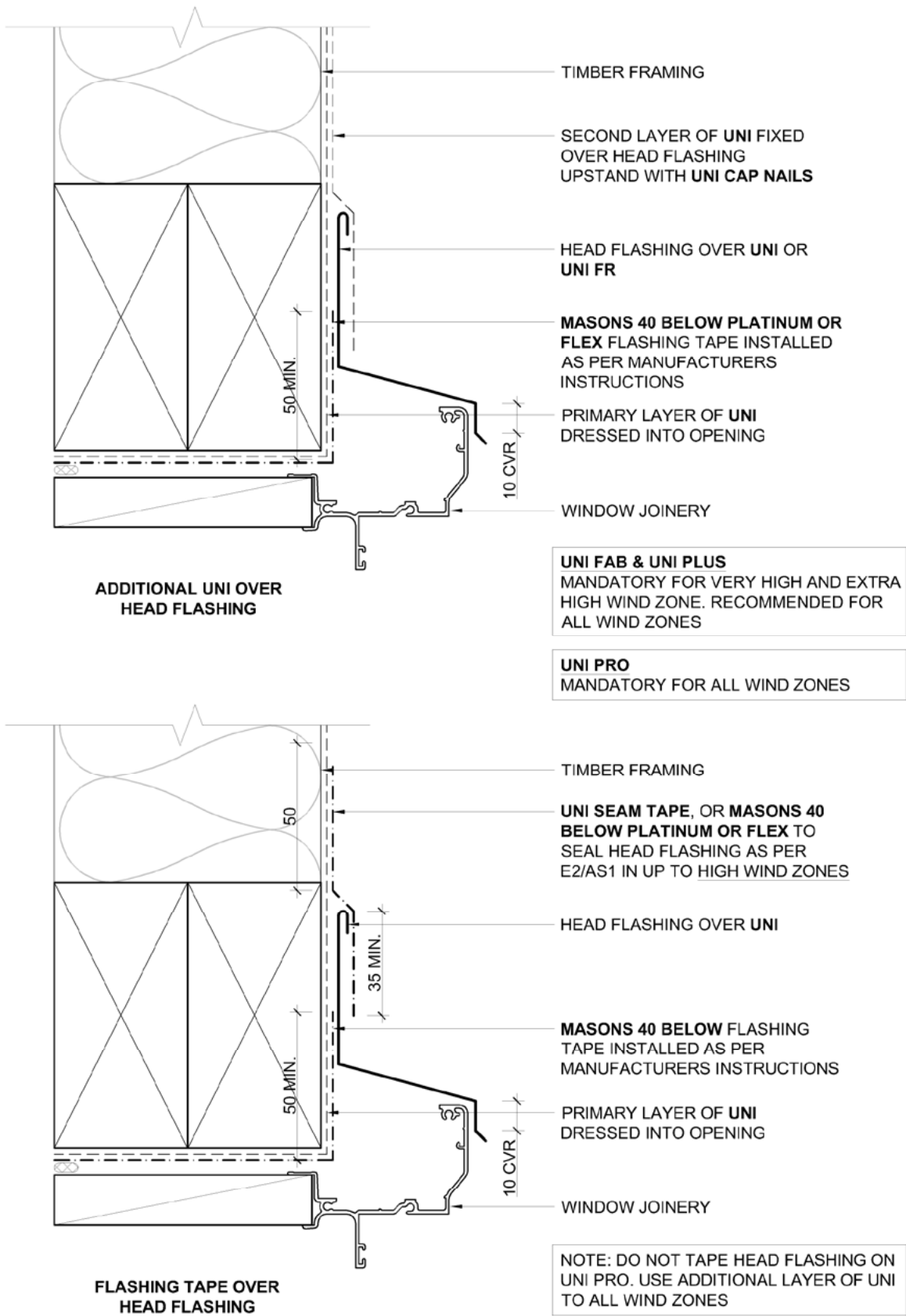
1:40

Date

Drawing Ref No.

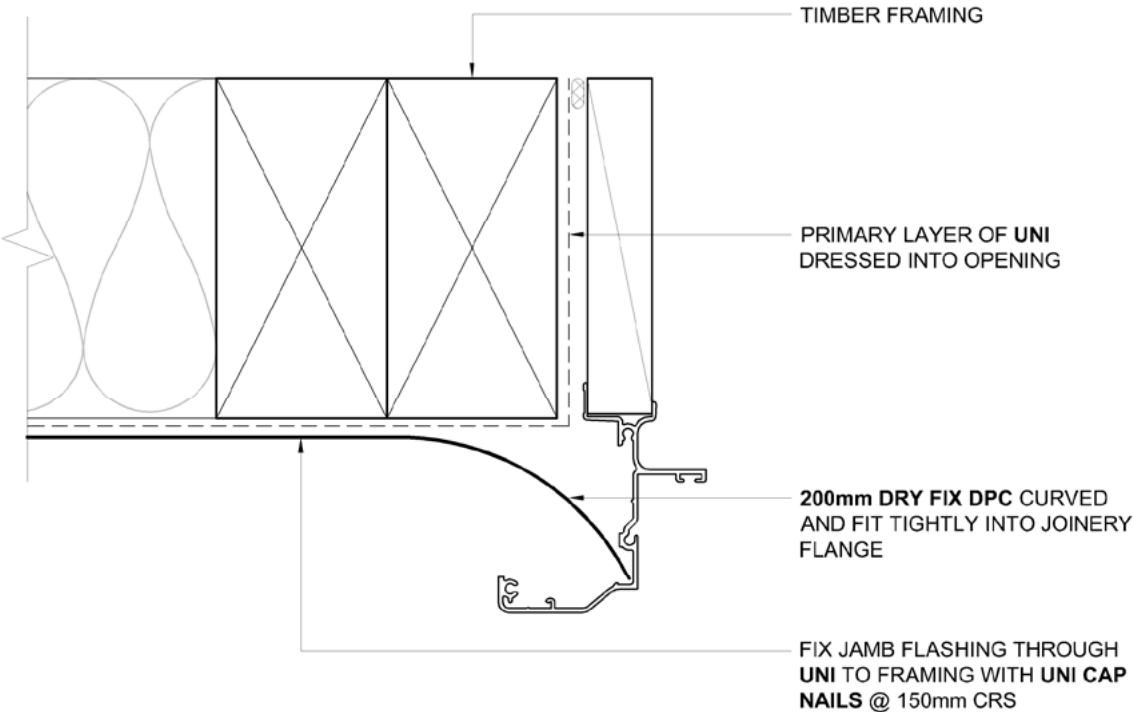
UNI.03

SDC - Approved Building Consent Document - BC240357 - Pg 115 of 402 - 19/03/2024 - warreg



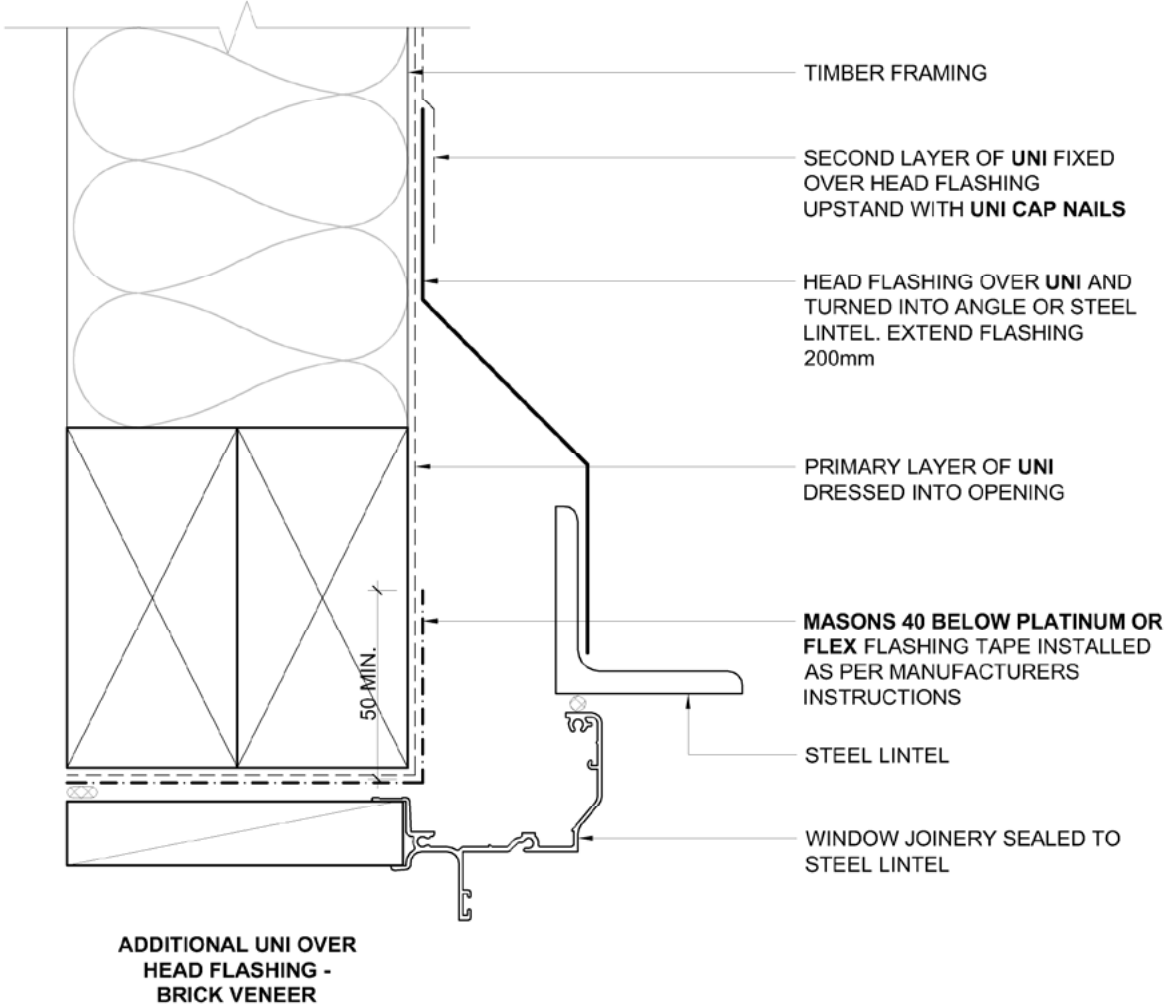
 MASONS Designed Smart, Built Tough.	Window Head Head Flashing to UNI FAB, UNI Plus & UNI Pro	Scale	Date
		1:2	
		Drawing Ref No. UNI.04	

SDC - Approved Building Consent Document - BC240357 - Pg 116 of 402 - 19/03/2024 - warreg



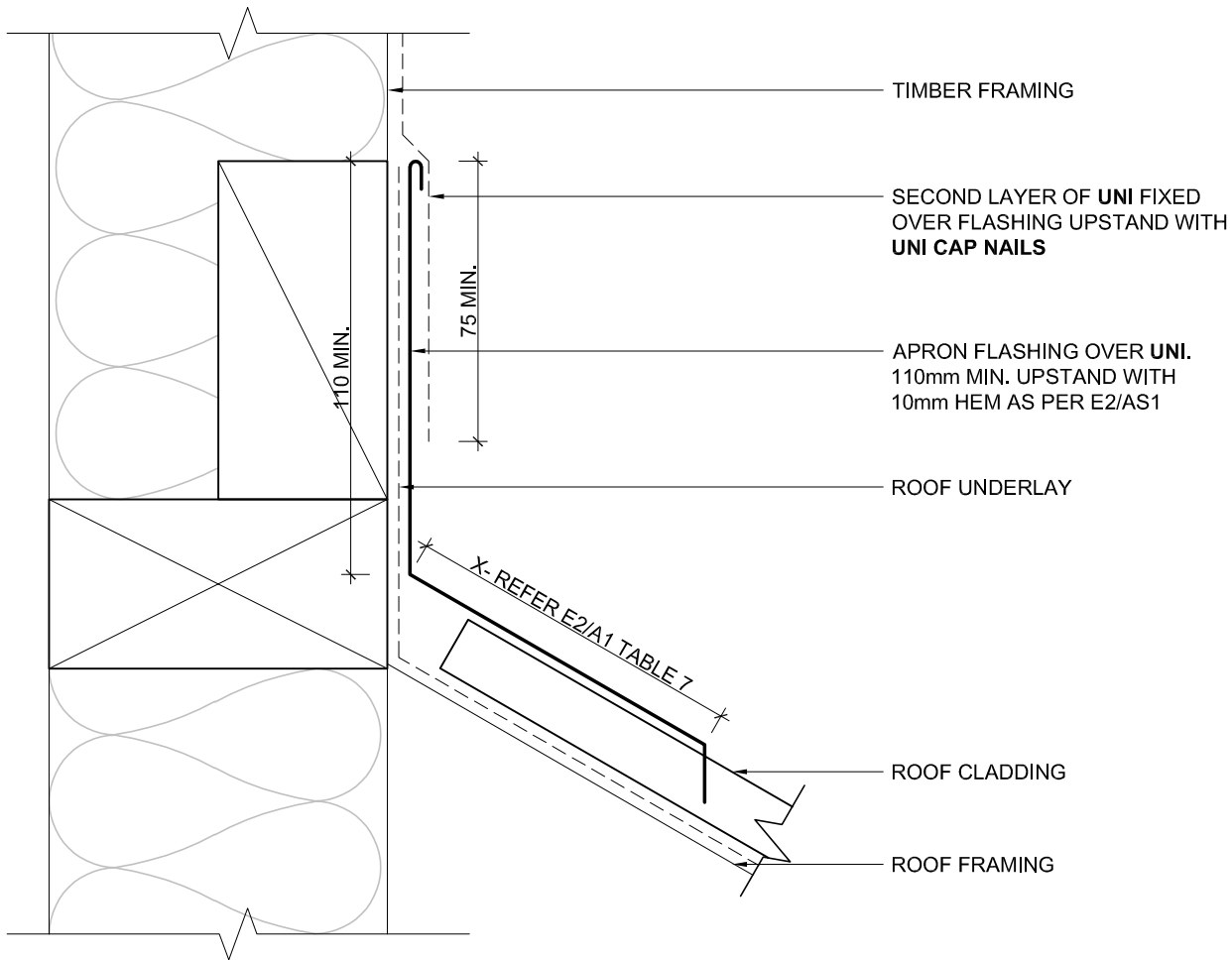
 MASONS Designed Smart, Built Tough.	Typical Jamb with 200mm Plastic DPC UNI FAB, UNI Plus & UNI Pro	Scale 1:2	Date
		Drawing Ref No. UNI.05	

SDC - Approved Building Consent Document - BC240357 - Pg 117 of 402 - 19/03/2024 - warreg

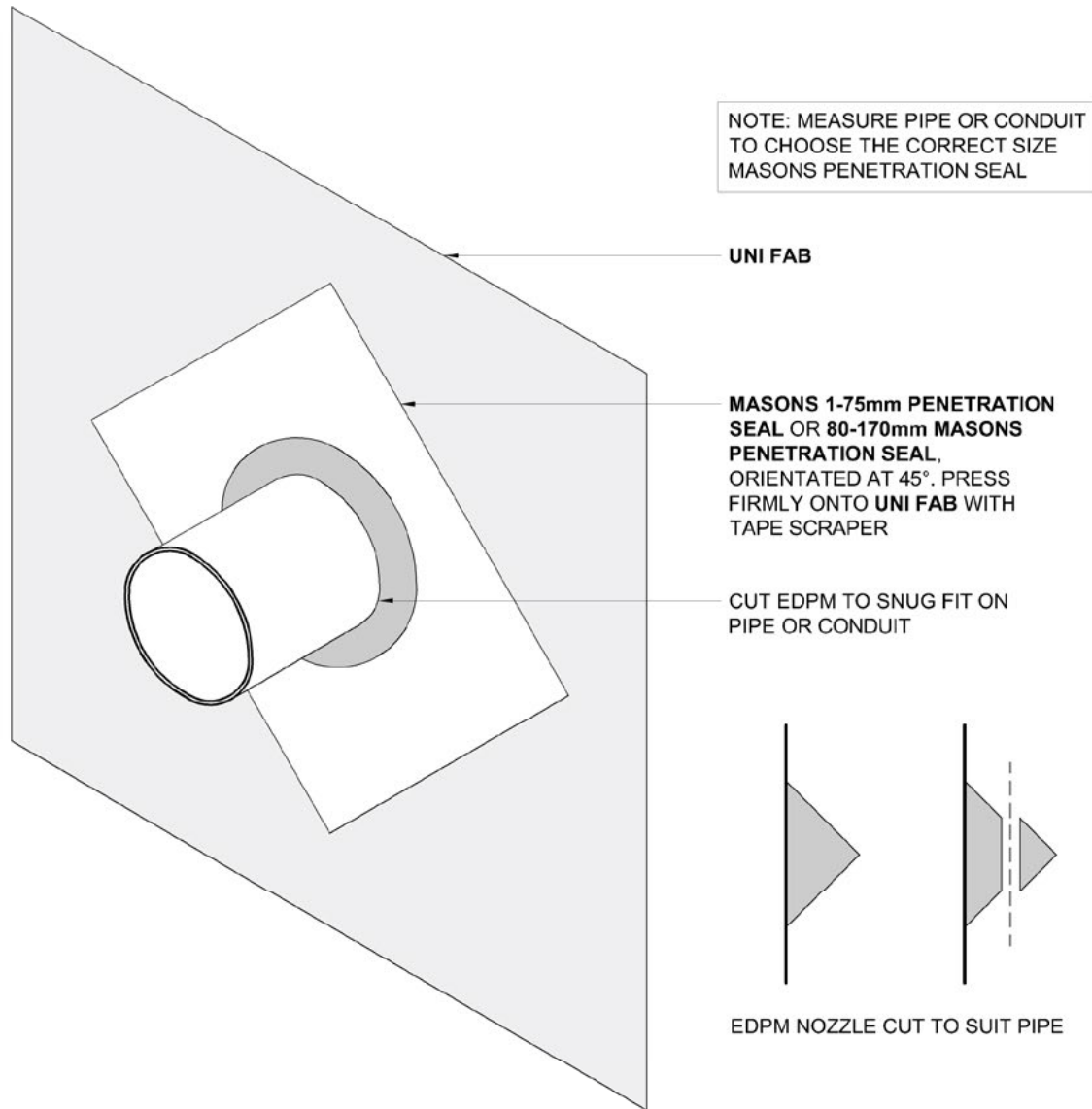


 MASONS Designed Smart, Built Tough.	Brick Lintel Veneer Window Head UNI FAB, UNI Plus & UNI Pro	Scale	Date
		1:2	
		Drawing Ref No. UNI.06	

SDC - Approved Building Consent Document - BC240357 - Pg 118 of 402 - 19/03/2024 - warreg



 MASONS Designed Smart, Built Tough	Apron Flashing Installation UNI FAB, UNI Plus & UNI Pro	Scale 1:2	Date
		Drawing Ref No. UNI.07	



Penetration Seals
UNI FAB, UNI Plus & UNI Pro

Scale

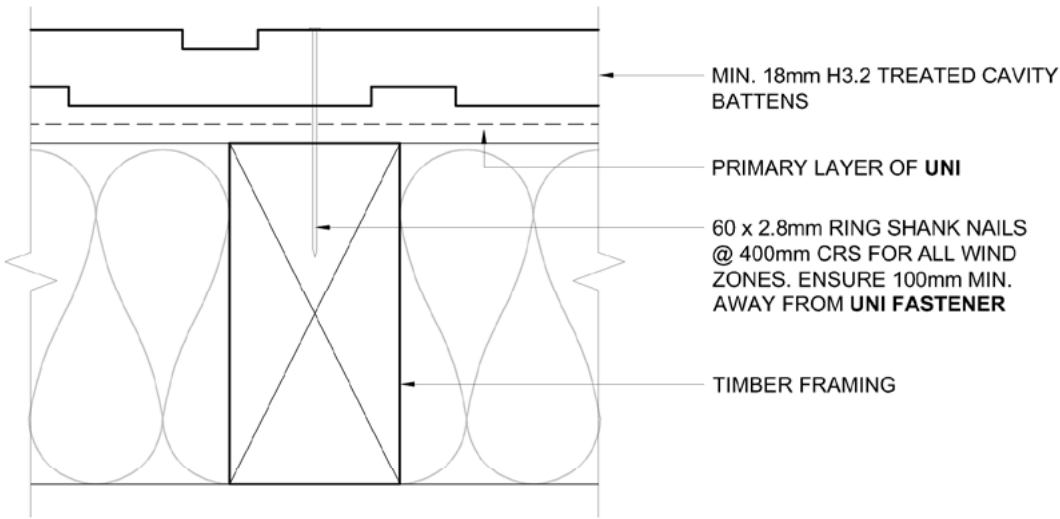
1:2

Date

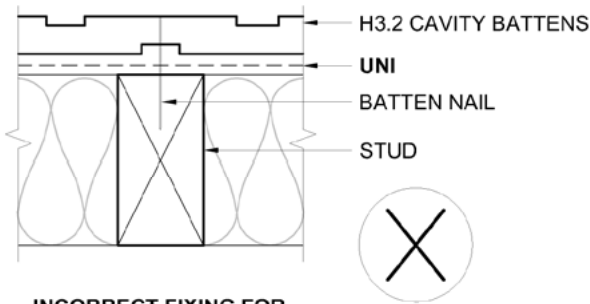
Drawing Ref No.

UNI.08

SDC - Approved Building Consent Document - BC240357 - Pg 120 of 402 - 19/03/2024 - warreg

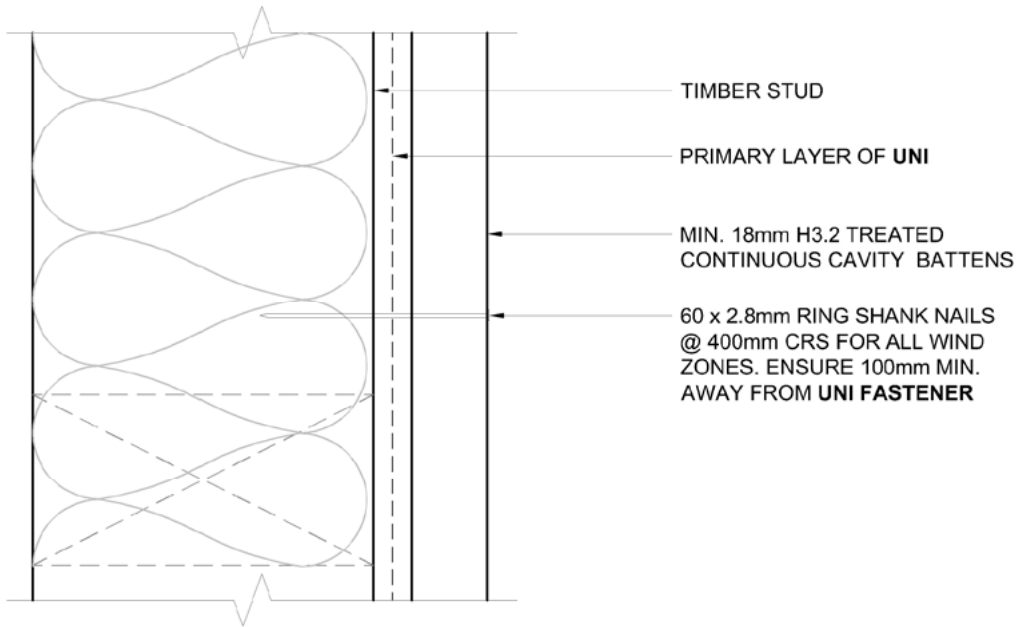


HORIZONTAL CAVITY BATTEN



INCORRECT FIXING FOR VENTILATED BATTENS

- NOTE:
- BATTEN FIXINGS REFER TO 'UNI WIND ZONE FIXING CHART'
 - USE APPROPRIATE FIXING FOR CORROSION ZONE
 - DO NOT FIX AT BATTEN NOTCHES
 - MASONS WRAP STRAP IS RECOMMENDED BEFORE INSTALLING BATTENS TO PREVENT BUILDING WRAP FROM BULGING



VERTICAL CAVITY BATTEN

 MASONS Designed Smart, Built Tough.	CAVITY BATTEN FIXING UNI FAB, UNI Plus & UNI Pro	Scale 1:2	Date
		Drawing Ref No.	
		UNI.09	



CERTIFICATE NO: CM70116 Rev1

Date of issue: 6 April 2022

1 CERTIFICATE HOLDER DETAILS

MASONS Plastabrick Ltd

18A David McCathie Place
Silverdale, Auckland 0932, New Zealand

info@mpb.co.nz
Ph: +64 9 414 7551
www.mpb.co.nz



2 PRODUCT CERTIFICATION BODY

Bureau Veritas Australia Pty Ltd

3/435 Williamstown Road
Port Melbourne VIC 3207
Australia

Ph: 1800 855 190
www.bureauveritas.com.au

Bureau Veritas Australia Pty Ltd

The complaints process for this certificate
can be found here:
www.bureauveritas.com.au/your-feedback

PRODUCT CERTIFICATE

Masons UNI® and UNI® PLUS Flexible Air Barriers



**BUREAU
VERITAS**

KEY INFORMATION

3 SUMMARY OF DESCRIPTION OF BUILDING METHOD OR PRODUCT

Masons UNI® and UNI® PLUS Flexible Air Barriers are tri-laminate synthetic sheets 2.74 metres wide consisting of two outer non-woven layers and a middle synthetic membrane which is dark grey.

UNI® Flexible Air Barrier has a blue front face marked "UNI® Flexible Air Barrier" and a black rear face.

UNI® PLUS Flexible Air Barrier has a blue front face marked "UNI® PLUS Flexible Air Barrier" and a white rear face.

UNI® Flexible Air Barrier is also available as 600 mm wide sheet with a self-adhesive strip, marketed as UNI® Soffit.

Continuation of description can be found in item 9. Supporting Information about Description of Building Product or Method.

Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and Limitations of Use.

4 SUMMARY OF INTENDED USE OF BUILDING METHOD OR PRODUCT

Masons UNI® and UNI® PLUS Flexible Air Barriers are wall underlays and flexible air barriers and are suitable for use as temporary weather protection to allow interior works to continue inside the building without the exterior wall cladding fully in place.

UNI® PLUS Flexible Air Barrier is fire retardant and suitable for use where exposed to view in an occupied space.

Continuation of intended use can be found in item 8. Supporting Information about Intended use of Building Product or Method.

5 BUILDING CODE PROVISIONS

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

B2 Durability: B2.3.1(a), B2.3.2

C3 Fire affecting areas beyond the fire source: C3.4(c) (UNI® PLUS)

E2 External moisture: E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.6 (contributes to), E2.3.7

F2 Hazardous building materials: F2.3.1

H1 Energy efficiency: H1.3.1(b) (contributes to)

How the building method or product complies or contributes can be found in item 12. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and Limitations of use.

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

CERTIFICATE V1.3



PRODUCT CERTIFICATE

Masons UNI® and UNI® PLUS Flexible Air Barriers



6 CONDITIONS AND LIMITATIONS OF USE

1. Masons UNI® and UNI® PLUS Flexible Air Barriers are certified for use as a wall underlay and air barrier on buildings:
 - a. within the scope limitations of:
 - i. NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area for timber-framed construction; or
 - ii. NZBC Acceptable Solution E2/AS4 with regards to building height and floor plan area for light-steel framed construction, and
 - b. situated in wind zones (as defined in NZS 3604:2011) up to and including 'Extra High', provided stud and fixing centres are no greater than specified in the Masons UNI® Flexible Air Barrier Design and Installation Manual V1.0, October 2021 - CM, or the Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 - CM respectively, and
 - c. with absorbent or non-absorbent wall claddings directly fixed to the frame; or 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 NZBC Acceptable Solution E2/AS4 for steel framed buildings, and
 - d. Masons UNI® Flexible Air Barrier must not be used where the underlay is exposed to view in an occupied space.
 - e. Masons UNI® PLUS Flexible Air Barrier may be used when exposed to view in an occupied space.
2. Masons UNI® and UNI® PLUS Flexible Air Barriers shall be:
 - a. installed in accordance with the Masons UNI® Flexible Air Barrier Design and Installation Manual V1.0, October 2021 - CM, or the Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 - CM respectively, and
 - b. separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 and C/AS2, Paragraph 7.5.9 for the protection of combustible materials, and
 - c. protected from sunlight within 90 days
3. Contribution to compliance with Building Code clause H1.3.1(b) is conditional on:
 - a. the element incorporating Masons UNI® and UNI® PLUS Flexible Air Barrier being part of the thermal envelope of the building, and
 - b. horizontal and vertical laps being securely taped.

NOTE: Together, items 3, 4, 5 and 6 define scope of use.

7 HEALTH AND SAFETY INFORMATION

The compliance with any manufacturer's installation instructions, maintenance, OH & S statements, MSDS's and other Health and Safety declarations will provide the necessary Health and Safety Information pertaining to the product.

8 SIGNATURES

Sam Guindi
Product Certification Manager

For and on behalf of
Bureau Veritas Australia Pty Ltd

Trent Mason
Director

For and on behalf of
MASONS Plastabrick Ltd

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.
CERTIFICATE V1.3



PRODUCT CERTIFICATE

Masons UNI® and UNI® PLUS Flexible Air Barriers



SCHEDULE: INFORMATION THAT SUPPORTS KEY INFORMATION

9 SUPPORTING INFORMATION ABOUT DESCRIPTION

The following accessories are used with Masons UNI® Flexible Air Barrier :

- UNI Seam Tape
- UNI Fasteners
- Masons 40 Below, 40 Below Platinum and 40 Below Flex flashing tapes
- Masons Corner Guards
- Penetration seals

10 SUPPORTING INFORMATION ABOUT INTENDED USE

N/A

11 SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE

N/A

This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification accreditation body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. The Ministry does not in any way warrant, guarantee, or represent that the building method or product that is the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry disclaims to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.
CERTIFICATE V1.3



PRODUCT CERTIFICATE

Masons UNI® and UNI® PLUS Flexible Air Barriers



12 BASIS FOR CERTIFICATION

- B2 Durability - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS2295
- C3 Fire affecting areas beyond the fire source - By testing and comparison with Acceptable Solutions C/AS1 and C/AS2
- E2 External moisture - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS2295
- F2 Hazardous building materials - By comparison with requirements of performance requirements of Building Code clause F2.3.1
- H1 Energy efficiency - By testing and comparison with Acceptable Solution E2/AS1 and referenced standard NZS 2295

13 SUPPORTING DOCUMENTATION FOR CERTIFICATION

1. C/AS2 Acceptable Solution for Buildings other than Risk Group SH for New Zealand Building Code Clauses C1-C6 Protection from Fire First edition (Amendment 2), 5 November 2020
2. C/VM1 Verification Method for Solid Fuel Appliances C/AS1 Acceptable Solution for Buildings with Sleeping (residential) and Outbuildings (Risk Group SH) For New Zealand Building Code Clauses C1-C6 Protection from Fire (Amendment 5), 5 November 2020
3. Verification Methods E2/VM1 and Acceptable Solutions E2/AS1, E2/AS2 and E2/AS3 for New Zealand Building Code Clause E2 External Moisture Third edition (Amendment 10), 5 November 2020
4. Acceptable Solution E2 External Moisture E2/AS4 First edition, 28 November 2019
5. NZS 2295 2295:2006 Pliable, permeable building underlays
6. AS1530.2:1993 Methods for fire tests on building materials, components and structures
7. Masons Plastabrick Material Safety Datasheet V2, January 2022
8. Scion Report No 2704886 [J31991 / QT8222VHPU] Evaluation of Roof VHP Ultra to NZS2295, July 2020
9. ProConsult Report Reference 13038 HP Ultra wall underlay system compliance with NZBC B1 Structure (including fixing recommendations), 22 March 20
10. L H Bolton Report 201265 Assessment of Masons Roofing Underlays for Buildings, 21 October 2020
11. NZWTA Test Report No.1374734.0 "SP180 Test for Flammability to AS1530 .2-1993", July 2021
12. Scion Report No 45558911 [J32028 / QT9596] Assessment of SP180 TO NZS 2295, January 2022
13. Masons UNI® Flexible Air Barrier Design and Installation Manual V1.0, October 2021 - CM
14. Masons UNI® PLUS Flexible Air Barrier Design and Installation Manual V2.0, March 2022 - CM



PRODUCT CERTIFICATE

Masons UNI® and UNI® PLUS Flexible Air Barriers



14 CONDITIONS RELATING TO NOTIFICATION

- (a) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change to any of the following particulars:
 - (i) the name, address, or contact details of the certificate holder;
 - (ii) any address of a location where a certified product is produced or manufactured;
- (b) the certificate holder notifies the product certification body (Bureau Veritas) in writing of any intended change, modification, or alteration to any of the following:
 - (i) the certified building method or product;
 - (ii) the method of its production or manufacture;
 - (iii) the product quality plan prepared in respect of the certified building method or product;
 - (iv) the application or installation instructions for the certified building method or product;
 - (v) any documentation relating to the use and maintenance of the certified building method or product;
- (c) if the certificate holder has any reason to suspect that the certified building method or product does not comply with the Building Code, the certificate holder notifies the product certification body (Bureau Veritas) in writing of the reason for that suspicion;
- (d) if the certificate holder or the product certification body (Bureau Veritas) finds that a certified building method or product that has been released on the market does not comply with the Building Code, the certificate holder discloses that fact in disclosure statements published in a form that is acceptable to the product certification body and to the chief executive;
- (e) if the certificate is suspended or revoked, the certificate holder—
 - (i) notifies all customers to whom the building method or product is regularly supplied; and
 - (ii) immediately ceases using the certificate, the mark of conformity, and any reference to the number of the certificate.

CodeMark

Certificate no: CMNZ70075

Version: 2

Original issue date: 08 April 2021

Version date: 31 August 2023

1. Certificate Holder Details



MASONS Plastabrick Ltd

13A David McCathie Place, Silverdale Auckland 0932
New Zealand
info@mpb.co.nz
Ph: +64 9 414 7551
www.mpb.co.nz

2. Product Certification Body

Bureau Veritas Australia Pty Ltd

11/500 Collins Street
Melbourne VIC 3000 Australia
product.certification@bureauveritas.com
Ph: 1800 855 190
www.bureauveritas.com.au

Complaints: The complaints process for this certificate can be found here:
www.bureauveritas.com.au/your-feedback

Sam Guindi – Bureau Veritas Product Certification Manager



**BUREAU
VERITAS**

Product Certificate

MASONS Flashing Tapes

3. Description of Building Method or Product

Name of the product or method in Aotearoa New Zealand, including any brand names used. Description of what it is and the components that make up any system and its physical attributes including the materials and make-up of the product, where applicable. Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and Limitations of Use. Continuation of description can be found in item 10 – Supporting Information about Description. [Delete if not applicable]. The building method's or building product's catalogue or model identification number or numbers or other unique identifiers that might be used to identify the building product or building method

Masons Flashing Tapes are made of three components (film or fabric carrier, adhesive, and a release liner).

This certificate covers the following products:

- 40 Below Window Flashing Tape
- 40 Below Platinum Flashing Tape
- 40 Below Flex Flashing Tape
- Hydro Flashing Tape
- Bayonet BayoWrap Window Sealing Tape

and the following optional accessories for sill flashing:

- CornerGuard
- BayoWrap Corner Guard

4. Intended use of Building Method or Product

Intended use of the building method or product as described in the product manual and other instructional materials. A statement of the function or purpose of the building method or product. Continuation of intended use can be found in item 11 – Supporting Information about Intended use. [Delete if not applicable]

Masons Flashing Tapes are used to flash around windows and doors as a secondary water-resistant barrier. Bayonet BayoWrap, 40 Below, 40 Below Platinum, 40 Below Flex tapes may be used to seal joints in rigid air barriers. Bayonet BayoWrap, 40 Below Platinum, 40 Below Flex and Hydro may also be used at joinery heads to seal flashing upstands to the wall underlay.

5. New Zealand Building Code Provisions

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

How the building method or product complies or contributes can be found in item 8. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

Clause B2 Durability: Performance Clauses B2.3.1(a), B2.3.2

Clause E2 External moisture: Performance Clauses E2.3.2 (contributes to), E2.3.5 (contributes to), E2.3.6 (contributes to), E2.3.7

Clause F2 Hazardous building materials: Performance Clauses F2.3.1



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70075

Version: 2

Original issue date: 08 April 2021

Revision date: 31 August 2023

Product Certificate

MASONS Flashing Tapes



6. Conditions and Limitations of Use

The building method or product's use is to be in accordance with the installation instructions and requirements against which the building method or product was assessed.

Conditions or limitations of conformity for the performance requirements the building method or product is compliant with, including any requirements for people with the qualifications and skills to install or use the building method or product, any known or demonstrated situations where the building method or product should not be used. A statement as to whether there are any matters that should be taken into account in the use or application of the building product or building method and, if so, what those matters are.

1. Masons Flashing Tapes are certified for use in buildings:
 - a. within the scope of E2/AS1, and
 - b. located in any wind zone up to and including Extra High, and
 - c. located in any exposure zone (both as defined in NZS3604:2011 Timber framed buildings)
2. 40 Below, 40 Below Platinum, 40 Below Flex Flashing Tapes shall be used in accordance with the 40 Below & Hydro Flashing Tape Installation Instructions, March 2021, and the requirements of Acceptable Solution E2/AS1.
3. Bayonet BayoWrap Window Sealing Tape shall be used in accordance with the Bayonet BayoWrap Window Sealing Tape. Installation Guide, Version 1 July 2023, and the requirements of Acceptable Solution E2/AS1.
4. Masons Flashing Tapes shall not be installed in areas where the tape has the potential to be exposed to heat, such as chimney flues.

7. Health and Safety Information

Health, safety, and well-being declarations associated with installation, maintenance, and use of the building method or product, and their specific editions and dates necessary to ensure the performance requirements of clauses F1 to F9 of the Building Code can be met.

The compliance with any manufacturer's installation instructions, maintenance, OH & S statements, MSDS's and other Health and Safety declarations will provide the necessary Health and Safety Information pertaining to the product.

8. Basis for Certification

How the performance requirements in the Building Code were met for each of the provisions. Where used as part of a system, the specific contribution to compliance.

B2 Durability - By testing and comparison with Acceptable Solution E2/AS1

E2 External moisture - By testing and comparison with Acceptable Solution E2/AS1

F2 Hazardous building materials - By comparison with the performance requirements of Building Code Clause F2.3.1



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.



Certificate no: CMNZ70075

Version: 2

Original issue date: 08 April 2021

Revision date: 31 August 2023

Product Certificate

MASONS Flashing Tapes



**BUREAU
VERITAS**

9. Supporting Documentation for Certification

Reference to any acceptable solutions, verification methods, New Zealand Standards, or other compliance pathways referenced against each individual performance requirement the building method or product is compliant with, and their specific version and date. Reference to documents describing tests and evaluations and any other documents relied on for certification or used to prove compliance, including their full title, specific version and date.

1. Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B2 Durability Second edition (Amendment 12), 28 November 2019
2. Acceptable Solutions and Verification Methods for New Zealand Building Code Clause F2 Hazardous building materials First edition (Amendment 3), 1 January 2017
3. Verification Methods E2/VM1 and Acceptable Solutions E2/AS1, E2/AS2 and E2/AS3 for New Zealand Building Code Clause E2 External Moisture Third edition (Amendment 10), 5 November 2020
4. PRI Test Report 2309T0001-01 Tests on 40 Below Flashing Tape to AAMA 711 "Voluntary Specification for Self-Adhering Flashing Used for Installation", 19 January 2021
5. PRI Test Report 2309T0001-02 Tests on 40 Below Platinum Flashing Tape to AAMA 711 "Voluntary Specification for Self-Adhering Flashing Used for Installation", 19 January 2021
6. PRI Test Report 2309T0001-03 Tests on Gerband 587 Flashing Tape to AAMA 711 "Voluntary Specification for Self-Adhering Flashing Used for Installation", 19 January 2021
7. LABORATORIO SUDAMERICANO DE ENSAYOS E INVESTIGACIONES TERMODINAMICAS Test Report No 17-13632 Tests on Hydra Flashing Tape to AAMA 711, 3 August 2018
8. Les Boulton & Associates Report 191235-02 Assessment of Masons Self-adhesive Window Flashing Tapes, 20 March 2019
9. PRI Test Report 2309T0003 Tests on LS-E 4934 ST PO80 40 Below to AAMA 711-20 "Voluntary Specification for Self-Adhering Flashing Used for Installation," 12 October 2021
10. PRI Test Report 2309T0004 Tests on LS-E 4930 ST PO80 Platinum to AAMA 711-20 "Voluntary Specification for Self-Adhering Flashing Used for Installation", 12 October 2021
11. PRI Test Report 2309T0005 Tests on LS-E 4832 PT/D 120w Below Flex to AAMA 711-20 "Voluntary Specification for Self-Adhering Flashing Used for Installation", 12 October 2021
12. 40 Below & Hydro Flashing Tape Installation Instructions, March 2021
13. Bayonet BayoWrap Window Sealing Tape. Installation Guide, Version 1 July 2023



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70075

Version: 2

Original issue date: 08 April 2021

Revision date: 31 August 2023

Product Certificate

MASONS Flashing Tapes



**BUREAU
VERITAS**

10. Supporting Information About Description (Optional)

Any supporting information for section 3.

- 40 Below Window Flashing Tape has a white woven facing and is supplied in 20 m rolls 75 mm, 100 mm, 150 mm or 230 mm wide.
- 40 Below Platinum Flashing Tape has a silver foil facing and is supplied in 20 m rolls 75 mm, 100 mm, 150 mm or 230 mm wide.
- 40 Below Flex Flashing Tape has white flexible facing and is supplied in 20 m rolls 75 mm, 100 mm, 150 mm or 230 mm wide.
- Hydro Flashing Tape has an aluminium facing and is supplied in rolls 75mm x 25m, 100mm x 25m, 150mm x 10m, 150mm x 25m, or 200mm x 25m.
- Bayonet BayoWrap Window Sealing Tape has a white woven facing and is supplied in 20 m rolls 75 mm, 150 mm or 230 mm wide.

11. Supporting Information About Intended Use (Optional)

Any supporting information for section 4.

N/A

12. Supporting Information About Conditions and Limitations of Use (Optional)

Any supporting information for section 6.

N/A

All CodeMark certificates that are current must be registered with MBIE. MBIE maintains a register of valid product certificates. [Please find the register here.](#)

If the certificate is not listed on this register or it appears as (SUSPENDED), it is not a valid CodeMark certificate and does not have to be accepted by a building consent authority as establishing compliance with the New Zealand Building Code.



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

MOISTOP 250 CONCRETE UNDERLAY

MOISTOP[®] 250

HEAVY WEIGHT CONCRETE UNDERLAY

(PREVIOUSLY MOISTOP[®] 759)

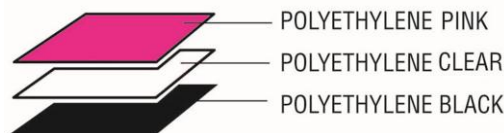
Application

Moistop[®] 250 (previously known as Moistop[®] 759) is a heavy weight, industrial strength concrete underlay designed to give permanent protection against ground water penetration in residential, commercial and industrial concrete slab applications. It can also be used as a ground cover membrane over damp sub-floors in suspended timber floor construction.

Features and Benefits

- Pink facing (rather than standard black) - for ease of identifying tears and unintentional penetrations.
- Extremely tough moisture and water proof barrier – for continual moisture protection in harsh conditions
- High strength and tear resistance properties - to resist penetration from below
- Three layer co-extruded virgin polyethylene laminate - to increase resistance to vapour transmission and UV light
- 4m wide rolls - to minimise joins

Product Description



Technical Data

NZS 3604:2011 Classification	Requirement	Performance
Vapour Barrier	> 90 MN.s/g	Pass
Dart Impact Test	> 800 g	Pass
Thickness	100µm	250 µm

Also meets requirements of NZS 4229: 1999 Section 7.4.1 and 7.6.1(a)

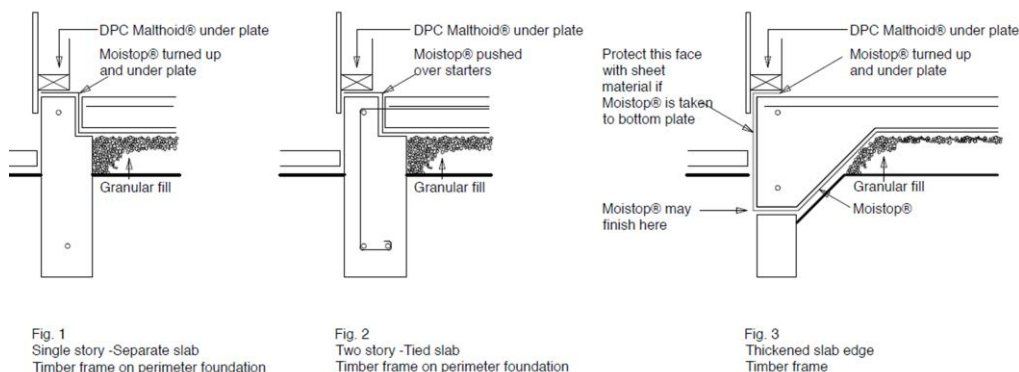
Installation

General

- Moistop[®] 250 should be installed over a properly prepared compacted gravel base in accordance with NZS 3604:2011 Section 7.5.3 to 7.5.6.2. Sand at no greater than 25mm depth may be used to blind coarser gravels
- Moistop[®] 250 should be laid with the **pink** side facing upwards to enable easy inspection of taped joints and allow tears and unintentional penetrations to be quickly identified
- Moistop[®] 250 shall be joined with 150mm minimum laps and sealed with a 48mm pressure sensitive PVC joining tape. To ensure a good seal, apply a firm pressure over the lapped seam.
- Moistop[®] 250 shall be installed beneath any damp proof course (DPC) used to protect timber
- All repairs to be carried out prior to concrete pour. Tears or penetrations are to be repaired by applying a Moistop[®] 250 patch with at least a 150mm overlap on all sides to cover the tear/penetration.
- Moistop[®] 250 must not be left permanently exposed. All above-ground material must be covered

Sub floor Installation

- Moistop[®] 250 may be used to cover damp sub floors beneath suspended timber floors.
- Site must be cleared of debris and sharp objects.
- Cross slit for any penetrations such as jack studs, pipes or similar
 - cut to the nearest edge of Moistop[®] 250
 - patch slits with at least a 300mm overlap and seal with a 48mm PVC pressure sensitive tape.
- Avoid storing items on top that may puncture the material.

Suggested detail additional to those in NZS 3604:2011 Figure 7.13

Limitations

 Moistop® 250 **must** be:

- Installed on a granular base that will not puncture the Moistop® 250 as described in NZS 4229:1999 Section 7.3.2 and 7.6.2
- Installed with pink side facing upwards
- Taped on all joins and around all penetrations and patches

 Moistop® 250 **must not** be:

- Left exposed for more than 28 days. All above-ground material must be covered
- Penetrated by pegs holding boxing in place for slab perimeters

Durability

When used, installed and maintained in accordance with the requirements outlined in this datasheet, Moistop® 250 will meet or contribute to meeting the following provisions of the New Zealand Building Code Clause B2 Durability B2 3.1 (a) (50 years) and B2 3.1 (b) 15 years when covered within 28 days of laying.

Specification Notes
Product required: Moistop® 250 concrete underlay (250 micrometers)

Product Specification
Product Previously known as Moistop® 759

Description	Product Code	Roll Size	Area	Nominal gsm
Moistop® 250	775910	4000mm x 25m	100m ²	230

Storage

Moistop® 250 must be protected against damage and weather. Rolls must be stored on end, under cover in a clean, dry environment. Product must be protected from sharp objects.

Accreditations/Appraisals/Certification

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

(1) This data sheet may have been superseded. Please refer to www.pinkbatts.co.nz for the most current information. This datasheet supersedes all previous versions. (2) Tasman Insulation New Zealand Ltd retains the right to change specifications without prior notification. (3) Do not use this product for any application not detailed in this data sheet. (4) Recommendations and advice regarding the use of this product are to be taken as a guide only. The purchaser should ascertain the suitability of this product for the particular end-use situation intended and when used in conjunction with other products. (5) Consult Tasman Insulation New Zealand Ltd for further information. (6) All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. (7) The liability of Tasman Insulation New Zealand Ltd and its employees and agents for any errors or omissions in this data sheet or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. (8) This information is provided without prejudice to Tasman Insulation New Zealand Ltd standard terms and conditions of sale.

Please consider the environment before printing this document

 For further information visit www.pinkbatts.co.nz or call 0800 PINK BATTS (746 522)

FLOOR

PRODUCT DATA SHEET

- SMOKE DETECTOR WITH HUSH DETAILS



CSIRO Verification Services
Highett, Victoria, Australia
+61 (0)3 9252 6000
<http://www.activfire.gov.au/>

Certificate of Conformity

Certificate num.	Registration date	Version	Valid until
afp - 2438	17-Sep-2010	5	30-Apr-2015

Page 1 of 2

Product designation

Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

CDB Consumer Products Limited
41A William Pickering Drive, Albany, AUCKLAND, NEW ZEALAND

Registrant

Eyston Company Limited
B2, 3rd Floor, Fortune Factory Building, 40 Lee Chung Street, CHAI WAN, HONG KONG, CHINA

Producer

Eyston Company Limited
B2, 3rd Floor, Fortune Factory Building, 40 Lee Chung Street, CHAI WAN, HONG KONG, CHINA

Conformance criteria and evaluation

The Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Australian Standard AS 3786-1993, 'Smoke alarms' incl. Amdt 1 (April 1995) / Amdt 2 (December 1995) / Amdt 3 (9 November 2001) / Amdt 4 (22 April 2004).

Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Issued by

David Whittaker

Executive Officer – ActivFire Scheme



© CSIRO Australia, 2014

This certificate remains the property of CSIRO and may be subject to amendment, suspension or withdrawal at any time.
The validity and authenticity of this certificate can be verified by the certification register located at <http://www.activfire.gov.au>

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	Page 2 of 2
afp - 2438	17-Sep-2010	Number 5	Issue date 29-Apr-2014	30-Apr-2015

Producer's description

The Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm is an internally powered, circular styled smoke alarm, intended for use in residential dwellings (domestic smoke alarm).

This product senses smoke using the photoelectric principle. An inbuilt piezo type sounder provides an audible alarm signal when the smoke alarm senses smoke which exceeds a predetermined level. When the smoke level drops below the alarm level, the sounder is de-energised.

This product is internally powered from a replaceable 9 Vdc battery which is supplied with the alarm. A self test facility is provided by means of a button on the cover of the device. If the button is depressed the alarm signal is emitted. It incorporates an alarm 'silence' feature with an independent button (adjacent to the 'test' button) for its operation.

A circular mounting base is supplied with the product and uses a twist lock action. The base has two holes for mounting to the ceiling using the screws and anchors provided. A mechanical arrangement prevents the alarm from clipping onto the mounting base without the battery installed. It has a diameter of approximately 106mm and a height of 33mm when installed on its mounting base. It is supplied in clamshell type packaging along with its mounting base, battery, screws, anchors and instruction leaflet.

Technical specification

The following details are a representative extract of the technical specification for the Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

Sensor type:	Photoelectric
Internal battery voltage:	9 Vdc
Recommended battery replacement:	Duracell MN1604, Goldpeak 1604P, 1604A Eveready 216 Energizer #522
Smoke alarm life cycle:	10 years



CSIRO Verification Services
Highett, Victoria, Australia
+61 (0)3 9252 6000
<http://www.activfire.gov.au/>

Certificate of Conformity

Certificate num.	Registration date	Version	Valid until
afp - 2438	17-Sep-2010	5	30-Apr-2015

Page 1 of 2

Product designation

Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm

(Refer to the Schedule/enclosures for further specified details)

Agent/distributor

CDB Consumer Products Limited
41A William Pickering Drive, Albany, AUCKLAND, NEW ZEALAND

Registrant

Eyston Company Limited
B2, 3rd Floor, Fortune Factory Building, 40 Lee Chung Street, CHAI WAN, HONG KONG, CHINA

Producer

Eyston Company Limited
B2, 3rd Floor, Fortune Factory Building, 40 Lee Chung Street, CHAI WAN, HONG KONG, CHINA

Conformance criteria and evaluation

The Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm has been evaluated and verified as conforming with the relevant requirements of the following criteria.

1. Australian Standard AS 3786-1993, 'Smoke alarms' incl. Amdt 1 (April 1995) / Amdt 2 (December 1995) / Amdt 3 (9 November 2001) / Amdt 4 (22 April 2004).

Limitations/conditions of conformance

Limitations/conditions of conformance, where identified on this certificate, are derived from qualifications from evaluation(s) for conformity and/or other related technical documentation. All details with respect to design, assembly and installation instructions and restrictions should be checked against the producer's current technical manual/data sheets and the requirements of the Authority having Jurisdiction.

This certification is issued within the scope of CSIRO Verification Services – Rules governing ActivFire Scheme and is valid only for the product(s) as submitted for evaluation and verification of conformity, subject to the following conditions.

- Reference to details, limitations and requirements, where documented as a schedule/enclosure with this certificate.
- The Registrant is responsible for their attestation of conformity and ensuring that on-going production complies with the conformance criteria defined in this certificate.
- This certificate will not be valid if any changes or modifications are made to the product which have not been notified and validated by CSIRO Verification Services.
- This certificate is subject to periodical re-validation upon verification that all requirements, as determined by the conformity assessment body, continue to be satisfactorily met by the Registrant.
- This certificate may only be reproduced in its published form, without modification and inclusive of all schedules/enclosures.
- Any changes, errors or omissions, must be submitted in writing and if necessary or requested, substantiated with relevant evidence.
- Any representations, such as advertising or other marketing related activities or articles shall reflect the correct contents of this certificate and conform with all relevant trade practices and consumer protection legislation and regulations.
- Any terms or conditions of use as applicable to content and documentation as published or accessed through web sites administered by the CSIRO Verification Services.

Issued by

David Whittaker

Executive Officer – ActivFire Scheme



© CSIRO Australia, 2014

This certificate remains the property of CSIRO and may be subject to amendment, suspension or withdrawal at any time.
The validity and authenticity of this certificate can be verified by the certification register located at <http://www.activfire.gov.au>

Schedule to Certificate of Conformity

Certificate num.	Registration date	Version	Valid until	
afp - 2438	17-Sep-2010	Number 5	Issue date 29-Apr-2014	30-Apr-2015

Page 2 of 2

Producer's description

The Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm is an internally powered, circular styled smoke alarm, intended for use in residential dwellings (domestic smoke alarm).

This product senses smoke using the photoelectric principle. An inbuilt piezo type sounder provides an audible alarm signal when the smoke alarm senses smoke which exceeds a predetermined level. When the smoke level drops below the alarm level, the sounder is de-energised.

This product is internally powered from a replaceable 9 Vdc battery which is supplied with the alarm. A self test facility is provided by means of a button on the cover of the device. If the button is depressed the alarm signal is emitted. It incorporates an alarm 'silence' feature with an independent button (adjacent to the 'test' button) for its operation.

A circular mounting base is supplied with the product and uses a twist lock action. The base has two holes for mounting to the ceiling using the screws and anchors provided. A mechanical arrangement prevents the alarm from clipping onto the mounting base without the battery installed. It has a diameter of approximately 106mm and a height of 33mm when installed on its mounting base. It is supplied in clamshell type packaging along with its mounting base, battery, screws, anchors and instruction leaflet.

Technical specification

The following details are a representative extract of the technical specification for the Elto, Model ESD-196H, 9 Vdc battery powered, silencing/hush facility, photoelectric smoke alarm and may be subject to change. Complete and current details should be determined from the designated producer's technical manual/data sheets.

Sensor type:	Photoelectric
Internal battery voltage:	9 Vdc
Recommended battery replacement:	Duracell MN1604, Goldpeak 1604P, 1604A Eveready 216 Energizer #522
Smoke alarm life cycle:	10 years

- GUTTER DETAILS



Roofing | Walling

Pergolas | Patios

Carports

Fencing

Garden Sheds

Garages

Solar Hot Water

Flashings

Steel Framing

Stainless Steel

Product Info



Brochures & Installation Guides

[Installation Guide Download](#)



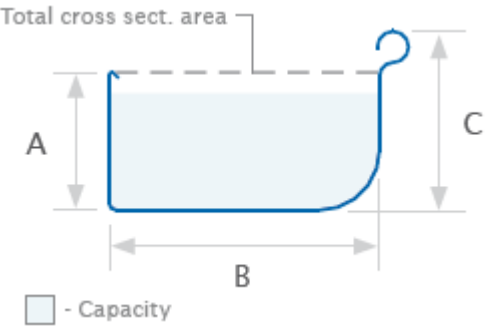
[Steel Selection, Use and Maintenance Download](#)



Quad Gutter

Quad gutter is so adaptable because of its classic form. It can blend perfectly with older style colonial and cottage homes and is also used extensively in new home construction. It is available in a wide choice of sizes and can be optioned withts to prevent overflow.

Quad Gutter - Dimensions

Profile	Dimensions (mm)	
 Total cross sect. area A B C - Capacity	Size (mm)	115 Quad
	A	61
	B	115
	C	90

Specifications

Size (mm)	Available in	Tensile (MPa)	BMT (mm)	Type	Capacity (mm ²)	Total Cross Sect. Area (mm ²)
115	NZ	G550	0.42	Standard	5621	6760
				Slotted	5057	6192

Note: Calculation of effective cross sectional area ‘Capacity’ for each nominal size of eaves gutter is based on requirements of section 3.8 AS/NZS 2179.1:1994

- PAINT SPECIFICATION FOR WET AREAS

Interior Design i.d®

Page 1 of 2

DESCRIPTION

- Wattyl Interior Design i.d® is an ultra premium, low VOC, 100% acrylic wall paint which produces a long lasting, elegant finish with virtually no paint odour.
- Wattyl Interior Design i.d® brings a fresh approach to the way you decorate your interior with a choice of designer colours, easier application and a smoother even finish.

PRINCIPAL CHARACTERISTICS

- Lower environmental impact with virtually no odour.
- Elegant finish in designer colours
- Excellent covering power and adhesion.
- Excellent flow and levelling, resulting in a smoother finish.
- Superior washability and excellent stain removal properties, including beading of water based stains.
- Good scuff resistance.
- Applies with minimum roller spatter.
- No paint odour one hour after painting in a ventilated room. Improves indoor air quality and reduces air pollution compared to traditional paints. Better for families and asthma/allergy sufferers. Reoccupy the room sooner.
- New Zealand Green Star – exceeds benchmark for VOC credit in NZGBC's rating tools.
- Verified to the Environmental Choice New Zealand Program (ECNZ) Specification EC-07-09.
- Interior Design i.d is a unique interior system. Approved by the Asthma & Respiratory Foundation of New Zealand as part of the Sensitive Choice programme as being better suited for people with asthma and allergies.
- Alkyl Phenol Ethoxylate (APE) surfactant free, reducing waterway pollution.



COLOURS AND GLOSS

- Bases may be tinted as required. May be tinted to the Wattyl Colour Designer colour range or other competitor colour ranges through the Wattyl tinting system.
- Silk and Eggshell

BASIC DATA

- | | |
|----------------------------|--|
| • Surface dry | Thirty (30) minutes at 20°C and 65% relative humidity. |
| • Recoat | Two (2) hours at 20°C and 65% relative humidity. |
| • Fully cured | Seven (7) days. |
| | All figures are quoted at 20°C and 65% relative humidity. Drying will take longer at lower temperatures or higher relative humidity. |
| • Coverage per coat | 16 m ² /L (depending on the surface porosity and method of application) |
| • WFT per coat | 63 microns |
| • DFT per coat | 26 microns |
| • Thinning | This product has been optimised to ensure superior application without the use of thinning or additives.
For brush and roller application – do not thin.
For airless spray application – thin only as required to aid atomisation, up to a maximum of 5% water. |
| • Clean Up | Thoroughly clean equipment with water. |
| • VOC | Silk: 0.5 g/litre' Eggshell 0.5 g/litre untinted or when tinted with Wattyl Ecotint, VOC (Volatile Organic Compounds).
Calculations are based on ECNZ definition and are in accordance with New Zealand Green Building Council requirements.
New Zealand Green Building Council standard for the maximum VOC level in interior silk washable paint is 60g/litre. |

RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURE

- For use on suitably prepared timber, brick, cement, paperfaced plasterboard and previously painted surfaces.
- Ideal for domestic living areas.
- Ensure surface is clean, dry and free from dust, dirt and grease. All loose, peeling or flaking material must be removed. Sand the surface smooth and remove all dust. Sand enamel painted surfaces to remove gloss. Fill holes and cracks with a suitable filler and sand lightly to an even finish.
- If mould is present, clean surface with household bleach then rinse well with clean water.
- For specific substrate preparation, see relevant specification sheets.
- Application **should not** be carried out if the air temperature or the substrate temperature is below 10°C or above 35°C. The temperature must not fall below 10°C during the drying process.

INSTRUCTIONS FOR USE

- Stir contents thoroughly with a flat stirrer before and during use.
- Apply two coats to a correctly prepared surface by brush, roller or spray equipment.
- For best results when rolling, use a 12mm pile synthetic roller on smooth and semi-smooth surfaces. Longer nap synthetic rollers may be used on rough surfaces.
- Ensure brushes and rollers are only slightly damp with water before use.
- When airless spraying, use a 13-15 thou spray tip.
- Cover brushes, rollers and trays with plastic during work breaks.
- Keep lid on cans

SAFETY DATA

- Caution Provide adequate ventilation during use.
- Spills and Disposal Do not allow spilt material to enter drains or other watercourses. Absorb spills with sand or other inert material. Unwanted paint should be kept in a sealed container, such as an empty paint can, and disposed of via special waste collection services. Check with your local Council regarding the disposal of empty paint containers.
- M.S.D.S. A Material Safety Data Sheet (M.S.D.S.) is available on request.
- First Aid:

If swallowed do not induce vomiting. Give plenty of water to drink. Contact a doctor or the Poisons Information Centre. Phone 0800 764766 (New Zealand).

If in eyes, hold eyes open and flood with water for at least 15 minutes. Contact a doctor if any irritation occurs.

If on skin remove contaminated clothing, wash skin thoroughly with soap and water or a proprietary skin cleanser. Do not use solvents.

If affected by inhalation remove person to fresh air. If breathing difficulties persist or occur later, contact a doctor.

ADDITIONAL DATA

- Available in 1, 2, 4, & 10 litre containers.
- Containers must be secured and stored upright during transit.
- Containers must not be exposed to excessive heat or cold. Do not store containers in areas susceptible to frost.
- Leave seven days after application of final coat before washing.
- When subject to steam or condensation, water based paints may develop a stain, which can be removed with a damp cloth.
- Avoid exposure to excessive steam or condensation for 48 hours after application of the final coat.
- For technical advice and assistance telephone toll free 0800 735 551.

1. This information is provided with respect to the listed Valspar products. Valspar recommends that:

(a) The user should check the date of printing, and if more than 24 months have elapsed, should verify with our nearest sales office that the information is still current. (b) you review the Technical Data Sheets (TDS) and Material Safety Data Sheets (MSDS) before you use or handle the product; (c) the product be used only in accordance with the information provided by Valspar; (d) the product be transported, stored and handled in accordance with the information on the MSDS and relevant TDS; and (e) you thoroughly test the product, using the recommended application method on a sample of intended substrate, before using the product.

2. The information in this technical data sheet was prepared using information gathered during product development. While Valspar endeavours to update this information and maintain the accuracy and currency of its contents, Valspar cannot guarantee that the information provided is wholly comprehensive.

3. Valspar recommends that you conduct such additional investigations as may be necessary to satisfy yourself of the accuracy, currency and comprehensiveness of the information on which you rely in using and handling the product. If you require further information please contact your nearest Valspar Office.

4. Because we cannot control the way these products may be used, or the conditions they may be exposed to, we can give no express guarantees in respect of these products or their performance. However certain guarantees may be implied by law.

Valspar Paint (NZ) Ltd, PO Box 1545, Shortland St, Auckland 1140

Phone 09 820 6700

Fax 09 820 6572

WATTYL **Granosite** **taubmans**

Valspar Paint (NZ) Ltd

INFORMATION HELP LINE: 0800 735551 (New Zealand)

- ROOFING UNDERLAY DETAILS



Product Data Sheet

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.

Thermakraft 215 comes in two roll sizes:

1250mm wide	20m long	25m ² coverage*
1250mm wide	40m long	50m ² coverage*

* **Note:** m2 is the roll size for actual coverage, allow for laps and joins.

Smarter products. Better buildings.
thermakraft.co.nz



Thermakraft 215

Self-supporting bituminous wall and roof underlay

Scope of Use (Roof Application)

- Suitable with masonry tile, metal tile and profiled metal roof cladding.
- Direct fix or cavity fix.
- Can be used on roofs up to and including NZS 3604 'Extra High' wind zones.
- Refer to installation guide regarding underlay support requirements.
- Will provide temporary weather protection during construction (maximum 7 days), same day coverage recommended.

Scope of Use (Wall Application)

- Suitable for use with both timber and steel framing, either direct fix or in conjunction with an 18mm minimum drained cavity.
- Can be used with absorbent wall claddings (e.g. timber, brick or fibre cement) or non-absorbent wall claddings (e.g. metal or plastic).
- Can be used with masonry veneer in accordance with NZS 3604.
- Suitable for buildings situated in NZS3604 Building Wind Zones up to and including 'Very High'.
- Thermakraft 215 can be used as an air barrier to reduce wind entry and is highly water resistant.
- Will provide temporary weather protection during construction (maximum 28 days).

General

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

Property Performance

NZBC E2/AS1 Wall Underlay Requirements

NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance
Property Performance Requirement	≥ 150gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	100mm for 24 hrs
Property Performance	Pass	Pass	Pass	Pass	Pass

NZS2295:2006 Classification

NZBC E2/AS1 Table 23 (NZS2295) Roof Underlay Properties	Flammability Index	Wind Zone	NZS2295:2006 Index
Property Performance Requirement		R2	R2
Property Performance	Non-Fire Retardant	Up to Extra High	Self - Support

Limitations

- In roofing applications must NOT be exposed to the weather or UV for more than 7 days.
- In wall applications must NOT be exposed to the weather or UV for more than 28 days.
- Must NOT be used under translucent sheeting.
- Is not fire retardant.
- Not suitable for School Property, please refer to Ministry of Education; Weather-Tightness & Durability requirements for School Property.

Compliance

Thermakraft 215 meets the requirements of NZBC Acceptable Solutions E2/AS1, Table 23 and NZS 2295:2006 for both wall & roof underlay.

Durability

Meets the Performance Requirements of NZBC Clause B2, Durability B2.3.1 (a) 50 years and B2.3.1 (b) 15 years, E2 External Moisture providing:

- It is installed in accordance to Thermakraft Installation Guide.
- Run length is no greater than 10 meters.
- Is NOT left exposed to the weather or UV for more than 7 days on roof.
- Is NOT left exposed to the weather or UV for more than 28 days on walls.
- Is installed by or under guidance of Licensed Building Practitioners.
- Is installed in accordance with the MRM Code of Practice.
- Is compatible with the cladding system used.*

* **Note:** roof cladding system compatibility testing must be done first before installation.

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Control of Condensation

In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation method to prevent moisture build-up in the roof cavities.

Factors which adversely affect the condensation risk in roofing systems include:

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

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

For passive ventilation of the roof space, it is recommended that all roof underlays are terminated at the ridge, and if not it should be slit or slotted to allow for passive ventilation. (For further information refer to the NZ MRM Roofing Code of Practice).

Product Warranty

Standard Thermakraft warranty applies. Refer to Thermakraft Warranty Statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595**.

