Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

BC No: 230758

SITE DETAILS:

175 TOWNSEND ROAD

RANGIORA

LEGAL:

LOT 115 DP 575822

AS BUILT TRUSS LAYOUT REQUIRED –
This must be received by the Building Unit **AT LEAST** 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap Inspection

Truss "As-Built" Designs may be sent to:
buildinginfo@wmk.govt.nz

Approved Building Consent Documents and Plans

(Full set)

On Site Copy

- These plans and specifications must be kept on site during construction, and made available to the building officer on request. Failure to do so will mean an automatic failure of the building inspection and will necessitate re-booking the inspection at the applicant's expense.
- All boundary survey pegs must be located and flagged by the owner before work is commenced.

Inspections

For bookings or building enquiries please phone the Building Unit on:

03 311 8906

or

Email inspection bookings to: bcbooking@wmk.govt.nz

- Please refer to your inspection schedule for details of inspections to be carried out.
- At least 2-3 full working days' notice should be given when booking an inspection.
- Please be advised that it may not always be possible to carry out the inspection within the time frame you require.
- Provision is to be made to allow access.
- The Code Compliance Certificate will be issued once the:
  - Final inspection has been carried out and passed.
  - Audit of WDC building consent file has been completed.
  - Payment of any outstanding invoices is received.

211208196566 / QD BU Information 003 – Version 1.0 – December 2021

Access Around House Building Sites

It is important when you are building your house that you take care not to damage roads, kerbs, footpaths, street trees, swales and berms.

The Council will be monitoring building sites in subdivisions to make sure that builders have the correct arrangements in place to help avoid damage and to ensure public safety.

In particular:

- **Vehicles accessing the site should only use an approved vehicle crossing**
- **Vehicles should not park on the footpath or berm**
- **Take care unloading plant and materials to protect the road surface**
- **You must ensure no litter encroaches into a public place (road/berm/footpath). Litter includes such items as earth, dirt or stones. An infringement notice up to $400.00 may be issued to any person or company found in breach of the Litter Act 1979.**

If you need to block footpaths for any reason such as pouring foundations or unloading materials you need to provide alternative access for pedestrians. You need to do this to fulfil the requirements of the Health and Safety in Work Act 2015, and the Code of Practice for Temporary Traffic Management (CoPTTM). As site owner you or your builder are responsible for the health and safety of workers and the general public.

Vehicles are not allowed to be parked on footpaths, berms or swales. The Council will issue parking infringement notices if required.

Thank you for helping to keep our roads and footpaths safe for everyone, and doing what you can to reduce costly damage to new roads, footpaths and berms.

Find out more at waimakariri.govt.nz

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mainpower

Dial Before You Dig

Safety near underground cables and services

MainPower is committed to providing a safe, secure and reliable electricity supply to all customers.

This fact sheet is designed to inform you about safety around electricity, particularly underground cables.

Working near electricity cables

Serious personal injury can result from damaging underground services during excavation and ground penetration. Supply disruption and repairs can be costly and extremely irritating to customers.

The positions where cables are buried are subject to reasonable tolerance however, the depth of cover may have changed since installation.

It is your responsibility to verify the position and depth of cables before excavation.

Steps to ensure safe digging

- Obtain up-to-date plans from the relevant local authorities.
- Use a cable locator, if possible, to mark-out the underground services before commencing work.
- Practice safe digging procedures.
- The Worksafe Guide for Safety with Underground Services sets out agreed work methods and preferred work practices for the location and excavation of underground services. Download the guide at - http://www.business.govt.nz/worksafe/information-guidance/all-guidance-items/underground-services-guide-for-safety-with/underground.pdf

Underground electricity cables

For copies of plans showing MainPower's electricity cables phone 03 311 8300, weekdays 8am - 5pm or email us at underground.records@mainpower.co.nz.

Please allow 2 working days to receive copies of plans. MainPower may hold some records of privately-owned cables connected to the MainPower network system; contact MainPower in the first instance.

Additional services MainPower can provide if you are planning your digging:

- Mark-out Services: MainPower can trace cables using an electronic locator.
- On-Site Supervision: For difficult work or locations, MainPower can provide on-site safety supervision.

Disclaimer This fact sheet is not an exhaustive list of all safety matters that need to be considered. Whilst care is taken in the preparation of this material, MainPower does not guarantee the accuracy and completeness of the information.

Underground council services

All contractors are reminded of their legal responsibility to take all practicable steps to locate and protect existing services. In the road corridor, service plans and a Corridor Access Request (CAR) permit need to be obtained through the Beforeudig website (www.beforeudig.co.nz). The Beforeudig service helps contractors to determine the location of any underground services before excavating. For service plans on private property, and lateral locations for work on private property that will not extend into any part of the road reserve, contact the Waimakariri District Council's Customer Services team at office@wmk.govt.nz.

Contact MainPower

To report a fault:
0508 60 70 80

For electricity emergencies:
0508 60 70 80

For general enquiries:
www.mainpower.co.nz
info@mainpower.co.nz
03 311 8300 (8am to 5pm, Monday to Friday)

mainpower

Dial before you dig.

Always remember to locate underground cables and services before digging and avoid serious injury, supply disruption and costly repairs. Phone MainPower for cable location advice.

03 311 8300

Think for Safety's Sake

www.mainpower.co.nz

THINGS YOU SHOULD KNOW ABOUT...

Noisy Heat Pumps

AS THE DISTRICT GROWS WE'RE SEEING MORE HOMES BEING BUILT ON SMALLER SECTIONS.

Smaller sections mean that you need to pay closer attention to products which both eliminate and produce noise.

While a heat pump is not assessed under the Building Consent application, and therefore not checked or signed off under any building inspection, some models produce noise which is deemed excessive under the District Plan.

The onus is upon the individual / landlord to ensure that it complies with your local council's District Plan rules.

BELOW ARE QUESTIONS TO ASK YOURSELF BEFORE INSTALLING A HEAT PUMP:

- **Does your heat pump comply with the permitted noise levels allowed by the Waimakariri District Council?** i.e. Does the noise produced from your heat pump measure less than 50dBA during the day and less than 40dBA at other times? You may not be allowed to use it if complaints are received.
- **Where are you mounting the unit?** The level of noise produced by your heat pump will depend upon the size, the location and how it has been fixed /mounted.

It is common sense that heat pumps will produce some noise as they do contain a compressor and fan. However what is regarded as 'acceptable noise' is a personal and subjective opinion.

Please note that if the unit makes a constant penetrating monotone engine noise similar to generators or water heater pumps, then those types of noise may cause significant issues for neighbours who will render the noise 'unreasonable'. Such noise may not even be exceeding the noise levels but will potentially still be rated as 'unreasonable'.

Most noise issues occur when the outdoor unit is located too close to the neighbouring boundary or not raised off the ground.

Noise specifications will be found in the sales brochure, and you are advised to check these prior to purchase and installation.

If you are having a heat pump installed, make sure the installer is trade qualified to install air conditioning units and heat pumps. The installer should be a member of IRHACE.

Have your heat pump installed by a qualified installer.

MORE INFORMATION Visit waimakariri.govt.nz for more information, or contact Customer Services on 0800 965 468 (0800WMKGOV)

190215017430 / MARCH 2019

Dwellings, Outbuildings, Swimming Pools and Other Works (Not Commercial)

Section 1
Statutory Forms

- **Inspection List** – By Council
- **Building Consent Form (Form 5)** – By Council
- **Code Compliance Application (Form 6)** – By Council
- **Installation & PS3 Forms** – By Council
- **Application Form**
- **LBP Design Certificates**
- **Record of Title or Sales & Purchase Agreement**
- **PIM, Resource Consent** – By Council

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

MINOR VARIATION
Building Consent BC230758.03

Section 45A, Building Act 2004

The building

Street address of building: 175 Townsend Road RANGIORA
Legal description of land where building is located: LOT 115 DP 575822 0.060000 Ha
Valuation number: 2166000232
Building name:
Location of building within site/block number:
Level/unit number: 1

The owner

Name of owner: Haydon G Baddock
Contact person:
Mailing address: 272 Whites Road RD 2 Kaiapoi 7692
Street address/registered office:
Phone number: Landline: Mobile:
Daytime: After hours:
Facsimile number:
Email address: hbaddock@hotmail.co.nz
Website:
First point of contact for communications with the council/building consent authority: Haydon Gifford Baddock

Building work

The following building work is authorised by this Minor Variation:
BC230758.03 MINOR VARIATION updated drawings to match as-built RWH

Primary Specified Intended Use: Housing - Detached dwellings
Description of Intended Use: Residential

This minor variation is granted under section 45A of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This minor variation also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

Refer to the approved building consent for applicable conditions and advice notes.

Shirley Cresswell
Building Unit Administrator
On behalf of: Waimakariri District Council
Date: 16 April 2024

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

PLEASE NOTE

- Although your Consent documentation states 2-3 full working days' notice is required, it may not always be possible to carry out the inspection within the time frame you require.
- If an inspection of the building works is not carried out in accordance with the Inspection Schedule it could affect the issue of the Code Compliance Certificate.

To book inspections ring WDC on
03 311 8906

All inspections are subject to a separate charge.

All re-inspections will be charged and recorded separately even if other inspections are carried out on the same day.

Using engineers & other professionals
If an engineer has been engaged to carry out various site inspections you will need to provide copies of his/her site notices to us and a producer statement, a PS4 from the engineer confirming the building elements designed and inspected by the engineer were completed in accordance with the approved design.

Confirmation of installation of products
We require producer statements, warranties & installation certificates from various installers as a way of confirming products have been installed in accordance with the manufacturer's recommendations. These are commonly required for exterior claddings, wet area tanking, membrane roofing/decking and effluent fields. Energy certificates such as electrical and gas certificates need to be provided too. You will need to provide these to us prior to the issue of the Code Compliance Certificate.

Applying for a Code Compliance Certificate (CCC)
When you are satisfied your project is complete please book a final inspection. The owner or their agent is also required to complete a separate application for the Code Compliance Certificate (Form 6) as soon as possible after the building work is completed. The application form to apply can be downloaded via the link below or call 03 311 8906 for further information.
https://www.waimakariri.govt.nz/building-services/building-services/building-consents/related-content/building-application-forms-and-fact-sheets
You should have this form ready for when the building Inspector arrives on site to carry out the final inspection, or email it to ccc@wmk.govt.nz . Please note all outstanding monies must be paid prior to the issue of the CCC.

Grant or refuse a CCC
We are required to make a decision to grant or refuse a CCC if you do not formally apply for a CCC within two years of the granting of the building consent. The date your consent was granted is the date at the bottom of the building consent form. If you do not apply for a CCC or arrange an extension with us within the two year period we may carry out an inspection of the building work. An additional fee applies for this work.

Lapsing of your consent
Your building consent will lapse if building work has not commenced within 12 months after the date of issue of the building consent. The issue date is deemed to be the day you paid for the consent. In saying this we understand things don't always run smoothly so you can apply for a time extension which we may agree to. A fee applies for this.

Site Inspection Sheet

Application

Haydon G Baddock 272 Whites Road RD 2 Kaiapoi 7692	No.	BC230758
	Issue date	14 September 2023
	Overseer	Brenna Ogier

Project

Description	1100 New (& prebuilt) House, Unit, Bach, Crib, Town Houses BC - New or Relocated Dwelling, New Detached Dwelling, 01 Standard Building Consent(20 W Processing Days)
Intended Life	Indefinite (50+)
Intended Use	Residential
Estimated Value	$420000.00
Location	175 Townsend Road RANGIORA
Legal Description	LOT 115 DP 575822 0.060000 Ha
Valuation No.	2166000232

This inspection sheet and all the approved plans and specifications relating to this building consent are to be available on site during construction. If the documentation required for a particular inspection is not available, this will mean automatic failure of the building inspection and will necessitate re booking the inspection at the applicant's expense.

Work cannot proceed past each step until that step has been inspected and approved.

All inspections listed below are to be inspected by a WDC Building Inspector, an Engineer may also need to be engaged to inspect engineer requirements, this will be noted below.

BC230758
Compacted Hardfill - pre DPM - Elliot Sinclair to inspect pre fill, HFC to inspect pre dpm
Foundation / Floor Slab - HFC to also inspect
Building Wrap & Sill Tape -
Cavity Battens & Flashings -
Mid Height Cladding -
AAC-AAC Panel Part Installed -
Pre Plaster & Flashings -
Drains -
Preline & Plumbing -
Prestopping -
Final -

Please give at least 2-3 full working days' notice for the next required inspection, please be advised that it may not always be possible to carry out the inspection within the time frame you require.

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

PLEASE NOTE

- Although your Consent documentation states 2-3 full working days' notice is required, it may not always be possible to carry out the inspection within the time frame you require.
- If an inspection of the building works is not carried out in accordance with the Inspection Schedule it could affect the issue of the Code Compliance Certificate.

To book inspections ring WDC on
03 311 8906

All inspections are subject to a separate charge.

All re-inspections will be charged and recorded separately even if other inspections are carried out on the same day.

Using engineers & other professionals
If an engineer has been engaged to carry out various site inspections you will need to provide copies of his/her site notices to us and a producer statement, a PS4 from the engineer confirming the building elements designed and inspected by the engineer were completed in accordance with the approved design.

Confirmation of installation of products
We require producer statements, warranties & installation certificates from various installers as a way of confirming products have been installed in accordance with the manufacturer's recommendations. These are commonly required for exterior claddings, wet area tanking, membrane roofing/decking and effluent fields. Energy certificates such as electrical and gas certificates need to be provided too. You will need to provide these to us prior to the issue of the Code Compliance Certificate.

Applying for a Code Compliance Certificate (CCC)
When you are satisfied your project is complete please book a final inspection. The owner or their agent is also required to complete a separate application for the Code Compliance Certificate (Form 6) as soon as possible after the building work is completed. The application form to apply can be downloaded via the link below or call 03 311 8906 for further information.
https://www.waimakariri.govt.nz/consents-and-licences/forms-a-to-z#building

You should have this form ready for when the building Inspector arrives on site to carry out the final inspection, or email it to ccc@wmk.govt.nz . Please note all outstanding monies must be paid prior to the issue of the CCC.

Grant or refuse a CCC
We are required to make a decision to grant or refuse a CCC if you do not formally apply for a CCC within two years of the granting of the building consent. The date your consent was granted is the date at the bottom of the building consent form. If you do not apply for a CCC or arrange an extension with us within the two year period we may carry out an inspection of the building work. An additional fee applies for this work.

Lapsing of your consent
Your building consent will lapse if building work has not commenced within 12 months after the date of issue of the building consent. The issue date is deemed to be the day you paid for the consent. In saying this we understand things don't always run smoothly so you can apply for a time extension which we may agree to. A fee applies for this.

Additional Site Inspection Sheet for Amendment

Application

Haydon G Baddock 272 Whites Road RD 2 Kaiapoi 7692	No.	BC230758.02
	Issue date	27 February 2024
	Overseer	Brenna Ogier

Project

Description	1100 New (& prebuilt) House, Unit, Bach, Crib, Town Houses BC - Amendments, Amendments, 01 Standard Building Consent(20 W Processing Days)
Intended Life	Indefinite (50+)
Intended Use	Residential
Estimated Value	$0.00
Location	175 Townsend Road RANGIORA
Legal Description	LOT 115 DP 575822 0.060000 Ha
Valuation No.	2166000232

This inspection sheet and all the approved plans and specifications relating to this building consent are to be available on site during construction. If the documentation required for a particular inspection is not available, this will mean automatic failure of the building inspection and will necessitate re booking the inspection at the applicant's expense.

Work cannot proceed past each step until that step has been inspected and approved.

<u>All</u> inspections listed below are to be inspected by a WDC Building Inspector, an Engineer may also need to be engaged to inspect engineer requirements, this will be noted below.

BC230758.02 AMENDMENT Rain water head added and bracing updated 175 TOWNSEND ROAD RANGIORA LOT 115 DP 575822
Other - Amendment Inspection

Please give at least 2-3 full working days' notice for the next required inspection, please be advised that it may not always be possible to carry out the inspection within the time frame you require.

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

Form 5
Building consent BC230758

Section 51, Building Act 2004

The building

Street address of building: 175 Townsend Road RANGIORA
Legal description of land where building is located: LOT 115 DP 575822 0.060000 Ha
Valuation number: 2166000232
Building name:
Location of building within site/block number:
Level/unit number: 1

The owner

Name of owner: Haydon G Baddock
Contact person:
Mailing address: 272 Whites Road RD 2 Kaiapoi 7692
Street address/registered office:
Phone number: Landline: Mobile:
Daytime: After hours:
Facsimile number:
Email address: hbaddock@hotmail.co.nz
Website:
First point of contact for communications with the council/building consent authority:
Haydon Gifford Baddock

Building work

The following building work is authorised by this building consent:
DWELLING WITH ATTACHED GARAGE

Primary Specified Intended Use: Housing - Detached dwellings
Description of Intended Use: Residential

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

This building consent is subject to the following conditions:

- The Building Act 2004, Section 90, states that agents authorised by the building consent authority (the Council) for the purposes of this section are entitled, at all times during normal working hours or while building work is being done, to inspect:
  (a) land on which building work is being or is proposed to be carried out; and
  (b) building work that has been or is being carried out on or off the building site; and
  (c) any building.

Compliance schedule

A Compliance Schedule is not required for this building.

Attachments

Copies of the following documents are attached to this building consent:
Consented Plans
Consented Specifications
Amended Inspection List

Amendments issued

Application ID	Issued	Description
BC230758.02	27/02/2024	AMENDMENT Rainwater head added and bracing updated

Shirley Cresswell
Building Unit Administrator Officer

On behalf of: Waimakariri District Council
Date: 27 February 2024

Advice notes

Building consent BC230758

Advice Notes as at 27/02/2024

Project description

Street address of building:	175 Townsend Road RANGIORA
Legal description where work is located:	LOT 115 DP 575822 0.060000 Ha
Description of consent:	DWELLING WITH ATTACHED GARAGE

Amendments issued

Application ID	Issued	Description
BC230758.02	27/02/2024	AMENDMENT Rain water head added and bracing updated

Advice Notes

This building consent is issued with the following advice notes listed below. Please read and follow the guidance given. Failure to do so may create difficulties in obtaining a code compliance certificate.

All inspections listed must be requested and carried out in accordance with the attached schedule (list) of inspection types. It is advisable to request bookings at least 2-3 full working days' in advance, please be advised that it may not always be possible to carry out the inspection within the time frame you require. It is the owner's responsibility to ensure all necessary inspections are carried out. Please contact the building consent authority if you are unsure what requires inspection - do not cover or enclose any building work without prior inspection.
Please note that the consent fees allow for a single inspection of construction stages of the project as specified in the inspection schedule. Any extra inspections required will be invoiced and must be paid for before a code compliance certificate is issued.

All boundary survey pegs must be located by discovery or redefinition before work is commenced.

Critical Siting: The owner/applicant/agent will need to supply a Building Location Certificate for this Lot two (2) working days prior to the Pre-Pour inspection. The certificate shall confirm that the building is wholly contained within the Lot/s to which it relates and meets the Consent Notice for finished floor levels (FFL).

Comply with the endorsements on the plan.

The duplicate copy of the approved consent documents and inspection schedule must remain on site during construction.

Engineers site reports are to be kept on site for the review and collection by the building Inspector.

A PS4 construction review will be required from the engineer prior to the issue of a Code Compliance Certificate.

Please note that any material deviation from the approved documents will require a formal application for amendment. Amendments that are not of a material nature can be approved by a Building Officer or Building Inspector by way of the endorsement of the approved consent documentation.

WorkSafe New Zealand to be notified prior to any disturbance of asbestos or hazardous materials on site during demolition or construction.

The electrical certificate shall be provided to the building consent authority prior to issue of Code Compliance Certificate where the project involves electrical works.

Your consent is issued subject to manufacturers technical information about their products, installation and maintenance is to be as this technical information requires.

Licenced building practitioners records of work shall be provided to the Territorial Authority (TA) / Building Consent Authority (BCA) for foundations, carpentry / primary structure, roof cladding, wall cladding systems, brick & block laying as applicable at the conclusion of the relevant work.

A Building Consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the building consent or any further period that the Building Consent Authority may allow. (Time extensions to commence building work after 12 months must be submitted to the Building Consent Authority in writing stating the reason for the request, prior to the lapse date of the consent.

A Building Consent is not completed until it has been issued with a Code Compliance Certificate. The owner is required to complete a separate application for a Code Compliance Certificate as soon as practicable after the building work is completed. In any event no later than two (2) years after the granting of the Building Consent. Council is required to decide whether or not a Code Compliance Certificate can be issued. If your project will not be completed within two years you will need to apply for a time extension*. *fees apply

A “Statement of Thermal performance of Windows and doors” to be supplied by window manufacturer/supplier confirming the thermal performance of the windows and doors has met minimum R values required by the building consent being R0.5, prior to the issue of a Code Compliance Certificate

The certifying drainlayer’s registration number shall be provided to the Building Consent Authority prior to issue of the Code Compliance Certificate.

The plumbing pressure test PS3 & plumbers registration number shall be provided to the Building Consent Authority prior to issue of the Code Compliance Certificate

The installer shall provide the building consent authority a PS3 for the installation of the AAC exterior cladding system prior to issue of Code Compliance Certificate

The installer shall provide the building consent authority a PS3 for the installation of the Internal wet area membrane prior to issue of Code Compliance Certificate.

WAIMAKARIRI
DISTRICT COUNCIL

Private Bag 1005, Rangiora 7440
Ph 03 311 8900, 03 327 6834 Fax 03 313 4432
www.waimakariri.govt.nz

PRODUCER STATEMENT PIPEWORK TESTING

BC No.

Issued by *(Plumber)*:

For *(Owner)*:

In respect of the testing of water pipe work prior to concealment.

At *(address)*:

I hereby state that I have personally tested the water pipe work installed in the building authorised under this Building Consent by the method indicated hereunder.

☐ By pressurising the pipe work to 1500 kPa for a period of not less than 15 minutes for the hot and cold water supply and checking to see there are no leaks. (NZBC G12/AS1 7.5.1 (a), (b).)

☐ By pressurising the uPVC pipe work to 1.5 times the maximum working pressure for a period of not less than 15 minutes and checking that there are no leaks. (NZBC G12/AS1 7.5.2, NZS 7643).

Max working pressure was:

☐ By pressurising the pipe work to 1500 kPa for a period of not less than 5 minutes and checking to see there are no leaks. (NZBC G12 VM1, AS3500:Part 1.2 1998)

And believe on reasonable grounds that the pipe work has passed that test.

☐ All work complies with the NZBC

I also understand that Waimakariri District Council in accepting this producer statement will be relying on it to issue the Code Compliance Certificate at the completion of the building work.

SIGNATURE OF LICENSED CERTIFYING PLUMBER:

Signature:

Date:

Registration Number:

Company Name:

Building Consent BC230758.03
Received 08/04/2024

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

BUILDING UNIT

Application for a Minor Variation to a Building Consent

It is the owner's (or authorised agent's) responsibility to notify Council of any changes to the approved plans under *The Building Act 2004, Section 40*

This application is to advise Waimakariri District Council that the following minor variation* is proposed to be undertaken on the building situated at the site address listed below. (As per *The Building Act 2004, Section 45A*)

**For guidance on minor variations, please refer to the fact sheet on our website waimakariri.govt.nz/council/documents-bylaws-plans/fact-sheets*

This variation will be processed in office and approved by a Building Control Officer.

Consent details

BC number: 230758 Site address: 175 Townsend Road. Rangiora

Owner/Agent name: Haydon Baddock

Owner/Agent email: hbaddock@hotmail.co.nz

Owner/Agent contact number: hbaddock@hotmail.co.nz

Applicant's role in project: Draughtsmen

Applicant name: *(if not Owner/Agent)* Andrew Siegenthaler

Applicant email: *(if not Owner/Agent)* ascadltd@gmail.com

Applicant contact number: *(if not Owner/Agent)* 0272838775

Description of Minor Variation and reason for change: *(Attach only relevant plans and supporting documents)*

On-site inspection requested updated drawings to match as-built RWH

Minor Variation requested during inspection ☑ Yes ☐ No

If yes, note type of inspection and date carried out:

Signature of: ☐ Owner ☑ Applicant on behalf of owner

Signature: Andrew Siegenthaler Date: 08/04/24

Print name: Andrew Siegenthaler

Invoice to be billed and sent to: ☑ Owner ☐ Applicant ☐ Other:

General information

Processing and administration fees apply. Our latest fees and charges are available on the WDC webpage waimakariri.govt.nz/services/fees-and-charges

NOTE: *Any charges incurred are required to be paid by the 20th day of the month following the month in which the invoice is issued and prior to issue of the Code Compliance Certificate.*

WAIMAKARIRI DISTRICT COUNCIL
MINOR VARIATION to Plan and/or Specifications
APPROVED
BC230758.03 15/04/2024 brennao
updated drawings to match as-built RWH

Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

BUILDING UNIT

Form 2 Application for a Project Information Memorandum and/or Building Consent

Dwellings, Outbuildings, Swimming Pools and Other Works e.g. Septic Tank, Bridge, Retaining Wall, Amendments and Exemptions

Under The Building Act 2004, Sections 33, 45 & Schedule 1, Part 1, Clause 2

BC No.: BC230758.02

1. The Building

Street address (street/road/township): (*for structures that do not have a street address, state the nearest street intersection and the distance and direction from that intersection)*

175 Townsend Road, Rangiora

Legal description of the land where the building is located: *(state legal description as at the date of application and, if the land is proposed to be subdivided, include details of relevant lot numbers and subdivision consent)*

Lot: 115 DP: 575822 Valuation Number: 2166000232 Resource Consent:

Building name: *(if applicable)*

Location of building within site/block number: *(include nearest street access)*

Number of levels: 1 Unit/Level No.:

Area: *(total floor area; indicate area affected by the building work if less than the total area)*

Existing: New: 204.9 Total: 204.9

Current lawfully established use: *(include number of occupants per level and per use if more than 1)*

Year building first constructed: *(Approximate date is acceptable, eg 1920's)*

2. The Owner - all details must be the legal owner's

Name of owner: *(include preferred form of address, e.g. Mr, Mrs, Ms, Miss, Dr, if an individual)*

Haydon Gifford Baddock

Contact person: *(not required if the owner is an individual. Must have a New Zealand address)*

Mailing address:

Street address/Registered office: *(if different than above)*

272 Whites Road, RD2, Kaiapoi 7692

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
0277 570 024				

Email: hbaddock@hotmail.co.nz Website:

As the owner, where you have given authorisation for an Agent to act on your behalf, please confirm if you require a copy of Building Consent/PIM correspondence and associated Building Consent Inspection Notices following the formally received notification: Yes [x] No

The following evidence of ownership is attached to this application:

☑ Copy of Record of Title OR ☐ Council to provide *(additional charge of $15)*
(Current within 1 month of being issued and must include a deposited plan [diagram]. Where the Record of Title is not current, Council will provide this [additional charge of $15 applies]).

☐ Signed copy of Sales and Purchase Agreement *(If Record of Title is not issued)*

3. Applicant - only required when the applicant is not the owner or the agent e.g. leasee/tenant

PLEASE NOTE - *Authorisation is required from the owner of the property.*

Name of applicant: *(e.g. leasee/tenant)*

Contact person: *(not required if the applicant is an individual)*

Mailing address:

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:

Email: Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*

4. Agent – only required when the application is being made on behalf of the owner

PLEASE NOTE - *Authorisation is required from the owner of the property.*

Name of agent: a.s.c.a.d. ltd

Contact person: *(not required if the applicant is an individual)* Andrew Siegenthaler

Mailing address: 59 Warwick Road, RD5, Rangiora 7475

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
	0272838775			

Email: ascadltd@gmail.com Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*
Draughtsmen

PLEASE NOTE - *The Agent will be the first point of contact for communications with the Council/Building Consent Authority regarding this application/building work*

5. Application

I request that the following (please select one) be issued for the building work described in this Application:

☐ Project Information Memorandum (PIM) only

☐ Building Consent with PIM

☐ Exemption from the need for B/C
(Refer Building Act 2004 Schedule 1, Part 1, Clause 2)

☐ Building Consent for PIM No:

☐ Building Consent without PIM *(Compliance Check applies)*

☑ Amendment to Building Consent BC230758
Please Note: *Amendments must be authorised by the owner*

☐ Building Consent for Above Ground Pool and/or Non-Exempt Small Heated Pool

I wish to receive my approved documentation in the following format:

PLEASE NOTE - *If USB or hard copy, please confirm if you wish to pick it up from the Council or have it posted.*

☑ Electronically via Sharefile Transfer Portal (You must be set up and registered for this option)

☐ USB: *(this is an additional charge)* ☐ Post OR ☐ Pick-up

☐ Hard copy: *(onsite - this is an additional charge)* ☐ Post OR ☐ Pick-up

PLEASE NOTE - *One set of "Onsite" hard copy consented documents must be available at all times for inspections.*

All consent related invoices/refunds to be billed and sent to:

☑ Owner ☐ Applicant ☐ Agent ☐ Or other (If other, please complete below)

Company name: *(if applicable)*

Contact person:

Mailing address:

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:

Email: Website:

PLEASE NOTE - *Any refunds are to the receipted name unless written authorisation has been received from the receipted person or company.*

Terms of trade

I/We understand that:

Building Consents shall be paid for when the consent is collected/uploaded or if the consent is not collected/uploaded within three months after the date of consent being granted, the work done to date portion i.e. admin and processing costs of the account will be due and payable. The balance of the invoice will be payable when the consent is collected/uploaded.

All other accounts shall be paid by the 20th day of the month following the month in which the invoice is issued.

I/We agree to pay according to these terms for any goods or services you supply to us. Failure to meet these Terms of Trade may result in any credit arrangement being withdrawn with any balance becoming payable within seven days. Should failure to meet the terms of trade result in debt recovery and/or legal proceedings, any costs whatsoever incurred in the collection of the debt including debt collector's fees and commissions and legal costs, charges and expenses on a solicitor and own client basis will be added to the account and will be payable by me/us.

Application authorisation

By entering your name in the box below you are giving your authority for this application to proceed under Sections 33 and 45 of the Building Act 2004.

Name: John Baddock Date: 13/02/24

I am the: ☑ Owner ☐ Applicant on behalf of, and with the authority of the owner
☐ Agent on behalf of, and with the authority of the owner

6. The Project

Description of work *(e.g. dwelling, alteration/addition). If an amendment, please provide a complete description of the nature of the amendment.*

RWH added, Bracing updated

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

Specify the intended use of the building: *(e.g. detached dwelling, multi-unit dwelling, show home, sleepout or outbuilding - shed/garage etc.)*

Will the building work result in a change of use of this building? ☐ Yes ☑ No

If Yes, provide details of the new use:

Will hazardous substances be stored in the building? ☐ Yes ☑ No

Intended life of the building:

☑ Indefinite but not less than 50 years Or specified as years

Is this a staged consent? ☐ Yes ☑ No

If staged, provide details *(e.g. Stage 1 of 3)*

List Building Consents previously issued for this building (if any): *(i.e. is this project being constructed in stages? Is this consent for a relocated or transportable building?)*

Estimated value of the building work on which the building levy will be calculated (incl. GST): *(state estimated value as defined in section 7 of the Building Act 2004)*

$ no change

If this is an application to amend a building consent, advise the estimated value of amended building work (incl. GST) $

Is this in addition to, or reduction from, what was stated with the original application?

☐ Addition ☐ Reduction ☑ No change

7. Restricted building work

Will the building work include any restricted building work? ☐ Yes ☐ No

If Yes, provide the following details of all Licensed Building Practitioners who will be involved in carrying out or supervising the restricted building work (if these details are unknown at the time of the application, they must be supplied before the work begins).

Licence class	Name	Licensed building practitioner number (or registration number if treated as being licensed under section 291 of the Building Act 2004)
Foundations		
Carpentry		
Exterior Plasterer		
Bricklayer		
Blocklayer		
Roofer		

Key personnel

Builder

Name: | Reg. No.:
Address:
Phone No.: | Email:

Designer(s)

Name: Andrew Siegenthaler - a.s.c.a.d. ltd | Reg. No.: 108550
Address: 59 Warwick Road, RD5, Rangiora
Phone No.: 03 329 2092 | Email: ascadltd@snap.net.nz

Certifying drainlayer

Name: | Reg. No.:
Address:
Phone No.: | Email:

Certifying plumber

Name: | Reg. No.:
Address:
Phone No.: | Email:

Certifying gasfitter

Name: | Reg. No.:
Address:
Phone No.: | Email:

Registered electrician

Name: | Reg. No.:
Address:
Phone No.: | Email:

Structural engineer

Name: | Reg. No.:
Address:
Phone No.: | Email:

8. Project Information Memorandum - this section is not applicable if this application is for a building consent only

The following matters are involved in the project:

- ☐ Subdivision
- ☐ Alterations to land contours
- ☐ New or altered connections to public utilities
- ☐ New or altered locations and/or external dimensions of buildings
- ☐ New or altered access for vehicles
- ☐ Building work over or adjacent to any road or public place
- ☐ Disposal of stormwater and wastewater
- ☐ Building work over any existing drains or sewers or in close proximity to wells or water mains
- ☐ Registered historic site or place, tick if applicable (only applies where a PIM has not previously been issued for the building work)
- ☐ Other matters known to the applicant that may require authorisations from the territorial authority:

Notes

Other notes or comments which you may wish to add, eg: Resource Consents

9. Building consent - this section is not applicable if this application is for a Project Information Memorandum only

The following plans and specifications are attached to this application, or refer to the Appendix section for plans and specifications provided. ☐

The building work will comply with the Building Code as follows: *(Note: if you are not sure what clauses are applicable, consult with your builder, designer or architect)*

Clause *(Tick relevant clause numbers of Building Code)*	**Means of compliance** *(Refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications)*	**Waiver/modification required** *(State nature of waiver or modification of building code required)*
☑ B1 Structure	AS1 & VM1	
☐ B2 Durability		
☐ C1-C6 Protection from fire		
☐ D1 Access routes		
☐ D2 Mechanical installations for access		
☑ E1 Surface water	AS1 & VM1	
☐ E2 External moisture		
☐ E3 Internal moisture		
☐ F1 Hazardous agents on site		
☐ F2 Hazardous building materials		
☐ F3 Hazardous substances and processes		
☐ F4 Safety from falling		
☐ F5 Construction and demolition hazards		
☐ F6 Visibility in escape routes		
☐ F7 Warning systems		
☐ F8 Signs		
☐ F9 Means of restricting access to residential pools		
☐ G1 Personal hygiene		
☐ G2 Laundering		
☐ G3 Food preparation and prevention of contamination		
☐ G4 Ventilation		
☐ G5 Interior environment		
☐ G6 Airborne and impact sound		
☐ G7 Natural light		
☐ G8 Artificial light		
☐ G9 Electricity		
☐ G10 Piped services		
☐ G11 Gas as an energy source		
☐ G12 Water supplies		
☐ G13 Foul water		
☐ G14 Industrial liquid waste		
☐ G15 Solid waste		
☐ H1 Energy efficiency		

10. Compliance schedule - this section is not applicable if there are no specified systems or if the application is for a Project Information Memorandum

The specified systems for the building are as follows: *(specified systems are defined in regulations)*

The following specified systems are being altered, added to, or removed in the course of the building work:

☑ There are no specified systems in the building

11. Attachments

The following documents are attached to this application:

☑ Plans and specifications (list under section 9)

☐ Memoranda from licensed building practitioner(s) who carried out or supervised any design work that is restricted building work

☐ Project information memorandum

☐ Development contribution notice

☐ Certificate attached to project information memorandum

☐ Completed relevant application checklist(s) – refer to Appendix

Please continue on the Appendix as follows for further information requested by the Waimakariri District Council.

Appendix - further information requested by the Waimakariri District Council

National Environment Standard (NES)

This section relates to the National Environmental Standard for Assessing & Managing Contaminants in Soil to Protect Human Health (NES).

The NES includes regulations controlling **soil disturbance, change of use, subdivision, and removal/ replacement of fuel storage systems** on properties which have been used either now or in the past for a hazardous activity or industry (known as HAIL) that may have resulted in contamination of the soil. The table below determines whether the NES applies to your proposal.

	Yes	No
Is the application site listed on Environment Canterbury's Listed Land Use Register (LLUR)? www.llur.ecan.govt.nz If **YES**, please include a copy of the LLUR statement with your application.	☐	☑
If the site is not listed on the LLUR, is an activity described on the Hazardous Substances and Industries List (HAIL) currently being undertaken on the piece of land to which this application relates, or is it more likely than not to have ever been undertaken on the land? The HAIL list is available to view at Hazardous Activities and Industries List (HAIL)	☐	☑

Type of HAIL activity:

If the answer to either of the above questions is YES, then the NES will apply, depending on the type of activity. Please identify whether the application involves the activities below.

PLEASE NOTE - *If the answer to both of the previous questions is No, you do not need to answer the remaining questions in this section.*

	Yes	No
Has the property been recently subdivided?	☐	☐
Will the proposed activity involve the disturbance of more than 25m³ of soil (per 500m² of disturbed area)? Volume of soil disturbed:	☐	☐
Will the proposed activity involve the removal of more than 5m³ of soil (per 500m² of disturbed area) from the site? Volume of soil removal:	☐	☐
Does the application involve changing the use of the land to one which, because the land has been subject to a HAIL activity, is reasonably likely to harm human health? (e.g. orchard to a residence)	☐	☐
Does the application involve replacing or removing fuel storage systems or parts of it?	☐	☐

If the answer to any of the above activity questions is also YES, then the NES will apply and you will need to establish whether the proposed activity complies with the NES.

- Changing the land use will require resource consent if the permitted activity requirements of the NES are not complied with. These include provision of a Preliminary Site Investigation carried out by a suitably qualified and experienced practitioner.
- Soil disturbance or removal exceeding the specified volumes require resource consent.
- Removal or replacement of a fuel storage system will require consent if the permitted activity requirements of the NES are not complied with.

Does the proposed activity require resource consent under the NES? If **YES**, a resource consent is required and with the application an assessment under the NES must be provided. A Detailed Site Investigation may be required.	☐	☐

Vehicle crossing

Is a new vehicle crossing required or an existing crossing altered for this project?

☐ Yes ☑ No ☐ Resource consent applied for

If yes, please complete and submit the Vehicle Crossing Application Form **and send to** office@wmk.govt.nz

Application form

(One copy)

Office use only

These have been provided:

- ☑ All sections fully completed as applicable to the project
- ☑ Means of Compliance with NZBC - designer to complete
- ☑ Provide the correct legal description (Council can help with this)
- ☑ Provide one copy of the current Record of Title, or Sales and Purchase Agreement - not more than one month old
- ☑ Give name and contact numbers of contact person (if not the owner)
- ☑ State the project location (street address or location details as near as possible if no address)
- ☑ Application authorised and dated
- ☑ Agent relationship to owner stated (where applicable)
- ☐ Certificate/s of design work (LBP) ☐

Bookmarks

PLEASE NOTE - *Our current software does not enable us to maintain bookmarks within the consent documents during processing and granting. (This may be reviewed once a software solution becomes available.)*

Project Information Memorandum (PIM)

This section must be completed if you are applying for a PIM. **DO NOT** *complete this section if a PIM has already been issued. The following documents are attached to this application:*

- ☐ Site plan, Floor plans, Elevations for proposed building (electronic preferred or if hard-copy minimum size A3)
- ☐ Record of Title, or Sales and Purchase Agreement if Record of Title is not issued. Current Record of Title required (current within one month of application)
- ☐ Application fee (as per Council Fees and Charges Schedule) ☐

Building consent

This section must be completed if you are applying for a building consent. **DO NOT** *complete this section if the Application is for a Project Information Memorandum only.*

The following documents are attached to this application:

- ☑ 1 copy - building plans (site plans, floor plans, elevation plans. All plans to be dimensioned, scaled and accurate electronic preferred or if hard-copy minimum size A3)
- ☑ 1 copy of each - specifications, producer statements, truss details (refer below)
- ☑ 1 copy - Record of Title or Sale and Purchase Agreement if Record of Title is not issued. Current Record of Title required (current within one month of application)
- ☑ Restricted building work - see page 4
- ☑ Key personnel - see page 5
- ☑ Building work compliance with the Building Code - see page 7 ☐

PLEASE NOTE - *Swimming Pool document checklist on the following page to be completed if applicable.*

Office use only

These have been provided:

Swimming pools (as applicable)

- ☐ Site plan, showing location of pool and existing buildings, location of fence, boundaries and existing waterways
- ☐ Fence construction. Show the height, gates, self-closing device, construction type etc (see "A Guide to Pool Fencing")
- ☐ Also show how any doors or windows that form part of the fence will comply

Brand and model of pool:

Size of the pool:

- ☐ Drainage plan. Show discharge point
- ☐ Producer statement (where applicable)
- ☐ Installation instructions/manual
- ☐ Show filling point for pool (tap) and backflow protection ☐

Design basis

(To be completed by the designer)

Please list the following basis for the building design:

☑ Wind zone	High
☑ Earthquake zone	2
☑ Snow zone/altitude	N4
☑ Corrosion zone (if applicable)	C

- ☐ Building is specifically engineer-designed
- ☑ Complies with NZS 3604:2011
- ☐ Both specific design and NZS 3604:2011 ☐

Design documents

(One copy)

- ☐ Weather tightness risk matrix
- ☐ Truss design layout and Producer Statement
- ☑ Bracing calculations/plan
- ☐ H1 Energy efficiency calculations ☐

Site plan

(One copy, electronic preferred or if hard-copy minimum size A3)

- ☐ Overview of site showing legal boundaries as per current Record of Title
- ☐ Showing proposed and existing structures (including swimming pools)
- ☐ Distances to boundaries
- ☐ Proposed and existing site levels
- ☐ North point
- ☐ Utility infrastructure (sewer, water pipelines, septic tanks etc) where applicable
- ☐ Water races, drains, topographic features ☐

Office use only

These have been provided:

Drainage layout

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☐ Foul water - showing waste pipes, sizes, grades, venting
- ☐ Foul water to discharge point
- ☑ Storm water - pipe sizes, grades, downpipe locations
- ☑ Storm water drain to discharge point ☐

Foundation layout

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☐ Full foundation layout plan
- ☐ For timber floors, show all pile layout, pile types and bracing location
- ☐ Slab thickenings, shrinkage control joints and reinforcing rebates ☐

Floor plans

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☐ Layout of all floors fully dimensioned. For alterations and/or additions provide both new and existing floor plans
- ☐ Doors and window positions and sizes
- ☐ Layout of amenity areas (laundry etc)
- ☐ Main structural beams that are not shown elsewhere
- ☐ Lintel sizes
- ☐ HWC location
- ☐ Roof space access
- ☐ Gas cylinder location
- ☐ Room names
- ☐ Location of smoke alarms
- ☐ Location of heating unit (if applicable) ☐

Exterior elevations

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☐ Elevations of all external walls showing claddings
- ☐ Doors and windows showing opening sections
- ☐ Show location of solar panels
- ☐ Accurate ground levels existing and proposed
- ☐ Subfloor ventilation for timber floors
- ☐ Show roof bracing on elevations if not shown elsewhere ☐

Cross section and construction details

(One copy to scale usually 1:50 or 1:20 for sections and 1:10 for details - minimum scale, electronic preferred or if hard copy minimum size A3)

- ☐ Roof lines, overhangs, floor levels, ground levels
- ☐ Major vertical dimensions
- ☐ Foundation, wall and roof structure materials
- ☐ Upper level decks or balconies over lower level room must be fully detailed including the stormwater disposal and overflow precautions

- ☐ Stairs, handrails and balustrade showing pitch and head clearances
- ☐ Structural connections, posts to footings, beams to posts, trusses or beams to walls
- ☐ Component fixing information is to be provided for all structural and framing components
- ☐ Foundation and footing details and reinforcing. Show height from finished floor to ground level
- ☐ Pile details for timber floors
- ☐ Floor bracing details
- ☐ Timber grade and treatment
- ☐ Damp proof membranes, building papers and insulation systems/materials
- ☑ Flashing details and documents
- ☐ Roof penetrations
- ☐ Shower floor details and wall to shower base junction detail
- ☐ Sealing to wet area fixtures
- ☐ Water splash prevention
- ☐ All other building components that are not otherwise detailed or are unusual in any way ☐

Specification

(One copy)

The specification must be for the project. We will not accept standard specifications unless they relate directly to the building and they cover the project accurately and fully. Multi-choice specifications will not be accepted. A brief accurate specification is usually best.

- ☑ Provide a written specification to cover all of the trades involved in the project. All materials used in the project are fully specified including fixings of all materials and components
- ☐ The specification can be written on the drawings as long as all materials are fully covered ☐

Important things to include in your application

(One copy - where relevent)

- ☐ The chartered professional engineer's Producer Statement
- ☐ The engineer's monitoring schedule if the engineer chooses to do site monitoring
- ☐ All structural calculations
- ☐ Structural details showing connections and details of the components
- ☐ Solar technical details and plumbing schematic
- ☐ Log fire and flue installation instructions
- ☐ If log fire secondhand, engineer's certification required
- ☐ Current potable water test (current within 18 months)
- ☐ Effluent disposal design & ECan's copy of the submitted application form or approval
- ☐ Wastewater system designs when required to be done by a chartered professional engineer such as in a hazard zone
- ☐ Supporting manufacturer's trade literature and appraisals / certificates included ☐

Geotechnical report

- ☐ Geotechnical report provided, if applicable. Record report number: ☐

Office use only

Further information required? ☐ Yes ☐ No

Date/time received: 13/02/2024 8.43am Officer:

Date/time vetted/accepted: 14/02/2024 10.23am Officer: Amanda McIntyre

Office use only

Amount paid: $ 0 Date: Officer:

☐ Fee paid on application ☐ Deposit invoice sent

Date payment processed: Receipt: Officer:

Important information

All the relevant information on this form is required to be provided under the *Building Act 2004* and/or *Resource Management Act 1991* for the Waimakariri District Council to assess your application. Under these Acts this information has to be made available to members of the public if requested. The information contained in this application may be made available to other units of the Council. You have the right to access the personal information held about you by the Council which can be readily retrieved. You can also request that the Council correct any personal information it holds about you.

Application information

a. Project Information Memorandum (PIM):

A PIM will be issued within 20 working days provided all the required information is supplied with the application. Processing time is stopped whenever further information is required and starts again when the correct information is received.

It is not mandatory to apply for a PIM. Applicants can choose not to apply for a PIM when they consider that the information would not be relevant for their building project.

A fee is required to accompany your PIM application (as per Council's Fees and Charges Schedule).

b. Compliance Check:

Where a PIM is not sought, a Compliance Check will be undertaken to ensure your proposal complies with the District Plan.

c. Building Consent (BC):

A Building Consent will be processed within a maximum allowable time of 20 working days provided all the information required has been supplied. Processing time is stopped whenever further information is required and starts again when the correct information is received.

Once the Building Consent has been granted, you will receive notification, which will include an invoice for the fees payable.

Once the fees are paid in full, your Building Consent will be issued. Work must not start until the Building Consent is issued, and any Resource Consent requirements have been resolved.

A Building Consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the Building Consent or any further period that the Building Consent Authority may allow. You may request an extension which will need to be agreed to by Council (fees apply), refer to building application forms and fact sheets.

d. Combined Project Information Memorandum & Building Consent Applications:

Applications for a combined PIM/BC will only be accepted when sufficient information is provided to permit the Building Consent to be processed.

If insufficient information is provided, then further information will be requested, or your application may be returned to you.

e. If the applicant does not own the land, they must provide written approval from the owner to submit this application.

Levies payable

Under *the Building Act 2004 s53, s55 s402* Council are authorised to collect levies for the MBIE (*Building Levy Order 2005*) and BRANZ (*Building Research Levy Act 1969*). Levies are only payable on building works where the construction value exceeds a prescribed amount.

Building Act 2004

Building Levy Order 2005

Building Research Levy Act 1969

Fees

The application for a PIM and/or Building Consent must be accompanied by the fees as described in *Sections 33 and 45 of the Building Act 2004*. The work to process a PIM and/or Building Consent will be invoiced and needs to be paid in full before the PIM and/or Building Consent can be granted, refer to building services fees and charges.

Inspections

During the process of construction, inspections will be necessary to confirm all work complies with your approved Building Consent documentation. Please phone the Council Building Unit on 03 311 8906 at least **48 hours in advance** of requiring an inspection. Bookings are subject to demand and the availability of Inspectors, **please be advised that it is not always possible to carry out an inspection within 48 hours.**

The inspections required will be set out in the Building Consent documentation issued by the Council. Failure to have a prescribed inspection carried out may put the issue of the Code Compliance Certificate at risk.

All inspections including re-inspections are subjected to a separate charge, even if carried out on the same day.

Resource consent

Your application will be assessed by the Planning Unit of the Council to determine whether your project complies with the relevant District Plan requirements.

If your application does not comply with District Plan requirements, you will need to either amend your proposal to comply or apply for a Resource Consent. A Certificate will be attached to your Project Information Memorandum to notify that a Resource Consent is required prior to building work commencing. It is recommended that you phone the Planning Unit on 0800 965 468 to discuss the process.

Code compliance certificate

A Building Consent is not completed until it has been issued with a Code Compliance Certificate. The owner is required to complete a separate application for a Code Compliance Certificate as soon as practicable after the building work is completed. In any event no later than two (2) years after the granting of the Building Consent, Council is required to decide whether or not a Code Compliance Certificate can be issued. If your project will not be completed within two years, you may request an extension which will need to be agreed to by Council (fees apply), refer to building application forms and fact sheets.

Agency

The owner may authorise an agent to submit an application on their behalf.

The Agent will be the first point of contact for all communications with the Council/Building Consent Authority regarding this application under *Sections 33 and 45 of the Building Act 2004*. They will receive all correspondence and must be authorised by the Owner. All amendments require new authorisation.

The owner can elect to receive a copy of correspondence regarding this Building Consent/PIM and associated Building Consent Inspection Notices in "The owner" section of this application form, or by notifying Council during the Building Consent/PIM and/or Code Compliance Certificate process.

BC230758
Waimakariri District Council
215 High Street
Private Bag 1005
Rangiora 7440, New Zealand
Phone 0800 965 468

BUILDING UNIT

Form 2 Application for a Project Information Memorandum and/or Building Consent

Dwellings, Outbuildings, Swimming Pools and Other Works e.g. Septic Tank, Bridge, Retaining Wall, Amendments and Exemptions

Under The Building Act 2004, Sections 33, 45 & Schedule 1, Part 1, Clause 2

BC No.: BC230758

1. The Building

Street address (street/road/township): (*for structures that do not have a street address, state the nearest street intersection and the distance and direction from that intersection)*

175 Townsend Road, Rangiora

Legal description of the land where the building is located: *(state legal description as at the date of application and, if the land is proposed to be subdivided, include details of relevant lot numbers and subdivision consent)*

Lot: 115 DP: 575822 Valuation Number: 2166000232 Resource Consent:

Building name: *(if applicable)*

Location of building within site/block number: *(include nearest street access)*

Number of levels: 1 Unit/Level No.:

Area: *(total floor area; indicate area affected by the building work if less than the total area)*

Existing: New: 204.9 Total: 204.9

Current lawfully established use: *(include number of occupants per level and per use if more than 1)*

Year building first constructed: *(Approximate date is acceptable, eg 1920's)*

2. The Owner - all details must be the legal owner's

Name of owner: *(include preferred form of address, e.g. Mr, Mrs, Ms, Miss, Dr, if an individual)*

Haydon Gifford Baddock

Contact person: *(not required if the owner is an individual. Must have a New Zealand address)*

Mailing address:

Street address/Registered office: *(if different than above)*

272 Whites Road, RD2, Kaiapoi 7692

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
0277 570 024				

Email: hbaddock@hotmail.co.nz Website:

BC230758

As the owner, where you have given authorisation for an Agent to act on your behalf, please confirm if you require a copy of Building Consent/PIM correspondence and associated Building Consent Inspection Notices following the formally received notification: ☐ Yes ☑ No

The following evidence of ownership is attached to this application:

☑ Copy of Record of Title OR ☐ Council to provide *(additional charge of $15)*
(Current within 1 month of being issued and must include a deposited plan [diagram]. Where the Record of Title is not current, Council will provide this [additional charge of $15 applies]).