SDC - Approved Building Consent Document - BC240357 - Pg 146 of 402 - 19/03/2024 - warreg

Thermakraft Limited / 0800 806 595

Smarter products. Better buildings.
thermakraft.co.nz



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

- RANGEHOOD TO KITCHEN SPECIFICATION

Lifestyle 1000 Canopy



RCAN-6S-1000



RCAN-6W-1000



RCAN-6W/S-1000

Lifestyle 1000 Canopy



RCAN-9W-1000



RCAN-9S-1000



RCAN-9W/S-1000

Slimline Pyramid Canopy



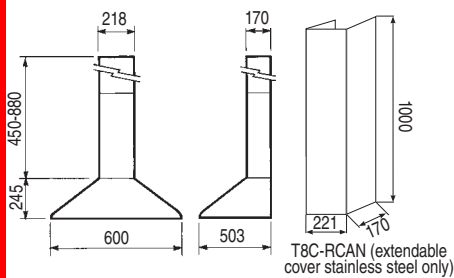
T4-13DM-SLI-1

600mm	900mm	900mm
1000m³/hour	1000m³/hour	1000m³/hour
***	***	****
56db	56db	47db
Pyramid	Pyramid	Slim pyramid
√	√	√
√	√	√
√	√	√
√	√	
√ (stainless steel only)	√ (stainless steel only)	√
√	√	√
		√
		√
		√

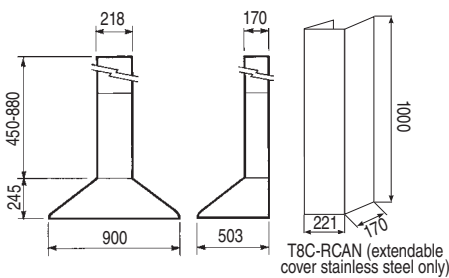
Canopy Specs

Pyramid Canopies

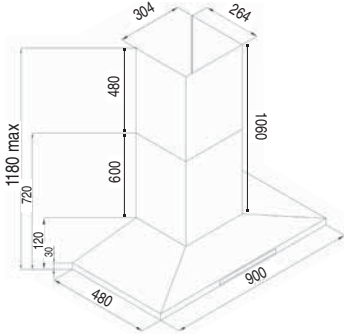
600mm Stainless Steel / White
Pyramid Canopy (500 & 1000)
RCAN-6W-500 / RCAN-6S-500
RCAN-6W-1000 / RCAN-6S-1000



900mm Stainless Steel / White
Pyramid Canopy (500 & 1000)
RCAN-9S-500
RCAN-9W-1000 / RCAN-9S-1000

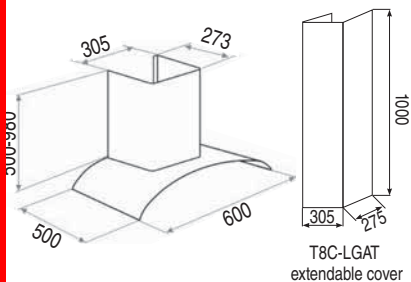


900mm Stainless Steel Slimline
Pyramid Canopy
T4-13DM-SLI-1

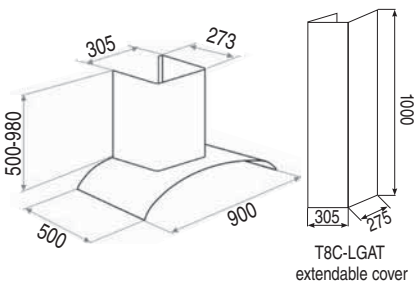


Glass Canopies

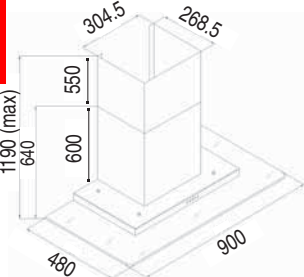
600mm Glass Curved Canopy
T4-11GLA-6



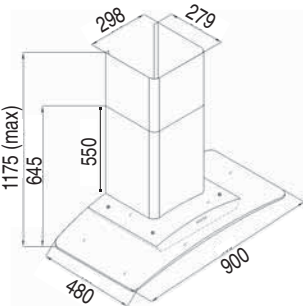
900mm Glass Curved Canopy
T4-11GLA



900mm Glass Slimline Canopy
T4-18GBOX



900mm Glass Curved Digimax Canopy
T4-15DM-CUR-1



Supplier Declaration of Conformity (SDoC)

In accordance with ISO/IEC 17050-1:2004

SDoC identification Number¹ - T4-12-LOW	
Issuer details	
Name² (of New Zealand manufacturer or importer)	Contact Address
PARNCO APPLIANCES	519 Mt WELLINGTON HWY
New Zealand Company Number (if applicable)	PAKURANGA
	AUCKLAND.
Telephone	Fax
(09) 573 5678	
Email address	
sales@parnco.co.nz.	
Medium Risk Article - Details³ (Product name, type, rating, brand, model, batch numbers, and serial numbers, as applicable)	
T4-12LOW 900mm LOW PROFILE CANOPY.	
The medium risk article listed above, fully complies with the standard(s), as listed:-	
Standard number & issue year:- AS/NZS 60335.2.31:2004	
Standard Title:-	
Edition / Amendment status:- AMDT 1-2.	
Or complies with the Conformity Cooperation Agreement - Yes / No (Delete as applicable)	
Names and addresses of any testing organisation or body	
Name(s)	Address(es)
ITACS	4-6 SECOND STREET
	HINDMARSH SA 5007
	AUSTRALIA.
Reference to relevant test reports/certification, and issue date of the reports/certification, that show how compliance is achieved:-	
Report/Certification N°(s)	Issue date(s)
# A/11966EA	10/11/2009
Reference to any management systems involved:-	
Additional⁴ information	
Declaration	
I hereby declare that the above specified fittings or electrical appliances comply with the requirements of Regulation 83 of the Electricity (Safety) Regulations 2010	Signed for and on behalf of:
	PARNCO APPLIANCES.
Issuer Identification:	Name⁵ & position, as authorized by the issuer
(as affixed to the article)	TREVOR PRESTON GENERAL MANAGER
	Signature Date
	22/9/2010

¹ Every declaration of conformity should be uniquely identified.

² The responsible issuer must be unequivocally specified.

³ The "Article" must be unequivocally described so that the declaration of conformity may be related to the article in question. For mass-produced products, it is not necessary to give individual serial numbers. Where variants of an article are to be covered, these must be detailed.

⁴ Text should appear here only if any limitation on the validity of the declaration of conformity and/or any additional information are given.

⁵ Full name and function of the signing person(s) authorised by the issuer's management to sign on its behalf should be given. The number of signatures, or equivalent, included will be the minimum determined by the legal form of the issuer's organization.

- DOWNLIGHT DETAIL

LED 3CCT DOWNLIGHT

STAN / HOWIE

Suitable for all residential and commercial applications where high quality, excellent colour rendering and reliable lighting is required.

Very shallow recessing depth of only 47mm. Able to be covered by thermal insulation meeting IC-F and IC-4 standards and easy to install.

The ThermoPlastic used in the housing and flange is suitable for under eaves and is resistant to salt air degradation. Easy connection with twin push connectors suitable for looping applications.

Available with Flush diffuser (STAN) or Regressed diffuser (HOWIE).



3CCT SWITCHABLE COLOUR TEMPERATURE SWITCH ON BACK OF LIGHT FITTING



FITTING COLOURS:

White 

Lumax	STAN	HOWIE
Input	240V	
Body	Aluminium/Thermo Plastic	
Diffuser	PMMA Opal FLUSH	PMMA Opal REGRESSED
Colour Trim	White	
Driver	Integral	
Connection	Push connectors (2 sets)	
LED Diodes	SMD	
Beam angle	90 deg	
Wattage	8 Watt	
Dimmable	Phase cut-off	
Lumen output	850 lm	
Power Factor (PFC)	>.90	
CRI (Colour Rendering Index)	>85	
CCT Selection	3 CCT via switch	
CCT (Correlated Colour Temp)	3000K / 4000K / 5000K	
IP Rating (Below)	IP54	
Electrical Class	II	
Cut out	90mm	
Height	40mm	47mm
Overall diam	107mm	
Operating Temp range	-20+50 deg	
Warranty	3 years	



INPUT VOLTAGE
240V



OUTPUT POWER
8W



LUMENS
850



ADJ COL TEMP
**3,000K
4,000K
5,000K**



DIMMABLE
YES



CUT HOLE
90MM



WARRANTY
3 YEARS



- BATHROOM AND ENSUITE VENT DETAILS

INSTALLATION INSTRUCTIONS

MANROSE
PRO-SERIES

PRO SERIES IN-LINE FAN SFLP150 MODELS

This Manrose Shower Fan is designed for ventilation within a shower cubicle. This high performance fan provides high levels of extraction and enables additional ducting to be added to this system.

Thank you for selecting our Manrose Pro Series 150mm In-Line Fan Kit. Please read all instructions before commencing installation.

1. First select the grille you prefer in your room. There are two designs a circular eggcrate fascia or a square low profile fascia to choose from for the interior grille.
2. The **interior grille** comes in two parts, the chassis (or spigot) and the fascia options. If using the gib-fixing clips option cut a 165mm hole in the ceiling directly over the shower head ensuring first that the area above is free from obstruction and between two joists. If not using the gib fixing clips option, cut a 155mm diameter hole.
3. If using the gib fixing clip option the white fastening wedge-type clips must be fitted onto the grille body – the closed end of the 'V' points towards the rear of the grille. Start the screw through the flange on the grille into the screw-hole in the clip with two or three turns. If the ceiling or wall lining is thicker than standard 12mm board it may be necessary to use longer screws than those supplied. When fitted, fasten the ducting onto the grilles using the tape supplied.

Push the grille fully into the hole and then use a screwdriver to push the clips up into the hole. Once through the hole the clips will spring open and can then be tightened with the screw to pull back down onto the rear side of the lining. Tighten until firm only, do not over-tighten.

Fit the chosen fascia onto the chassis. Note if using the round option, there are two lugs on the rear rim of the egg-crate insert which locate into corresponding slots in the black housing, adjacent to the ends of the bridge-piece in the housing. This ensures the egg-crate pattern is lined up with the bridge-piece correctly.

4. Select a suitable place for the Fan to be screwed to a joist and secure using two screws through the fixing bracket. The fan motor is of ball bearing design to prolong the life of the motor. **Note: The discharge end of the Fan unit is the end where you can see the fan blade clearly. There is also an arrow on the unit showing airflow direction.**
5. For the **exterior grille** there is also a choice of options, either a weatherproof cowl or a fixed grille. Select a suitable position either in the soffit or on an outside wall for your chosen grille. Carefully remove the grille insert/cowl from its housing by levering gently at the sides with a small screwdriver. Cut a 160mm hole ensuring first that the area above is free from obstruction.

Flexible Duct

The Shower Fan
screwed to the joistInternal
GrilleExternal
Grille

IMPORTANT

Isolate the mains supply before making any electrical connections. This system should be installed by a qualified electrician.

When fitting through an external wall, an external grille must be fitted at all times.

Fan should only be installed by fixed wiring, a flexible cord should not be used.

This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience or knowledge, unless they have been given supervision or instruction concerning the use of the appliance by a person responsible for their safety.

Young children should be supervised to ensure that they do not play with the appliance.

Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other open-fire appliances when mounted in outside windows or walls.

If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

The fan is to be installed so that the blades are more than 2.1m above the floor.

We reserve the right to change specification without prior warning



5468

Simx

Manrose is proudly distributed by Simx Limited
PO Box 14 347, Panmure, Auckland, NZ. Technical Support (09) 259 1662
e: sales@simx.co.nz | www.simx.co.nz | www.manrose.com.au

Diagram 1

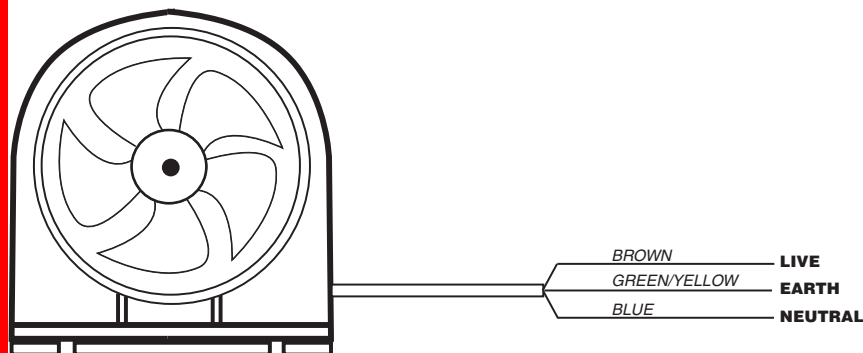
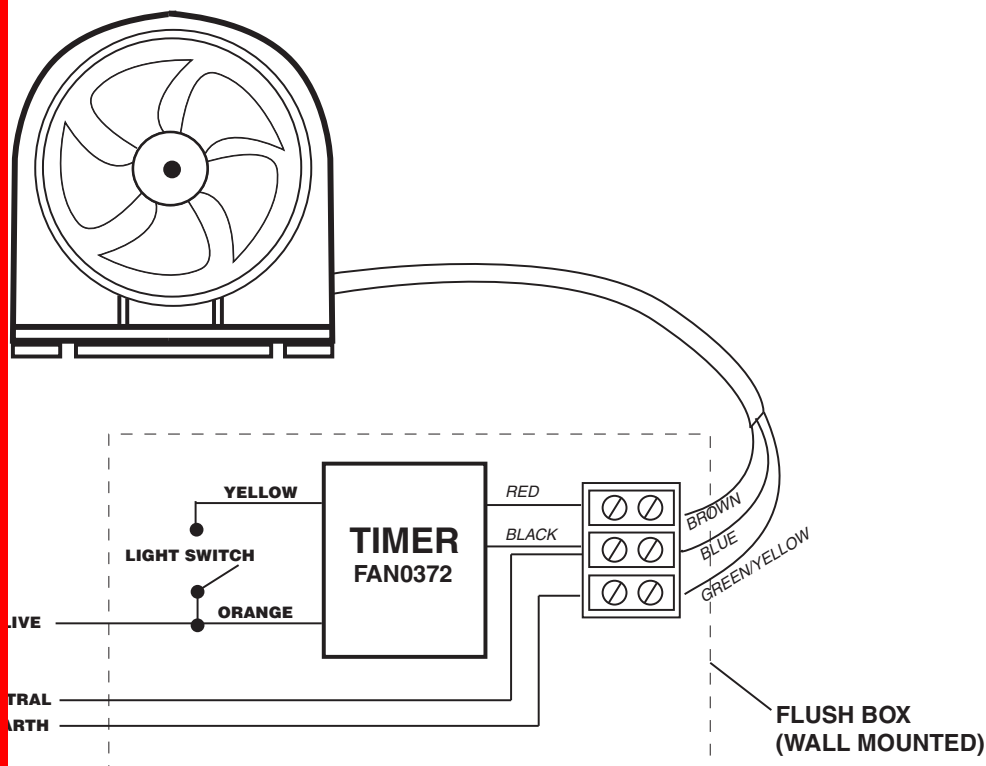


Diagram 2



6. Attach one end of the flexible duct to the spigot with the duct tape provided and from the outside feed the duct through the hole until the grille is flush with the soffit/wall. Mark the position of the fixing holes on the soffit/wall. Drill the holes and screw the grille to the soffit/wall then refit the chosen grille to the chassis.
Note: It is best not to cut the flexible duct until the grille has been screwed to the outside surface to avoid the possibility of cutting the duct too short.
7. Pull the flexible duct gently to the discharge spigot of the fan and cut it to length and connect to the fan with duct tape provided.
Note: The discharge end of the Fan unit is the end where you can see the fan blade clearly. There is also an arrow on the unit showing airflow direction.
8. Connect the remaining piece of duct to the ceiling grille and onto the fan using the duct tape provided. **Note:** Make sure wherever possible to keep the duct running in a straight line as this will improve the performance of the fan.
9. Make the electrical connection as follows:

Wiring of Standard Model FAN0618 - SFLP150S (Diagram 1).

The fan can be connected to the light switch so that the fan will start when the light is switched on, or a dedicated fan switch (not supplied). The fan should not be accessible to a person using either the shower or the bath.

Note: All wiring must be fixed securely and the cable to the fan should be a minimum of 1mm² in section. All wiring must comply with current Regulations. This system should be installed by a qualified electrician.

Wiring of Timer Model FAN0619 - SFLP150T (Diagram 2).

The fan can be connected to the light switch so that the fan will start when the light is switched on, or a dedicated fan switch (not supplied). The fan should not be accessible to a person using either the shower or the bath.

Note: All wiring must be fixed securely and the cable to the fan should be a minimum of 1mm² in section. All wiring must comply with current Regulations. This system should be installed by a qualified electrician.

The timer mechanism supplied is a fixed timer which is installed in the flush box. This means that the fan will run on for approx 3-7 minutes after it has been switched off depending on how long the switch was on for. (see diagram 2 for wiring instructions, and also instructions included with FAN0372 timer).

Please Note:

There is a 45 second delay after switching the fan on until the motor starts, this is to prevent accidental triggering. This unit must be mains earthed.

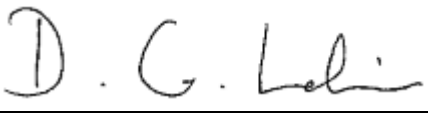
Specifications:

Motor: All metal aluminium die cast with metal impeller, outer rotor, shaded pole motor

Voltage:	220-240 V ~ 50Hz	Fan Performance:	394m3/hr
Wattage:	27W		(zero pressure)
Noise Level:	38dB(A)@3m	IP Rating:	IPX2
Maximum pressure:	120 Pa	Compliance:	AS/NZS60335-2.80:2004

Supplier Declaration of Conformity (SDoC)

In accordance with ISO/IEC 17050-1:2004

SDoC identification Number :- FAN0618			
Issuer Details:			
Name (of New Zealand manufacturer or importer)		Contact Address	
SIMX Limited		1 Haliday Place	
New Zealand Company Number (if applicable)		East Tamaki	
12487274		Auckland 2013	
		New Zealand	
Telephone	Fax	Email address	
+64 9 259 1660	+64 9 259 1661	davidl@simx.co.nz	
High Risk Article – Details (Product name, type, rating, brand, model, batch numbers, and serial numbers, as applicable)			
FAN0618 MANROSE SFLP150S LOW PROFILE SHOWER FAN KIT			
230-240V ~ 50Hz			
26-28W, IPX2, T, Class I			
Model : A15055V2HBLM-DA			
The High Risk Article, listed above, fully complies with the cited standard(s), as listed:-			
Standard number & issue year:- AS/NZS 60335.1.80:2011		Standard number & issue year:- AS/NZS 60335.2.80:2016	
Standard Title:- Household and Similar Electrical Appliances – Safety Part 1: General Requirements		Standard Title:- Household and Similar Electrical Appliances – Safety Part 2.80: Particular Requirements for Fans	
Edition / Amendment status:- +A1-A3	AS/NZS ZZ modified N	Edition / Amendment status:-	AS/NZS ZZ modified N
Or complies with the Conformity Cooperation Agreement - No (Delete as applicable)			
Names and addresses of any testing organisation or body			
Name(s)		Address(es)	
Spectrum Laboratories Ltd.		23 Highbrook Drive, East Tamaki, Auckland 2013 New Zealand	
Reference to relevant test reports/certification, and issue date of the reports/certification, that show how compliance is achieved:-			
Standard(s) or document(s) used, to show how compliance with cited standard is achieved:-	Report/Certification or Document reference	Issue date(s)	
Test Report	7017	1 st May 2017	
Reference to any management systems involved:-			
Additional information :-			
Declaration:			
I hereby declare that the above specified fittings or electrical appliances comply with the requirements of Regulation 83 of the Electricity (Safety) Regulations 2010		Signed for and on behalf of:	
Issuer Identification: (as affixed to the article).		DAVID LATIMER	
 5468		Name & position, as authorized by the issuer	
FAN0618		TECHNICAL MANAGER	
		Signature	Date
			1/05/2017

- GIB EZYBRACE – JUNE 2011



EzyBrace[®] Systems

Specification and installation manual

SDC - Approved Building Consent Document - BC240357 - Pg 158 of 402 - 19/03/2024 - warreg

CBI 5113

AUGUST 2016

NATIONAL SUPPORT

VISIT: Winstone Wallboards Limited
37 Felix Street, Penrose,
Auckland 1061, New Zealand

POST: PO Box 12 256, Penrose 1642,
Auckland, New Zealand

PHONE: +64 9 633 0100

FAX: +64 9 633 0101
Free Fax: 0800 229 222

EMAIL: info@gib.co.nz

WEB: gib.co.nz

GIB® HELPLINE

0800 100 442

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

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

¹ Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

CONTENTS

System Summary	5
GIB EzyBrace® Systems — August 2016	5
GIB® Plasterboard Substitution Table	5
Introduction	6
Scope of Use	6
Finish Quality — Framing and Substrates	6
New GIBFix® Framing Systems	6
New GS2-NOM Bracing Element	6
Compliance with the NZ Building Code	7
CAD Design Detail	7
Appraisal	7
Bracing Resistance and Demand	8
Bracing Resistance	8
Bracing Demand	9
Software Functionality	10
Design and Construction	12
GIB® Plasterboard Linings	12
GIB EzyBrace® Systems in Water-Splash Areas	12
Renovation	12
Openings in Bracing Elements	12
Timber Framing	13
GIBFix® Framing System (Alternative Layout)	13
Guidelines for Intersection Walls	13
Top Plate Connections	14
Parapets and Gable End Walls	14
Bottom Plate Fixing	14
Bracing Strap Installation	15
GIB HandiBrac® Installation	16
GIB HandiBrac® Placement with GIBFix® Framing	
System Layout	17
Ceiling Diaphragms	18
Ceiling Battens in Ceiling Diaphragms	19
Openings in Ceiling Diaphragms	20
Length of GIB EzyBrace® Elements ('N' Type)	21
Length of GIB EzyBrace® Elements ('H' Type)	22
System Specifications	23
GIB EzyBrace® Systems Specification — GS1-N	23
GIB EzyBrace® Systems Specification — GS2-NOM	24
GS2-NOM Adhesive Fixing Option at Door Jambs	25
GIB EzyBrace® Systems Specification — GS2-N	26
GIB EzyBrace® Systems Specification — GSP-H	27
GIB EzyBrace® Systems Specification — BL1-H	28
GIB EzyBrace® Systems Specification — BLG-H	29
GIB EzyBrace® Systems Specification — BLP-H	30
Sustainability and the Environment	31



GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

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

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

PATENTS

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

Beware of substitution

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

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

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

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

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

Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

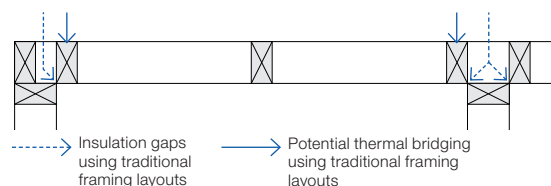
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

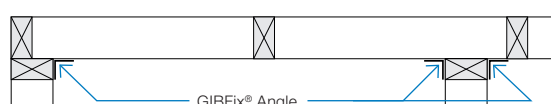
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFix® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

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

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 – STRUCTURE

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

NZBC CLAUSE B2 – DURABILITY

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

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

NZBC CLAUSE F2 – HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 – ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

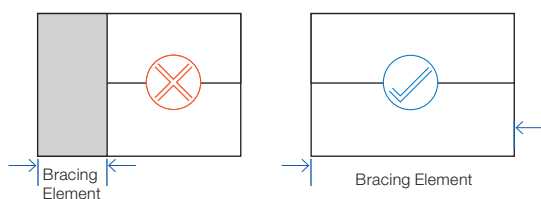
It is of prime importance to comply with the details of design, construction and workmanship in this document.

Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

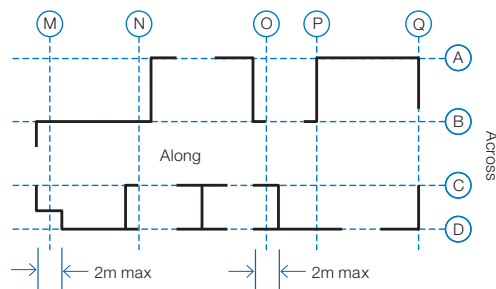
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

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

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

Bracing demand

GIB EZYBRACE® CALCULATOR

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

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

DEMAND

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

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

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

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

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

FIGURE 5: GIB EZYBRACE® 2016 – DEMAND CALCULATION SHEET AND ‘POP UP’ HELP FACILITY

GIB EzyBrace® PLUS No Street Address -> Accessories Wind Data Settings Help Report PDF

File **Home**

GIB EzyBrace® Bracing Software

Job Details

Name:	A Job
Street and Number:	100 Job Street
Lot and DP Number:	Lot 321, DP 456
City/Town/District:	Johannesburg
Designer:	AR Chitwick
Company:	Gibs Limited
Date:	1/06/16

Building Specification

Number of Storeys	Single
Floor Loading	2 kPa
Foundation Type	Slab

Single	
Cladding Weight	Light
Roof Weight	Light
Roofs in Roof Space	No
Roof Pitch	25
Roof Height above Eaves (m)	1.5
Building Height to Apex (m)	4.5
Ground to Lower Floor (m)	0.2
Stud Height (m)	2.4
Building Length (m)	10
Building Width (m)	10
Building Area (m ²)	100

Bracing Location

Wind Zone = Low	Earthquake Zone	1
Wind Zone or Consent Authority	Sol Type	D & E (Deep to Very Soft)
Wind Region	Annual Prob. of Exceedance	1 in 500 (NZS3604:2011 Default)
Lee Zone		
Ground Roughness		
Site Exposure		
Topography Class		

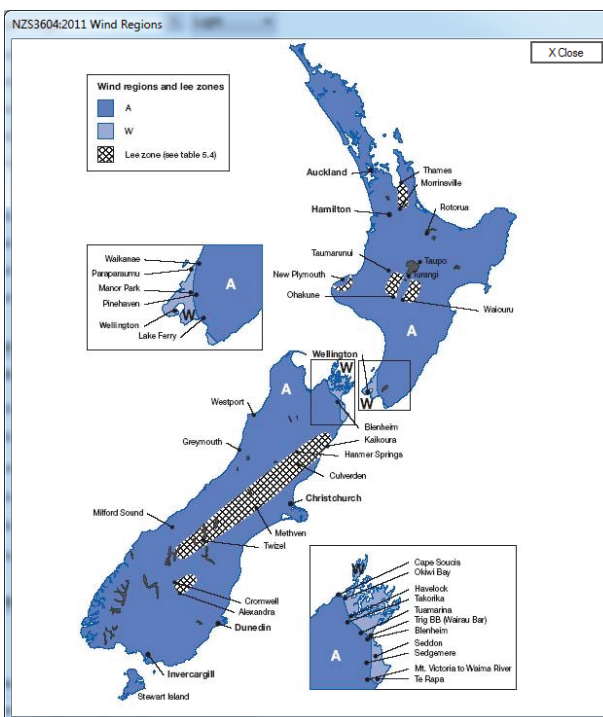
Bracing Units required for Wind

	Along	Cross
Single Level	258	222

Bracing Units required for Earthquake

	Along and Cross
Single	264

[Demand](#) |
 [Simple Along](#) |
 [Simple Across](#) |
 [Custom](#)



 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

Line	Ext. Len. (m)	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BU)	Earthquake (BU)
a	11.25	1	0.5		2.44	GSP-H	GIB®	53	58
		2	1.1		2.44	GS1-N	GIB®	72	65
		3	0.6		2.44	GSP-H	GIB®	67	73
b	6.41	1	1.2		2.44	GS1-N	GIB®	81	71
		2	0.6		2.44	GS1-N	GIB®	34	35
		3	4		2.44	GS2-NOM	GIB®	197	197
c		1	3.2		2.44	GS2-NOM	GIB®	157	157
d		1	7.9		2.44	GS2-NOM	GIB®	389	389
e	17.9	1	0.6		2.44	BL1-H	GIB®	58	60
		2	0.6		2.44	BL1-H	GIB®	58	60
		3	0.8		2.44	GS1-N	GIB®	48	46
		4	2.1		2.44	GS1-N	GIB®	143	124
		5	1.2		2.44	EP1-1.2	CHH	142	159

Demand		Resistance	
Wind	Earthquake	Wind	Earthquake
682	880	1499	1492
220%	170%		

193 OK 196 OK

312 OK 302 OK

157 OK 157 OK

389 OK 389 OK

449 OK 449 OK

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

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

Line	Ext. Len. (m)	Element	Length (m) or No.	Angle (degrees)	Type	Supplier	Wind (BU)	Earthquake (BU)
A		1	1		Braced Piles	NZS3604	160	120
		2	1		Anchor Pile	NZS3604	160	120
		3	1		Braced Piles	NZS3604	160	120
B		1	1		Braced Piles	NZS3604	160	120
		2	1		Cantilever Pile	NZS3604	70	30
		3	1		Cantilever Pile	NZS3604	70	30
C		1	1		Anchor Pile	NZS3604	160	120
		2	1		Anchor Pile	NZS3604	160	120

Demand		Resistance	
Wind	Earthquake	Wind	Earthquake
426	687	1100	780
258%	114%		

480 OK 360 OK

300 OK 180 OK

320 OK 240 OK

Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET

Supplier	System	Min. Length m	Wind BU/s/m	EQ BU/s/m	Element Height Dependant	Element Foundation Dependant
Custom1	CU1.0.4	0.4	80	95	☒	☒
Custom1	CU1.0.6	0.6	95	105	☒	☒
Custom1	CU1.1.2	1.2	120	135	☒	☒
Custom2	CU2.0.4	0.4	90	98	☒	☒
Custom2	CU2.0.6	0.6	127	136	☒	☒
Custom2	CU2.1.2	1.2	164	135	☒	☒
Engineer	Portal	1	300	300	☒	☒

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 EzyBrace® PLUS

File Home

New, Save, Save As, Open, Recent, Print, Exit

☒ Demand Sheet
☒ Single Level Along Resistance Sheet
☒ Single Level Across Resistance Sheet
☒ Lower Level Along Resistance Sheet
☒ SubFloor Level Along Resistance Sheet
☒ SubFloor Level Across Resistance Sheet
☒ Custom Elements Sheet

Preview Page: 1 of 4, Magnification: 100%

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name: Example
 Project and Number: 100 Job Sheet
 Lot and DP Number: Lot 123 DP 101
 City/Town District: Selwyn District
 Designer: A.R. Architect
 Company: JKL Limited
 Date: 11/6/15

Building Specification

Number of Storeys: 1
 Floor Loading: 2 kPa
 Foundation Type: Raft
 Cladding Weight: Single
 Light: Light
 Roof Weight: No
 Room to Roof Space: No
 Roof Pitch: 20
 Roof Height above Eave (m): 2.5
 Building Height to Apex (m): 5
 Ground to Lower Floor (m): 0.3
 Average Stud Height (m): 2.44
 Building Length (m): 17.9
 Building Width (m): 15.8
 Building Plot Area (m²): 100

Building Location

Wind Zone: High
 Earthquake Zone 1
 Soil Type: C (Shallow)
 Annual Prob. of Exceedance: 1 in 500 (NZS3104:2011 Default)

Bracing Units required for Wind

	Along	Across
Single Level	682	960

Bracing Units required for Earthquake

	Along & Across
Single Level	177

GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

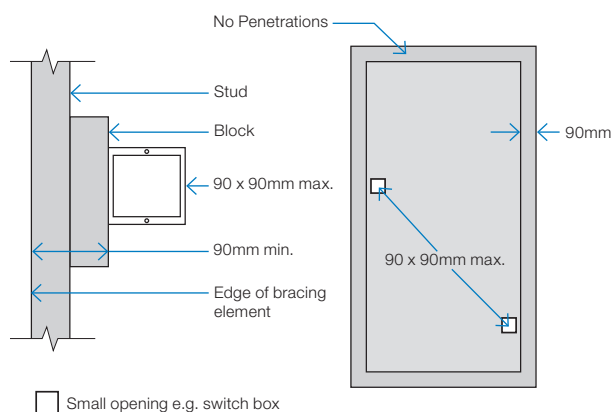
SMALL OPENINGS

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

LARGE OPENINGS

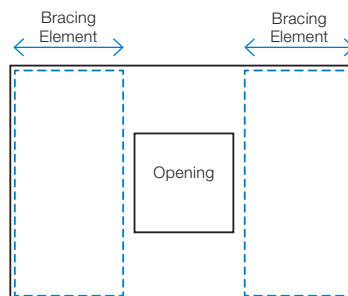
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

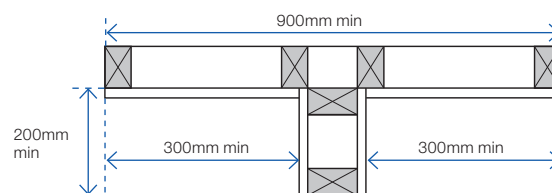
Guidelines for intersection walls

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

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

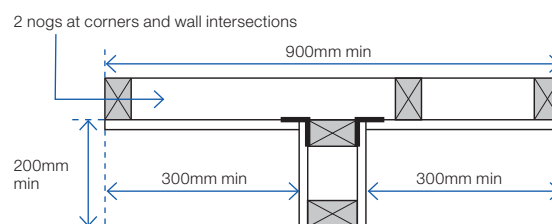
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



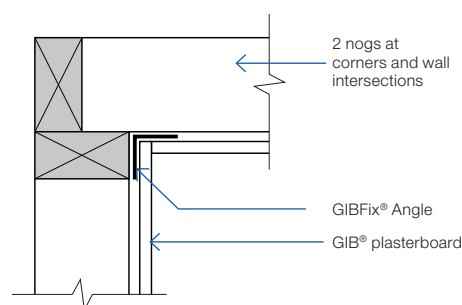
GEB002

FIGURE 13: WALL INTERSECTION (GIBFix® FRAMING SYSTEM)



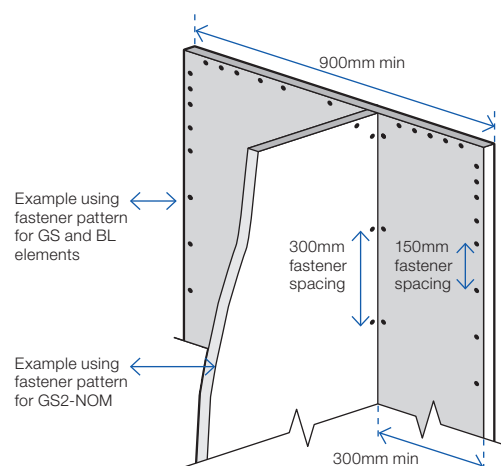
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFix® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR – EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR – INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

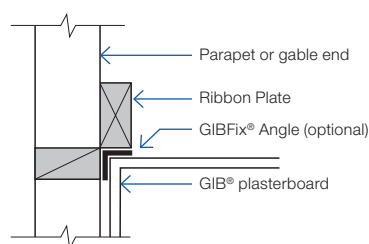
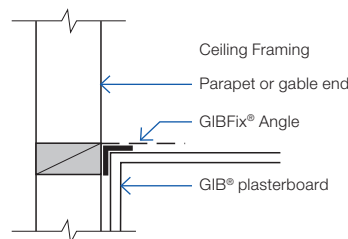


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

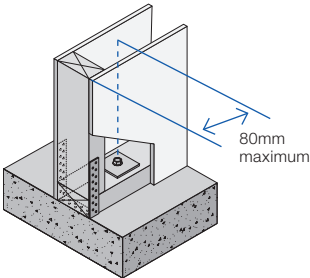
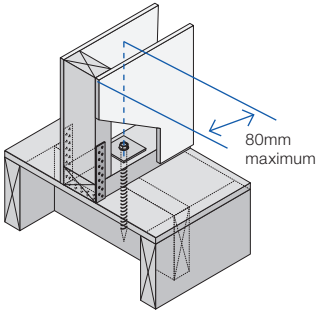
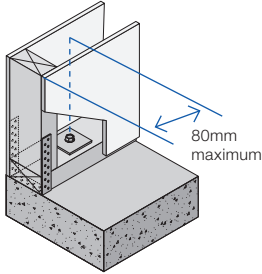
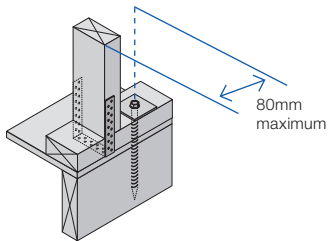
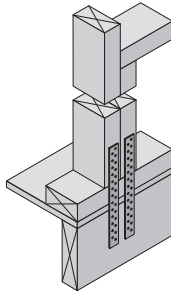
BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

Bracing strap installation

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

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

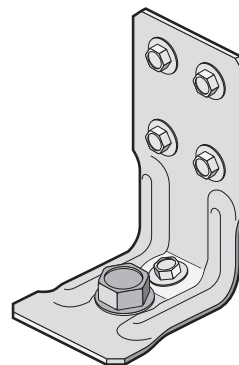
Concrete floor	Timber floor
400 x 25 x 0.9mm galvanised strap to pass under the plate and up the other side of the stud. Six 30 x 2.5mm flat head galvanised nails to each side of the stud. Three 30 x 2.5mm flat head galvanised nails to each side of the plate. Hold down bolt with 50 x 50 x 3mm washer 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

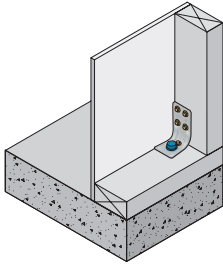
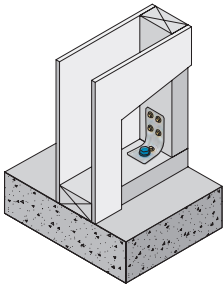
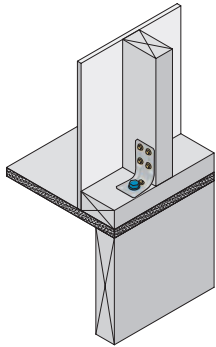
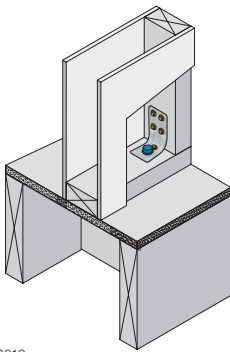
GIB HandiBrac® installation

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 Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.	 GEB010 Position GIB HandiBrac® at the stud/plate junction and at mid-width of plate.	 GEB011 Position GIB HandiBrac® flush with the outside stud face, as close as practicable to the centre of the boundary joist.	 GEB012 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.

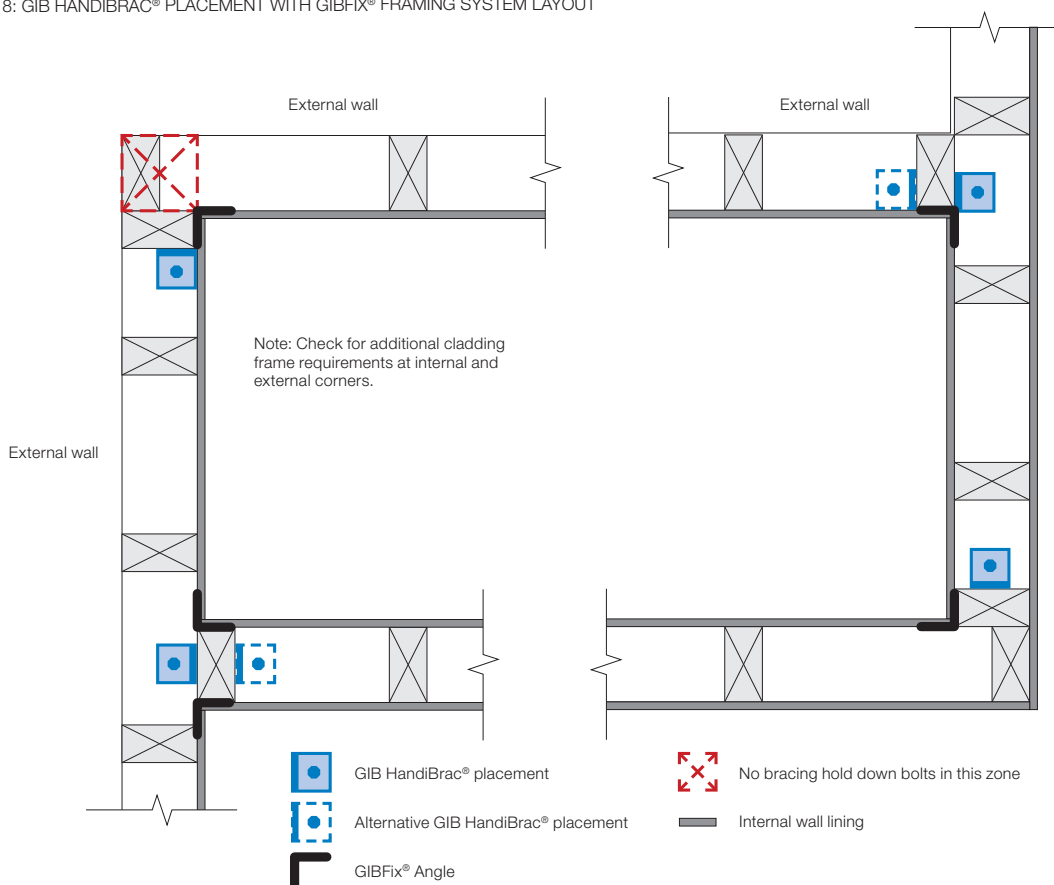
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

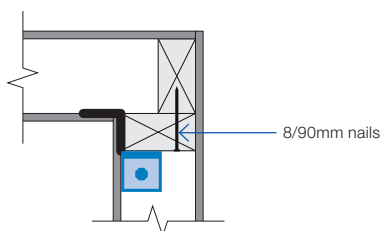
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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

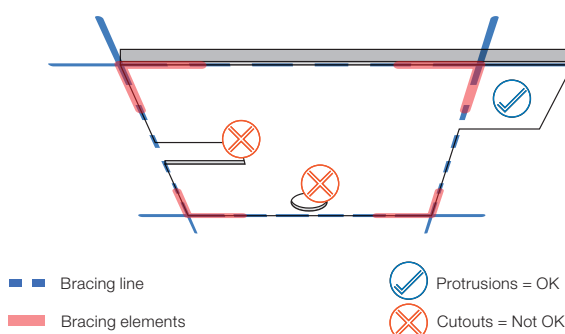


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

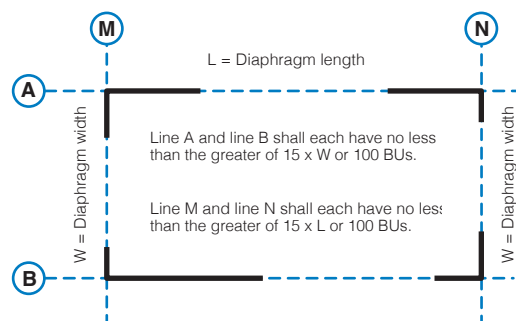


FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS

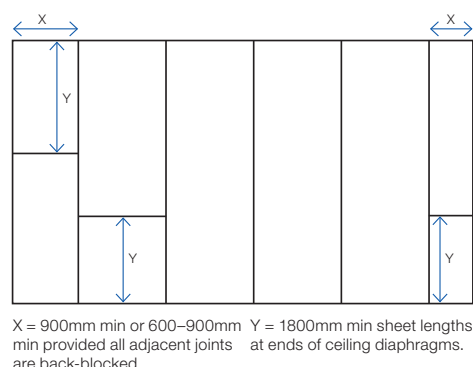
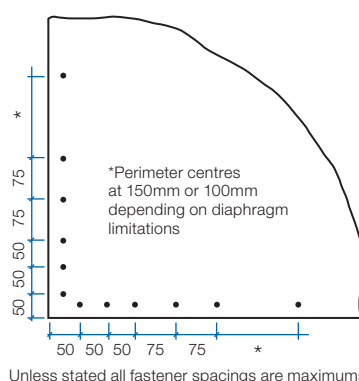


FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



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.

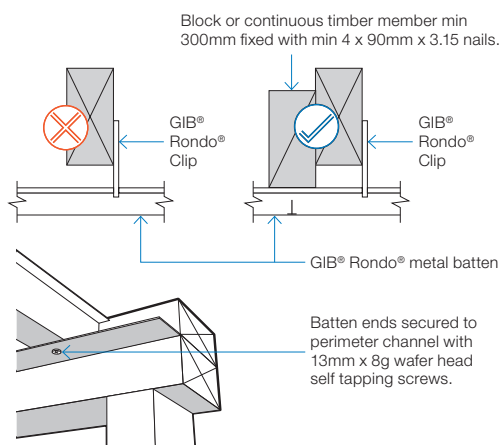
For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

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:

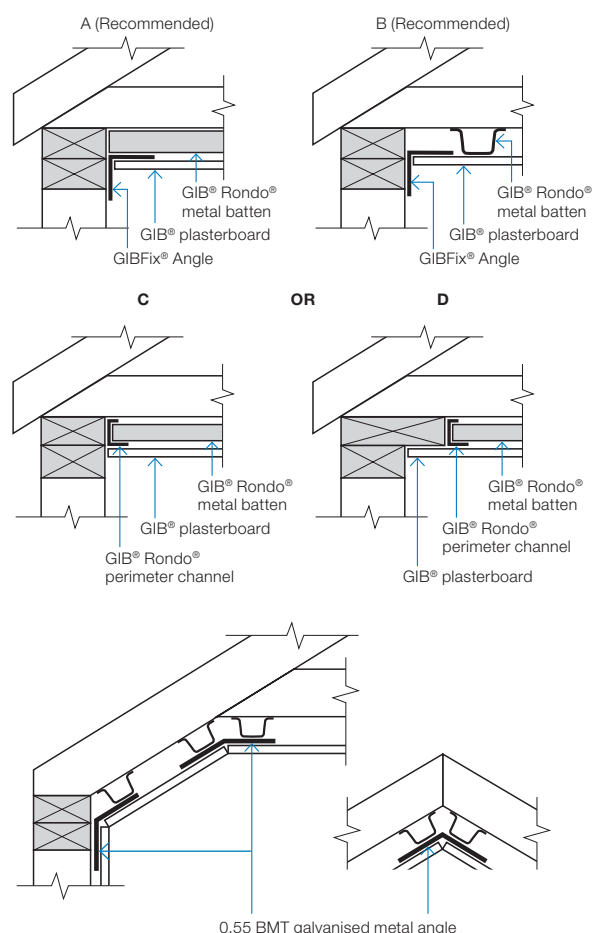
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screws.
- Fastened to timber framing using 32mm x 7g GIB® Grabber® Dual Thread screws when linings are installed.

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



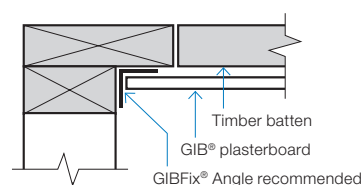
GEB016

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 within 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 galvanised 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

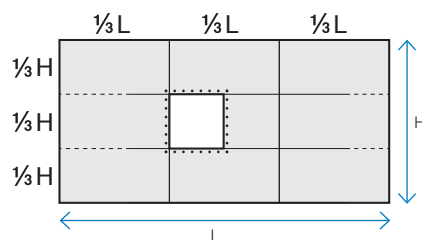
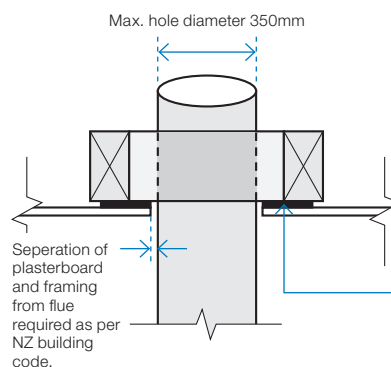


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

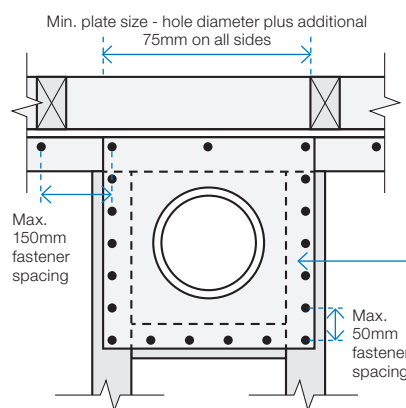
Section view



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.

Plan view



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.

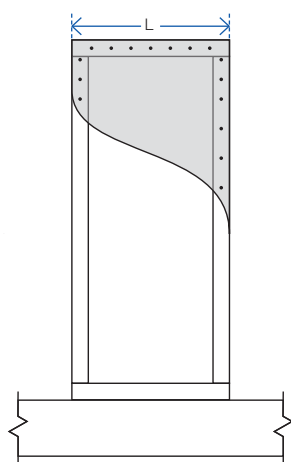
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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.

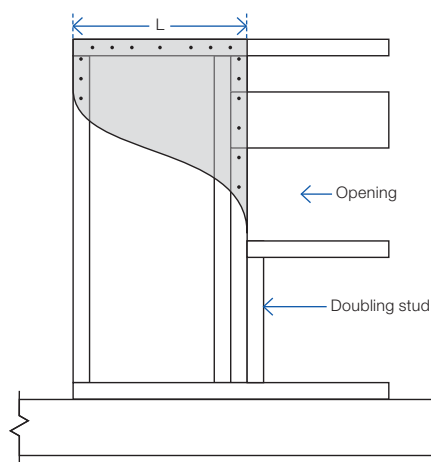
Fastener spacings and diagram scales shown in Figures 29-32 are indicative only. Refer to p.23-30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



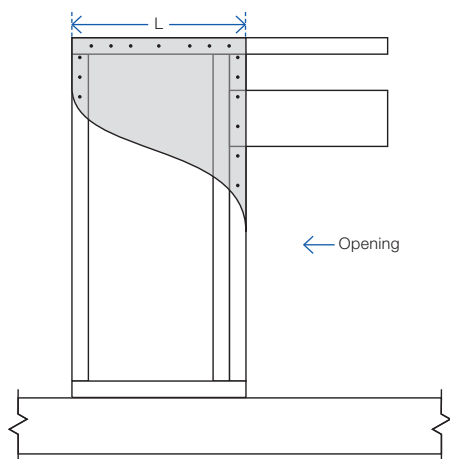
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



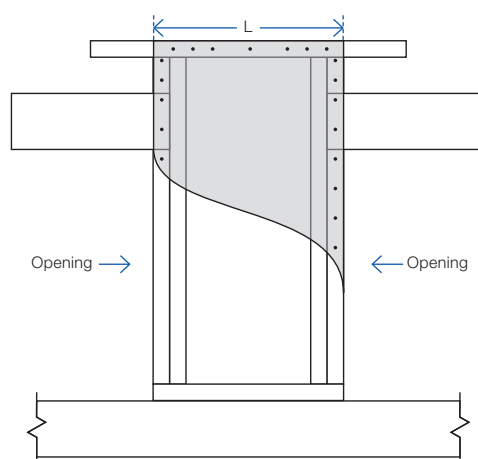
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

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.

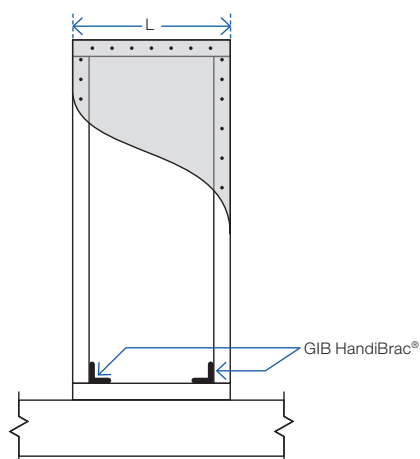
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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.

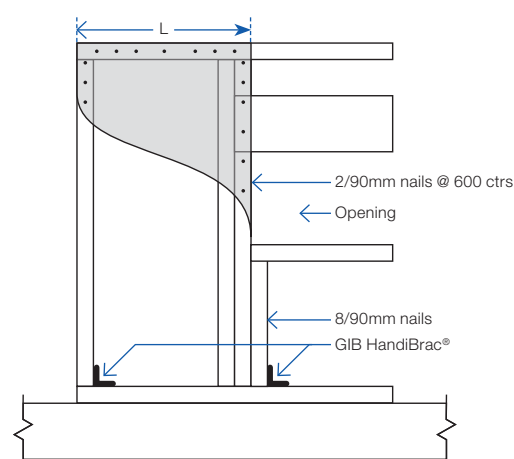
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



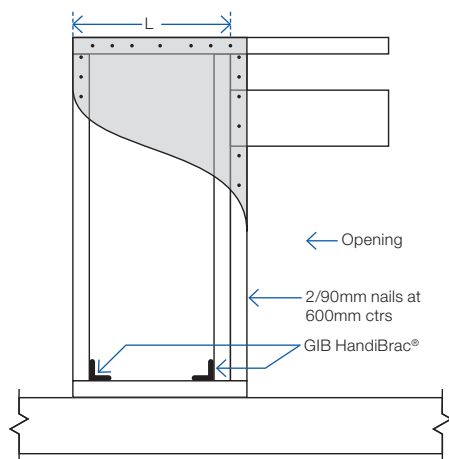
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



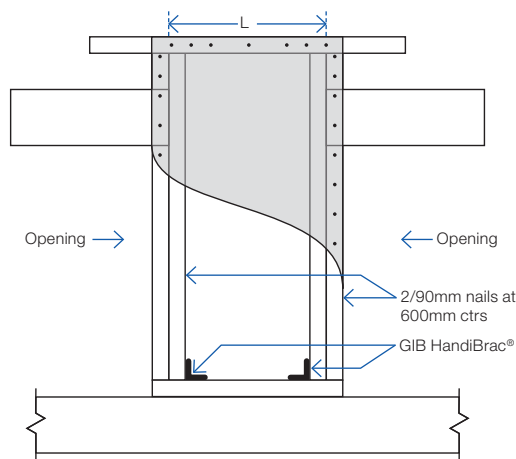
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

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

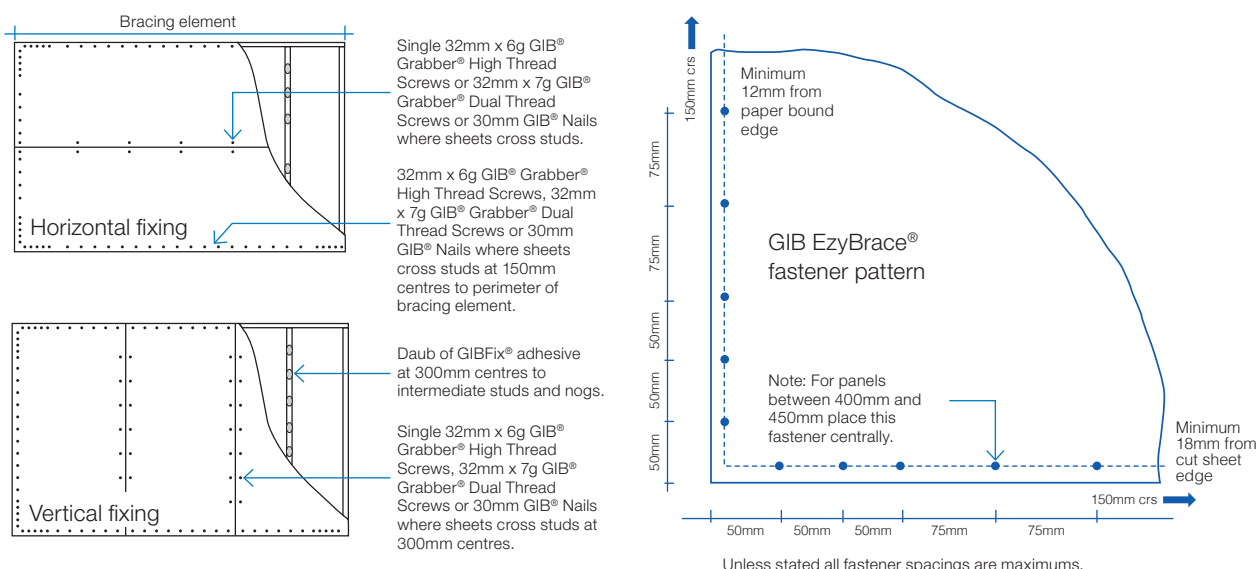
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

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.



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

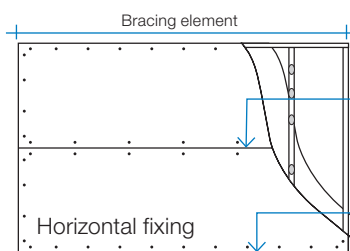
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

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.

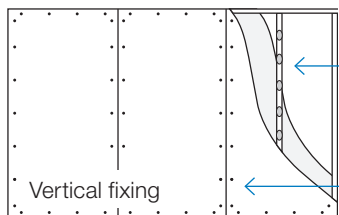
JOINTING

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.



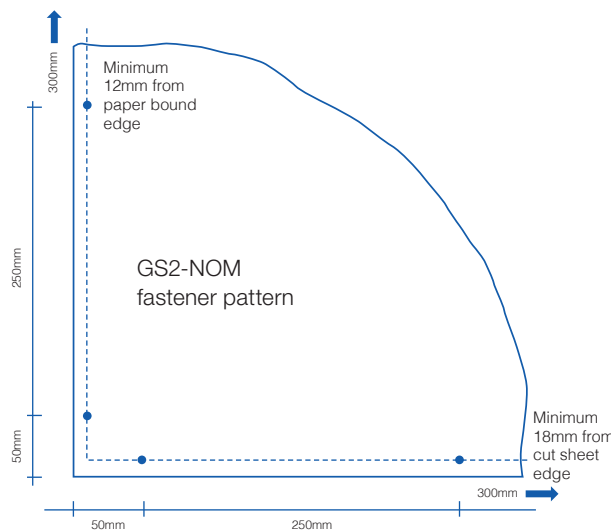
Single 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws where sheets cross studs.

Single 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws to perimeter of bracing element (note corner fastening pattern).



Daub of GIBFix® adhesive at 300mm centres to intermediate studs and nog.s

32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws at 300mm centres to perimeter of bracing element (note corner fastener pattern).



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

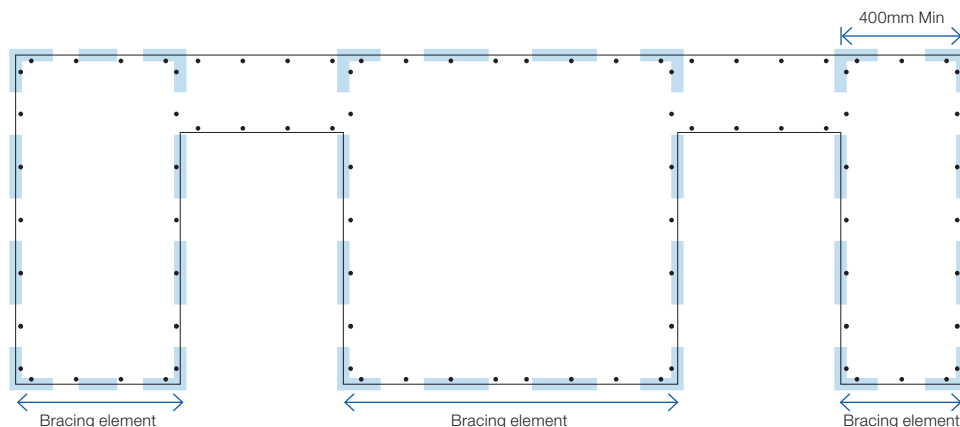
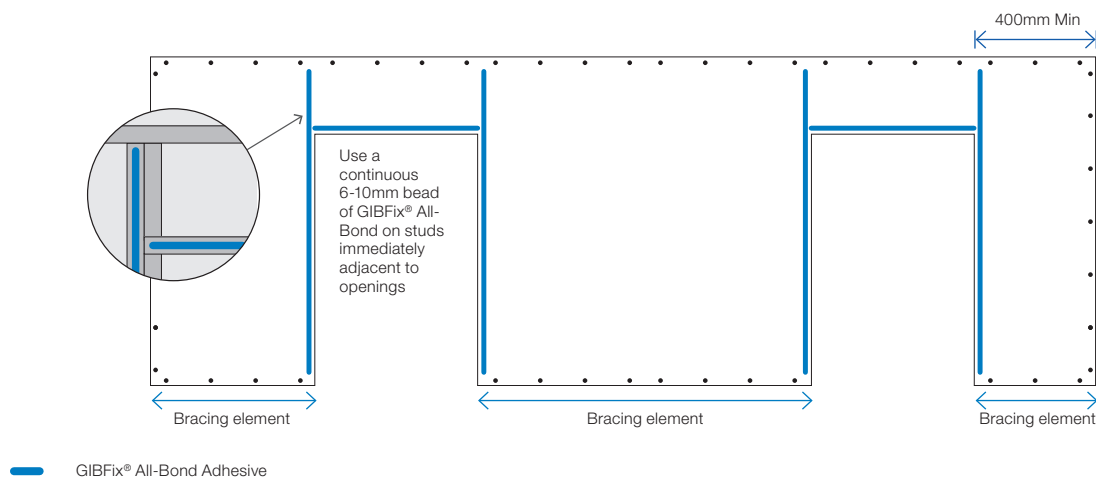
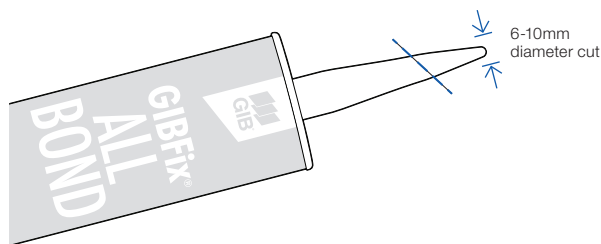


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



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

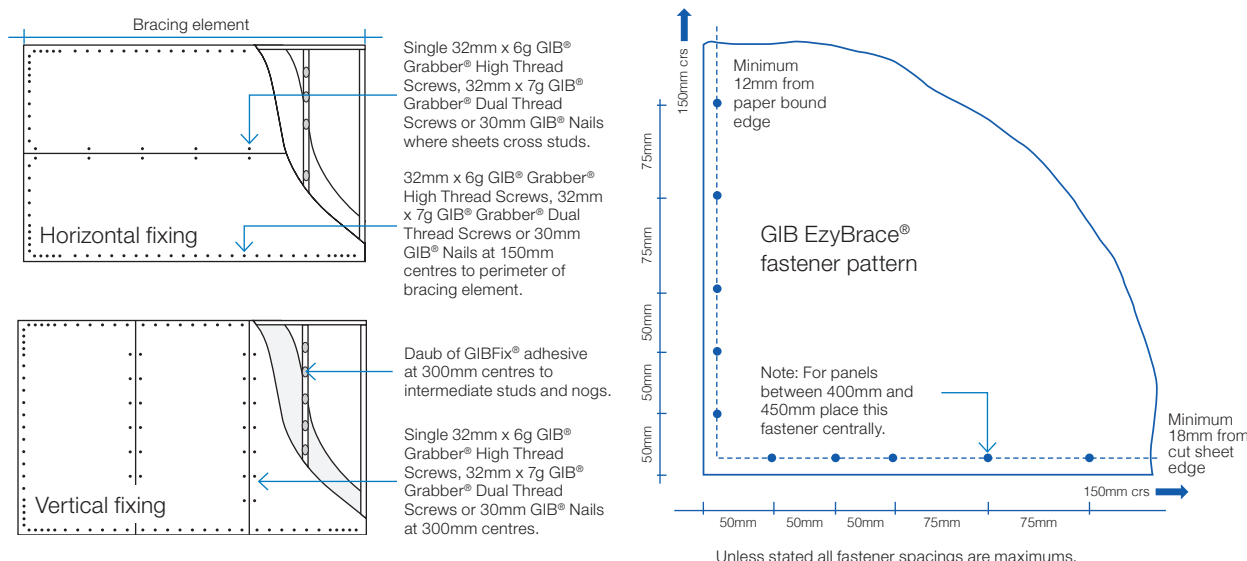
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

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.



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.

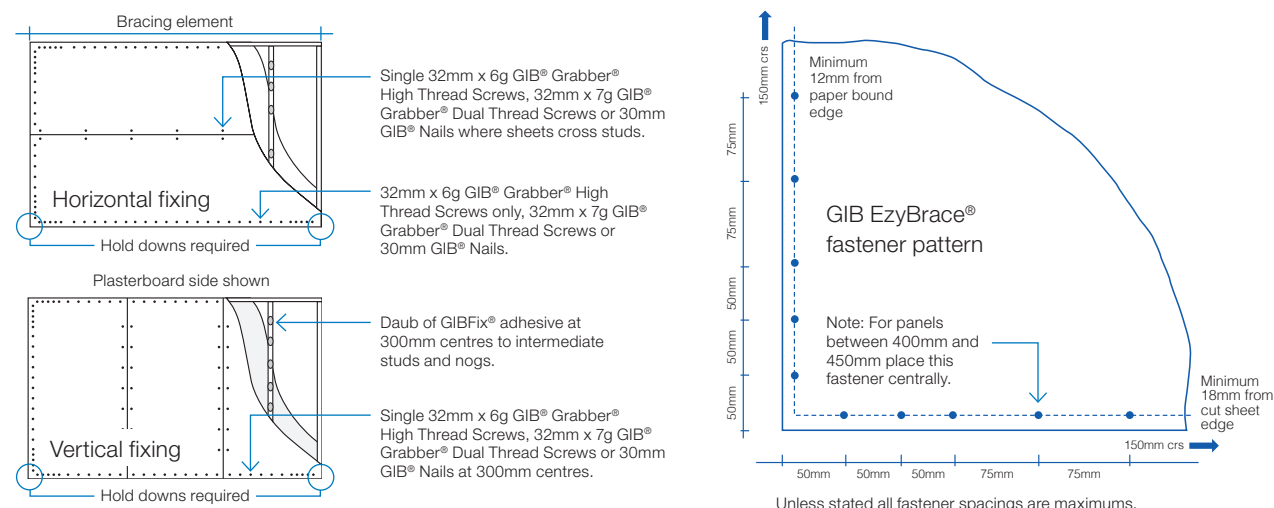
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

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.



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

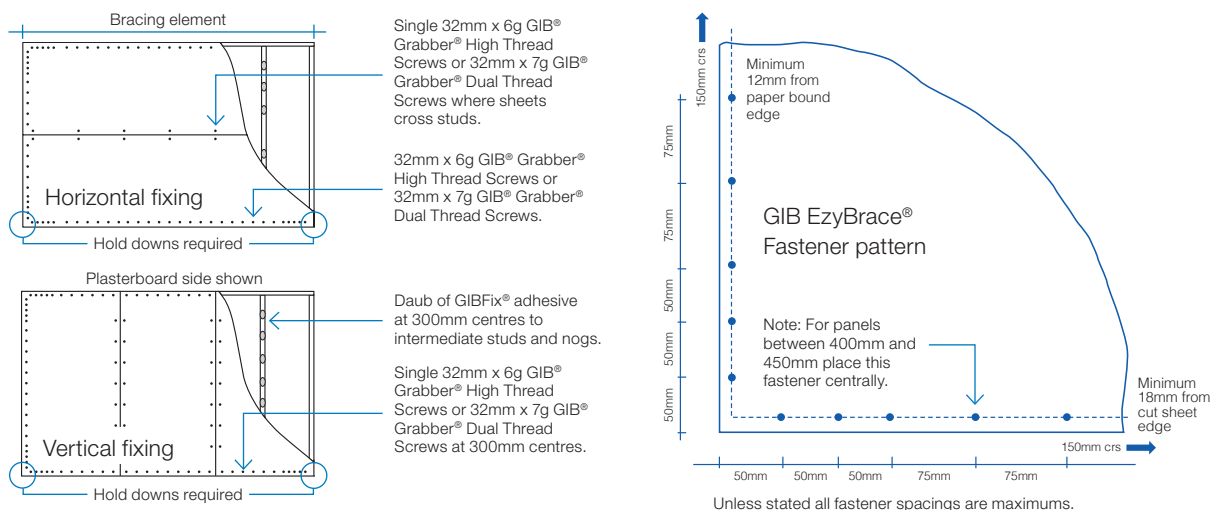
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

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.



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.

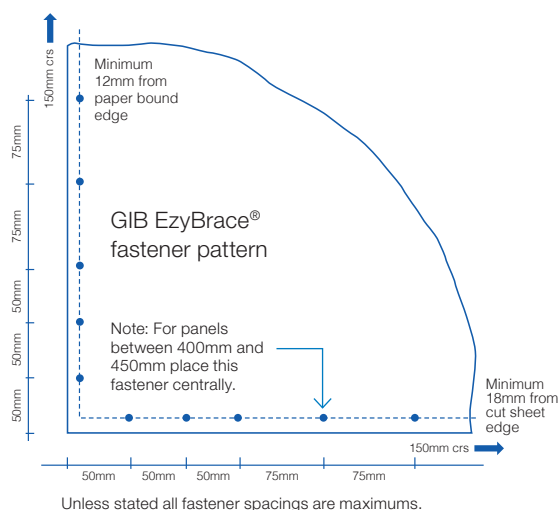
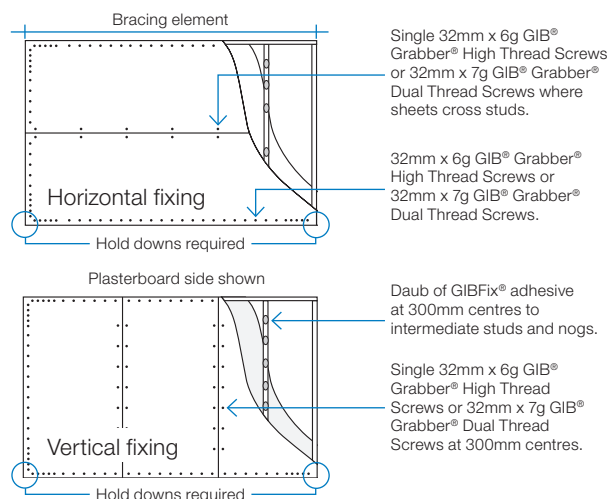
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

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.



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

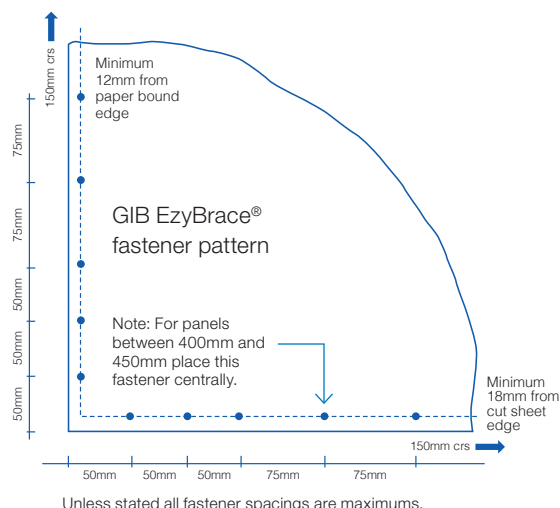
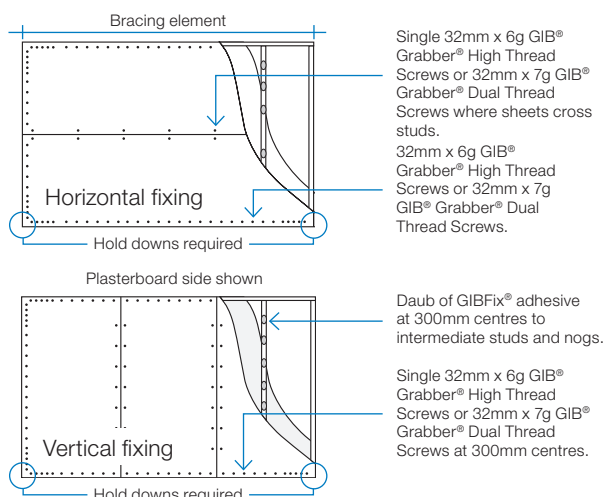
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread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



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^{CERT}™

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

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

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

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

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

COPYRIGHT

Copyright © Winstone Wallboards Ltd 2016. All of the material contained in this brochure, including all text, tables, charts, graphs, drawings, images, diagrams are protected by copyright. These materials may not be reproduced, adapted or transmitted in any form by any process, without the permission of Winstone Wallboards Ltd.

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 Fyrelime®, 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 Fyrelime®, 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.



SDC - Approved Building Consent Document - BC240357 - Pg 189 of 402 - 19/03/2024 - warreg

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

WATERPROOF MEMBRANE SPECIFICATIONS



BRANZ Appraised

Appraisal No. 484 [2018]

MAPEGUM WPS, MAPELASTIC,
MAPELASTIC SMART AND
MAPELASTIC AQUADEFENSE
WET AREA MEMBRANES

Appraisal No. 484 [2018]

This Appraisal replaces BRANZ

Appraisal No. 484 [2012]

Amended 06 October 2022

BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Product

- 1.1 Mapegum WPS and Mapelastic AquaDefense are one-component, liquid-applied waterproofing membranes for internal applications under trafficable floor finishes.
- 1.2 Mapelastic and Mapelastic Smart are two-component liquid-applied waterproofing membranes suitable for internal applications on substrates under trafficable floor finishes.

Scope

- 2.1 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes have been appraised for use as waterproofing membranes for the internal wet areas of buildings, within the following scope:
 - on floor substrates of concrete, flooring grade particle board, plywood, fibre cement compressed sheet and fibre cement sheet tile underlay, 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 trafficable floor finishes; and,
 - where floors are designed and constructed such that deflections do not exceed $1/360^{\text{th}}$ of the span.
- 2.2 The use of Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.
- 2.3 Movement and control joints in the substrate must be carried through the membrane and trafficable floor finish. The design and construction of the substrate and movement and control joints is specific to each building, and is therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.4 The trafficable floor finishes are outside the scope of this Appraisal.
- 2.5 The membranes must be installed by trained applicators, approved by MBP [NZ] Ltd, to the conditions of the Technical Data Sheet [TDS] of the products.



EXCLUSIVELY DISTRIBUTED BY MBP (NZ) LTD.

MBP [NZ] Ltd

Exclusive distributor of Mapei
products in New Zealand

P.O. Box 12 326

Penrose

Auckland

Tel: 09 921 1994

Fax: 09 921 1993

Web: www.MBPLtd.co.nz



BRANZ

BRANZ

11-22 Moonshine Rd,

Rimutaka, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

Tel: 04 237 1170

branz.co.nz



Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes, 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 and B2.3.2. Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes meet these requirements. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes will meet this requirement. See Paragraphs 11.1-11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes meet this requirement.

Technical Specification

4.1 Materials supplied by MBP [NZ] Ltd are as follows:

- **Mapegum WPS** - a one-part, fast drying, polymer-based, ready-to-use, liquid-applied membrane. It is supplied as a light grey-coloured paste in 5, 10 and 25 kg buckets.
- **Mapelastic** - a two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 24 kg multi-wall bags and a Part B liquid in 8 kg plastic containers. When dry, the membrane is grey in colour.
- **Mapelastic Smart** - a two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 10 kg plastic containers. When dry, the membrane is light grey in colour.
- **Mapelastic AquaDefense** - a one-part, solvent-free, ultra-quick drying synthetic resin-based paste in water dispersion liquid-applied membrane. It is supplied as a light blue coloured paste in 15 kg drums.
- **Mapeband and Mapeband Gaskets** - a rubber-coated polyester tape for waterproofing expansion joints and sealing around drains and pipes. Available as a tape 120 mm wide in rolls 50 m long, and also in ready-made internal and external corners [90 and 270 degrees] and pipe gaskets 118 x 118 mm and 300 x 300 mm, "T" profiles 515 mm x 315 mm and cross profiles 515 x 515 mm.
- **Mapeband PE120** - a PVC fabric tape used to reinforce wall/wall and floor/wall joints. It is only used with Mapegum WPS and Mapelastic AquaDefense. Available as a tape 120 mm wide, in rolls 10 m and 50 m long, and also as preformed angles 90° and 270°.
- **Mapetex Sel** - a macro-holed non-woven fabric, used to reinforce the first and second layer of the waterproofing membranes. It is supplied as a polypropylene white fabric, in rolls 100 mm, 200 mm and 1 m wide x 25 m long.
- **Mapenet 150** - a glass fibre mesh used to reinforce the membranes. It is supplied as a blue mesh in rolls 1 m wide and 50 m long.
- **Mapeband SA** - a self-adhesive butyl rubber tape used to reinforce all joints. It is supplied as a 2 mm thick, 100 mm wide tape in rolls 25 m long.
- **Mapei Primer 3296** - an acrylic primer for absorbent surfaces. It is an opaque colour and supplied in 5 and 10 kg drums.

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 24 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:
- Mapelastic Smart, Version 2013-4-2022-gb, 2022.
 - Mapegum WPS, Version 2014-10-2020-en (IT), 2020.
 - Mapelastic, Version 331-5-2018-gb, 2018.
 - Mapelastic AquaDefense, Version 2013-11-2016-gb, 2016.
- 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

General

- 7.1 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are 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 Mapegum WPS and Mapelastic AquaDefense are designed to be used where a one-component product is preferred.
- 7.3 The membranes must be protected from physical damage by the application of trafficable floor finishes.
- 7.4 Movement and control joints may be required depending on the shape and size of the building or room, and the floor finish specified. Design guidelines can be found in the BRANZ Good Practice Guide: Tiling.
- 7.5 Timber framing 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 $1/360^{\text{th}}$ 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.
- 8.2 The plywood must be laid with the face grain at right angles to the floor joists. The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres along the sheet 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 tile 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.

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, concrete slab-on-ground to NZS 3604 or NZS 4229 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 suitable for use in internal wet areas.
- 8.7 Fibre cement sheet must be suitable for use in wet areas and comply with AS/NZS 2908.2.
- 8.8 Installation of plasterboard or fibre cement wall linings must be carried out in accordance with the instructions of the manufacturer.

Durability

Serviceable Life

- 9.1 The Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with trafficable floor finishes with a design service life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the trafficable floor finish remains intact. Regular checks must be made of the floor finish to ensure it is sound and will not allow moisture to penetrate. Any issues must be repaired immediately by repairing the floor finish.
- 10.2 In the event of damage to a membrane, the trafficable floor finish must be removed and the membrane repaired by removing the damaged portion and applying a patch with sufficient overlap over the damaged section.
- 10.3 Drainage outlets must be maintained to operate effectively, and floor finishes must be kept clean.

Internal Moisture

- 11.1 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are impervious to water, and when appropriately designed and installed, will avoid the likelihood of water penetrating behind linings or entering concealed spaces.
- 11.2 Surfaces must be finished with a trafficable floor finish. A means of compliance with NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1, Paragraph 3.1.1 b), 3.1.2 b) and 3.3.1 b).
- 11.3 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 and drainage flanges must be provided and the floor must fall to the outlet.
- 11.4 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Paragraph 2.
- 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 wall lining manufacturers.
- 11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must be installed as per the NZBC requirements. 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 and plywood floors are used.

Installation Information

Installation Skill Level Requirement

- 12.1 Installation of the membranes must be completed by trained applicators approved by MBP [NZ] Ltd
- 12.2 Installation of substrates must always be carried out in accordance with the Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

Preparation of Substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth 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 concrete substrates must be 75% or less before membrane application. The 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 a reinforcement installed as set out in the Technical Literature.
- 13.4 Refer to the product manufacturer for correct priming requirements.

Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 8°C or above 35°C.
- 14.2 Mapelastic and Mapelastic Smart require the liquid and powder to be mixed and left to stand for 5 minutes before re-mixing, then applying. Mapegum WPS and Mapelastic AquaDefense must be thoroughly stirred before application.
- 14.3 The membranes must be applied in a minimum of two coats, at the rates set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the Mapegum WPS and Mapelastic AquaDefense membranes must be a minimum of 1 mm and the Mapelastic and Mapelastic Smart Membranes must be a minimum of 2 mm.
- 14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a notched steel trowel (finished with a flat steel trowel).
- 14.5 Reinforcement fabric or Mapeband is bedded into the wet layer between coats 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.
- 14.6 Clean up may be undertaken with water.
- 14.7 For further information, refer to the Technical Literature.

Floor Finishes

- 15.1 The membranes must be fully cured before installing the trafficable floor finish. The cured membranes 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 MBP [NZ] Ltd.



Impregnating Drain Vertical fabric with Mapelastiq AquaDefense



Application of Mapeband to a wall-floor joint with Mapelastiq AquaDefense



Application of the first coat of Mapelastiq AquaDefense



Application of the second coat of Mapelastiq AquaDefense

Inspections

- 16.1 The Technical Literature must be referred to during the inspection of membrane installations.
- 16.2 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 floor finish including protection from mechanical damage during curing and prior to installation.

Health and Safety

- 17.1 Safe use and handling procedures for the membranes 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 has been undertaken by various organisations:
- Mapegum WPS and Mapelastic Wet Area Membranes in accordance with; EN 14891 for initial tensile adhesion strength, tensile strength after water contact, tensile adhesion strength after heat ageing, tensile adhesion strength after contact with lime water, tensile adhesion strength after contact with chlorine water, tensile adhesion strength after freeze-thaw cycles, waterproofing and crack bridging ability; DIN 53504 for tensile strength and maximum elongation after exposure to air and water immersion [Mapegum WPS only] and; Mapei internal method for water absorption after exposure and water immersion.
 - Mapelastic Smart in accordance with EN 1502-4 for bond strength to concrete, freeze thaw, flexibility, static and dynamic crack bridging, water vapour permeability, impermeability to water and bond strength after water immersion, heat ageing, freeze-thaw and alkali ageing.
 - Mapelastic in accordance with; EN 14891 for crack bridging after 28 days exposure to air, crack bridging after 7 days exposure to air and 21 days immersion in water, adhesion to concrete surface after 28 days exposure to air, adhesion to concrete surface after 28 days exposure to air and 21 days immersion in water; DIN 52615 for resistance to water vapour transmission and; Mapei internal method for deformability under low temperatures.
 - Mapegum WPS in accordance with; EN 1384 for tensile adhesion strength after exposure and water immersion; UNI 8202/22 for water absorption after exposure and water immersion and; DIN 53505 for shore A hardness.
 - Mapelastic AquaDefense in accordance with AS/NZS 4858 Appendix A including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission to ASTM E96-92 and cyclic movement resistance requirements of AS/NZS 4858 Appendix B. Testing to ANSI 118.10-1999 including seam strength, breaking strength, dimensional stability, resistance to fungi, static head and shear strength to ceramic tile and cement mortar. Also tensile adhesion on a plywood substrate and low temperature flexibility of the membrane.
- 18.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 18.3 Testing of Mapegum WPS and Mapelastic has been undertaken by BRANZ for durability in accordance with AS/NZS 4858, Appendix A covering tensile strength and elongation after immersion in water, bleach, detergent, and after heat ageing.
- 18.4 Testing for suitability of Mapelastic over particleboard in accordance with AS/NZS 4858, Appendix C has been undertaken by BRANZ and found to be satisfactory.

Other Investigations

- 19.1 An assessment was made of the durability of the Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes by BRANZ technical experts.
- 19.2 Site inspections have been carried out by BRANZ to examine 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 membranes has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 20.2 The quality management system of the membranes 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 MBP [NZ] Ltd.
- 20.4 Quality on-site is the responsibility of the MBP [NZ] Ltd trained applicators.
- 20.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems and substrates.
- 20.6 Building owners are responsible for the maintenance of the trafficable floor finish in accordance with the instructions of MBP [NZ] Ltd.

Sources of Information

- AS 3958.1:2007 Guide to the installation of ceramic tiles.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2908.2:2000 Cellulose-cement products – Flat sheet.
- AS/NZS 2269:2012 Plywood-Structural.
- AS/NZS 4858:2004 Wet area membranes.
- BRANZ Good Practice Guide: Tiling, April 2015.
- DIN 53504 May 1994 Determination of tensile stress/strain properties of rubber.
- EN 1348: 1997/A1 Adhesives for tiles – Determination of tensile adhesion strength for cementitious adhesives.
- EN 14891 March 2003 Liquid applied waterproofing membranes for use beneath ceramic tiling – Definitions, specifications and test methods.
- 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.
- UNI 8202 – 22: 1987 Building. Water proof sheets. Determination of behaviour in water.
- Ministry of Business, Innovation and Employment Record of amendments – Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 25 February 2021

This Appraisal has been amended to update the Appraisal holder.

Amendment No. 2, dated 06 October 2022

This Appraisal has been amended to include trafficable floors and to remove Mapelastic Turbo.

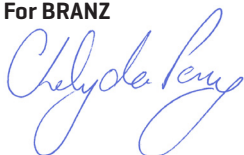
In the opinion of BRANZ, **Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic Aquadefense Wet Area Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **MBP [NZ] 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. **MBP [NZ] Ltd:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **MBP [NZ] 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 **MBP [NZ] Ltd** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

09 February 2018



MAPESIL AC

SILICONE SEALANT

Solvent-free, acetic-cross-linking mildew-resistant silicone sealant, available in 26 colour and transparent.

Applications:

Interior, exterior, ceramic tile floor and wall sealing of expansion joints of $\pm 25\%$ expansion of the initial size in swimming pools, bathrooms and showers.

Mapesil AC can also be used for forming a perfectly elastic gasket between different elements in constructions, mechanical engineering, ship-building, automobile manufacturing, etc.

N.B. Mapesil AC adheres perfectly to glass, ceramics and anodized aluminium.

If treated beforehand with Primer FD, adhesion is good also on concrete, wood, metal, painted surfaces, plastics, rubber etc.

Mapesil AC is classified F-25-LM in compliance with ISO 91600 standards.

Technical data:

Formation of surface film: 10 minutes.

Shrinkage during cross-linking: 3.5%.

Speed of cross-linking: 4 mm a day; 10 mm in 7 days.

Ultimate elongation: 800%.

Movements under working conditions: $\pm 25\%$.

Shore-A-Hardness: 20.

Colours: 26 and transparent.

Application: sealant gun.

Storage: 24 months.

Consumption

depends on the size of the joint.

Packaging

310 ml cartridges.



MAPESIL AC is part of the lines:

Products for Ceramics and Stone Materials - Elastic Sealants

Products for building - Sealing and waterproofing expansion and construction joints

Elastic sealants and adhesives - Sealants for ceramic and sanitary fittings

Elastic sealants and adhesives - Sealants for glass and window fittings

Related **documentation**



Technical data sheet



Safety Data Sheet

Product documentation

Manuals, Brochure, Selection chart

Guide for the Installation of Ceramic Materials



103 Moon white

110 Manhattan 2000

111 Silver Grey

Last Projects MAPESIL AC



SPECIAL PROJECT

2018

St. Stephen's Basilica, Altar of Mary's Chapel

Budapest, Hungary

Installation of floors



TOURISM AND WELLNESS

2018

Thermal bath of Zalakaros

Hungary

Installation of floor and wall coverings, Waterproofing



RESIDENTIAL BUILDINGS

2017/2018

Condominium is Siófok

Siófok, Hungary

Installation of floors, Waterproofing



SPORT FACILITIES

2017/2021

MTK volleyball and fencing hall

Budapest, Hungary

Solutions for sports flooring



Mapegum WPS

**Quick-drying flexible
liquid membrane
for waterproofing
internal surfaces**



WHERE TO USE

Waterproofing indoor floor and wall surfaces that are not subject to rising damp nor in permanent water immersion.

Flexible, anti-fracture membrane. Apply before the installation of ceramic tiles or stone material.

Mapegum WPS may be used on the following:

- plasterboard, gypsum or cementitious render, lightweight cement block and marine-plywood;
- cementitious, anhydrite, wooden and magnesite substrates and existing ceramic and natural stone after the application of **Eco Prim T** primer.

ADVANTAGES

- Product certified EC1 Plus by the GEV Institute (Gemeinschaft Emissions-kontrollierte Verlegewerkstoffe e.V) as a product with very low emission of volatile organic compounds.
- Ready to use.
- Rapid application.
- Floor coverings may be installed after 12 hours.
- Excellent elongation properties.
- No reinforcement required.

Some application examples

- Waterproofing walls and floors in bathrooms and shower cubicles before laying ceramic tiles, natural stone and mosaic.

- Waterproofing kitchen walls and floors, and work tops before laying ceramic tiles and natural stone.

TECHNICAL CHARACTERISTICS

Mapegum WPS is a ready-to-use, solvent-free, one-component, grey-coloured paste with a base of synthetic resins in water dispersion.

Mapegum WPS has a thixotropic consistency which makes it easy to apply on horizontal, sloping and vertical surfaces.

After rapid evaporation of the water content,

Mapegum WPS forms a flexible membrane which is not sticky and which is strong enough to withstand light pedestrian traffic. It also forms an excellent surface which bonds perfectly to adhesives used for laying ceramics, marble and natural stone.

The flexibility of **Mapegum WPS** enables it to withstand normal expansion and contraction movements of the substrate due to temperature variations and vibrations.

Mapegum WPS is resistant to water, limewater (pH > 12), water which contains chlorides and normal household detergents and cleaning products.

Systems based on the use of **Mapegum WPS** flexible membrane, on which various types of tiles have been laid using MAPEI cementitious-based adhesives (such as **Granirapid**, **Keraflex** and **Adesilex P9**) and water dispersion adhesives (**Ultramastic III**), have been certified for use in damp environments by the following institutes:

- Säurefliesner (Germany);
- Sp Swedish National Testing & Research Institute (Sweden);



Application of a 90° Mapeband PE 120 corner piece using Mapegum WPS



Application of Mapeband PE 120 using Mapegum WPS



Application of Mapeband PE 120 using Mapegum WPS

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Consistency:	paste
Colour:	light grey
Density (g/cm³):	1.45
pH:	9.0
Dry solids content (%):	73
Brookfield viscosity (mPa·s):	120,000 (rotor E - 5 revs)
EMICODE:	EC1 Plus - very low emission
APPLICATION DATA (at +23°C - 50% R.H.)	
Minimum film-forming temperature:	+5°C
Recommended application temperature range:	from +5°C to +35°C
Waiting time between the first and second coat:	approx. 60 min (touch dry)
Waiting time before laying coating material:	12-24 hours
Completely dry (1 mm of thickness) at +23°C:	5 hours
FINAL PERFORMANCE (final dry thickness of 0.5 mm)	
Initial adhesion according to EN 14891-A.6.2 (N/mm²):	1.6
Adhesion after water immersion according to EN 14891-A.6.3 (N/mm²):	1.2
Adhesion after heat ageing according to EN 14891-A.6.5 (N/mm²):	1.6
Adhesion after freeze/thaw cycles according to EN 14891-A.6.6 (N/mm²):	1.0
Adhesion after immersion in basic water (saturated solution of lime) according to EN 14891-A.6.9 (N/mm²):	1.2
Adhesion after immersion in sodium hypochlorite solution in compliance with EN 14891-A.6.7 (N/mm²):	0.6
Impermeable to water under pressure according to EN 14891-A.7 (150 kPa) 7 days:	no penetration
Permeable to water vapour according to EN ISO 12572:	$S_d \geq 5$ m (per 1 mm thickness of dry film)



– Norwegian Research and Building Institute (Norway).

RECOMMENDATIONS

- Do not apply **Mapegum WPS** if the temperature is lower than +5°C.
- Create sloping surfaces where necessary to avoid the formation of puddles of water.
- Do not apply **Mapegum WPS** on damp cementitious substrates or on substrates which are subject to rising damp.
- Do not use **Mapegum WPS** on surfaces continuously immersed in liquid such as swimming pools, fountains, storage tanks, etc. Use **Mapelastic** or **Mapelastic Smart** for these types of application.
- Do not use **Mapegum WPS** to cover cracks.
- **Mapegum WPS** must be protected from abrasion caused by pedestrian traffic by installing ceramic tiles or stone material.

APPLICATION PROCEDURE

Preparation of the substrate

Substrates must be solid, clean, dry and free of oil, grease, old paintwork or any other material which could affect bonding. When it is applied on existing ceramic coatings, accurately check if the substrate is sound, and clean all the mould, loose material, etc. from the surfaces to be waterproofed by washing and brushing them down, or by spraying with water and steam. Cementitious substrates must be stable and dry, and not subject to rising damp. Substrates which are highly absorbent or gypsum-based must be pre-treated with **Primer G** (usually diluted with water at a ratio of 1 : 1 or 1 : 2 to ensure thorough penetration). Wait several hours until the coating of **Primer G** is completely dry. Anhydrite or gypsum substrates must be perfectly dry (maximum residual humidity 0.5%), sanded and treated with a coat of **Primer G** or **Primer S**. Existing substrates of ceramic tiles or natural stone must be treated with **Eco Prim T** primer before applying

Mapegum WPS.

If a slope has to be created and the base needs to be smoothed off before spreading on **Mapegum WPS**, use **Adesilex P4** or **Planitop Fast 330**.

Application of the product

In order to guarantee continuity in the waterproofing coat, we recommend placing a rubber tape such as **Mapeband**, **Mapeband PE 120** or **Mapeband Easy** to form elastic joints between the wall and the floor and between contiguous walls before applying **Mapegum WPS**.

For drains, use the special-shaped pieces from the **Drain** range.

Mapeband, **Mapeband PE 120** or **Mapeband Easy** must be bonded to the substrate using **Mapegum WPS**.

Mapegum WPS may be applied by trowel, with a roller, by brush or spray (if required, dilute with up to 5% of water).

The product must be applied evenly in thin coats. Wait until the first coat is dry before applying further coats crossways (1-2 hours according to temperature conditions).

The final thickness of **Mapegum WPS** must never be less than 0.8 mm (equivalent to a dry thickness of 0.5 mm), in order to form a consistent, flexible continuous coat. Make sure that there are no gaps caused by imperfections in the substrate.

After 12-24 hours from applying the final coat of **Mapegum WPS** (according to temperature conditions), the surface is ready for laying ceramic tiles or natural stone, etc. Use an adhesive from the MAPEI range to lay ceramic tiles and natural stone; class C2 if it is cementitious based or class D2TE if it is a water dispersion type, in accordance with standard EN 12004.

Laying the tiles

After applying **Mapegum WPS** wait:

- 12-24 hours on absorbent substrates;
- 4-5 days on substrates which are not absorbent.

Lay the tiles using an adhesive from the MAPEI range (such as **Keraquick S1**, **Granirapid**, **Adesilex P9**, **Keraflex S1** or **Ultramastic III**); the width of the joints depends on the size of the tiles to be laid. Grout the tile joints using **Ultracolor Plus**, **Keracolor FF** or **Keracolor GG** plus **Fugolastic**, or with **Kerapoxy** or **Kerapoxy CQ**, available in a variety of colours. Expansion joints must be sealed using the special MAPEI sealants.

Cleaning

Mapegum WPS may be easily removed while still fresh from tools and surfaces with water.

CONSUMPTION

The consumption of **Mapegum WPS** is approximately 1.2 kg/m² in two coats, equal to 0.8 mm wet thickness (equivalent to 0.5 mm dry thickness).

NB: the consumption figures indicated are for a seamless film applied on a flat surface and will be higher on uneven surfaces..



Application of a **Mapeband PE 120** seal for through holes using **Mapegum WPS**



Application of a **Drain Vertical fitting** using **Mapegum WPS**



Application of **Mapegum WPS** with a roller

PACKAGING

Mapegum WPS is available in 20, 10 and 5 kg drums.

STORAGE

Up to 24 months in original packaging.
Protect from frost.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.com.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in effect at the time of the MAPEI product installation. For the most up-to-date TDS and warranty information, please visit our website at www.mapei.com. ANY ALTERATIONS TO THE WORDING OR REQUIREMENTS CONTAINED IN OR DERIVED FROM THIS TDS SHALL VOID ALL RELATED MAPEI WARRANTIES.



This symbol is used to identify Mapei products which give off a low level of volatile organic compounds (VOC) as certified by GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.), an international organisation for controlling the level of emissions from products used for floors.

All relevant references for the product are available upon request and from www.mapei.com

SDC - Approved Building Consent Document - BC-240357 - Pg 209 of 402 - 19/03/2024 - waiereg



Installing wall covering using Keraflex Maxi S1



Installing floor covering using Ultramastic III



BUILDING THE FUTURE

DYNAFLASH

UNIVERSAL BACK FLASHING

BY **DYNEX**build



50x50 mm | 75x75 mm | 100x100 mm | 25m Coil

25M COIL

The builder-friendly carton design allows the installer to use exactly the right amount of product from the long coil. DynaFlash is easily cut to the appropriate length eliminating joins and significantly reducing waste.

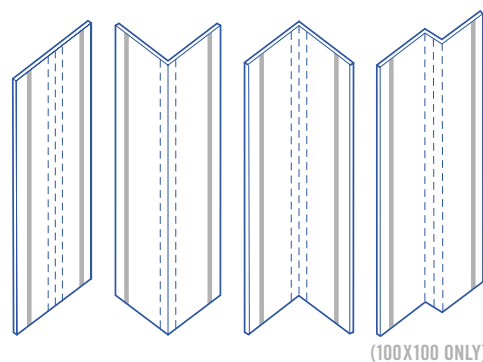
UNIQUE FIXING STRIP

The engineers at DynexBuild have cleverly incorporated the fixing strip into the flashing itself, reducing the need for fixings to penetrate the critical area between the beads. The flashing can be fixed using staples, screws or nails.

COMPRESSIBLE CO-EX BEAD

This unique Co-Extruded Bead is designed to help divert any moisture to the bottom of the flashing. Due to its compressible and slim nature, this bead will not push out the cladding, reducing unsightly cladding bulges.

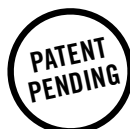
DynaFlash is proudly made in NZ from high grade polymers that have been independently tested to ensure their performance. Please go to DynexBuild.co.nz to see a simple installation video.



ONE PRODUCT, MULTIPLE APPLICATIONS

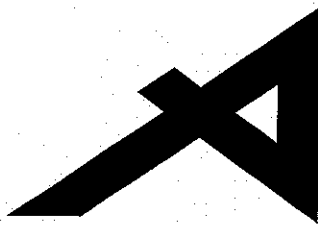


Please scan
QR code or visit
website to view
short installation
video.



dynexbuild.co.nz
0800 4 DYNEX (0800 439 639)

AVAILABLE AT ALL GOOD
BUILDING MERCHANTS



BRANZ Appraised

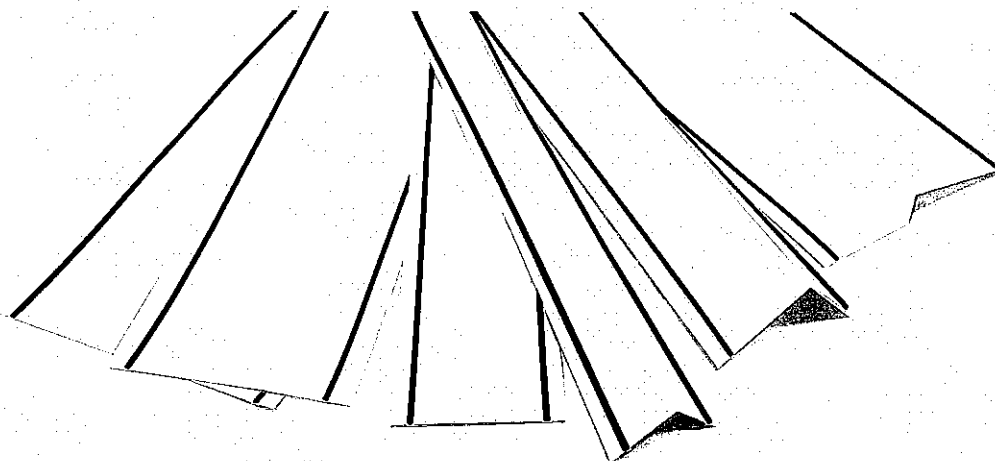
Appraisal No. 913 [2021]

DYNAFLASH FLASHINGS

Appraisal No. 913 [2021]

This Appraisal replaces BRANZ

Appraisal No. 913 [2016]



BRANZ Appraisals

Technical Assessments of
Products for building and
construction.



Dynex Extrusions Ltd

PO Box 19 133

Worale

Wickland

tel: 09 820 2800

fax: 09 820 2801

Web: www.dynex.nz



BRANZ

BRANZ

1222 Moonsline Rd,

RD1, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

tel: 04 237 1170

branz.co.nz

Product

- 1.1 DynaFlash Flashings are concealed corner and transition flashings designed to meet the flashing requirements of NZBC Acceptable Solution E2/AS1.

Scope

Timber Framing

- 2.1 DynaFlash Flashings have been appraised for use as concealed flashings on timber-framed buildings within the following scope:
- constructed with timber framing in accordance with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - with direct fixed or cavity-based wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or with proprietary direct fixed or cavity-based cladding systems covered by a valid BRANZ Appraisal; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.

Steel Framing

- 2.2 DynaFlash Flashings have been appraised for use as concealed flashings on steel-framed buildings within the following scope:
- constructed with steel framing in accordance with the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1; and,
 - with direct fixed or cavity-based wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or with proprietary direct fixed or cavity-based cladding systems covered by a valid BRANZ Appraisal; and,
 - situated in NASH Standard Part Two Wind Zones up to, and including, Extra High.

Specific Design

- 2.3 DynaFlash Flashings can also be used on buildings subject to specific weathertightness design. Weathertightness design and detailing of these installations is the responsibility of the designer and is outside the scope of this Appraisal.



Building Regulations

New Zealand Building Code (NZBC)

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

Clause B2 DURABILITY: Performance B2.3.1 [b] 15 years and B2.3.2. DynaFlash Flashings meet these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. DynaFlash Flashings contribute to meeting this requirement. See Paragraphs 11.1 and 11.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. DynaFlash Flashings meet this requirement.

Technical Specification

- 4.1 DynaFlash Flashings are extruded from 1 mm thick white polypropylene with co-extruded black EPDM rubber seals along each edge. They are available 100 mm wide (50 x 50 mm when folded), 150 mm wide (75 x 75 mm when folded) and 200 mm wide (100 x 100 mm when folded). They are supplied in 25 m coils.
- 4.2 The flashings are extruded with a groove along the centre line to enable them to be bent in either direction to suit internal and external corner applications, or they can be left unfolded for flat transition flashing applications. The 200 mm wide flashing has additional grooves to enable it to be bent as a stepped transition flashing.
- 4.3 Accessories used with the DynaFlash Flashings, which are supplied by the building contractor, are:
- **Fixings (timber frame)** – 30 or 40 x 2.5 mm hot-dip galvanised flathead nails, or staples.
 - **Fixings (steel frame)** – self-drilling 6 g AS 3566 Class 4 galvanised screws, or staples (when fixing to timber cavity battens).

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Dynex Extrusions Ltd, whether on-site or off-site, is under the control of the installer. DynaFlash Flashings must be protected from physical damage and must be stored in clean, dry conditions.

Technical Literature

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

Design Information

General

- 7.1 DynaFlash Flashings can be used as an alternative to concealed internal and external corner flashings specified within NZBC Acceptable Solution E2/AS1.
- 7.2 DynaFlash Flashings 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.
- 7.3 Where a proprietary cladding manufacturer specifies a specific flashing as part of their system, permission must be obtained from the cladding manufacturer before the flashing system is substituted with DynaFlash Flashings.

- 7.4 Where DynaFlash Flashings are used with other cladding systems not covered by this Appraisal (refer to Paragraph 2.1), designers must detail the junction between the DynaFlash Flashings and the cladding to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Durability

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

Serviceable Life

- 8.2 Provided they are 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, DynaFlash Flashings are expected to have a serviceable life equal to that of the cladding.

Maintenance

- 9.1 No maintenance is required for DynaFlash Flashings. Annual inspections must be made to ensure that all aspects of the cladding system, and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to the DynaFlash Flashings from heat sources such as fireplaces, heating appliances 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

- 11.1 DynaFlash Flashings when installed in accordance with this Appraisal and the Technical Literature assist in preventing the penetration of moisture that could cause undue dampness or damage to building elements.
- 11.2 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing flashings and wall interfaces as shown in NZBC Acceptable Solution E2/AS1 and 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.

Installation Information

Installation Skill Level Requirements

- 12.1 All design and building work must be carried out in accordance with the DynaFlash Flashings Technical Literature and this Appraisal by competent and experienced tradespersons conversant with DynaFlash Flashings. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License Class.

System Installation

DynaFlash Flashings Installation

- 13.1 DynaFlash Flashings are supplied in coils and are cut to length on-site. Flashings must be installed in a continuous length where possible, but to avoid wastage, the flashing can be lapped 100 mm. The direction of the lap must ensure that water is shed to the outer face of the flashing.
- 13.2 DynaFlash Flashings must be installed over the wall underlay (for direct fixed wall cladding), or cavity battens (for cavity-based wall cladding). The flashings must be fixed in place with 30 or 40 x 2.5 mm hot-dip galvanised flathead nails or staples (timber frame construction), or self-drilling 6 g AS 3566 Class 4 galvanised screws (steel frame construction) at approximately 400 mm centres. The fixings should be installed through the section of flashing between the EPDM seal and outside edge.
- 13.3 DynaFlash Flashings must be used and installed in conjunction with the selected cladding system in accordance with the installation methods and requirements of NZBC Acceptable Solution E2/AS1, or the proprietary cladding system manufacturer.

Basis of Appraisal

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

- 14.1 BRANZ expert opinion on NZBC E2 code compliance for DynaFlash Flashings was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the flashings will meet the performance levels of NZBC Acceptable Solution E2/AS1.
- 14.2 The practicability of installation of DynaFlash Flashings has been assessed by BRANZ.
- 14.3 The Technical Literature for DynaFlash Flashings has been examined by BRANZ and found to be satisfactory.

Quality

- 15.1 The manufacture of DynaFlash Flashings 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.
- 15.2 The quality of materials, components and accessories supplied by Dynex Extrusions Ltd is the responsibility of Dynex Extrusions Ltd. The quality control system of Dynex Extrusions Ltd has been assessed and registered as meeting the requirements of ISO 9001.
- 15.3 The environmental management system of Dynex Extrusions Ltd has been assessed and registered as meeting the requirements of ISO 14001.
- 15.4 Quality on-site is the responsibility of the installer.
- 15.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems, wall underlays, cavity battens and cladding system in accordance with the instructions of the designer.
- 15.6 Building owners are responsible for the maintenance of the cladding system in accordance with the instructions of cladding manufacturer and designer.

Sources of Information

- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light steel-framed buildings.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



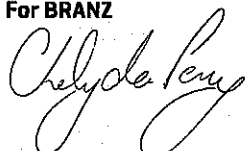
In the opinion of BRANZ, DynaFlash Flashings are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Dynex Extrusions 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. Dynex Extrusions Ltd:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by Dynex Extrusions 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 Dynex Extrusions Ltd or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

25 August 2021



Wet Area Systems

Specification and installation manual

SDC - Approved Building Consent Document - BC240357 - Pg 218 of 402 - 19/03/2024 - warreg

CBI 5113

FEBRUARY 2021



NATIONAL SUPPORT

VISIT: Winstone Wallboards Limited
37 Felix Street, Penrose,
Auckland 1061, New Zealand

POST: PO Box 12 256, Penrose,
Auckland 1642, New Zealand

PHONE: +64 9 633 0100

EMAIL: info@gib.co.nz

WEB: gib.co.nz

GIB® HELPLINE

0800 100 442

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.

CONTENTS

Introduction	5	Construction Details	18-30
Design considerations	6-11	Limitations	31
Where to use GIB® Wet Area linings	6	Use only the current specification	31
Benefits	6	Substitution	31
Handling and storage	6	Trademarks	31
Limitations	6	Copyright	31
Board substitution options	7		
Penetrations and sealants	8		
Renovations	8		
Maintenance	8		
Compliance with the NZ Building Code	9-11		
Installation	12-17		
Non-tiled walls – Timber Framing	12		
Non-tiled walls – Steel Framing	13		
Tiled walls – Timber Framing	14		
Tiled walls – Steel Framing	15		
Metal angles and maximum tile weights	16		
Ceilings	17		

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®

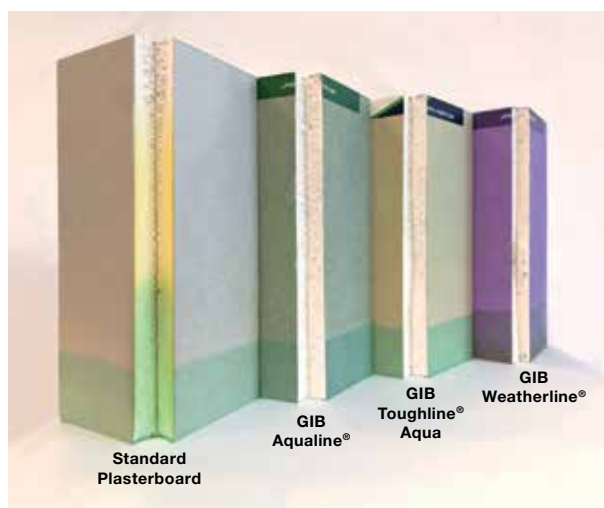
Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

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 pre-seal 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

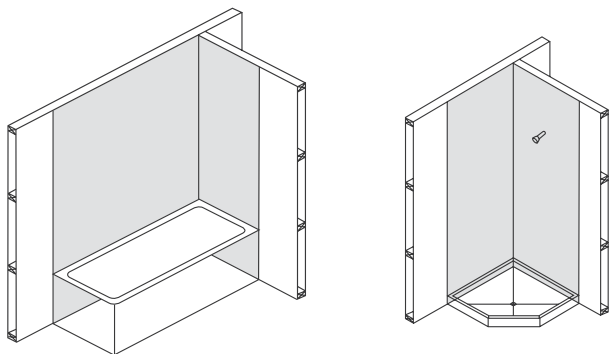
STRUCTURE – CLAUSE B1

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

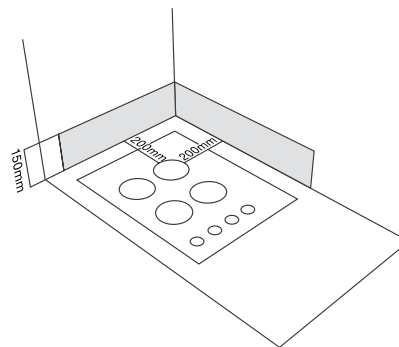
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers,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

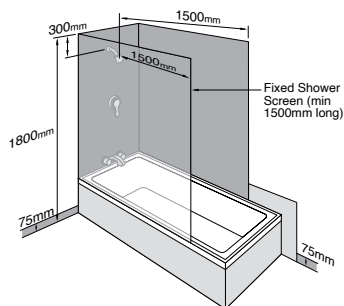
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

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.

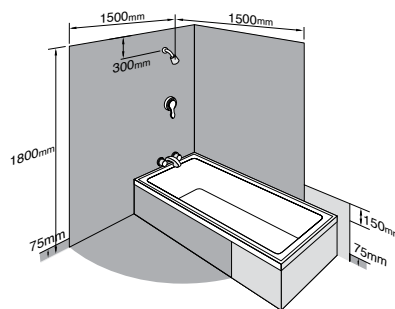
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

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

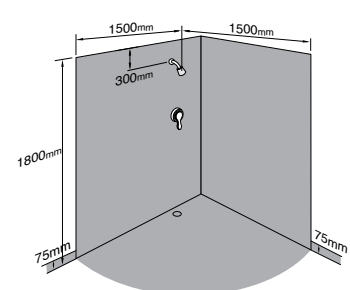
Enclosed shower over bath



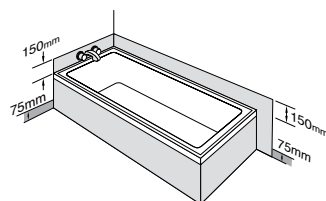
Unenclosed shower over bath



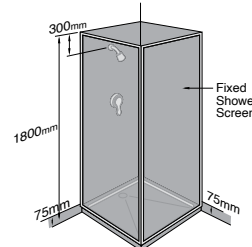
Unenclosed shower



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 Fyrelite®, 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.

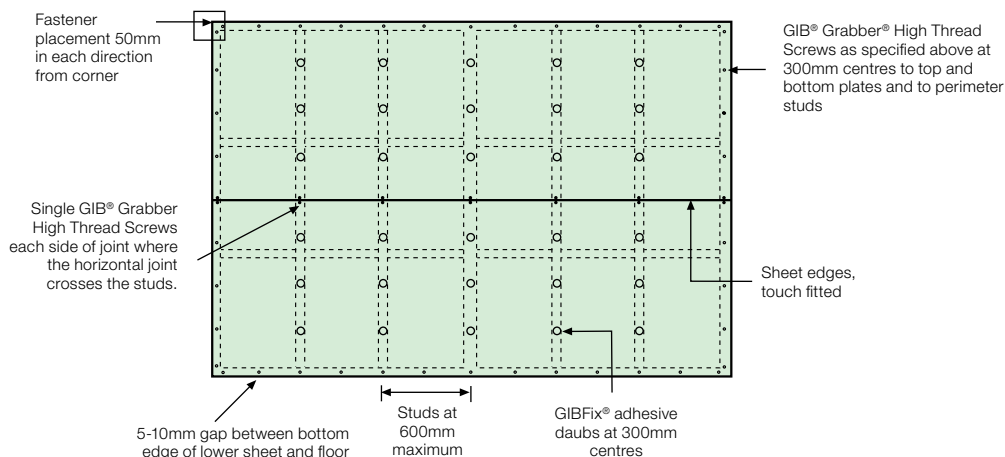
LINING

- 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.

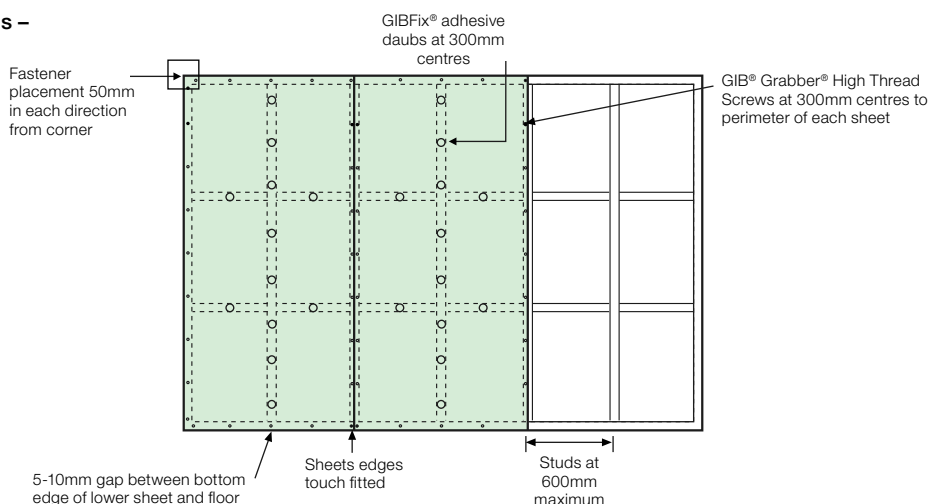
JOINTING

- 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.

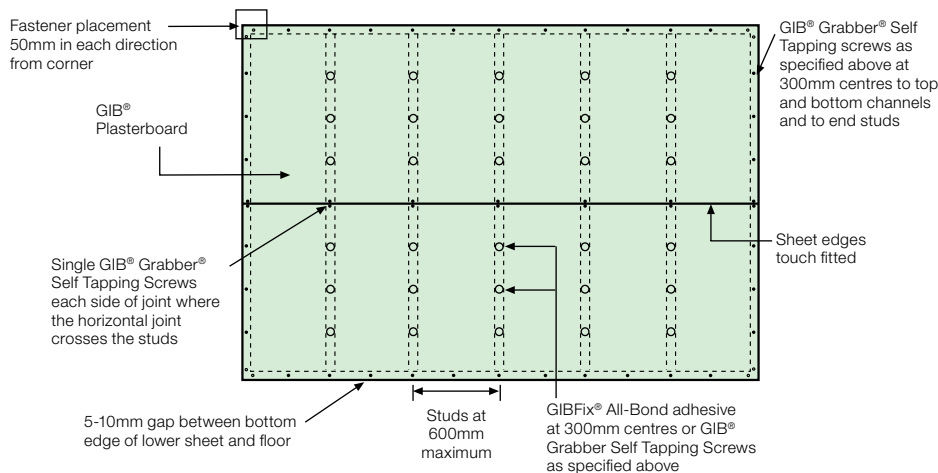
LINING

- 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.

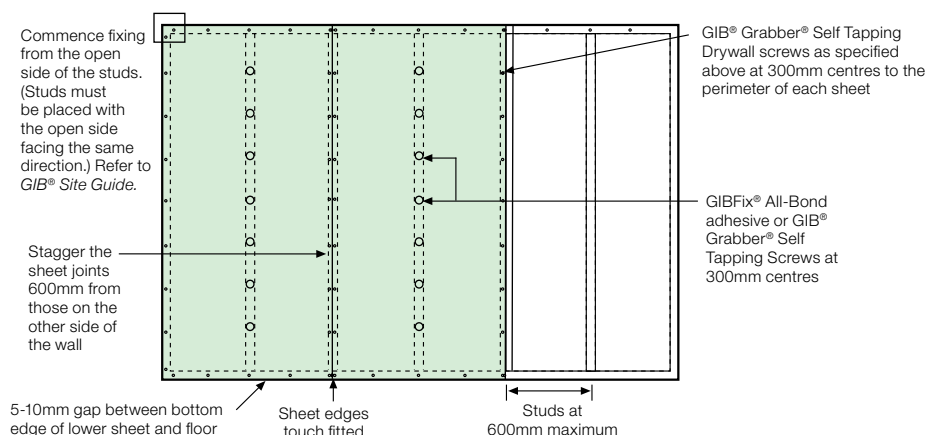
JOINTING

- 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 noggs. Also provide noggs:

- 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. Each leg shall be fastened to the framing at 300mm centres

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.

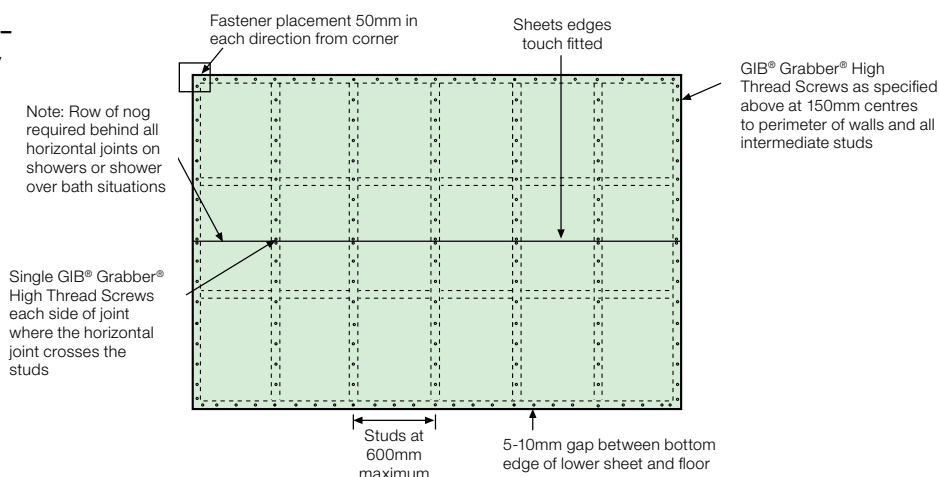
LINING AND TILE WEIGHTS

- 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

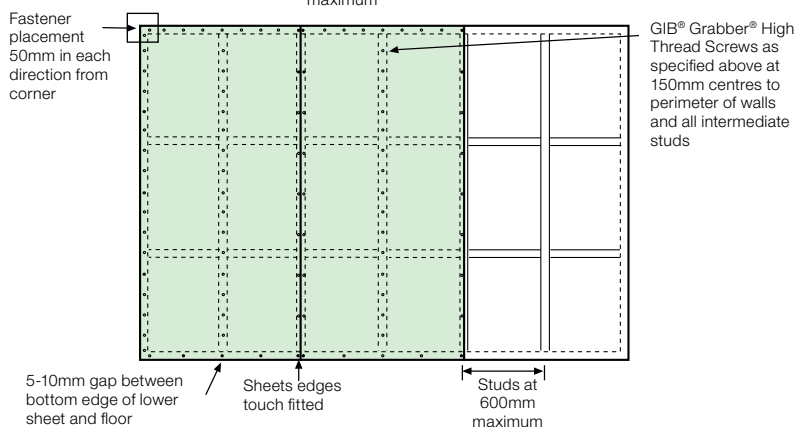
JOINTING

- 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. Each leg is fastened to the framing at 600mm centres

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.

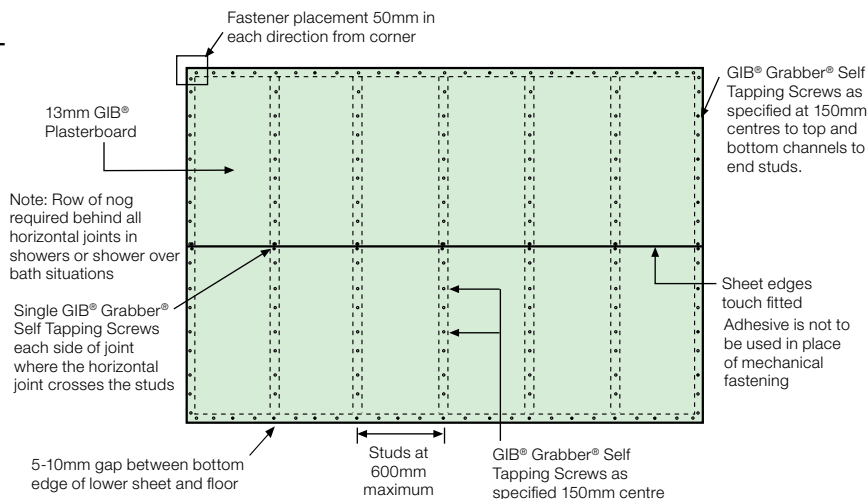
LINING AND TILE WEIGHTS

- 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

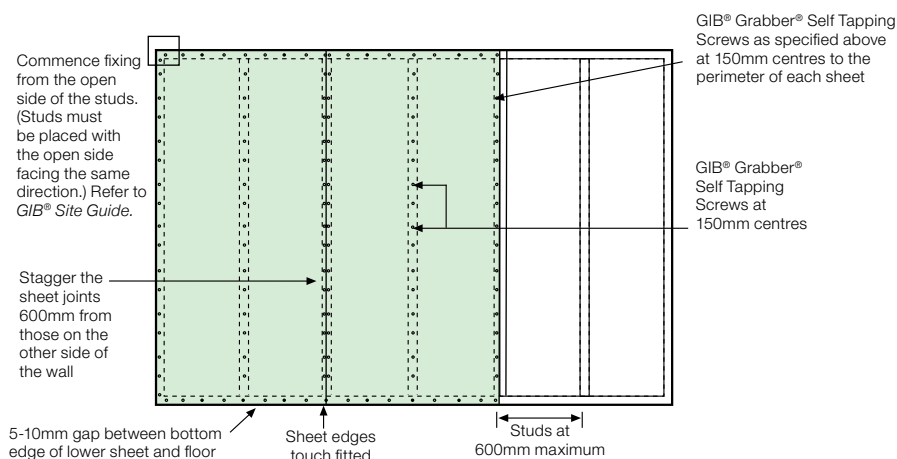
JOINTING

- 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



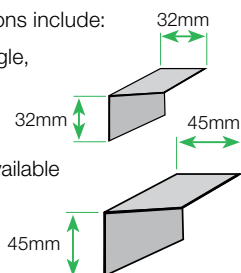
METAL ANGLES FOR TILED INTERNAL CORNERS

- 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.

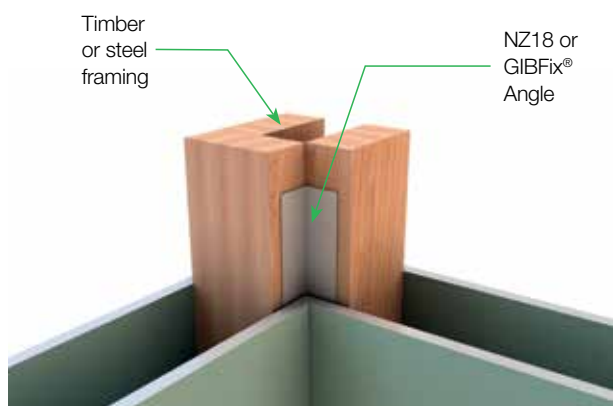
- Suitable GIB® metal angle options include:

- GIB® Rondo® NZ18 metal angle, available length: 3.0m

- GIBFix® Angle metal angle, available lengths: 2.4m and 2.7m



- Each side of the angle is secured to the framing with at 600mm centres
- 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/m² 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

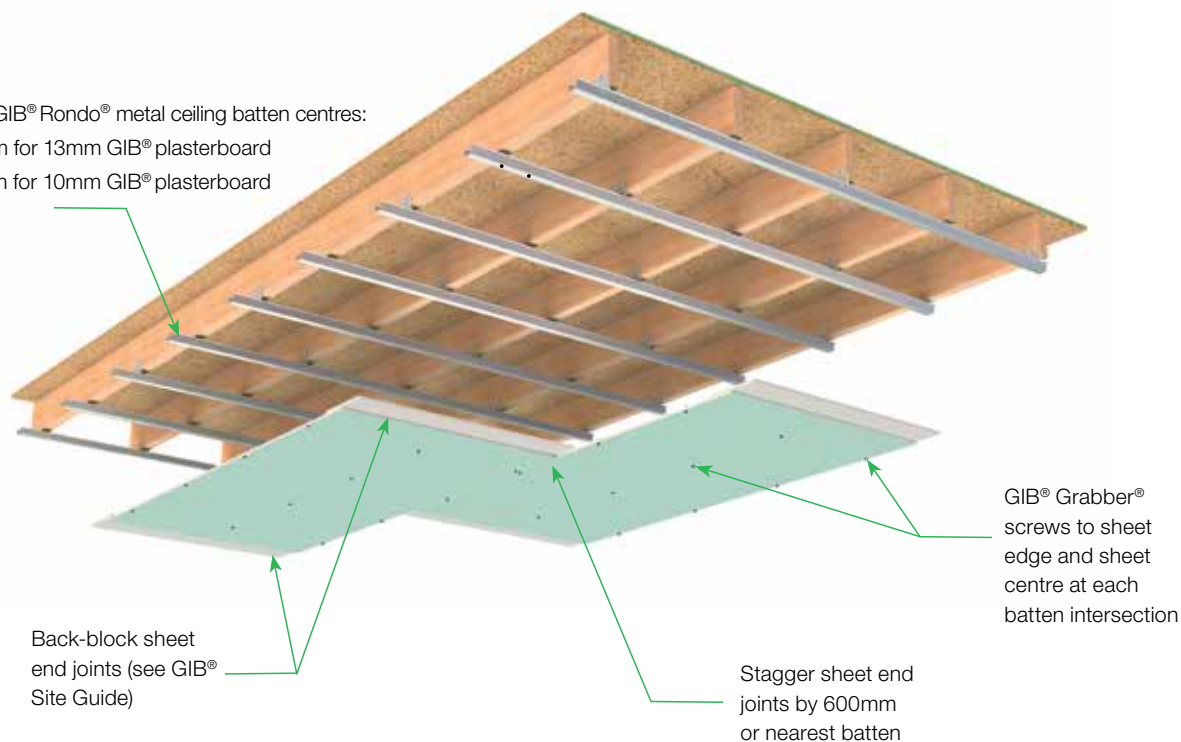
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

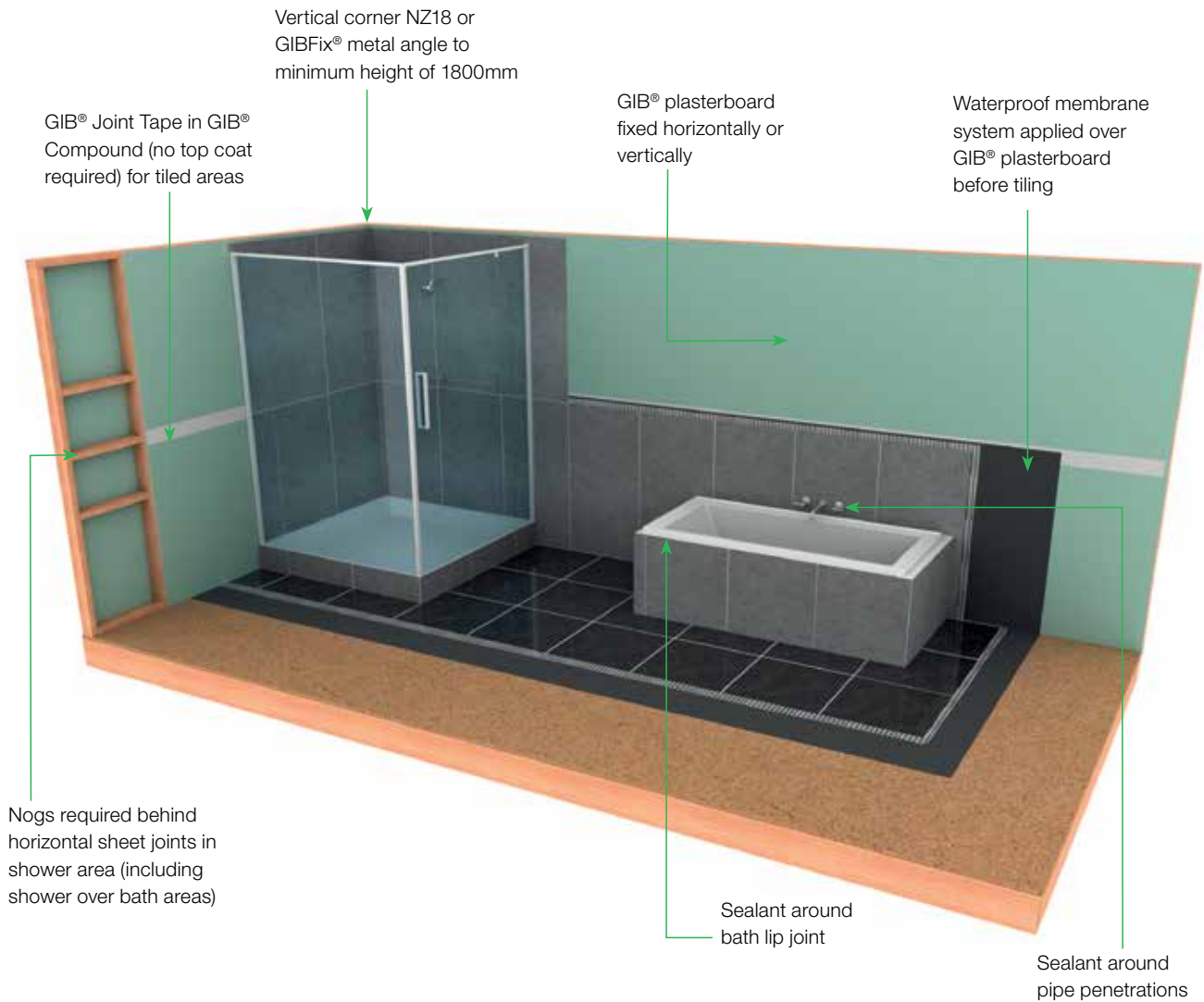
JOINTING

- 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

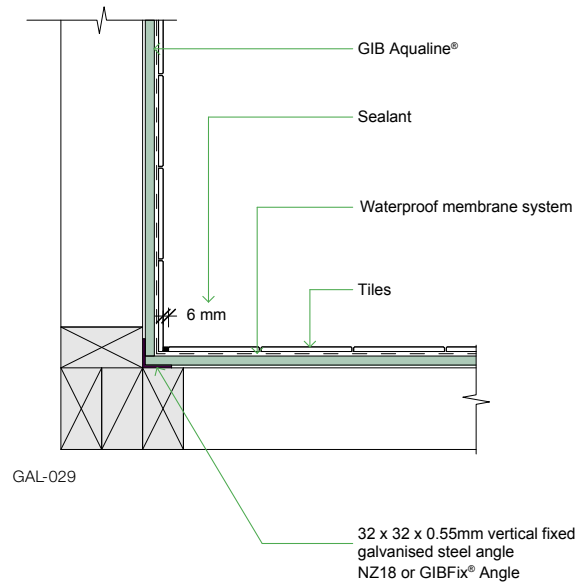
Maximum GIB® Rondo® metal ceiling batten centres:

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

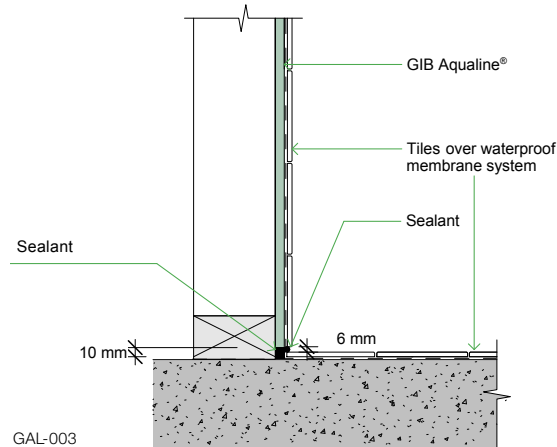




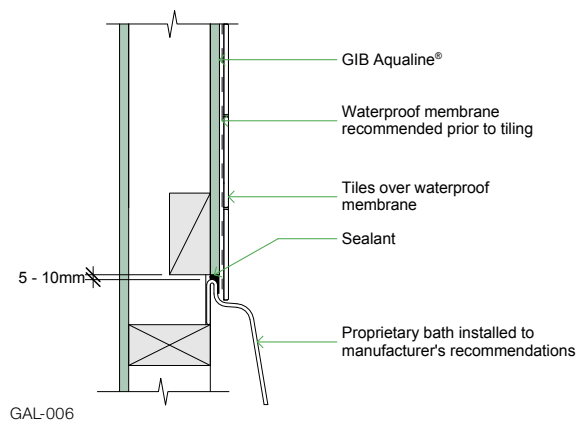
A: TILED INTERNAL CORNER



B: CERAMIC FLOOR LINING JUNCTION



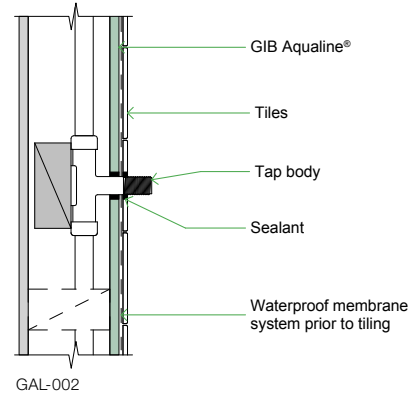
C: BATH LINING JUNCTION



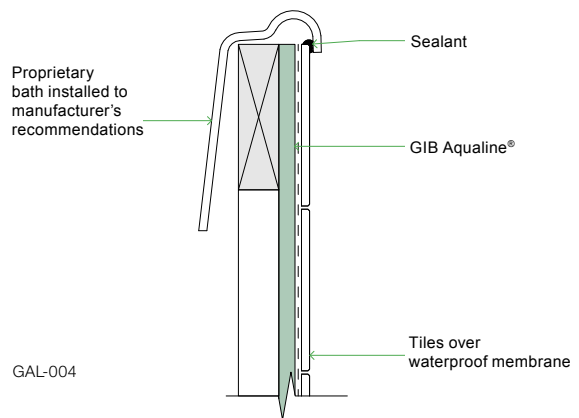
G: SHOWER MIXER PENETRATION IN WET WALL LININGS

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.

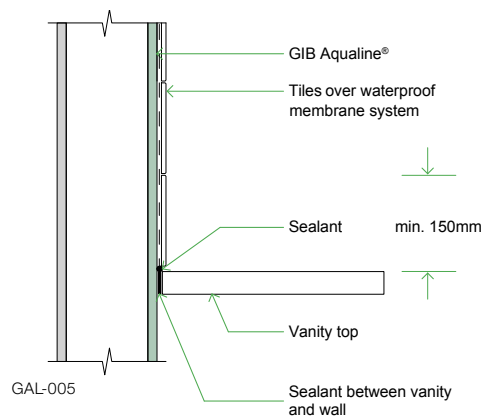
D: SEALING WET AREA PENETRATION



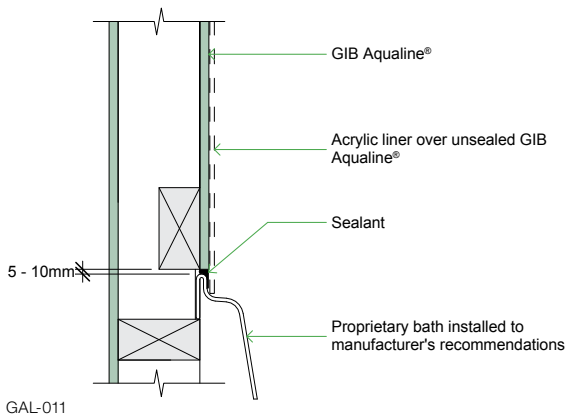
E: BATH CRADLE LINING DETAIL



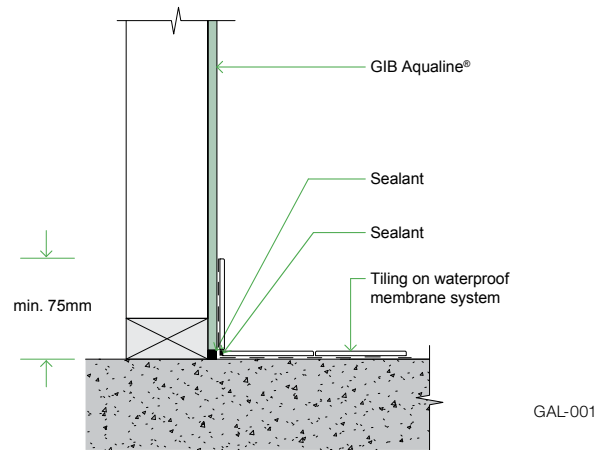
F: VANITY TOP LINING JUNCTION



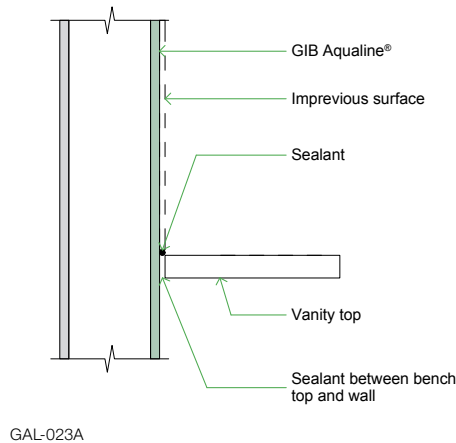
A: BATH LINING JUNCTION



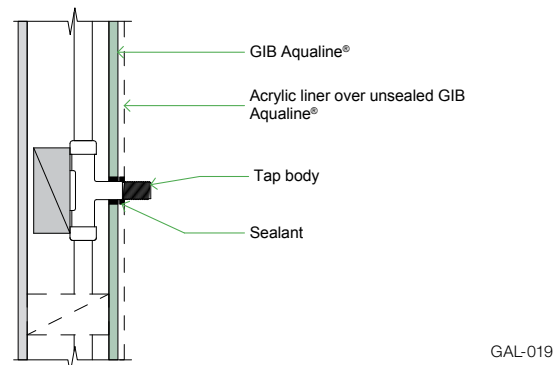
D: CERAMIC FLOOR SKIRTING LINING JUNCTION



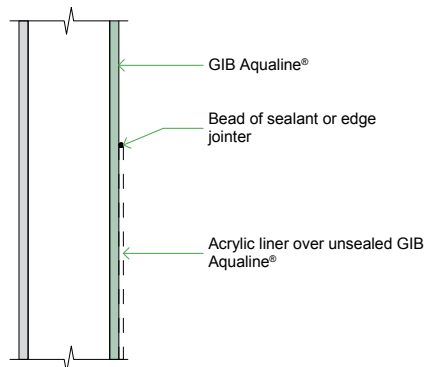
B: VANITY TOP LINING JUNCTION



E: SEALING SEMI WET AREA PENETRATION



C: UNSEALED PLASTERBOARD LINING

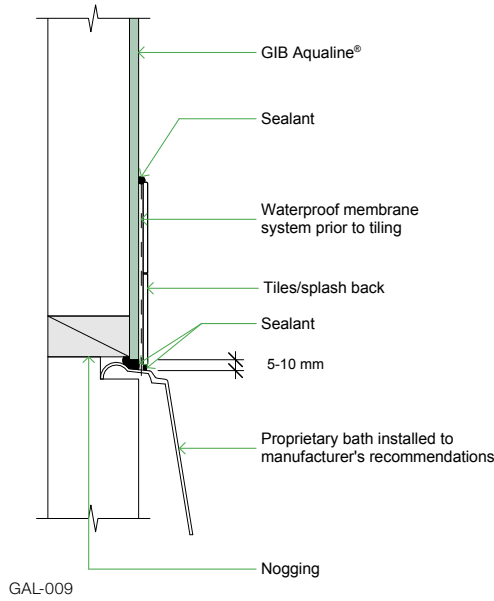


F: SHOWER MIXER PENETRATION IN WET WALL LININGS

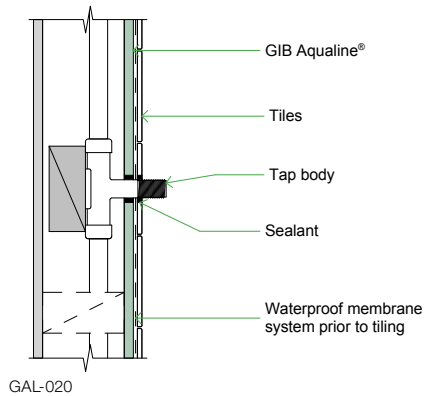
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



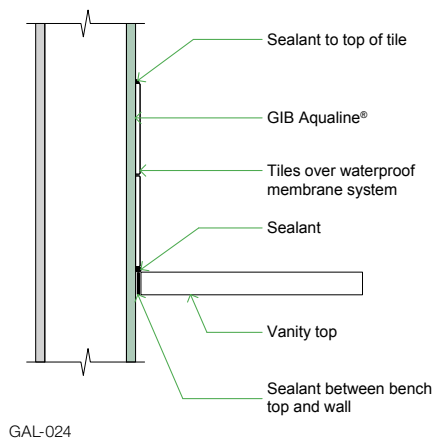
A: BATH LINING JUNCTION



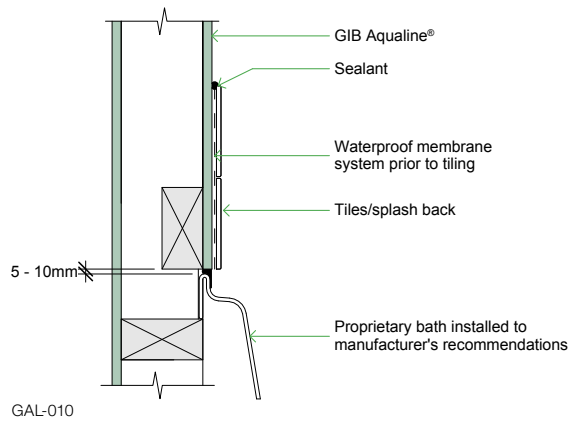
B: SEALING SEMI WET AREA PENETRATION



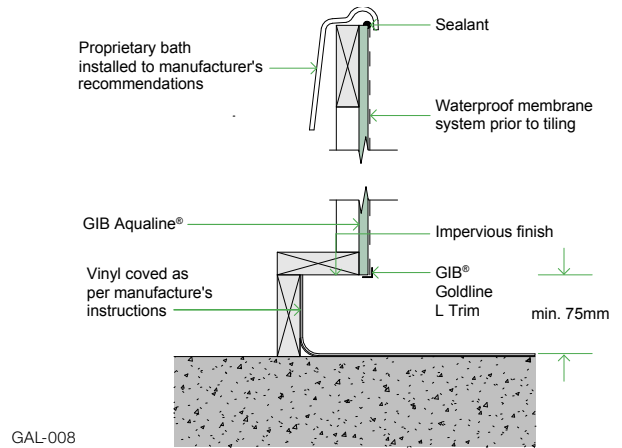
C: VANITY TOP LINING JUNCTION



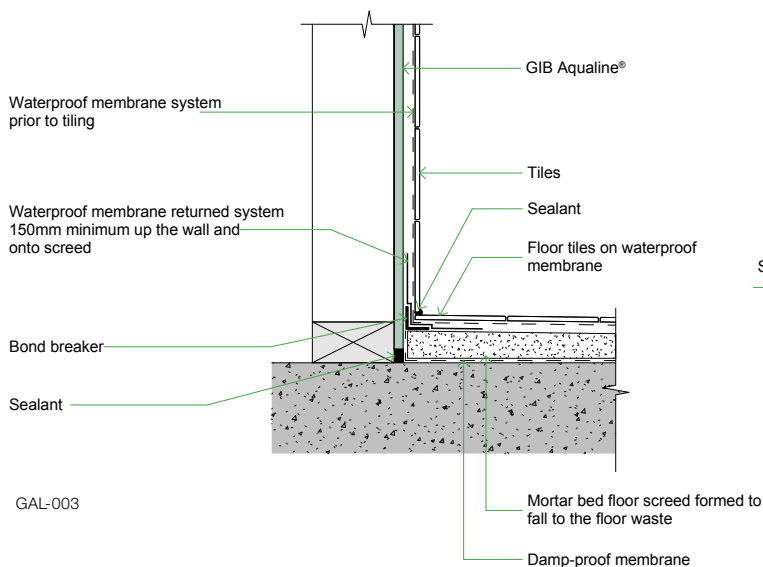
D: BATH LINING JUNCTION



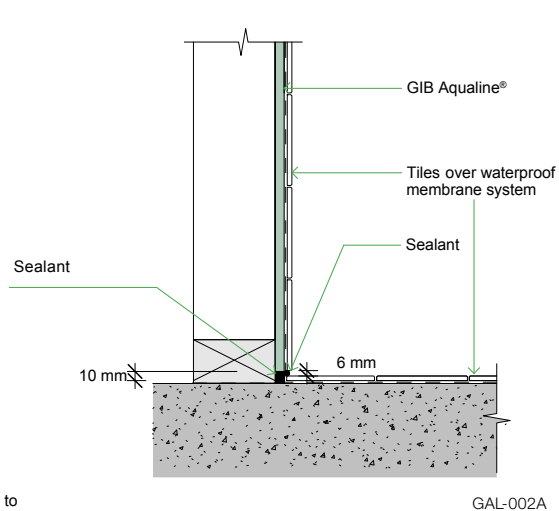
E: CRADLE VINYL LINING JUNCTION



A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



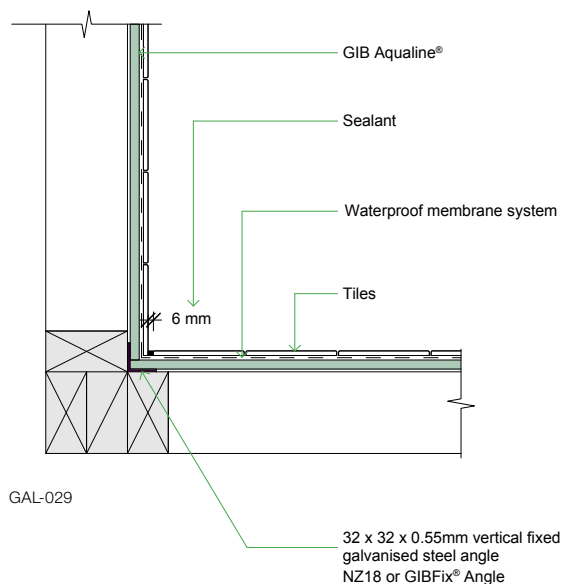
C: CERAMIC FLOOR LINING JUNCTION



PREFORMED SHOWER BASE JUNCTIONS

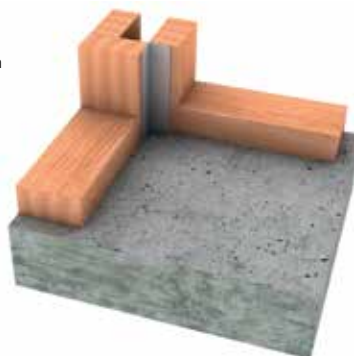
Refer to the shower base manufacturer for proprietary shower tray installation detailing including wet wall lining junction detailing.