☐ Signed copy of Sales and Purchase Agreement *(If Record of Title is not issued)*

3. Applicant - only required when the applicant is not the owner or the agent e.g. leasee/tenant

PLEASE NOTE - *Authorisation is required from the owner of the property.*

Name of applicant: *(e.g. leasee/tenant)*

Contact person: *(not required if the applicant is an individual)*

Mailing address:

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:

Email: Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*

4. Agent – only required when the application is being made on behalf of the owner

PLEASE NOTE - *Authorisation is required from the owner of the property.*

Name of agent: a.s.c.a.d. ltd

Contact person: *(not required if the applicant is an individual)* Andrew Siegenthaler

Mailing address: 59 Warwick Road, RD5, Rangiora 7475

Street address/Registered office: *(if different than above)*

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
	0272838775			

Email: ascadltd@gmail.com Website:

Relationship to owner: *(state details of the authorisation from the owner to make the application on the owner's behalf)*
Draughtsmen

PLEASE NOTE - *The Agent will be the first point of contact for communications with the Council/Building Consent Authority regarding this application/building work*

5. Application

I request that the following (please select one) be issued for the building work described in this Application:

☐ Project Information Memorandum (PIM) only

☐ Building Consent for PIM No:

☐ Building Consent with PIM

☑ Building Consent without PIM *(Compliance Check applies)*

☐ Exemption from the need for B/C
(Refer Building Act 2004 Schedule 1, Part 1, Clause 2)

☐ Amendment to Building Consent
Please Note: *Amendments must be authorised by the owner*

☐ Building Consent for Above Ground Pool and/or Non-Exempt Small Heated Pool

I wish to receive my approved documentation in the following format:

PLEASE NOTE - *If USB or hard copy, please confirm if you wish to pick it up from the Council or have it posted.*

☑ Electronically via Sharefile Transfer Portal (You must be set up and registered for this option)

☐ USB: *(this is an additional charge)* ☐ Post OR ☐ Pick-up

☐ Hard copy: *(onsite - this is an additional charge)* ☐ Post OR ☐ Pick-up

PLEASE NOTE - *One set of "Onsite" hard copy consented documents must be available at all times for inspections.*

All consent related invoices/refunds to be billed and sent to:

☑ Owner ☐ Applicant ☐ Agent ☐ Or other (If other, please complete below)

Company name: *(if applicable)*

Contact person:

Mailing address:

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:

Email: Website:

PLEASE NOTE - *Any refunds are to the receipted name unless written authorisation has been received from the receipted person or company.*

Terms of trade

I/We understand that:

Building Consents shall be paid for when the consent is collected/uploaded or if the consent is not collected/uploaded within three months after the date of consent being granted, the work done to date portion i.e. admin and processing costs of the account will be due and payable. The balance of the invoice will be payable when the consent is collected/uploaded.

All other accounts shall be paid by the 20th day of the month following the month in which the invoice is issued.

I/We agree to pay according to these terms for any goods or services you supply to us. Failure to meet these Terms of Trade may result in any credit arrangement being withdrawn with any balance becoming payable within seven days. Should failure to meet the terms of trade result in debt recovery and/or legal proceedings, any costs whatsoever incurred in the collection of the debt including debt collector's fees and commissions and legal costs, charges and expenses on a solicitor and own client basis will be added to the account and will be payable by me/us.

Application authorisation

By entering your name in the box below you are giving your authority for this application to proceed under Sections 33 and 45 of the Building Act 2004.

Name: John Baddock Date: 19/07/23

I am the: ☑ Owner ☐ Applicant on behalf of, and with the authority of the owner
☐ Agent on behalf of, and with the authority of the owner

6. The Project

Description of work *(e.g. dwelling, alteration/addition). If an amendment, please provide a complete description of the nature of the amendment.*

New 3 Bedroom domestic dwelling with attached garage

Specify the intended use of the building: *(e.g. detached dwelling, multi-unit dwelling, show home, sleepout or outbuilding - shed/garage etc.)*

Will the building work result in a change of use of this building? ☐ Yes ☑ No

If Yes, provide details of the new use:

Will hazardous substances be stored in the building? ☐ Yes ☑ No

Intended life of the building:

☑ Indefinite but not less than 50 years Or specified as years

Is this a staged consent? ☐ Yes ☑ No

If staged, provide details *(e.g. Stage 1 of 3)*

List Building Consents previously issued for this building (if any): *(i.e. is this project being constructed in stages? Is this consent for a relocated or transportable building?)*

Estimated value of the building work on which the building levy will be calculated (incl. GST): *(state estimated value as defined in section 7 of the Building Act 2004)*

$ 420000

If this is an application to amend a building consent, advise the estimated value of amended building work (incl. GST) $

Is this in addition to, or reduction from, what was stated with the original application?

☐ Addition ☐ Reduction ☐ No change

7. Restricted building work

Will the building work include any restricted building work? ☐ Yes ☐ No

If Yes, provide the following details of all Licensed Building Practitioners who will be involved in carrying out or supervising the restricted building work (if these details are unknown at the time of the application, they must be supplied before the work begins).

Licence class	Name	Licensed building practitioner number (or registration number if treated as being licensed under section 291 of the Building Act 2004)
Foundations		
Carpentry		
Exterior Plasterer		
Bricklayer		
Blocklayer		
Roofer		

Key personnel

Builder

Name: Reg. No.:

Address:

Phone No.: Email:

Designer(s)

Name: Andrew Siegenthaler - a.s.c.a.d. ltd Reg. No.: 108550

Address: 59 Warwick Road, RD5, Rangiora

Phone No.: 03 329 2092 Email: ascadltd@snap.net.nz

Certifying drainlayer

Name: Reg. No.:

Address:

Phone No.: Email:

Certifying plumber

Name: Reg. No.:

Address:

Phone No.: Email:

Certifying gasfitter

Name: Reg. No.:

Address:

Phone No.: Email:

Registered electrician

Name: Reg. No.:

Address:

Phone No.: Email:

Structural engineer

Name: Reg. No.:

Address:

Phone No.: Email:

8. Project Information Memorandum - this section is not applicable if this application is for a building consent only

The following matters are involved in the project:

- ☐ Subdivision
- ☐ Alterations to land contours
- ☑ New or altered connections to public utilities
- ☑ New or altered locations and/or external dimensions of buildings
- ☑ New or altered access for vehicles
- ☐ Building work over or adjacent to any road or public place
- ☑ Disposal of stormwater and wastewater
- ☐ Building work over any existing drains or sewers or in close proximity to wells or water mains
- ☐ Registered historic site or place, tick if applicable (only applies where a PIM has not previously been issued for the building work)
- ☐ Other matters known to the applicant that may require authorisations from the territorial authority:

Notes

Other notes or comments which you may wish to add, eg: Resource Consents

9. Building consent - this section is not applicable if this application is for a Project Information Memorandum only

The following plans and specifications are attached to this application, or refer to the Appendix section for plans and specifications provided. ☐

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The building work will comply with the Building Code as follows: *(Note: if you are not sure what clauses are applicable, consult with your builder, designer or architect)*

Clause *(Tick relevant clause numbers of Building Code)*	**Means of compliance** *(Refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications)*	**Waiver/modification required** *(State nature of waiver or modification of building code required)*
☑ B1 Structure	AS1 & VM1	
☑ B2 Durability	AS1	
☑ C1-C6 Protection from fire	AS1	
☑ D1 Access routes	AS1	
☐ D2 Mechanical installations for access		
☑ E1 Surface water	AS1 & VM1	
☑ E2 External moisture	AS1	
☑ E3 Internal moisture	AS1	
☐ F1 Hazardous agents on site		
☑ F2 Hazardous building materials	AS1	
☐ F3 Hazardous substances and processes		
☑ F4 Safety from falling	AS1	
☑ F5 Construction and demolition hazards	AS1	
☐ F6 Visibility in escape routes		
☑ F7 Warning systems	AS1	
☐ F8 Signs		
☐ F9 Means of restricting access to residential pools		
☑ G1 Personal hygiene	AS1	
☑ G2 Laundering	AS1	
☑ G3 Food preparation and prevention of contamination	AS1	
☑ G4 Ventilation	AS1	
☑ G5 Interior environment	AS1	
☐ G6 Airborne and impact sound		
☑ G7 Natural light	AS1	
☑ G8 Artificial light	AS1	
☑ G9 Electricity	AS1	
☐ G10 Piped services		
☐ G11 Gas as an energy source		
☑ G12 Water supplies	AS1	
☑ G13 Foul water	AS1 & AS2	
☐ G14 Industrial liquid waste		
☐ G15 Solid waste		
☑ H1 Energy efficiency	AS1	

10. Compliance schedule - this section is not applicable if there are no specified systems or if the application is for a Project Information Memorandum

The specified systems for the building are as follows: *(specified systems are defined in regulations)*

The following specified systems are being altered, added to, or removed in the course of the building work:

☑ There are no specified systems in the building

11. Attachments

The following documents are attached to this application:

☑ Plans and specifications (list under section 9)

☑ Memoranda from licensed building practitioner(s) who carried out or supervised any design work that is restricted building work

☐ Project information memorandum

☐ Development contribution notice

☐ Certificate attached to project information memorandum

☑ Completed relevant application checklist(s) – refer to Appendix

Please continue on the Appendix as follows for further information requested by the Waimakariri District Council.

Appendix - further information requested by the Waimakariri District Council

National Environment Standard (NES)

This section relates to the National Environmental Standard for Assessing & Managing Contaminants in Soil to Protect Human Health (NES).

The NES includes regulations controlling **soil disturbance, change of use, subdivision, and removal/ replacement of fuel storage systems** on properties which have been used either now or in the past for a hazardous activity or industry (known as HAIL) that may have resulted in contamination of the soil. The table below determines whether the NES applies to your proposal.

	Yes	No
Is the application site listed on Environment Canterbury's Listed Land Use Register (LLUR)? www.llur.ecan.govt.nz If **YES**, please include a copy of the LLUR statement with your application.	☐	☑
If the site is not listed on the LLUR, is an activity described on the Hazardous Substances and Industries List (HAIL) currently being undertaken on the piece of land to which this application relates, or is it more likely than not to have ever been undertaken on the land? The HAIL list is available to view at Hazardous Activities and Industries List (HAIL)	☐	☑

Type of HAIL activity:

If the answer to either of the above questions is YES, then the NES will apply, depending on the type of activity. Please identify whether the application involves the activities below.

PLEASE NOTE - *If the answer to both of the previous questions is No, you do not need to answer the remaining questions in this section.*

	Yes	No
Has the property been recently subdivided?	☐	☐
Will the proposed activity involve the disturbance of more than 25m³ of soil (per 500m² of disturbed area)? Volume of soil disturbed:	☐	☐
Will the proposed activity involve the removal of more than 5m³ of soil (per 500m² of disturbed area) from the site? Volume of soil removal:	☐	☐
Does the application involve changing the use of the land to one which, because the land has been subject to a HAIL activity, is reasonably likely to harm human health? (e.g. orchard to a residence)	☐	☐
Does the application involve replacing or removing fuel storage systems or parts of it?	☐	☐

If the answer to any of the above activity questions is also YES, then the NES will apply and you will need to establish whether the proposed activity complies with the NES.

- Changing the land use will require resource consent if the permitted activity requirements of the NES are not complied with. These include provision of a Preliminary Site Investigation carried out by a suitably qualified and experienced practitioner.
- Soil disturbance or removal exceeding the specified volumes require resource consent.
- Removal or replacement of a fuel storage system will require consent if the permitted activity requirements of the NES are not complied with.

Does the proposed activity require resource consent under the NES? If **YES**, a resource consent is required and with the application an assessment under the NES must be provided. A Detailed Site Investigation may be required.	☐	☐

Vehicle crossing

Is a new vehicle crossing required or an existing crossing altered for this project?

☑ Yes ☐ No ☐ Resource consent applied for

If yes, please complete and submit the Vehicle Crossing Application Form **and send to** office@wmk.govt.nz

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Application form

(One copy)

Office use only

These have been provided:

- ☑ All sections fully completed as applicable to the project
- ☑ Means of Compliance with NZBC - designer to complete
- ☑ Provide the correct legal description (Council can help with this)
- ☑ Provide one copy of the current Record of Title, or Sales and Purchase Agreement - not more than one month old
- ☑ Give name and contact numbers of contact person (if not the owner)
- ☑ State the project location (street address or location details as near as possible if no address)
- ☑ Application authorised and dated
- ☑ Agent relationship to owner stated (where applicable)
- ☑ Certificate/s of design work (LBP) ☑

Bookmarks

PLEASE NOTE - *Our current software does not enable us to maintain bookmarks within the consent documents during processing and granting. (This may be reviewed once a software solution becomes available.)*

Project Information Memorandum (PIM)

This section must be completed if you are applying for a PIM. **DO NOT** *complete this section if a PIM has already been issued. The following documents are attached to this application:*

- ☑ Site plan, Floor plans, Elevations for proposed building (electronic preferred or if hard-copy minimum size A3)
- ☑ Record of Title, or Sales and Purchase Agreement if Record of Title is not issued. Current Record of Title required (current within one month of application)
- ☐ Application fee (as per Council Fees and Charges Schedule) ☑

Building consent

This section must be completed if you are applying for a building consent. **DO NOT** *complete this section if the Application is for a Project Information Memorandum only.*

The following documents are attached to this application:

- ☑ 1 copy - building plans (site plans, floor plans, elevation plans. All plans to be dimensioned, scaled and accurate electronic preferred or if hard-copy minimum size A3)
- ☑ 1 copy of each - specifications, producer statements, truss details (refer below)
- ☑ 1 copy - Record of Title or Sale and Purchase Agreement if Record of Title is not issued. Current Record of Title required (current within one month of application)
- ☑ Restricted building work - see page 4
- ☑ Key personnel - see page 5
- ☑ Building work compliance with the Building Code - see page 7 ☑

PLEASE NOTE - *Swimming Pool document checklist on the following page to be completed if applicable.*

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Office use only

These have been provided:

Swimming pools (as applicable)

- ☐ Site plan, showing location of pool and existing buildings, location of fence, boundaries and existing waterways
- ☐ Fence construction. Show the height, gates, self-closing device, construction type etc (see "A Guide to Pool Fencing")
- ☐ Also show how any doors or windows that form part of the fence will comply

Brand and model of pool:

Size of the pool:

- ☐ Drainage plan. Show discharge point
- ☐ Producer statement (where applicable)
- ☐ Installation instructions/manual
- ☐ Show filling point for pool (tap) and backflow protection ☐

Design basis

(To be completed by the designer)

Please list the following basis for the building design:

☑ Wind zone	High
☑ Earthquake zone	2
☑ Snow zone/altitude	N4
☑ Corrosion zone (if applicable)	C

- ☐ Building is specifically engineer-designed
- ☑ Complies with NZS 3604:2011
- ☐ Both specific design and NZS 3604:2011 ☑

Design documents

(One copy)

- ☑ Weather tightness risk matrix
- ☑ Truss design layout and Producer Statement
- ☑ Bracing calculations/plan
- ☑ H1 Energy efficiency calculations ☑

Site plan

(One copy, electronic preferred or if hard-copy minimum size A3)

- ☑ Overview of site showing legal boundaries as per current Record of Title
- ☑ Showing proposed and existing structures (including swimming pools)
- ☑ Distances to boundaries
- ☑ Proposed and existing site levels
- ☑ North point
- ☑ Utility infrastructure (sewer, water pipelines, septic tanks etc) where applicable
- ☐ Water races, drains, topographic features ☑

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These have been provided:

Drainage layout

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☑ Foul water - showing waste pipes, sizes, grades, venting
- ☑ Foul water to discharge point
- ☑ Storm water - pipe sizes, grades, downpipe locations
- ☑ Storm water drain to discharge point ☑

Foundation layout

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☑ Full foundation layout plan
- ☐ For timber floors, show all pile layout, pile types and bracing location
- ☑ Slab thickenings, shrinkage control joints and reinforcing rebates ☑

Floor plans

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☑ Layout of all floors fully dimensioned. For alterations and/or additions provide both new and existing floor plans
- ☑ Doors and window positions and sizes
- ☑ Layout of amenity areas (laundry etc)
- ☑ Main structural beams that are not shown elsewhere
- ☑ Lintel sizes
- ☑ HWC location
- ☑ Roof space access
- ☐ Gas cylinder location
- ☑ Room names
- ☑ Location of smoke alarms
- ☐ Location of heating unit (if applicable) ☑

Exterior elevations

(One copy to scale usually 1:100 or 1:50, electronic preferred or if hard copy minimum size A3)

- ☑ Elevations of all external walls showing claddings
- ☑ Doors and windows showing opening sections
- ☐ Show location of solar panels
- ☑ Accurate ground levels existing and proposed
- ☐ Subfloor ventilation for timber floors
- ☐ Show roof bracing on elevations if not shown elsewhere ☑

Cross section and construction details

(One copy to scale usually 1:50 or 1:20 for sections and 1:10 for details - minimum scale, electronic preferred or if hard copy minimum size A3)

- ☑ Roof lines, overhangs, floor levels, ground levels
- ☑ Major vertical dimensions
- ☑ Foundation, wall and roof structure materials
- ☐ Upper level decks or balconies over lower level room must be fully detailed including the stormwater disposal and overflow precautions

- ☐ Stairs, handrails and balustrade showing pitch and head clearances
- ☐ Structural connections, posts to footings, beams to posts, trusses or beams to walls
- ☐ Component fixing information is to be provided for all structural and framing components
- ☑ Foundation and footing details and reinforcing. Show height from finished floor to ground level
- ☐ Pile details for timber floors
- ☐ Floor bracing details
- ☑ Timber grade and treatment
- ☑ Damp proof membranes, building papers and insulation systems/materials
- ☑ Flashing details and documents
- ☑ Roof penetrations
- ☑ Shower floor details and wall to shower base junction detail
- ☑ Sealing to wet area fixtures
- ☑ Water splash prevention
- ☐ All other building components that are not otherwise detailed or are unusual in any way ☑

Specification

(One copy)

The specification must be for the project. We will not accept standard specifications unless they relate directly to the building and they cover the project accurately and fully. Multi-choice specifications will not be accepted. A brief accurate specification is usually best.

- ☑ Provide a written specification to cover all of the trades involved in the project. All materials used in the project are fully specified including fixings of all materials and components
- ☐ The specification can be written on the drawings as long as all materials are fully covered ☑

Important things to include in your application

(One copy - where relevent)

- ☐ The chartered professional engineer's Producer Statement
- ☐ The engineer's monitoring schedule if the engineer chooses to do site monitoring
- ☐ All structural calculations
- ☐ Structural details showing connections and details of the components
- ☐ Solar technical details and plumbing schematic
- ☐ Log fire and flue installation instructions
- ☐ If log fire secondhand, engineer's certification required
- ☐ Current potable water test (current within 18 months)
- ☐ Effluent disposal design & ECan's copy of the submitted application form or approval
- ☐ Wastewater system designs when required to be done by a chartered professional engineer such as in a hazard zone
- ☐ Supporting manufacturer's trade literature and appraisals / certificates included ☐

Geotechnical report

- ☑ Geotechnical report provided, if applicable. Record report number: ☑

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Office use only

Further information required? ☐ Yes ☑ No

Date/time received: 20/07/2023 1.50pm Officer:

Date/time vetted/accepted: 20/07/2023 3.34pm Officer: Amanda McIntyre

Office use only

Amount paid: $ 1950 Date: Officer:

☐ Fee paid on application ☑ Deposit invoice sent

Date payment processed: 21/08/2023 Receipt: dc Officer: shirley cresswell

Important information

All the relevant information on this form is required to be provided under the *Building Act 2004* and/or *Resource Management Act 1991* for the Waimakariri District Council to assess your application. Under these Acts this information has to be made available to members of the public if requested. The information contained in this application may be made available to other units of the Council. You have the right to access the personal information held about you by the Council which can be readily retrieved. You can also request that the Council correct any personal information it holds about you.

Application information

a. Project Information Memorandum (PIM):

A PIM will be issued within 20 working days provided all the required information is supplied with the application.

Processing time is stopped whenever further information is required and starts again when the correct information is received.

It is not mandatory to apply for a PIM. Applicants can choose not to apply for a PIM when they consider that the information would not be relevant for their building project.

A fee is required to accompany your PIM application (as per Council's Fees and Charges Schedule).

b. Compliance Check:

Where a PIM is not sought, a Compliance Check will be undertaken to ensure your proposal complies with the District Plan.

c. Building Consent (BC):

A Building Consent will be processed within a maximum allowable time of 20 working days provided all the information required has been supplied. Processing time is stopped whenever further information is required and starts again when the correct information is received.

Once the Building Consent has been granted, you will receive notification, which will include an invoice for the fees payable.

Once the fees are paid in full, your Building Consent will be issued. Work must not start until the Building Consent is issued, and any Resource Consent requirements have been resolved.

A Building Consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the Building Consent or any further period that the Building Consent Authority may allow. You may request an extension which will need to be agreed to by Council (fees apply), refer to building application forms and fact sheets.

d. Combined Project Information Memorandum & Building Consent Applications:

Applications for a combined PIM/BC will only be accepted when sufficient information is provided to permit the Building Consent to be processed.

If insufficient information is provided, then further information will be requested, or your application may be returned to you.

e. If the applicant does not own the land, they must provide written approval from the owner to submit this application.

Levies payable

Under *the Building Act 2004 s53, s55 s402* Council are authorised to collect levies for the MBIE (*Building Levy Order 2005*) and BRANZ (*Building Research Levy Act 1969*). Levies are only payable on building works where the construction value exceeds a prescribed amount.

Building Act 2004

Building Levy Order 2005

Building Research Levy Act 1969

Fees

The application for a PIM and/or Building Consent must be accompanied by the fees as described in *Sections 33 and 45 of the Building Act 2004*. The work to process a PIM and/or Building Consent will be invoiced and needs to be paid in full before the PIM and/or Building Consent can be granted, refer to building services fees and charges.

Inspections

During the process of construction, inspections will be necessary to confirm all work complies with your approved Building Consent documentation. Please phone the Council Building Unit on 03 311 8906 at least **48 hours in advance** of requiring an inspection. Bookings are subject to demand and the availability of Inspectors, **please be advised that it is not always possible to carry out an inspection within 48 hours.**

The inspections required will be set out in the Building Consent documentation issued by the Council. Failure to have a prescribed inspection carried out may put the issue of the Code Compliance Certificate at risk.

All inspections including re-inspections are subjected to a separate charge, even if carried out on the same day.

Resource consent

Your application will be assessed by the Planning Unit of the Council to determine whether your project complies with the relevant District Plan requirements.

If your application does not comply with District Plan requirements, you will need to either amend your proposal to comply or apply for a Resource Consent. A Certificate will be attached to your Project Information Memorandum to notify that a Resource Consent is required prior to building work commencing. It is recommended that you phone the Planning Unit on 0800 965 468 to discuss the process.

Code compliance certificate

A Building Consent is not completed until it has been issued with a Code Compliance Certificate. The owner is required to complete a separate application for a Code Compliance Certificate as soon as practicable after the building work is completed. In any event no later than two (2) years after the granting of the Building Consent, Council is required to decide whether or not a Code Compliance Certificate can be issued. If your project will not be completed within two years, you may request an extension which will need to be agreed to by Council (fees apply), refer to building application forms and fact sheets.

Agency

The owner may authorise an agent to submit an application on their behalf.

The Agent will be the first point of contact for all communications with the Council/Building Consent Authority regarding this application under *Sections 33 and 45 of the Building Act 2004*. They will receive all correspondence and must be authorised by the Owner. All amendments require new authorisation.

The owner can elect to receive a copy of correspondence regarding this Building Consent/PIM and associated Building Consent Inspection Notices in "The owner" section of this application form, or by notifying Council during the Building Consent/PIM and/or Code Compliance Certificate process.

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.
If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: **175 Townsend Road**	
Suburb:	
Town/City **Rangiora**	Postcode:

THE OWNER

Name(s): **Haydon Baddock**	
Mailing address: **272 Whites Road, RD2**	
Suburb:	PO Box/Private Bag:
Town/City: **Kaiapoi**	Postcode: **7692**
Phone number: **0277 570 024**	Email address: **hbaddock@hotmail.co.nz**

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (√)	
( )	**sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design myself – no other person will be providing any additional memoranda for the project
( )	**lead** designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
✓	**lead** designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memoranda relating to their specific RBW design
( )	**specialist** designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I **Andrew Siegenthaler** carried out in part the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	**Description**	**Carried out/ supervised**	**Reference to plans and specifications**
Tick(√)if included *Cross (X) if excluded*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*

Primary structure

All RBW Design work relating to B1 ( )		( ) Carried out ( ) Supervised	
Foundations and subfloor framing		Carried out in part ( ) Supervised	
Walls ✓	*Timber Framed Walls*	✓ Carried out in part ( ) Supervised	Floor Plan, Sections & Details
Roof ✓	*Timber Truss*	Carried out in part (✓) Supervised	Roof Plan & Truss Manufactures Design
Columns and beams ✓	*Columns & Fixings*	✓ Carried out in part ( ) Supervised	Floor Plans & Details
Bracing ✓	*Sheet Bracing*	✓ Carried out in part ( ) Supervised	Bracing Plan & Bracing Calcs
Other ( )		( ) Carried out ( ) Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2 ( )		( ) Carried out ( ) Supervised	
Damp proofing ✓	*DPM underside of slab & DPC under bottom plate*	✓ Carried out in part ( ) Supervised	Cross Section & Construction Details
Roof cladding or roof cladding system ✓	*Roof Cladding on Building Paper plus fixings*	✓ Carried out in part ( ) Supervised	Roof Plan & Construction Details
Ventilation system (for example, subfloor or cavity) ✓	*Mechanical Vents* *20mm Cavity System*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plans Cross Sections &

			Construction Details
Wall cladding or wall cladding system ✓	*Exterior Wall Claddings*	✓ Carried out in part ( ) Supervised	Elevations, Cross Sections & Construction Details
Waterproofing ✓	*Bath, Shower, WHB*	✓ Carried out in part ( ) Supervised	Details
Other ( )		( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ✓	*Smoke Alarms*	✓ Carried out in part ( ) Supervised	Floor Plan & Electrical Plan

Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

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.

ISSUED BY

Name: **Andrew Siegenthaler**	LBP or Registration number: **108550**

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

Design Entity or Company (optional): **a.s.c.a.d. ltd**

Mailing address (if different from below):

Street address / Registered office: **59 Warwick Road**	
Suburb: **Ohoka**	Town/City: **Rangiora**
PO Box/Private Bag:	Postcode:
Phone number: **03 329 2092**	Mobile:
After Hours:	Fax:
Email address: **ascadltd@snap.net.nz**	Website:

DECLARATION

I **Andrew Siegenthaler** LBP **108550**

state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code; or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature:

Date: **19/07/2023**

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Residential development at Lot 115 Townsend Fields, Rangiora HFC job reference: 23-135

Structural maintenance schedule

This schedule of ongoing inspection and maintenance of structural elements shall be included with the Operations and Maintenance manual and provided to the Owner/Body Corporate and building managers.

Inspection/maintenance timeframe and item	
Half-yearly	Wash down all exposed steelwork that is not in a fully interior environment including: • Veranda steelwork • Steel Carpark structure (beams, columns, braces etc) • Deck and balcony steelwork • Exposed façade steelwork, both primary and secondary structure • Plantrooms and plenums with fresh-air intakes • External structural components such as Buckling Restrained Braces, Viscous Dampers, Eccentrically Braced Frames and the like • Sub-ground floor mild-steel structures such as beams, isolation bearings etc.
(b) 5 yearly	Inspect and repair sealant that encloses structural mild-steel components and/or timber with mild-steel fixings
(c) 10 yearly	Check exposed timber fixings for corrosion, repair as required.
	Inspect/replace sealant that encloses structural mild-steel components and/or timber with mild-steel fixings. This will typically include sealants around the perimeter of precast panels. Note that 10 years is the expected useful life for many sealants
	Check exposed structural steel within plantrooms and plenums for corrosion. Repair protective coatings as required.
	Check all exposed steelwork that is not in a fully interior environment for signs of corrosion. Repair protective coatings as required.
	Audit of damage to exposed intumescent coatings. Repair as required.
(d) 25 yearly	Inspect samples of structural steel that is hidden from view but not enclosed within a vapour barrier, and repair protective coatings as necessary. A typical example is a veranda with built-in steelwork. (Such steelwork should typically have duplex protective coatings). Inspection may typically require removal of claddings and/or the drilling of holes for borescope access. Repair as required.
	Inspect all exposed, external timber. Repair as required.
	Inspect all exposed, external reinforced concrete for signs of spalling or cracking. Repair as required.
	Audit of damage to enclosed intumescent coatings. Repair as required.
Following fit-out or alterations	Audit of damage to intumescent coatings. Repair as required.
Following seismic shaking > SLS1 event	Inspections and repair as per b), c) and d) above

The durability of structural building work is reliant on protection from external water and moisture being achieved and maintained throughout the life of the building or structure. Protection against external water and moisture is dependent on appropriate detailing, materials, proprietary products and construction practices which HFC does not design/or inspect for compliance with the requirements of the building code.

HFC accepts no liability in contract, tort, or otherwise (including negligence) for the failure of the building or structure to meet or perform to the requirements of the Building Act 2004 (or any subsequent Act) and any regulations made there under (or any amendment or substitu thereof) in relation to: External water and/or moisturethe loss of structural durability or strength to the building or structure as a result of external moisture entering the building or structure, or the effects thereof.

Yours faithfully,
per: HFC: Civil and Structural (South) Ltd

Tomoaki Watanabe
Associate Director

engineering new zealand

CERTIFICATE OF DESIGN WORK
MEMORANDUM FROM LICENSED BUILDING PRACTITIONER

Section 30C and Section 45, Building Act 2004

The Building

Street address	Lot 115 Townsend Fields		
Suburb		Town/city	Rangiora
Postcode		Building consent no.	

The Owner

Name(s)	John Baddock		
Email	john.baddock@outlook.com	Phone	
Address			

Basis for providing this memorandum

I am providing this memorandum in my role as the **specialist** designer who carried out or supervised specific Primary structure elements of restricted building work (RBW) design work as described in this memorandum. Other designers will provide memoranda covering the remaining RBW design work. Refer also to the attached PS1.

Identification of restricted building work (RBW) design work

I, Tomoaki Watanabe carried out or supervised the following RBW design work:

Primary structure: B1

Design work that is RBW		Description (as required) and reference to plans and specifications	Carried out or supervised
Foundations and subfloor framing	☑	Foundation Design as per HFC PS1	Supervised
Retaining walls	☐	N/A	N/A
Beams	☐	N/A	N/A
Portal	☐	N/A	N/A
Bracing	☐	N/A	N/A
Other (primary)	☐	N/A	N/A

Note: SED = Elements subject to Specific Engineering Design outside of the scope of NZS3604:2011, unless otherwise noted.

Initial TW Date 22/06/2023

Waivers and modifications

Are waivers or modifications of the Building Code required? No

If yes, please provide details of the waivers or modifications:

Building Code clause	Waiver/modification required

Issued by

Name	Tomoaki Watanabe	**Design entity/company**	HFC: Civil and Structural (South) Ltd
Chartered status	CPEng	**Chartered no.**	1010912
Email	Tom.Watanabe@hfc.co.nz	**Website**	https://hfc.co.nz/
Phone (daytime)	03 339 7000	**Phone (after hours)**	
Mobile	021 278 1561		
Postal address	P.O. Box 28006, Christchurch 8242		
Physical address	Unit 4, 295 Blenheim Road, Upper Riccarton, Christchurch		

Declaration

I, Tomoaki Watanabe, LBP state that I have applied the skills and care reasonably required of a competent design professional in carrying out or supervising the RBW described in this memorandum and that based on this, I certify that the RBW described in this memorandum:

- complies with the Building Code; or
- complies with the Building Code subject to any waiver or modification of the Building Code described in this memorandum.

Signature Tom Watanabe. **Date** 22/06/2023

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BC230578 14/09/2023 brennao

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **1057847**

Land Registration District **Canterbury**

Date Issued 11 August 2022

Prior References
1000986

Estate Fee Simple

Area 600 square metres more or less

Legal Description Lot 115 Deposited Plan 575822

Registered Owners
Haydon Gifford Baddock

Interests

Appurtenant hereto is a right of way, right to convey electricity, water and telecommunications, right to drain sewage and water created by Easement Instrument 12468169.5 - 11.8.2022 at 2:45 pm

The easements created by Easement Instrument 12468169.5 are subject to Section 243 (a) Resource Management Act 1991

Land Covenant (in gross) in favour of Townsend Fields Limited created by Covenant Instrument 12468169.6 - 11.8.2022 at 2:45 pm (Limited as to duration)

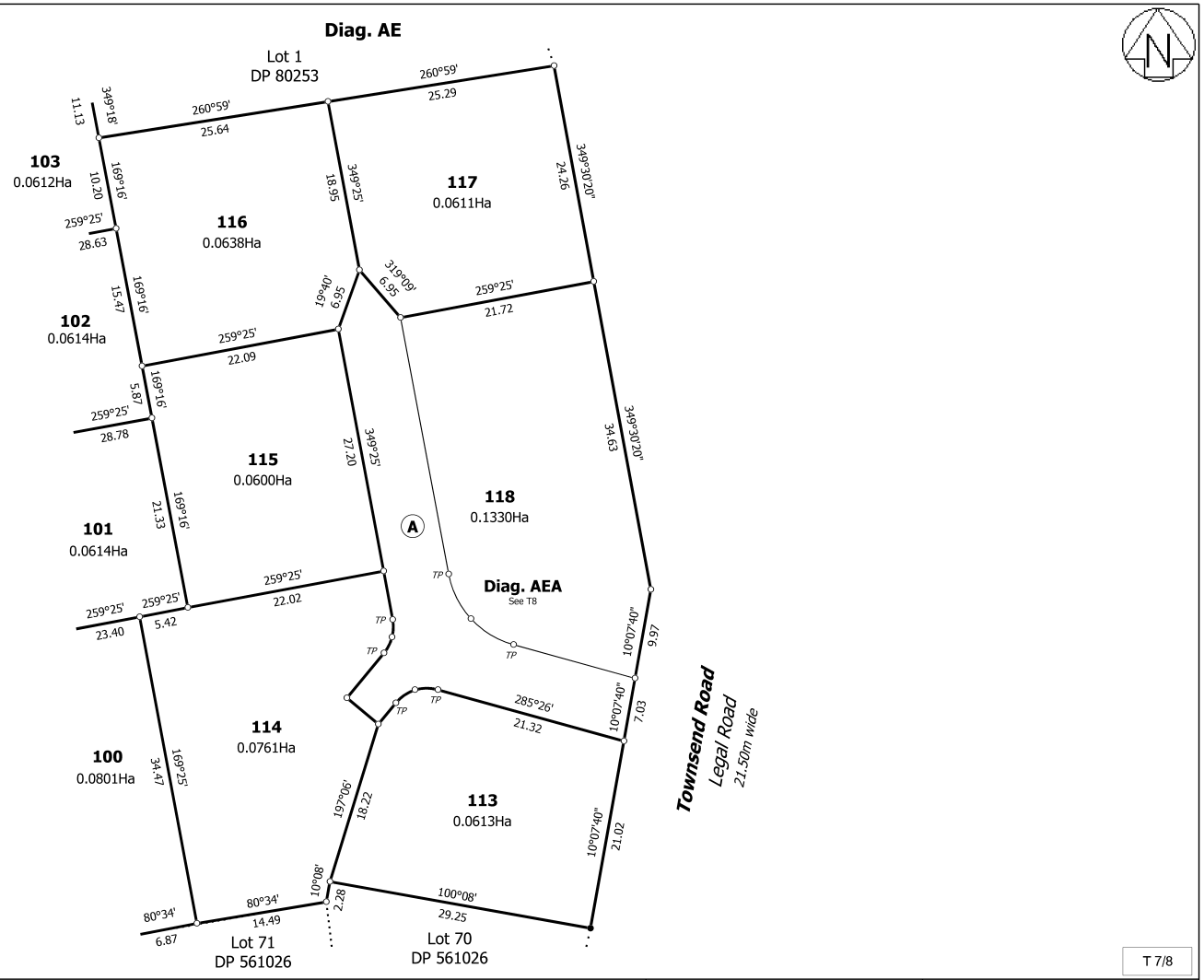
Land Covenant in Covenant Instrument 12468169.7 - 11.8.2022 at 2:45 pm

12468169.8 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 11.8.2022 at 2:45 pm

Fencing Agreement in Deed 12537146.1 - 17.8.2022 at 7:00 am

Fencing Covenant in Transfer 12549174.2 - 12.9.2022 at 12:20 pm

BC230758



T 7/8

Land District: Canterbury Digitally Generated Plan Generated on: 25/08/2022 12:05am Page 10 of 11	LOTS 77 TO 118, 253, 302 & 303 BEING SUBDIVISION OF LOT 411 DP 561026	Surveyor: Andrew Peter Marr Firm: Eliot Sinclair & Partners Ltd	Title Plan LT 575822 Approved on: 25/08/2022

Section 2
Geotech, Engineer Reports & Conditions PS1 & 2s

- Calculations
- A4 Details

CONSENT ISSUED BC230758 - Page 59 of 467

BC230758

Geotechnical Report for Lot 115

Stage 3, Townsend Fields Subdivision, Rangiora

Prepared for Townsend Fields Ltd

501948

eliot sinclair

Geotechnical Report for Lot 115

Stage 3, Townsend Fields Subdivision, Rangiora

Prepared for Townsend Fields Ltd

501948

Quality Control Certificate

Eliot Sinclair & Partners Limited

eliotsinclair.co.nz

Action	Name	Signature	Date
Prepared by:	Quentin Farrelly Geotechnical Engineering Technician NZDE Civil		2 August 2022
Reviewed by:	Nick Harwood Geotechnical Engineer | Principal BE(Hons) MSc DIC MInstD CMEngNZ CPEng		2 August 2022
Directed and approved for release by:	Nick Harwood Geotechnical Engineer | Principal BE(Hons) MSc DIC MInstD CMEngNZ CPEng		2 August 2022
Status:	Final		
Release date:	2 August 2022		
Reference no:	501948		
Distributed to:	Townsend Fields Ltd		

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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Appendix A. Site Investigation Records

1. Introduction

This geotechnical report is intended to be used as technical supporting documentation for (i) the specific engineering design (SED) of foundations for the dwelling, and (ii) for Building Consent application purposes.

2. Geotechnical information

2.1. Information sources

Geotechnical information for the Stage 3 area and the individual Lots is available from several sources, including Environment Canterbury (ECan) well logs, Coffey (2012) CPT & Borehole investigations, Eliot Sinclair groundwater monitoring bores (2011) and water level records (2011 to 2015), Eliot Sinclair (2016, 2018 & 2021) Section 106 natural hazards assessment reports, Lot-specific shallow investigation records (March 2022), and earthworks construction monitoring records (2021/22) and earthworks completion reporting (2022).

2.2. Ground profile

GNS' online geological mapping[1] indicates the subdivision area is underlain by unit Q2 described as- '*Unweathered, brownish-grey, variable mix of gravels/sand/silt/clay in low river terraces; locally up to 2m silt (?loess) cap.*' The GNS 2008 Christchurch 1:250,000 geological map refers to the unit as Q2a River Deposits of '*Brownish-grey river alluvium*'.

The natural ground profile is summarised as a three-layer system of topsoil (typically 0.2 to 0.3m thickness) overlying fine-grained alluvium (sandy clay/silt) typically to 1.5 to 2.0m depth, overlying deep sandy gravel. The depth of the fine-grained overburden is consistent with the GNS estimate of 2m.

2.3. Groundwater level

An array of groundwater monitoring standpipes was installed across the wider subdivision area in 2011 and groundwater level data was collected over the period 2011 to 2015. Monitoring bore A was located in the northwest area of Stage 3 and installed to a depth of 3.5m, with the zone at 2.0 to 3.5m depth being in the sandy gravel unit.

Over the 4-year monitoring period the groundwater level was observed to seasonally fluctuate between 0.9m depth and 3.8m depth. The depth information relates to the original ground surface (pre-development).

2.4. Liquefaction vulnerability

Investigations prior to subdivision construction concluded the site has a low susceptibility to liquefaction, and is consistent with **Technical Category 1** land performance, i.e., TC1-equivalent.

ECan's liquefaction hazard mapping[2] categorises the subdivision and environs in an area where "Liquefaction damage is unlikely".

[1] GNS online geological map https://data.gns.cri.nz/geology/# [accessed retrieved 15 May 2022].
[2] https://apps.canterburymaps.govt.nz/CanterburyLiquefactionHazards/

2.5. Expansive soil potential

Ground conditions in the Rangiora area may include expansive soils. The soil may seasonally swell and shrink with changes in soil moisture content. Indications are that the insitu fine-grained alluvium at the site has expansive soil potential. These materials have been used for filling at the subdivision.

The Waimakariri District Council's Engineering Code of Practice Section 4.4.7 comments on local geotechnical conditions and the requirement to "*Consider the range of soil types which exist within the Waimakariri District e.g., expansive soils, volcanic soils, dispersive soils, soft alluvial sediments and compressible soils. Also consider the liquefaction of saturated non-cohesive soils. The Council and Canterbury Regional Council (Environment Canterbury) may have information on the soil types of particular areas.*"

We have undertaken a suite of soil testing across the Stage 3 area and assessed the expansive soil classification for each Lot in accordance with NZBC B1[3] and AS2870:2011 *Residential slabs and footings*. Our determination of the appropriate expansive soil class considers the laboratory test results and the potential for additional ground movement effects associated with the environment of each lot, as advised in AS2870:2011 and NZBC B1.

Ground conditions potentially fall outside the definition of 'Good Ground' owing to the NZBC B1 and NZS3604 exclusions of (i) possible presence of 'expansive soil' and/or (ii) ground which could foreseeably experience movement of 25 mm or greater due to, for example, seasonal swelling and shrinking, and effects of vegetation (tree) roots.

[3] Acceptable Solutions and Verification Methods for NZBC Clause B1 Structure; Amendment 20 (effective 29 November 2021), including revisions to NZS3604 regarding 'slab-on-ground in expansive soils'.

2.6. Site-specific information

2.6.1. Earthworks

Across Lots 115 the earthworks process typically involved:

- Stripping of the original topsoil to expose the insitu subgrade,
- Placement and compaction of layers of site-won earthfill (clayey silt and gravelly clayey silt). The compacted fill was placed and compacted in accordance with the requirements of NZS4431:1989 '*Code of Practice for Earthfill for Residential Development*'.
- Placement and compaction of a topping layer of fill to make up the ground levels ready to receive the topsoil. This layer was not subject to QA testing and is not certified under NZS4431. We observed the layer to have been placed and compacted with the same plant and methods as for the NZS4431 fill.
- Placement of a ~100mm dressing of topsoil sown with grass.

2.6.2. Scope of geotechnical investigation

Site-specific geotechnical testing of each Lot was undertaken after completion of the filling earthworks. Refer to the attached Site Investigation Records.

The investigations comprised four dynamic cone penetrometer (DCP) tests to estimate the index ultimate bearing capacity of the soil for foundation assessment purposes. The assessment of bearing capacity given here is the *index* geotechnical ultimate bearing capacity (GUBC) using the DCP blow count profile method given in the MBIE Residential Guidance Section 3.4.

2.6.3. Bearing capacity

Typically, below the layer of topsoil, DCP resistances exceeded 2 blows per 100mm giving an index GUBC (q_U) of at least 150 kPa at time of testing in March 2022 (summer/autumn climate conditions). DCP resistances can reduce in wet conditions.

The soil profile is summarised in Table 1.

Table 1: Inferred ground profile

Soil Description	Depth below existing ground level	Source of Information
Non-certified Fill, including the topping layer (Clayey SILT and/or gravely clayey SILT) and the 100mm dressing layer of TOPSOIL.	From GL to ~0.4m bgl	Observations made during the earthworks and survey information provided by the earthworks contractor.
Certified (engineered) Fill. Clayey SILT and/or gravely clayey SILT	From ~0.4m bgl to between ~0.5m to ~0.6m bgl	Observations made during the earthworks and survey information provided by the earthworks contractor.
Insitu clayey SILT.	From between ~0.5m to ~0.6m bgl to ~2.0m bgl	Investigations undertaken before subdivision construction and observations made after insitu topsoil strip.
Insitu sandy GRAVEL.	Below ~2.0m bgl	Investigations undertaken before subdivision construction.

3. Site Design Requirements

3.1. Design principles

3.1.1. Geotechnical ultimate bearing capacity

The index GUBC is as given earlier in the report. If deemed necessary by the foundation designer, specific assessment of bearing capacity can be undertaken in accordance with MBIE/NZGS Module 4 *Earthquake resistant foundation design*.

3.1.2. Liquefaction

The site has **TC1 earthquake performance characteristics**, and the provisions of the MBIE Residential Guidance[4] apply, including that other (non-liquefaction) ground characteristics must be considered, as noted below.

3.1.3. Expansive soil

Residential foundations shall be designed adopting **expansive soil class M**.

Residential foundations shall be subject to design in accordance with either:

- NZS3604 as amended by Acceptable Solution B1/AS1 (Amendment 20), or
- AS2870:2011 *Residential slabs and footings*.

The provisions of NZBC B1/AS1 and AS2870 apply to the site's shrink-swell potential classification, foundation design, construction requirements and site maintenance.

NZBC B1/AS1 and AS2870 give design, construction and maintenance advice on features such as drainage of the site, limitations on gardens, restrictions on trees and shrubs, repair of pipe leaks, and the performance of walls and floors.

3.1.4. Foundation options

NZBC B1/AS1 and AS2870 provide for a range of foundation options including the use of slabs with thickenings, beam grid and slab foundations, and waffle slabs. Waffle slabs are a common and cost-effective foundation option for residential buildings and can have the benefit of reducing the amount of subgrade excavation required when preparing the building area compared to other foundation types.

With regards to the non-certified fill topping layer, we recommend that the SED foundation design engineer recognises that the layer is relatively thin and has adequate bearing capacity, and we would not recommend that the fill be removed solely due to it being 'non-certified'. We believe that with normal diligent SED review and on-site verification of ground conditions at the time of subgrade preparation (as per the advice in this report) that a waffle slab with its reduced excavation for embedment is likely to be a suitable, cost-effective foundation solution for the site.

3.2. Minimum Floor Level

The designer should contact the Council to confirm the minimum floor level that needs to be achieved and allow for this in the building design before submitting the application for Building Consent.

[4] MBIE Residential Guidance https://www.building.govt.nz/building-code-compliance/canterbury-rebuild/repairing-and-rebuilding-houses-affected-by-the-canterbury-earthquakes/

3.3. Excavation requirements

The foundation designer will make specific recommendations for the preparation of the building platform.

General preparation advice is to strip topsoil and subsoil to the design depth, and then proof-roll or compact the subgrade to achieve a firm, uniform surface.

The prepared subgrade and foundation excavations should be inspected and approved before they are covered.

3.4. Inspection/verification by Engineer

A geotechnical engineer, or experienced geotechnician, should inspect and probe the prepared subgrade and foundation excavations to verify the ground provides the required ultimate bearing capacity, that the exposed ground is consistent with the expected conditions presented in this report, and that the ground has been prepared in accordance with the requirements of the specific engineering design assessment and drawings.

The geotechnical engineer/experienced geotechnician will provide approval for foundation construction to proceed or provide the required site preparation advice to attain approval.

Please provide **at least 48 hours' notice** if you require us to provide this inspection service.

Following a satisfactory inspection, we will provide a 'Producer Statement - Construction Review' by the Engineer to confirm the ground is prepared in accordance with the requirements of the specific engineering design assessment and drawings, and that foundation construction and backfilling can proceed.

3.5. Backfill under foundations

General advice for backfill under foundations is as follows, though may vary depending on the requirements of the specific engineering design.

After approval by the Engineer, backfill that needs to be placed under the foundations can proceed. We recommend backfill comprise AP40 sandy gravels that are placed and compacted in maximum 200mm thick layers to achieve a dry density of at least **2,150kg/m^3**. Compacted backfill should extend up to the underside of the foundations.

The contractor shall measure the density of the compacted backfill at regular intervals, at each layer where appropriate, to ensure an adequate standard of compaction is achieved. Testing should be undertaken using a nuclear densometer (NDM). We recommend the results of the NDM testing be reviewed and approved by the Engineer before construction of the floor slab proceeds.

3.6. Site maintenance

Regarding site maintenance, Lot owners should adhere to the provisions of NZS3604, NZBC B1 and AS2870[5] for expansive soil.

For example, NZS3604 notes the following: ***C3.7.1*** *Effects of tree roots on foundations*:

Trees remove moisture from the soil for a radius equal to the height of the tree. This causes expansive soils to shrink to varying degrees, and when near houses leads to differential settlement occurring under foundations. The mature height of the tree must be considered in the location of trees near houses. Movement of the foundations may lead to cracks in the building and doors jamming.

[5] AS2870[5] Appendix B *Foundation Performance and Maintenance*

4. Disclaimer

This report has been prepared by Eliot Sinclair & Partners Limited ("Eliot Sinclair") only for the intended purpose as technical supporting documentation for the specific engineering design (SED) of residential foundations.

The report is based on:

- Existing reporting by others and Eliot Sinclair as detailed in the report.
- Ministry of Business, Innovation and Employment's (MBIE) December 2012 guidelines.
- NZBC B1/AS1
- NZS 3604 Timber framed buildings
- AS 2870 Residential slabs and footings
- New Zealand Geotechnical Society (NZGS) Modules
- Lot-specific DCP testing

Where data supplied by Townsend Fields Ltd or other external sources, including previous site investigation reports, have been relied upon, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Eliot Sinclair for incomplete or inaccurate data supplied by other parties.

Whilst every care has been taken during our investigation and interpretation of subsurface conditions to ensure that the conclusions drawn, and the opinions and recommendations expressed are correct at the time of reporting, Eliot Sinclair has not performed an assessment of all possible conditions or circumstances that may exist at the site.

Variations in conditions may occur between investigatory locations and there may be conditions such as subsoil strata or features at depth that were not detected by the scope of the investigation that was carried out or have been covered over or obscured over time. Additionally, seismicity may lead to deterioration of ground conditions that could not have been anticipated at the time of writing this report. Eliot Sinclair does not provide any warranty, either express or implied, that all conditions will conform exactly to the assessments contained in this report.

At the time of foundation excavation, should the exposed soil conditions vary from those described in this report, or the requirements MBIE's guidelines, NZ Standards, the NZBC or the specific engineering design that relate to foundations and floors be updated, a review of our reporting may be required. Eliot Sinclair should be contacted to confirm the validity of this report should any of these scenarios occur.