B: TILED INTERNAL CORNER



D: TILED INTERNAL CORNER METAL ANGLE POSITION

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

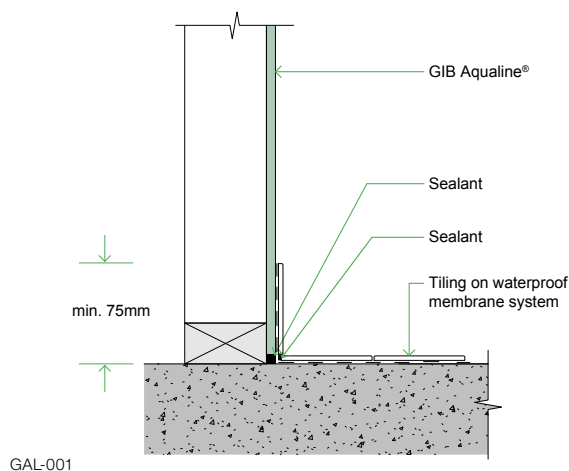


E: SHOWER MIXER PENETRATION IN WET WALL LININGS

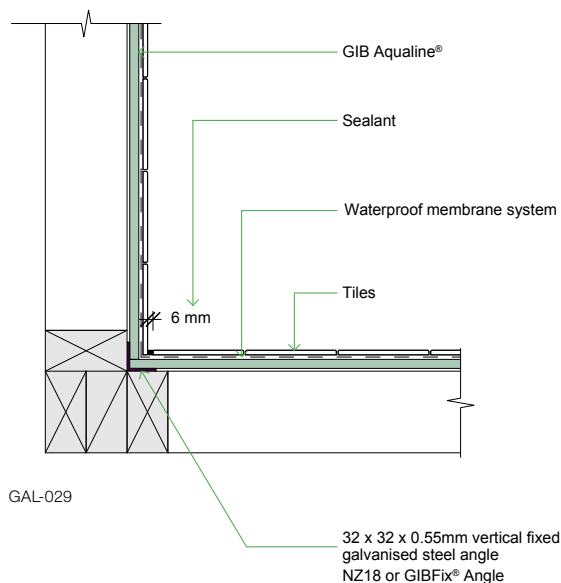
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



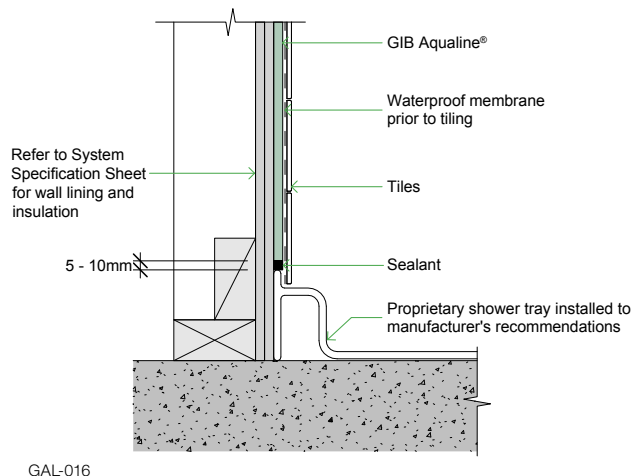
A: CERAMIC FLOOR SKIRTING LINING JUNCTION



C: TILED INTERNAL CORNER

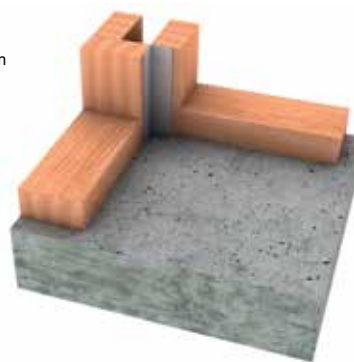


B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



D: TILED INTERNAL CORNER METAL ANGLE POSITION

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

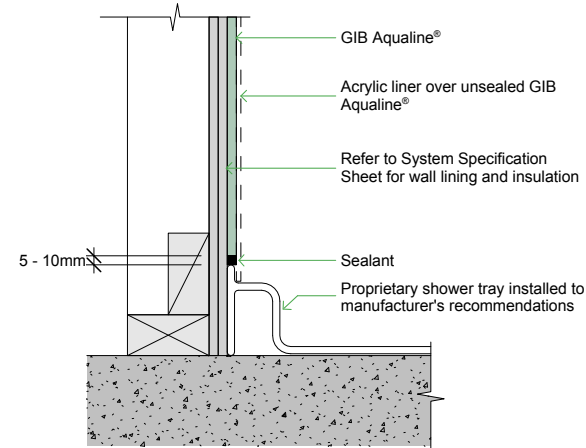


E: SHOWER MIXER PENETRATION IN WET WALL LININGS

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.

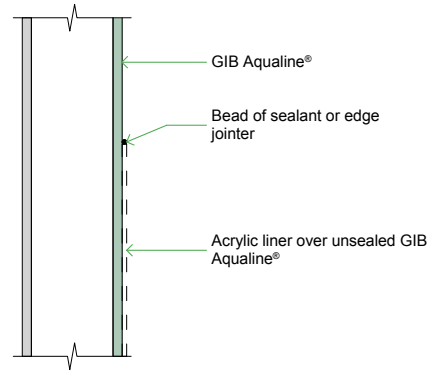


A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



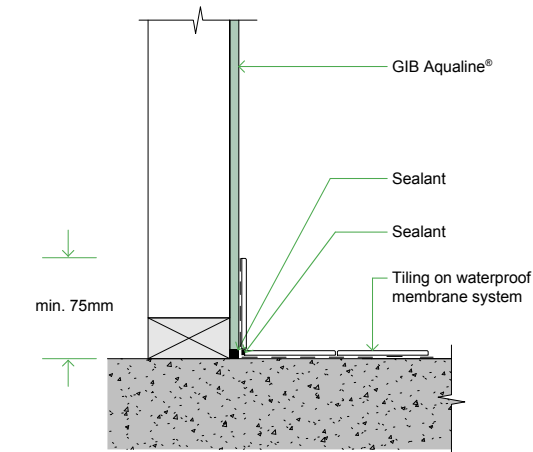
GAL-015

C: UNSEALED PLASTERBOARD LINING



GAL-028

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



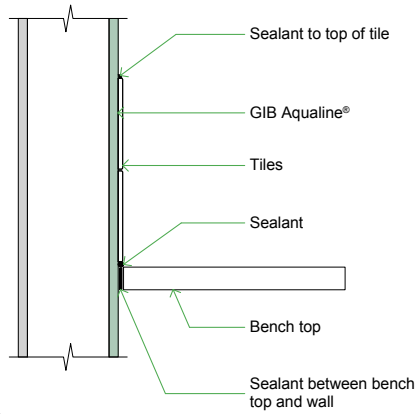
GAL-001

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.

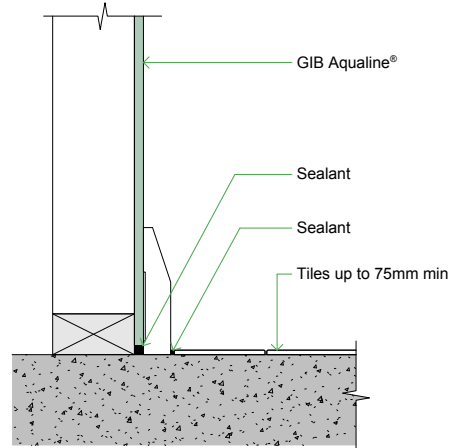


A: BENCH TOP LINING JUNCTION



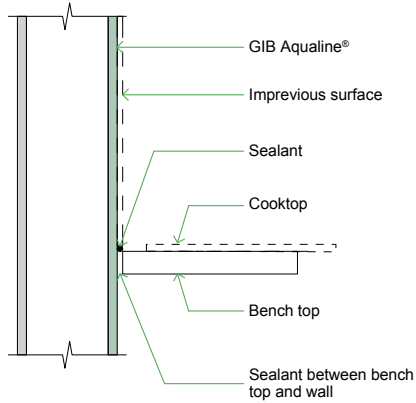
GAL-024

CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001A

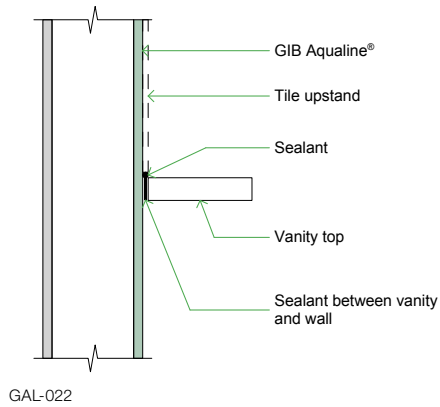
B: COOKTOP LINING JUNCTION



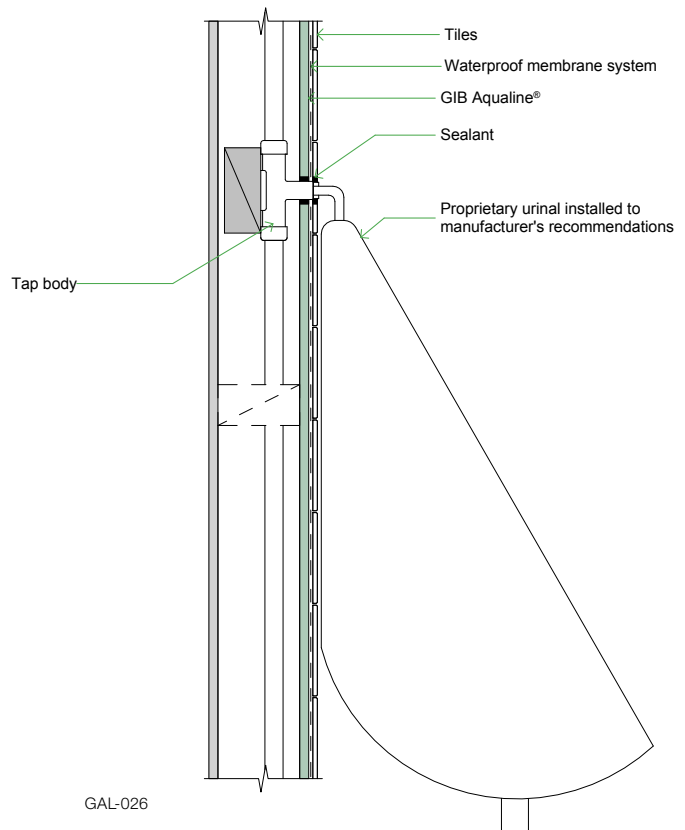
GAL-023B



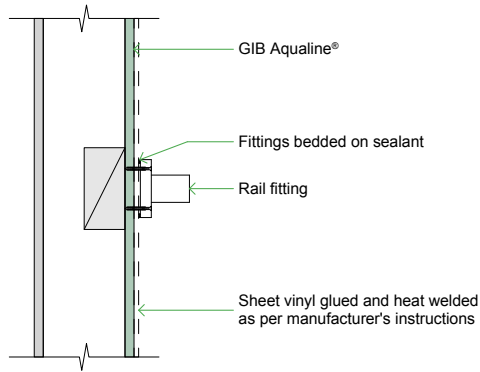
A: VANITY TOP LINING JUNCTION



B: SEALING WET AREA PENETRATION LINING JUNCTION

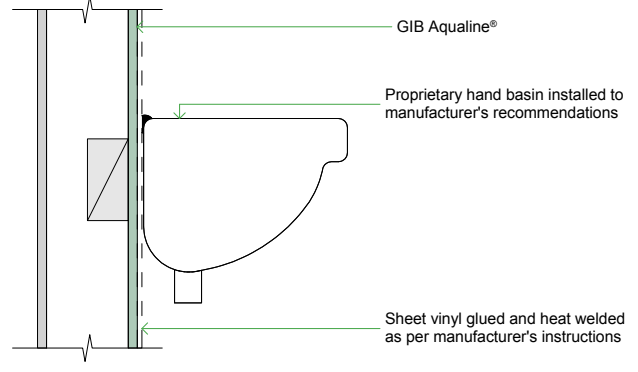


A: SURFACE MOUNTED WITH NOG



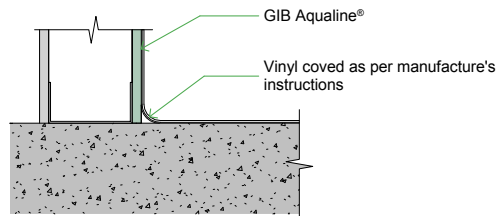
GAL-027

C: BASIN LINING JUNCTION



GAL-025

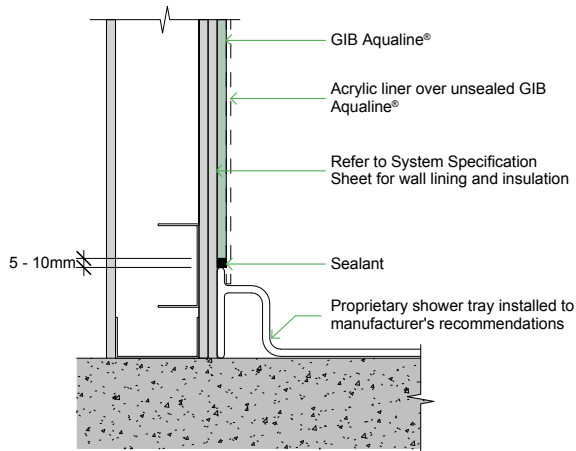
B: VINYL FLOOR LINING JUNCTION



GAL-006A

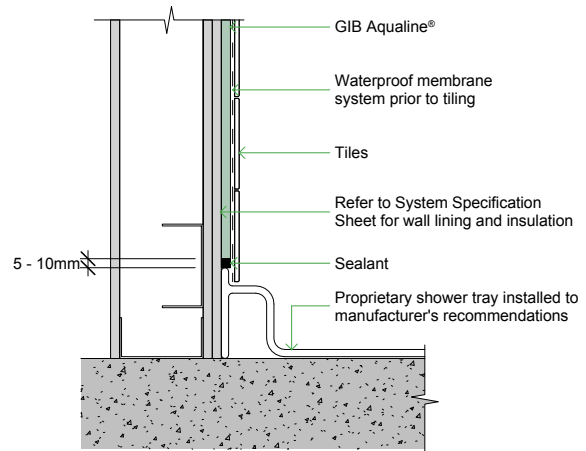


A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



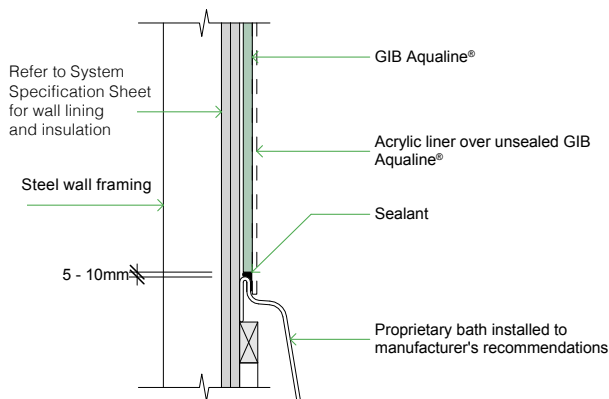
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



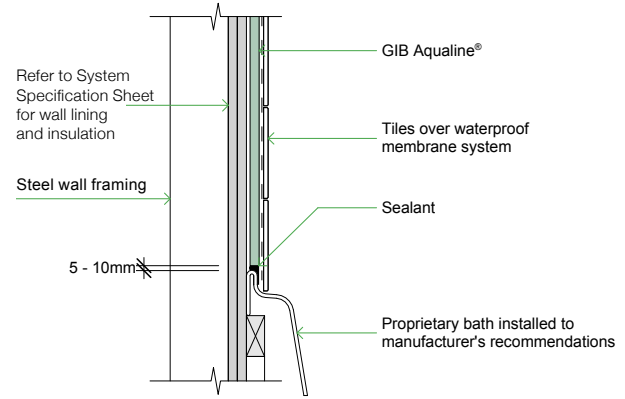
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



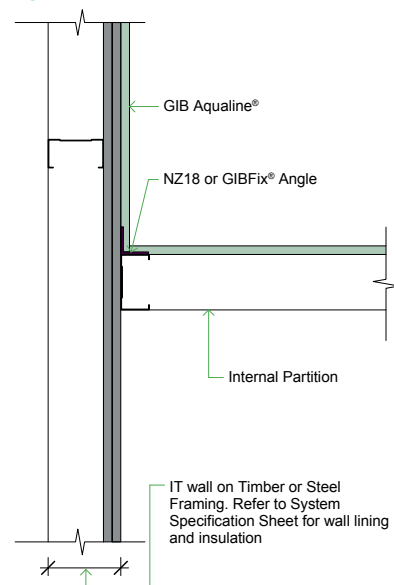
GAL-014

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.

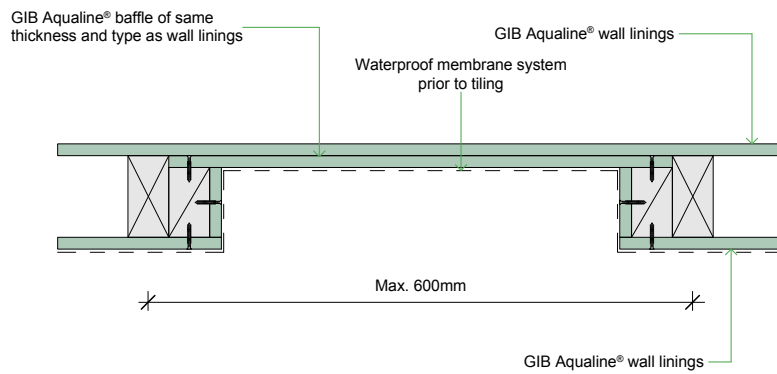
Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

E: INTERTENANCY WALL AND WET AREA WALL JUNCTION

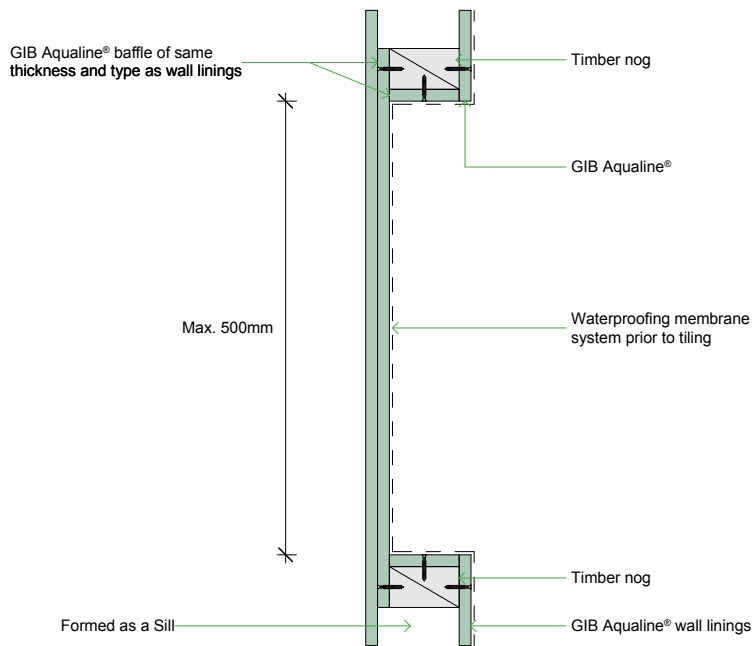


GAL-031C

TIMBER FRAME TILE RECESS

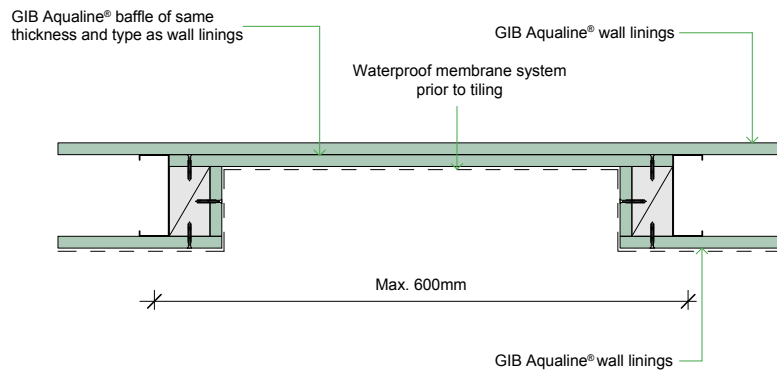


Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.

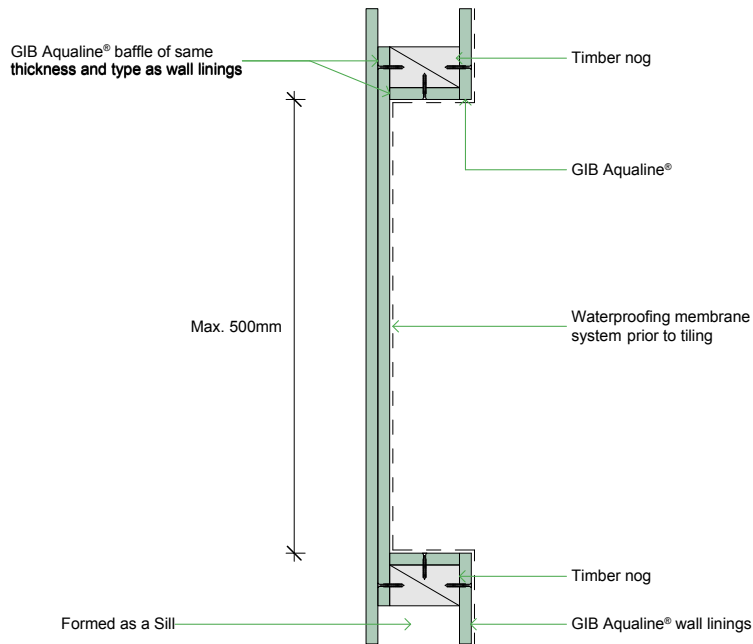


GAL-029B

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.

COPYRIGHT

All of the material contained in this brochure, including all text, tables, charts, graphs, drawings, images and diagrams, are protected by copyright. These materials may not be reproduced, adapted or transmitted in any form by any process, without the permission of Winstone Wallboards Ltd.

Copyright© Winstone Wallboards Ltd, 2021.



SDC - Approved Building Consent Document - BC240357 - Pg 249 of 402 - 19/03/2024 - warreg

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

LUXURY VINYL TILE (LVT) WET ROOMS WATERSPLASH INSTALLATION SYSTEM ALTERNATIVE SOLUTION

- E3/AS1 BUILDING CODE- INTERNAL MOISTURE FOR FINISHES TO FLOORS: BATHROOMS

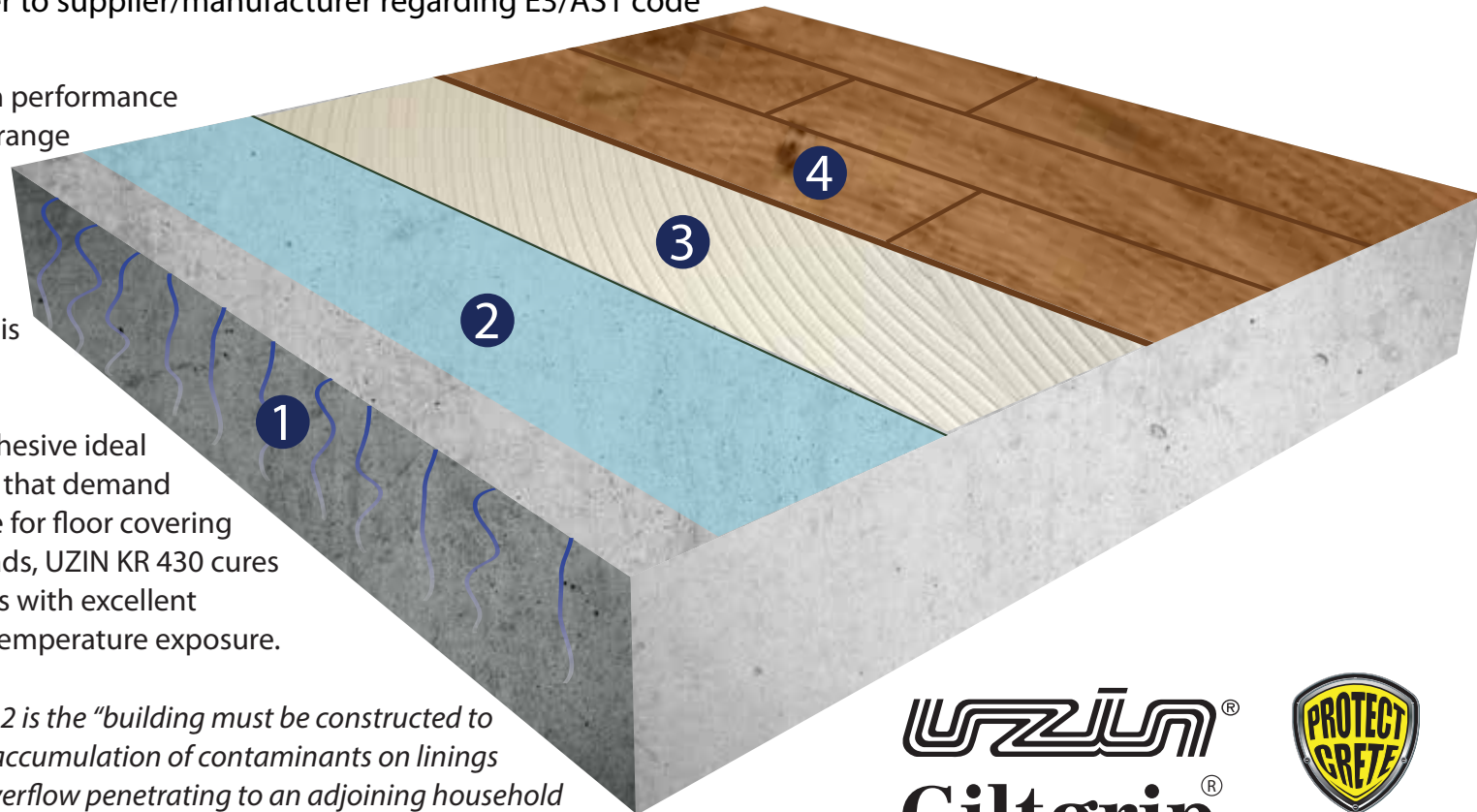
Must be read in conjunction with E3/AS1 November 4th 2021 Building Code. The following information is based on adhesive performance only to assist in the Alternative Solutions options for the installer. It is essential the LVT supplier provides their own documentation as to the floorcoverings suitability as required by E3/AS1.

- 1 Concrete substrate treated with Protect Crete Densi-Proof (Optional.)
- 2 Subfloor Preparation Systems (Optional site specific as required.)
Subfloor primed with Uzin PE280 (Non-porous) or Uzin PE520 (Porous)
- 3 **OPTION 1.)** Uzin NC160 or NC170 Levelling Compound
OPTION 2.) Uzin NC888 feather Finish
ADHESIVE OPTION 1: UZIN KE68T 1- Component Hybrid Adhesive
ADHESIVE OPTION 2: UZIN KR430 2-Part Urethane Adhesive
- 4 Luxury Vinyl Tile (LVT) as Specified: Refer to supplier/manufacturer regarding E3/AS1 code compliance.

Uzin KE68T adhesive is a single component high performance 'urethane type' adhesive that is suited to a large range of installations requiring high dimensional stability in extreme conditions such as sun-drenched areas, high point loading and areas requiring water-resistance from the top of the floor coverings (wet areas). Uzin KE68T adhesive is suited to installations on floors and walls.

Uzin KR 430 is a 2-component polyurethane adhesive ideal for the installation of all types of floor coverings that demand reliable bonding in extreme conditions. Suitable for floor covering installations subject to heavy use and rolling loads, UZIN KR 430 cures to an extremely high final strength and hardness with excellent resistance to plasticizers, surface moisture and temperature exposure.

The functional requirement given in the clause E3.2 is the "building must be constructed to avoid the likelihood of – (a) Fungal growth or the accumulation of contaminants on linings and other building elements; and (b) Free water overflow penetrating to an adjoining household unit; and (c) Damage to building elements being caused by the presence of moisture"



UZIN[®]
Giltgrip[®]



19/03/2024 - warres
Pg 252 of 403
BC240357 -
Document-
Consent
Building
Approved
- Approved
DC -

LUXURY VINYL TILE (LVT) WET ROOMS WATERSPLASH INSTALLATION SYSTEM ALTERNATIVE SOLUTION - E3/AS1 BUILDING CODE- INTERNAL MOISTURE FOR FINISHES TO FLOORS: KITCHENS, TOILETS AND LAUNDRIES

Must be read in conjunction with E3/AS1 November 4th 2021 Building Code. The following information is based on adhesive performance only to assist in the Alternative Solutions options for the installer. It is essential the LVT supplier provides their own documentation as to the floorcoverings suitability as required by E3/AS1.

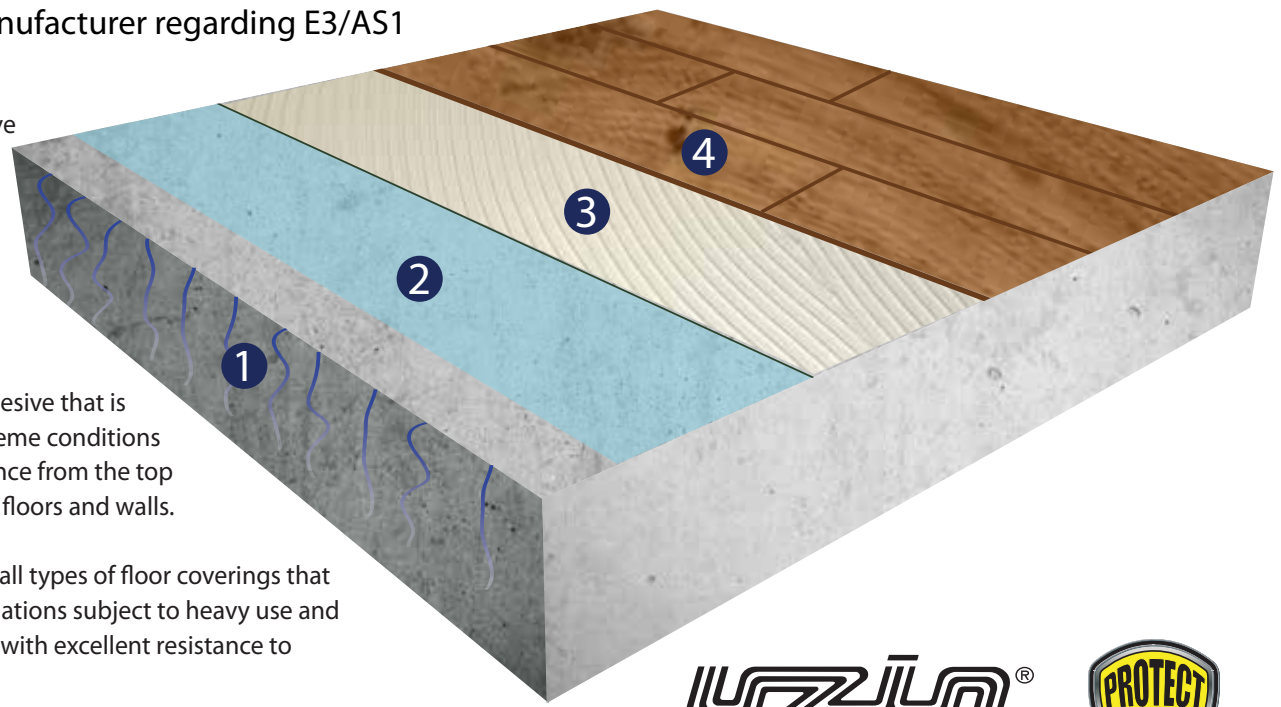
- 1 Concrete substrate treated with Protect Crete Densi-Proof (Optional.)
- 2 Subfloor Preparation Systems (Optional site specific as required.)
- 3 Subfloor primed with Uzin PE280 (Non-porous) or Uzin PE520 (Porous)
- OPTION 1.)** Uzin NC160 or NC170 Levelling Compound
- OPTION 2.)** Uzin NC888 feather Finish
- ADHESIVE OPTION 1:** UZIN KE66 Fibre Reinforced Adhesive
- ADHESIVE OPTION 2:** UZIN KE68T 1- Component Hybrid Adhesive
- ADHESIVE OPTION 3:** UZIN KR430 2-Part Adhesive
- 4 Luxury Vinyl Tile (LVT) as Specified: Refer to supplier/manufacturer regarding E3/AS1 code compliance.

UZIN KE66 Fibre-reinforced adhesive is a highly shear-resistant dispersion adhesive contributes greatly in minimizing open joints, e.g. for PVC design floor coverings. Uzin KE66 adhesive can be used in areas subject to elevated temperatures. When exposed to prolonged water forms from the top, a single or 2- component high performance 'urethane type' adhesive such as UZIN KE68T 1-part or UZIN KR 430 2-part must be used. Refer to document Uzin KE66 Statement of Usage E3/AS1 12112021

Uzin KE68T adhesive is a single component high performance 'urethane type' adhesive that is suited to a large range of installations requiring high dimensional stability in extreme conditions such as sun-drenched areas, high point loading and areas requiring water-resistance from the top of the floorcoverings (wet areas). Uzin KE68T adhesive is suited to installations on floors and walls.

Uzin KR 430 is a 2-component polyurethane adhesive ideal for the installation of all types of floor coverings that demand reliable bonding in extreme conditions. Suitable for floor covering installations subject to heavy use and rolling loads, UZIN KR 430 cures to an extremely high final strength and hardness with excellent resistance to plasticizers, surface moisture and temperature exposure.

The Functional requirement given in the clause E3.2 is the "building must be constructed to avoid the likelihood of – (a) Fungal growth or the accumulation of contaminants on linings and other building elements; and (b) Free water overflow penetrating to an adjoining household unit; and (c) Damage to building elements being caused by the presence of moisture"





TECHNICAL SUPPORT

Technical Bulletin

Adhesives to meet special requirements

IVC Moduleo manufacture various types of floorcovering from sheet materials to individual plank and tiles.

Recent changes to the New Zealand Building code and the requirement for flooring within 1.5m of a water source to be impervious, unaffected by water sprays and spills, require the use an adhesive that is unaffected by moisture. An example of just such an adhesive is given below. The Moduleo LVT itself would be unaffected by water spills or sprays. In all cases, it is best practice to remove spills as soon as possible.

Occasionally, we are asked to liaise with adhesive manufacturers to offer a system solution for individual projects. An example would be an ongoing project that involves the installation of Moduleo Dryback LVT into a series of UK care homes for the elderly. The requirement was for an adhesive that is unaffected by moisture and urine.

On the advice of Ardex UK, they have recommended the use of ARDEX AF2525 for the above scenario and installation. This is a 2-component adhesive that must be mixed at the time of use and used within its open time as per the manufacturer's instructions. It can be used externally, including installing artificial grass, therefore can withstand permanent moisture and will not breakdown. Using the adhesive as recommended by the manufacturer and ensuring total coverage of the subfloor, provides the qualities required by the specifiers of the project, i.e. a combination of LVT and adhesive that will be unaffected by moisture or urine from above.

The longevity and success of any installation is dependent upon the quality, suitability, and condition of the subfloor the floorcovering is installed on to. All necessary moisture testing, appropriate moisture control of residual moisture and subfloor preparation should be undertaken before installation of the final flooring, using suitable preparation products. The recommendations of both the relevant countries Standards (e.g. NZS AS 1884:2013, BS 8203:2017, etc) and the installation instructions of the floor covering should be adhered to. If there are any discrepancies between the two, the most stringent of the two should be followed.

Other adhesive manufacturers have similar adhesives that will perform as required. Always check with the adhesive manufacturer for compatibility with IVC Moduleo products.

04/11/2021

Declaration of suitable use in relation to E3/AS1 'internal moisture' Building Code Nov. 4th 2021.

Uzin KE66 Fibre reinforced adhesive.

Uzin KE66 Fibre reinforced adhesive is a wet-bed dispersion adhesive with short open time and excellent adhesion. The high shear-resistant and fibre-reinforced adhesive reduces the formation of pressure marks on the installed floor covering. Uzin KE66 adhesive has exceptional dimensional stability due to integrated fibre reinforcement. Uzin KE66 is formulated for interior use only.

UZIN KE66 adhesive has been used since development globally for LVT installations in commercial and domestic environments termed as 'water splash areas' without issue and has a proven track record for durability and performance. ***This statement excludes the installation of LVT's in bathroom areas where a reactive resin based adhesive or a single component synthetic adhesive is specified.***

Intended Uses.

- for PVC design floor coverings (luxury vinyl tiles)
- for PVC and CV floor coverings in sheets or tiles
- for rubber floor covering in sheets and tiles up to 4 mm with smooth or hammered surface (e.g. norament®, noraplan®, or noraplan® acoustic) for chlorine-free enomer floor coverings (e.g. Upofloor Lifeline®)
- on absorbent and levelled substrates
- on warm water underfloor heating system
- for exposure to castor wheels in accordance with DIN
- EN 12 529 from 1 mm thickness of levelling compound
- for heavy wear in residential, commercial and industrial locations
- areas subject to elevated temperatures. Please also refer to important notes within the manufacturers technical datasheets.

Limitations of use.

Water spills and splashes on the surface of the LVT floorcoverings must be removed and dried in the shortest time possible or as soon as practicable to eliminate any opportunity for water to migrate through LVT joints and degrade the adhesive bond strength. If there is any doubt we highly recommend specialised water resistant adhesive such as Uzin KE68T and Uzin KR430.

Conventional cleaning methods **without soaking** of the LVT floorcoverings with a detergent and water is acceptable however standing water must be dried from the surface as soon as practicable to eliminate any opportunity for water to migrate through LVT joints and degrade the adhesive bond strength.

Wet towels, clothing and other items that retain water must be removed from the LVT floorcovering as soon as practicable or in the shortest time possible to eliminate any opportunity for water to migrate through LVT joints and degrade the adhesive bond strength.

Long term water exposure from leaking appliances **will** result in adhesive/floorcovering failure.

NOTE:

The above recommendations are provided as a typical guideline for use. Site conditions vary widely and it is the responsibility of the contractor in conjunction with the property owner to ascertain as to whether the conditions are suitable for the use of the above products. Uzin Utz South Pacific Ltd. and their distribution partners will not imply or carry any product warranties for failures caused by incorrect product use or installation.

Yours faithfully,



Tony King

National Sales Manager and Technical Support

UZIN Utz South Pacific Ltd

Email tony@uzin-sp.com

Phone - +64 225933782



CORRUGATE

SDC - Approved Building Consent Document - BC240357 - Pg 257 of 402 - 19/03/2024 - warreg



CORRUGATE

Minimum Pitch: 8 degrees.
Width: Cover = 760mm Sheet = 851mm.
Applications: Commercial and residential.
Orientation: Roofs, horizontal and vertical wall cladding.

Manufactured in Auckland, Whangarei, Hamilton, Palmerston North, Hastings, Wellington, Christchurch, Cromwell, New Plymouth, Tauranga. Available Nationwide.

| 76 | 18

Dimensions, cover and sheet widths are all nominal and may vary with manufacturing and installation tolerances.

PRODUCT APPLICATION

The correct application of each grade of material is critical to product performance and life expectancy. Before commencing a project the user must refer to the New Zealand Steel Environmental Guide and Metalcraft Roofing's product information. Further information including load span data and graphs are available from Metalcraft branches and freely viewable and downloadable at www.metalcraftgroup.co.nz.

For information on COLORSTEEL® Zinalume® and Galvsteel® visit: www.colorsteel.co.nz or www.nzsteel.co.nz.

It is important that the requirements of these guides are taken into account when making the selection of the material to be used. Installation of Corrugate is as per the NZMRM Code of Practice. www.metalroofing.org.nz

ENVIRONMENT

The correct grade of material for use in various environments is given in the New Zealand Steel Environmental Guide. This is available from Metalcraft branches and can be viewed and downloaded at www.metalcraftgroup.co.nz

MAINTENANCE

Regular maintenance is required to maximize the lifetime of metal roofing products. Areas that do not receive regular washing with rain, such as canopies, cladding, garage doors, fascia, gutters and downpipes require increased maintenance. Accelerated corrosion can occur where salts and pollutants combine with condensation.

WARRANTIES

The correct grade of material for use in various environments is given in the New Zealand Steel Environmental Guide. Material warranties are closely linked to environmental categories.

The New Zealand Steel Environmental Guide gives a guide to the classification of the environmental categories and the associated warranties that the various material finishes are given. Please contact your local Metalcraft Roofing branch.

SHEET LENGTHS

Sheet lengths vary depending on geographical locations in New Zealand, please discuss with your local Metalcraft Roofing Branch. Depending on colours and sheet lengths load spreading washers and step joints may be required. Refer to MRM Code of Practice on www.metalroofing.org.nz or Metalcraft Roofing website: www.metalcraftgroup.co.nz

COLOURS

Corrugate is available in 20 standard colours from New Zealand Steel in trusted brands: COLORSTEEL® ENDURA® and COLORSTEEL® MAXX®. Colour brochures and steel swatches are available on request. Please do not select colours based on pdf,s or websites. Corrugate is also available in Zinalume® and Galvsteel®.

MINIMUM PITCHES

The minimum pitch is determined by the ability of the roof cladding to discharge maximum rainfall without water penetration through the side laps or flashings.

The minimum pitch for Corrugate is:
8° after deflection for sheet lengths of 30m.
9° after deflection for sheet lengths exceeding 30m but less than 50m.

The above minimum requirement has been calculated assuming peak rainfall to be less or equal to 100mm/hr.

HANDLING AND STORAGE

Handling and storage of Corrugate is as per the NZMRM Code of Practice. www.metalroofing.org.nz. Some important considerations are as follows:

- Site Storage which ensures that sheets are kept dry and ventilated.
- Reducing risk of surface damage to surface coatings during handling, installation and by other trades.
- Ensuring that spans and pitches used are not outside those recommended by Metalcraft Roofing
- Ensuring that correct and sufficient fasteners are used.
- Installation in contact with incompatible materials is avoided.

ROOF NOISE

The homeowner should be aware that temperatures of dark colours are higher than those of lighter colours. Thermal expansion of metal roofs is covered in the NZMRM Code of Practice.

The MBIE document on roof cladding advises that noise from thermal expansion is normal and should be expected. Refer to MBIE -Guide to tolerances, materials and workmanship in new residential construction 2015.

FASTENERS

The selection of the appropriate fastener is essential to performance of the roof. The durability of the fastener should be, as a minimum requirement, equal to that of the roofing or cladding. If in doubt, refer to your nearest Metalcraft Roofing branch. Please refer to loadspan and fixing table for recommended fixings, fastener patterns and centres. This can be downloaded from: www.metalcraftgroup.co.nz

DISCLAIMER

As part of Metalcraft Roofing's policy of continued improvement, final specifications may vary from those contained in this publication. The company reserves the right at any time and without notice to change the design, materials or features and withdraw products from the market without incurring any liability whatsoever.

This publication is issued as a general guide only and should not be treated as a substitute for technical advice. Contact with your nearest Metalcraft branch is recommended to confirm current specifications and availability.

METALCRAFT CORRUGATE

PURPOSE

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

EXPLANATION

Metalcraft Corrugate is a corrugated long-run wall and roof cladding manufactured from New Zealand (NZ) Steel product. Available in a range of protective coatings and the full range of Colorsteel® colours to withstand NZ's exposure zones.

Metalcraft Corrugate is available in the following NZ Steel branded products:

- Colorsteel® Endura®
- Colorsteel® Maxx®
- Galvsteel®
- Zincalume®

Sheets are available in the following sizes:

- Thickness (mm): 0.40, 0.55
- Width (mm): Cover – 760, Sheet – 851.



Figure 1: Profile Dimension (nominal)

SCOPE AND LIMITATIONS OF USE

Scope	Limitations
Location	
In all wind zones as defined in NZS 3604:2011 and in all calculated design loads.	- Metalcraft Corrugate load spans apply in wind zones up to and including extra high. - Where the calculated design loads exceed 2.5kPa the engineer must satisfy themselves that the product, pitch and fixings will meet the conditions.
In all exposure zones as defined by NZS 3604:2011.	- In exposure Zone D only Colorsteel® Endura® or Colorsteel® Maxx® may be used. - For use in "Microclimatic considerations," (as defined in Sec 4.2.4) refer to Metalcraft Roofing. - For more information on the specific exposure zones refer to www.colorsteel.co.nz.
On buildings located any proximity to a relevant boundary.	Metalcraft Corrugate is non-combustible.
Building	
On timber or steel structural framing.	Where Metalcraft Corrugate is used in an insulated building and in conjunction with steel framing, a thermal break is required.
In conjunction with a primary structure that complies with the NZ Building Code or where the designer has established that the existing structure is suitable for the intended building work.	- Building height is limited by the Metalcraft Corrugate design load span tables (refer to: www.metalcraftgroup.co.nz) or specific engineering, where applicable. - Fixings to be in accordance with E2/AS1 or specific engineering, where applicable.
As a wall cladding.	- When installed vertically, Metalcraft Corrugate may be direct-fixed up to a risk score of 20, where the risk score calculation relies on the E2/AS1 risk matrix methodology. - When installed horizontally, Metalcraft Corrugate must always be installed over a drained and ventilated cavity unless the building is unlined or a building, importance level 1, in which case it may be direct-fixed. - Flashings, flexible and rigid building underlays and Metalcraft Corrugate fixings must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0). - Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).
As a roof cladding	- Metalcraft Corrugate lengths ≤40m must be installed on a roof with a minimum pitch of 8°. - Metalcraft Corrugate lengths >40m but less than <60m must be installed on a roof with a minimum pitch of 9°. - A potable water collection system may be installed. - Flashings, flexible and rigid building underlays and Metalcraft Corrugate fixings must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0). - Contact with other materials must be in accordance with E2/AS1 and NZMRM Code of Practice (V3.0).

NZ STEEL ASSURANCE

- Australasian registered Environmental Protection Declaration (EPD); compliant with EN 15804.
- ISO 9001:2015. Telarc No.82.
- ISO 14001:2015. Telarc No. 63.

PERFORMANCE CLAIMS

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



PERFORMANCE CLAIMS CONTINUED

NZ Building Code clauses		BASIS OF COMPLIANCE	
Compliance statement		Demonstrated by	
B1 Structure B1.3.1, B1.3.2, B1.3.3 (a, b, c, d, g, i)	ACCEPTABLE SOLUTION B1/AS1	- Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. AS 1397 is cited in NASH Standard Part 1:2016 and NASH Standard Part 2:2019 (BlueScope, 2016). - Metalcraft span tables in accordance with AS/NZS 1170.	
B2 Durability B2.3.1 (b) B2.3.2 (b)	VERIFICATION METHOD B2/VM1	- Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. AS 1397 is cited in NASH Standard Part 1:2016 and NASH Standard Part 2:2019 (BlueScope, 2016). - Coating to AS 2728, which is cited in E2/AS1. (BlueScope, 2013) - NZ Steel and their parent company BlueScope provides assurance that when correctly installed and maintained, their products will meet or exceed NZ Building Code B2: Durability	
C3 Fire Affecting Areas Beyond the Fire Source C3.4 (a), C3.7 (a)	ACCEPTABLE SOLUTION C/AS1 C/AS2	- Steel is defined in C/AS1 and C/AS2 as non-combustible. - Non-combustible products achieve a material group number 1.	
E2 External Moisture E2.3.1, E2.3.2, E2.3.7 (a, b, c)	ACCEPTABLE SOLUTION E2/AS1	- In accordance with E2/AS1 or E2/AS4 - In accordance with NZMRM Code Of Practice V3.0.	
F2 Hazardous Building Materials F2.3.1	ALTERNATIVE SOLUTION	- Steel in accordance with AS 1397:2021, which is equivalent to AS 1397:2011 for the NZ Steel steel. (BlueScope, 2016). - Use in accordance with manufacturer's safety requirements.	
Other performance statement		BASIS OF STATEMENT	
Performance statement		Demonstrated by	
Metalcraft Corrugate will not contaminate potable water.		- Claimed by manufacturer: NZ Steel. - BRANZ statement of metal roof suitability, refer to www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater/.	

SOURCES OF INFORMATION

- BlueScope (2016). *Specification clauses for steel to ensure compliance with relevant Australian standards/regulations*. Refer <http://www.steel.com.au/library>. [Accessed 27/02/2022].
- BlueScope (2013). *New Colorbond® steel*. Refer <http://www.steel.com.au/articles/article-44--new-colorbond-steel>. [Accessed 27/02/2022].
- BRANZ. (20/05/2020). *Harvesting rainwater*. Refer <https://www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater/>. [Accessed 27/02/2022].
- EPD Australasia. (23/10/2018). *Colorsteel®, Endure®, Colorsteel Maxx® Environmental Product Declaration*. Refer <https://epd-australasia.com/epd/colorsteel-endura-and-colorsteel-maxx/>. [Accessed 27/02/2022].
- NZ Steel. (10/2018). *Maintenance recommendations brochure V4.0*. Refer <https://www.colorsteel.co.nz/resources/downloads-and-brochures/>. [Accessed 27/02/2022].
- NZ Steel. (2022). *Zincalume® steel features*. Refer <https://www.nzsteel.co.nz/products/zincalume/features/>. [Accessed 27/02/2022].
- NZ Metal Roof Manufacturer's (NZMRM) (06/2018, Amend 12/2021). *Code of Practice V3.0*. Refer <https://www.metalroofing.org.nz/codeonline>. [Accessed 27/02/2022].
- Telarc (14/08/2019). *ISO 9001:2015 The design, manufacture and supply of hot and cold rolled steel plate, sheet and strip, and coated, steel coil and flat sheet. No 82*. Refer <https://www.nzsteel.co.nz/new-zealand-steel/responsibilities/certificates-and-memberships/>. [Accessed 28/02/2022].
- Telarc (24/07/2003). *ISO 14001:2015 The management of environmental aspects associated with the operation of: the Glenbrook Mill Site; the Waikato North Head Iron Sand Quarry; Pacific Steel NZ Ltd – Wire Mill; Pacific Steel NZ Ltd – Rolling Mill. No. 63*. Refer <https://www.nzsteel.co.nz/new-zealand-steel/responsibilities/certificates-and-memberships/>. [Accessed 28/02/2022].

Where a standard is referenced it is to be read as amended by the acceptable solution or verification method as applicable.

Sources of information also include the Building Act 2004 and its regulations, including the Building Code (Schedule 1 of the Building Regulations 1992), Acceptable Solutions and Verification Methods, and relevant cited standards.

The quality and assurance that the supplied products meet the performance claims stated in this pass™ are the responsibility of the company that is the holder of this pass™.

Where E2/AS1 is referenced it is to be read as including E2/AS4.

Metalcraft Roofing confirms that if Metalcraft Corrugate are used in accordance with the requirements of this pass™ the product will comply with the NZ Building Code and other performance claims set out in this pass™ and the company has met all of its obligations under s14 G of the Building Act.

Date of first issue: 29/11/2019

Date of current issue: 01/02/2023

NZBN: 9429032461152

Scan or click this QR code for a full download of Compliance Documentation for this pass™.

www.metalcraftgroup.co.nz



Kevin Brunton

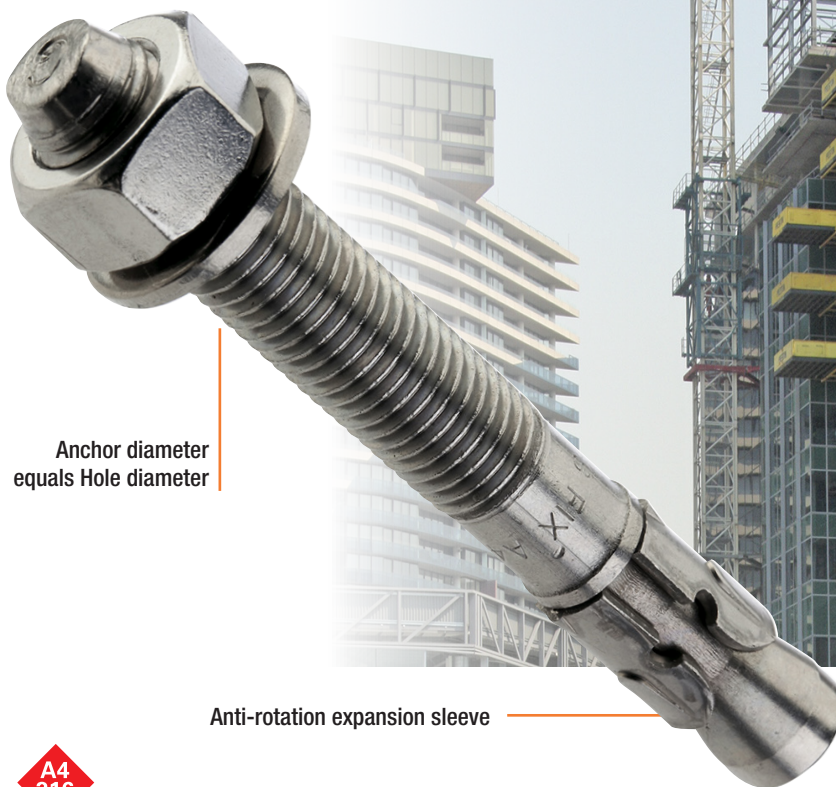
Kevin Brunton, Technical Director, TBB confirms that this pass has been prepared on behalf of Metalcraft Roofing and in accordance with MBIE PTS guidelines and in accordance with the TBB pass™ process which is within the scope of TBB's ISO 9001 certification.

9606D66ADE51EA6CCC25850D00239F99



For more information visit www.metalcraftgroup.co.nz.

Copyright © 2017, The Building Business Limited (TBB). All rights reserved.



Anchor diameter
equals Hole diameter

Anti-rotation expansion sleeve

Materials



Description

The TruBolt™ Stud Anchor is a true-to-size, heavy duty, torque controlled expansion anchor, for permanent anchoring into concrete.

Specification

Material - Bolt	Carbon Steel, Stainless Steel 316 (A4)
Corrosion Protection	Zinc Plating, Hot Dipped Galvanising
Head Styles	Hex Nut
Fixing Method	Through Fixture
Sitting Method	Torque Controlled
Anchoring Method	Expansion
Thread Diameters	M6, M8, M10, M12, M16, M20
Drilled Hole Diameters	6mm, 8mm, 10mm, 12mm, 16mm, 20mm
Anchor Lengths	55mm, 65mm, 75mm, 80mm, 85mm, 90mm, 100mm, 120mm, 125mm, 140mm, 150mm, 160mm, 175mm, 180mm, 215mm
Maximum Fixture Thickness*	6mm, 8mm, 10mm, 12mm, 15mm, 20mm, 25mm, 30mm, 35mm, 40mm, 45mm, 50mm, 65mm, 70mm, 80mm, 90mm, 100mm
Indicative Working	Max Tensile 3.4kN - 32.5kN
Loads in 32MPa Concrete*	Max Shear 2.8kN - 27.3kN
Substrates	Concrete

* Refer to load table

Features & Benefits

- The TruBolt™ diameter equals the required hole diameter providing maximum shear capacity for hole size and making drill bit selection simple. Its cold forged construction ensures superior strength and reliability.
- The anchor design ensures maximum expansion of the sleeve and pull-down on the fixture. These actions are both further assisted by the application of load.
- The anti-rotation expansion sleeve is designed to grip the sides of the hole, preventing anchor rotation during installation.

Related Products

DynaDrill™
Carbide Drill Bits
Diamond Motor
Diamond Core Drill Bits
Hole Cleaning Brush

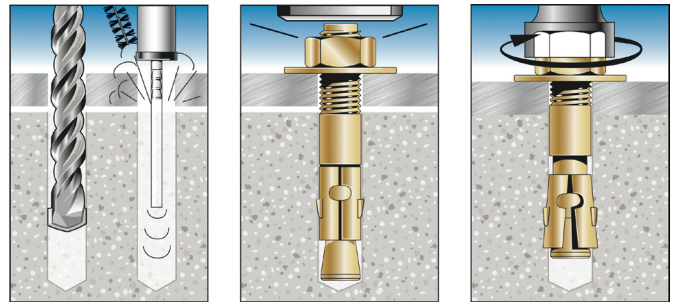
Hole Cleaning Pump
Wet and Dry Vacuum

Trades & Applications

	Steel Fabricator	Elevator Installer	Construction Contractor	Seating Contractor	Racking Installer
Installing handrails, balustrades & safety barriers	✓				
Anchoring elevator guide rails		✓	✓		
Anchoring structural steel columns/beams	✓				
Stadium seating				✓	
Pallet racking					✓

Installation

1. Drill or core a hole to the recommended diameter (same as the TruBolt™) and depth using the fixture as a template. Clean the hole thoroughly with a hole cleaning brush. Remove the debris with a hand pump, compressed air, or vacuum.
2. Insert the anchor through the fixture and drive with a hammer until the washer contacts the fixture.
3. Tighten the nut with a torque wrench to the specified assembly torque.



TruBolt™ Stud Anchors - Hex Nut - Stainless Steel

Ramset Part No	Description	Thread Diameter	Drill Diameter	Total anchor length	Hole depth minus fixture thickness	Minimum Drilling depth	Maximum fixture thickness	Maximum tightening Torque	Fixture clearance hole diameter
T06055SSA	Trubolt M6 x 55mm	ø6	ø6	55mm	66mm	51mm	15mm	10Nm	ø8
T08055SSA	Trubolt M8 x 55mm	ø8	ø8	55mm	70mm	65mm	5mm	20Nm	ø9
T08070SSA	Trubolt M8 x 70mm	ø8	ø8	70mm	85mm	65mm	20mm	20Nm	ø9
T08090SSA	Trubolt M8 x 90mm	ø8	ø8	90mm	105mm	65mm	40mm	20Nm	ø9
T08130SSA	Trubolt M8 x 130mm	ø8	ø8	130mm	145mm	65mm	80mm	20Nm	ø9
T10065SSA	Trubolt M10 x 65mm	ø10	ø10	65mm	83mm	78mm	5mm	35Nm	ø12
T10075SSA	Trubolt M10 x 75mm	ø10	ø10	75mm	93mm	78mm	15mm	35Nm	ø12
T10095SSA	Trubolt M10 x 95mm	ø10	ø10	95mm	113mm	78mm	35mm	35Nm	ø12
T10120SSA	Trubolt M10 x 120mm	ø10	ø10	120mm	138mm	78mm	60mm	35Nm	ø12
T12080SSA	Trubolt M12 x 80mm	ø12	ø12	80mm	100mm	95mm	5mm	50Nm	ø14
T12100SSA	Trubolt M12 x 100mm	ø12	ø12	100mm	120mm	95mm	25mm	50Nm	ø14
T12115SSA	Trubolt M12 x 115mm	ø12	ø12	115mm	135mm	95mm	40mm	50Nm	ø14
T12140SSA	Trubolt M12 x 140mm	ø12	ø12	140mm	160mm	95mm	65mm	50Nm	ø14
T16125SSA	Trubolt M16 x 125mm	ø16	ø16	125mm	147mm	117mm	30mm	100Nm	ø18
T16150SSA	Trubolt M16 x 150mm	ø16	ø16	150mm	172mm	117mm	55mm	100Nm	ø18
T16170SSA	Trubolt M16 x 170mm	ø16	ø16	170mm	192mm	117mm	75mm	100Nm	ø18

TruBolt™ Stud Anchors - Hex Nut - Stainless Steel

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
T20140SS	M20	10	120	20	24	140	85	10
T20160SS	M20	35	160	20	24	170	115	10



TruBolt™ Stud Anchors - Hex Nut - Hot Dipped Galvanised

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
2080GH	M12	6	80	12	15	90	58	20
2100GH	M12	25	100	12	15	105	71	20
2120GH	M12	45	120	12	15	105	93	20
2140GH	M12	65	140	12	15	105	111	20
2180GH	M12	100	180	12	15	125	151	20
6110GH	M16	8	100	16	19	115	67	20
6125GH	M16	20	125	16	19	135	85	20
6150GH	M16	45	150	16	19	145	110	20
6175GH	M16	70	175	16	19	145	135	20
0140GH	M20	15	140	20	24	140	95	10
0160GH	M20	35	160	20	24	170	115	10
0215GH	M20	90	215	20	24	200	170	10



TruBolt™ Stud Anchors - Hex Nut - Zinc Plated

Part No	Thread Size	Max Fixture Thickness (mm)	Overall Anchor Length (mm)	Drilled Hole Ø (mm)	Fixture Hole Ø (mm)	Min Hole Depth (mm)	Effective Length	Order Qty
6055	M6	15	55	6	8	55	38	100
6085	M6	45	85	6	8	75	68	100
6120	M6	80	120	6	8	75	103	50
6150	M6	110	150	6	8	75	133	100
6180	M6	140	180	6	8	75	163	100
8065	M8	12	65	8	10	65	45	50
8090	M8	40	90	8	10	75	70	50
0075	M10	12	75	10	12	80	52	50
0090	M10	30	90	10	12	90	67	50
0120	M10	50	120	10	12	100	97	20
2080	M12	6	80	12	15	90	58	20
2100	M12	25	100	12	15	105	71	20
2120	M12	45	120	12	15	105	93	20
2140	M12	65	140	12	15	105	111	20
2180	M12	100	180	12	15	125	151	20
6110	M16	8	110	16	19	125	67	20
6125	M16	20	125	16	19	135	85	20
6150	M16	45	150	16	19	145	110	20
6175	M16	70	175	16	19	145	135	20
0140	M20	15	140	20	24	160	95	10
0160	M20	35	160	20	24	170	115	10
0215	M20	90	215	20	24	200	170	10

TruBolt™ Stud Anchors - Indicative Working Loads in 32MPa Concrete

Thread Size	Embedment Depth (mm)	Tightening Torque (Nm)	Min Edge Distance (mm)	Min Anchor Spacing (mm)	Max Tensile Load, N _a (kN)*	Max Shear Load, V _a (kN)*
M6	32	10	50	100	3.4	2.8
M8	54	20	80	160	7.2	4.9
M10	72	35	110	220	9.9	6.8
M12	86	50	130	260	12.7	8.6
M16	115	155	170	340	20.9	14.4
M20	145	355	220	440	32.5	27.3

*The design engineer should ensure the structural element is capable of supporting these loads. Refer to Ramset™ Specifiers Resource Book for more information or explanation of technical data.

GABLE END BRACING

OVER ROOF SECTION OF END WALLS



SDC - Approved Building Consent Document - BC:240357 - Pg 266 of 402 - 19/03/2024 - warreg

- ★ Covers bracing of the roof section on gable end construction.
- ★ Includes bracing on extra high gables.
- ★ All timber to be minimum grade SG8 as defined in NZS 3604:2011 apart from gable end webs which are either SG6 or SG8 (see Tables 1A & 1B).
- ★ Tables cover gable end truss installed as single component 45mm thick, double component 90mm thick, 45x70mm or 45x90mm webs “on flat”.
- ★ “On flat” description here refers to truss fabrication terminology.
- ★ Design assumes restraints are provided at the ceiling and roof lines.
- ★ Bracing covers loading conditions as per NZS 3604:2011 up to Extra High wind and includes full height brick veneer gables.
- ★ Height of webs design for wind serviceability deflection limit of $h/180$ and a maximum of 15mm in accordance with NZS 3604:2011.

TABLE 1A - STRONGBACK LOCATION FOR WEBS @ 600MM CRS.

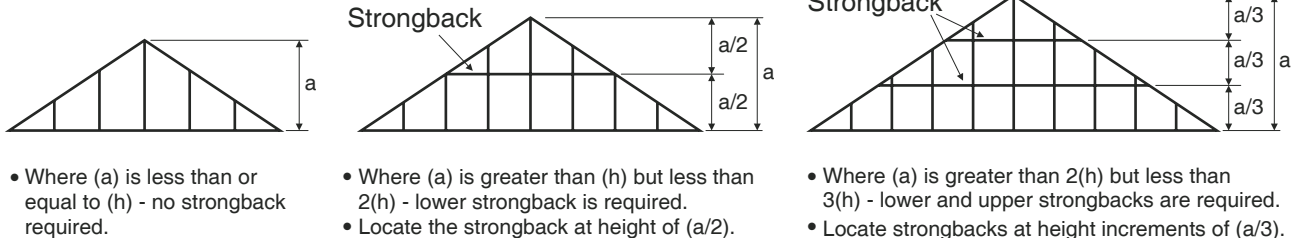
WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs				45x70 on flat		45x90 on flat	
	SG6	SG8	SG6	SG8	2/ 70x45		2/ 90x45		SG6	SG8	SG6	SG8
LOW	1750	1950	1900	2100	2200	2450	2400	2650	2350	2600	2950	3150
MEDIUM	1600	1750	1750	1900	2000	2200	2200	2400	2150	2350	2750	2950
HIGH	1400	1500	1500	1650	1750	1900	1900	2100	1800	2050	2350	2650
VERY HIGH	1250	1400	1400	1500	1600	1750	1750	1900	1600	1900	2050	2400
EXTRA HIGH	1150	1350	1300	1450	1550*	1700*	1650*	1850*	1450	1700	1850*	2200*

TABLE 1B - STRONGBACK LOCATION FOR WEBS @ 400MM CRS.

WIND ZONE	MAXIMUM STRONGBACK HEIGHT (h)											
	70x45 Web		90x45 Web		Double Component Gable End Webs				45x70 on flat		45x90 on flat	
	SG6	SG8	SG6	SG8	2/ 70x45		2/ 90x45		SG6	SG8	SG6	SG8
LOW	2000	2200	2200	2400	2550	2750	2750	2950	2700	2900	3250	3500
MEDIUM	1800	2000	2000	2200	2300	2550	2500	2750	2450	2700	3050	3300
HIGH	1600	1750	1750	1900	2000	2200	2200	2400	2150	2350	2750	2950
VERY HIGH	1450	1600	1600	1750	1850	2000	2000	2200	1950	2200	2500	2750
EXTRA HIGH	1400	1550	1500	1650	1750*	1950*	1900*	2100*	1800	2100	2300*	2650*

*Use these values for full height brick veneer attached to gable end.
Please note that the maximum height of brick veneer on a gable end wall is 5.5m.

SELECTION PROCESS



STRONGBACK OPTIONS

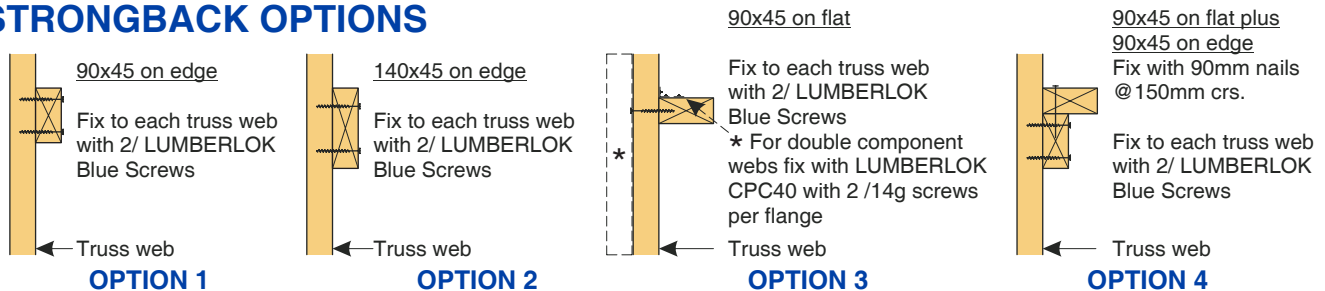
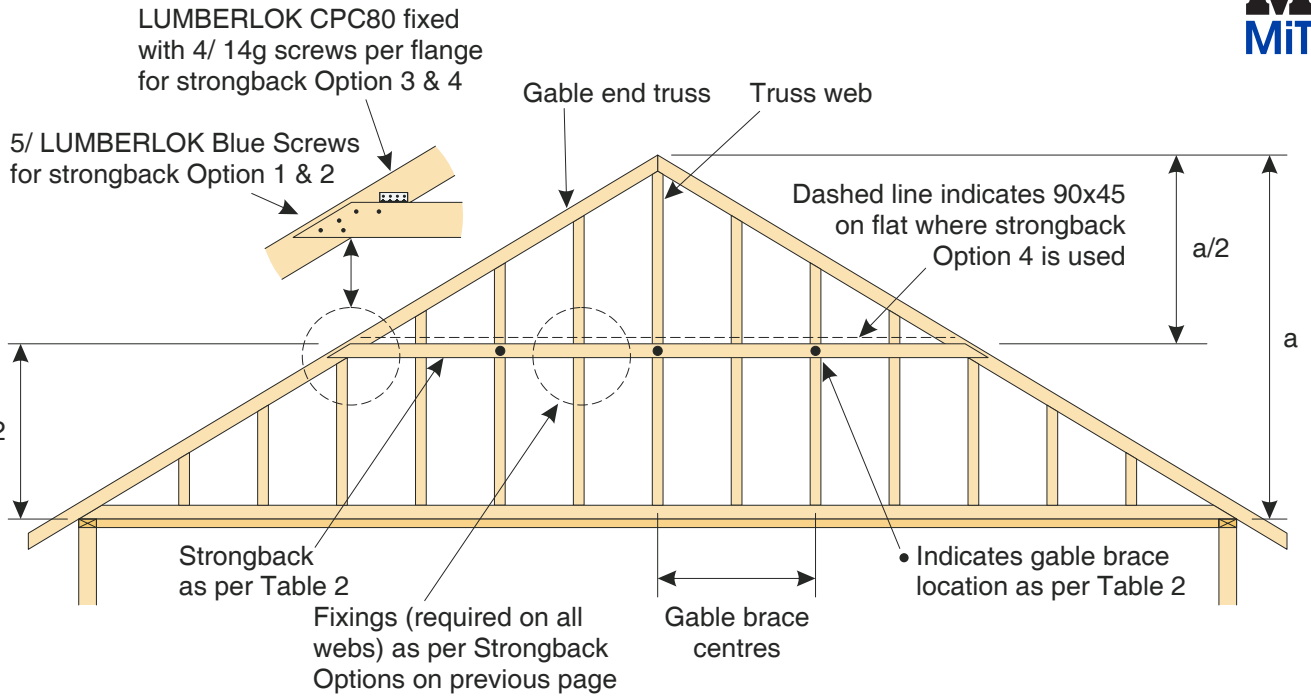
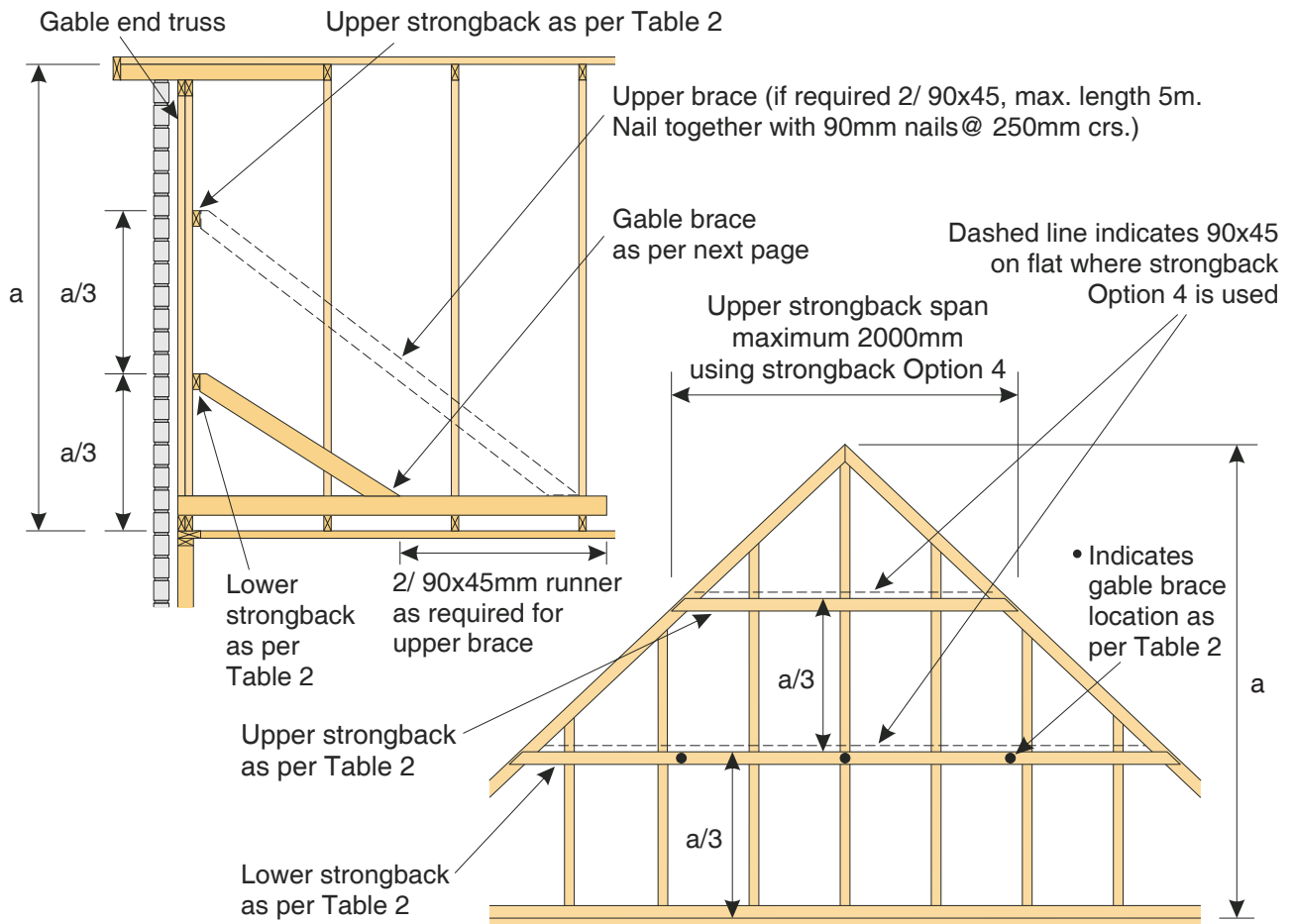


TABLE 2 - STRONGBACK SPAN AND GABLE BRACE LOCATION

OPTION 1	OPTION 2	OPTION 3	OPTION 4
90x45 on edge	140x45 on edge	90x45 on flat	90x45 on flat plus 90x45 on edge
Max. span and/or gable brace location 1200mm	Max. span and/or gable brace location 1400mm	Max. span and/or gable brace location 1600mm	Max. span and/or gable brace location 2000mm



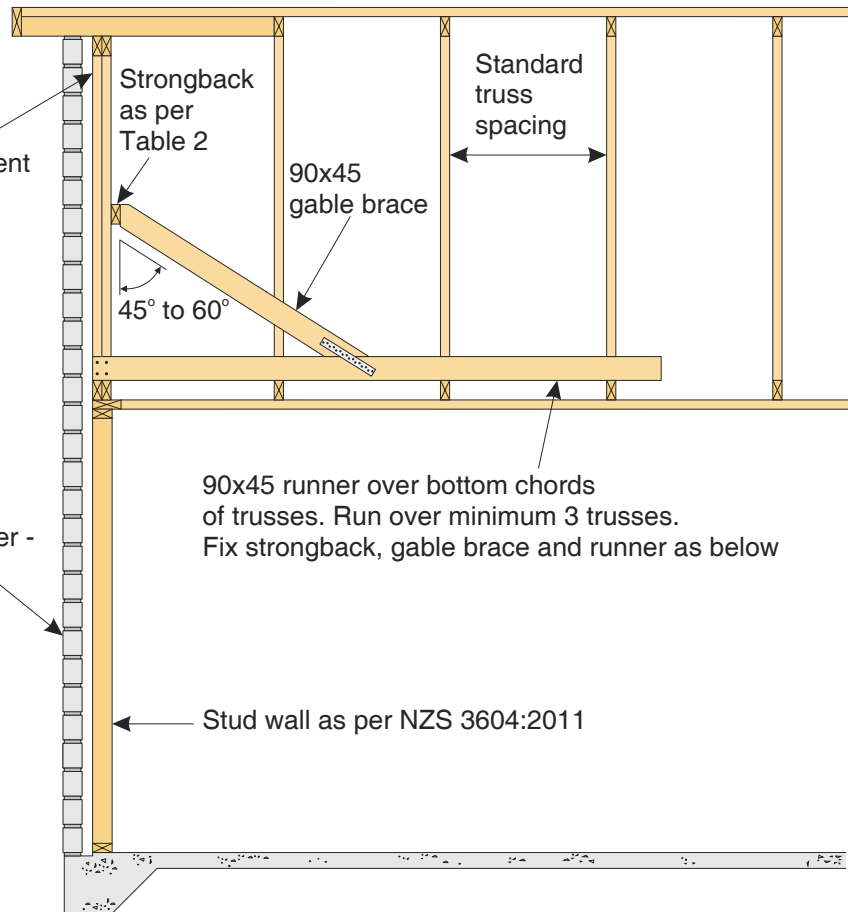
SINGLE STRONGBACK DETAILS



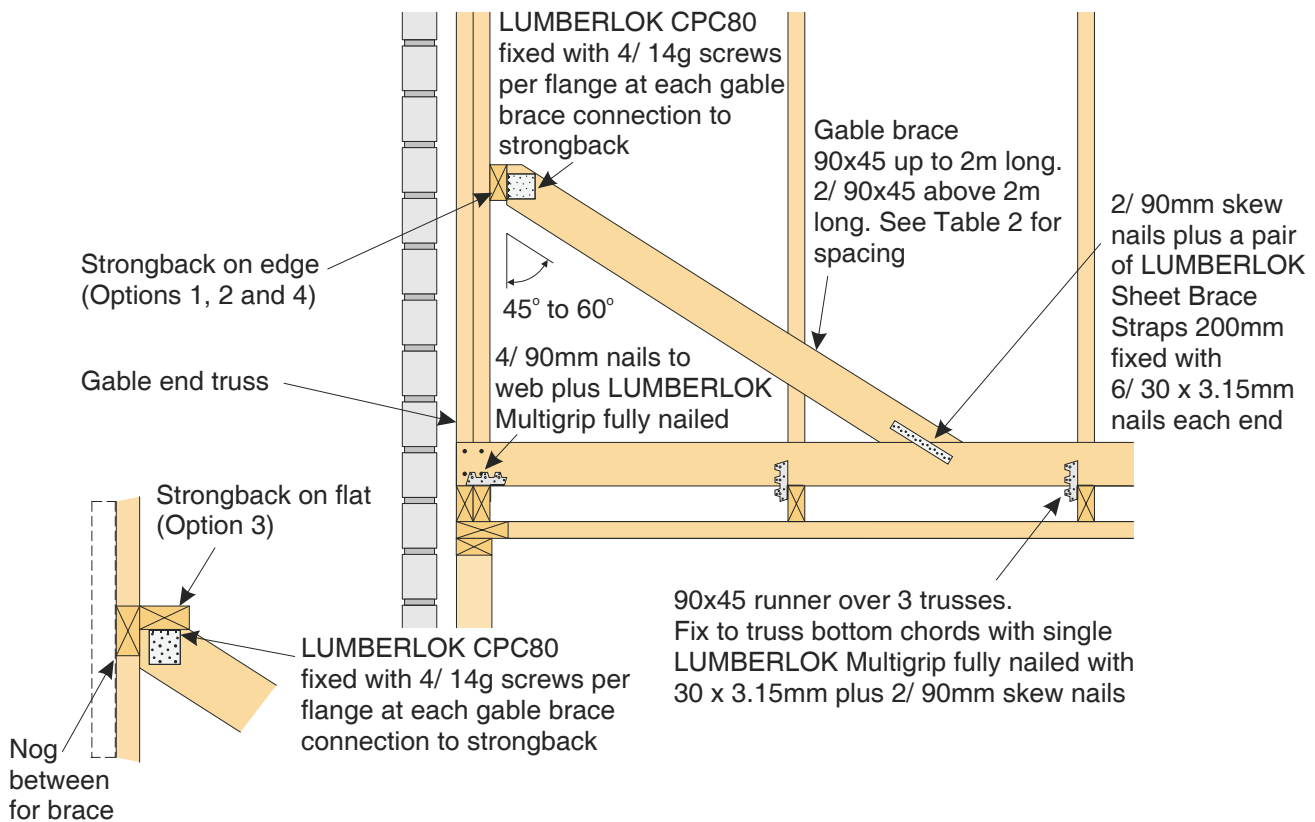
DOUBLE STRONGBACK DETAILS FOR ALL GABLE END OPTIONS (full height brick veneer option shown)

Note: Double component gable end truss or 45x90 webs on flat required for full height brick veneer gable

Full height brick veneer - Max. height 5.5m on gable end wall, Clause 1.1.2(o) NZS 3604:2011



CROSS SECTION
(full height brick veneer option shown)



GABLE BRACE DETAIL FOR ALL GABLE END OPTIONS
(full height brick veneer option shown)

H1 CALCULATIONS



H1/AS1 5th Edition Calculation Method Spreadsheet - Results

Version: 4 May 2023

Client	TODAY HOMES LTD
Project name	TODADY HOMES LTD
Address	LOT 27 KERSEY PARK DARFIELD
Designer	SHAUN HALPINE
Date	05-03-2024

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

Proposed Building		
Element	Area (m ²)	Proposed Building Heat Loss (W/K)
Slab Floors	140.0	95.2
Other Floors	0.0	0.0
Roof	140.0	20.9
Skylights	0.0	0.0
Walls	118.3	59.2
Glazing (walls & doors) (22.6% of total wall area)	35.0	70.0
Doors (opaque)	1.8	3.6
	435.1	Total 248.9

Reference Building		
Element	Area (m ²)	Reference Building Heat Loss (W/K)
Slab Floors	140.0	1.6 87.5
Other Floors	0.0	3.0 0.0
Total Roof (includes skylight area)	140.0	6.6 21.2
Walls (70% of total wall area)	108.6	2.0 54.3
Glazing allowance (30% of total wall area)	46.5	0.50 93.1
	435.1	Total 256.1

Comparison of proposed building against the reference building

PASS

Element type	Description	Embed heating?	Area (m ²)	Construction R-value (m ² .K/W)	Heat Loss (W/K)	Errors
1 Slab Floors	CONCRETE RAFT FLOOR	No	140.0	1.5	95.2	
2 Roof	TRUSS ROOF 900mm CRS	No	140.0	6.7	20.9	
3 Walls	90mm TIMBER FRAMING 2.4	No	118.3	2.0	59.2	
4 Glazing (walls & doors)	EXTERIOR WINDOWS AND		35.0	0.50	70.0	
5 Doors (opaque)	D-1		1.8	0.50	3.6	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						

Cladding & exterior secondary insulating layer (ESIL)

Exterior Bracing / RAB

Primary frame

Interior Bracing / RAB

Interior secondary insulating layer (ISIL)

Interior lining

Insulation thermal resistance m²K/W

Wall thermal resistance m²K/W

Masonry Veneer

7mm plywood

Timber 90 mm

10 mm plasterboard

none

10 mm plasterboard

2.6

2.00

N/A

N/A

N/A

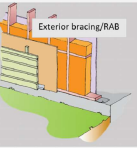
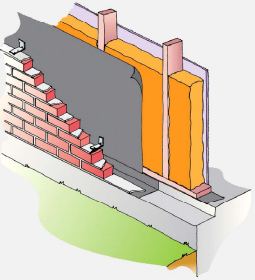
Frame fraction %

24

Target wall thermal resistance m²K/W

2.0

	frame fraction (%)	Insulation thermal resistance (primary frame) (m ² K/W)												frame fraction (%)
		1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8		
Typical wall framing	56	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	56	
	54	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	54	
	52	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	52	
	50	1.3	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	50	
	48	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	48	
	46	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.6	46	
	44	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	44	
	42	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	42	
	40	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	40	
	38	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.7	1.7	38	
Relatively simple wall	36	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	36	
	34	1.5	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	34	
	33	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	33	
	32	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8	32	
	31	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8	31	
	30	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	30	
	29	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	29	
	28	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	28	
	27	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	27	
	26	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.9	26	
Clear-wall with only a few small windows & no	25	1.6	1.7	1.7	1.7	1.8	1.8	1.9	1.9	1.9	1.9	2.0	25	
	24	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	2.0	24	
	23	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	23	
	22	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.1	22	
	21	1.7	1.7	1.8	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.1	21	
	20	1.7	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.1	20	
	19	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.1	2.1	2.2	19	
	18	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	18	
	17	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.2	2.2	17	
	16	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	16	
	15	1.8	1.8	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3	15	
	14	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3	14	
		1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8		



BRANZ External Research Report ERS3 [2020]

Measuring the Extent of Thermal Bridging in External Timber Framed Walls in New Zealand - Beacon Pathway Inc.

Funded by the Building Research Levy, stage one of the Wall Project measured the extent of timber framing in 47 new-build dwellings in Auckland, Christchurch, Wellington, and Hamilton. The results show that the average percentage of timber framing compared to the area of the wall is above 34% – based on the 47-dwelling case study sample. This is much higher than the 14–18% framing content generally assumed by both regulators and the industry when undertaking compliance calculations.

When individual house levels across the sample were looked at, the minimum percentage of timber framing found was 24%, while the maximum was slightly over 57%.

H1/VM1 5th edition amendment 1

2.1.3.2 The thermal resistance (*R*-values) of insulation materials may be verified by using AS/NZS 4859.1.

2.1.3.3 The construction *R*-values of building elements shall be calculated as follows:

a) For walls and roofs, the *R*-value is of a typical area of the building element; and

b) For framed walls, the *R*-value shall include the effects of studs, dwangs, top plates and bottom plates, but may exclude the effects of lintels, sills, additional studs that support lintels and sills, and additional studs at corners and junctions; and

c) For walls without frames, the *R*-value excludes any attachment requirements for windows and doors;

Clause 2.1.3.3 b) clearly enables demonstration of compliance by including all wall framing, and since stage two of the ERS3 project found that only a small part of the wall framing (1-3%) was added on site, the frame fraction could in principle be obtained from the frame manufacturer.

The path for demonstrating compliance when adopting the option to exclude additional studs etc is not explained in these clauses, nor anywhere else in the H1 documentation. There is no suggestion that path is to simply assume the nominal stud and dwang spacings (plus top and bottom plates) and to ignore all other framing that is affecting thermal performance.

BBWB - bevelbacked weatherboard RWB - Rusticated weatherboard
FCWB - fibre cement weatherboard FC - fibre cement sheet (or similar sheet cladding)
ESIL - External secondary insulating layer - R-value includes facing/cladding

ISIL - Interior secondary insulating layer - R-value is for the layer system so needs to include the effect of any framing
NZS4214 or similar 1-D calculation method can be used to determine the R-value if the layer is bridged by framing

Thermal resistance is for a 2.4 m wall with two rows of dwangs, including top and bottom plates, and surface resistances of 0.13 m²K/W interior and 0.04 m²K/W exterior
Modelled using 3D finite element software
For framing above 25%, the wall is modelled with an increasing fraction of double studs
Frame % is by volume for the staggered stud cases (not including facings)

Steel frame cases have the frame faced on the exterior with a sheet (full coverage) thermal break with an R-value of R 0.25
For steel framing, the % framing is by face area of the flange.
Steel framing was modelled by determining an equivalent homogenous frame with the same width as flange width and the same depth as stud depth
All steel framing is assumed to have same thickness, including top and bottom plates.
R0.38 insulated RAB is assumed to be used without a separate R0.25 thermal break layer against steel framing
H1/AS1 5th ed. Schedule method minimum R 2.0 in all climate zones

Studs per meter of wall length' values assume there are three rows of dwangs

BRANZ

Thermal resistance of slab-on-ground floor (m²K/W)

www.branz.co.nz/terms-conditions/

ActiveK Controls

10/05/2023

Target floor thermal resistance
m²K/W

1.6

Wall type

Masonry veneer

Floor topper insulating

none

Vertical edge insulation

none

Floor type and under-slab insulation style

Concrete raft foundation

Wall depth (mm)

90 +

A/P ratio

2.3

Floor thermal resistance
m²K/W

1.47

A/P fraction	Wall depth (mm) from outer edge of slab to edge of internal floor										A/P fraction	Wall depth (mm) from outer edge of slab to edge of internal floor											
	90 +	140 +	180 +	250 +	300 +	90 +	140 +	180 +	250 +	300 +		90 +	140 +	180 +	250 +	300 +	90 +	140 +	180 +	250 +	300 +		
	90 ≤ < 140	140 ≤ < 180	180 ≤ < 250	250 ≤ < 300	300 ≤	90 ≤ < 140	140 ≤ < 180	180 ≤ < 250	250 ≤ < 300	300 ≤		90 ≤ < 140	140 ≤ < 180	180 ≤ < 250	250 ≤ < 300	300 ≤	90 ≤ < 140	140 ≤ < 180	180 ≤ < 250	250 ≤ < 300	300 ≤		
3.8	2.0	2.1	2.1	2.2	2.2	10.0	4.3	4.4	4.4	4.5	4.6	3.8	2.0	2.1	2.1	2.2	2.2	10.0	4.3	4.4	4.4	4.5	4.6
3.7	2.0	2.0	2.1	2.1	2.2	9.5	4.1	4.2	4.2	4.3	4.4	3.7	2.0	2.0	2.1	2.1	2.2	9.5	4.1	4.2	4.2	4.3	4.4
3.6	2.0	2.0	2.0	2.1	2.1	9.0	3.9	4.0	4.1	4.2	4.2	3.6	2.0	2.0	2.0	2.1	2.1	9.0	3.9	4.0	4.1	4.2	4.2
3.5	1.9	2.0	2.0	2.0	2.1	8.5	3.8	3.8	3.9	4.0	4.0	3.5	1.9	2.0	2.0	2.0	2.1	8.5	3.8	3.8	3.9	4.0	4.0
3.4	1.9	1.9	2.0	2.0	2.0	8.0	3.6	3.6	3.7	3.8	3.8	3.4	1.9	1.9	2.0	2.0	2.0	8.0	3.6	3.6	3.7	3.8	3.8
3.3	1.8	1.9	1.9	2.0	2.0	7.5	3.4	3.5	3.5	3.6	3.6	3.3	1.8	1.9	1.9	2.0	2.0	7.5	3.4	3.5	3.5	3.6	3.6
3.2	1.8	1.8	1.9	1.9	2.0	7.0	3.2	3.3	3.3	3.4	3.5	3.2	1.8	1.8	1.9	1.9	2.0	7.0	3.2	3.3	3.3	3.4	3.5
3.1	1.8	1.8	1.8	1.9	1.9	6.5	3.0	3.1	3.1	3.2	3.3	3.1	1.8	1.8	1.8	1.9	1.9	6.5	3.0	3.1	3.1	3.2	3.3
3.0	1.7	1.8	1.8	1.8	1.9	6.0	2.8	2.9	2.9	3.0	3.1	3.0	1.7	1.8	1.8	1.8	1.9	6.0	2.8	2.9	2.9	3.0	3.1
2.9	1.7	1.7	1.8	1.8	1.8	5.5	2.7	2.7	2.8	2.8	2.9	2.9	1.7	1.7	1.8	1.8	1.8	5.5	2.7	2.7	2.8	2.8	2.9
2.8	1.7	1.7	1.7	1.8	1.8	5.0	2.5	2.5	2.6	2.6	2.7	2.8	1.7	1.7	1.7	1.8	1.8	5.0	2.5	2.5	2.6	2.6	2.7
2.7	1.6	1.7	1.7	1.7	1.8	4.9	2.4	2.5	2.5	2.6	2.6	2.7	2.7	1.6	1.7	1.7	1.8	4.9	2.4	2.5	2.5	2.6	2.6
2.6	1.6	1.6	1.6	1.7	1.7	4.8	2.4	2.4	2.5	2.5	2.6	2.6	2.6	1.6	1.6	1.6	1.7	4.8	2.4	2.4	2.5	2.5	2.6
2.5	1.5	1.6	1.6	1.7	1.7	4.7	2.4	2.4	2.4	2.5	2.6	2.6	2.5	1.5	1.6	1.6	1.7	4.7	2.4	2.4	2.4	2.5	2.6
2.4	1.5	1.5	1.6	1.6	1.6	4.6	2.3	2.4	2.4	2.5	2.5	2.5	2.4	1.5	1.5	1.6	1.6	4.6	2.3	2.4	2.4	2.5	2.5
2.3	1.5	1.5	1.5	1.6	1.6	4.5	2.3	2.3	2.4	2.4	2.5	2.5	2.3	1.5	1.5	1.5	1.6	4.5	2.3	2.3	2.4	2.4	2.5
2.2	1.4	1.5	1.5	1.5	1.6	4.4	2.3	2.3	2.3	2.4	2.4	2.4	2.2	1.4	1.5	1.5	1.5	4.4	2.3	2.3	2.3	2.4	2.4
2.1	1.4	1.4	1.5	1.5	1.5	4.3	2.2	2.3	2.3	2.4	2.4	2.4	2.1	1.4	1.4	1.5	1.5	4.3	2.2	2.3	2.3	2.4	2.4
2.0	1.4	1.4	1.4	1.5	1.5	4.2	2.2	2.2	2.3	2.3	2.4	2.4	2.0	1.3	1.4	1.4	1.4	4.2	2.2	2.2	2.3	2.3	2.4
1.9	1.3	1.4	1.4	1.4	1.4	4.1	2.1	2.2	2.2	2.3	2.3	2.3	1.9	1.3	1.3	1.3	1.4	4.1	2.1	2.2	2.2	2.3	2.3
1.8	1.3	1.3	1.3	1.4	1.4	4.0	2.1	2.1	2.2	2.2	2.3	2.3	1.8	1.2	1.3	1.3	1.3	4.0	2.1	2.1	2.2	2.2	2.3
1.7	1.2	1.3	1.3	1.3	1.4	3.9	2.1	2.1	2.1	2.2	2.2	2.2	1.7	1.2	1.3	1.3	1.3	3.9	2.1	2.1	2.1	2.2	2.2
1.6	1.2	1.2	1.3	1.3	1.3	3.8	2.0	2.1	2.1	2.2	2.2	2.2	1.6	1.2	1.2	1.3	1.3	3.8	2.0	2.1	2.1	2.2	2.2

Correction for when there is no vertical edge insulation between house and garage slabs

These tables and the ones for slab-on-ground floors in H1/AS1, are based on the assumption that the insulation is full coverage, i.e under all of the slab (underslab insulation) or along all of the perimeter (vertical or horizontal edge insulation). If the insulation is not full coverage such as when there is no vertical perimeter insulation between a house and garage a correction will need to be made to account for the extra heatloss.

Floor R-value without vertical edge insulation

1.47

m²K/W

Fraction of total perimeter length that has no vertical edge insulation

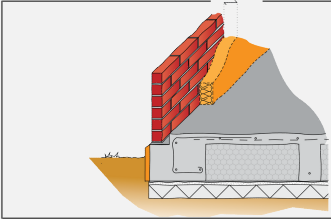
0 %

Approximate overall floor R-value

1.47

m²K/W

Calculation uses H1/AS1 2.1.3.7 except using perimeter length instead of area to proportionally weight the (same area) 'perimeter edge insulated' and 'perimeter edge un-insulated' U-values (linear thermal transmittance).



H1/AS1 5th ed. Schedule method minimum R 1.5 in climate zones 1-4, R 1.6 in zone 5 and R 1.7 in zone 6
For heated floors R 2.5 in zones 1-3, R 2.8 zone 4, & R 3.0 in zones 5 & 6.

Verical edge insulation assumed to be R 1.0 installed vertically against exterior face of wall footing.

A/P: area-to-perimeter fraction

Calculated using 2D finite element modelling with some initial verification using 3D FEM
Does not include the effect of missing underslab insulation such as wall thickenings or support beams

Putting insulation underneath the foundation requires specific engineering design (SED).

Target roof thermal resistance m²K/W

6.6

Roof cladding

Profiled metal

Joist/Cord height (mm)

90

Insulation conductivity

0.05

Interior secondary insulating layer (ISI)

none

Interior lining

13 mm plasterboard

Joist/Cord spacing (mm)

900

Insulation thermal resistance m²K/W

7.2

thickness (mm)

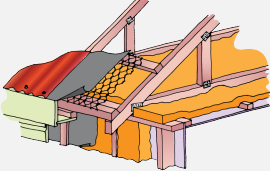
360

Roof R-value if joist/cord un-covered m²K/W

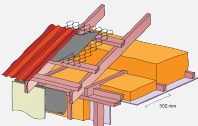
5.94

Roof R-value if joist/cord covered by insulation m²K/W

7.31



The insulation R-value (thickness) around perimeter of a ceiling may need to be reduced to ensure a separation of at least 25 mm between underside of the roof underlay and the top surface of the insulation. The schedule method of H1/AS1 allows the roof R-value in the that area to be reduced to R3.3 for a width of 500 mm.



Insulation covering over the top of joist/cord											
Insulation		joist / cord spacing (mm)		Insulation		joist / cord spacing (mm)					
thickness	R-value	600	900	1200	thickness	R-value	600	900	1200		
310	6.2	6.3	6.3	6.3	500	10	10.3	10.3	10.3		
305	6.1	6.2	6.2	6.2	495	9.9	10.2	10.2	10.2		
300	6.0	6.1	6.1	6.1	490	9.8	10.1	10.0	10.0		
295	5.9	6.0	6.0	6.0	485	9.7	10.0	9.9	9.9		
290	5.8	5.9	5.9	5.9	480	9.6	9.9	9.8	9.8		
285	5.7	5.8	5.8	5.8	475	9.5	9.8	9.7	9.7		
280	5.6	5.7	5.7	5.7	470	9.4	9.7	9.6	9.6		
275	5.5	5.6	5.6	5.6	465	9.3	9.6	9.5	9.5		
270	5.4	5.5	5.5	5.5	460	9.2	9.5	9.4	9.4		
265	5.3	5.4	5.3	5.4	455	9.1	9.4	9.3	9.3		
260	5.2	5.3	5.2	5.3	450	9.0	9.2	9.2	9.2		
255	5.1	5.2	5.1	5.2	445	8.9	9.1	9.1	9.1		
250	5.0	5.1	5.0	5.1	440	8.8	9.0	9.0	9.0		
245	4.9	5.0	4.9	5.0	435	8.7	8.9	8.9	8.9		
240	4.8	4.9	4.8	4.9	430	8.6	8.8	8.8	8.8		
235	4.7	4.8	4.7	4.8	425	8.5	8.7	8.7	8.7		
230	4.6	4.7	4.6	4.7	420	8.4	8.6	8.6	8.6		
225	4.5	4.6	4.5	4.6	415	8.3	8.5	8.5	8.5		
220	4.4	4.5	4.4	4.5	410	8.2	8.4	8.4	8.4		
215	4.3	4.4	4.3	4.4	405	8.1	8.3	8.3	8.3		
210	4.2	4.3	4.2	4.3	400	8.0	8.2	8.1	8.2		
205	4.1	4.2	4.1	4.2	395	7.9	8.1	8.0	8.1		
200	4.0	4.1	4.0	4.1	390	7.8	8.0	7.9	8.0		
195	3.9	4.0	3.9	4.0	385	7.7	7.9	7.8	7.9		
190	3.8	3.9	3.8	3.9	380	7.6	7.8	7.7	7.8		
185	3.7	3.8	3.7	3.8	375	7.5	7.7	7.6	7.6		
180	3.6	3.7	3.6	3.7	370	7.4	7.6	7.5	7.5		
175	3.5	3.5	3.5	3.5	365	7.3	7.5	7.4	7.4		
170	3.4	3.4	3.4	3.4	360	7.2	7.4	7.3	7.3		
165	3.3	3.3	3.3	3.3	355	7.1	7.3	7.2	7.2		
160	3.2	3.2	3.2	3.2	350	7.0	7.2	7.1	7.1		
155	3.1	3.1	3.1	3.1	345	6.9	7.1	7.0	7.0		
150	3.0	3.0	3.0	3.0	340	6.8	7.0	6.9	6.9		
145	2.9	2.9	2.9	2.9	335	6.7	6.9	6.8	6.8		
140	2.8	2.8	2.8	2.8	330	6.6	6.8	6.7	6.7		
135	2.7	2.7	2.7	2.7	325	6.5	6.7	6.6	6.6		
130	2.6	2.6	2.6	2.6	320	6.4	6.6	6.5	6.5		
125	2.5	2.5	2.5	2.5	315	6.3	6.4	6.4	6.4		

Insulation not covering over the top of joist/cord											
Insulation		joist / cord spacing (mm)		Insulation		joist / cord spacing (mm)					
thickness	R-value	600	900	1200	thickness	R-value	600	900	1200		
310	6.2	4.9	5.4	5.6	500	10	5.7	7.0	7.8		
305	6.1	4.8	5.3	5.6	495	9.9	5.7	7.0	7.8		
300	6.0	4.8	5.3	5.5	490	9.8	5.7	7.0	7.7		
295	5.9	4.7	5.2	5.4	485	9.7	5.7	7.0	7.7		
290	5.8	4.7	5.1	5.3	480	9.6	5.7	6.9	7.6		
285	5.7	4.6	5.1	5.3	475	9.5	5.7	6.9	7.6		
280	5.6	4.6	5.0	5.2	470	9.4	5.7	6.9	7.5		
275	5.5	4.5	4.9	5.1	465	9.3	5.7	6.8	7.5		
270	5.4	4.5	4.9	5.0	460	9.2	5.7	6.8	7.4		
265	5.3	4.4	4.8	5.0	455	9.1	5.7	6.8	7.4		
260	5.2	4.4	4.7	4.9	450	9.0	5.6	6.7	7.3		
255	5.1	4.3	4.7	4.8	445	8.9	5.6	6.7	7.3		
250	5.0	4.3	4.6	4.7	440	8.8	5.6	6.7	7.2		
245	4.9	4.2	4.5	4.7	435	8.7	5.6	6.6	7.2		
240	4.8	4.1	4.4	4.6	430	8.6	5.6	6.6	7.1		
235	4.7	4.1	4.4	4.5	425	8.5	5.6	6.5	7.1		
230	4.6	4.0	4.3	4.4	420	8.4	5.6	6.5	7.0		
225	4.5	4.0	4.2	4.3	415	8.3	5.5	6.5	7.0		
220	4.4	3.9	4.1	4.2	410	8.2	5.5	6.4	6.9		
215	4.3	3.8	4.1	4.2	405	8.1	5.5	6.4	6.9		
210	4.2	3.8	4.0	4.1	400	8.0	5.5	6.3	6.8		
205	4.1	3.7	3.9	4.0	395	7.9	5.4	6.3	6.7		
200	4.0	3.6	3.8	3.9	390	7.8	5.4	6.2	6.7		
195	3.9	3.5	3.7	3.8	385	7.7	5.4	6.2	6.6		
190	3.8	3.5	3.7	3.7	380	7.6	5.4	6.1	6.6		
185	3.7	3.4	3.6	3.7	375	7.5	5.3	6.1	6.5		
180	3.6	3.3	3.5	3.6	370	7.4	5.3	6.0	6.4		
175	3.5	3.3	3.4	3.5	365	7.3	5.3	6.0	6.4		
170	3.4	3.2	3.3	3.4	360	7.2	5.2	5.9	6.3		
165	3.3	3.1	3.2	3.3	355	7.1	5.2	5.9	6.2		
160	3.2	3.0	3.1	3.2	350	7.0	5.2	5.8	6.2		
155	3.1	2.9	3.1	3.1	345	6.9	5.1	5.8	6.1		
150	3.0	2.9	3.0	3.0	340	6.8	5.1	5.7	6.0		
145	2.9	2.8	2.9	2.9	335	6.7	5.1	5.7	6.0		
140	2.8	2.7	2.8	2.8	330	6.6	5.0	5.6	5.9		
135	2.7	2.6	2.7	2.7	325	6.5	5.0	5.6	5.8		
130	2.6	2.5	2.6	2.6	320	6.4	5.0	5.5	5.8		
125	2.5	2.5	2.5	2.5	315	6.3	4.9	5.4	5.7		

Correction for reduced perimeter insulation

For compliance with the calculation method of H1/AS1, clause 2.1.3.7 allows in a general sense to calculate the average R-value of a roof or other building component with two or more distinctly different areas or zones, by area averaging the U-values of the separate zones. The following calculation is based on that process but only requires knowledge of the A/P ratio instead of needing to know both the area and perimeter length.

Ceiling Area-Perimeter fraction

2.3

Insulation width (mm)

400

Insulation R-value (m²K/W)

3.6

R-value around perimeter (m²K/W)

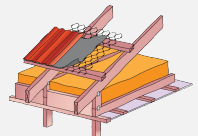
3.49

Overall roof R-value (m²K/W)

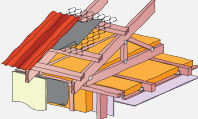
6.70

An alternative to reducing the perimeter insulation is to use a raised heel truss.

This solution requires a simple correction to the engineering design to account for wind loading on a what is effectively a slightly taller wall.



Another alternative is to add an interior secondary insulation layer (ISI).



Nogs / battens are assumed to be spaced at 600 mm centres

Interior secondary insulation layer - 50 mm deep x 70 mm high horizontal battens @ 600 ctrs
insulation is either R 1.56 (k=0.032 W/m.K) or R 1.25 (k=0.04 W/m.K)
resulting overall R-value for the layers of 1.2 m²K/W and 1.1 m²K/W respectively

Modelled using 3D finite element software

H1/AS1 5th ed. Schedule method minimum R 6.6 in all climate zones

Joist cover with insulation can be achieved either with two separate layers of insulation or cutting a single thick layer of insulation such that it spill over the top when tightly fitted

thickness (mm)

180

R-value (m² K/W)

3.6

=

0.0500

=

conductivity (W/m.K)

ELIMENT INSULATION

DESCRIPTION

Eliment ceiling insulation, the new generation of glasswool insulation manufactured in partnership with PGF Insulation is intended for both thermal and acoustic insulation application. It is manufactured using recycled glass and with SensiTouch[®] Technology, employs a phenolic resin based binder that incorporates a natural anti-formaldehyde ingredient. The Eliment insulation range encompasses multiple densities, thicknesses and dimensions to suit typical timber or steel framed constructions and to satisfy a broad spectrum of building requirements.

SensiTouch[®] TECHNOLOGY

Formaldehyde has traditionally been used as part of the binder in glasswool insulation. Although there is no health risk with the traditional product, formaldehyde at a higher level may cause irritation and sensitivity. Eliment utilises SensiTouch[®] Technology, an innovative new binder that incorporates a natural anti-formaldehyde ingredient and is low in volatile organic compounds, making for a safer and more pleasant installation process.

AS/NZS 4859.1:2018 COMPLIANT

All Eliment products are compliant with AS/NZS 4859.1:2018. This independent assurance gives you peace of mind that you are fulfilling all your obligations as required.

SUSTAINABLE PRODUCT

Eliment Insulation is committed to providing environmentally sustainable products. Eliment ceiling insulation is free from CFCs, HCFCs and any other material with ozone depletion potential in the manufacture/composition content and represent no known threat to the environment. Made using up to 80% recycled glass, Eliment ceiling insulation helps address sustainability and environmental concerns.

APPLICATION

Eliment ceiling insulation is designed to be used in ceiling systems in residential and commercial buildings for enhanced thermal and acoustic performance. It is installed by laying them on top of the ceiling in between the ceiling joists enabling complete coverage for optimal effectiveness.

INDIVIDUAL VOLATILE ORGANIC COMPOUND (VOC's) EMISSION

Safe to use due to the low Volatile Organic Compound (VOC) content. This ensures that no harmful levels of VOCs are released. Tested in accordance with ASTM D5116.



Feel the difference.

DIFFERENT FEEL

Soft to touch. Specifically engineered to produce a softer feel compared to conventional glasswool.

Firm friction fit. The rigidity of the ceiling insulation assures users the product will leave no gaps or voids. Gaps or voids can lead to the loss of thermal and acoustic performance.

Reduced sound transmission. Exceptional acoustic performance. Designed to reduce transmission of unwanted noise, Eliment insulation minimises sound transfer through ceiling systems in residential or commercial buildings.

Vermin resistant. Does not encourage growth of mould, fungus, bacteria or act as food source for rodents. Tested in accordance with ASTM C1338-08.

Non-corrosive. Chemically inert. Hydrogen ion concentration at pH 8~9. Will not cause or accelerate corrosion of steel, stainless steel, copper or aluminium. Tested in accordance with ASTM C665-12.

Non-hygroscopic. Water vapour absorption less than 0.2% by volume. Tested in accordance with ASTM C1104.

High service Temperature. Maximum service temperature of 450 °C. Tested in accordance with ASTM C411.

NEW ZEALAND BUILDING CODE (NZBC)

Eliment products have been evaluated through the CodeMark process. When used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 - DURABILITY

Performance B2.3.1 (a) The life of the building, being not less than 50 years

Clause C3 - FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE

Performance C3.7 (a) be constructed from materials which are not combustible building materials, or

Clause E3 - INTERNAL MOISTURE

Performance E3.3.1

Clause F2 - HAZARDOUS BUILDING MATERIALS

Performance F2.3.1

Clause H1 ENERGY EFFICIENCY

Performance H1.3.1 (a) and H1.3.2E.

FIRE SAFETY PROPERTIES

The ceiling insulation is inherently non-combustible and therefore won't burn if exposed to fire. Tested in accordance with:

- B.S. 476: Part 4 Non-combustibility
- B.S. 476: Part 6 Fire propagation
- B.S. 476: Part 7 Surface spread of flame
- ASTM E84 - surface burning characteristics.

SURFACE BURNING CHARACTERISTICS

Meets the surface burning characteristics and limited combustibility in accordance with ASTM E84.

THERMAL PERFORMANCE

The thermal resistance value was determined at mean temperature of 15°C as per AS/NZS 4859.1 : 2018. This assures users the products deliver the specified thermal resistance which contribute to the operational efficiencies of the building. Please refer to the table on 'Products Available' for more information on the thermal resistance values.

ACOUSTIC PERFORMANCE

Eliment ceiling insulation acts as a natural and effective sound barrier. It minimises sound transfer. Please contact one of our Eliment Insulation representatives for further information relating to acoustic performance.

BIOSOLUBILITY

Eliment is manufactured with bio-soluble fibres, creating a product that is safe to use in any residential, commercial or industrial application. Bio-soluble fibres have been extensively researched and shown to pose no long term health risks.

PRODUCT WARRANTY

This product is covered by a 70 year product warranty. For full details, please visit elimentinsulation.co.nz.

*Terms & conditions apply.



SPECIFICATION NOTES

The insulation material shall be Eliment ceiling insulation R ____ m2 K/W ____ x ____ x ____ mm (specify material R-value, width, length, thickness) as manufactured by PGF Insulation.

PRODUCT AVAILABLE

R- Value (m ² K/W)	Thickness (mm)	Width (mm)	Length (mm)	Piece Per Pack	Packs Per Bale	Area Per Pack (m ²)
R3.6	165	432	1220	12	8	6.32
R4.0	195	432	1220	10	8	5.27
R5.0	230	432	1220	8	8	4.22
R6.0	278	432	1220	7	8	3.69

Technical specifications as shown in this literature are intended to be used as general guidelines only. The physical and chemical properties of glass wool insulation listed herein represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Warranty and liability upon delivery shall be in accordance with our General Terms and Conditions. No responsibility is assumed for the correctness of this information. Version of 3rd Sep 21.

Another Quality Product
Manufactured by :



PGF Insulation Sdn. Bhd.
2449, Lorong Perusahaan Sepuluh



DESCRIPTION

Eliment wall insulation, the new generation of glasswool insulation manufactured in partnership with PGF Insulation is intended for both thermal and acoustic insulation application. It is manufactured using recycled glass and SensiTouch[®] Technology, a phenolic resin based binder that incorporates a natural anti-formaldehyde ingredient. The Eliment insulation range encompasses multiple densities, thicknesses and dimensions to suit typical timber or steel framed constructions and to satisfy a broad spectrum of building requirements.

SensiTouch[®] TECHNOLOGY

Formaldehyde has traditionally been used as part of the binder in glasswool insulation. Although there is no health risk with the traditional product, formaldehyde at a higher level may cause irritation and sensitivity. Eliment utilises SensiTouch[®] Technology, an innovative new binder that incorporates a natural anti-formaldehyde ingredient and is low in volatile organic compounds, making for a safer and more pleasant installation process.

AS/NZS 4859.1:2018 COMPLIANT

All Eliment products are compliant with AS/NZS 4859.1:2018. This independent assurance gives you peace of mind that you are fulfilling all your obligations as required.

SUSTAINABLE PRODUCT

Eliment Insulation is committed to providing environmentally sustainable products. Eliment wall insulation is free from CFCs, HCFCs and any other material with ozone depletion potential in the manufacture/composition content and represent no known threat to the environment. Made using up to 80% recycled glass, Eliment wall insulation helps address sustainability and environmental concerns.

APPLICATION

Eliment insulation is designed to be used in partition wall systems in residential and commercial buildings for enhanced thermal and acoustic performance. It can be fitted between timber or steel studs in a wall cavity system and is specifically designed for press-fit between studs.

INDIVIDUAL VOLATILE ORGANIC COMPOUND (VOC's) EMISSION

Safe to use due to the low Volatile Organic Compound (VOC) content. This ensures that no harmful levels of VOCs are released. Tested in accordance with ASTM D5116.

ADVANTAGES

Soft to touch. Specifically engineered to produce a softer feel compared to conventional glasswool.



Feel the difference.

firm friction fit. The rigidity of the wall insulation assures users the product will not sag within the cavity. Sagging of insulation can create voids which in turn diminish a building systems overall thermal and acoustic performance.

Reduced sound transmission. Designed to reduce transmission of unwanted noise, Eliment minimises sound transfer through drywall partition systems in residential or commercial buildings.

Vermin resistant. Does not encourage growth of mould, fungus, bacteria or act as food source for rodents. Tested in accordance with ASTM C1338-08.

Non-corrosive. Chemically inert. Hydrogen ion concentration at pH 8~9. Will not cause or accelerate corrosion of steel, stainless steel, copper or aluminium. Tested in accordance with ASTM C665-12.

Non-hygroscopic. Water vapour absorption less than 0.2% by volume. Tested in accordance with ASTM C1104.

High service temperature. Maximum service temperature of 450 °C. Tested in accordance with ASTM C411.

FIRE SAFETY PROPERTIES

The wall insulation is inherently non-combustible and therefore won't burn if exposed to fire. Tested in accordance with :

- B.S. 476: Part 4 Non-combustibility
- B.S. 476: Part 6 Fire propagation
- B.S. 476: Part 7 Surface spread of flame
- ASTM E84 - surface burning characteristics.



SURFACE BURNING CHARACTERISTICS

Meets the surface burning characteristics and limited combustibility in accordance with ASTM E84.

NEW ZEALAND BUILDING CODE (NZBC)

Eliment products have been evaluated through the CodeMark process. When used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 - DURABILITY

Performance B2.3.1 (a) The life of the building, being not less than 30 years

Clause C3 - FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE

Performance C3.7 (a) be constructed from materials which are not combustible building materials, or

Clause E3 - INTERNAL MOISTURE

Performance E3.3.1

Clause F2 - HAZARDOUS BUILDING MATERIALS

Performance F2.3.1

Clause H1 ENERGY EFFICIENCY

Performance H1.3.1 (a) and H1.3.2E.

ACOUSTIC PERFORMANCE

Eliment wall insulation acts as a natural and effective sound barrier. It minimises sound transfer. Please contact one of our Eliment Insulation representatives for further information relating to acoustic performance.

THERMAL PERFORMANCE

The thermal resistance value was determined at mean temperature of 15°C as per AS/NZS 4859.1 : 2018. This assures users the products deliver the specified thermal resistance which contribute to the operational efficiencies of the building. Please refer to the table on 'Products Available' for more information on the thermal resistance values.

PRODUCT WARRANTY

This product is covered by a 70 year product warranty. For full details, please visit elimentinsulation.co.nz.

*Terms & conditions apply.



SPECIFICATION NOTES

The insulation material shall be Eliment wall insulation.

R ____ m² K/W ____ x ____ x ____ mm (specify material R-value, width, length, thickness) as manufactured by PGF Insulation.

PRODUCT AVAILABLE

R- Value (m ² K/W)	Thickness (mm)	Width (mm)	Length (mm)	Piece Per Pack	Packs Per Bale	Area Per Pack (m ²)
R2.2	90	560	1140	16	8	10.21
		580				10.58
R2.4	90	560	1140	12	8	7.66
		580				7.93
R2.6	90	560	1140	10	8	6.38
		580				6.61
R2.8	90	560	1140	7	8	4.47
		580				4.63
R3.2	140	560	1140	13	8	8.30
		580				8.60
R3.6	140	560	1140	9	8	5.75
		580				5.95
R4.1	140	560	1140	6	8	3.83
		580				3.97

Technical specifications as shown in this literature are intended to be used as general guidelines only. The physical and chemical properties of glass wool insulation listed herein represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Any references to numerical flame spread or smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Warranty and liability upon delivery shall be in accordance with our General Terms and Conditions. No responsibility is assumed for the correctness of this information. Version of 18th May 2022.

Another Quality Product
Manufactured by :



PGF Insulation Sdn. Bhd.
2449, Lorong Perusahaan Sepuluh



AS/NZS



CodeMark

Certificate no: CMNZ70114

Version: 6

Original issue date: 08 September 2021

Version date: 12 December 2023

1. Certificate Holder Details

**PGF INSULATION SDN BHD**

2449, Lorong Perusahaan Sepuluh Kawasan
Perusahaan Perai 13600, Perai Penang, Malaysia
info@ecowool.com.my
+604 390 8460
www.elimentinsulation.co.nz

2. Product Certification Body

Bureau Veritas Australia Pty Ltd

11/500 Collins Street
Melbourne VIC 3000 Australia
product.certification@bureauveritas.com
Ph: 1800 855 190
www.bureauveritas.com.au

Complaints: The complaints process for this
certificate can be found here:
www.bureauveritas.com.au/your-feedback

Sam Guindi – Bureau Veritas Product Certification Manager

**BUREAU
VERITAS**

Product Certificate

ELIMENT® Insulation - Glass Mineral Wool Insulation

3. Description of Building Method or Product

Name of the product or method in Aotearoa New Zealand, including any brand names used. Description of what it is and the components that make up any system and its physical attributes including the materials and make-up of the product, where applicable. Matters that should be taken into account in the use or application of the building method or product can be found in item 6. Conditions and Limitations of Use. Continuation of description can be found in item 10 – Supporting Information about Description. [Delete if not applicable]. The building method's or building product's catalogue or model identification number or numbers or other unique identifiers that might be used to identify the building product or building method

ELIMENT® Insulation - Glass Mineral Wool Insulation is a non-combustible resin bonded glass mineral wool thermal insulation material. It is supplied in blanket form (ELIMENT® Insulation Blanket) and slab form (ELIMENT® Insulation Slab).

4. Intended use of Building Method or Product

Intended use of the building method or product as described in the product manual and other instructional materials. A statement of the function or purpose of the building method or product. Continuation of intended use can be found in item 11 – Supporting Information about Intended use. [Delete if not applicable]

ELIMENT® Insulation - Glass Mineral Wool Insulation is suitable for installation in walls and ceilings in new and existing timber and steel framed buildings.

5. New Zealand Building Code Provisions

The performance clauses of the New Zealand Building Code that are relevant to the intended use and with which the building method or product complies or contributes to (where used as part of a system).

How the building method or product complies or contributes can be found in item 8. Basis for Certification. Any qualifications on the extent of that compliance can be found in item 6. Conditions and limitations of use.

Clause B2 Durability: Performance Clauses B2.3.1 (a)

Clause C3 Fire affecting areas beyond the fire source: Performance Clauses C3.7 (a) (contributes to)

Clause E3 Internal moisture: Performance Clauses E3.3.1 (contributes to)

Clause F2 Hazardous building materials: Performance Clauses F2.3.1

Clause H1 Energy efficiency: Performance Clauses H1.3.1 (a), H1.3.2E (contributes to)



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70114

Version: 6

Original issue date: 08 September 2021

Revision date: 12 December 2023

Product Certificate

ELIMENT® Insulation - Glass Mineral Wool Insulation



6. Conditions and Limitations of Use

The building method or product's use is to be in accordance with the installation instructions and requirements against which the building method or product was assessed.

Conditions or limitations of conformity for the performance requirements the building method or product is compliant with, including any requirements for people with the qualifications and skills to install or use the building method or product, any known or demonstrated situations where the building method or product should not be used. A statement as to whether there are any matters that should be taken into account in the use or application of the building product or building method and, if so, what those matters are.

1. ELIMENT® Insulation - Glass Mineral Wool Insulation is certified for use in any building located in any climate zone (as defined Acceptable Solution H1/AS1 Appendix C).
2. ELIMENT® Insulation - Glass Mineral Wool Insulation shall be installed in accordance with the installation instructions applicable to the product:
 - ELIMENT® Ceiling Blanket Installation Instructions version BCII6899, 29 September 2023
 - ELIMENT® Ceiling Slab Installation Instructions version SCII6899, 29 September 2023
 - ELIMENT® Wall Blanket Installation Instructions version BWII6899, 1 June 2021
 - ELIMENT® Wall Slab Installation Instructions version SWII6899, 13 September 2023
3. ELIMENT® Insulation - Glass Mineral Wool Insulation shall:
 - a. be separated by 25 mm minimum from any rigid roof substrate or flexible roof underlay
 - b. remain dry during installation and throughout the life of the building
 - c. Avoid blocking ceiling vents and take care around downlights and other sources of heat. Check downlight compliance labels and manufacturer's installation instructions before installing around and over downlights, as well as NZS4246:2016 for recommended clearances for different downlight ratings.

7. Health and Safety Information

Health, safety, and well-being declarations associated with installation, maintenance, and use of the building method or product, and their specific editions and dates necessary to ensure the performance requirements of clauses F1 to F9 of the Building Code can be met.

The compliance with any manufacturer's installation instructions, maintenance, OH & S Statements, MSDS's and other Health and Safety declarations will provide the necessary Health and Safety Information pertaining to the product.

8. Basis for Certification

How the performance requirements in the Building Code were met for each of the provisions. Where used as part of a system, the specific contribution to compliance.

B2 Durability - By testing and comparison with Verification Method B2/VM1

C3 Fire affecting areas beyond the fire source - By analysis and comparison with Verification Method C/VM2

E3 Internal moisture - By comparison with Acceptable Solution E3/AS1

F2 Hazardous building materials - By comparison with the performance requirements of Building Code clause F2.3.1

H1 Energy efficiency - By testing and comparison with Acceptable Solution H1/VM1



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70114

Version: 6

Original issue date: 08 September 2021

Revision date: 12 December 2023

Product Certificate

ELIMENT® Insulation - Glass Mineral Wool Insulation

BUREAU
VERITAS

9. Supporting Documentation for Certification

Reference to any acceptable solutions, verification methods, New Zealand Standards, or other compliance pathways referenced against each individual performance requirement the building method or product is compliant with, and their specific version and date. Reference to documents describing tests and evaluations and any other documents relied on for certification or used to prove compliance, including their full title, specific version and date.

1. Acceptable Solutions and Verification Methods for New Zealand Building Code Clause B2 Durability Second edition (Amendment 12), 28 November 2019
2. C/VM2 Verification Method: Framework for Fire Safety Design For New Zealand Building Code Clauses C1-C6 Protection from Fire (Amendment 6), 5 November 2020
3. Acceptable Solutions and Verification Methods for New Zealand Building Code Clause E3 Internal Moisture Second edition (Amendment 7), 5 November 2020
4. H1 Energy Efficiency, Acceptable Solution H1/AS1, Energy efficiency for all housing, and buildings up to 300 m², Fifth edition Amendment 1, 4 August 2022
5. TUD SUD Test Report No. 7191263506-MEC21-YWA, Non-combustibility test on Ecowool Brownie V2 roofing blanket insulation material, 30 July 2021
6. CETEC VOC Emission Test Certificate, 21 July 2021
7. R&D Services Test Report RD16031-R2 Thermal Resistance Test Report 25 mm Brownie EWBL, 1 February 2016
8. TUV Test Report No.719083340-MEC14/01-TYK Thermal Conductivity Brownie EWBL 1.35 50 mm, 24 March 2014
9. TUV Test Report No.719083340-MEC14/02-TYK Thermal Conductivity Brownie EWBL 1.45 50 mm, 24 March 2014
10. R&D Services Test Report RD16714 Thermal Resistance Test Report 50 mm Brownie EWBL 1.60, 14 December 2016
11. R&D Services Test Report RD15720-R2 Thermal Resistance Test Report Brownie Rigislab 50 mm, 15 December 2015
12. R&D Services Test Report RD19581-R2 Thermal Resistance Test Report Brownie Wall Slab R3.2, 5 August 2019
13. R&D Services Test Report RD19582-R2 Thermal Resistance Test Report Brownie Wall Slab R3.6, 5 August 2019
14. R&D Services Test Report RD19580-R2 Thermal Resistance Test Report Brownie Wall Slab R4.1, 5 August 2019
15. BRANZ Report DI0518/DU01 Thermal Resistance of Polyglass Fibre Insulation R3.2, 27 August 2015
16. BRANZ Report DI0518/DU03 Thermal Resistance of Polyglass Fibre Insulation R2.2, 18 September 2015
17. BRANZ Report DI0518/DU04 Thermal Resistance of Polyglass Fibre Insulation R2.6, 22 September 2015
18. BRANZ Report DI15702-01 Thermal Resistance of ELIMENT® Insulation Ceiling Slab R3.6, 19 January 2022
19. BRANZ Report DI15702-02 Thermal Resistance of ELIMENT® Insulation Ceiling Slab R4.0, 27 January 2022
20. BRANZ Report DI17304-02 Thermal Resistance of ELIMENT® Insulation Ceiling Slab R7.0, 15 May 2023
21. James Fricker CPEng (Australia), Review of Thermal Insulation Tests, 27 November 2023.
22. ELIMENT® Insulation Ceiling Segment Data Sheet version CTDS, 21 July 2021
23. ELIMENT® Insulation Wall Segment Data Sheet version WTDS, 21 July 2021
24. ELIMENT® Ceiling Blanket Installation Instructions version BCII6899, 29 September 2023
25. ELIMENT® Ceiling Slab Installation Instructions version SCII6899, 29 September 2023
26. ELIMENT® Wall Blanket Installation Instructions version BWII6899, 1 June 2021
27. ELIMENT® Wall Slab Installation Instructions version SWII6899, 13 September 2023



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70114

Version: 6

Original issue date: 08 September 2021

Revision date: 12 December 2023

Product Certificate

ELIMENT® Insulation - Glass Mineral Wool Insulation



10. Supporting Information About Description (Optional)

Any supporting information for section 3.

WALL - Slab Products for ELIMENT® Insulation Glass Mineral Wool Insulation - R Value@15°C

- R2.2 90mm x 0.58m x 1.14m
- R2.4 90mm x 0.58m x 1.14m
- R2.6 90mm x 0.58m x 1.14m
- R2.8 90mm x 0.58m x 1.14m
- R3.2 140mm x 0.58m x 1.14m
- R3.6 140mm x 0.58m x 1.14m
- R4.1 140mm x 0.58m x 1.14m

- R2.2 90mm x 0.56m x 1.14m
- R2.4 90mm x 0.56m x 1.14m
- R2.6 90mm x 0.56m x 1.14m
- R2.8 90mm x 0.56m x 1.14m
- R3.2 140mm x 0.56m x 1.14m
- R3.6 140mm x 0.56m x 1.14m
- R4.1 140mm x 0.56m x 1.14m

WALL - Blanket Products for ELIMENT® Insulation Glass Mineral Wool Insulation - R Value@15°C

- R1.8 75mm x 1.2m x 12m
- R2.2 90mm x 1.2m x 13m
- R2.4 90mm x 1.2m x 10m
- R2.6 90mm x 1.2m x 7m
- R2.8 90mm x 1.2m x 5m
- R3.6 140mm x 1.2m x 5m

CEILING - Slab Products for ELIMENT® Insulation Glass Mineral Wool Insulation - R Value@15°C

- R3.6 165mm x 0.432 m x 1.22m
- R4.0 195mm x 0.432m x 1.22m
- R5.0 230mm x 0.432m x 1.22m
- R6.0 278mm x 0.432m x 1.22m
- R7.0 285mm x 0.432m x 1.22m
- R7.0 285mm x 0.60m x 1.2m



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

Certificate no: CMNZ70114

Version: 6

Original issue date: 08 September 2021

Revision date: 12 December 2023

Product Certificate

ELIMENT® Insulation - Glass Mineral Wool Insulation



- R7.0 285mm x 0.46m x 1.22m
- R7.0 2 layers of 165mm x 0.432m x 1.22m (total thickness 330mm, effective thickness 320mm)

CEILING – Blanket Products for ELIMENT® Insulation Glass Mineral Wool Insulation - R Value@15°C

- R2.7 120mm x 1.2m x 10m
- R2.9 130mm x 1.2m x 10m
- R3.3 145mm x 1.2m x 8.5m
- R3.6 160mm x 1.2m x 10m
- R4.0 180mm x 1.2m x 8m

MASONRY - Blanket Products for ELIMENT® Insulation Glass Mineral Wool Insulation - R Value@15°C

- R1.0 40mm x 1.2m x 30m
- R1.3 50mm x 1.2m x 15m
- R1.3 55mm x 1.2m x 30m

Refer to the ELIMENT® Insulation Data Sheets, 21 July 2021 for details of these products.

11. Supporting Information About Intended Use (Optional)

Any supporting information for section 4.

N/A

12. Supporting Information About Conditions and Limitations of Use (Optional)

Any supporting information for section 6.

N/A

All CodeMark certificates that are current must be registered with MBIE. MBIE maintains a register of valid product certificates. [Please find the register here.](#)

If the certificate is not listed on this register or it appears as (SUSPENDED), it is not a valid CodeMark certificate and does not have to be accepted by a building consent authority as establishing compliance with the New Zealand Building Code.



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.



ECOPLY®
STRUCTURAL

FLOORING

ECOPLY®
STRUCTURAL

ROOFING

ECOPLY®
STRUCTURAL

Square
EDGE

ECOPLY®
STRUCTURAL

BARRIER

SDC - Approved Building Consent Document - BC240357 - Pg 285 of 402 - 19/03/2024 - warreg

ECOPLY® SPECIFICATION & INSTALLATION GUIDE

OCTOBER 2022



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® SPECIFICATION & INSTALLATION GUIDE

Contents

1.0 Ecoply® Product Range	3
1.1 Technical Information & CAD Details	3
1.2 Product Description & Range.....	4
1.3 Surface Grades.....	5
1.4 Preservative Treatment.....	6
1.5 Section Properties.....	7
1.6 Product Identification.....	8
1.7 Code Compliance	9
1.8 General Design Considerations	9
1.9 Sustainability	11
1.10 Health & Safety.....	11
1.11 Storage & Handling	11
2.0 General Installation Guide.....	12
2.1 Framing	12
2.2 Sheet Fasteners & Fixing.....	12
2.3 Adhesives.....	14
3.0 Structural Bracing & Ceiling Diaphragms	15
3.1 Design to Comply with the New Zealand Building Code	15
3.2 Ecoply Bracing Specifications Summary.....	17
3.3 Ecoply Bracing Specification - EPI.....	18
3.4 Ecoply Bracing Specification – EPG.....	20
3.5 GIB Handibrac® – Recommended Installation Method	22
3.6 Structural Ceiling Diaphragms.....	22
4.0 Roofs & Decks.....	23
4.1 Flexible Membrane Systems	23
4.2 Roof Tile Systems	24
4.3 Roofing & Decking – Product Selection Guide	24
4.4 Frame Spacings for Ecoply Roofs & Decks.....	25
4.5 Roofing – Design Considerations.....	26
4.6 Roofing – Installation.....	28
5.0 Flooring.....	30
5.1 Flooring – Range	30
5.2 Flooring – Installation.....	30
5.3 Flooring – Finishing.....	31
6.0 Frequently Asked Questions	32
7.0 References & Sources of Information.....	34
8.0 Limitations	34
9.0 Historical Ecoply Section Properties.....	35



1.0 ECOPLY® PRODUCT RANGE

Manufactured in New Zealand 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. All Ecoply products carry Engineered Wood Products Association of Australasia (EWPA) Joint Accreditation System - Australia and New Zealand (JAS-ANZ) certification.

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 October 2022. 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 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 radiata pine wood veneers. The veneers are placed at right angles to each other for maximum strength and stability then bonded together with synthetic phenolic (PF) resin to form a strong and permanent Type A bond.

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 F8/F8.
 - For Ecoply plywood products 17mm thick and above most products are F8/F5.
 - Ecoply 19mm Longspan Flooring is F1 I/F8 stress grade (See Tables 1, 4 and 5). Other Ecoply products are also available in F1 I/F8 upon request.

- Thickness - ranging from 7mm to 25mm. (Thicknesses above 25mm subject to availability).
- 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	BD			●		●	●	●		●							
	CD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	DD	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ecoply Flooring (pt)	CD							●	●	●	●	●	●	●	●		●
Ecoply Roofing (pt) ¹	DD							●	●								

● Available untreated only

● Available either untreated or H3.2 CCA

● Available either untreated or H3.1 LOSP

pt Machine grooves on both long edges with a plastic polypropylene tongue in one groove, 1200mm cover.

I Ecoply 15mm Roofing and Ecoply 19mm Longspan Flooring are supplied as standard in F1 I/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.
- Other Ecoply products are also available in F1 I/F8 upon request.