This report has been prepared for the benefit of Townsend Fields Ltd and the Waimakariri District Council for the purposes as stated above. No liability is accepted by Eliot Sinclair or any of their employees with respect to the use of this report, in whole or in part, for any other purpose or by any other party.

Appendix A. Site Investigation Records

BC230758

Site Investigation Record

Client: Townsend Fields Ltd.

Site: Townsend stage 3

Technical Category: TC1 Equivalent

Lot: 115

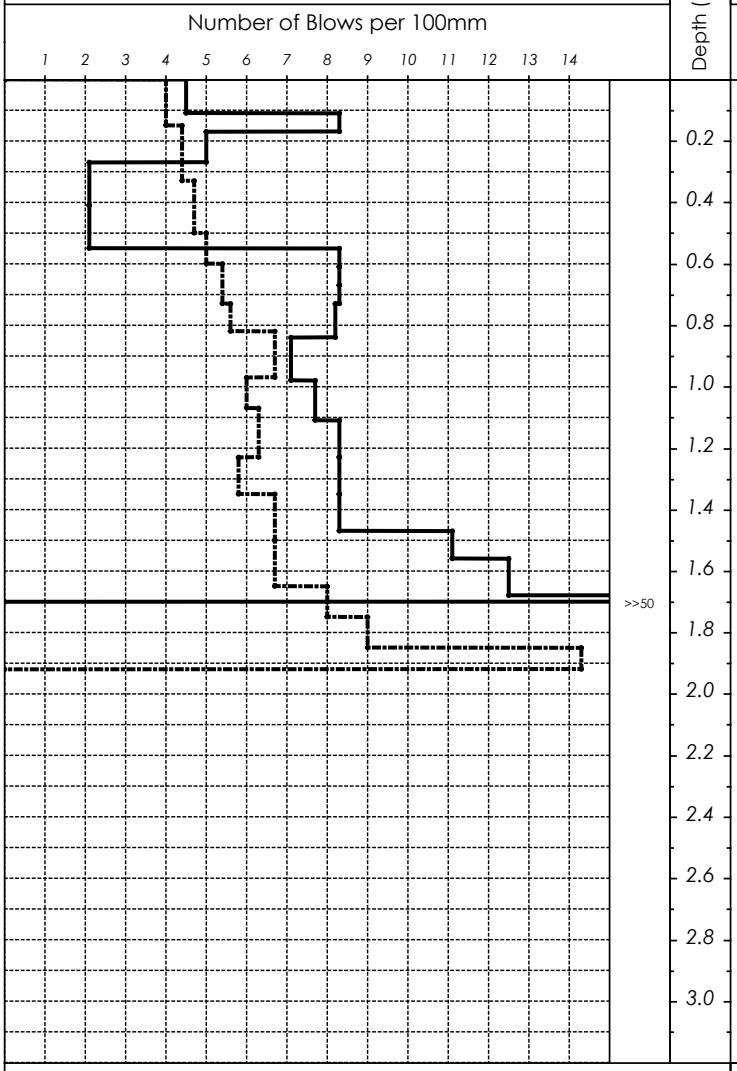
D.P.: 575822

Date Tested: 8-Mar-2022

Log Sheet No.: 1 of 1

Project No.: 501948

Dynamic Cone Penetrometer (DCP) Test Results



Lot 115 01 — Lot 115 02

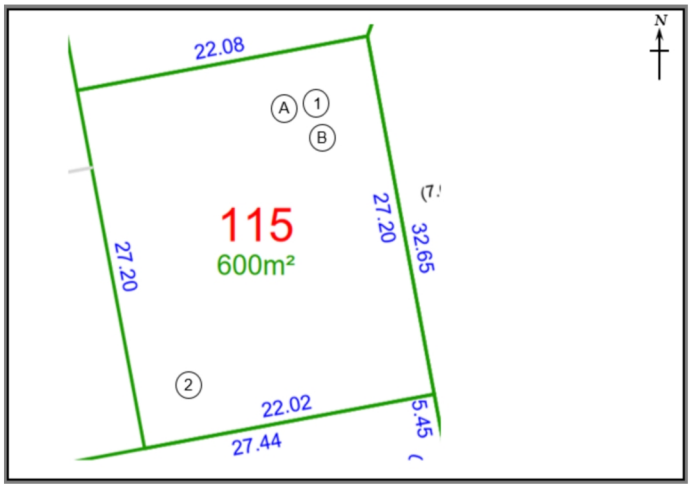
Soil Profile

Water

Comments:

Field Staff:	Prepared By:	Soil Profile From:
QJF	QJF	☐ Hand Auger
Job Manager:	**Approved By:**	☐ Spade Hole
NKH	NKH	☐ Test Pit

Site Plan: (Not to Scale)



Note: This record identifies the geotechnical conditions encountered at the noted test location(s) only. It is possible that ground conditions could be different away from the point(s) of testing.

eliot sinclair

Produced with CORE-GS Report Published: 19/07/2022 12:27:36 p.m.

BC230758

Site Investigation Record

Client: Townsend Fields Ltd.

Site: Townsend stage 3

Technical Category: TC1 Equivalent

Lot: 115

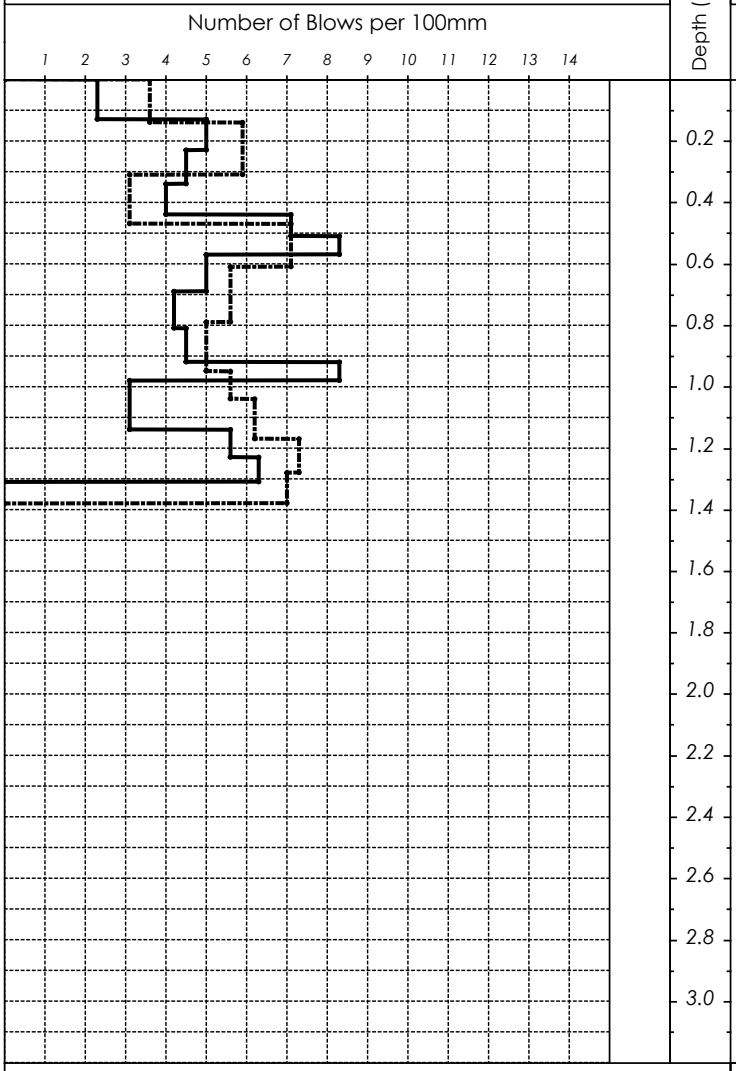
D.P.: 575822

Date Tested: 4-Apr-2022

Log Sheet No.: 1 of 1

Project No.: 501948

Dynamic Cone Penetrometer (DCP) Test Results



Lot 115 01 A — Lot 115 01 B

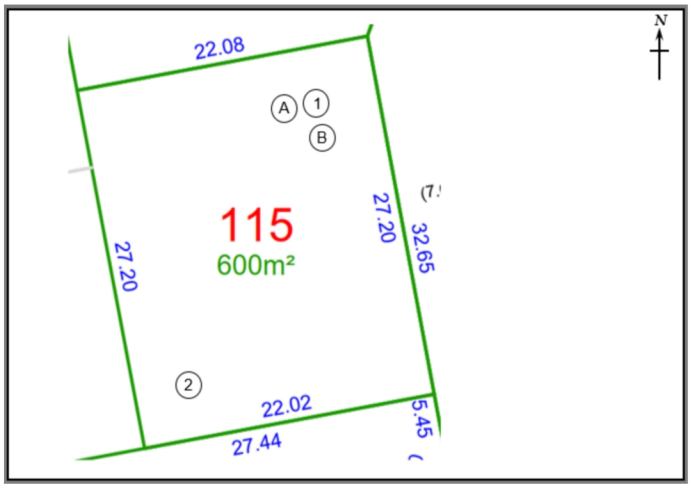
Soil Profile

Water

Comments:

Field Staff:	Prepared By:	Soil Profile From:
QJF	QJF	☐ Hand Auger
Job Manager:	**Approved By:**	☐ Spade Hole
NKH	NKH	☐ Test Pit

Site Plan: (Not to Scale)



Note: This record identifies the geotechnical conditions encountered at the noted test location(s) only. It is possible that ground conditions could be different away from the point(s) of testing.

eliot sinclair

Produced with CORE-GS Report Published: 19/07/2022 12:27:36 p.m.

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Received 13/09/2023

HFC GROUP
CIVIL & STRUCTURAL ENGINEERS

STRUCTURAL CALCULATIONS FOR

LOT 115, STAGE 3 TOWNSEND FIELDS

RANGIORA

PREPARED FOR

JOHN BADDOCK

JOB NO. 23-135

22 June 2023

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Building Consent BC230758
023

PRODUCER STATEMENT – PS1
DESIGN

BUILDING CODE CLAUSE(S): B1 **JOB NUMBER: 23-135**

ISSUED BY: HFC: Civil and Structural (South) Ltd
(Engineering Design Firm)
TO: John Baddock
(Owner/Developer)
TO BE SUPPLIED TO: Waimakariri District Council Council
(Building Consent Authority)
IN RESPECT OF: New residential house (structural engineering design as per appended schedule)
(Description of Building Work)
AT: Lot 115, Townsend Fields, Rangiora
(Address, Town/City)
LEGAL DESCRIPTION: **N/A** ☑

We have been engaged by the owner/developer referred to above to provide (*Extent of Engagement*):
Structural engineering services as per the attached calculations
in respect of the requirements of the Clause(s) of the Building Code specified above fi **Part-only** , as specified in the Schedule, of the proposed building work.

The design carried out by us has been prepared in accordance with:

☑ Compliance documents issued by the Ministry of Business, Innovation & Employment (*Verification method/acceptable solution*) **B1-VM1/AS1, VM4** and/or;

☐ Alternative solution as per the attached Schedule.

The proposed building work covered by this producer statement is described on the drawings specified in the Schedule, together with the specification, and other documents set out in the Schedule.

On behalf of the Design Firm, and subject to:

- Site verification of the following design assumptions: Refer to Schedule to PS1
- All proprietary products meeting their performance specification requirements;

I believe on reasonable grounds that:

- the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the Schedule, will comply with the relevant provisions of the Building Code and that;
- the persons who have undertaken the design have the necessary competency to do so.

I recommend the **CM3 level of construction monitoring.**

I, (*Name of Design Professional*) **Tomoaki Watanabe** , am:

☑ CPEng number **1010912**

and hold the following qualifications **BE, ME, CMEngNZ, CPEng, IntPE**

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000
The Engineering Design Firm **is not** a member of ACE New Zealand.

SIGNED BY (*Name of Engineering Design Professional):* **Tomoaki Watanabe**
(Signature below):

Tom Watanabe.

ON BEHALF OF (*Engineering Design Firm):* **HFC: Civil and Structural (South) Ltd** Date: **12/09/2023**

Note: This statement has been prepared solely for the Building Consent Authority named above and shall not be relied upon by any other person or entity. Any liability in relation to this statement accrues to the Engineering Design Firm only. As a condition of reliance on this statement, the Building Consent Authority accepts that the total maximum amount of liability of any kind arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in tort or otherwise, is limited to the sum of $200,000.

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

GUIDANCE ON USE OF PRODUCER STATEMENTS

Information on the use of Producer Statements and Construction Monitoring Guidelines can be found on the Engineering New Zealand website https://www.engineeringnz.org/engineer-tools/engineering-documents/producer-statements/

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects (NZIA), Institution of Professional Engineers New Zealand (now Engineering New Zealand), Association of Consulting and Engineering New Zealand (ACE NZ) in consultation with the Building Officials Institute of New Zealand (BOINZ). The original suite of producer statements has been revised at the date of this form to ensure standard use within the industry.

The producer statement system is intended to provide Building Consent Authorities (BCAs) with part of the reasonable grounds necessary for the issue of a Building Consent or a Code Compliance Certificate, without necessarily having to duplicate review of design or construction monitoring undertaken by others.

PS1 DESIGN Intended for use by a suitably qualified independent engineering design professional in circumstances where the BCA accepts a producer statement for establishing reasonable grounds to issue a Building Consent;

PS2 DESIGN REVIEW Intended for use by a suitably qualified independent engineering design review professional where the BCA accepts an independent design professional's review as the basis for establishing reasonable grounds to issue a Building Consent;

PS3 CONSTRUCTION Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011[2]

PS4 CONSTRUCTION REVIEW Intended for use by a suitably qualified independent engineering construction monitoring professional who either undertakes or supervises construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

This must be accompanied by a statement of completion of building work (Schedule 6).

The following guidelines are provided by ACE New Zealand and Engineering New Zealand to interpret the Producer Statement.

Competence of Engineering Professional
This statement is made by an engineering firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its personnel.

The person signing the Producer Statement on behalf of the engineering firm will have a professional qualification and proven current competence through registration on a national competence-based register such as a Chartered Professional Engineer (CPEng).

Membership of a professional body, such as Engineering New Zealand provides additional assurance of the designer's standing within the profession. If the engineering firm is a member of ACE New Zealand, this provides additional assurance about the standing of the firm.

Persons or firms meeting these criteria satisfy the term "suitably qualified independent engineering professional".

Professional Indemnity Insurance
As part of membership requirements, ACE New Zealand requires all member firms to hold Professional Indemnity Insurance to a minimum level.

The PI Insurance minimum stated on the front of this form reflects standard practice for the relationship between the BCA and the engineering firm.

Professional Services during Construction Phase
There are several levels of service that an engineering firm may provide during the construction phase of a project (CM1-CM5 for engineers[3]). The building Consent Authority is encouraged to require that the service to be provided by the engineering firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4
Building Consent Authorities should ensure that the applicant is aware of any requirement for producer statements for the construction phase of building work at the time the building consent is issued as no design professional should be expected to provide a producer statement unless such a requirement forms part of the Design Firm's engagement.

Refer Also:

1. Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013
2. NZIA Standard Conditions of Contract SCC 2011
3. Guideline on the Briefing & Engagement for Consulting Engineering Services (ACE New Zealand/Engineering New Zealand 2004)
4. PN01 Guidelines on Producer Statements

www.acenz.org.nz
www.engineeringnz.org

Building Consent BC230758
023

SCHEDULE TO PRODUCER STATEMENT - PS1 DESIGN

BUILDING/JOB DESCRIPTION: New residential house

SCOPE OF WORKS: Foundation design only as per HFC Documentation listed below

AT: Townsend Fields, Rangiora

ALTERNATIVE SOLUTIONS:

NZ Standards

Standards used for the design are covered under B1-VM1/AS1, VM4 unless noted within Alternative Solutions or HFC supporting documentation.

HFC Documentation

Engineering Drawings S99 -> S103 and Specification as per HFC job reference 23-135.

Engineering calculations:

Design Features Report

Other reference documents

Geotechnical Report by: Eliot Sinclair

SCHEDULE TO PRODUCER STATEMENT - PS1 DESIGN

DESIGN ASSUMPTIONS, PROPRIETARY PRODUCTS AND OTHER EXCLUSIONS:

i) Site verification of the following design assumptions:

Ground conditions to be in accordance with geotechnical report provided by Eliot Sinclair with job reference number 501948dated 02/08/2022 including the provision for a corresponding PS4.

Geotechnical inspections as per HFC inspection schedule and all SED elements including the provision for a corresponding PS4.

ii) All products meeting their performance specification requirements; in particular this Producer Statement excludes: (if applicable)

- Proprietary brackets/fixings and hold downs
- Proprietary suspended ceiling gravity support and bracing
- Proprietary balustrades
- Proprietary roof trusses
- Proprietary floor cassettes
- Glazing systems
- Structural supports for services and/or conduits
- Proprietary aluminimum features/elements (including screens and louvres)
- Prestressed or post-tensioned precast floor systems

iii) Other exclusions; this producer statement excludes all aspects of;

- Weather tightness and waterproofing details and materials are specifically excluded from our PS1
- Any differential settlement greater than the limits stated in NZBC B1

The Producer Statements issued should not be relied on to establish compliance with the building code clauses E1, E2, E3. Weathertightness and waterproofing design, materials, proprietary products, construction and/or inspections are specifically excluded from these producer statements

SIGNED BY

Tom Watanabe.

Tomoaki Watanabe

On behalf of HFC: Civil and Structural (South) Ltd

DATE 12/09/2023

Building Consent BC230758
Received 13/09/2023

22/06/2023
Attention: Waimakariri District Council Council

HFC Job reference: 23-135

To the Building Official,

Waimakariri District Council Council

New residential house at Lot 115, Lot 115 Townsend Fields, Rangiora

Compliance with the Building Code Clause B2 - Durability

The purpose of this letter is to demonstrate how compliance with Clause B2 (Durability) of the Building Code will be achieved for the above project. We can confirm that for specifically designed structural elements that are included within our design documentation (if applicable):

Material	Means of compliance	Details
Reinforced Concrete	B2/AS1	Concrete cover to reinforcement bars has been selected in accordance with NZS3101, Part 1, Section 3
Structural Timber	B2/AS1	Timber treatment has been selected in accordance with Table 1A of B2/AS1
Mild Steel Structure	Alternative Solution	Protection for mild steel has been specified in accordance with SNZ TS 3404 - Durability requirements for steel structures and components, and AS/NZS2312 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings. This guide works on a time to first maintenance basis and assumes on-going maintenance as outlined in SNZ TS 3404 section 1.7. Refer to the attached maintenance plan.
Other		

The durability of structural building work is reliant on protection from external water and moisture being achieved and maintained throughout the life of the building or structure. Protection against external water and moisture is dependent on appropriate detailing, materials, proprietary products and construction practices which HFC does not design/or inspect for compliance with the requirements of the building code.

HFC accepts no liability in contract, tort, or otherwise (including negligence) for the failure of the building or structure to meet or perform to the requirements of the Building Act 2004 (or any subsequent Act) and any regulations made there under (or any amendment or substitution thereof) in relation to:

- External water and/or moisture
- The loss of structural durability or strength to the building or structure as a result of external moisture entering the building or structure, or the effects thereof.

If you have any queries regarding the above, please phone to discuss at your convenience.

Yours faithfully,
Tom Watanabe.
Tomoaki Watanabe
For and on behalf of
HFC: Civil and Structural (South) Ltd
Ph: 03 339 7000

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Received 13/09/2023

D Design Features Report

The site has been assigned as TC1 in terms of potential liquefaction and class M in terms of expansive soil.

Ground conditions have been referred to be in accordance with the geotechnical report provided by Eliot Sinclair, job number 501948 dated 2 August 2022.

Site scrape and engineered fill/gravel raft to be inspected by Eliot Sinclair.

An email is attached for the Hs value provided by Eliot Sinclair on 22 June 2023. (Hs = 2.0m)

Foundation has been designed as waffle foundation for TC1With Class M expansive soil.

Prepour foundation is to be undertaken by HFC.

Building Consent BC230758
Received 13/09/2023

HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

DESIGN INFORMATION INPUT

CLIENT	John Baddock
JOB DESCRIPTION	TC1 class M superslab design
STREET ADDRESS	Lot 115, Townsend Fields
TOWN/CITY	Ranglora
COUNCIL	Waimakariri District
LOT	115
DP	
GEOTECHNCIAL COMPANY	Eliot Sinclair
REFERENCE NUMBER	501948
DATE	2/07/2023
TOPSOIL DEPTH	400 mm
FRICTION ANGLE	28°
ALLOWABLE BEARING	50 kPa
LIQUEFACTION RISK	TC1(LOW RISK)
EXPANSIVE SOIL TYPE	M (NZBC)
SOIL SUCTION DEPTH, H_s	2.0 m; CUSTOM Y_s
SLAB DIMENSIONS (Stiffness Check)	LENGTH = 19.50 m; WIDTH = 15.42 m
PS1 SIGN	Tomoaki Watanable
DRAWING NO.s	

SUPERSLAB INPUTS

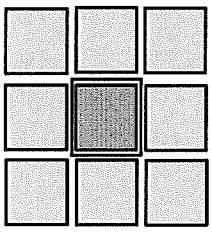
TOPPING THICKNESS	0.085 m	Concrete Strength	
POD SIZE	0.300 m	25 MPa	
MESH	SE62	fy	500 MPa
HOCKEY STICK BAR	12 mm	FIBRE CONCRETE?	
BOTTOM RIB BAR	12 mm	NO	
RIB WIDTH	0.10 m		
POD SIZE (SQUARE)	1.10 m		
SDL SLAB LOAD	HOUSE SLAB SDL 0.50 kPa		
MAX SLAB LIVE LOAD	Residential Garage 2.50 kPa	13.00 kN	
SLAB WEIGHT (kPa)	3.323 kPa		
FOOTING WIDTH	0.30 m		
PERIMETER STEEL	TOP HD12 BOTTOM 2 x HD12		
SEISMIC SOIL CLASS	D		
RIB HOCKEY STICK BAR LENGTH	1350mm long + 150mm hook	OK	
SEISMIC COEFFICENT (D soils) T = 0, μ = 1.0	Ranglora	ULS 0.990	SLS 0.248

BUILDING CLADDING INPUTS

1) LINE LOAD COLLATION

NUMBER OF STOREYS	1		G (kPa)		G LINE LOAD kN/m		Q (kPa)	Q LINE LOAD kN/m
EAVE TRIB WIDTH (m)	0.5 m	PERMANENT LOADING		TRIB WIDTH / HEIGHT (m)		IMPOSED LOADING		
ROOF CLADDING		LONGRUN	0.66 kPa	4.0 m	2.95 kN/m	Roof	0.25 kPa	1.11 kN/m
ROOF PITCH (WEIGHT MODIFIED)		25°						
LEVEL 1 WALL CLADDING		50MM ROCKCOTE	0.60 kPa	2.55 m	1.53 kN/m			
SLAB S/W AND SDL			3.82 kPa	0.6 m	2.29 kN/m	Domestic (House)	1.50 kPa	0.90 kN/m
FOOTING S/W			9.63 kPa		2.89 kN/m			
DEEPEND FOOTING		0.00 m			0.00 kN/m			
TOTAL UNFACTORED LINE LOADS					9.66 kN/m			2.01 kN/m

ALLOWABLE BEARING STRENGTH = 50 kPa
DEPENDABLE BEARING STRENGTH = 75 kPa
COMPACTED HARDFILL GRAVEL RAFT DEPTH = 140 mm



2) RIB BEARING CHECK

BEARING AREA 0.230 m^2

LOADING		PRESSURE UNDER RIB	
G + 0.4Q	4.82 kPa	30 kPa	
BEARING UNDER GRAVEL RAFT:		12 kPa	BEARING OK
1.2G+1.5Q	8.34 kPa	52 kPa	
BEARING UNDER GRAVEL RAFT:		19 kPa	BEARING OK

SETTLEMENT ASSUMED TO BE LIMITED TO LESS THAN 25MM AS PER NZBC- B1 AND ADOPTING A FOS OF 3 FOR THE ALLOWABLE BEARING STRENGTH

3) FOOTING BEARING CHECK

LOAD COMBINATIONS		BEARING PRESSURE	
G + 0.4Q	10.46 kN/m	35 kPa	BEARING OK
1.3SG	13.04 kN/m	43 kPa	BEARING OK
1.2G+1.5Q	14.61 kN/m	49 kPa	BEARING OK

HARDFILL THICKNESS	140 mm
21 kPa	BEARING OK
26 kPa	BEARING OK
28 kPa	BEARING OK

4) EXPANSIVE SOIL DESIGN *(G + 0.5Q Case)*

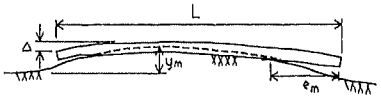
STRENGTH CHECK PODS = 300 mm TOPPING = 85 mm MESH = SE62 RIB SPACING = 1200 mm

Ys = 48 mm
CENTRE HEAVE OR EDGE SUBSIDENCE 1.191 m

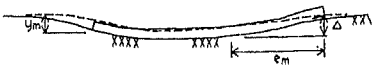
M* =	12.5 kNm	ØMn =	35.9 kNm	OK
V* =	14.4 kN	ØVc =	26.6 kN	OK

EDGE HEAVE 1.568 m

M* =	1.7 kNm	ØMn =	15.3 kNm	OK
V* =	4.3 kN	ØVc =	15.2 kN	OK



a. CENTER LIFT



b. EDGE UPLIFT

rebate+cover = 52 mm

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TC1 CLASS M SUPERSLAB DESIGN

FOR:

JOHN BADDOCK

AT

LOT 115, TOWNSEND FIELDS,

RANGIORA

(LOT 115)