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 B	Face Grade C	Face Grade D
		
Appearance grade with a solid sanded surface. Suitable for a higher quality finish. Possible Uses: - Furniture/Joinery/Signs - Interior Linings - Sheathing - Engineering components where a superior visual finish is required	Solid sanded surface with filled holes and splits, with intergrown knots. Suitable for a basic paint finish. Possible Uses: - Structural gussets - Stressed skin panels - Bins, boxes, crates - Hoardings - Membrane substrate	Non appearance grade allowing open imperfections up to 75mm across the face veneer. Splits and knots allowable. Possible Uses: - 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. Features void free second layer under the face veneer for increased protection against high point loads. Possible Uses: - Substrate for flooring overlays such as linoleum, tiles and rigid coverings - Substrate for membrane roofing and decking where visible appearance is critical	Unfilled D grade surface with tongue and groove profile on long edges. Possible Uses: - 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. H3.1 LOSP is the standard preservative treatment for BD Structural Square Edge products and by special request for other Ecoply plywood products.

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 except for Ecoply® BD	Treated to order for CD, DD, flooring and roofing products. Standard treatment for Ecoply BD
Applications (Refer NZ3602)	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								
Nominal Plywood Thickness ² (mm)	ID Code ²	Mass (kg/m ²)	Parallel to the Face Grain			Perpendicular to the Face Grain		
			Parallel Moment of Inertia (mm ⁴)	Section Modulus Z (mm ³)	Shear Constant ³ I/Q (mm ²)	Perpendicular Moment of Inertia I (mm ⁴)	Section Modulus Z (mm ³)	Shear Constant ³ I/Q (mm ²)
7	7-24-3	4.0	30.0	8.3	5.2	2.0	1.7	2.3
9	9-30-3	5.0	58.6	13.0	6.4	4.0	2.7	2.9
12	12-24-5	6.6	115.0	19.2	9.3	33.4	9.3	5.4
15	15-30-5	8.3	225.0	29.9	11.6	65.2	14.5	6.8
17	17-38-5	9.2	367.4	42.0	13.2	84.8	15.1	7.2
19	19-38-5	10.6	456.3	47.7	14.8	132.5	20.9	9.2
21	21-38-6	11.6	626.2	58.6	15.4	191.7	25.4	10.9
25	25-38-7	13.5	991.6	78.6	17.9	349.6	36.8	13.7

Table 4B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design

Nominal Strengths (Limit States) per mm width								
Nominal Plywood Thickness ² (mm)	ID Code ²	Stress Grade	Parallel to the Face Grain			Perpendicular to the Face Grain		
			Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm ²)	Rolling Shear f _{pr} I/Q (N)	Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm)	Rolling Shear f _{pr} I/Q (N)
12	12-24-5	F8/F8	1046.5	480.0	15.6	303.9	231.8	9.8
15	15-30-5	F8/F8	2047.5	747.5	19.5	593.3	362.5	11.4
15	15-30-5	F11/F8	2362.5	926.9	20.9	593.3	362.5	11.4
17	17-38-5	F8/F5	3343.3	1050.0	22.2	585.1	211.4	10.7
17	17-38-5	F11/F8	3857.7	1302.0	23.8	771.7	377.5	12.3
19	19-38-5	F8/F5	4152.3	1192.5	24.9	914.3	292.6	12.1
19	19-38-5	F11/F8	4791.2	1478.7	26.6	1205.8	522.5	14.0
21	21-38-6	F8/F5	5698.4	1465.0	25.9	1322.7	355.6	16.1
25	25-38-7	F8/F5	9023.6	1965.0	30.1	2412.2	515.2	20.3

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, B and C 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 AS 1720 for the design of timber components. The characteristic strengths in Table 5 have been used to provide the nominal strengths in Tables 4B and 4C.

Table 5: Structural Properties of Ecoply® Plywood

Stress Grade	Characteristic Strength MPa		
	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_{pn})		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, the section properties are multiplied by stresses and 'k' and ϕ factors to determine resistances for limit states design.

Resistances and nominal strengths in Tables 4B and 4C assume all 'k' factors are equal to 1.0. Multiply tabled values by the strength reduction factor ϕ and 'k' factors for specific in-service conditions for design to a structural code such as NZS 3603.

Table 5A: Strength Reduction Factors

Structural Timber Material	Application of Structural Member		
	Category 1	Category 2	Category 3
	Structural members for houses for which failure would be unlikely to affect an area ¹ greater than 25m ² ; OR Secondary members in structures other than houses	Primary structural members in structures other than houses; OR Elements in houses for which failure would be likely to affect an area ¹ greater than 25m ²	Primary structural members in structures intended to fulfil essential services or post disaster function
	Value of Strength Reduction Factor ϕ		
Structural Plywood – AS/NZS 2269.0	0.95	0.85	0.75

¹ In this context area should be taken as plan area.

1.6 PRODUCT IDENTIFICATION

In accordance with AS/NZS 2269, Ecoply structural plywood sheets have the following information marked on the back:

- Brand name: 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).
- The Engineered Wood Products Association of Australasia (EWPA) brand and mill number: e.g. 911 (Tokoroa mill).

Untreated example:

ECOPLY® CD FLOORING STRUCTURAL
19-30-7 A BOND E0 AS/NZS 2269.0:2012
PAT 01/12/15 12:23:45 F11/F8



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.

Treated example:

ECOPLY CD STRUCTURAL
25-30-9 A BOND E0 AS/NZS 2269.0:2012
AS/NZS 1604.3:2012 046 01 H3 E CCA
RETREAT CUTS PAT 01/12/15 12:23:45 F8/F8



1.7 CODE COMPLIANCE

Ecoply® plywood manufacture is third-party audited through the product quality control programme of the Engineered Wood Products Association of Australasia (EWPAA) which is itself audited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).

CHH Plywood is licensed by the EWPAA to stamp plywood with the EWPAA/JAS-ANZ Product Certification Mark. This certifies it has been manufactured under the third party audited Joint Product Certification programme to monitor compliance with joint Australian/New Zealand Standard AS/NZS 2269 Plywood – Structural. Plywood to this standard 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 PSI-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 softwood solid radiata pine 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 E₀).

Actual formaldehyde emissions for Ecoply plywood have been tested and approved as having an actual formaldehyde emission level of less than 0.3mg/litre (equivalent to a Super E₀ emission level).

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 decorative or 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.

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

The following data on early fire hazard properties of uncoated Ecoply plywood are the result of tests carried out by Australian Wool Testing Authority AWTA to test structural plywood manufactured to AS/NZS 2269 in accordance with ISO 5660, reaction to fire tests (heat release, smoke production and mass loss rate). Part 1: Heat Release rate (cone calorimeter method).

Table 6 summarises the test configurations and associated material groups.

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.

Table 6: Early Fire Hazard Properties of Ecoply® Plywood

Material	Species	Origin	Thickness	Treatment	Material groups
Plywood	Radiata Pine	New Zealand	7mm	CCA Treated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	12mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	Untreated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	LOSP Treated	Group 3
Plywood	Radiata Pine	New Zealand	19mm	CCA Treated	Group 3

1.9 SUSTAINABILITY

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

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

Ecoply is manufactured in New Zealand at CHH Plywood.

Ecoply is available Forest Stewardship Council® (FSC®) certified (FSC® C012019) upon request.

1.10 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.

1.11 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.

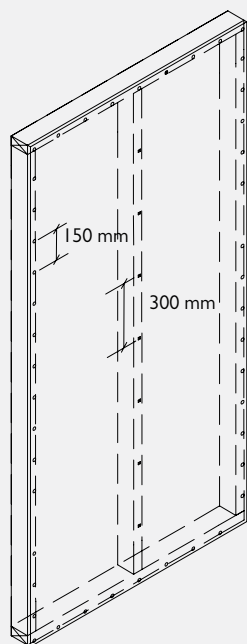
For plywood used as exterior cladding refer to the current Shadowclad® Specification and Installation Guide for Cavity Construction which can be downloaded from www.chhpoly.co.nz.

For plywood used as a rigid air barrier refer to the current Ecoply Barrier Specification and Installation Guide which can be downloaded from www.chhpoly.co.nz.

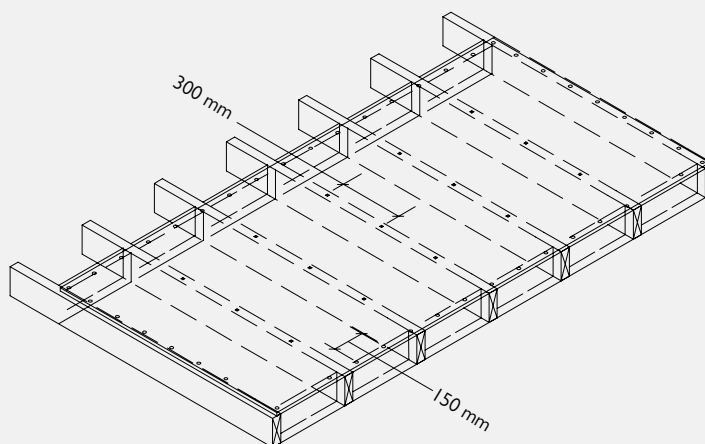
2.2 SHEET FASTENERS & FIXING

- 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 3 fastener diameters or 7mm from the edge of the sheet.
- 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

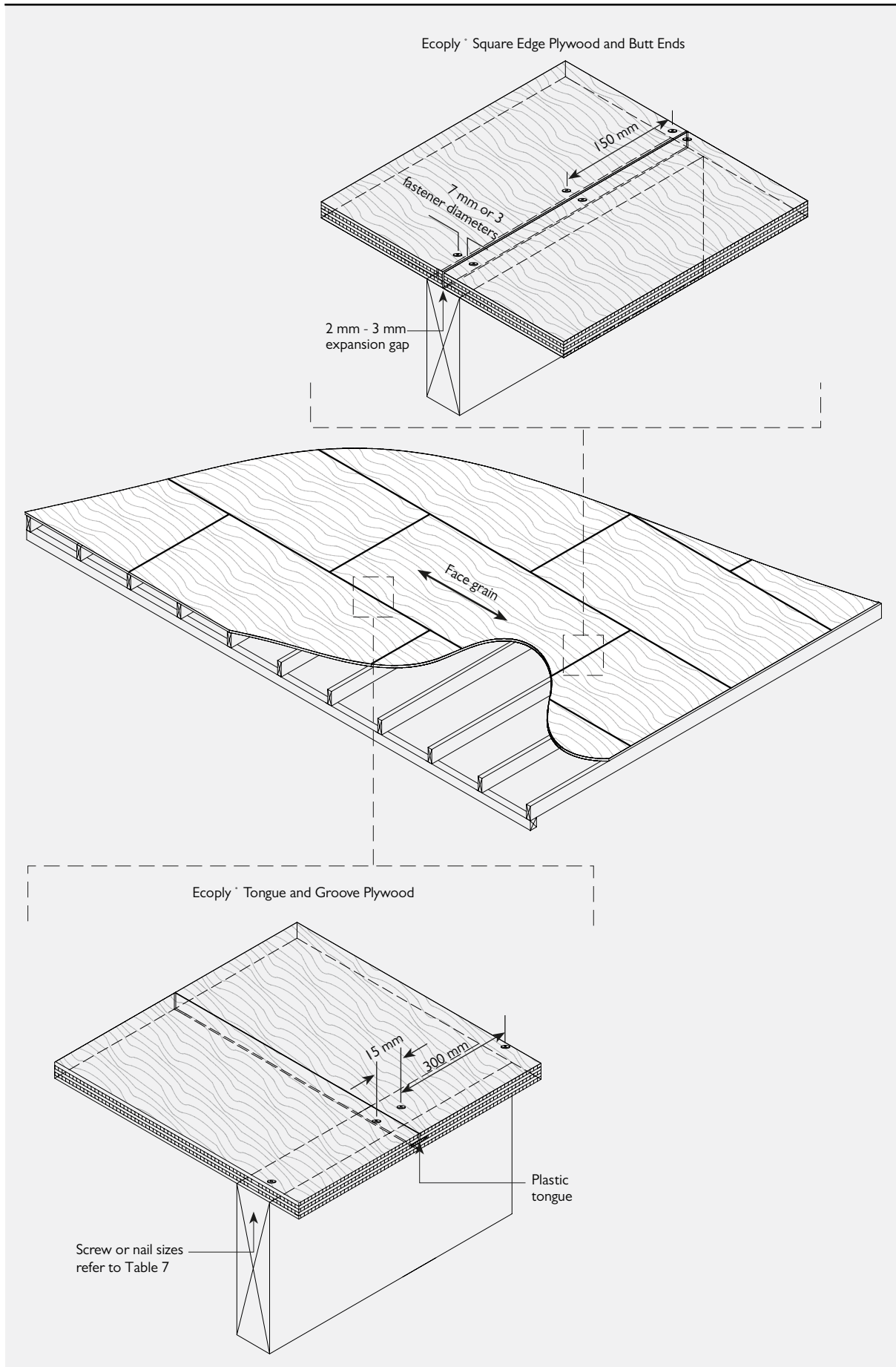


Table 7: Fasteners and Characteristic Shear Loads for Ecoply®

Nominal Thickness (mm)	7mm 9mm	Load¹	12mm 15mm	Load¹	17mm	Load¹	19mm 21mm	Load¹	25mm	Load¹
Minimum nail size in timber framing²	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 framing²	8g x 30mm	1230	8g x 40mm	1230	10g x 40mm	1650	10g x 45mm	1650	10g x 50mm	1650
1.15mm steel framing³	10-24-35⁴	1300	10-24-40⁴	2000	10-16-45⁴	2100	10-16-45⁴	2100	10-16-45⁴	2100
Screw size in 2.80mm steel framing³	10-24-35⁴	1200	10-16-40⁴	1200	14-20-45⁴	3000	14-20-45⁴	4000	14-20-45⁴	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 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 advice on fixing and treatments.

2.3 ADHESIVES

Tube Applied Construction Adhesives

Site applied construction adhesives 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 Nailpower®) and elastomeric (e.g. Bostik® Wallboard Gold) based adhesives.

Elastomeric adhesives should meet the requirements of APA Performance specification AFG 01 Adhesives for field gluing plywood to wood framing. Other types should have appraisal from an independent authorising body such as BRANZ or equivalent authorities for the specific applications 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 glue line 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. Contact CHH Plywood on 0800 326 759 for further information.

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 - BI 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.

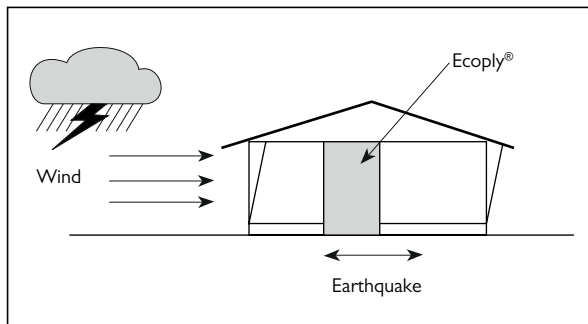
3.1 DESIGN TO COMPLY WITH THE NEW ZEALAND BUILDING CODE

Structure

Timber framed buildings to NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under Clause 3.0 Timber in Acceptable Solution BI/ASI Structure.

CHH Plywood have developed a range of wall bracing elements tested using P2.I 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 BI/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 120BU/m. This does not exclude the installation of bracing elements that are rated higher than 120BU/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 120BU/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 I 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.

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:

- For wall bracing elements of heights other than 2.4m, the bracing rating determined by test or from Table 9 should be multiplied by $2.4 \div \text{element height in metres}$, except that elements less than 2.4m high shall be rated as if they are 2.4m high.
- Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height."
- 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 (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).

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 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

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, or waste pipe outlets of max. 150mm diameter placed at no closer than 150mm to the edge of the braced element.

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	BU's/m Wind	BU's/m Earthquake
EPI	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 by Carter

Holt Harvey 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.

OCTOBER 2022

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
EPI_0.4	0.4m	Ecoply® one side	80	95
EPI_0.6	0.6m	Ecoply one side	95	105
EPI_1.2	1.2m	Ecoply one side	120	135

Framing

Wall framing must comply with:

- NZBC B1 - Structure: ASI Clause 3 Timber (NZS 3604).
- NZBC B2 - Durability: ASI 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® or 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.

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.

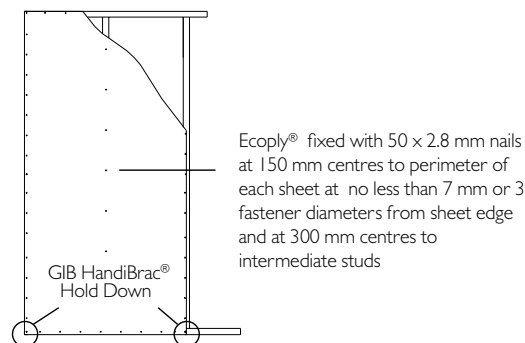
Fasteners for H3.2 CCA Treated Ecoply Panels

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® 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/ASI Structure. Testing was carried out using Ecoply manufactured by Carter

Holt Harvey 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.

OCTOBER 2022

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 by Carter

Holt Harvey 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.

OCTOBER 2022

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: ASI Clause 3 Timber (NZS 3604).
- NZBC B2 - Durability: ASI 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.

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

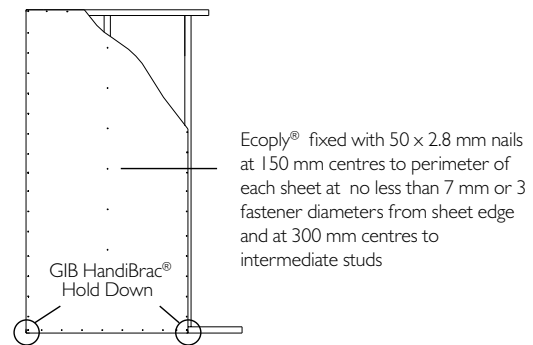
Fasten with 50 x 2.8mm hot dipped galvanised or stainless steel flat head nails for direct fix. Place fasteners no less than 7mm or 3 fastener diameters from sheet edges. Screws cannot be used. Power driven nails are suitable. Do not overdrive, nails must be full round head.

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® 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/ASI Structure. Testing was carried out using Ecoply manufactured by Carter

Holt Harvey 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.

OCTOBER 2022

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.

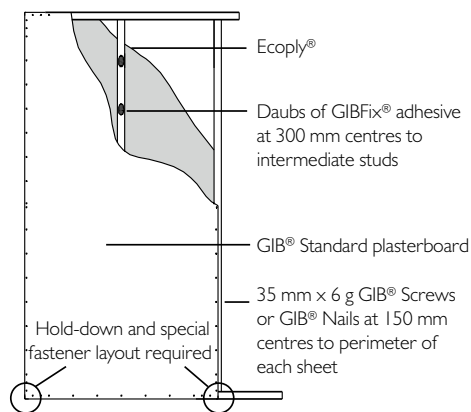


Table 13: Ecoply® Suitability for Bracing Applications Including Treatment Type and Fastener Material*

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 zones I 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 I 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.

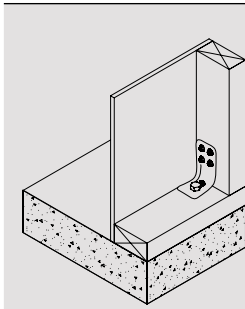
- The GIB HandiBrac® registered design provides for quick and easy installation.
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to

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.

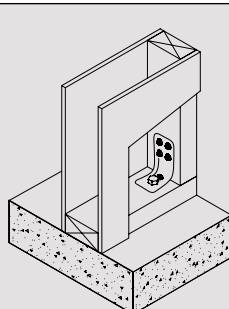
Concrete Floor

External Walls



Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate.

Internal Walls



Position GIB HandiBrac® at the stud/plate junction.

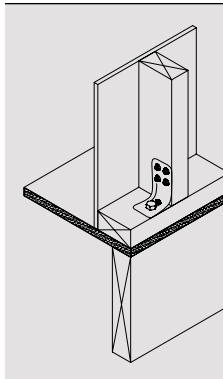
Hold-down Fastener Requirements

A mechanical fastening with a minimum characteristic uplift capacity of 15kN or screw bolt supplied with the bracket

Reproduced with the permission of Winstone Wallboards Ltd

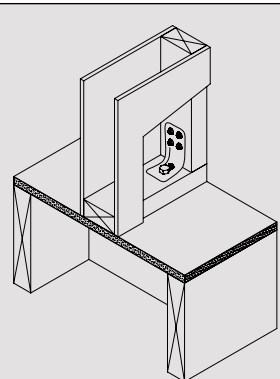
Timber Floor

External Walls



Position GIB HandiBrac® in the centre of the perimeter joist or bearer.

Internal Walls



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

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:

- Diaphragms not steeper than 25 degrees to the horizontal and not exceeding 12 metres long under light or heavy roofs and;
- Diaphragms not steeper than 45 degrees to the horizontal and not exceeding 7.5 metres long under light or heavy roofs.

Plywood ceiling diaphragms required to comply with NZS 3604 must be constructed as follows:

- The length of diaphragm shall not exceed twice its width measured between supporting walls.
- The ceiling lining must consist of plywood over the entire area of the diaphragm.
- Complete sheets with a minimum size of 1800 x 900 must be used.
- Framing size and spacing must comply with NZS 3604.
- Fastener size should comply with Table 7 of this guide. E.g. 40mm x 2.5mm flat head nails for 7mm and 9mm EcoPLY®.
- Fastening is at 150mm centres around the perimeter of each sheet and at 300mm centres to intermediate framing.
- Fixings are no closer than 10mm from sheet edges.
- 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.
- Sheets must be layed in a staggered pattern.
- 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 EWPA Technical Note; Plywood Roofing and Flooring: Installation and Detailing Factors. This can be downloaded from www.ewp.asn.au.

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' 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 I for range and treatment options		
Product Features	Blocking required to support all edges	Second void free layer under surface veneer for increased protection against punching through the first veneer under high point loads and increased moisture resistance. 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	600	800	800	900
		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 Ecopyl® With Face Grain Across Framing				
	Ecopyl 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 Ecopyl® With Face Grain Across Framing			
	Ecopyl Nominal Thickness (mm)			
	17	19	21	25
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 Ecopyl® 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. 3350mm² 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.

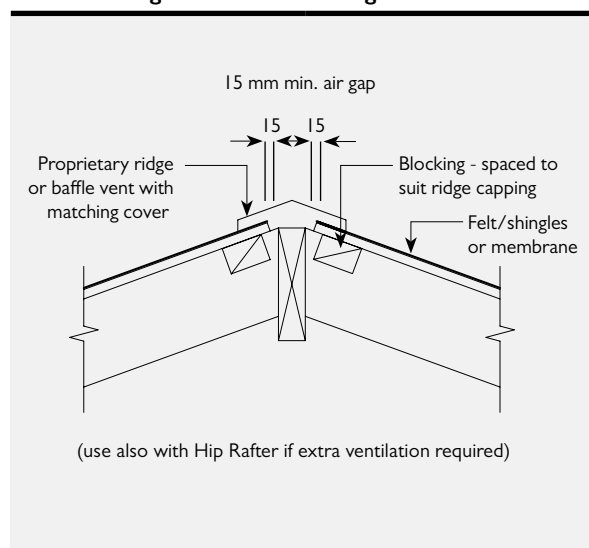
Bubbling

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 high visual finish is required.

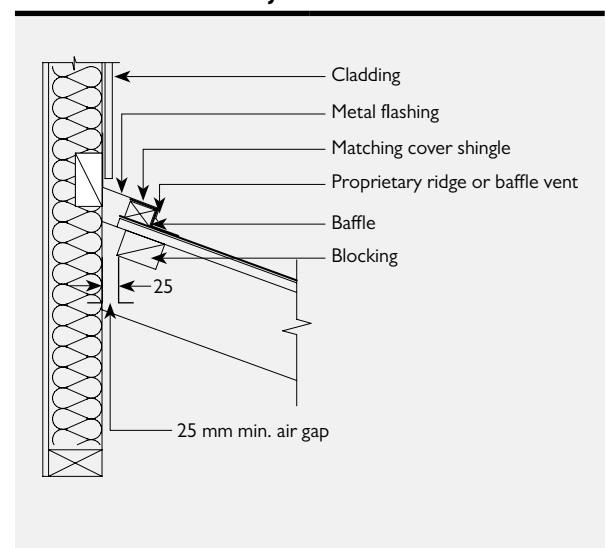
Soil

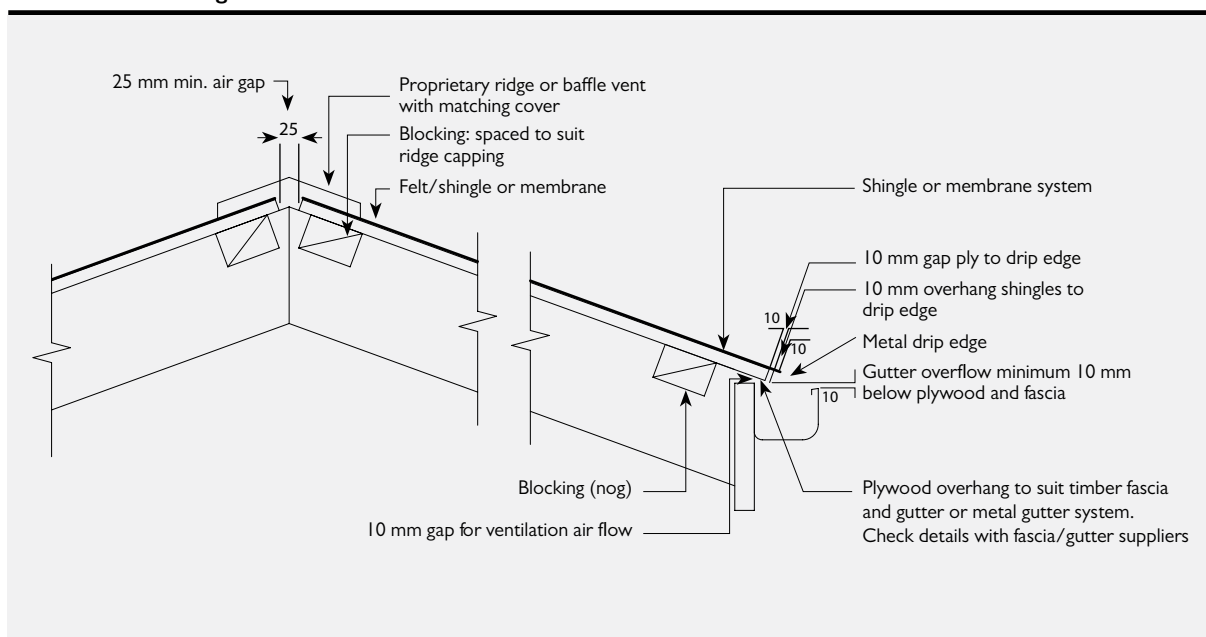
Ecoply plywood (untreated or H3.1 LOSP/H3.2 CCA treated) must not be allowed to come in contact with soil. Surfaces, flashings and gutters should be detailed to avoid trapping detritus and moisture.

EC003: Ridge Detail With Ridgeboard



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

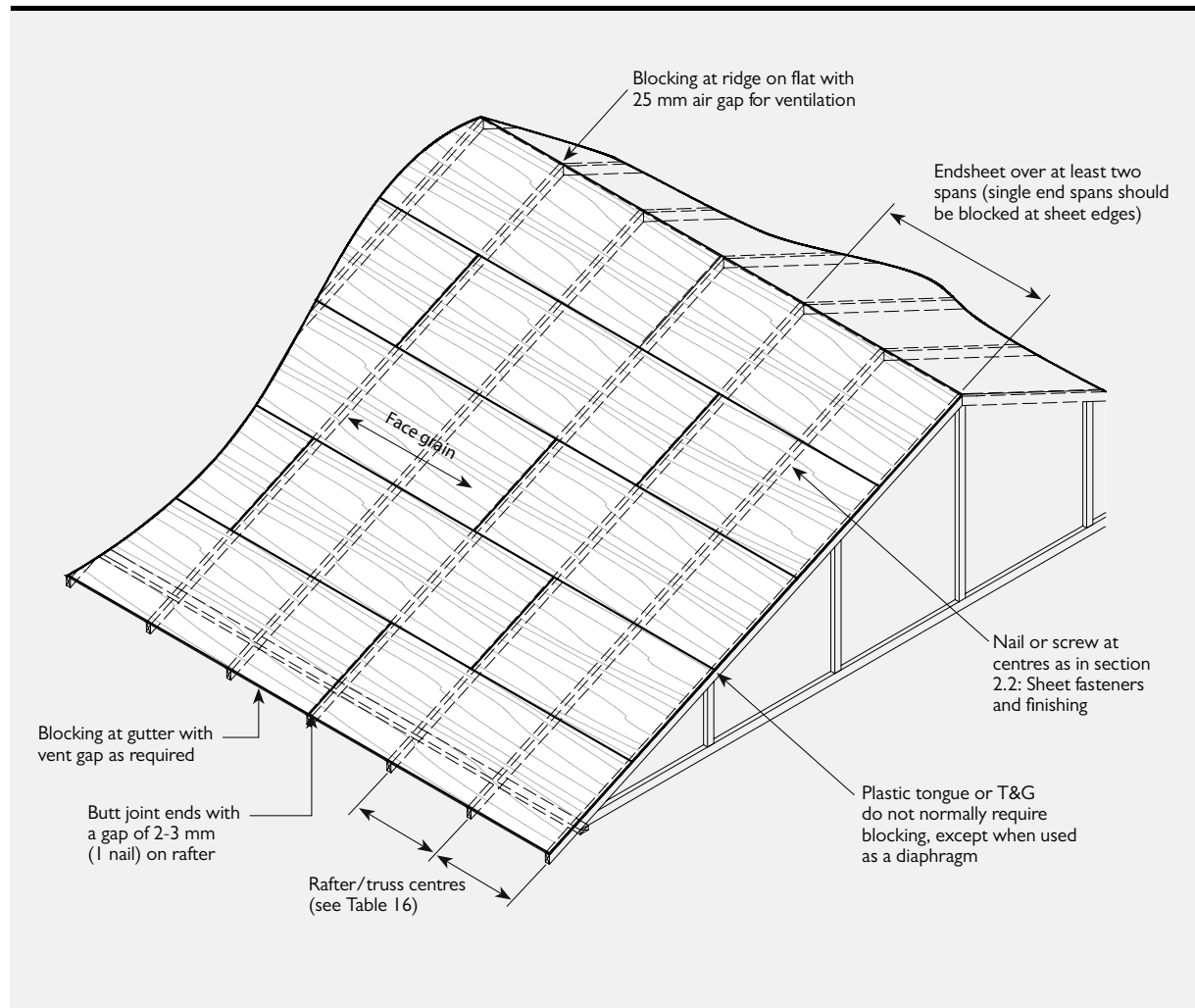
Frames should be at spacings to suit plywood thicknesses in Table 15A, page 25. Additional requirements for roof framing are:

- 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

- Ecoply Flooring features a void free second layer under the surface veneer for increased protection against moisture bubbles and punch through of the first veneer under high point loads than normal Ecoply Structural Square Edge plywood.
- 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.
- Sanded B grade surface is available in 19mm thickness (untreated only) for clear finish applications. Designers must expect the surface to dent or mark more easily than hardwood flooring systems as Ecoply is manufactured from relatively soft radiata pine.
- 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.

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

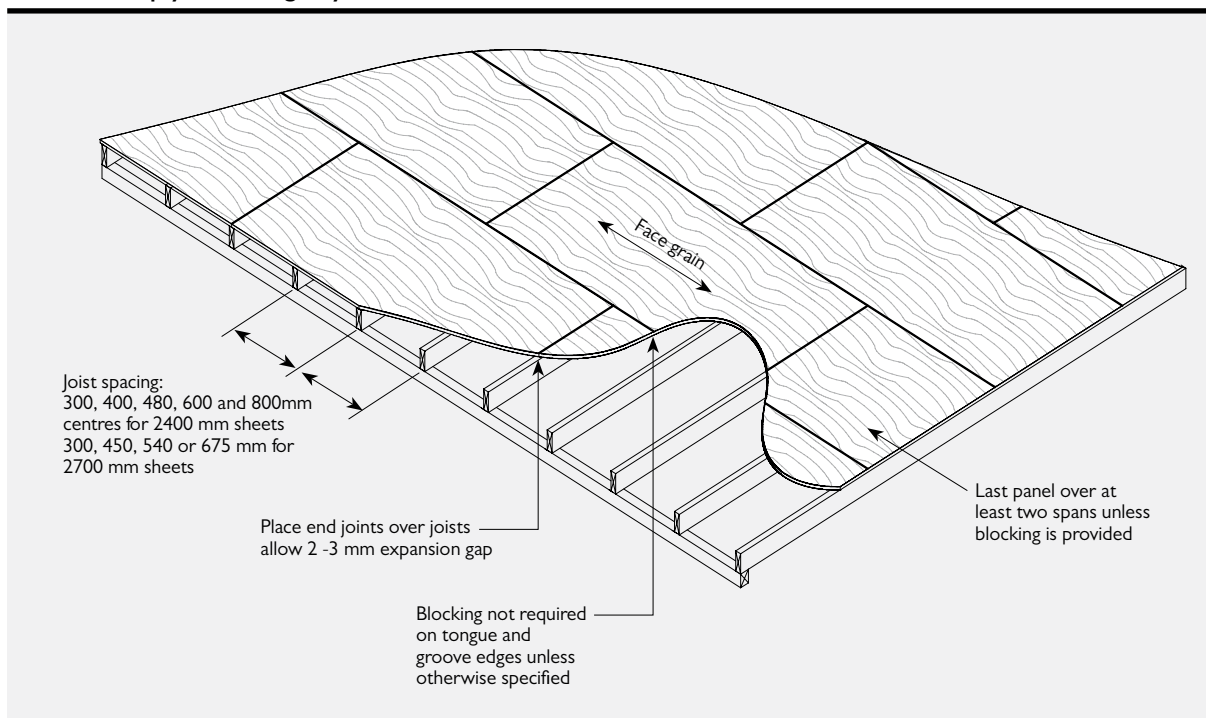
- Joist spacings should be at spacings to suit plywood thicknesses in Table 17.
- Use dry Laserframe®, hyJOIST® or hySPAN® framing to achieve a moisture content of 18% or less.

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 radiata pine 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 <http://www.paslode.co.nz/images/fix-app-CHH-Plywood.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 3 fastener diameters or 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/m²) 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: 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 the relevance of the EWPAA stamp?

A: Ecoply is manufactured under a third party audited, product quality control programme by the Engineered Wood Products Association of Australasia (EWPAA) to monitor compliance with AS/NZS 2269. Given that compliance with Standards is not actively policed by Standards New Zealand, this third party auditing provides important peace of mind for users and consumers of Ecoply plywood products.

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	EWPAA product certified ³

¹ Stress grades may vary between different manufacturers and products.

² Type A-bonds are suitable for permanent exposed applications and structural applications.

³ The EWPAA JAS-ANZ Product Certification Mark certifies that Ecoply® structural plywood products have been manufactured under a third party audited joint product certification programme to monitor compliance with AS/NZS 2269.

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. BD, 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 BD, Grooved Lining and 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 meets the lowest formaldehyde emission class (E₀ - less than 0.5mg/litre). Actual formaldehyde emissions have been tested to be less than 0.3mg/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 www.chhply.co.nz/document-library.
- 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".
- AS 1684:2010 "Residential Timber Framed Construction".
- US Product Standard PS1-95.
- Acceptable Solution 'E2/AS1 - External Moisture'.
- Acceptable Solution 'B2/AS1 - Durability'.
- BRANZ Bulletin 345: Flat membrane roofs – design and installation.
- BRANZ Bulletin 346: Flat membrane roofs – materials.
- BRANZ Bulletin 289: Asphalt shingle roofing.
- BRANZ Appraisals 307, 404, 411.
- 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).
- EWPA (www.ewp.asn.au).
- Product Technical Statement for Ecoply available online (www.chhply.co.nz/product-technical-statements).
- EWPA 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 October 2022 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.

9.0 HISTORICAL ECOPLY® SECTION PROPERTIES

Table 18A: Section Properties of Ecoply® Structural Plywood

Section Properties per mm width								
Nominal Plywood Thickness ¹ (mm)	ID code ²	Mass (kg/m ²)	Parallel to the Face Grain			Perpendicular to the Face Grain		
			Parallel Moment of Inertia (mm ⁴)	Section Modulus Z (mm ³)	Shear Constant ³ I/Q (mm ²)	Perpendicular Moment of Inertia I (mm ⁴)	Section Modulus Z (mm ³)	Shear Constant ³ I/Q (mm ²)
7	7-24-3	4.0	30.0	8.3	5.2	2.0	1.7	2.3
9	9-30-3	5.0	58.6	13.0	6.4	4.0	2.7	2.9
12	12-24-5	6.6	115.0	19.2	9.3	33.4	9.3	5.4
15	15-30-5	8.3	225.0	29.9	11.6	65.2	14.5	6.8
17	17-24-7	9.2	285.0	33.9	12.2	122.0	20.4	9.4
17	17-24-6	9.2	273.0	32.5	12.3	134.0	22.3	9.5
19	19-30-7	10.6	451.0	46.9	13.7	157.0	23.8	10.7
21	21-30-7	11.6	556.0	52.9	15.2	239.0	31.9	11.8
25	25-30-9	13.5	897.0	72.9	17.8	381.0	41.0	13.9

Table 18B: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F8/F8 Grade

Nominal Strengths (Limit States) per mm width							
Nominal Plywood Thickness ¹ (mm)	ID code ²	Parallel to the Face Grain (F8)			Perpendicular to the Face Grain (F8)		
		Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm)	Rolling Shear f _{pr} I/Q (N)	Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm)	Rolling Shear f _{pr} I/Q (N)
12	12-24-5	1046.5	480.0	15.6	303.9	231.7	9.2
15	15-30-5	2047.5	747.5	19.5	593.3	362.5	11.4
17	17-24-7	2593.5	847.5	20.5	1110.2	510.0	15.9
17	17-24-6	2484.3	812.5	20.7	1219.4	557.5	16.0
19	19-30-7	4104.1	1172.5	23.0	1428.7	595.0	18.0
21	21-30-7	5059.6	1322.5	25.5	2174.9	797.5	19.8
25	25-30-9	8162.7	1822.5	29.9	3467.1	1025.0	23.4

Table 18C: Nominal Strengths of Sections of Ecoply® Structural Plywood For Limit States Design: F11/F8 Grade (Including Longspan Flooring)

Nominal Strengths (Limit States) per mm width							
Nominal Plywood Thickness ¹ (mm)	ID code ²	Parallel to the Face Grain (F11)			Perpendicular to the Face Grain (F8)		
		Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm)	Rolling Shear f _{pr} I/Q (N)	Bending Stiffness EI (1000 Nmm ²)	Bending Moment f _{pb} Z (Nmm)	Rolling Shear f _{pr} I/Q (N)
12	12-24-5	1207.5	595.2	16.7	303.9	231.7	9.2
15	15-30-5	2362.5	926.9	20.9	593.3	362.5	11.4
17	17-24-7	2992.5	1050.9	22.0	1110.2	510.0	15.9
17	17-24-6	2866.5	1007.5	22.1	1219.4	557.5	16.0
19	19-30-7	4735.5	1453.9	24.7	1428.7	595.0	18.0
21	21-30-7	5838.0	1639.9	27.4	2174.9	797.5	19.8
25	25-30-9	9418.5	2259.9	32.0	3467.1	1025.0	23.4

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:

- Use Tables 18A and B values for all F8 stress grade Ecoply products.
- Use Tables 18A and C values for all F11/F8 stress grade Ecoply (including 19 mm Ecoply Longspan Flooring).
- The section properties in Tables 18A, B and C 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.



Private Bag 92-106
Victoria Street West
Auckland 1142
New Zealand

Freephone: 0800 326 759
Freefax: 0800 746 400

www.chhply.co.nz

ECOPLY: V5. 10.1122





BRANZ Appraised

Appraisal No. 827 [2019]

ECOPLY® BARRIER RIGID AIR BARRIER

Appraisal No. 827 [2019]

This Appraisal replaces BRANZ

Appraisal No. 827 [2014]

Amended 03 September 2021

BRANZ Appraisals

Technical Assessments of
products for building and
construction.

CHH Plywood

Carter Holt Harvey

Plywood Ltd

Private Bag 92 106

Auckland

Tel: 0800 326 759

Fax: 09 633 1582

Web: www.chhply.co.nz



BRANZ

122 Moonshine Rd,

Rimutika, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

Tel: 04 237 1170

branz.co.nz



Product

- 1.1 The Ecoply® Barrier Rigid Air Barrier is sealed plywood sheets and tapes designed for use as a rigid wall underlay and air barrier (sheathing) behind cavity wall cladding systems. Ecoply® Barrier is also for use as a wall bracing system to resist wind and earthquake loads on timber-framed buildings.

Scope

- 2.1 Ecoply® Barrier has been appraised for use as a rigid wall underlay, air barrier and temporary weather-protecting sheathing on timber-framed buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained and vented cavity; and,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Ecoply® Barrier has also been appraised for use as wall bracing systems for timber-framed buildings within the scope of NZS 3604.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Ecoply® Barrier, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Ecoply® Barrier meets the requirements for loads arising from earthquake and wind [i.e. B1.3.3 (f) and (h)]. See Paragraphs 8.1-8.4.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Ecoply® Barrier meets these requirements. See Paragraphs 9.1-9.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the wall cladding system, Ecoply® Barrier contributes to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Ecoply® Barrier meets this requirement.

- 3.2 Ecoply® Barrier can be used to satisfy the bracing demand requirements of Section 5 of NZS 3604 which is an Acceptable Solution for compliance with NZBC Clause B1.

Technical Specification

- 4.1 The components and accessories for Ecoply® Barrier, which are supplied by Carter Holt Harvey Plywood Ltd are:
- **Ecoply® Barrier sheets** are 7 mm thick, 1,197 mm wide and 2,440 and 2,745 mm long structural plywood, manufactured from radiata pine in accordance with AS/NZS 2269, and H3.2 CCA treated in accordance with AS/NZS 1604.3. The sheets are coated on the front face and four edges with a beige polyester powder coating. Plywood sheets are marked Ecoply® Barrier for identification.
 - **Ecoply® Sealing Tape** - 60 mm x 30 m tape for sheet joints.
 - **Ecoply® Frame Flashing Tape** - 150 mm x 30 m and 200 mm x 30 m.
 - **Ecoply® Sill Tape** - 150 mm x 20 m and 200 mm x 20 m.
- Tapes are marked Ecoply® and type for identification.
- 4.2 The components and accessories for the Ecoply® Barrier, which are supplied by the building contractor are:
- **Ecoply® Horizontal Jointer** - PVC horizontal 'Z' flashing supplied by E2 Flashing Solutions.
 - **Fasteners** - 50 x 2.8 mm flathead hand-driven nails, hot-dip galvanised or stainless steel. Paslode Impulse 50 x 2.8 mm round head gun-nails. Hot-dip galvanised or stainless steel. Stainless steel nails must be ring shanked.
- [Note: Hot-dip galvanising must comply with AS/NZS 4680 and stainless steel must be Grade 304 or 316.]*
- **Bracing panel end stud connection** - GIB® HandiBrac® one-piece, 2 mm thick, galvanised steel angle bracket approximately 95 mm high, 65 mm long and 54 mm wide. The bracket is supplied with 5 Type 17 screws 14 g x 35 mm.
 - **Timber floor end stud hold down** - 12 mm x 150 mm hot-dip galvanised coach screws.
 - **Concrete floor end stud hold down** - cast-in bolts M12 x 150 mm minimum, or proprietary fixings with a minimum characteristic strength of 15 kN.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Carter Holt Harvey Plywood Ltd or the building contractor, whether on-site or off-site, is under the control of the building contractor. Ecoply® Barrier plywood sheets 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 providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. The Ecoply® Tapes must be protected from damage and weather and stored in clean, dry conditions away from direct exposure to sunlight. uPVC jointers must be protected from physical damage and should be stored flat and under cover.
- 5.2 Other accessories must be stored so they are kept clean, dry and undamaged.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Ecoply® Barrier Specification & Installation Guide, which must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Ecoply® Barrier Specification & Installation Guide and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Ecoply® Barrier is intended for use as a rigid wall underlay and an air barrier fixed over timber-framed walls in order to support wind pressures and to act as a secondary barrier to wind-driven rain. With all joints sealed with Ecoply® Tapes, no flexible wall underlay is required over the Ecoply® Barrier plywood.
- 7.2 Commencing from installation, the Ecoply® Barrier, including the Ecoply® Tapes, must not be exposed to the weather for more than 180 days.
- 7.3 Ecoply® Barrier may be used as a temporary weather protecting sheathing to allow the insulation and internal lining of the building to proceed before the wall cladding is installed. To achieve temporary weathertightness, all joints, internal and external corners of the Ecoply® Barrier must be sealed, the roof cladding and soffit linings must be installed, the flexible sill and jamb flashing tape system must be installed around the window and door openings, and the window and door joinery must be installed complete with head flashings and air seals. The timber wall framing must have a maximum moisture content as specified by the internal lining system supplier at the time of the insulation installation and internal lining application.
- 7.4 Ecoply® Barrier is suitable for use under wall claddings as a rigid wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings. Refer to Table 1.

Table 1: NZBC E2/AS1, Table 23 Requirements

NZBC E2/AS1 Table 23 Rigid Wall Underlay Properties	Property Performance Requirement	Ecoply® Barrier Actual Property Performance
Vapour Resistance	≤ 7 MN s/g	2.2 MN s/g
Absorbency	≥ 100 g/m ²	1,451 g/m ²
Water Resistance	≥ 20 mm	Pass

Timber Treatment

- 7.5 Timber wall framing behind the Ecoply® Barrier must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

- 7.6 Timber framing must be minimum 90 x 45 mm structural grade SG8 and 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, considering local factors. In all cases, studs must be at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1,200 mm centres. *[Note: The timber framing must also be suitable for the selected wall cladding. Refer to the selected cladding system's Technical Literature for specific framing requirements.]*
- 7.7 Timber wall framing where the Ecoply® Barrier plywood sheets are joined must be nominal 50 mm width [i.e. 45 mm minimum finished width].
- 7.8 Timber framing must be kiln dried and as dry as practically possible at the time of the Ecoply® Barrier installation.

Ecoply® Barrier Set Out

- 7.9 All Ecoply® Barrier plywood sheet edges must be fully supported by framing.
- 7.10 Ecoply® Barrier must be installed vertically. At the base of the wall the plywood sheets must hang below the bottom plate a minimum of 25 mm, up to a maximum of 40 mm.

Ecoply® Barrier Plywood and Cladding Fixing

- 7.11 Ecoply® Barrier plywood sheets must be fixed at maximum 150 mm centres around the perimeter of each sheet and at maximum 300 mm centres to intermediate studs. In Extra High Wind Zones, the fixing centres on the intermediate studs must be closed up to maximum 150 mm centres. The fixings are at the same centres regardless of whether the Ecoply® Barrier plywood is being used for bracing or not.
- 7.12 The length of the selected wall cladding fasteners must be increased by a minimum of 7 mm to maintain the face load strength of the wall cladding system.

Structure

Mass

- 8.1 The mass of Ecoply® Barrier is approximately 4 kg/m². This mass must be added to the selected wall cladding system mass when determining the overall wall cladding mass in terms of NZS 3604.

Wind Zones

- 8.2 Ecoply® Barrier is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

Bracing

- 8.3 The bracing units achieved [wind and earthquake] for the Ecoply® Barrier are given in Table 2. The Technical Literature gives details of edge and end fixing distances and provides comprehensive construction and panel hold-down details.
- 8.4 The bracing units are derived from the BRANZ P21 test method based on a wall height of 2.4 m. For greater wall heights the bracing rating is calculated by multiplying the appropriate value shown in Table 2 by 2.4 divided by the wall height in metres. Walls lower than 2.4 m shall be rated as if they were 2.4 m in high.

Table 2: Bracing Ratings for Ecoply® Barrier Structural Plywood Brace

Specification No.	Minimum Wall Length	Lining Requirements	Bottom Plate Hold-down and Fixing	BUs/m Wind	BUs/m Earthquake
EPBI	0.4 m	Ecoply® Barrier one side	GIB HandiBrac®*	80	95
	0.6 m			95	105
	1.2 m			120	135**
EP2	0.6 m	Ecoply® Barrier or Ecoply® each side	GIB Handibrac®	105	115
EPBS	0.4 m	Ecoply® Barrier one side	No additional fastening*	60	60
	0.6 m			60	65
	1.2 m			65	70
	2.4 m			80	90
EPBG	0.4 m	Ecoply® Barrier one side and 10 mm GIB® Standard plasterboard other side	GIB HandiBrac®	100	115
	1.2 m			150**	150**

Notes:

* Bottom plate fixed in accordance with the requirements of NZS 3604.

** Timber Floors - A limit of 120 BU/m applies to NZS 3604 timber floors.

Penetrations for Services

- 8.5 Small openings for services of up to 90 x 90 mm may be placed no closer than 90 mm to the edge of the bracing element and service penetrations up to a maximum of 150 mm diameter may be placed no closer than 150 mm from the sheet edge, without affecting the bracing rating of the panel.

Connections

- 8.6 The Ecoply® Barrier Technical Literature contains a top plate hold down detail and a lintel tie down connection detail that are alternatives to the details given in NZS 3604.

Durability

- 9.1 Ecoply® Barrier meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years when used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, or where it is used as a bracing element, and code compliance with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years and the Ecoply® Barrier is not used as a bracing element.

Serviceable Life

- 9.2 Provided Ecoply® Barrier is not exposed to the weather or ultraviolet (UV) light for a total of more than 180 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the Ecoply® Barrier is expected to have a serviceable life of at least 50 years.
- 9.3 Areas of geothermal activity and coastal locations can be very corrosive to fasteners, especially coastal locations within distances of up to 500 metres of the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets in some instances. These coastal locations are defined in NZS 3604 as Zone D and stainless steel fasteners must be used. For installation in NZS 3604 Corrosion Zones C and B, hot-dip galvanised steel fasteners complying with the requirements of NZS 3604 may be used.

Maintenance

- 10.1 Ecoply® Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the sheathing or to the sheathing itself, then repairs or replacement must be carried out to ensure the integrity of the rigid air barrier.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Ecoply® Barrier from heat sources such as fireplaces, heating appliances 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 Ecoply® Barrier must be used behind claddings that meet the performance requirements of NZBC Clause E2.
- 12.2 Ecoply® Barrier, when installed in accordance with the Ecoply® Barrier Specification & Installation Guide and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

- 13.1 All design and building work must be carried out in accordance with the Ecoply® Barrier Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the Ecoply® Barrier. Where the work involves Restricted Building Work (RBW), this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License Class.

System Installation

Ecoply® Barrier Installation

- 14.1 Ecoply® Barrier plywood sheets may be cut using any circular saw or hand saw tool. Holes and cut-outs may be formed by using a hole saw.
- 14.2 Sheets must be dry prior to installation. Cut edges that are left exposed must be sealed in accordance with the Ecoply® Barrier Specification & Installation Guide prior to installation.
- 14.3 Prior to fixing Ecoply® Barrier plywood sheets, a check must be made to ensure all sheet edges will be supported by framing. At the base of the wall, the sheet must hang below the bottom plate by a minimum of 25 mm.
- 14.4 Ecoply® Barrier plywood sheets must be fixed to the timber framing with 50 x 2.8 mm hot-dip galvanised flathead clouts, or 50 x 2.8 mm ring shanked stainless steel nails. Nails may be either hand-driven or power-driven. Refer to Paragraph 7.11 for fixing centres and Paragraph 9.3 for material selection.
- 14.5 At vertical joints, Ecoply® Barrier must be installed with a 1.5-3 mm gap between the sheet edges. Sheets at horizontal joints between floor levels must be installed with a minimum 15 mm gap between the edges and must be supported over horizontal framing. All horizontal joints must be flashed with the Ecoply® Horizontal Jointer.
- 14.6 Any damaged areas of Ecoply® Barrier, or gaps around service penetrations, must be repaired by covering with joint sealing tape.

Joint Sealing Tape Installation

- 14.7 Ecoply® Barrier plywood sheets must be cleaned of dust and other surface contaminants prior the application of the joint sealing tape to ensure adequate adhesion is achieved.
- 14.8 All vertical sheet joints, internal and external corners, penetrations or damaged areas and over driven nails must be covered with Ecoply® Sealing Tape. The manufacturer's instructions regarding the application temperatures for the joint sealing tapes must be followed.

Flexible Sill and Jamb Tape Installation

- 14.9 The Ecoply® Sill Tape and Ecoply® Frame Flashing Tape must be installed in accordance with the Ecoply® Barrier Specification & Installation Guide. Particular attention must be paid to the installation of the sill and jamb tapes around window and door joinery openings to ensure all exposed timber wall framing in the opening is protected.

Inspections

- 14.10 The Ecoply® Barrier Specification & Installation Guide must be referred to during the inspection of the Ecoply® Barrier installations.

Health and Safety

- 15.1 Ecoply® Barrier must be handled in accordance with the Material Safety Data Sheet for H3.2 CCA treated Ecoply®.
- 15.2 When power tools are used for cutting or forming holes, health and safety measures as set out in the Ecoply® Barrier Specification & Installation Guide must be undertaken because of the amount of dust generated.
- 15.3 Safe use and handling procedures for the Ecoply® Barrier and the components that make up the cladding system are provided in the relevant manufacturers' Installation Guides.

Basis of Appraisal

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

Tests

- 16.1 Racking tests were carried out in accordance with BRANZ Technical Paper P21. The earthquake and wind bracing ratings were determined using the evaluation procedures outlined in BRANZ Technical Recommendation No. 10. The test results and laboratory methods have been reviewed by BRANZ and found to be satisfactory.
- 16.2 Testing has been carried out by BRANZ to determine the face load pressure resistance of Ecoply® Barrier.
- 16.3 Testing to determine the resistance of Ecoply® Barrier plywood to water vapour transmission in accordance with AS/NZS 4200.1 and resistance to water penetration in accordance with AS/NZS 4201.4 has been completed. The results have been reviewed by BRANZ and found to be satisfactory.
- 16.4 The Ecoply® Sealing Tape, Frame Flashing Tape and Sill Tape have been tested to BRANZ criteria to assess the tensile strength of control and UV aged material, nail sealability, water resistance of control and UV accelerated aged material and pliability. BRANZ has determined that the tapes are fit for purpose for the intended use. The adhesion to the Ecoply® Barrier plywood sheet has also been tested and found to be satisfactory.

Other Investigations

- 17.1 Structural and durability opinions were given by BRANZ technical experts.
- 17.2 An assessment was made of the durability of the Ecoply® Barrier Tapes by BRANZ technical experts.
- 17.3 BRANZ expert opinion on NZBC E2 code compliance for Ecoply® Barrier was based on evaluation of all details within the scope and as stated within this Appraisal. The details contained within the Ecoply® Barrier Specification & Installation Guide have been reviewed and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for a rigid wall underlay.
- 17.4 Site inspections were carried out by BRANZ to assess the practicability of installation.
- 17.5 The Ecoply® Barrier Specification & Installation Guide has been examined by BRANZ and found to be satisfactory.

Quality

- 18.1 The manufacture of the Ecoply® Barrier plywood has been examined by BRANZ, including methods adopted for quality control. Details regarding the composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 18.2 The quality of materials, components and accessories supplied by Carter Holt Harvey Plywood Ltd is the responsibility of Carter Holt Harvey Plywood Ltd. The quality control system for the manufacture of the plywood used for the Ecoply® Barrier has been assessed and registered as meeting the requirements of AS/NZS 2269 by the Engineered Wood Products Association of Australasia, Certificate No. 911.
- 18.3 The manufacture of Ecoply® Tapes has been examined on behalf of BRANZ, including methods adopted for quality control. Details of the quality and composition of the materials used were obtained and found to be satisfactory.
- 18.4 Quality of installation on-site of components and accessories supplied by Carter Holt Harvey Plywood Ltd and the building contractor is the responsibility of the installer.
- 18.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation in accordance with the instructions of Carter Holt Harvey Plywood Ltd.

Sources of Information

- AS/NZS 1170:2002 Structural design action - General principles.
- AS/NZS 2269:2012 Plywood - Structural.
- AS/NZS 4200.1:2017 Pliable building membranes and underlays - materials.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber Structures Standard.
- NZS 3604:2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 03 September 2021.

This Appraisal has been amended to reflect building code updates relating to fire.

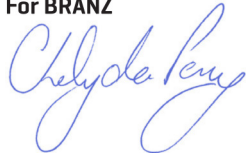
In the opinion of BRANZ, **Ecoply® Barrier Rigid Air Barrier** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Carter Holt Harvey Plywood 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. **Carter Holt Harvey Plywood Ltd:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Carter Holt Harvey Plywood 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 **Carter Holt Harvey Plywood Ltd** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

21 June 2019



SDC - Approved Building Consent Document - BC240357 - Pg 332 of 402 - 19/03/2024 - warreg

INSTALLATION & OPERATING MANUAL

IGNITE XL

Models: XLF50, XLF74, XLF100



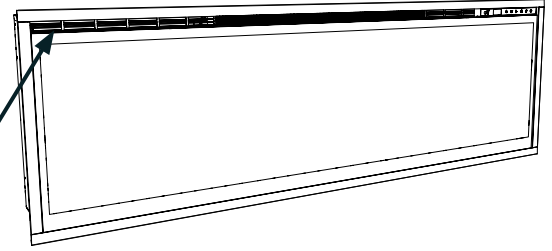
The product is compliant with the local electrical standards of all countries where offered for sale by Glen Dimplex and its subsidiaries.

08/53411/0 VERSION X.3

WELCOME

Thank you for purchasing the IGNITE XL electric fireplace. The edge to edge panoramic display will ensure you create endless memories in front of this dazzling electric fire.

Rating Label



CAUTION: Read all instructions and warnings carefully before starting installation. Failure to follow these instructions may result in a possible electric shock, fire hazard and will void the warranty.

Important Safety Advice

When using electrical appliances, basic precautions should always be followed to reduce the risk of fire, electrical shock and injury to persons, including the following:

If the appliance is damaged, check with the supplier before installation and operation.

- Do not use outdoors.
- Do not use in the immediate surroundings of a bath, shower or swimming pool.
- Do not locate the appliance immediately below a fixed socket outlet or connection box.
- Do not use this heater if it has been dropped.
- Do not use if there are visible signs of damage to the heater.
- Use this heater on a horizontal and stable surface.

The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance. Children shall not plug in, regulate and clean the appliance or perform user maintenance.

CAUTION: Some parts of this product can become very hot and cause burns. Particular attention has to be given where children and vulnerable people are present.

Do not use this appliance in series with a thermal control, a program controller, a timer or any other device that switches on the heat automatically, since a fire risk exists when the heater is accidentally covered or displaced. Although this appliance complies with safety standards, we do not recommend its use on deep pile carpets or on long hair type of rugs.

In the event of a fault disconnect the appliance.

Disconnect the appliance when not required for long periods.

The appliance must be positioned so that the plug is accessible. Electrical Requirements section for more details. If the supply cord is damaged it must be replaced by the manufacturer or service agent or a similarly qualified person in order to avoid a hazard.

Keep the supply cord away from the front of the appliance.

Warning: This appliance must be earthed.

The use of an extension lead or multi-plug adaptor is not advised when connecting this product to the mains. Connection through these devices could lead to a risk of overloading, overheating and even fire at the extension lead or adaptor due to inadequate connection quality.

This heater must be used on an alternating current supply (~) only and the voltage marked on the heater must correspond to the supply voltage.

WARNING: In order to avoid overheating, do not cover the appliance. Do not place material or garments on the appliance, or obstruct the air circulation around the appliance.

The appliance carries a DO NOT COVER warning symbol.



This appliance is equipped with a device to control the room temperature. Do not use this appliance in small rooms when they are occupied by persons not capable of leaving the room on their own, unless constant supervision is provided.

The electrical information regarding your electric fireplace can be found on the rating label located on the top of the unit.

If you have any technical questions or concerns regarding the operation of your electric fireplace, or require service contact the relevant customer service as listed on your warranty card.

WARNING - KEEP BATTERIES OUT OF REACH OF CHILDREN

- Swallowing may lead to serious injury in as little as 2 hours or death, due to chemical burns and potential perforation of the esophagus.
- If you suspect your child has swallowed or inserted a button battery immediately call the 24-hour Poisons Information Centre on 13 11 26 (in Australia) or 0800 764 766 (in New Zealand) for fast, expert advice.
- Examine devices and make sure the battery compartment is correctly secured, e.g. that the screw or other mechanical fastener is tightened. Do not use if the compartment is not secure.
- Dispose of used button batteries immediately and safely. Flat batteries can still be dangerous.



INSTALLATION

⚠ CAUTION: Ensure installation does not allow fireplace to be in direct contact with building vapor barrier or insulation and meets all local building code.

⚠ NOTE: A dedicated 10 AMP, 230-240 Volt circuit is required. A dedicated circuit is preferred but not essential in all cases. A dedicated circuit will be required if, after installation, the circuit breaker trips or fuse blows on a regular basis when the heater is operating.

Power: 2000 W at 240 V

⚠ WARNING: Construction and wiring must comply with local building codes and other applicable regulations to reduce the risk of fire, electric shock and injury to persons.

⚠ WARNING: To reduce the risk of fire, electric shock or injury to persons, always use a licensed electrician.

⚠ WARNING: To reduce the risk of fire, do not store or use gasoline or other flammable vapors or liquids in the vicinity of the heater.

1. Select a location that is not susceptible to moisture and is away from drapes, furniture and high traffic.
2. Unpack the fireplace and hardware from the box.

⚠ NOTE: Leave the front glass and partially reflective glass, safely, in the box until the time you are ready to install it.

3. Store the fireplace in a safe, dry and dust free location until you are ready to install the fireplace.
- Installation

⚠ CAUTION: Two people will be required for various steps of this procedure.

This design of this unit allows three options for installation: partial recess, flush mounted or sub-surface mounted.

⚠ CAUTION: Sub-surface mounting should be limited to ½ in. (12 mm) to ensure adequate air flow of heated air out of the firebox area.

1. Prepare a wall with a framed opening of 16 in. (406 mm) high,
 - XLF50 - 50 ⅝ in. (1287 mm)
 - XLF74 - 74 ⅝ in. (1897 mm)
 - XLF100 - 100 ⅝ in. (2557 mm) wide, with a bottom sill that is a minimum of 4 in. (102 mm) deep. The sill can be constructed to support the front of the unit to allow the power supply wires to easily be run behind or flush with the back of the unit and a pass through hole drilled for electrical wire routing.

⚠ WARNING: Do not attempt to wire your own new circuits. To reduce the risk of fire, electric shock or injury to persons, always use a licensed electrician.

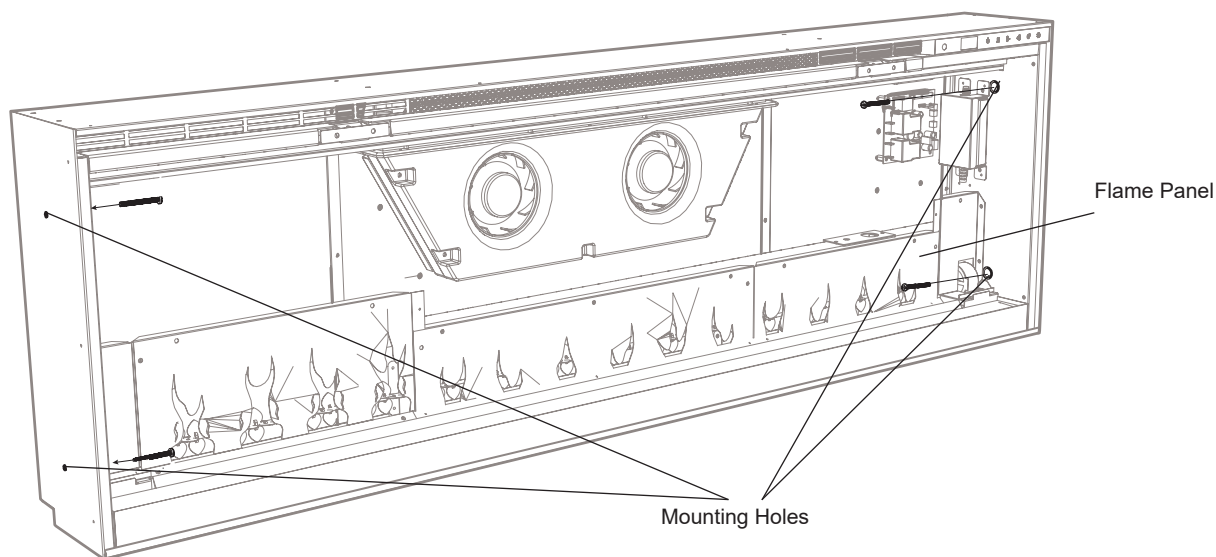
⚠ WARNING: Ensure that the circuit on which the fireplace is to be installed has the power cut off at

the service panel until installation is complete.

2. The unit is provided with an installed $\frac{3}{4}$ in. (20 mm) trim. Depending on the installation, this trim can be removed by removing the securing screws and the 4 trim pieces.
3. Lift fireplace, from the bottom and the handles located on the back, and insert into opening to the desired depth.
4. Using a bubble level (supplied) ensure that the fireplace is level within the framing. Adjust as required.
5. Drive four supplied mounting screws through the four mounting holes located on the inside surface of the fireplace chassis, into wall studs (Figure 1).

NOTE: The unit can also be installed without the trim for a seamless installation look.

FIGURE 1



For Bathroom Use

If this unit is installed in a bathroom it must be protected by a GFI receptacle or circuit. If receptacle is used it must be readily accessible.

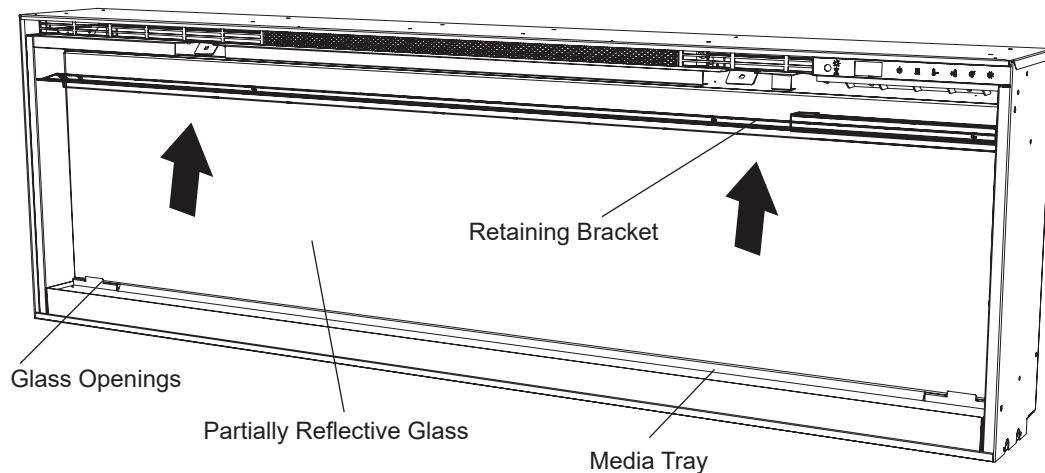
To prevent electrical shock this unit is an electrical appliance that is NOT watertight and must be installed as to prevent water from entering unit. This must be installed away from showers, tubs, etc. Never locate fireplace where it may fall into a bathtub or other water container.

Final Assembly

1. Locate and remove the 12 screws securing the partially reflective glass bracket to the unit, along the top of the opening, and set bracket and screws aside.
2. Remove the provided suction cup from the inside cavity of the unit (only for XLF74 and XLF100 units).
3. Before installation ensure that the front glass and the partially reflective glass are clean. Particles can be removed by dusting lightly with a clean dry cloth. To remove fingerprints or other marks, the glass can be cleaned with a damp cloth. Ensure that the glass has completely dried before installation.
4. Carefully secure the suction cup to the partially reflective glass, reflective side out, and place into the openings on either side of the unit.

5. Tip the glass into the unit and using the removed screws secure the glass into the unit with the provided bracket (Figure 2). Remove the suction cup.

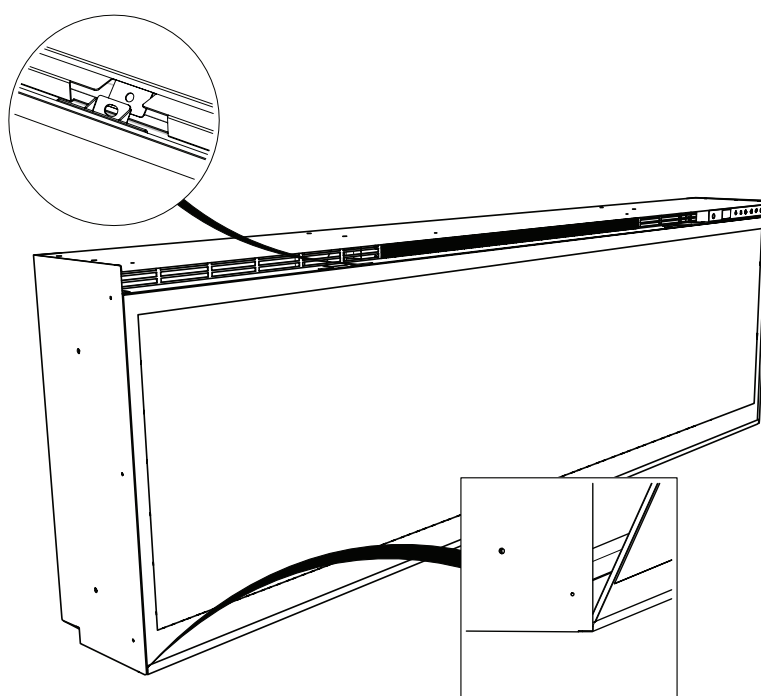
FIGURE 2



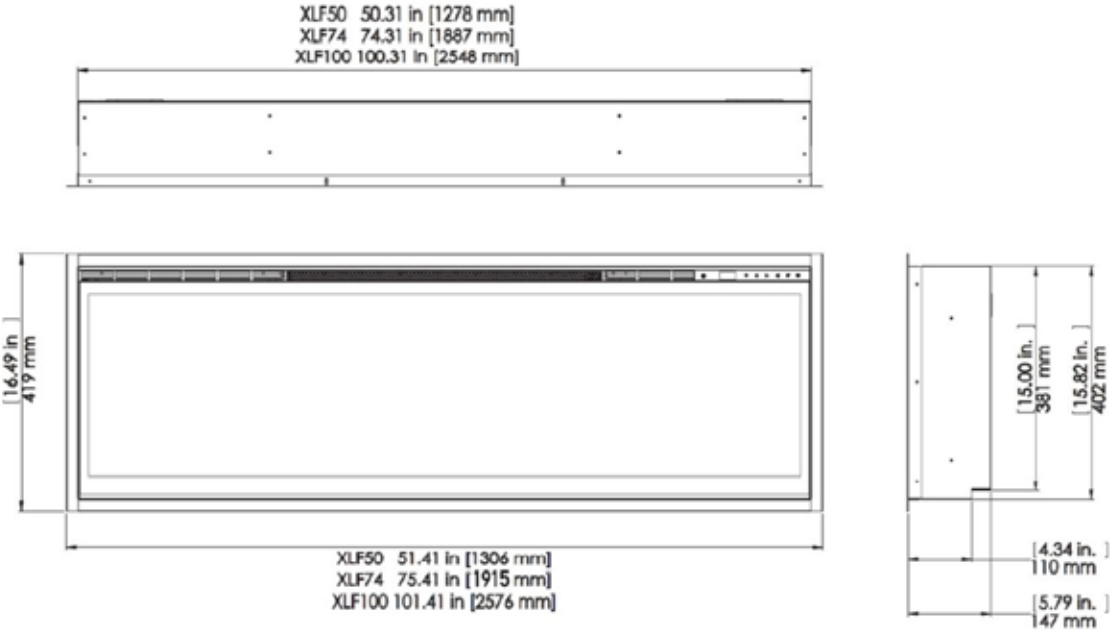
6. Evenly space the large media in the media tray along the back of the media tray (for optimum media effect), then carefully pour and evenly distribute the smaller media into the Media Tray.
7. Carefully place the front glass into the lip located at the bottom of the opening of the firebox.
8. Tip the front glass into the unit and secure using the provided screws and Allen key. (Figure 3).

NOTE: Ensure that the suction cup and Allen key are kept for any future maintenance or service.

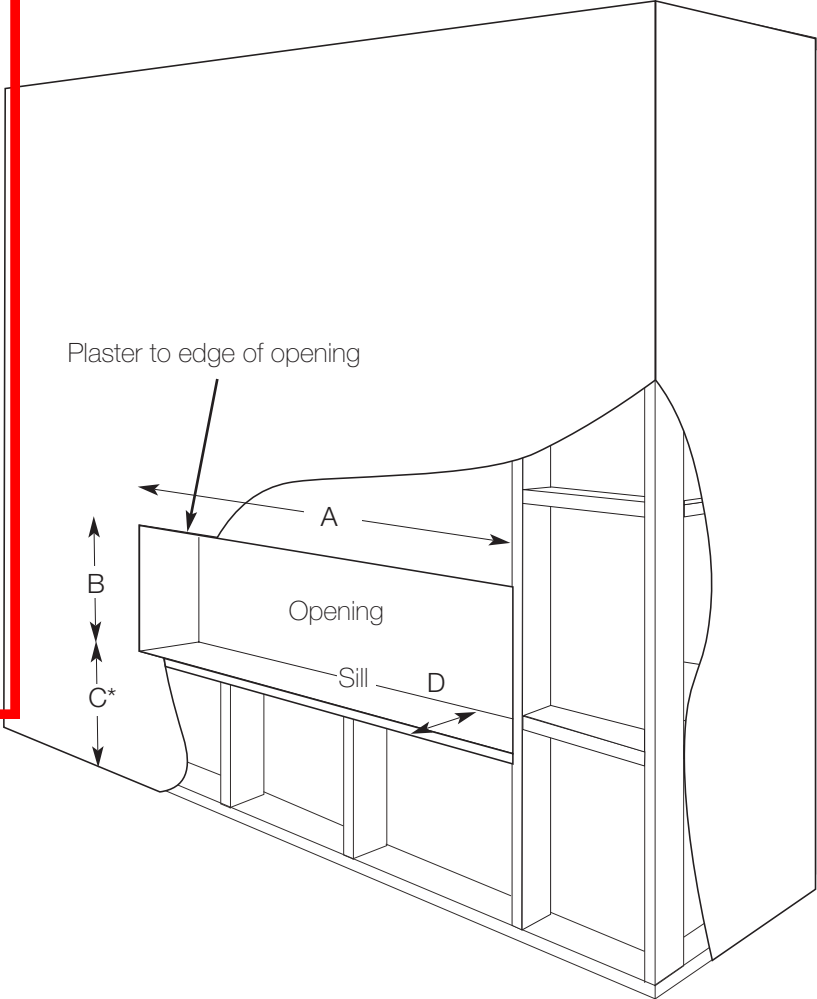
FIGURE 3



UNIT DIMENSIONS



FRAMING DIMENSIONS



	XLF50	XLF74	XLF100
A	1287	1897	2557
B	406	406	406
C*	600	600	600
D	160	160	160

*C has no minimum, these measurements are for ideal viewing only

OPERATIONS

General Operation

⚠ WARNING: This electric firebox must be properly installed before it is used.

This firebox operates with ComfortSaver™ technology, which automatically adjusts the fan speed and heater wattage to safely and precisely match the requirements of the room based on the thermostat setting. The heater operates such that once the room reaches the set point, the fan and heater will continuously run at a low level, to maintain the desired room temperature. If the temperature in the room rises significantly, i.e. sun coming through a window or a central furnace turns on, the heater will turn off and periodically turn back on to circulate the air around the unit, until the room temperature drops and requires the heater to be constantly on again.

NOTE: The unit is designed so that the fan will run continuously while the heater is on.

NOTE: The element retains heat after shutdown, there is a built in cool down period of 2 minutes before the fan shuts off completely, when the heat function is turned Off.

Remote Operation

The fireplace is supplied with an IR multi-function remote control.

NOTE: To operate correctly, the remote control must be pointed towards the front of the unit.

A. Power Button
Switches the product on and off. Restores to previous setting when switched on.

B. Flame Effect
Turns the Flame Effect On and Off

D. Temp Down
Decreases the temperature in intervals of 1° C.

F. Eco Operation
Runs the heater in a reduced wattage range when activated.

H. Colour Theme
Different presets of lighting color combinations are available in the unit.

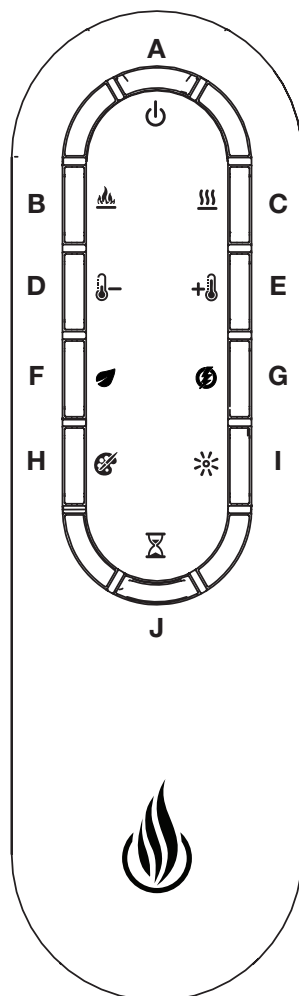
C. Heat
Switches the heat on and off. Use Temp buttons to regulate heat.

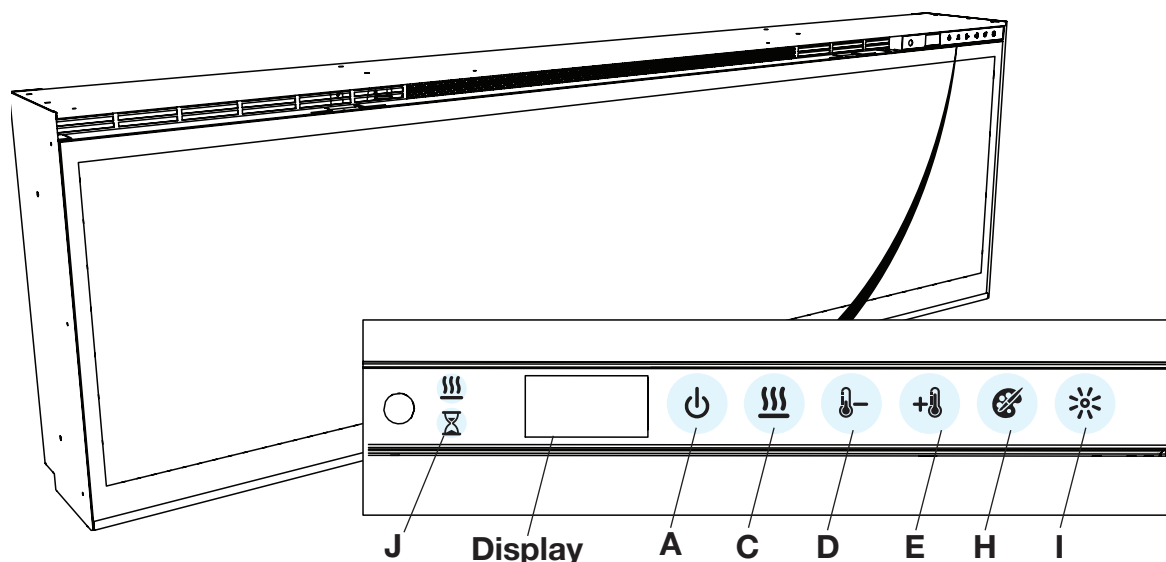
E. Temp Up
Increases the temperature in intervals of 1° C.

G. Heat Boost
Turns the Heater Boost On and Off. Runs the unit at the full rated wattage.

I. Brightness
Press to change brightness of the LEDs from high to low.

J. Sleep Timer
The timer button increases the timer by 0.5hrs on each press. Up to 8hrs cycle.





	Icon	Function	Description
A		Power/ Standby	Turns the unit On and Off. Activated by pressing the Standby button on the remote or the unit. The unit will turn On with the same functions that it was set to when it was turned Off and the intake temperature will be indicated on the Display. ! NOTE: When any button is pressed on the unit the intake temperature will be displayed on the Display for 7 seconds.
B		Flame Effect	Turns the Flame Effect On and Off. Activated by pressing the button on the remote.
C		Heat ON/OFF	Turns the heater On and Off. Activated by pressing the button on the remote or the unit. Indicated by the icon and the set point temperature will flash on the display, then the intake temperature will be displayed before turning off. ! NOTE: After the heater is switched off, there is a 2 minute fan delay, where the fan will continue running before turning off. ! NOTE: The unit can be operated in Heat Only Mode. When the unit is only running with the heater, the icon will continuously be displayed on the Display. ! NOTE: The heater may emit a slight, harmless odor when first used. This odor is a normal condition caused by initial heating of internal heater parts and will not occur again.
D		Temp Down	Decreases the temperature setting. Adjusted by repeatedly pressing the corresponding button on the remote.* Indicated by set point temperature on the Display decreasing and the speed of the fan decreasing to reduce the amount of heat being projected into the room.**

	Icon	Function	Description
E		Temp Up	Increases the temperature setting. Adjusted by repeatedly pressing the corresponding button on the remote.* Indicated by the set point on the Display increasing and the speed of the fan increasing to increase the amount of heat being projected into the room. * The first time the button is pressed the current temperature set point will be displayed for 2 seconds. ** The temperature can be adjusted from 5 °C to 37 °C (41 °F to 99 °F).
			! NOTE: Holding the  and the  buttons down for two seconds, on the unit, will change the temperature scale from °C to °F, or vice versa.
F		Eco Operations	Runs the heater in a reduced wattage range when activated. Adjusted by pressing the corresponding button on the remote when the heater is on. Indicated by the Display and a reduced fan speed.
G		Heat Boost	Turns the Heater Boost On and Off. Runs the unit at the full rated wattage. Activated and adjusted by repeatedly pressing the corresponding button on the remote. Indicated by the heater running at full heat, for a user set amount of time, to quickly heat up a cold room/space. The Heat Boost can be set for a maximum of 20 minutes, in 5 minute increments.
			Disable Heat If desired, depending on the season, the heater on the unit can be disabled. The function of the remaining controls will continue to function as outlined in this manual. Pressing the  and  buttons on the unit at the same time and holding for 2 seconds will disable and enable the heater. ! NOTE: When the heater has been disabled and any of the heat related functions are used, the Display will indicate “---”.
H		Colour Themes	Different presets of lighting color combinations are available in the unit. Changed by repeatedly pressing the corresponding button on the remote or the unit. Cycles through the different preset light settings of the unit, this includes different combinations of colors of the flame base and media lighting. ! NOTE: Two of the themes in the cycle are a prism where the unit cycles through a variety of colors. Pressing the  stops the cycling and holds the unit on the preferred color, indicated by a solid circle. When the unit is on prism, and is cycling through the colors, a rotating circle will be displayed.
I		Brightness	Changes the Brightness of the lights in the unit. Adjusted by repeatedly pressing the corresponding button on the remote or the unit. Indicated by the second digit on the Display changing to show: “H” (high), and “L” (low).

	Icon	Function	Description
J		Sleep Timer	The Sleep Timer can be set to automatically shut off the fireplace after a preset time (from 30 minutes to 8 hours). To set the timer press the timer button on the remote, repeatedly, until the desired time is displayed. The Display will display the different times as it is adjusted. Once the timer has begun, pressing the  button will display the time remaining before the unit turns Off. ! NOTE: The Sleep Timer can be canceled at any time by pressing the  button repeatedly until the sleep timer displays nothing.

RESETTING THE TEMPERATURE CUTOFF SWITCH

Should the heater overheat, an automatic cut out will turn the whole unit off and it will not come back on without being reset. If the  button on the unit is pressed, Er2 will be displayed on the unit. It can be reset by turning the unit off at the main disconnect panel and waiting 5 minutes before turning the unit back on.

CAUTION: If you need to continuously reset the heater, turn the unit off at the main disconnect panel and call technical support.

REMOTE CONTROL BATTERY REPLACEMENT

To replace the Battery:

1. Slide battery cover open on the remote control.
2. Correctly install one 3 Volt (CR2032 [longer life] or CR2025) Battery in the battery holder.
3. Close the battery cover.



Battery must be recycled or disposed of properly. Check with your Local Authority or Retailer for recycling advice in your area

GENERAL MAINTENANCE

⚠ WARNING: Disconnect power and allow heater to cool before attempting any maintenance or cleaning to reduce the risk of fire, electric shock or damage to persons.

! NOTE: The fireplace should not be operated with an accumulation of dust or dirt on or in the unit, as this can cause a build up of heat and eventual damage. For this reason the heater must be inspected regularly, depending upon conditions and at a minimum yearly intervals.

Partially Reflective Glass Cleaning

The partially reflective glass is cleaned in the factory during the assembly operation. During shipment, installation, handling, etc., the partially reflective glass may collect dust particles; these can be removed by dusting lightly with a clean dry cloth.

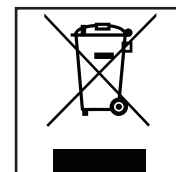
To remove fingerprints or other marks, the partially reflective glass can be cleaned with a damp cloth. The partially reflective glass should be completely dried with a lint free cloth to prevent water spots. To prevent scratching, do not use abrasive cleaners.

Fireplace Surface Cleaning

Use only a damp cloth to clean painted surfaces of the fireplace. Do not use abrasive cleaners.

Recycling

For electrical products sold within the European Community. At the end of the electrical products useful life it should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice in your country.



After Sales Service

Your product is guaranteed for one year from the date of purchase.

Within this period, we undertake to repair or exchange this product free of charge (excluding lamps & subject to availability) provided it has been installed and operated in accordance with these instructions.

Your rights under this guarantee are additional to your statutory rights, which in turn are not affected by this guarantee.

Should you require after sales service you should contact our customer services the contact number is located on your warranty card. It would assist us if you can quote the model number, series, date of purchase, and nature of the fault at the time of your call. The customer services help desk will also be able to advise you should you need to purchase any spares.

Please do not return a faulty product to us in the first instance as this may result in loss or damage and delay in providing you with a satisfactory service.

Please retain your receipt as proof of purchase.

WARRANTY

TWO YEAR LIMITED WARRANTY

Products to which this limited warranty applies

This limited warranty applies to your newly purchased Real Flame IGNITE XL fireplace. This limited warranty applies only to purchases made in any State and Territory of Australia and New Zealand. This limited warranty applies to the original purchaser of the product only and is not transferable.

What this limited warranty covers and for how long

Products covered by this limited warranty have been tested and inspected prior to shipment and, subject to the provisions of this warranty, Glen Dimplex warrants such products to be free from defects in material and workmanship for a period of 2 years from the date of the first purchase of this product. The limited 2 year warranty period also applies to any implied warranties that may exist under applicable law. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to the purchaser.

What this limited warranty does not cover

This limited warranty does not apply to products that have been repaired (except by Glen Dimplex or its authorised service representatives) or otherwise altered. This limited warranty does further not apply to defects resulting from misuse, abuse, accident, neglect, incorrect installation, improper maintenance or handling, or operation with an incorrect power source.

What you must do to get service under this limited warranty

Defects must be brought to the attention of Technical Service at 1300 554 155 for Australia and 09 274 8265 for New Zealand. Please have proof of purchase, catalogue/ model and serial numbers available when calling. Limited warranty service requires a proof of purchase of the product.

What Glen Dimplex will do in the event of a defect

In the event a product or part covered by this limited warranty is proven to be defective in material or workmanship during the 2 years limited warranty period you have the following rights:

- 1) Glen Dimplex will in its sole discretion either repair or replace such defective product or part without charge. If Glen Dimplex is unable to repair or replace such product or part, or if repair or replacement is not commercially practicable or cannot be timely made, Glen Dimplex may, in lieu of repair or replacement, choose to refund the purchase price for such product or part.
- 2) Limited warranty service will be performed solely by dealers or service agents of Glen Dimplex authorised to provide limited warranty services.
- 3) The purchaser is responsible for removal and transportation of such product or part (and any repaired or replacement product or part) to and from the authorised dealer's or service agent's place of business.
- 4) This limited warranty does not entitle the purchaser to on-site or in-home services. On-site or in-home services may be performed at the purchaser's request and expense at Glen Dimplex's then-current rates for such services.
- 5) Glen Dimplex will not be responsible for, and the limited warranty services shall not include, any

expense incurred for installation or removal of the product or part (or any replacement product or part) or any labour or transportation costs. Such costs shall be the purchaser's responsibility.

What Glen Dimplex and its dealers and service agents are also not responsible for:

IN NO EVENT WILL GLEN DIMPLEX, OR ITS DIRECTORS, OFFICERS, OR AGENTS, BE LIABLE TO THE PURCHASER OR ANY THIRD PARTY, WHETHER IN CONTRACT, IN TORT, OR ON ANY OTHER BASIS, FOR ANY INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, CONSEQUENTIAL, OR INCIDENTAL LOSS, COST, OR DAMAGE ARISING OUT OF OR IN CONNECTION WITH THE SALE, MAINTENANCE, USE, OR INABILITY TO USE THE PRODUCT, EVEN IF GLEN DIMPLEX OR ITS DIRECTORS, OFFICERS, OR AGENTS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES, COSTS OR DAMAGES, OR IF SUCH LOSSES, COSTS, OR DAMAGES ARE FORESEEABLE. IN NO EVENT WILL GLEN DIMPLEX, OR ITS OFFICERS, DIRECTORS, OR AGENTS BE LIABLE FOR ANY DIRECT LOSSES, COSTS, OR DAMAGES THAT EXCEED THE PURCHASE PRICE OF THE PRODUCT. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO THE PURCHASER.

SDC - Approved Building Consent Document - BC240357 - Pg 345 of 402 - 19/03/2024 - warreg



Website:

www.realflame.com.au

www.realflame.co.nz

Telephone:

AU: 1300 554 155

NZ: +64 9 274 8265

This product is protected by Intellectual property rights and patents owned by the Glen Dimplex Group on an international basis. The Glen Dimplex Group of Companies will actively protect these rights.

© Glen Dimplex.

All rights reserved. Material contained in this publication may not be reproduced in whole or in part, without prior permission in writing from Glen Dimplex.

LINEA CLADDING SPECIFICATIONS

SDC - Approved Building Consent Document - BC240357 - Pg 347 of 402 - 19/03/2024 - warreg

Linea™ Weatherboard Cavity Fix

Technical Specification
June 2023 New Zealand

We value your feedback!

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

Ask James Hardie™
litteraturefeedback@jameshardie.co.nz

Make sure your information is up to date

When specifying or installing Hardie™ fibre cement products, ensure that you have the current manual. Additional installation information, warranties and warnings are available at www.jameshardie.co.nz or **Ask James Hardie™** on 0800 808 868.

Contents

1	Product Overview	4	6	Installation	15
1.1	Product Information	4	6.1	Fastener	15
1.2	Manufacturing and Classification	4	6.2	Framing	17
1.3	Components and Accessories	5	6.3	Flexible Underlay or HomeRAB™ Pre-Cladding	18
2	Application and Scope	8	6.4	Intermediate Support	18
2.1	Application	8	6.5	Rigid Air Barrier	18
2.2	Scope	8	6.6	Vent Strip	18
2.3	Limitations	8	6.7	Cavity Battens	18
2.4	Details	8	6.8	Joints	19
3	Compliance	9	6.9	Junctions and Penetrations	19
3.1	NZBC Compliance	9	7	Finishes	20
4	Design	9	7.1	Preparation and Priming	20
4.1	Responsibility	9	7.2	Sealants	20
4.2	Clearances	10	7.3	Painting	20
4.3	Structure	10	8	Care and Maintenance	21
4.4	Structural Bracing	10	9	Details Section Index	22
4.5	Energy Efficiency	10	Product Warranty	47	
4.6	Fire Rated Walls	10			
4.7	Control of External Fire Spread	11			
4.8	Alpine regions	11			
5	Safe Working Practices	12			
5.1	Storage and delivery	14			
5.2	Tips for Safe and Easy Handling of Linea™ Weatherboard	15			

1 Product Overview

1.1 Product Information

Linea™ Weatherboard is an external cladding.

Linea™ Weatherboard is a 16mm thick, pre-primed bevel back fibre cement weatherboard. The bottom front edge of Linea™ Weatherboard is chamfered. It has tongue and groove ends for jointing and is classified as lightweight wall cladding for use in residential and light commercial buildings using timber or lightweight steel framed external walls. Linea™ Weatherboard is available in 150mm and 180mm widths.

James Hardie also has available:

- Hardie™ Axent™ Trim is a 19mm thick, pre-primed fibre cement product available in two widths. For use as decorative trims around openings and external corners.

For fixing to a steel frame. Ask James Hardie™ on 0800 808 868 for specific requirements. Or refer to the Cladding to Steel Framing Technical Supplement by James Hardie about the installation of Linea™ Weatherboard to steel frame.

Table 1

Linea™ Weatherboard and Hardie™ Axent™ Trim sizes							Coverage Information		
Product	Code	Length (mm)	Width (mm)	Thickness (mm)	End details	Effective cover (mm)	No. of planks/ metre height (approx.)	Mass kg/ lineal m (approx. at EMC)	Mass kg/m² (approx. at EMC)
Linea™ Weatherboard 150	402533	4200	150	16	T & G	120	8.3	3.1	24.93
Linea™ Weatherboard 180	401847	4200	180	16	T & G	150	6.7	3.57	23.92
Hardie™ Axent™ Trim	405260	3000	45	19	Square	N/A	N/A	1.1	N/A
Hardie™ Axent™ Trim	405257	3000	70	19	Square	N/A	N/A	1.6	N/A
Hardie™ Axent™ Trim	405258	3000	89	19	Square	N/A	N/A	2	N/A

The effective thickness of finished Linea™ Weatherboard on the wall at the lap is approximately 33 to 35mm

All dimensions and masses provided are approximate only and are subject to manufacturing tolerances.

Linea™ Weatherboard is categorised as a Light Weight Wall Cladding as described in the NZS 3604.

1.2 Manufacturing and Classification

The manufacturing process of Linea™ Weatherboard by James Hardie is ISO 9001 Certified.

Linea™ Weatherboard is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre, water and proprietary additives. The product is easily identified by the name 'Linea' printed on the back.

Hardie™ Axent™ Trim is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre, water and proprietary additives. The trims come pre-sealed on all sides, ready for paint..

Linea™ Weatherboard is manufactured in Australia to the Australian/New Zealand Standard AS/NZS 2908.2 'Cellulose-Cement Products' (ISO 8336 'Fibre-Cement Flat Sheet').

Linea™ Weatherboard is classified Type A, Category 2 in accordance with AS/NZS 2908.2 "Cellulose-Cement Products".

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz and view them in the technical literature section or Ask James Hardie™ on **0800 808 868**.

1.3 Components and Accessories

Table 2

Accessories/tools supplied by James Hardie			
Accessories	Description	Size (mm)	Code
	External corner soaker 90° for Linea™ Weatherboard 180mm • Aluminium	200 long	301186
	External corner soaker 135° for Linea™ Weatherboard 180mm • Aluminium	200 long	301178
	External corner soaker 90° for Linea™ Weatherboard 150mm • Aluminium	170 long	302820
	External Slimline Box Corner Mould Etched primed aluminium extrusion used to create external corner	2700 long 4000 long	301195 305809
	Linea™ 35mm Cavity Closer	3000 long	306035
	Internal 'W' Mould 90° Etched primed aluminium extrusion used to create 90° internal corner	2700 long 4000 long	301184 305807
	Internal 'W' Mould 135° Etched primed aluminium extrusion used to create 135° internal corner	2700 long	301183
	Hardie™ Corner Under Flashing 50 x 50mm PVC moulding used as under flashing for internal and external corners	3000 long	303745
	Hardie™ Flex Galvanised nail - 5kg	60 x 3.15mm	302784
	Hardie™ Flex Stainless steel nail - 5kg	60 x 3.15mm	302782
	Hardie™ Blade Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included	4 tooth - 184mm	300660
	Hardie™ Blade Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included	6 tooth - 254mm	303375
	Gecko Gauge™ This easy to use tool gauges and supports the weatherboard for a one person install.		305941

Table 3

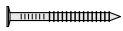
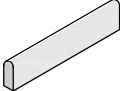
Accessories not supplied by James Hardie			
James Hardie recommends the following products for use in conjunction with its Linea™ Weatherboard. James Hardie does not supply these products. There may also be some other accessories required depending upon the application. Please contact component manufacturer for information on their warranties and further information on their products.			
Accessories	Description	Size (mm)	Material/appearance
	Flexible Underlay To comply with Table 23 of E2/AS1		
	D head or RounDrive Nail Gun nail for concealed fixing Linea™ Weatherboard.	60 x 2.87mm 75 x 3.06mm	Hot Dip Galvanised/ Stainless Steel
	Hardie™ Flex Hot Dip Galv. Nails For concealed fixing by hand nail	60 x 3.15mm 75 x 3.15mm	Hot Dip Galvanised/ Stainless Steel
	Jolt Head Nail for face fixing Linea™ Weatherboard	75 x 3.15mm 90 x 3.55mm	Hot Dip Galvanised/ Stainless Steel
	Titanium Coated High Speed Drill Bit. For pre-drilling prior to face fixing with jolt head.	3.0mm 3.5mm	
	Brad Nail To tie boards together	32mm	
	Joint sealant Paintable flexible sealants are recommended for filling the joints. Refer to Section 7.2 for information.	Tube	Sika®, Bostik® or similar Holdfast®
	CRC® ADOS® Builders Fill Two part exterior grade fill to finish over jolt head nails.		
	PEF Rod	Polyethylene foam	Sika® or similar
	Flexible tape A flexible self-adhesive tape used in preparation of a window. Refer to the Window installation section in this manual for more information.	Proprietary tape to adhere to flexible underlay	Tyvek®, Marshall Innovations or similar
	Flashing Material as per Table 20, 'E2/AS1'		Flashing Fabricator
Dimension to suit 	Planted Sill		H3.1 minimum Treated Timber Timber Merchant or cut on site

Table 3 contd.

Accessories not supplied by James Hardie			
Accessories	Description	Size (mm)	Material/appearance
	Timber Scribe To scribe beside window, site cut to suit.	As required	H3.1 minimum Treated Timber Timber Merchant or cut on site
	Fibre Cement Cutting Blade Diamond tip 305mm diameter circular saw blade to fit drop saw.	305mm	Diamond Tipped
	Cavity Closer - aluminium Used in walls taller than 10m for inter-tenancy fire separation.		
	Primers. Dulux® 1-Step Prep, Resene® Quick Dry etc.		

2 Application and Scope

2.1 Application

This specification includes the installation of Linea™ Weatherboard cavity construction where risk matrix is 13 or more and must be read in conjunction with the current CodeMark Certificate and BRANZ Appraisal. This installation method can also be used for buildings where the risk matrix score is 0 - 12 if desired.

This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Linea™ Weatherboard. The document also serves the purpose of an installation manual for this product.

For use of Linea™ Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design. For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

Refer to the Linea™ Weatherboard Direct Fixed Technical Specification when installing Linea™ Weatherboard without a cavity.

2.2 Scope

Linea™ Weatherboard cavity construction is suitable for use in timber framed buildings that fall within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

Linea™ Weatherboard cavity construction is also suitable for use in specific engineering design projects (SED) subject to a wind pressure of 3.2kPa (ULS) maximum for building heights upto 25m.

2.3 Limitations

- Linea™ Weatherboard cladding must not be used on curved wall applications
- Linea™ Weatherboard cladding must not be installed vertically or angled
- The minimum ground clearances specified must be maintained
- Timber window joinery/recessed openings is subject to an alternative design by the designer
- Maximum SLS inter-story seismic deflections up to span/180 when used in specific design buildings (SED) buildings above 10m height. To accommodate higher inter-story drifts, a deflection should be used.

2.4 Details

Various typical Linea™ Weatherboard details are provided within this document. In addition to these, the construction details with HomeRAB™ Pre-Cladding/RAB™ Board have also been developed and are available on our website. These details are available in dwg, dxf, jpg and pdf file format and can be downloaded at www.jameshardie.co.nz.

All dimensions shown are in millimetres unless noted otherwise.

3 Compliance

3.1 NZBC Compliance

When installed in accordance with the conditions of CodeMark number GM-CM30018 Linea™ Weatherboard complies with all relevant requirements of the NZBC. Please refer to www.building.govt.nz or jameshardie.co.nz for a copy of the certificate.



Linea™ Weatherboard cavity fixed cladding also has a BRANZ Appraisal number 447 (2020) available at www.branz.co.nz or www.jameshardie.co.nz.



4 Design

4.1 Responsibility

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification.

All New Zealand Standards referenced in this manual are current edition and must be complied with.

Specifier

If you are a specifier or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

Installer

If you are an installer ensure that you follow the design, moisture management principles, associated figures and material selection provided by the designer and this technical specification by James Hardie.. All the details provided in this document must be read in conjunction with the project specification.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets their aesthetic expectations before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation. James Hardie will only offer a replacement product if the Linea™ Weatherboard supplied is found to be out of its manufacturing specification.

4.2 Clearances

The clearance between the bottom edge of cladding and the paved/unpaved ground must comply with section 9.1.3 of E2/AS1. On the roofs and decks the minimum clearance must be 50mm. These clearances must be maintained throughout the life of the building.

Linea™ Weatherboard must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by the NZBC Acceptable Solution, E2/AS1 Table 18.

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'.

Do not install cladding such that it may remain in contact with water or ground, refer to figures in section 9 of this manual.

4.3 Structure

4.3.1 Timber Framing

Timber framing must be in accordance with NZS 3604 (Timber-framed buildings) or designed as for specific engineering design (SED) in accordance with NZS 3603 and AS/NZS 1170 where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604.

The stud spacing must not exceed 600mm centres maximum for buildings within the scope of NZS 3604 and 400mm centres maximum for wind pressures more than 1.5kPa (ULS).

For timber frame walls longer than 12m, it is best practice to allow for construction joints to accommodate movements generated due to timber shrinkage or deflections.

4.3.2 Durability

Timber framing must be treated to a minimum H1.2 treatment requirements and comply with Acceptable Solution B2/AS1 'Durability' of the NZBC. For further timber treatment information refer to the NZS 3602 (Timber and Wood-Based Products for use in Buildings) for minimum timber treatment selection and treatment requirements. Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers. Refer to the NZS 3602 for information about the allowable moisture content in timber framing.

4.4 Structural Bracing

Bracing can be achieved by using HomeRAB™ Pre-Cladding or RAB™ Board installed direct to framing instead of a flexible underlay or by using the Villaboard™ Lining bracing system on the internal face.

4.5 Energy Efficiency

External walls constructed as per this technical specification, using Linea™ Weatherboard cladding must use suitable bulk insulation to meet the minimum thermal insulation requirements as per Clause H1/AS1 'Energy Efficiency' of the NZBC.

4.6 Fire Rated Walls

External walls with Linea™ Weatherboard cavity fix construction method can achieve fire resistance ratings up to 60/60/60 when constructed in accordance with the Fire and Acoustic Design Manual by James Hardie. Linea™ Weatherboard must be face fixed for fire rated applications.

Refer to the Fire and Acoustic Design Manual by James Hardie for further information about fire rated systems.

4.7 Control of External Fire Spread

Linea™ Weatherboard material is classified as 'Type-A' when tested to the requirements of Appendix C7.1.1 of C/AS1 and C/AS2 of NZBC and is suitable for use where 'Non Combustible Material' or 'Limited Combustibility Material' is required for use in buildings located anywhere in relation to the relevant boundary for building within the scope of C/AS1 or C/AS2.

- Where the upper floors contain sleeping uses or other property as per C/AS2, a horizontal flashed joint must be provided to block the top of lower cavity at each floor or intervals of no greater than 3.5m vertical height. Refer to Figure 38 & 39.
- On buildings greater than 10m in height a RAB™ Board must be used.

4.8 Alpine Regions

In regions subject to freeze/thaw conditions, Linea™ Weatherboard must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions subject to snow drifts over winter.

The Linea™ Weatherboard has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

5 Safe Working Practices

WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

Hardie™ fibre cement products contain sand, a source of respirable crystalline silica may cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/NZS1716 P1 filter and refer to Australian/New Zealand Standard 1715:2009 Selection, Use and Maintenance of Respiratory Protective Equipment for more extensive guidance and more options for selecting respirators for workplaces. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

Crystalline Silica is

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

Why is Crystalline Silica a health hazard?

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

When is Crystalline Silica a health hazard?

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

Avoid breathing in crystalline silica dust

Safe working practices

- ✗ NEVER use a power saw indoors or in a poorly ventilated area
- ✗ NEVER dry sweep
- ✓ ALWAYS use M Class or higher vacuum or damp down dust before sweeping up
- ✗ NEVER use grinders
- ✓ ALWAYS use a dust reducing circular saw equipped with a sawblade specifically designed to minimise dust creation when cutting fibre cement – preferably a sawblade that carries the Hardie™ Blade name or one with at least equivalent performance – connected to an M Class or higher vacuum
- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ✓ ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

When cutting

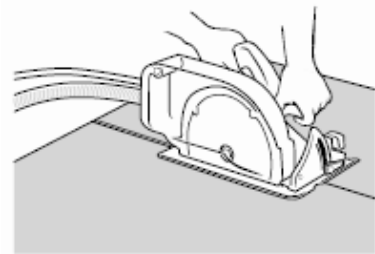
- ✓ Work outdoors only
- ✓ Make sure you work in a well ventilated area
- ✓ Position cutting station so wind will blow dust away from yourself and others in the working area
- ✓ Rotate employees across cutting task over duration of shift
- ✓ Cut products with a Hardie™ Blade Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
 - Wear your P1 or higher (correctly fitted in accordance with manufacturers' instructions), ask others to do the same.
 - Keep persons on site at least 2 metres and as far as practicable away from the cutting station while the saw is in operation
 - If you are not clean shaven, then use a powered air respirator with a loose fitting head top
 - Wear safety glasses
 - Wear hearing protection
- ✓ Make sure you clean up BUT never dry sweep. Always hose down with water/wet wipe or use an M Class or higher vacuum

If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

Working Instructions

Hardie™ Blade Saw Blade

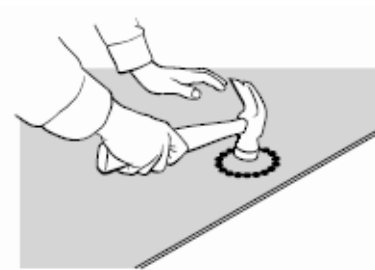
The Hardie™ Blade Saw Blade used with a dust-reducing saw is ideal for fast, clean cutting of Hardie™ fibre cement products. A dust-reducing saw uses a dust collector connected to a M Class or higher vacuum. When sawing, clamp a straight edge to the sheet as a guide and run the saw base plate along the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



Hole-Forming

For smooth clean cut circular holes:

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



For irregular holes:

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

5.1 Storage and Delivery

Keeping products and people safe

Off loading

- ✓ Hardie™ fibre cement products should be off-loaded carefully by hand or by forklift
- ✓ Hardie™ fibre cement products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

Hardie™ fibre cement products should be stored:

- ✓ In their original packaging
- ✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry
- ✓ Off the ground – either on a pallet or adequately supported on timber or other spacers
- ✓ Flat so as to minimise bending

Hardie™ fibre cement products must not be stored:

- ✗ Directly on the ground
- ✗ In the open air exposed to the elements

James Hardie is not responsible for damage due to improper storage and handling.

5.2 Tips for Safe and Easy Handling of Linea™ Weatherboard

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

6 Installation

The horizontal lap between the two Linea™ Weatherboard must be 30mm minimum. In certain scenarios you may require to creep up the lap, this must not exceed 33mm.

Linea™ Weatherboard must be kept dry whilst in storage prior to and during fixing. Site cut ends that are exposed such as slimline box corners, internal corners etc. and any sanded patches on the boards surface must be primed prior to installation. Dust and loose material must be removed before priming.

6.1 Fastener

6.1.1 Fastener – Size and Method

Linea™ Weatherboard must be fixed to timber with the types of nails specified in Tables 4 and 5, in accordance with the following requirements:

- Linea™ Weatherboard can either be face/exposed fixed or concealed fixed
- Linea™ Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing, refer to figures in section 9 of this manual
- All concealed nails must be driven flush with the board surface
- When concealed fixing Linea™ Weatherboard, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Linea™ Weatherboard must be face fixed, refer to figures in section 9 of this manual
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 6.1.2
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised by fixing a jolt head nail through the lap as per the exposed nailing method. Refer to figures in section 9 of this manual
- When using concealed fixing method, Linea™ Weatherboard may be tied together by face fixing through the lap using a 32mm brad nail if desired.
- When face fixing Linea™ Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail

Table 4

Wind pressure (kPa)	Underlay	Fixing method	Fixing type	Instructions
Up to 1.5 (up to and including VH Wind Zone)	Flexible underlay	Concealed nailing	60 x 3.15mm Hardie™ Flex nail or a 60 x 2.87mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	75 x 3.15mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3mm drill bit.
	Rigid air barrier	Concealed nailing	75 x 3.15mm Hardie™ Flex nail or a 75 x 3.06mm D/round head gun nail	Finish flush with the board surface.
		Face nailing	90 x 3.55mm jolt head nails	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.
1.5 to 2.5 (EH Wind Zone and SED projects)	RAB™ Board	Face nailing	90 x 3.55mm jolt head nail	Hot-dipped galvanised/stainless steel jolt head nail with pre-drilling through the top weatherboard. Use a 3.5mm drill bit.

Table 5

Nail requirements for Hardie™ Axent™ Trim	
Single thickness	60mm jolt head nails. If fixing over Linea™ Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit.
Single thickness plus packer	If fixing over Linea™ Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled hole, using a 3mm drill bit. When fixing to timber support use 60mm jolt head nails.

For fire rated wall applications the Linea™ Weatherboard must be face fixed. For more information Ask James Hardie on 0800 808 868.

6.1.2 Gun Nailing

Linea™ Weatherboard can be gun nailed with a D-Head or RounDrive nail when concealed fixing method is used.

- Nails must be no closer than 50mm from the ends of boards when gun nailing is used, double studs will be required.
- Be minimum length and nearest gauge as per Table 4.
- Be finished flush with surface of board.

6.1.3 Fastener Durability

Fasteners must meet the minimum durability requirements of the NZBC. Refer to Table 6 for fixing materials requirements to be used in relation to the exposure conditions.

Table 6

Exposure conditions and nail selection prescribed by NZS 3604		
Zone	Application	
D (sea spray) and geothermal hot spots	General	Stainless steel 304/316
	Fire	
*C and B	General	Hot dip galvanised**
	Fire	

* Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made. Microclimatic conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

**Hot dip galvanised must comply with AS/NZS 4680.

Also refer to the NZBC Acceptable Solution E2/AS1 Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

6.2 Framing

Framing to be in accordance with the NZS 3604. The following must be provided for fixing Linea™ Weatherboard:

- Studs at 600mm centres maximum for all wind speed zones up to and including very high (VH)
- Studs at 400mm centres maximum for wind pressures more than 1.5 kPa (ULS)
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.1 Specific Engineering Design (SED)

For EH wind zone and specific engineering design projects the timber framing is required to be designed in accordance with NZS 3603 and AS/NZS 1170. The minimum framing sizes and layout must comply with this specification:

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Double studs are required at internal corners
- Extra packers may be required at external corners
- Extra studs are required for aluminium internal corner sections

6.2.2 Gable Ends

In case of gable end trusses sitting on top plates of the external wall frame, the frame size must be in accordance with truss design and specification supplied by the frame and truss manufacturer/supplier supported by independent design producer statement.

6.2.3 Tolerances

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604 and the manufacturer's specifications. All framing must be made flush. The visual aspects of the finished cladding can differ between two different sites or the builders installing the product. It is recommended that you also refer to a building guidance document published by MBIE to understand an acceptable level of tolerances allowed in building materials and workmanship. www.building.govt.nz Guide to tolerances, materials and workmanship in new residential construction 2015

6.3 Flexible Underlay or HomeRAB™ Pre-Cladding

Flexible underlay or HomeRAB™ Pre-Cladding must be provided to comply with the requirements of E2/AS1 up to and including very high wind zone.

Walls which are not lined on the inside face (e.g. garage walls or gable ends) must include a rigid sheathing or an air barrier behind the cladding. HomeRAB™ Pre-Cladding is suitable for use as an air barrier and must be installed in accordance with the HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual.

6.4 Intermediate Support

Where studs are at 600mm centres an intermediate means of restraining the flexible underlay and insulation from bulging into the cavity must be installed. An acceptable method to achieve this is using one of the following:

- Intermediate cavity batten between the studs; or
- 75mm galvanised mesh; or
- Polypropylene tape at 300mm centres fixed horizontally and drawn taut.

No intermediate supports are required:

- Where studs are at maximum 400mm centres; or,
- When rigid sheathings instead of flexible underlays are used.

6.5 Rigid Air Barrier

In EH wind zone or for specific design wind zone, a rigid air barrier i.e. RAB™ Board, must be used instead of flexible underlay.

For buildings more than 10m, RAB™ Board must be used. To achieve the temporary weathertightness using HomeRAB™ Pre-Cladding and RAB™ Board, windows/doors need to be installed with required flashing tapes and seals etc. Refer to HomeRAB™ Pre-Cladding and RAB™ Board Installation Manual for information regarding its installation and to achieve temporary weathertightness.

6.6 Vent Strip

Linea™ 35mm cavity closer vent strip must be installed at the bottom of all walls constructed using the drained and ventilated for cavity construction method. Linea™ 35mm cavity closer vent strip has an opening area of 1000mm²/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities. Alternate cavity closer can be used ensuring compliance of E2 and may need to be used with a cant strip.

6.7 Cavity Battens

The cavity battens provide airspace between the frame and cladding and are considered a “packer” only in this specification.

The timber battens must be minimum H3.1 treated to comply with the durability requirements of B2/AS1.

Cavity battens must comply with E2/AS1 and:

- Be minimum 18mm thick
- Be minimum 45mm wide
- Until claddings are fixed the battens need only to be tacked to framing with 40 x 2.8mm nails at 800mm centres maximum (batten fixing is required temporarily to keep them straight on the wall during construction)

6.8 Joints

6.8.1 Jointing

The ends of Linea™ Weatherboard are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Flexible sealant must be applied to the front of tongue before pushing into the groove at the time of installation. From a visual perspective, the joint line will be visible and must not be hard filled.

6.8.2 Drainage Joint

After every two floors a horizontal drainage joint flashing is required, refer to Figure 29 in section 9 of this manual.

6.8.3 External Corner Joint

There are a number of options to select from when detailing external corners:

- 90° corner soaker in aluminium
- 135° corner soaker 180mm aluminium
- Aluminium boxed corners
- Box corners using Hardie™ Axent™ Trim
- Mitred corners to weatherboards

Refer to figures in section 9 of this manual.

6.8.4 Internal Corner Joint

There are a number of options to select from when detailing internal corners:

- 90° or 135° Aluminium W-mould
- Scribed corner

Refer to figures in section 9 of this manual.

6.9 Junctions and Penetrations

All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Linea™ Weatherboard which meet the performance requirements of E2 'External Moisture', an approved document of the NZBC, refer to figures in section 9 of this manual.

7 Finishes

Protective coating of Linea™ Weatherboard is required in order to meet the durability requirements of the NZBC.

7.1 Preparation and Priming

The Linea™ Weatherboard must be dry before painting. Punch and fill all exposed jolt head nails a maximum of 2mm below the surface. Fill the hole with an exterior grade 2 part builders fill, eg CRC® ADOS® Builders Fill, allow to cure and sand using 60 grit sand paper smooth ready for painting. Prime any sanded patch on board surface or the site cut edges that will be exposed.

It is not recommended to seal gap under the lap of weatherboards as it helps in circulation of air behind the weatherboard cladding. However if sealing of the gaps is undertaken, the product warranty still applies.

7.2 Sealants

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 Painting

All Linea™ Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat.

Linea™ Weatherboard must be painted within 90 days of installation. Dark coloured paints can be used, i.e. there is no restriction on the Light Reflectance Value (LRV) of paint to be applied. All exposed faces, including the top edges under the sills and bottom edges of Linea™ Weatherboard and accessories must be finished with an exterior paint system.

For best aesthetic results a low sheen paint is recommended.

The dark colours in certain environments may fade quicker. Special paints/coatings are required in certain harsh environments.

Paint selection and the preparation required is dependent on paint chosen. Refer to the paint manufacturer for information before starting painting.

8 Care and Maintenance

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

- Washing down exterior surfaces every 6-12 months using low pressure water and a brush, and every 3-4 months in extreme coastal conditions or sea spray zones. Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.
- Re-coating exterior protective finishes. Always refer to your paint manufacturer for re-coating requirements
- Maintaining the exterior envelope and connections including junctions, penetrations, flashings and sealants
- Cleaning out gutters, blocked pipes and overflow pipes as required
- Pruning back vegetation close to or touching the building as well as ensuring the NZBC ground clearance requirements are maintained especially where gardens are concerned
- The clearances between the bottom edge of Linea™ Weatherboard and the finished/unfinished ground must always be maintained
- Stainless steel soakers used in extreme coastal conditions or in sea spray zones may show some signs of 'tea staining'. It is an aesthetic issue and to minimise staining soaker must be washed/polished frequently

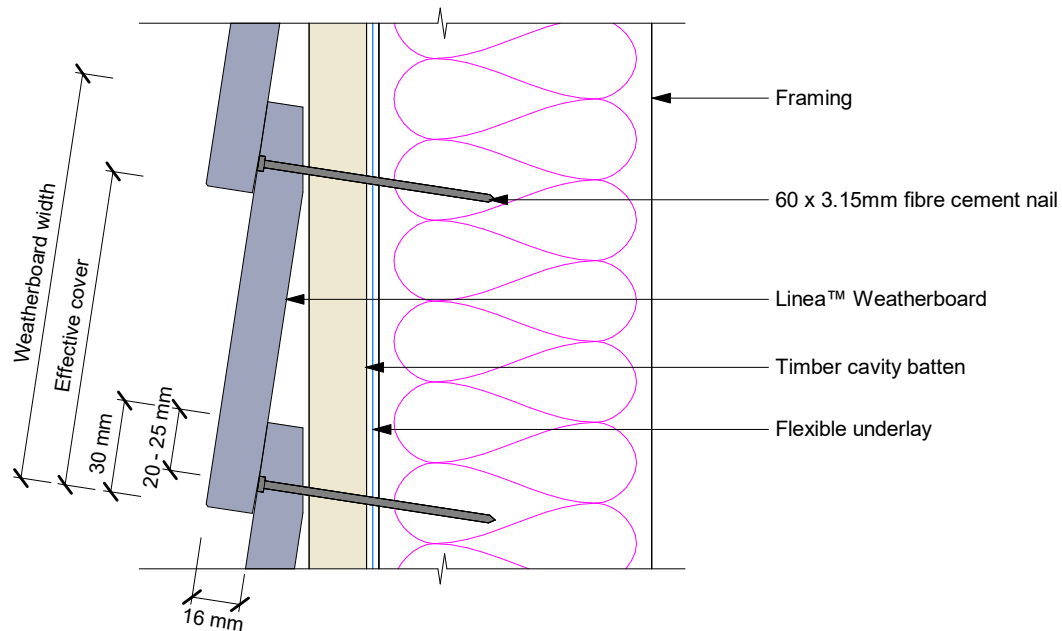
9 Details Section Index

Description	Page
Figure 1: Weatherboard fixing	24
Figure 2: Batten fixing	25
Figure 3: Batten layout at window opening	25
Figure 4: Foundation detail	26
Figure 5: Enclosed Deck	26
Figure 6: Jointing off stud	27
Figure 7: External corner soaker	27
Figure 8: Aluminium box corner	28
Figure 9: Boxed corner	28
Figure 10: Mitre corner	29
Figure 11: Internal 90 ° aluminium 'W' mould corner	29
Figure 12: Internal 135 ° aluminium 'W' mould corner	30
Figure 13: Internal corner joint flashing	30
Figure 14: Wall to soffit junction 'X'	31
Figure 15: Nil soffit detail	31
Figure 16: Sloping soffit and wall junction	32
Figure 17: Window and door sill	32
Figure 18: Window head	33
Figure 19: Window jamb	33
Figure 20: Window head stop end	34
Figure 21: Window sill with facing	35
Figure 22: Window head with facings	35
Figure 23: Window jamb with facings	36
Figure 24: Door sill support detail	36
Figure 25: Pipe penetration	37
Figure 26: Continuous cladding over joist	37
Figure 27: Drained flashing joint at floor level	38
Figure 28: Timber deck junction	38
Figure 29: One piece apron flashing joint	39
Figure 30: Roof to wall junction detail	39
Figure 31: Parapet flashing	40
Figure 32: Enclosed deck balustrade to wall	40
Figure 33: Enclosed balustrade to wall	41
Figure 34: Junction Linea™ Weatherboard and fascia board	42

Description	Page
Figure 35: Enclosed roof to wall intersection	43
Figure 36: Garage door head	44
Figure 37: Garage door jamb	44
Figure 38: Framing setout building height over 10m	45
Figure 39: Intertenancy vertical fire separation	46

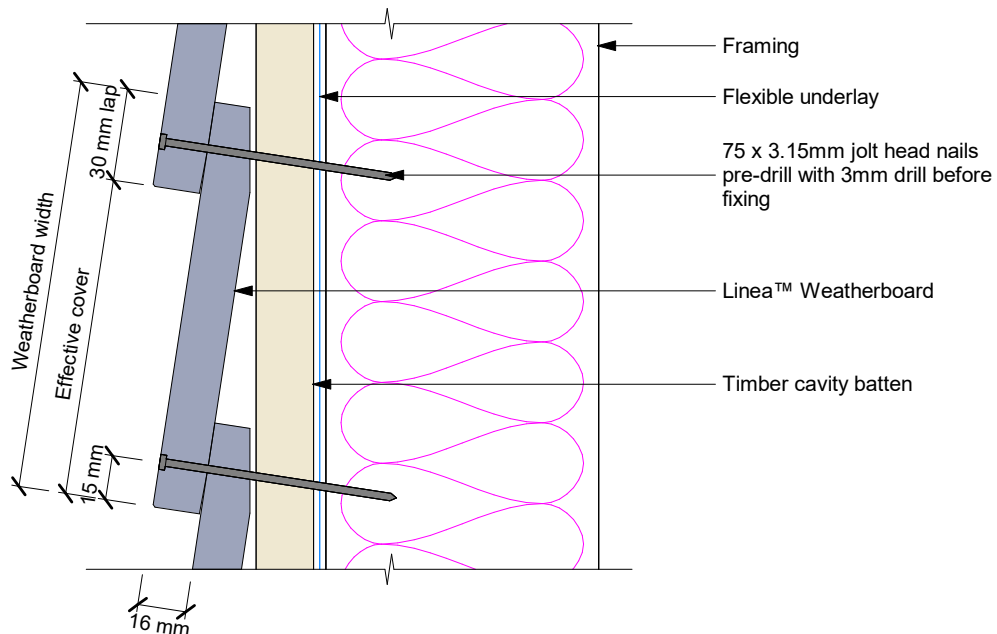
For all meter box details please visit our website at www.jameshardie.co.nz or Ask James Hardie™ on **0800 808 868**.

Figure 1: Weatherboard fixing

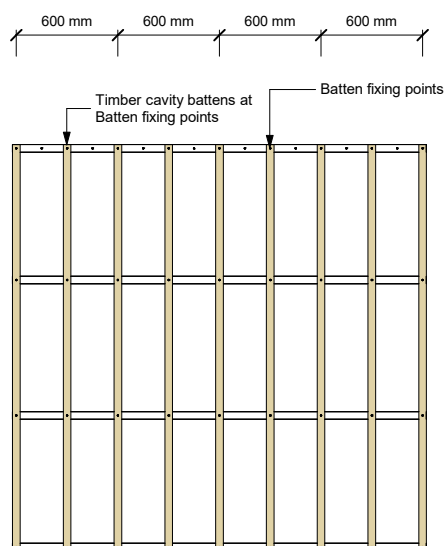


Concealed Nailing

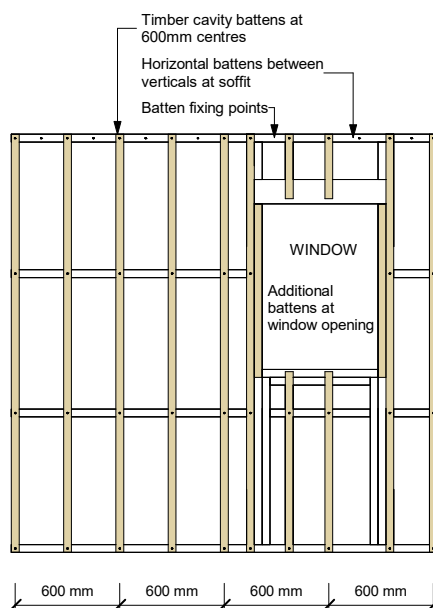
Linea™ Weatherboards to be face fixed at corners and down window and door openings using jolt head nails at 90° to face, punch 2mm below surface and fill. Refer to fixing table 4



Face/Exposed Nailing

Figure 2: Batten fixing

The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 3: Batten layout at window opening

-The intermediate support for insulation between the studs could be a timber cavity batten, polypropylene tape or 75 mm galvanised wire mesh. Refer to E2/AS1 Paragraph 9.1.8.5 Polypropylene tape must be fixed horizontally and drawn taut at 300 mm centres.

Figure 4: Foundation detail

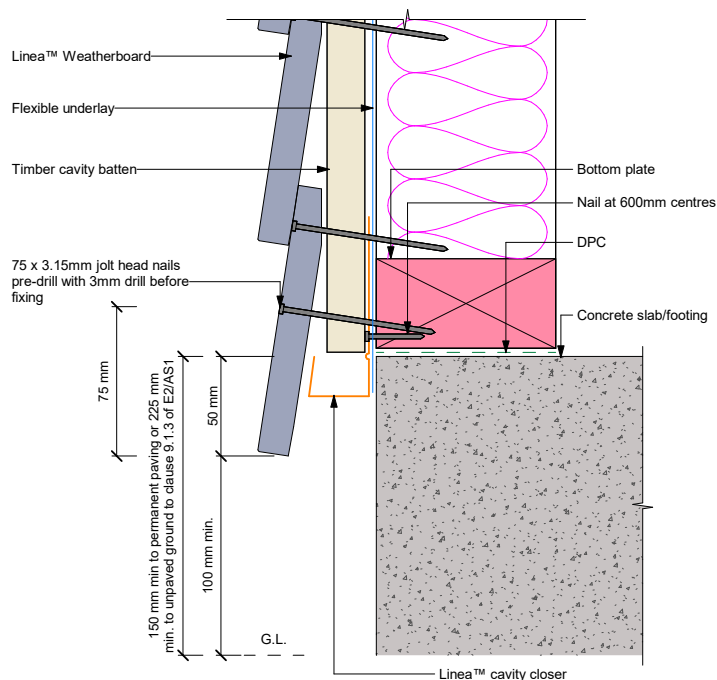


Figure 5: Enclosed Deck

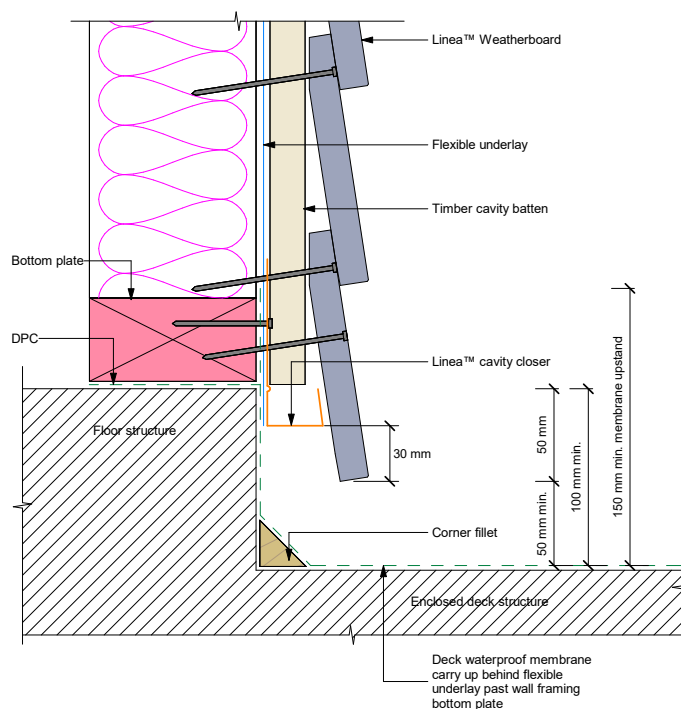


Figure 6: Jointing off stud

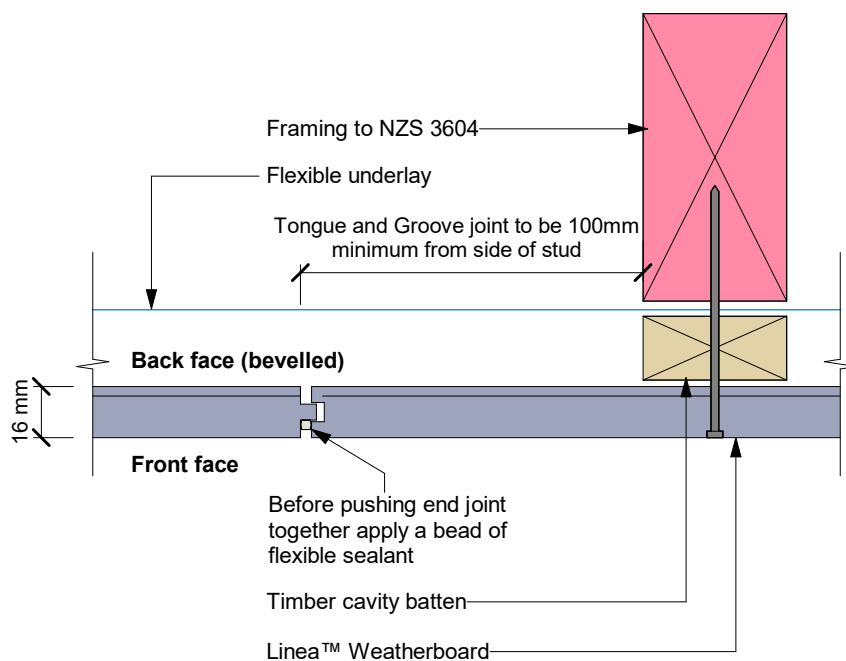


Figure 7: External corner soaker

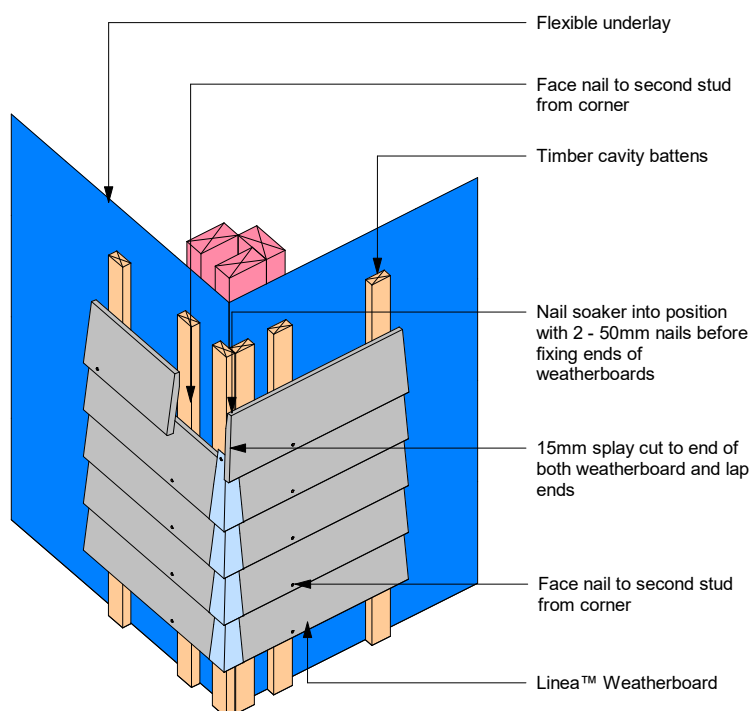


Figure 8: Aluminium box corner

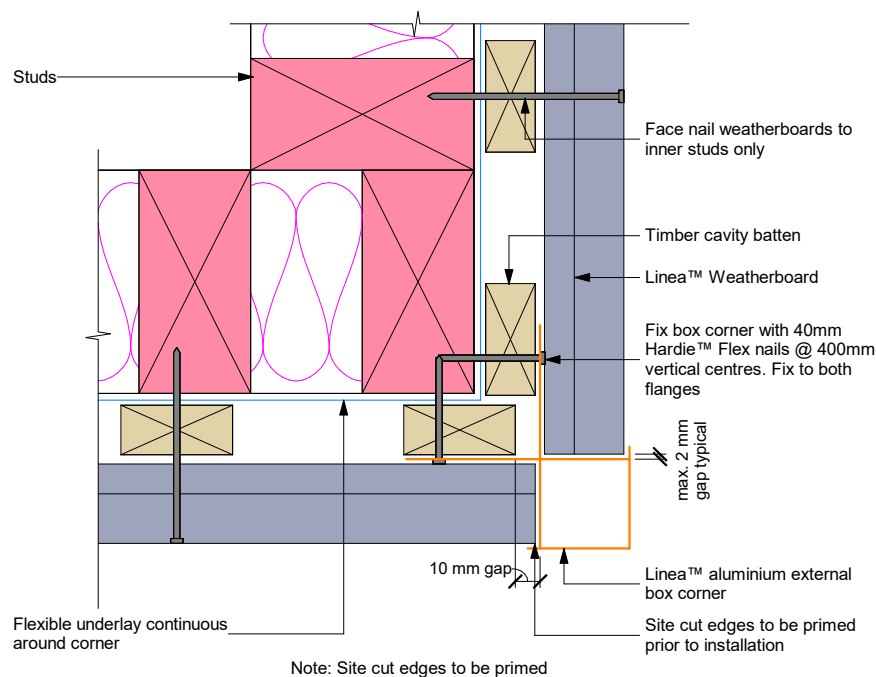


Figure 9: Boxed corner

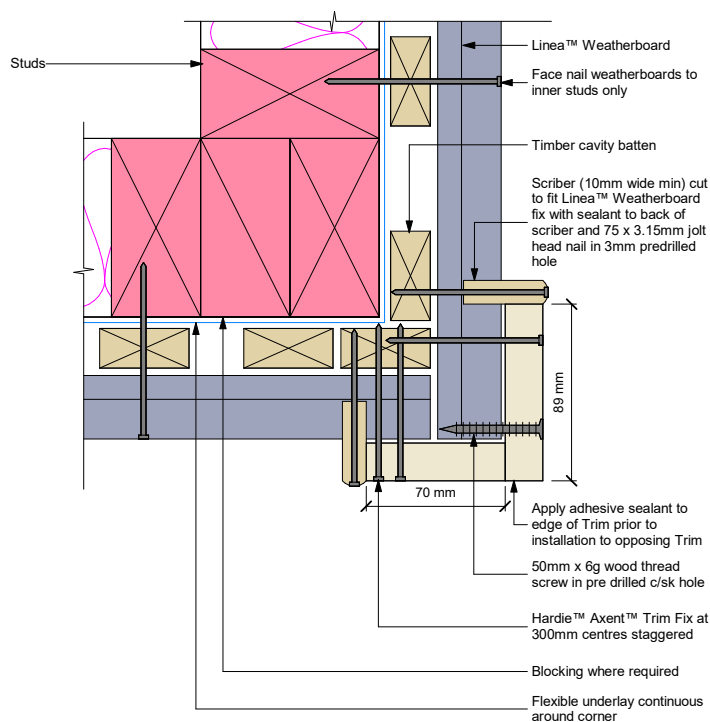
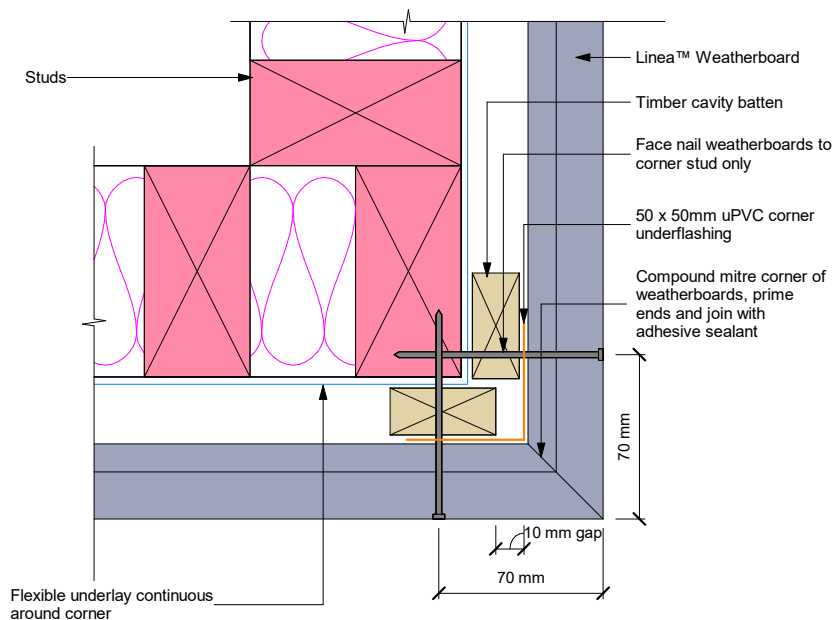


Figure 10: Mitre corner



Note: Adhesive sealant must be used on the full end face of both weatherboards. Push lightly together