Building Consent BC230758
Received 13/09/2023

HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

JOB OVERVIEW

CLIENT NAME: John Baddock

ADDRESS: Lot 115, Townsend Fields, Rangiora

LOT: 115

COUNCIL: Waimakariri District Council

DWG TITLE: TC1 class M superslab design

DRAWING NO.S: 0

DESIGN PRINCIPAL CHARACTERISTICS

ROOF CLADDING:	LONGRUN	=	**0.7 kPa**	ROOF TRIBUTARY WIDTH	=	**4.45 m**
STOREYS:	SINGLE					
EXTERIOR WALLS:	50MM ROCKCOTE					

GEOTECHNICAL REQUIREMENTS

ULITMATE BEARING CAPACITY:	150 kPa	**LIQUEFACTION CATEGORY:**	TC1(LOW RISK)
DEPENDABLE BEARING CAPACITY:	75 kPa	**EXPANSIVE SOILS CLASSIFICAITON:**	M (NZBC)
ALLOWABLE BEARING CAPACITY:	50 kPa	**DIFFERENTIAL MOUND MOVEMENT (0.7Ys):**	34 mm

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HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

SLAB DESIGN

1) General Living Areas

DEAD LOADS (G)	Slab	=	2.13 kPa	
	SDL	=	0.50 kPa	
	Total	=	**2.63 kPa**	
LIVE LOADS (Q)	Domestic (House)	=	**1.50 kPa**	
	-> 1.2G + 1.5Q	=	**5.40 kPa**	
Two way spanning slab :	Lx = L y =		1.10 m	
	Mult =	=	0.41 kNm per metre	
SE62 Mesh:	As	=	145 mm² per metre	
	fy	=	500 MPa	
	d	=	36 mm	
	a	=	3.41 mm	
	ϕMn	=	**2.1 kNm**	OK
Check punching shear	V* (1.5 x P)	=	19.50 kN	
	ϕVc	=	**28.46 kN**	OK
Min. shrinkage reinforcement		=	119 mm² per metre	
SE62		=	**145 mm²** per metre	OK

2) Garage Areas

DEAD (G)	Total	=	2.63 kPa	
LIVE (Q)	Garage	=	2.50 kPa	
	Point load	=	13.00 kN	
	-> 1.2G + 1.5Q	=	6.90 kPa	
Two way spanning slab :	Lx = L y =		1.10 m	
Mult =		=	**0.5 kNm**	OK
Mult =		=	**1.6 kNm**	OK

BEARING UNDER SLAB

Allowable bearing pressure	=	50 kPa	
Dependable bearing pressure	=	75 kPa	
Compacted hardfill gravel raft depth	=	140 mm	

Assume loads can be transfgerred to subgrade in 2 Ways:

Slab load transmitted through polystyrene blocks	=	5.13 kPa	
OK by inspection			
Total contact area:			
Check ultimate beaing under a 1200 x 1200 panel (bearing area = 0.23 m²)			
Total slab weight including ribs = 2.125 + 1.2	=	3.3 kPa	
SDL	=	0.50 kPa	
G + 0.4Q = 3.323 + 0.5 + 0.4 x 2.5	=	4.8 kPa	
Pressure under rib	=	**30.2 kPa**	
Pressure under gravel raft	=	**12.3 kPa**	OK
1.2G + 1.5Q = 1.2 x (3.323 + 0.5) + 1.5 x 2.5	=	8.3 kPa	
Pressure under rib	=	**52.2 kPa**	
Pressure under gravel raft	=	**18.9 kPa**	OK

Settlement Soil Pressures:

Use long term live load reduction factor	=	0.4
Living areas:	=	24.6 kPa
Residential Garage:	=	27.1 kPa
		7.2 kPa
Max bearing load for settlement	=	**34 kPa**

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HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

PERIMETER FOOTINGS

Structure Data

No. of storeys = 1

		Trib Width/Height	G Line Load	Q Line Load
ROOF CLADDING	LONGRUN	4.00 m	2.95 kN/m	1.1 kN/m
ROOF PITCH (WEIGHT MODIFIED)	25 degrees			
LEVEL 1 WALL CLADDING	50MM ROCKCOTE	2.55 m	1.53 kN/m	
SLAB S/W AND SDL		0.60 m	2.3 kN/m	0.9 kN/m
FOOTING S/W			2.9 kN/m	
DEEPEND FOOTING	0.00 m		0.0 kN/m	
Total Unfactored Line Loads			9.7 kN/m	2.0 kN/m

Footing width = 0.300 m

Wult (G + 0.4Q)	=	10.5 kN/m	=	35 kPa	**BEARING OK**
Wult (1.35G)	=	13.0 kN/m	=	43 kPa	**BEARING OK**
Wult (1.2G + 1.5Q)	=	14.6 kN/m	=	49 kPa	**BEARING OK**

Sliding Check

Soil Friction Angle = 28°
Coefficient of friction = 0.8 x tan(Ø') = 0.43

SEISMIC COEFFICENT (D soils) T = 0, μ =1.0
SLS = **0.248**
FRICTIONAL RESISTANCE LARGER THAN SLIDING FORCE, THEREFORE SLIDING OK BY INSPECTION
ULS = **0.990**
PIPE PENETRATIONS TO BE DETAILED IN ACCORDANCE WITH MBIE GUIDANCE REPORT PART A, FIG 5.14

Settlement Soil Pressures:

Use long term live load reduction factor for roof = 0.4

Footing width = 0.300 m

Max bearing load for settlement = **35 kPa**

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HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

EXPANSIVE SOILS (AS 2870:2011)

Summary:

f'c	=	25 MPa			
Top perimeter steel	=	HD12	=	113 mm²	
Bottom perimeter steel	=	2 x HD12	=	226 mm²	
Mesh	=	SE62	=	145 mm²	per metre
Hockey stick bar	=	12 mm	=	113 mm²	

Soil classification	=	M (NZBC)
Site Y_s	=	48 mm (ULS)
Pod size	=	0.300 m
Topping	=	0.085 m
20% CRACKING MOMENT REQUIREMENT TO AS 2870 CLAUSE 4.4(i) IS...	=	OK
Moment Capacity of Rib check for loss of support case	=	OK
Shear Capacity of Rib check for loss of support case	=	OK

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HFC STRUCTURES LTD

JOB NAME	LOT 115 TOWNSEND	JOB NO	23-135
SUBJECT	FOUNDATION	REVISION	1.019
ENGINEER	RJ	DATE	20/06/2023

METHODOLOGY AND CONSTRUCTION SEQUENCE

1) Clear topsoil and form a level building platform (hardfill as required).

2) Ensure/confirm 50 kPa allowable bearing capacity unless a specific design has been carried out for lower capacities.

3) In accordance with NZS3604:2011 expansive clay shall be assumed to be present in the soil supporting the foundation unless:
   (a) Reasonable enquiry does not reveal any incidence of major cracks in dry weather on the building site itself or in the surrounding locality
   (b) The locality has not been indentified as an area where expansive clay is likely to be found
   (c) Excavation for foundation does not reveal plastic clay

   or

   Geotechnical investigations have been carried out and do not reveal expansive clays

4) Where expansive clays have been identified, additional reinforcing and other details may be required, and a specific design by HFC Structures Ltd is required.

5) Cover building platform with 20 mm sand blinding.

6) Cover blinding with DPC.

7) Place 1100 x 1100 x 300 polystyrene panels in a pattern as shown on the foundation plan (i.e. 1200 x 1200 grid)

8) Cut out additional internal load bearing foundation thickenings where shown and reinforce slab and thickenings (refer to additional details for expansive clays).

9) Refer to special details required for expansive soils (if any) and provide additional reinforcing to suit.

10) Refer to architectural drawings for all dimensions, recesses and under slab service locations.

11) Waste pipes to be installed in accordance with the New Zealand Building Code.

12) Place reinforcing, pour topping slab, internal and exterior thickenings in one operation.

13) Seismic 500E Grade Mesh as per engineering drawings on S99. Saw cut slab in accordance with the drawings.

14) Concrete as per S99 to be used unless noted otherwise. Cure slab in accordance with the good building practices.

15) All HD12 Grade 500 laps shall be 600 mm minimum.

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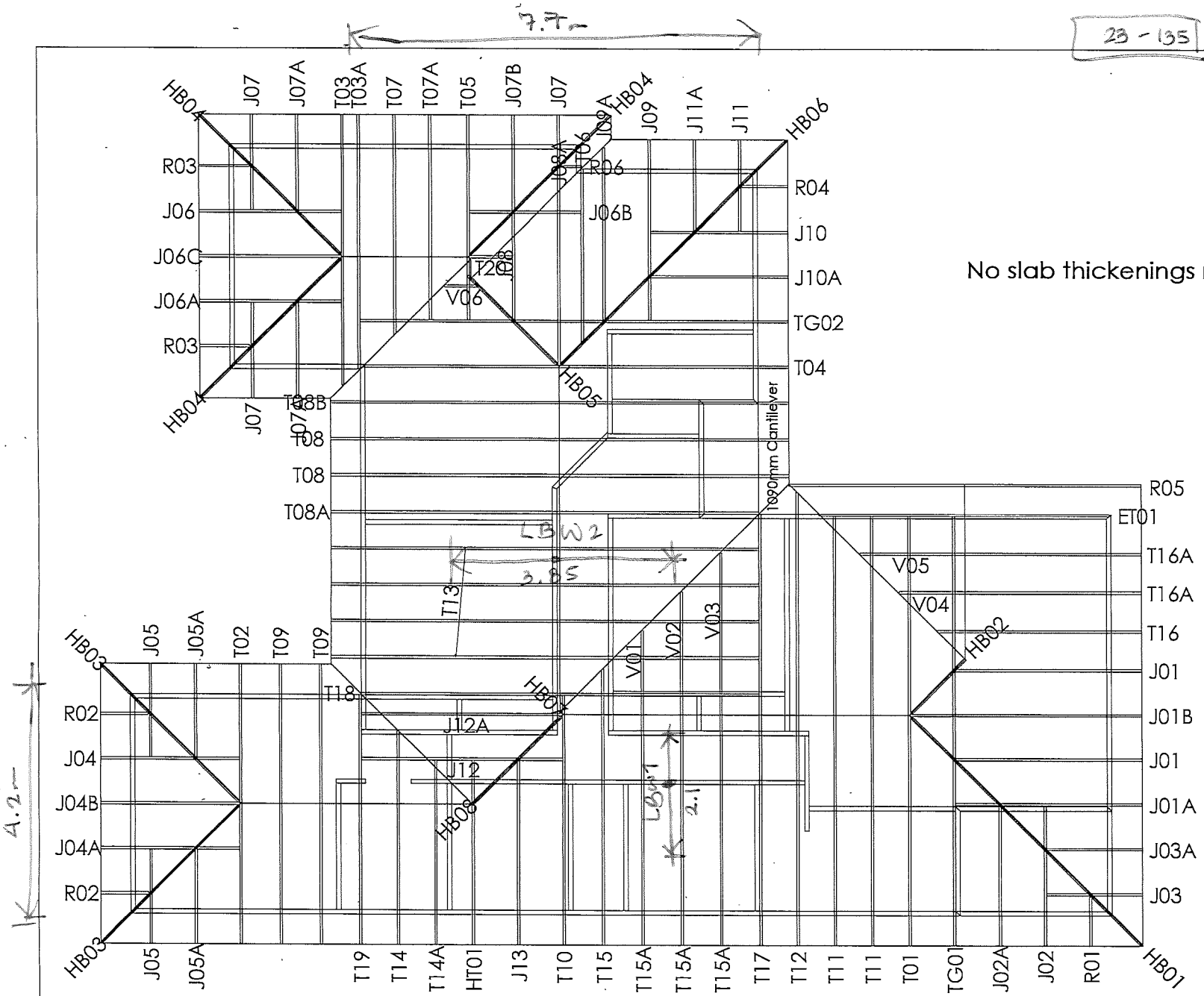

No slab thickenings required

WESTIMBER LTD.	Site Address : Lot 115 Townsend Road Rangiora	Sheet Title : For Building Consent Buildable Truss Layout	Job Details:
		Date : 16 Jun,2023	Drawn : George Gibson
		Scale : 1:100	System : MiTek 20/20

Roof Pitch	: 25.00deg	Truss Centres	: 900mm
Roof Material	: Galv Iron 0.55mm	Roof Live Load	: 0.250kPa
Ceiling Material	: Standard Plaster Board 13mm	Floor Live Load	:
Wind Zone	: High	Wind Speed	: 44m/s
Roof Snow Load	: 0.441kPa	Overhang	: 600mm

PrimeCad v4.7.334

MiTek™

Job Title : 11595

Sheet : 1

Revision Number :

Building Consent BC230758
Received 13/09/2023

INTERNAL/EXTERNAL LBW CHECK REF: **(23-135) - LBW 1** 20/06/2023

SOIL BEARING CAPACITY:

Ultimate (ULS): 150 kPa
Allowable(SLS): 50 kPa

Beam/Pod Depth: 300 mm
Beam Width: 100 mm

Slab: 85 mm

Dead loads:	kPa	Tribt(m)	Line load (kN/m)	
Foundation	7.2	0.1	0.72	
Ground Floor Slab	2.04	1.2	1.224	Suspended 4 sides
Internal Walls	0.3	2.55	0.765	
Roof	0.4	2.1	0.84	
2nd/Upper Floor	0.5	0	0	
External wall	0	0	0	
		G=	**3.55 kN/m**	

Imposed loads:	kPa	Tribt(m)	Line load (kN/m)	
Ground Floor	1.5	1.2	0.9	Suspended 4 sides
Roof	0.25	2.1	0.525	
2nd/Upper Floor	1.5	0	0	
		Q=	**1.43 kN/m**	

Snow Load:

Sg= 0.9 kPa
Pitch= 35 degrees
μi= 0.35
μi max= 0.7

	kPa	Tribt(m)	Line load (kN/m)
Roof	0.315	2.1	0.6615
		Suls=	**0.66 kN/m**
		Ssls=	**0.45 kN/m**

SLS Load Combinations

G + 0.7Q = 4.5465 kN/m

G + Ssls + 0.4Q= 4.35882 kN/m Exclude roofing for Q

Max for SLS = 45 kPa > 50 OK

ULS Load Combinations

1.2G + 1.5Q= 6.3963 kN/m

1.2G + Suls + 0.4Q= 5.2803 kN/m Exclude roofing for Q

Max for ULS= 64 kPa > 75 OK

Building Consent BC230758
Received 13/09/2023

INTERNAL/EXTERNAL LBW CHECK REF: **(23-135) - LBW 2** 20/06/2023

SOIL BEARING CAPACITY:

Ultimate (ULS): 150 kPa
Allowable(SLS): 50 kPa

Beam/Pod Depth: 300 mm
Beam Width: 300 mm

Slab: 85 mm

Dead loads:	kPa	Tribt(m)	Line load (kN/m)	
Foundation	7.2	0.3	2.16	
Ground Floor Slab	2.04	1.2	1.224	Suspended 4 sides
Internal Walls	0.3	2.55	0.765	
Roof	0.4	3.85	1.54	
2nd/Upper Floor	0.5	0	0	
External wall	0	0	0	
		G=	**5.69 kN/m**	

Imposed loads:	kPa	Tribt(m)	Line load (kN/m)	
Ground Floor	1.5	1.2	0.9	Suspended 4 sides
Roof	0.25	3.85	0.9625	
2nd/Upper Floor	1.5	0	0	
		Q=	**1.86 kN/m**	

Snow Load:

Sg= 0.9 kPa
Pitch= 25 degrees
μi= 0.49
μi max= 0.7

	kPa	Tribt(m)	Line load (kN/m)
Roof	0.441	3.85	1.69785
		Suls=	**1.70 kN/m**
		Ssls=	**1.15 kN/m**

SLS Load Combinations

G + 0.7Q = 6.99275 kN/m

G + Ssls + 0.4Q= 7.203538 kN/m Exclude roofing for Q

Max for SLS = 24 kPa > 50 OK

ULS Load Combinations

1.2G + 1.5Q= 9.62055 kN/m

1.2G + Suls + 0.4Q= 8.88465 kN/m Exclude roofing for Q

Max for ULS= 32 kPa > 75 OK

Building Consent BC230758
Received 13/09/2023

CALCULATION TEMPLATE

HFC | GROUP

JOB NAME	Lot 115 Townsend Fields, Rangiora	JOB NO	23-135
SUBJECT	Post footing	REVISION	1.000
ENGINEER	RJ	DATE	22/06/2023

NZS3604 :2011 CANOPY POST FOUNDATION DESIGN

Roof Type	Light	Roof Type		
Wind zone	High	Wind Zone	light	
Tributary Area	1.00 m	Tributary width		
	1.50 m	Tributary Length		
	1.50 m²	Tributary Area	1.50 m²	2
	150 kPa	Ultimate Geotechnical Capacity		
Footing size	1.00 m	Foundation Height	Volume	
	0.60 m	Foundation Width	0.075	light
	0.60 m	Foundation Breadth	0.040	heavy
Loading	0.50 kPa	Gravity - ROOF		
	0.25 kPa	Live		
	0.00 kPa	Snow - ULS mew x Sg		
	2 kN	Post cladding weight		

Factored loading

ULS	0.98 kPa	
SLS	1.20 kPa	
Soil pressure ULS	40.2 kPa	Satisfactory
Soil pressure SLS	35.1 kPa	Satisfactory

Volume required for uplifting under NZS3604

0.08 m³	Satisfactory

Summary

USE FOUNDATION DIMENSIONS OF HEIGHT = 1m, WIDTH = 0.6m, BREADTH = 0.6m FOOTING

Building Consent BC230758
Received 13/09/2023

Romualdo Jay-Ar

From: Nick Harwood <nick.harwood@eliotsinclair.co.nz>
Sent: Thursday, 22 June 2023 11:13 am
To: Romualdo Jay-Ar
Cc: Quentin Farrelly
Subject: RE: [#501948] Lot 115, Townsend Fields - "Hs" value in Lot 115

Hi Romualdo,

Yes, Hs = 2m OK.

Kind regards,
Nick

Nick Harwood
GEOTECHNICAL ENGINEER | PRINCIPAL
BEng (Hons) MSc DIC CMEngNZ IntPE(NZ) MInstD CPEng
+64 3 379 4014 ext. 175 Christchurch | Rangiora | Wānaka
+64 21 896 360 Queenstown | Hokitika | Nelson
eliotsinclair.co.nz

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From: Romualdo Jay-Ar <Romualdo.Zamudio@hfc.co.nz>
Sent: Thursday, 22 June 2023 10:25 am
To: Nick Harwood <nick.harwood@eliotsinclair.co.nz>
Cc: Quentin Farrelly <qjf@eliotsinclair.co.nz>
Subject: RE: [#501948] Lot 115, Townsend Fields - "Hs" value in Lot 115

[EXTERNAL EMAIL: Always check the FROM address of an email and treat links and attachments with caution. Check with Helpdesk if unsure.]

Hi Nick,

Can we adopt similar Hs as 2m for this Lot 115 which was previously adopted to Lot 80 and 82 before?

Your geotechnical report reference is 501948 dated 2 August 2022 (Lot 115).

Thanks and Best Regards,

ROMUALDO JR. ZAMUDIO (JAY-AR) | STRUCTURAL ENGINEER (MENGNZ)
HFC: CIVIL & STRUCTURAL (SOUTH) LTD

Section 3
Truss Details & Bracing Details

- Manufacturers bracing instruction and construction documentation
- Design IT Calcs
- Hyspan etc.

CONSENT ISSUED BC230758 Page 91 of 467

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

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

www.miteknz.co.nz

MiTek 20/20 Engineering 4.7.334.0

Printed: 07:15:38 21 Jun 2023

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

ISSUED BY: **MiTek New Zealand Limited**

TO: **Westimber Ltd**

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

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **11595** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

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

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

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

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

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

On behalf of MiTek New Zealand Limited, **Date: Wednesday, 21 June 2023**

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

-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

Truss "As-Build" designs shall be sent to buildinginfo@wmk.govt.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details

Importance Level : 2

Design Working Life : 50 years

Roof Truss

Timber Group:	TRUSS	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron 0.55mm	Material:	Standard Plaster Board 13mm	Area:	High (44.0 m/s)
Dead Load:	0.220 kPa	Dead Load:	0.210 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	1800 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
	Qc = 1.100 kN			Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
ET01	1	5800	25.000	900	T12	1	8030	25.000	741	J04	1	2177	25.000	900
*HB01	1	6472	18.249	900	T13	4	7900	25.000	726	J06	1	2227	25.000	900
*HB02	1	1545	18.249	900	T14	1	3092	25.000	746	J08A	1	2145	25.000	900
*HB03	2	3906	18.249	900	T15	1	4400	25.000	782	J10	1	2127	25.000	900
*HB04	3	3976	18.249	900	T16	1	3100	25.000	775	J12	1	3992	25.000	900
*HB05	1	2522	18.249	900	T20	1	854	25.000	900	TG01	1	7985	25.000	900
*HB06	1	6380	18.249	900	V01	1	1285	25.000	900	J02A	1	2200	25.000	900
*HB08	1	2535	18.249	900	V02	1	2067	25.000	900	J04A	1	2177	25.000	900
HT01	1	3092	25.000	900	V03	1	2848	25.000	900	J04B	1	2177	25.000	900
J01	2	3100	25.000	900	V04	1	1105	25.000	900	J06A	1	2227	25.000	900
J03	1	1300	25.000	900	V05	1	1880	25.000	900	J06B	1	2227	25.000	900
J05	2	1277	25.000	900	V06	1	644	25.000	900	J06C	1	2227	25.000	900
J07	3	1327	25.000	900	J01B	1	3100	25.000	900	J10A	1	2127	25.000	900
J11	1	1227	25.000	900	J03A	1	1300	25.000	900	J12A	1	3992	25.000	900
J13	1	3092	25.000	900	J05A	2	1277	25.000	900	J09	1	3027	25.000	900
*R01	1	991	25.000	900	J07A	2	1327	25.000	900	T02	1	4400	25.000	900
*R02	2	968	25.000	900	J07B	1	1327	25.000	900	T03	1	4500	25.000	900
*R03	2	1018	25.000	900	J08	1	2145	25.000	900	T05	1	3517	25.000	900
*R04	1	918	25.000	900	J11A	1	1227	25.000	900	T06	1	3027	25.000	900
*R05	1	7000	25.000	900	J14	1	3100	25.000	900	T10	1	4400	25.000	900
*R06	1	436	25.000	900	T07A	1	3517	25.000	709	T19	1	4400	25.000	793
T01	1	7985	25.000	900	T08A	1	7900	25.000	732	J09A	1	3027	25.000	900
T04	1	7900	25.000	900	T08B	1	7900	25.000	732	T18	1	7900	25.000	726
T07	1	3517	25.000	709	T14A	1	3092	25.000	746	T17	1	8030	25.000	741
T08	2	7900	25.000	732	T15A	3	4400	25.000	782	TG02	1	7900	25.000	900
T09	2	4400	25.000	793	T16A	2	3100	25.000	775	T03A	1	4500	25.000	900
T11	2	7985	25.000	741	J02	1	2200	25.000	900					

Total quantity : 100

-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

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WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

The computer design input has been carried out by:

Signed: ..... Date: ...Wednesday, 21 June 2023....

Name of Detailer: Qualifications and Title:

On behalf of: Westimber Ltd

CONSENT ISSUED BC230758 - Page 93 of 467

Westimber Ltd

Job: 11595 | Client: John Baddock | Site: Lot 115 Townsend Road Rangiora | BC230758

Description: | Phone: | Phone:

Building Consent No.:

MiTek 20/20 Engineering 4.7.334.0 | MiTek New Zealand Limited | Printed: 07:12:20 21 Jun 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	Fixing Selected
ET01	1	5800	A	0.594	0.133	Wide		No fixing selected
			M	0.594	0.133	Wide		No fixing selected
			R	0.719	0.513	Wide		No fixing selected
			Q	0.646	0.503	Wide		No fixing selected
			P	0.702	0.519	Wide		No fixing selected
			O	0.471	0.356	Wide		No fixing selected
			N	1.355	0.869	Wide		No fixing selected
			S	0.648	0.000	Wide		No fixing selected
			T	0.719	0.513	Wide		No fixing selected
			U	0.646	0.503	Wide		No fixing selected
			V	0.702	0.519	Wide		No fixing selected
			W	0.471	0.356	Wide		No fixing selected
			X	1.355	0.869	Wide		No fixing selected
*HB01	1	6472						Refer NZS3604:2011 Tables 15.6
*HB02	1	1545						Refer NZS3604:2011 Tables 15.6
*HB03	2	3906						Refer NZS3604:2011 Tables 15.6
*HB04	3	3976						Refer NZS3604:2011 Tables 15.6
*HB05	1	2522						Refer NZS3604:2011 Tables 15.6
*HB06	1	6380						Refer NZS3604:2011 Tables 15.6
*HB08	1	2535						Refer NZS3604:2011 Tables 15.6
HT01	1	3092	B	3.495	1.381	Cross	1	Pair of Wire Dog Staples
			I	2.071	1.502	Butt	1	JH 47x90
			H	0.704	0.218	Cross	1	Pair of Wire Dog Staples
J01	2	3100	B	2.879	1.179	Cross	2	Pair of Wire Dog Staples
			F	1.791	1.279	Butt	2	JH 47x90
			D	0.581	0.626	Butt	2	Pair of 3.15d Nails
J03	1	1300	B	2.414	0.641	Cross	1	Pair of Wire Dog Staples
			D	0.595	0.239	Butt	1	Pair of 3.15d Nails
J05	2	1277	B	2.414	0.633	Cross	2	Pair of Wire Dog Staples
			D	0.583	0.224	Butt	2	Pair of 3.15d Nails
J07	3	1327	B	2.415	0.650	Cross	3	Pair of Wire Dog Staples
			D	0.608	0.256	Butt	3	Pair of 3.15d Nails
J11	1	1227	B	2.415	0.615	Cross	1	Pair of Wire Dog Staples
			D	0.558	0.193	Butt	1	Pair of 3.15d Nails
J13	1	3092	B	4.326	1.157	Cross	1	Pair of Wire Dog Staples
			G	1.836	1.160	Butt	1	JH 47x90
			D	0.968	0.624	Butt	1	JH 47x90
			F	0.426	0.135	Cross	1	Pair of Wire Dog Staples
*R01	1	991						Refer NZS3604:2011 Tables 15.6
*R02	2	968						Refer NZS3604:2011 Tables 15.6
*R03	2	1018						Refer NZS3604:2011 Tables 15.6
*R04	1	918						Refer NZS3604:2011 Tables 15.6
*R05	1	7000						Refer NZS3604:2011 Tables 15.6
*R06	1	436						Refer NZS3604:2011 Tables 15.6
T01	1	7985	B	2.234	0.499	Cross	1	Pair of Wire Dog Staples
			F	4.637	2.606	Cross	1	Pair of Wire Dog Staples
			G	7.788	4.761	Cross	1	CT200 pair
T04	1	7900	A	6.634	3.864	Cross	1	CT200 pair
			G	7.518	3.919	Cross	1	CT200 pair
T07	1	3517	B	3.071	1.377	Cross	1	Pair of Wire Dog Staples
			I	2.616	1.396	Butt	1	JH 47x90
T08	2	7900	B	5.139	2.744	Cross	2	Pair of Wire Dog Staples
			P	7.094	2.616	Cross	2	Pair of Wire Dog Staples
T09	2	4400	B	3.998	1.940	Cross	2	Pair of Wire Dog Staples
			F	3.998	1.940	Cross	2	Pair of Wire Dog Staples
T11	2	7985	A	4.799	2.766	Cross	2	Pair of Wire Dog Staples
			G	4.316	2.035	Cross	2	Pair of Wire Dog Staples
			N	2.765	1.672	Cross	2	Pair of Wire Dog Staples
T12	1	8030	B	3.808	1.823	Cross	1	Pair of Wire Dog Staples
			N	6.895	4.198	Cross	1	CT200 pair
			H	2.156	0.585	Cross	1	Pair of Wire Dog Staples
T13	4	7900	B	2.674	1.009	Cross	4	Pair of Wire Dog Staples
			F	1.914	0.965	Butt	4	JH 47x90
			H	7.125	4.305	Cross	4	CT200 pair
T14	1	3092	G	2.811	1.339	Butt	1	JH 47x90
			E	2.911	1.250	Cross	1	Pair of Wire Dog Staples
T15	1	4400	H	1.900	0.932	Butt	1	JH 47x90
			F	2.744	0.842	Cross	1	Pair of Wire Dog Staples
			J	4.190	2.048	Cross	1	Pair of Wire Dog Staples

-- AS BUILT TRUSS LAYOUT REQUIRED --
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WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Westimber Ltd

CONSENT ISSUED BC230758 - Page 94 of 467

Job: 11595 Client: John Baddock Site: Lot 115 Townsend Road Rangiora BC230758

Description: Phone: Phone:

Building Consent No.:

MiTek 20/20 Engineering 4.7.334.0 MiTek New Zealand Limited Printed: 07:12:20 21 Jun 2023

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	---------- Fixing ---------- Qty	Selected
T16	1	3100	G	2.355	1.569	Butt	1	JH 47x90
			E	2.579	1.112	Cross	1	Pair of Wire Dog Staples
T20	1	854	C	1.003	0.704	Butt	1	JH 47x90
			D	1.309	0.714	Butt	1	JH 47x90
V01	1	1285	A			Wide		No fixing selected
V02	1	2067	A			Wide		No fixing selected
V03	1	2848	A			Wide		No fixing selected
V04	1	1105	A			Wide		No fixing selected
V05	1	1880	A			Wide		No fixing selected
V06	1	644	A			Wide		No fixing selected
J01B	1	3100	B	2.830	0.902	Cross	1	Pair of Wire Dog Staples
			E	0.291	0.361	Butt	1	Pair of 3.15d Nails
			D	2.757	2.651	Cross	1	Pair of Wire Dog Staples
J03A	1	1300	B	2.618	0.529	Cross	1	Pair of Wire Dog Staples
			D	0.386	0.031	Butt	1	Pair of 3.15d Nails
			C	0.856	0.731	Butt	1	JH 47x90
J05A	2	1277	B	2.599	0.521	Cross	2	Pair of Wire Dog Staples
			D	0.379	0.031	Butt	2	Pair of 3.15d Nails
			C	0.831	0.716	Butt	2	JH 47x90
J07A	2	1327	B	2.642	0.538	Cross	2	Pair of Wire Dog Staples
			D	0.394	0.032	Butt	2	Pair of 3.15d Nails
			C	0.884	0.747	Butt	2	JH 47x90
J07B	1	1327	B	2.663	0.549	Cross	1	Pair of Wire Dog Staples
			D	0.394	0.032	Butt	1	Pair of 3.15d Nails
			C	0.918	0.766	Butt	1	JH 47x90
J08	1	2145	D	2.146	0.666	Butt	1	JH 47x90
			F	2.151	1.613	Butt	1	JH 47x90
J11A	1	1227	B	2.557	0.504	Cross	1	Pair of Wire Dog Staples
			D	0.364	0.029	Butt	1	Pair of 3.15d Nails
			C	0.778	0.686	Butt	1	Pair of 3.15d Nails
J14	1	3100	B	2.797	1.295	Cross	1	Pair of Wire Dog Staples
			F	1.598	1.370	Butt	1	JH 47x90
T07A	1	3517	B	3.086	1.374	Cross	1	Pair of Wire Dog Staples
			H	2.261	1.378	Butt	1	JH 47x90
T08A	1	7900	B	2.892	1.136	Cross	1	Pair of Wire Dog Staples
			H	6.068	3.873	Cross	1	CT200 pair
			K	2.932	0.524	Cross	1	Pair of Wire Dog Staples
T08B	1	7900	B	5.710	2.956	Cross	1	Pair of Wire Dog Staples
			H	3.843	1.824	Cross	1	Pair of Wire Dog Staples
			P	2.741	1.588	Cross	1	Pair of Wire Dog Staples
T14A	1	3092	F	1.705	1.133	Butt	1	JH 47x90
			D	2.920	1.214	Cross	1	Pair of Wire Dog Staples
			G	0.639	0.201	Cross	1	Pair of Wire Dog Staples
T15A	3	4400	G	0.608	0.934	Butt	3	JH 47x90
			E	2.777	0.829	Cross	3	Pair of Wire Dog Staples
			I	4.194	2.020	Cross	3	Pair of Wire Dog Staples
T16A	2	3100	F	1.788	1.560	Butt	2	JH 47x90
			D	2.585	1.095	Cross	2	Pair of Wire Dog Staples
J02	1	2200	B	3.521	1.350	Cross	1	Pair of Wire Dog Staples
			E	1.325	0.874	Cross	1	Pair of Wire Dog Staples
J04	1	2177	B	3.470	1.326	Cross	1	Pair of Wire Dog Staples
			E	1.291	0.846	Butt	1	JH 47x90
J06	1	2227	B	3.580	1.377	Cross	1	Pair of Wire Dog Staples
			E	1.379	0.907	Butt	1	JH 47x90
J08A	1	2145	F	2.918	0.178	Butt	1	JH 47x90
			H	1.079	0.924	Butt	1	JH 47x90
			E	0.439	0.299	Butt	1	Pair of 3.15d Nails
			D	2.338	1.570	Cross	1	Pair of Wire Dog Staples
J10	1	2127	B	3.359	1.272	Cross	1	Pair of Wire Dog Staples
			E	1.245	0.787	Butt	1	JH 47x90
J12	1	3992	A	7.347	3.671	Butt	1	Pair of MultiGrips
			G	6.202	3.932	Butt	1	JH 47x90
TG01	1	7985	B	1.593	0.323	Cross	1	Pair of Wire Dog Staples
			I	7.967	6.421	Cross	1	CT200 pair
			L	14.067	11.892	Cross	1	16kN Truss to Top Plate
J02A	1	2200	B	3.470	0.854	Cross	1	Pair of Wire Dog Staples
			F	1.576	0.908	Cross	1	Pair of Wire Dog Staples
			D	0.682	0.410	Butt	1	Pair of 3.15d Nails
J04A	1	2177	B	3.470	1.326	Cross	1	Pair of Wire Dog Staples
			E	1.291	0.846	Butt	1	JH 47x90
J04B	1	2177	B	3.458	0.844	Cross	1	Pair of Wire Dog Staples
			F	1.560	0.900	Butt	1	JH 47x90
			D	0.714	0.435	Butt	1	Pair of 3.15d Nails
J06A	1	2227	B	3.580	1.377	Cross	1	Pair of Wire Dog Staples
			E	1.379	0.907	Butt	1	JH 47x90
J06B	1	2227	A	4.167	1.190	Butt	1	JH 47x90
			D	2.997	1.223	Butt	1	JH 47x90
J06C	1	2227	B	3.507	0.862	Cross	1	Pair of Wire Dog Staples
			F	1.602	0.942	Butt	1	JH 47x90
			D	0.700	0.425	Butt	1	Pair of 3.15d Nails

-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

Truss "As-Build" designs shall be sent to buildinginfo@wmk.govt.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

CONSENT ISSUED BC230758 - Page 95 of 467

Westimber Ltd

Job: 11595
Client: John Baddock
Phone:
Site: Lot 115 Townsend Road
Rangiora
BC230758
Phone:
Description:
Building Consent No.:

MiTek 20/20 Engineering 4.7.334.0 — MiTek New Zealand Limited — Printed: 07:12:20 21 Jun 2023

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	---------- Fixing ---------- Qty	Selected
J10A	1	2127	B	3.399	0.828	Cross	1	Pair of Wire Dog Staples
			F	1.513	0.847	Butt	1	JH 47x90
			D	0.702	0.426	Butt	1	Pair of 3.15d Nails
J12A	1	3992	A	4.177	1.444	Butt	1	JH 47x90
			G	3.267	1.844	Cross	1	Pair of Wire Dog Staples
			D	0.910	0.621	Butt	1	JH 47x90
J09	1	3027	B	5.232	2.040	Cross	1	Pair of Wire Dog Staples
			F	3.471	2.143	Butt	1	JH 47x90
T02	1	4400	B	6.366	3.469	Cross	1	CT200 pair
			F	6.366	3.469	Cross	1	CT200 pair
T03	1	4500	B	6.612	3.598	Cross	1	CT200 pair
			F	6.163	3.568	Cross	1	CT200 pair
T05	1	3517	F	4.313	2.558	Butt	1	JH 47x90
			D	5.865	2.678	Cross	1	Pair of Wire Dog Staples
T06	1	3027	A	5.982	1.895	Cross	1	Pair of Wire Dog Staples
			F	5.129	2.272	Butt	1	JH 47x90
T10	1	4400	F	3.399	2.506	Butt	1	JH 47x90
			D	3.522	1.050	Cross	1	Pair of Wire Dog Staples
			H	7.910	4.903	Cross	1	CT200 pair
T19	1	4400	A	6.265	2.606	Cross	1	Pair of Wire Dog Staples
			E	2.985	1.229	Cross	1	Pair of Wire Dog Staples
			H	8.894	4.700	Cross	1	CT200 pair
J09A	1	3027	B	3.964	1.134	Cross	1	Pair of Wire Dog Staples
			F	2.194	1.256	Butt	1	JH 47x90
			D	0.921	0.608	Butt	1	JH 47x90
T18	1	7900	A	1.677	0.582	Cross	1	Pair of Wire Dog Staples
			G	2.031	1.856	Butt	1	JH 47x90
			J	11.152	8.415	Cross	1	CT200 pair
T17	1	8030	A	8.911	5.024	Cross	1	CT200 pair
			E	4.385	2.189	Cross	1	Pair of Wire Dog Staples
			J	5.975	3.651	Cross	1	CT200 pair
TG02	1	7900	A	18.437	10.923	Butt	1	SPH140
			H	17.019	9.642	Cross	1	CT200 pair
T03A	1	4500	B	8.455	4.493	Cross	1	CT200 pair
			F	17.675	10.434	Cross	1	CT200 pair

Fixing List

Qty	Selected Fixing
90	Pair of Wire Dog Staples
53	JH 47x90
23	Pair of 3.15d Nails
22	CT200 pair
1	Pair of MultiGrips
1	16kN Truss to Top Plate
1	SPH140
19	No fixing selected

-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

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WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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.

CONSENT ISSUED BC230758 - Page 96 of 467

Westimber Ltd

Job: 11595
Client: John Baddock
Site: Lot 115 Townsend Road Rangiora
BC230758
Description:
Building Consent No.:
Phone:
Phone:

TRUSS BEARINGS EXCEEDING 10KN REPORT - Ultimate Limit State Loads

MiTek® Truss List

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

Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN) Down	Uplift
TG02	1	7900	A	11.799	8.738
			H	10.892	7.714
T03A	1	4500	F	11.312	8.347

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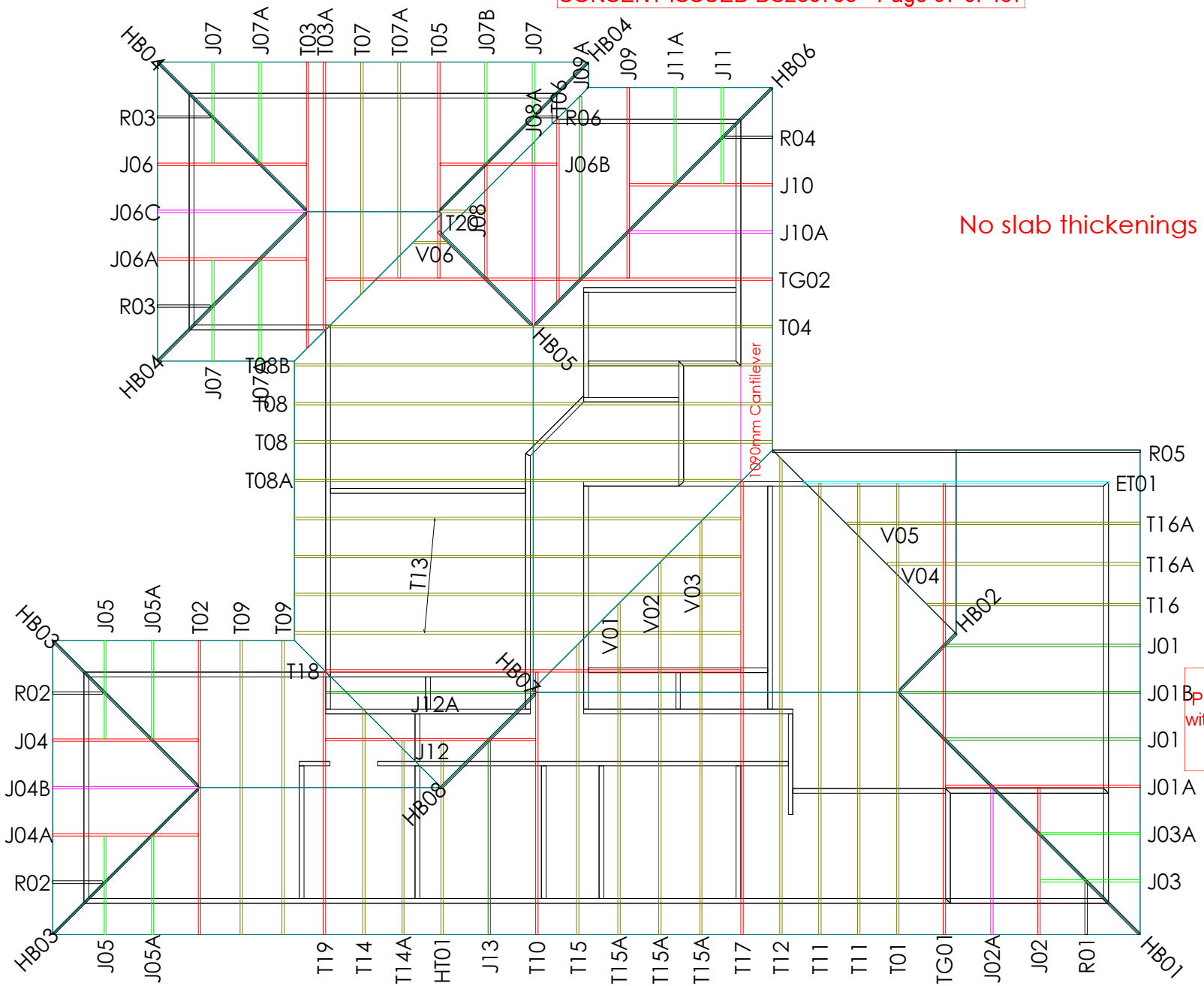
BC230578 14/09/2023 brennao

Note:

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

BC230758



No slab thickenings required

-- AS BUILT TRUSS LAYOUT REQUIRED --
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WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

WESTIMBER LTD.

Site Address :
Lot 115 Townsend Road
Rangiora

Sheet Title :
For Building Consent
Buildable Truss Layout

Date : 16 Jun,2023
Drawn : George Gibson
Scale : 1: 100
System : MiTek 20/20

Job Details:

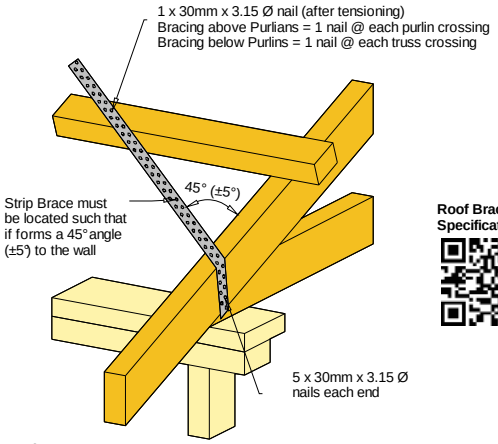
Roof Pitch	: 25.00deg	Truss Centres	: 900mm
Roof Material	: Galv Iron 0.55mm	Roof Live Load	: 0.250kPa
Ceiling Material	: Standard Plaster Board 13mm	Floor Live Load	:
Wind Zone	: High	Wind Speed	: 44m/s
Roof Snow Load	: 0.441kPa	Overhang	: 600mm

PrimeCad v4.7.334

Job Title : 11595
Sheet : 1
Revision Number :

BC230758

LUMBERLOK® ROOF BRACING



Roof Bracing Specifications

Refer to:
LUMBERLOK Roof Bracing Specifications 10/2011
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance (As per NZS 3604:2011)

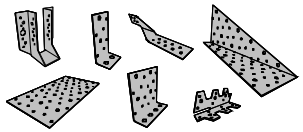
LUMBERLOK® TRUSS FIXINGS

D - Pair of Wire Dogs and 2 x 90mm 3.15mm skew nails
X - LUMBERLOK JH47x90 Joist Hanger
Z - LUMBERLOK JH47x120 Joist Hanger
P - LUMBERLOK JH47x190 Joist Hanger
E - LUMBERLOK JH95x165 Joist Hanger
T - LUMBERLOK CT200 Ceiling Tie
O - Pair of LUMBERLOK CT200 Ceiling Ties
H - LUMBERLOK CT400 Cyclone Tie
B - LUMBERLOK CT600 Cyclone Tie
4 - LUMBERLOK Multi Grip
M - Pair of LUMBERLOK Multi Grips
NP - LUMBERLOK Nailon Plate
N - LUMBERLOK N21 Diagonal Cleat
V - LUMBERLOK CPC40 Cleat
W - Pair of LUMBERLOK CPC40 Cleats
K - LUMBERLOK TTP 16kN Truss to Top Plate set
G - LUMBERLOK TTP 9kN Truss to Top Plate set

Joist Hanger Installation

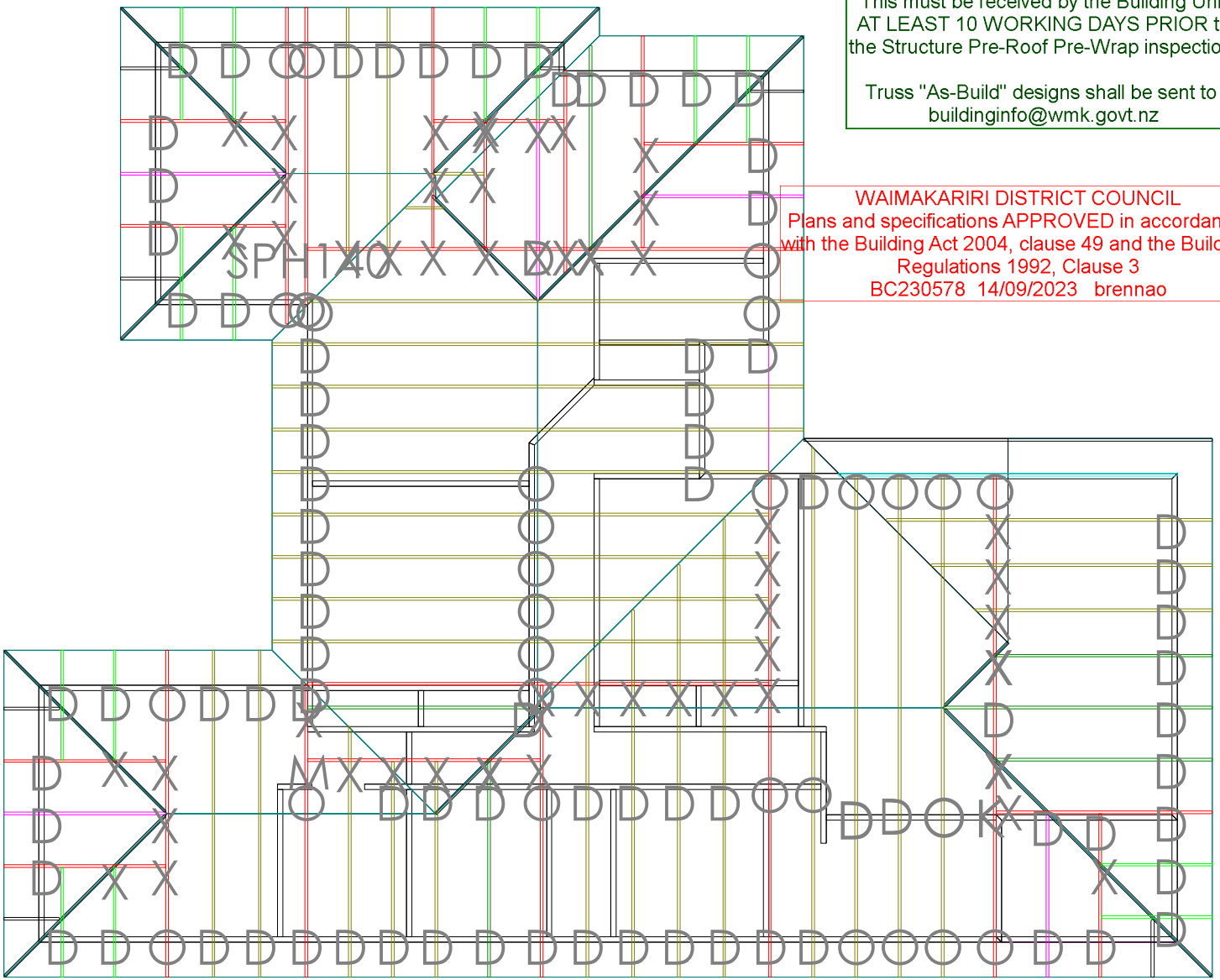
CT200 Truss to Top Plate Fixing Installation

16kN & 9kN Truss to Top Plate Fixing Installation



Notes:
All other areas must have the minimum 2 x 90mm 3.15mm skew nails and 2 x wire dogs for truss to top plate connections

Refer to:
LUMBERLOK Timber Connectors Characteristic Loadings Data Brochure 08/2014



-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

Truss "As-Build" designs shall be sent to buildinginfo@wmk.govt.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

WESTIMBER LTD.

Site Address :
Lot 115 Townsend Road
Rangiora

Sheet Title :
For Building Consent
Truss Fixings

Date : 16 Jun,2023 | Drawn : George Gibson
Scale : 1: 100 | System : MiTek 20/20

Job Details:

Roof Pitch	: 25.00deg	Truss Centres	: 900mm
Roof Material	: Galv Iron 0.55mm	Roof Live Load	: 0.250kPa
Ceiling Material	: Standard Plaster Board 13mm	Floor Live Load	:
Wind Zone	: High	Wind Speed	: 44m/s
Roof Snow Load	: 0.441kPa	Overhang	: 600mm

PrimeCad v4.7.334

MiTek™

Job Title : 11595
Sheet : 2
Revision Number :

BC230758

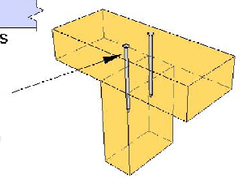
BOWMAC® STUD-LOK

STUD TO TOP PLATE FIXING OPTIONS

TYPE A - 0.7 kN

*Images are indicitive only. Timber sizes may vary.

Non-Load Bearing Walls



2 x 90mm x 3.15 Ø plain steel wire nails driven vertically through single Top Plate into stud

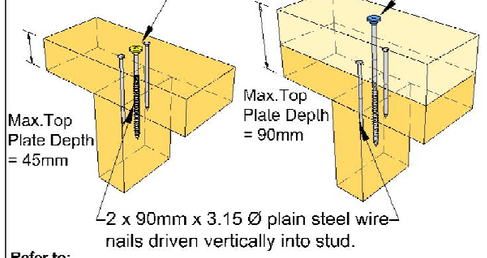
TYPE B - 4.7 kN

Load Bearing Walls

1 x STUD-LOK **SL125** screwed vertically through single Top Plate into stud.

'OR'

1 x STUD-LOK **SL170** screwed vertically through single or double Top Plate into stud.