Figure 11: Internal 90 ° aluminium 'W' mould corner

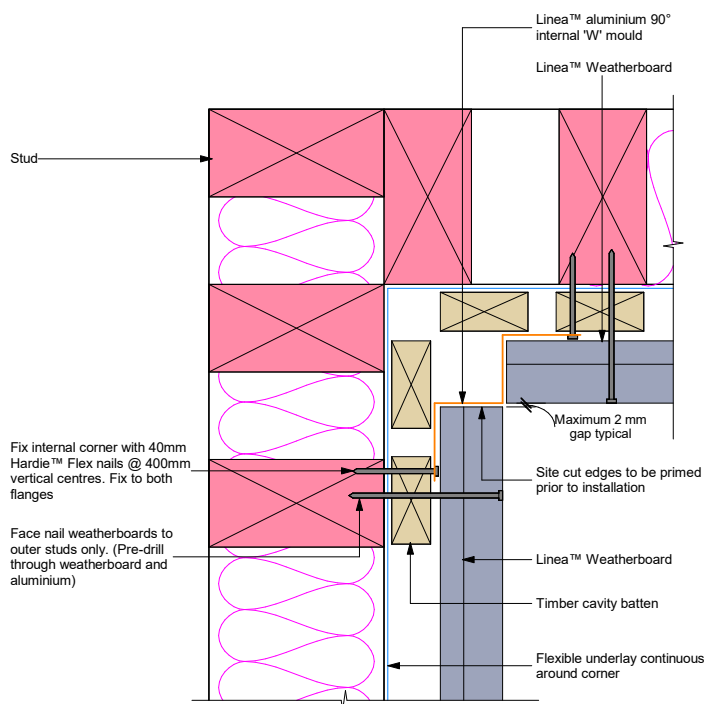


Figure 12: Internal 135 ° aluminium 'W' mould corner

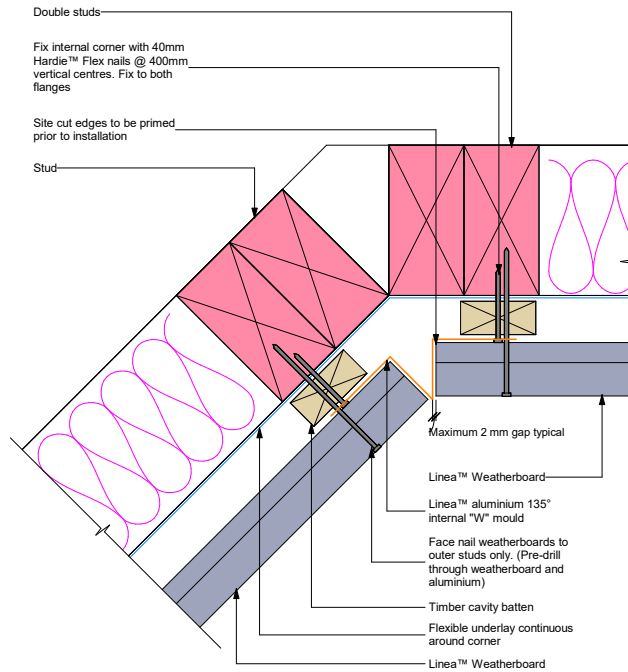


Figure 13: Internal corner joint flashing

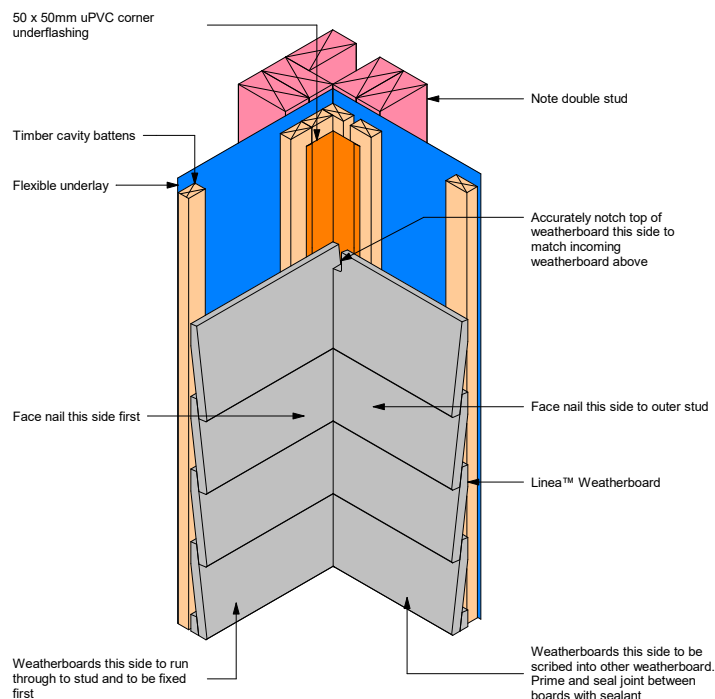


Figure 14: Wall to soffit junction 'X'

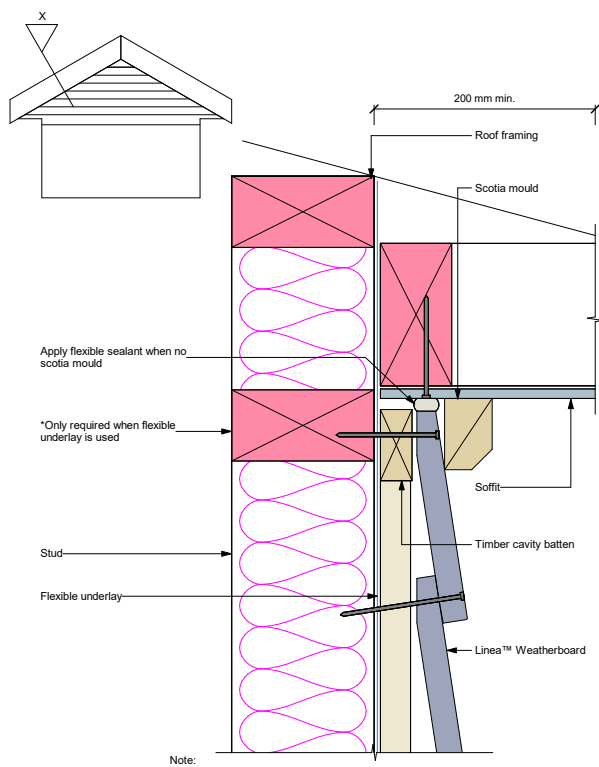


Figure 15: Nil soffit detail

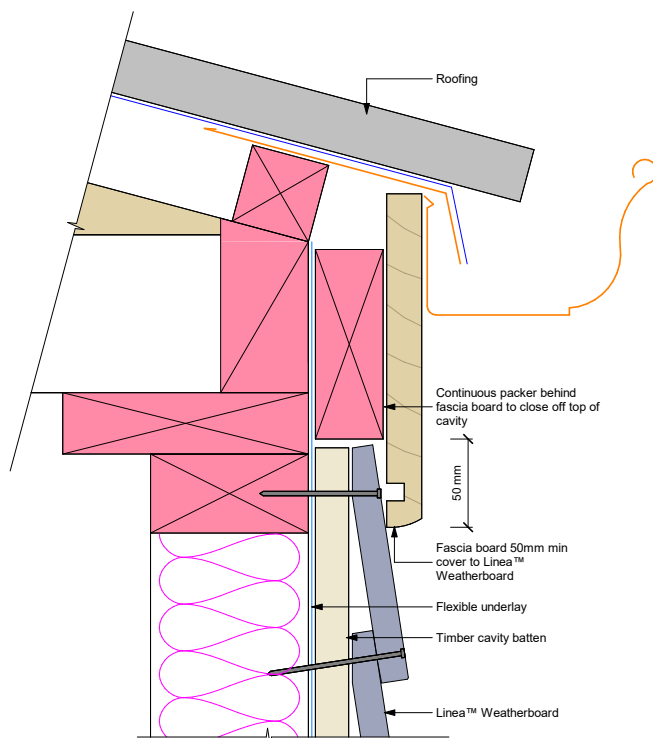


Figure 16: Sloping soffit and wall junction

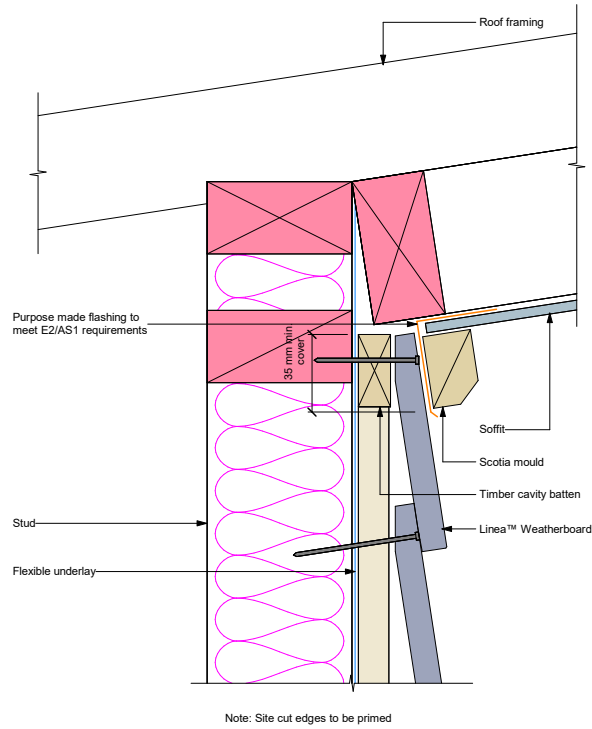
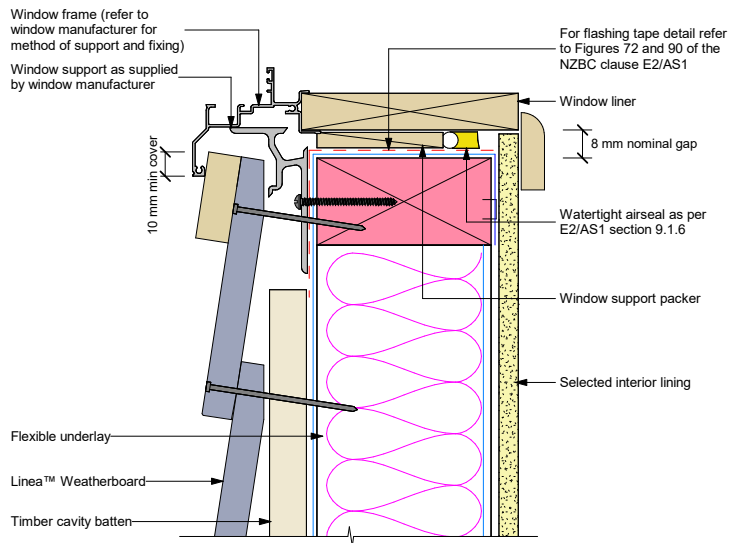


Figure 17: Window and door sill

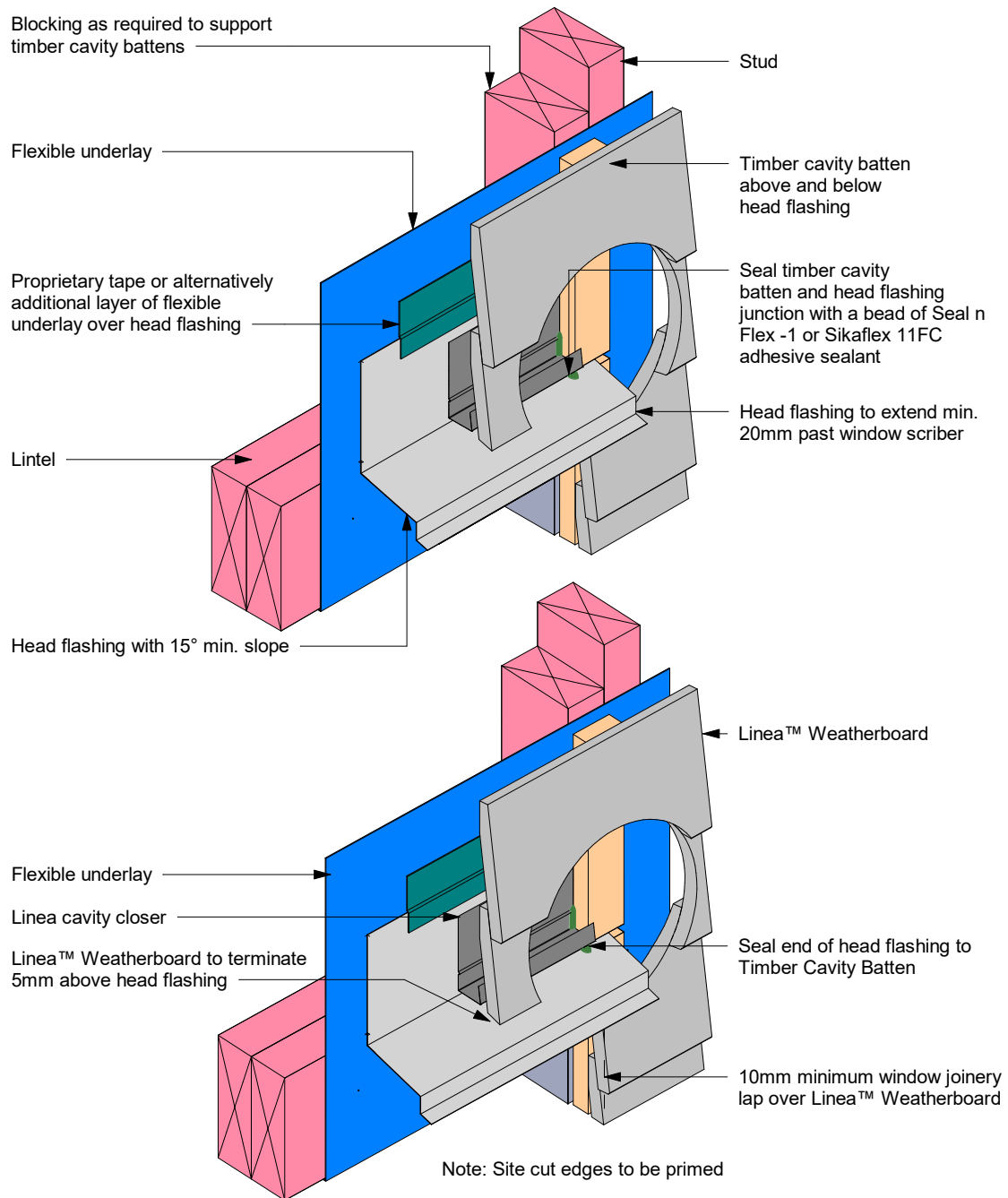


General notes for materials selection

1. Flexible underlay must comply with acceptable solution E2/AS1
2. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Refer to the manufacturer or supplier for technical information for these materials

Figure 20: Window head stop end



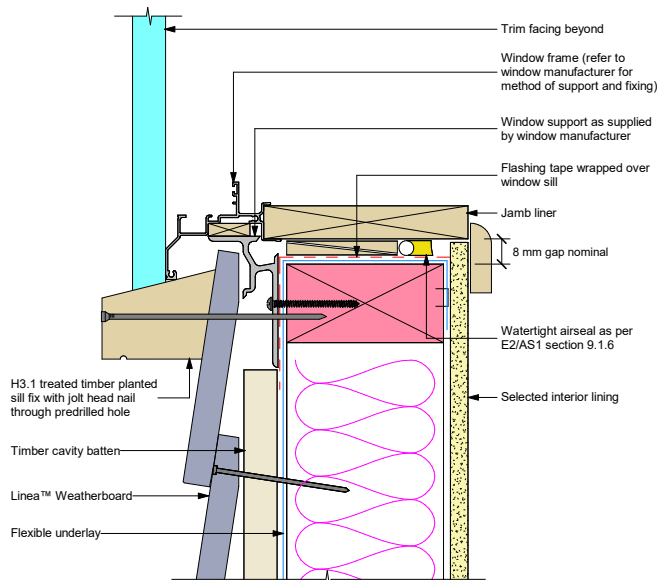
interactive assembly
instructions available

<http://wksp.nz/jh-lin-win>



Get WORKINGSPEC from
Apple App Store/Google Play

Figure 21: Window sill with facing



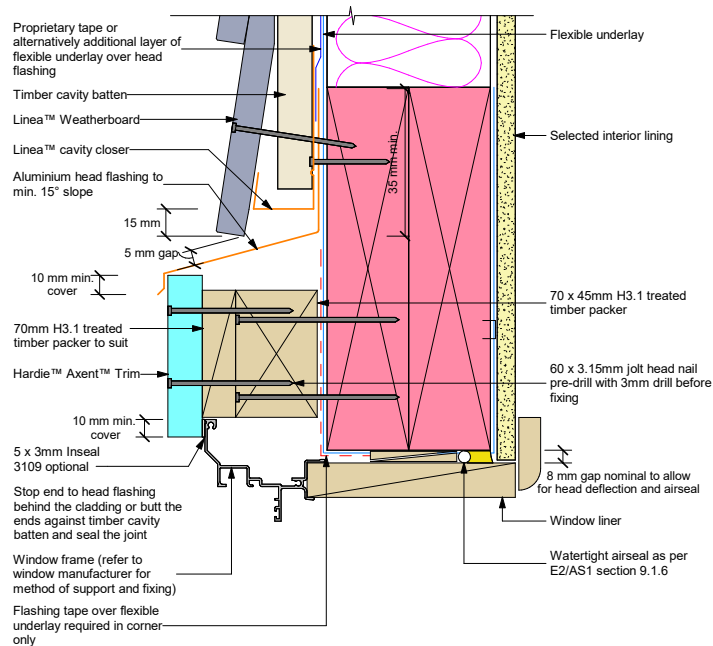
General notes for materials selection

1. Flexible underlay must comply with acceptable solution E2/AS1

2. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

Refer to the manufacturer or supplier for technical information for these materials

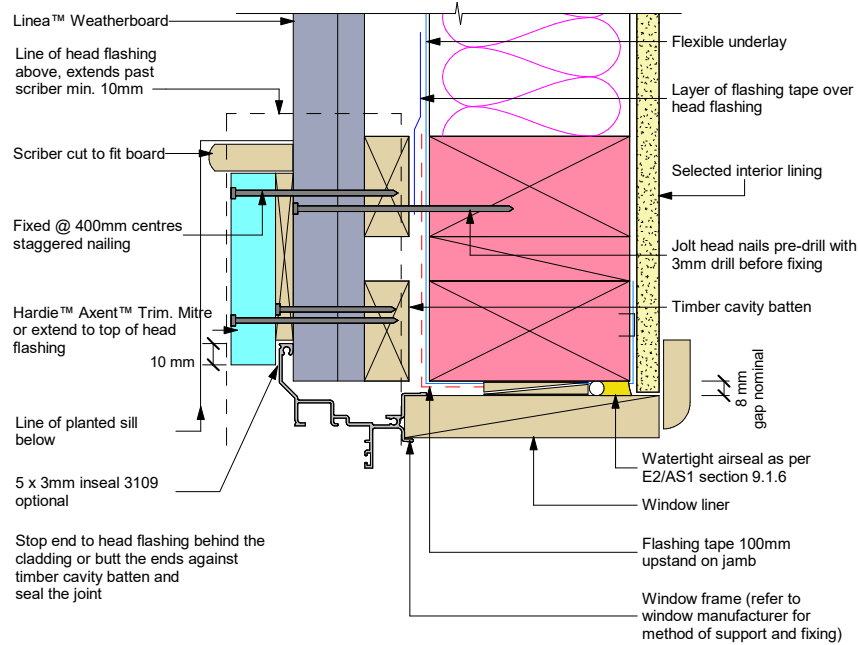
Figure 22: Window head with facings



Note:

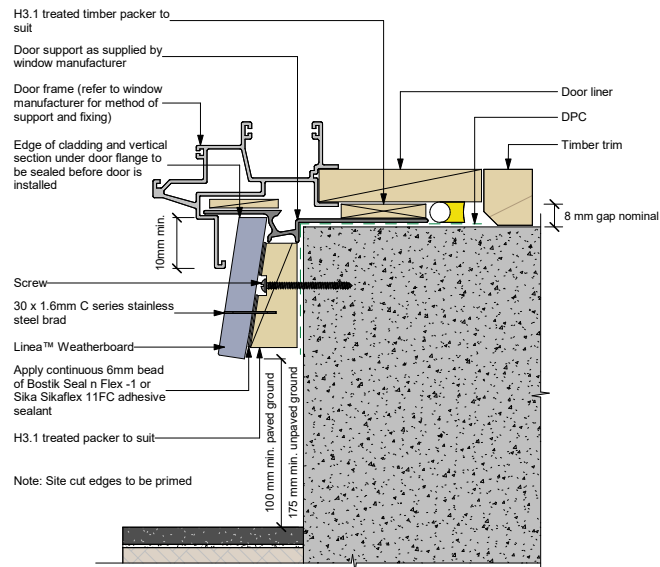
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing

Figure 23: Window jamb with facings



Note:
• Site cut edges to be primed

Figure 24: Door sill support detail

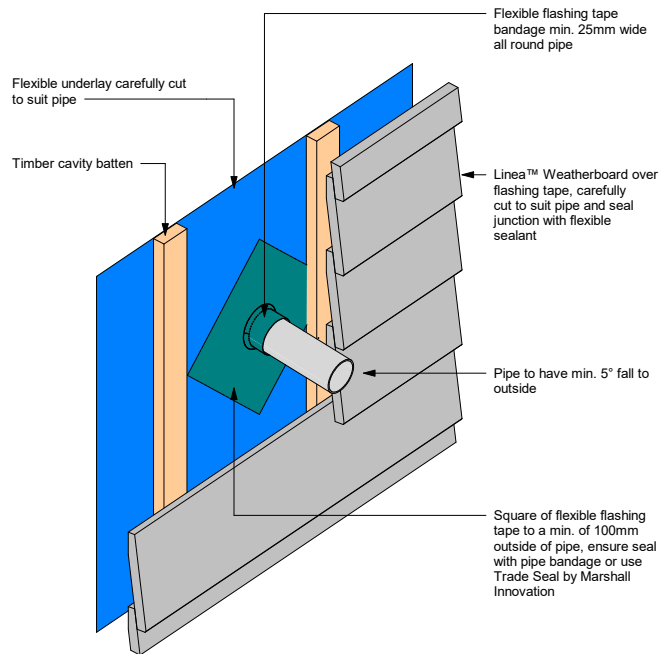


Note: Site cut edges to be primed

Refer to the manufacturer or supplier for technical information for these materials

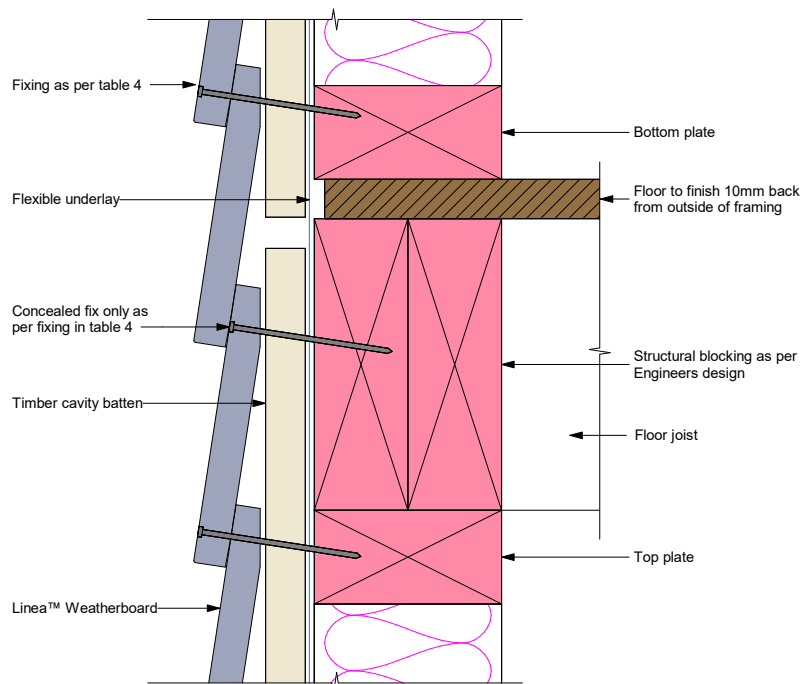
- General notes for materials selection
1. Flexible underlay must comply with acceptable solution E2/AS1
 2. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
 3. Linea™ Weatherboard to have sealed butt joint over batten at each corner of opening

Figure 25: Pipe penetration



Note: Site cut edges to be primed

Figure 26: Continous cladding over joist

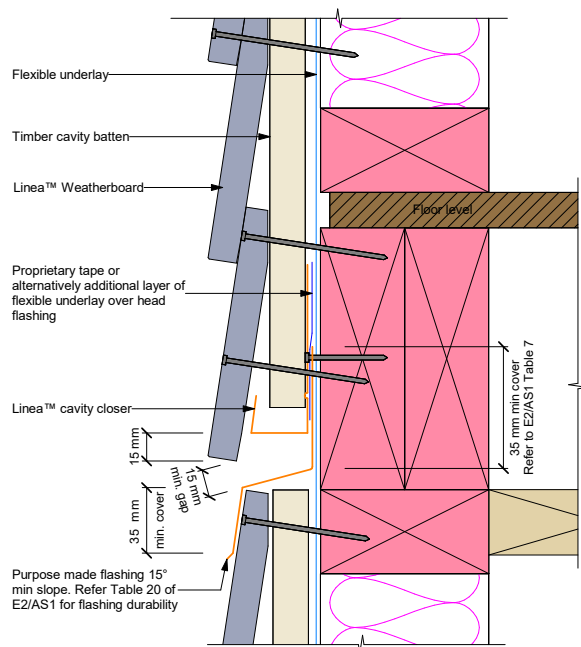


interactive assembly
instructions available
<http://wksp.nz/jh-lin-flj>



Get WORKINGSPEC from
Apple App Store/Google Play

Figure 27: Drained flashing joint at floor level



Note:
This detail is required to limit cavities to a maximum of 2 stories
or 7 metres. Refer E2/AS1 clause 9.1.9.4.

Figure 28: Timber deck junction

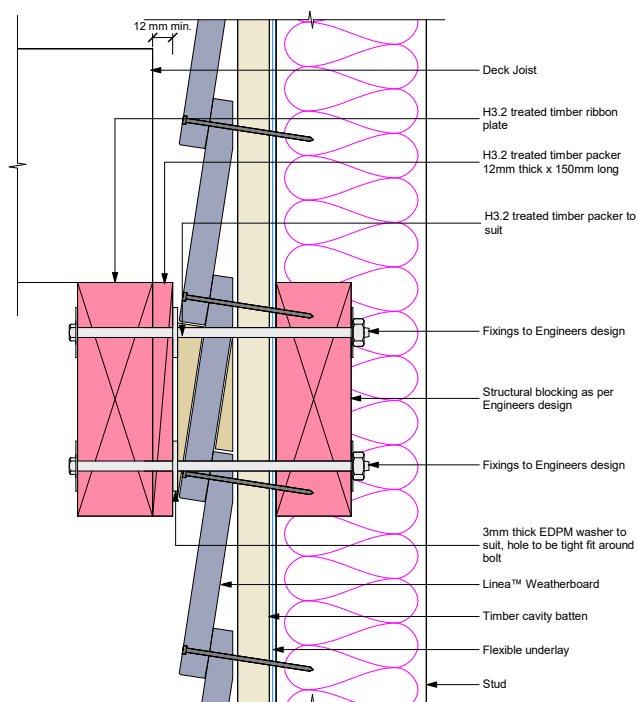


Figure 29: One piece apron flashing joint

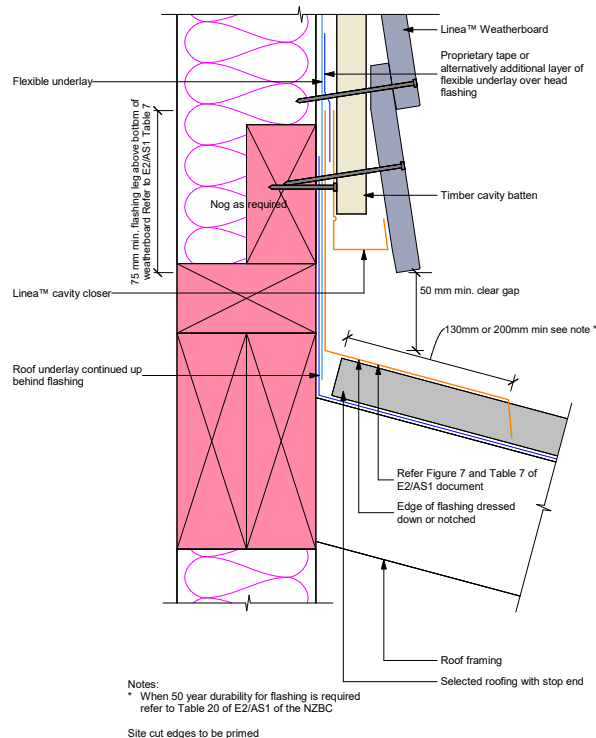


Figure 30: Roof to wall junction detail

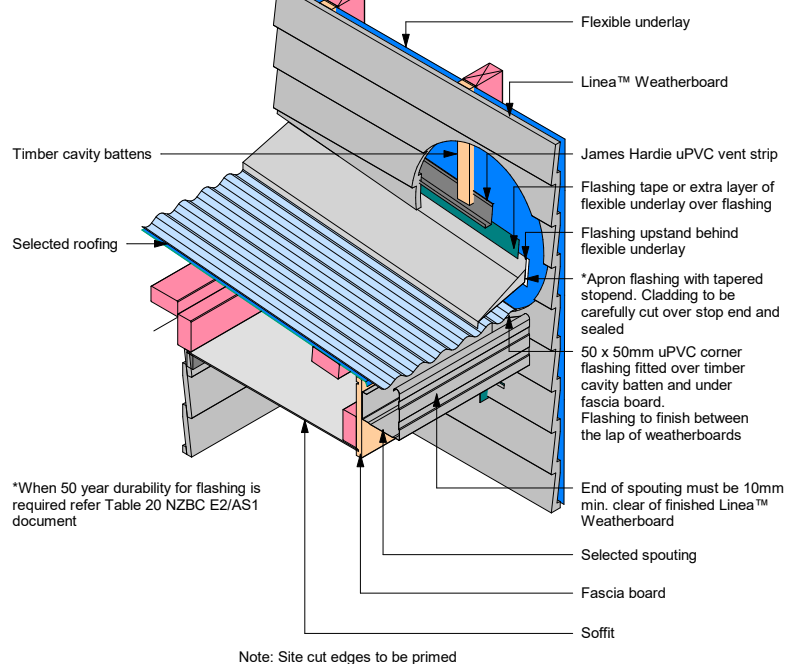


Figure 31: Parapet flashing

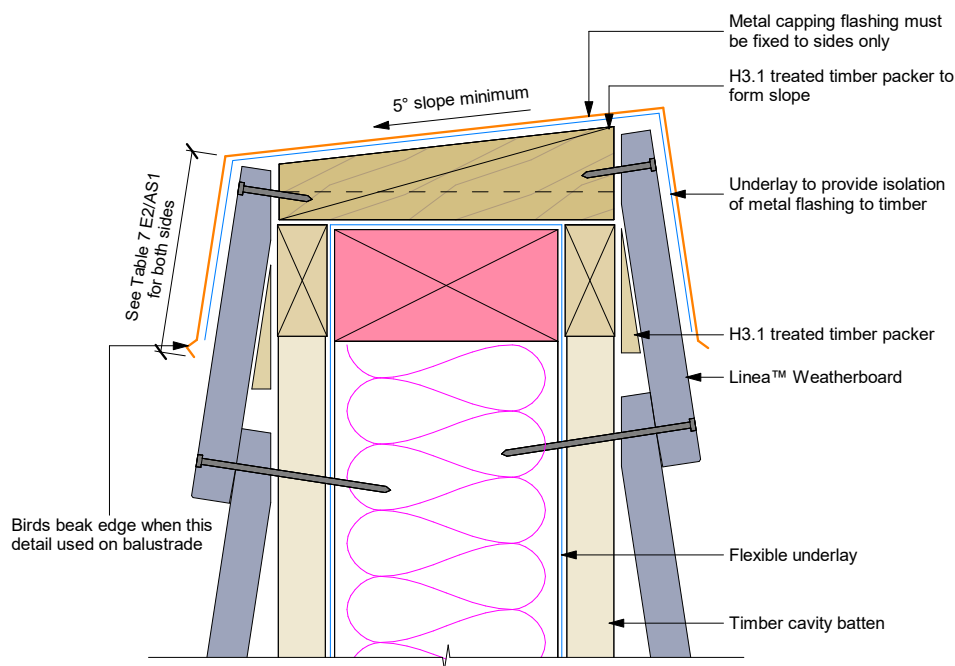


Figure 32: Enclosed deck balustrade to wall

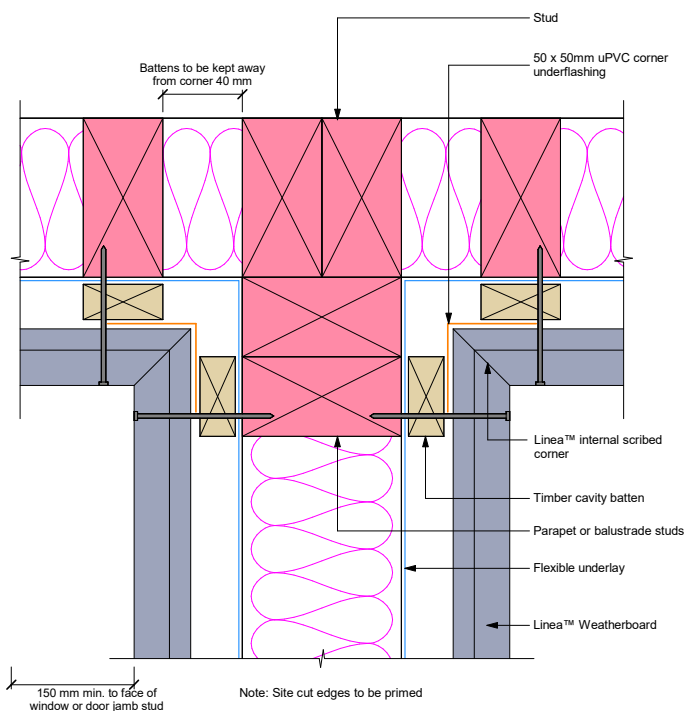


Figure 33: Enclosed balustrade to wall

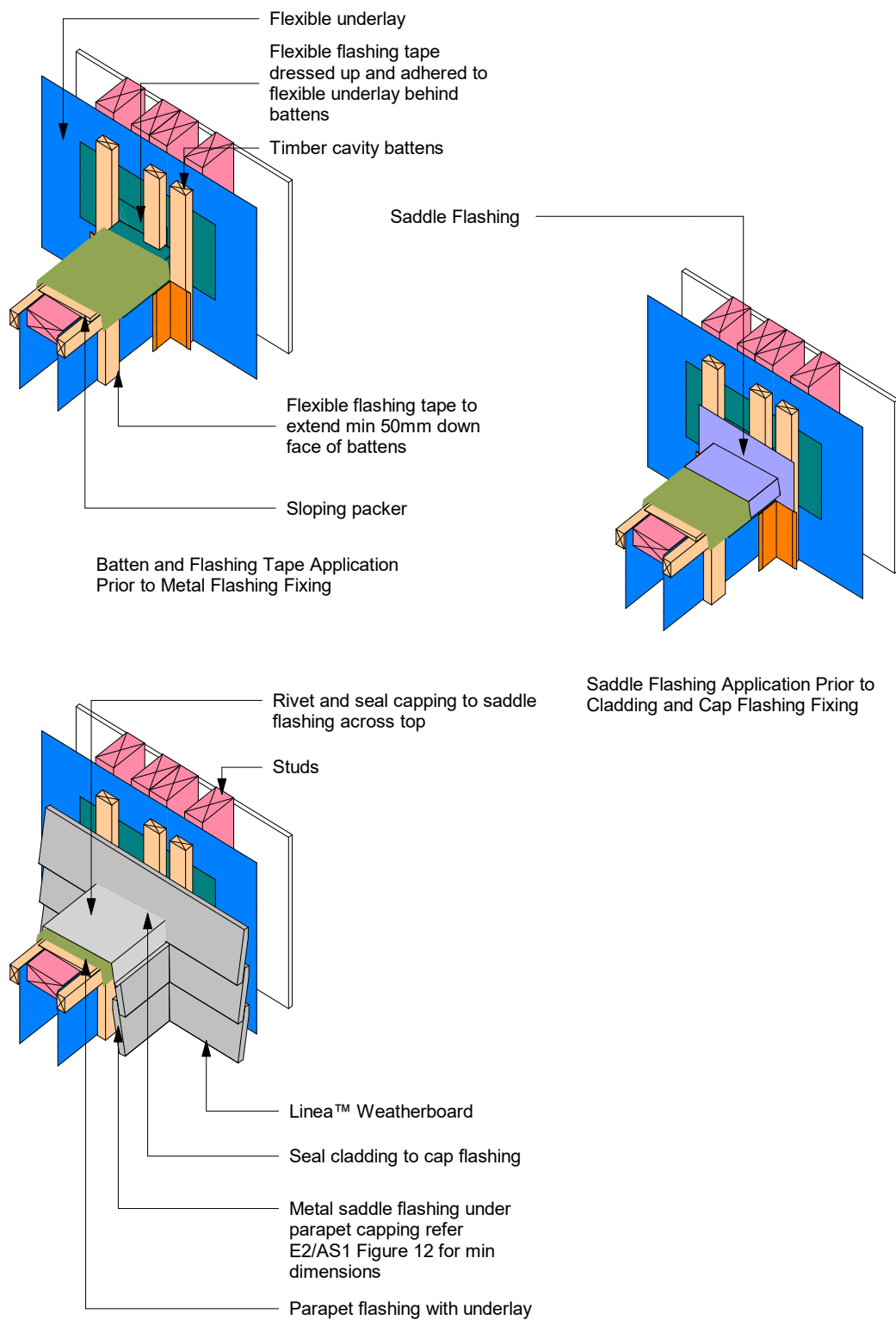
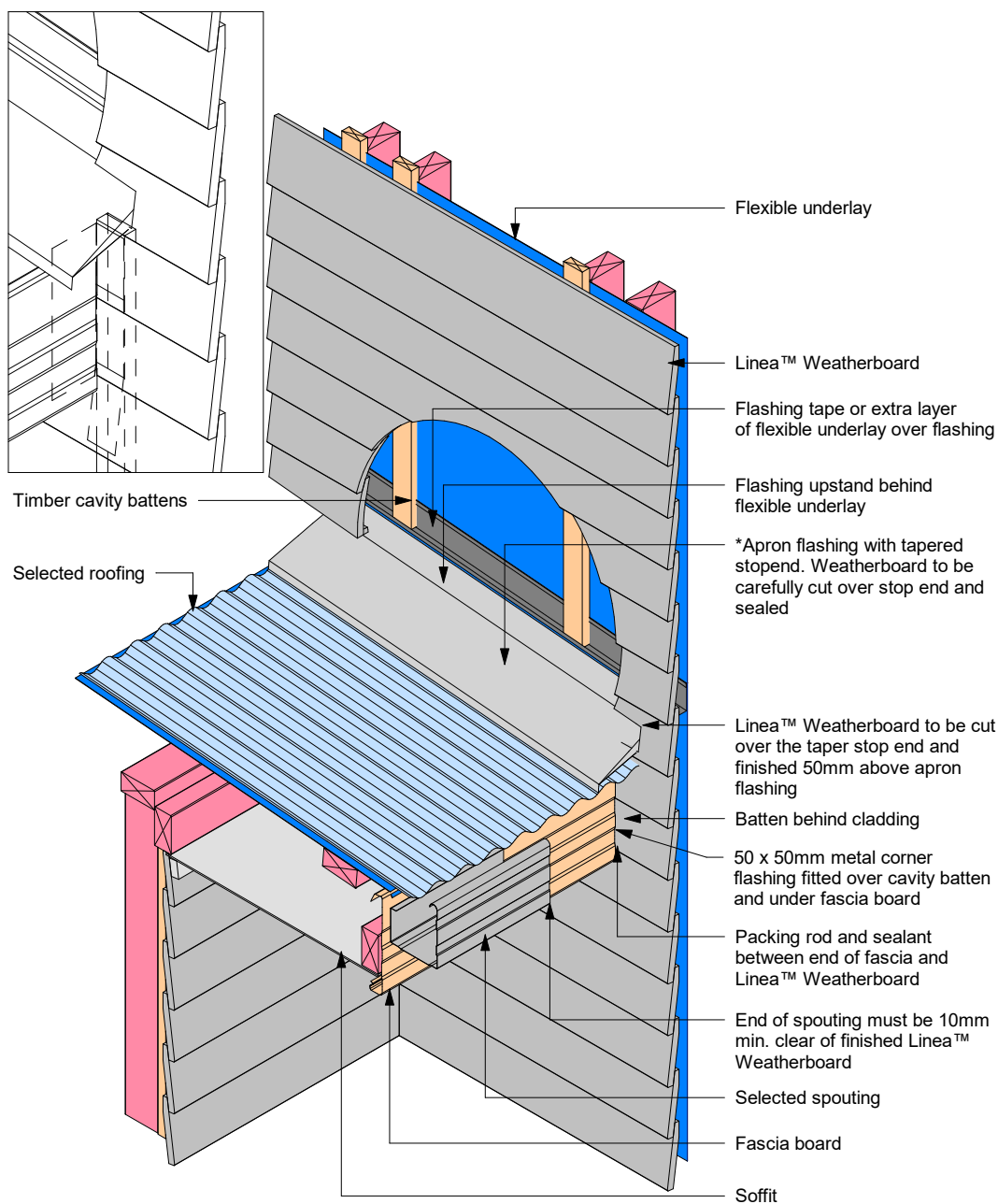


Figure 34: Junction Linea™ Weatherboard and fascia board



*When 50 year durability for flashing is required refer Table 20 NZBC E2/AS1 document

Note: Site cut edges to be primed

Figure 35: Enclosed roof to wall intersection

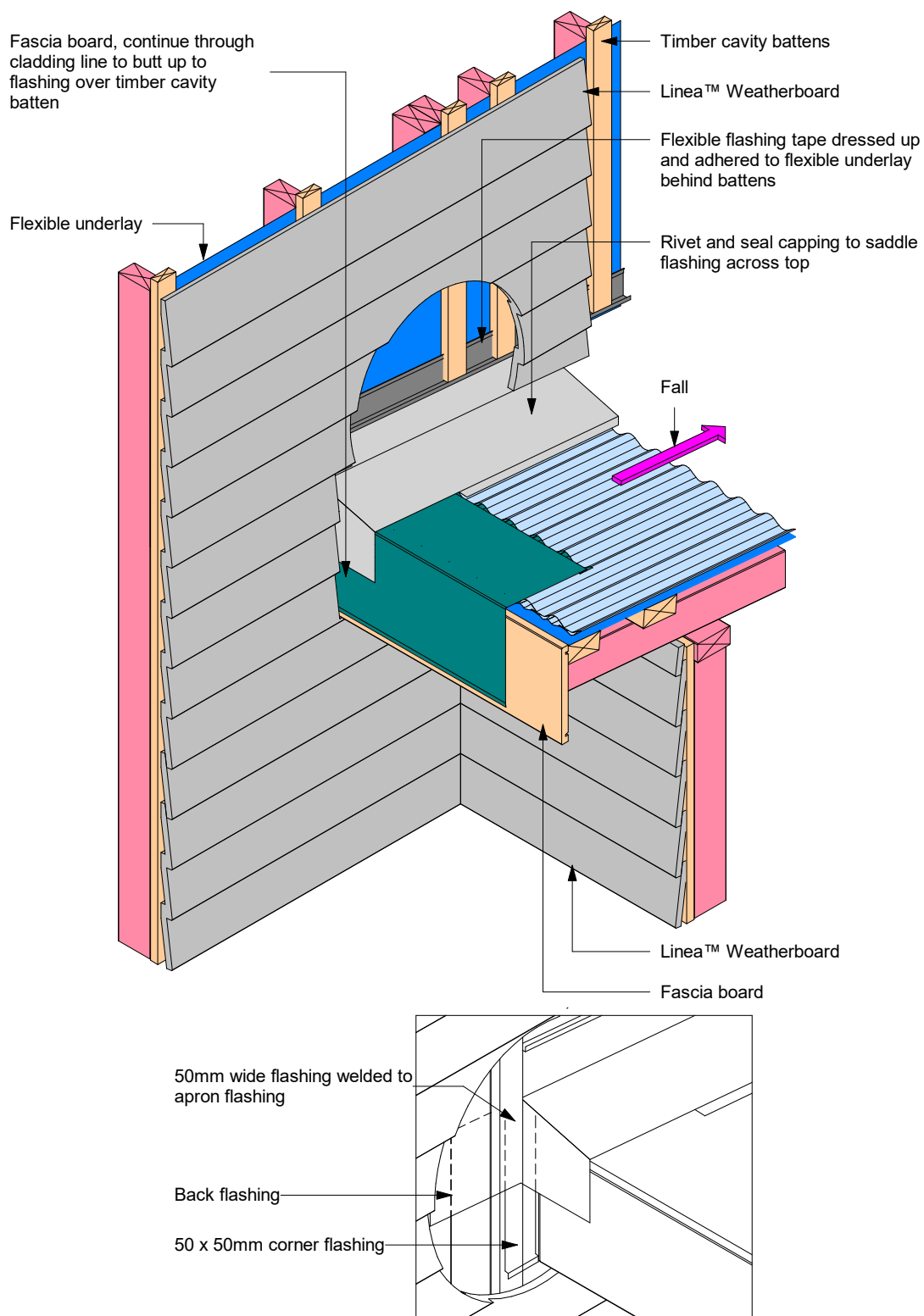
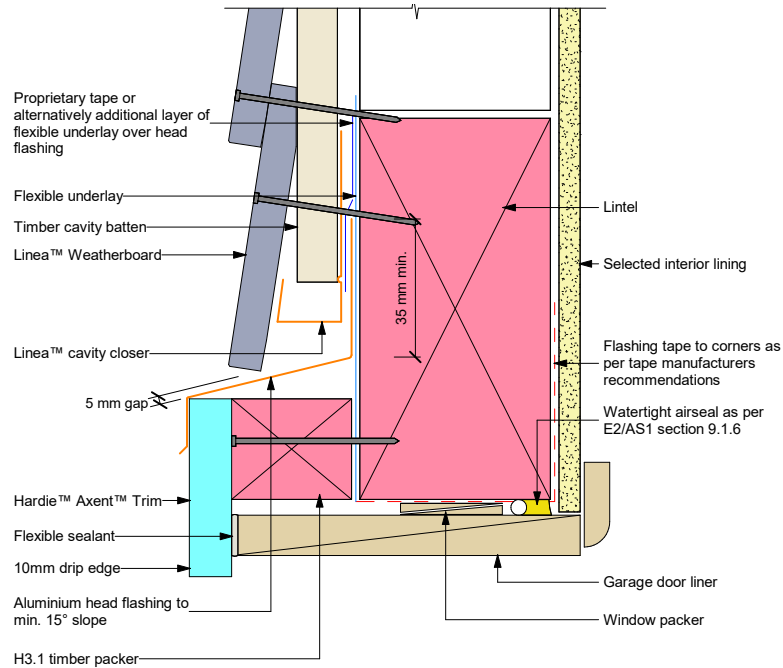


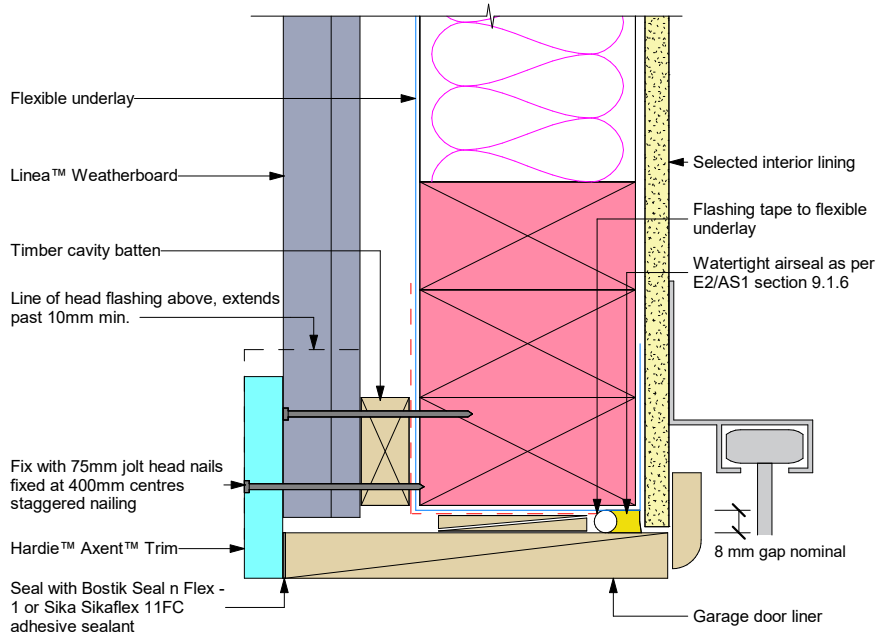
Figure 36: Garage door head



Note:

- Sealant must be applied between head flashing and liner in VH and EH wind zones and SED wind pressures
- Site cut edges to be primed

Figure 37: Garage door jamb



Note: Site cut edges to be primed

Figure 38: Framing setout building height over 10m

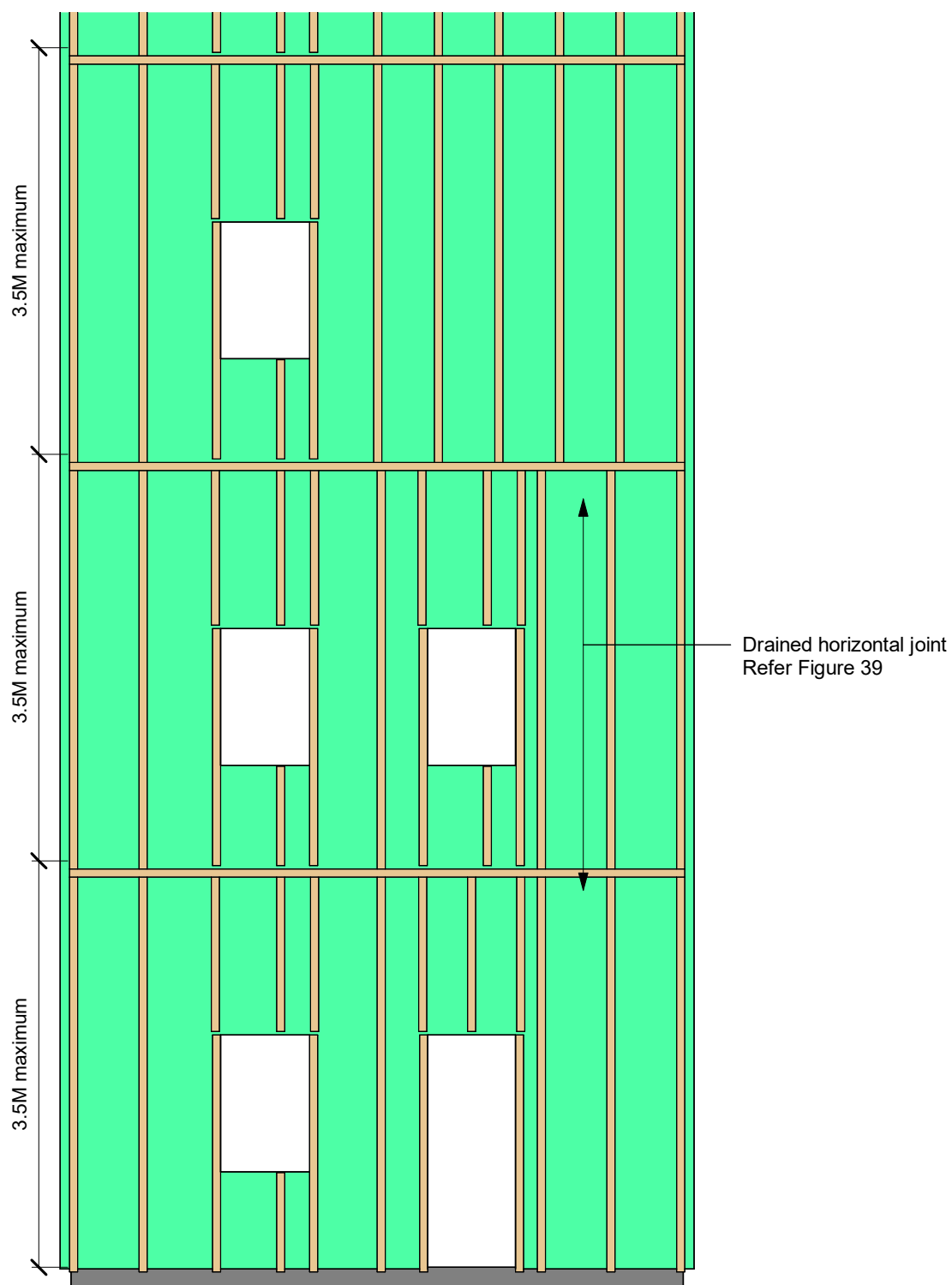
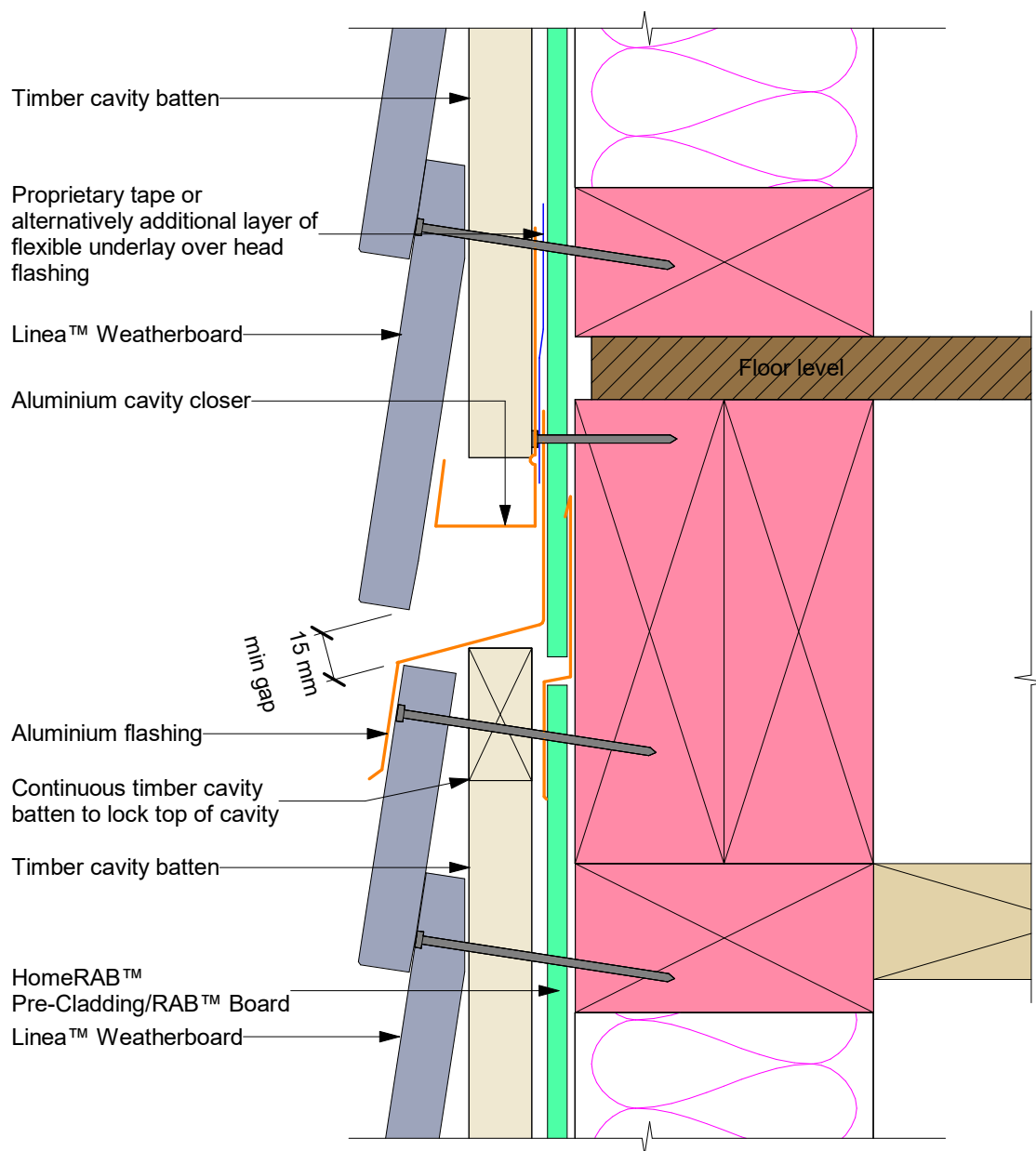


Figure 39: Intertenancy vertical fire separation



Product Warranty

James Hardie New Zealand Limited ("James Hardie") warrants for a period of 25 years from the date of purchase that the Linea™ Weatherboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

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

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

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

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

© 2023. James Hardie New Zealand Limited. TM and ® denotes a Trademark or Registered Mark owned by James Hardie Technology Limited.





PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems



CERTIFICATE: CMNZ 30018
Version No: RevN

3 DESCRIPTION OF BUILDING METHOD OR PRODUCT

Linea™ Weatherboard is a 16 mm thick bevelback fibre cement weatherboard, which is designed to be used as part of an external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

Linea™ Weatherboard Direct Fixed Cladding system consists of Linea™ Weatherboards applied direct to the external wall framing over a flexible underlay.

Linea™ Weatherboard Cavity Cladding system consists of Linea™ Weatherboards fixed over timber battens to form the cavity.

Both cladding methods (referenced as the system) incorporate secondary protection behind all internal and external corners, flashings for window, door and meter box penetrations as well as air seals to all wall penetrations.

4 INTENDED USE OF BUILDING METHOD OR PRODUCT

The system is designed to be used as part of an external cladding system on timber framed building.

5 NEW ZEALAND BUILDING CODE PROVISIONS

The systems if designed, used, installed and maintained in accordance with this certificate will meet the following provisions of the NZBC:

Clause B1 STRUCTURE:	Performance B1.3.1, B1.3.2, B1.3.4 for the relevant physical conditions of B1.3.3 (a), (f), (h), (j) and (q).
Clause B2 DURABILITY:	Performance B2.3.1(b) 15 years and B2.3.2.
Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE:	Performance C3.5, C3.7
Clause E2 EXTERNAL MOISTURE:	Performance E2.3.2, E2.3.5, E2.3.6 and E2.3.7
Clause F2 HAZARDOUS BUILDING MATERIALS:	Performance F2.3.1.

1 CERTIFICATE HOLDER DETAILS

James Hardie New Zealand Limited
Trading as James Hardie
1 O'Rorke Road, Penrose, Auckland
1061, New Zealand,
TechnicalTeam@jameshardie.co.nz
Tel: 0800 808 868,
www.jameshardie.co.nz

ORIGINAL ISSUE DATE

26/05/2020

VERSION DATE

06/10/2022

RECERTIFICATION

03/07/2025

8 SIGNATURE

Herve Michoux, Global Mark Managing Director

2 PRODUCT CERTIFICATION BODY

Global-Mark Pty Ltd
57 Willis Street, Wellington, 6011
customer.service@global-mark.co.nz
+64 9 889 0622
www.global-mark.co.nz

The complaints process for this certificate
can be found here:

<https://www.global-mark.com.au/?s=complaint>



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie

Direct Fixed and Cavity Cladding systems



6 CONDITIONS AND LIMITATIONS OF USE

1. The systems (respectively) are certified:
 - a. as a direct fixed external wall cladding for buildings:
 - i. within the scope limitations of the New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 1.1, and
 - ii. with a risk score of 0-12, calculated in accordance with the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 2, and
 - iii. situated in NZS 3604:2011 Wind Zones up to, and including Very High, and
 - b. as a cavity fixed external wall cladding for buildings:
 - i. within the scope limitations of the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 1.1,
 - ii. with a risk score of up to 20, calculated in accordance with the NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 2,
 - iii. situated in in NZS 3604:2011 Wind Zones up to, and including Extra High, and
 - c. as a cavity fixed external wall cladding for buildings specifically engineering designed (SED):
 - i. up to 25m in height, and
 - ii. with an inter-storey drift of span/180 maximum, and
 - iii. the design ultimate limit state (ULS) differential wind pressure does not exceed 3.2 kPa, and
 - iv. with the stud spacing no more than 600mm centres
 - d. located:
 - i. in all exposure zones (except microclimates) as defined in NZS 3604:2011 section 4.2, and
 - ii. located anywhere in relation to the relevant boundary for building within the scope of:
 - C/AS1, amendment 5, 5 November 2020 or
 - C/AS2, amendment 2, 5 November 2020
2. The system shall be specified, installed, inspected and maintained in accordance with the following sets of documents collectively referenced as the Applicable Technical Specification to the extent that their scope covers that for this Certificate:
 - a. For direct fixed external wall cladding application
 - i. James Hardie Linea™ Weatherboard Direct Fix Technical Specification (May 2020)
 - ii. Fire & Acoustic Design Manual (November 2020) by James Hardie section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGL30 and JHETGL60. These details have only been assessed and certified with respect to external fire spread via Linea™ Weatherboard. For walls located within 1.0m of a relevant boundary, Linea™ Weatherboard may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate
 - iii. BRANZ Appraisal No 446 (2020) Linea™ Weatherboard Direct Fixed Cladding
 - b. For cavity fixed external wall cladding applications:
 - i. James Hardie Linea™ Weatherboard Cavity Fix Technical Specification (May 2020)
 - ii. Fire & Acoustic Design Manual (November 2020) by James Hardie section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie

Direct Fixed and Cavity Cladding systems



JHETGL30 and JHETGL60. These details have only been assessed and certified with respect to external fire spread via Linea™ Weatherboard. For walls located within 1.0m of a relevant boundary, Linea™ Weatherboard may be used as an external façade/cladding attached to the exterior of fire rated wall systems as depicted within the Fire and Acoustic Design Manual (November 2020). Fire Resistance rating performance of the wall assembly falls outside the scope of this certificate

iii. BRANZ Appraisal No 447 (2020) Linea™ Weatherboard Cavity Cladding

(Note: Provisions within the documents above related to the use of the systems with steel-frame construction are outside the scope of this certification).

3. In wind zones greater than Very High a rigid air barrier which complies with Table 23 of E2/AS1 shall be used. In Buildings exceeding 10 m in height RAB™ Board must be used including horizontal control joints in accordance with the requirements of the CodeMark certificate for RAB™ Board. (Refer to GM-CM30130)
4. The system is certified for use:
 - a. with the ancillary components as described in this certificate,
 - b. with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. Only joinery compliant with the requirements of NZS 4211:2008 including amendment 1 for the relevant Wind Zone or wind pressure shall be used or have a current CodeMark
5. The weatherboards must only be installed horizontally on vertical surfaces.
6. All exposed faces, including top edges at sills and all bottom edges of Linea™ Weatherboard and fibre cement ancillary components must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730
7. E2.3.5 and E2.3.6 compliance is limited to cavities created between the internal surface of the panels and the underlay or RAB™ Board's.

7 HEALTH AND SAFETY INFORMATION

Standard industry safety practices and manufacturer safety requirement as detailed in the technical literature including the applicable SDS must be observed at all time. Please refer to James Hardie SDS Fibre Cement Products June 2022

9 BASIS FOR CERTIFICATION

The certification decision is based on independent technical review(s) of test report(s), engineering opinion(s) and other documented evidence(s), factory audit(s) and site review(s)

Code Clause	Compliance pathway	Evidence
B1 STRUCTURE	Alternative solution -Expert judgement	001, 002, 003, 021 and 022
B2 DURABILITY	Alternative solution -Expert judgement	001, 002, 003, 021 and 022
C3 FIRE AFFECTING AREAS BEYOND THE SOURCE	Alternative solution -Expert judgement	001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 021, 022 and 023
E2 EXTERNAL MOISTURE	Alternative solution -Expert judgement	001, 002, 003, 013, 014, 015, 016, 017, 018, 019, 020, 021 and 022
F2 HAZARDOUS BUILDING MATERIALS	Alternative solution -Expert judgement	001, 002, 003, 021, 022 and 024

10 SUPPORTING DOCUMENTATION FOR CERTIFICATION



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie

Direct Fixed and Cavity Cladding systems



Ref	Author	Title	Date and/or revision
001	BRANZ	LINEA™ - WEATHERBOARD CAVITY CLADDING - Appraisal No. 447 [2020]	02 September 2020
002	BRANZ	LINEA™ - WEATHERBOARD DIRECT FIXED CLADDING - Appraisal No. 446 [2020]	02 September 2020
003*	BRANZ	BRANZ Appraisals Means of Compliance - Basis of Appraisal - LINEA™ WEATHERBOARD DIRECT FIXED AND CAVITY CLADDING - Appraisal No 446 and 447 (2020)	TV10686-001 21/08/2020
004*	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH3182 21 November 2002
005*	BRANZ	Fire Assessment Report based Cone calorimeter test.	FH 2976 15 May 2001
006*	BRANZ	Fire Assessment Report based Cone calorimeter test (BRANZ Project No. FC10254-001).	FSR 4206 Issue2 7 November 2018
007*	BRANZ	Fire technical Opinion: Technical opinion based on NFPA 285 Compliance with NZBC C/AS2, clause 5.8.2 (b) and C/VM2 Part A (a).	FC12172-001 1 November 2019
008*	BRANZ	Fire Assessment Report Review of James Hardie Fire and Acoustic Manual	FAR 4620 – 04 November 2016
009*	BRANZ	Fire technical Opinion: Fire resistance of James Hardie Wall Systems with Service Penetrations	FC12040-004 -03 december2019
010*	BRANZ	Technical Assessment "Fire Resistance of External Wall and Soffit" Various JH Products	FAR 2597- 5th October 2005
011*	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6706.01-121-24 - 20th August 2019
012*	Intertek B&C	JH cavity fix wall assembly fire test as per NFPA 285	J6707.01-121-24 - 21st August 2019
013*	Clarkson Consulting Services	JH NZ_RAB_Weathertightness Assessment_200626_R1.5	26 June 2020
014*	James Hardie Building Product	Weathertightness Testing of Residential Façade Fibre Cement Cladding System On Cavity Battens to the requirement of Verification Method E2/VM1	TS061-05, dated 15 February 2006
015*	James Hardie Building Product	TESTING OF A TITAN RESIDENTIAL FIBRE CEMENT CLAD FAÇADE FOR COMPLIANCE WITH THE REQUIREMENTS OF AS/NZS 4284:1985 "TESTING OF BUILDING FACADES"	TS010-06, dated 14 November 2006
016*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS003-13, dated 4 December 2013
017*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS022-13, dated 12 November 2013
018*	James Hardie Technical Support group	Weathertightness (E2/VM1)	TS033-13, dated 8 January 2014
019*	James Hardie Technical Support group	Weathertightness & Façade System (E2/VM1)	TS009-15, dated 14 October 2015
020*	James Hardie Technical Support group	Testing of James Hardie NZ ExoTec Façade panel top hat rainscreen façade system in accordance with AS/NZS 4284:2008	FT-R1005, dated May 2017
021	James Hardie New Zealand Limited	James Hardie Linea™ Weatherboard Direct Fix Technical Specification (May 2020)	May 2020
022	James Hardie New Zealand Limited	James Hardie Linea™ Weatherboard Cavity Fix Technical Specification (May 2020)	May 2020



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems



023	James Hardie New Zealand Limited	James Hardie Fire & Acoustic Design Manual. Section 4:16 Control of External Fire Spread, figures No's. 1 to 8 and 12 to 20, specifically details JHETGL30 and JHETGL60	November 2020
024	James Hardie New Zealand Limited	LQA8N - SAFETY DATA SHEET- JAMES HARDIE FIBRE CEMENT SHEETS PRODUCTS	Version No.: 2.0 ISSUED Date : 22/06/2022
* These documents were provided commercial in confidence and are not publicly available			



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004. This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>. The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems



11 SUPPORTING INFORMATION ABOUT DESCRIPTION (OPTIONAL)

Linea™ Weatherboard cladding is finished with a latex paint system

Linea™ Weatherboards are bevel-back profile weatherboards with tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and edges.

Linea™ Weatherboards are 16 mm thick and are available 150mm and 180 mm wide. The boards are supplied 4200 mm long.

Linea™ Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a reuel profile is machined on the back face of the weatherboard, the bottom of the board is chamfered and the tongue and groove are machined on the ends. Linea™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

James Hardie supplies the following ancillary components:

- Hardie™ Axent™ Trim - a 19mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Hardie™ Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 70 mm and 89mm wide by 3000 mm long.
- External and internal corner mouldings - chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2,700 mm and 4,000 mm lengths.
- Corner soakers - 90° soakers are available for 150 mm and 180 mm Linea™ Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
- Cavity vent strip - uPVC, available in 3,000 mm lengths.
- Rigid wall underlay – HomeRAB™ Pre-Cladding, RAB™ Board or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.

Other components not supplied by James Hardie must meet the following requirements

- Flexible wall underlay – building paper complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 23, or breather-type membranes covered by a valid CodeMark certificate for use as wall underlays.
- Flexible building underlay support – polypropylene strap at 300 mm centres fixed horizontally and drawn taut, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. (Note: Mesh and wire galvanising must comply with AS/NZS 4534. Additional vertical battens may also be installed to provide support.)
- Flexible sill, head and jamb flashing tape - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- Cavity battens - nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- Cavity batten fixings - 40 x 2.8 mm flathead hot-dip galvanised nails.
- Joinery sill and head flashings - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 20 for durability requirements.
- Planted sill and scribes - timber treated to Hazard Class H3.1, pre-primed before installation.



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2



PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie

Direct Fixed and Cavity Cladding systems



- Window and door trim cavity air seal - air seals complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Paragraph 9.1.6, or self-expanding, moisture-cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- Flexible sealant - sealant complying with NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- Linea™ Weatherboard fixings
 - Direct fix cladding method:- 40 x 2.8 mm flathead hot-dip galvanised Hardie™ Flex nails or stainless steel ring shank Hardie™ Flex nails (for concealed nailing), and 60 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing).
 - Cavity cladding method - 60 x 3.15 mm flathead hot-dip galvanised Hardie™ Flex nails or stainless steel ring shank Hardie™ Flex nails (for concealed nailing in NZS 3604 Wind Zones up to, and including, Very High), 75 x 3.15 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 Wind Zones up to, and including, Very High), and 90 x 3.55 mm jolthead hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 3.2 kPa).
- Hardie™ Axent™ Trim fixings - 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolthead nails and stainless steel ring shank jolthead nails.
(Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680).
- Flashings - balustrade and parapet cap flashings and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, 3rd Edition, amendment 10, 5 November 2020, Table 20 for durability requirements.

Aluminium joinery head flashing - as supplied by the joinery manufacturer or the contractor

12 SUPPORTING INFORMATION ABOUT INTENDED USE (OPTIONAL)

Nil

13 SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE (OPTIONAL)

Linea™ Weatherboard Cavity Cladding can be used to provide fire resistance rated construction, but this aspect has not been assessed and is outside the scope of this certificate

End of document



This certificate is issued by an independent certification body accredited by JAS-ANZ, the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment under the Building Act 2004.

This certificate may only be reproduced in its entirety. It is advised to check that this certificate is currently valid and not withdrawn or suspended by referring to the Register of Product Certificates on the Building Performance website <http://www.building.govt.nz>.

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advice or reports. In placing the CodeMark mark on the product/system, the certificate holder makes a declaration of compliance with the certification standard(s) and confirms that the product is identical to the product certified herein.

CERTIFICATE V2