Refer to:
BOWMAC STUD-LOK Stud to Top Plate Fixing Selection Chart ##/####
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance
(Alternative to NZS 3604:2011 Section 8)

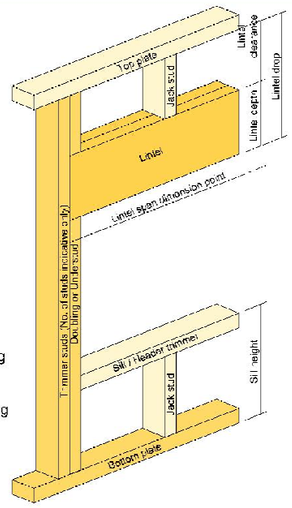
LUMBERLOK® LINTEL FIXING

TYPE E
1.4 kN

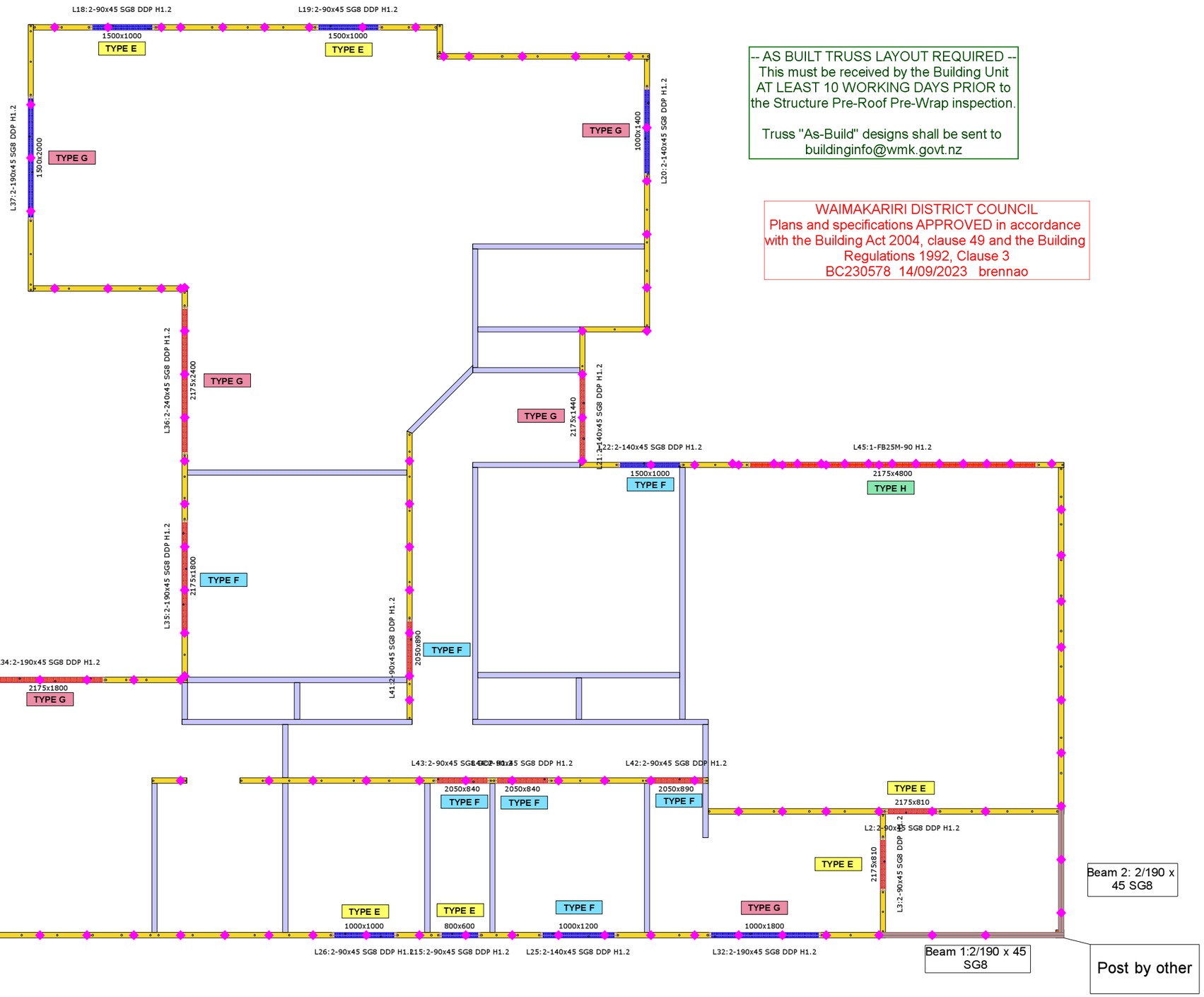
TYPE F
4.0 kN

TYPE G
7.5 kN

TYPE H
13.5 kN



Refer to:
LUMBERLOK Lintel Fixing Schedule 10/2011,
MiTek Structural Fixings **On-Site Guide** for Building Code Compliance
(Alternative to Table 8.14 & Figure 8.12 NZS 3604:2011)



-- AS BUILT TRUSS LAYOUT REQUIRED --
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WAIMAKARIRI DISTRICT COUNCIL
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BC230578 14/09/2023 brennao

WESTIMBER LTD.
299b Flaxton Rd, Rangiora

Sheet Title: **Lintel Fixing & STTP Layout for Building Consent**

OT No.:	**11595-OD-01**	Name:	
Address:	Lot 115 Townsend Road , Ranigora		
Wind Area:	High	Design Wind Speed:	44.0 m/s

MiTek SAPPHIRE™ Ver. 8.6.3
Better Technology. Better Building.

Building Consent No.:		Structure:	11595-ST-01
Drawn By:	George Gibson	Date:	21/06/2023

MiTek SAPPHIRE™ Better Technology. Better Building.

Lintel Summary

Client: John Baddock
Phone:

Job: 11595-ST-01
Westimber
Site: Lot 115 Townsend Road
Ranigora

BC230758

Printed: 07:35:15 21-06-2023
MiTek SAPPHIRE™ 8.6.3.353.Update5.9

LINTEL SUMMARY

This Lintel Summary is issued by MiTek accredited fabricator Westimber being licensed to use the MiTek SAPPHIRE™ software, and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

Design Parameters

The MiTek SAPPHIRE™ design for this job is based on the following design parameters entered into the program. The Detailer/Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek SAPPHIRE™ lintels.

Job Details

Importance Level : 2 **Design Working Life :** 50 years

Details :

Roof Pitch :	25.000 °	**Loading :**			
Ceiling Pitch :	0.000 °	**Roof :**	Galv Iron 0.55mm	0.19 kPa	
Overhang :	600 mm	**Ceiling :**	Standard Plaster Board 13mm	0.18 kPa	
Truss Spacing :	900 mm	**Wind :**	High	44.0 m/s	**Cpe :** Varies **Cpi :** Varies
		Snow :	N4 (Sub-Alpine) at 100.000 m		
		Open Ground Snow (Sg) :		0.900 kPa	

Lintel Schedule

Label	Span (mm)	Size	Opening (HxW)	Panel	Level	Design Status
L42:2-90x45 SG8 DDP H1.2	980	2/90x45 SG8 DDP H1.2	2050x890	1(LB)	1st Floor	Designed
L43:2-90x45 SG8 DDP H1.2	930	2/90x45 SG8 DDP H1.2	2050x840	1(LB)	1st Floor	Designed
L44:2-90x45 SG8 DDP H1.2	930	2/90x45 SG8 DDP H1.2	2050x840	1(LB)	1st Floor	Designed
L41:2-90x45 SG8 DDP H1.2	980	2/90x45 SG8 DDP H1.2	2050x890	2(LB)	1st Floor	Designed
L37:2-190x45 SG8 DDP H1.2	2090	2/190x45 SG8 DDP H1.2	1500x2000	E1	1st Floor	Designed
L35:2-190x45 SG8 DDP H1.2	1890	2/190x45 SG8 DDP H1.2	2175x1800	E3	1st Floor	Designed
L36:2-240x45 SG8 DDP H1.2	2490	2/240x45 SG8 DDP H1.2	2175x2400	E3	1st Floor	Designed With
L34:2-190x45 SG8 DDP H1.2	1890	2/190x45 SG8 DDP H1.2	2175x1800	E4	1st Floor	Designed
L33:2-190x45 SG8 DDP H1.2	2090	2/190x45 SG8 DDP H1.2	1000x2000	E5	1st Floor	Designed
L15:2-90x45 SG8 DDP H1.2	690	2/90x45 SG8 DDP H1.2	800x600	E6	1st Floor	Designed
L25:2-140x45 SG8 DDP H1.2	1290	2/140x45 SG8 DDP H1.2	1000x1200	E6	1st Floor	Designed
L26:2-90x45 SG8 DDP H1.2	1090	2/90x45 SG8 DDP H1.2	1000x1000	E6	1st Floor	Designed
L32:2-190x45 SG8 DDP H1.2	1890	2/190x45 SG8 DDP H1.2	1000x1800	E6	1st Floor	Designed
L3:2-90x45 SG8 DDP H1.2	900	2/90x45 SG8 DDP H1.2	2175x810	E7	1st Floor	Designed
L2:2-90x45 SG8 DDP H1.2	900	2/90x45 SG8 DDP H1.2	2175x810	E8	1st Floor	Designed
L22:2-140x45 SG8 DDP H1.2	1090	2/140x45 SG8 DDP H1.2	1500x1000	E10	1st Floor	Designed
L45:1-FB25M-90 H1.2	4890	1/FB25M-90 H1.2	2175x4800	E10	1st Floor	Designed With
L21:2-140x45 SG8 DDP H1.2	1530	2/140x45 SG8 DDP H1.2	2175x1440	E11	1st Floor	Designed
L20:2-140x45 SG8 DDP H1.2	1490	2/140x45 SG8 DDP H1.2	1000x1400	E13	1st Floor	Designed
L18:2-90x45 SG8 DDP H1.2	1090	2/90x45 SG8 DDP H1.2	1500x1000	E16	1st Floor	Designed
L19:2-90x45 SG8 DDP H1.2	1090	2/90x45 SG8 DDP H1.2	1500x1000	E16	1st Floor	Designed

Total Quantity: 41

-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

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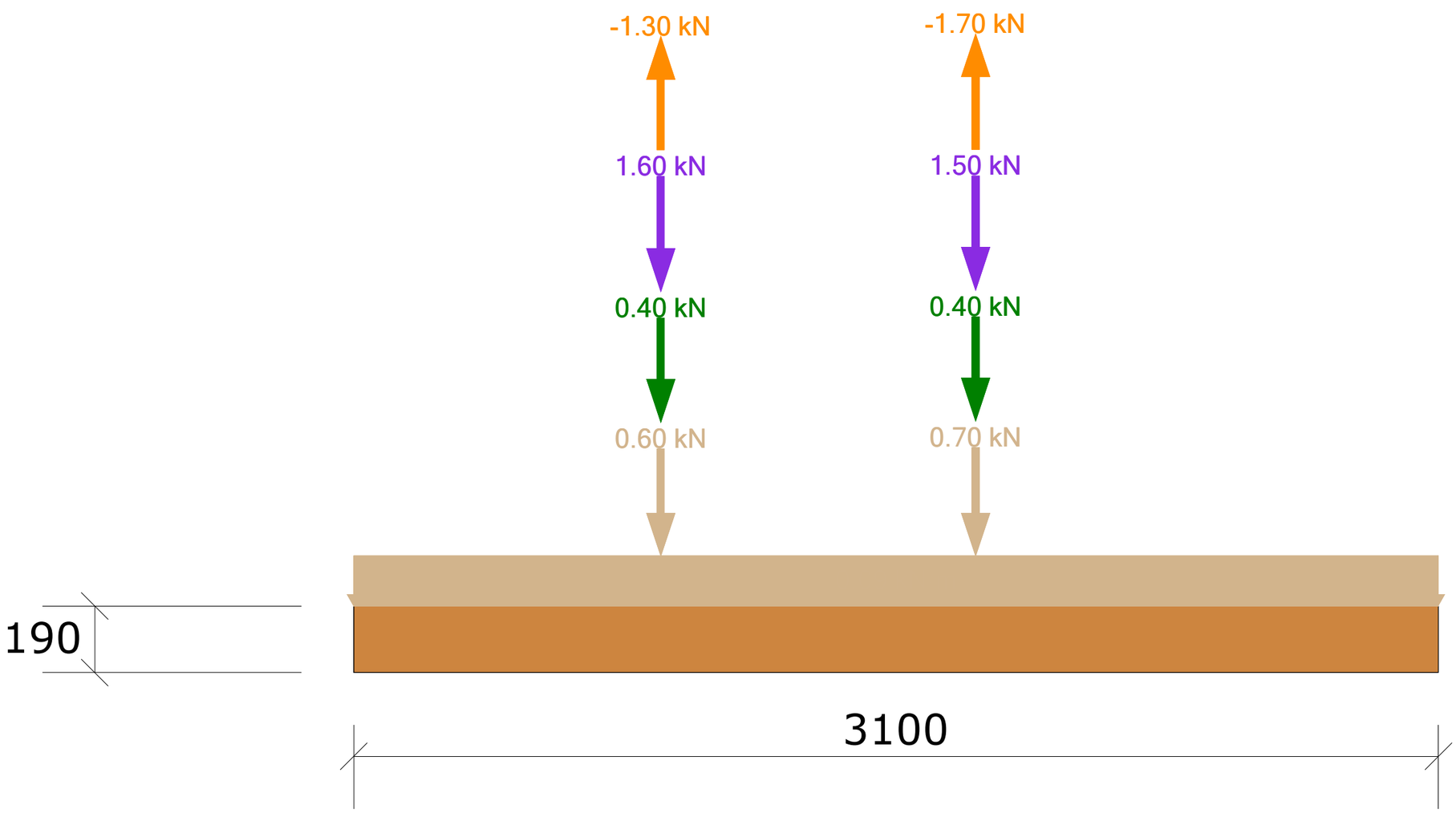
WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

The lintel design input has been carried out by:

Signed: Date: Wednesday, 21 June 2023



-- AS BUILT TRUSS LAYOUT REQUIRED --
This must be received by the Building Unit AT LEAST 10 WORKING DAYS PRIOR to the Structure Pre-Roof Pre-Wrap inspection.

Truss "As-Build" designs shall be sent to buildinginfo@wmk.govt.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

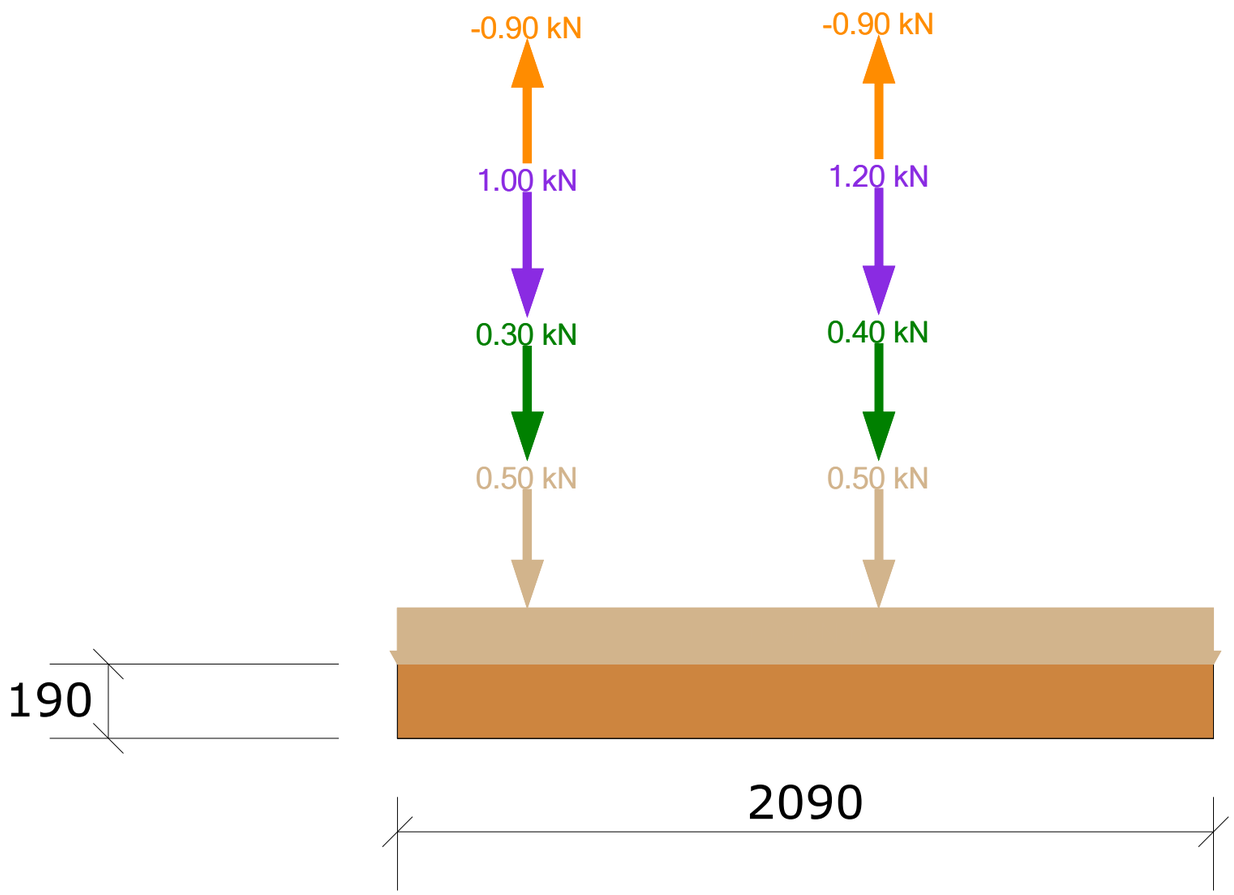
Material: 190x45 SG8 DDP H1.2 - 2 Ply

Design Summary:

Consideration	Design	Control	Result	LDF	Load Combination
Moment:	2.64 kNm @ 1928 mm	5.53 kNm	Passed - 48%	0.80	Strength: 14a) 1.2G + S
Shear:	2.82 kN @ 45 mm	31.58 kN	Passed - 9%	0.80	Strength: 14a) 1.2G + S
Max Deflection:	4 mm @ 1539 mm	10 mm (L/1)	Passed - L/999	-	Strength: 1) 1.35G

Design Notes:

* Contributary area could not be determined. Designing for large contributary area.



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WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Material: 190x45 SG8 DDP H1.2 - 2 Ply

Design Summary:

Consideration	Design	Control	Result	LDF	Load Combination
Moment:	1.45 kNm @ 986 mm	6.91 kNm	Passed - 21%	1.00	Strength: 3) 1.2G + 1.5Qcr
Shear:	2.20 kN @ 35 mm	31.58 kN	Passed - 7%	0.80	Strength: 14a) 1.2G + S
Max Deflection:	1 mm @ 1040 mm	7 mm (L/1)	Passed - L/999	-	Serviceability: 18) G + ψsQcr (Short Term)

Design Notes:

* Contributary area could not be determined. Designing for large contributary area.

GIB EzyBrace® Bracing Software

Building Consent BC230758.02
Received 14/02/2024

GIB

Demand Calculation Sheet

Job Details

Name:	Baddock
Street and Number:	175 Townsend Road
Lot and DP Number:	Lot 115 DP 575822
City/Town/District:	Rangiora
Designer:	AS
Company:	
Date:	18/07/23

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Medium
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.35
Building Height to Apex (m)	4.77
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.4
Building Length (m)	20.70
Building Width (m)	16.62
Building Plan Area (m²)	204.9

Building Location

Wind Zone = High

Earthquake Zone 2

Soil Type	D & E (Deep to Very Soft)
Annual Prob. of Exceedance:	1 in 500 (NZS3604:2011 Default)

Bracing Units required for Wind

	Along	Across
Single Level	**848**	**1023**

Bracing Units required for Earthquake

	Along & Across
Single Level	**912**

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Rain water head added and bracing updated

GIB EzyBrace® Bracing Software

Single Level Along Resistance Sheet

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Received 14/02/2024

Job Name: Baddock

									Wind	EQ
									Demand	
									848	912
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1414 167%	1507 165%
a	1	1.00		2.4	BBI 0.6	BBI	72	80		
	2	1.00		2.4	BBI 0.6	BBI	72	80		
	3	1.20		2.4	BBI 1.2	BBI	112	120		
	External Length = 10.50								256 OK	280 OK
b	1	1.20		2.4	BBI 1.2	BBI	112	120		
	2	1.00		2.4	BBI 0.6	BBI	72	80		
	External Length = 3.69								184 OK	200 OK
c	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	1.20		2.4	BBI 1.2	BBI	112	120		
	3	0.40		2.4	BBI 0.4	BBI	22	23		
	External Length = 8.09								258 OK	251 OK
d	1	1.20		2.4	BBI 1.2	BBI	112	120		
	2	1.20		2.4	BBI 1.2	BBI	112	120		
	External Length = 4.60								223 OK	240 OK
e	1	1.20		2.4	BBI 1.2	BBI	112	120		
	External Length = 3.01								112 OK	120 OK
f	1	1.20		2.4	BBI 1.2	BBI	112	120		
	2	1.20		2.4	BBI 1.2	BBI	112	120		
	3	1.10		2.4	BBI 0.6	BBI	79	88		
	4	1.10		2.4	BBI 0.6	BBI	79	88		
	External Length = 16.49								382 OK	416 OK

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

GIB EzyBrace® Bracing Software

Single Level Across Resistance Sheet

Building Consent BC230758.02
Received 14/02/2024

Job Name: Baddock

									Wind	EQ
									Demand	
									1023	912
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1480 145%	1495 164%
m	1	1.20		2.4	BBI 1.2	BBI	112	120		
	2	1.20		2.4	BBI 1.2	BBI	112	120		
	3	1.20		2.4	BBI 1.2	BBI	112	120		
	4	1.20		2.4	BBI 1.2	BBI	112	120		
	External Length =					8.90			446 OK	480 OK
n	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	0.80		2.4	BBI 0.6	BBI	58	64		
	3	1.10		2.4	BBI 0.6	BBI	79	88		
	External Length =					6.52			261 OK	260 OK
o	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	0.40		2.4	BBI 0.4	BBI	22	23		
	External Length =					0.49			147 OK	131 OK
p	1	1.80		2.4	GS1-N	GIB®	124	108		
	2	1.80		2.4	GS1-N	GIB®	124	108		
	3	1.20		2.4	BBI 1.2	BBI	112	120		
	4	0.60		2.4	BBI 0.6	BBI	43	48		
	External Length =					6.90			403 OK	384 OK
q	1	1.20		2.4	BBI 1.2	BBI	112	120		
	2	1.20		2.4	BBI 1.2	BBI	112	120		
	External Length =					5.94			223 OK	240 OK

WAIMAKARIRI DISTRICT COUNCIL
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BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

Custom Wall Elements

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Received 14/02/2024

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
BBI	BBI 0.4	0.4	56	58
BBI	BBI 0.6	0.6	72	80
BBI	BBI 1.2	1.2	93	100
NZS4299	Conc	1	581.25	581.25
Gamma	GBPF24	1	124	137
Gamma	GBF220/2.4	1	37	44
JH	JHD600	0.6	99	107
JH	JHD1200	1.2	154	140
JH	Vv	1.2	130	101
BBI	BBI 0.4	0.4	56	58
BBI	BBI 0.6	0.6	72	80
BBI	BBI 1.2	1.2	93	100
IBS RigidRAP	OSB2	0.4	70	79
IBS RigidRAP	OSB3	0.6	76	81
IBS RigidRAP	OSB4	1.2	131	107

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

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Received 14/02/2024

PlyBrace™ Plywood Technical Note

Version 1 July 2022

Endless possibilities.

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BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

bbi wood products

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20 bbi® AraucoPly® DD F8 Structural Pine Plywood 7mm 600mm Wall, Brackets

26 bbi® AraucoPly® DD F8 Structural Pine Plywood 7mm 1200mm Wall, Brackets

32 bbi® Redline® Poplar Core Plywood 9mm 1200mm Wall, Brackets

38 bbi® Redline® Poplar Core Plywood 12mm 1200mm Wall, Brackets

44 bbi® Redline® Premium Hardwood Core Plywood 12mm 1200mm Wall, Brackets

50 bbi® Blondeline® Birch Poplar Core Plywood 9mm 1200mm Wall, Brackets

56 bbi® Blondeline® Birch Poplar Core Plywood 12mm 1200mm Wall, Brackets

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AraucoPly® is a registered trademark of Maderas Arauco S.A.

Please check our website www.bbi.net.nz for any updates to this document.

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Received 14/02/2024

bbi® PlyBrace™ Plywood Wall Bracing Specifications

Product	Min Wall Length	PlyBrace™ Thickness	Max Stud Spacing	Wind*	Earthquake**
	mm	mm	mm	BU/m	BU/m
bbi® AraucoPly®® DD F8	200	7	600	41	49
bbi® AraucoPly® DD F8	400	7	600	56	58
bbi® AraucoPly® DD F8	600	7	600	72	80
bbi® AraucoPly® DD F8	1200	7	600	93	100
bbi® Redline® Poplar Core	1200	9	600	109	111
bbi® Redline® Poplar Core	1200	12	600	101	108
bbi® Redline® Premium Hardwood Core	1200	12	600	134	157
bbi® Blondeline® Birch Poplar Core	1200	9	600	102	114
bbi® Blondeline® Birch Poplar Core	1200	12	600	106	106

As limited by the serviceability load capacity.* As limited by the ultimate load capacity.**
Maximum hold down rating for NZS 3604:2011 timber floors is 120BU's/m.
Maximum hold down rating for NZS 3604:2011 concrete floors is 150BU's/m.

bbi® PlyBrace™ Plywood Wall Bracing Systems

bbi® has a range of wall bracing systems in 7 mm, 9 mm, and 12 mm thicknesses used to resist earthquake and wind loads on timber framed buildings.

These products have been manufactured and tested in accordance with NZS3604:2011.

Wall Framing

Wall framing must comply with the New Zealand building code requirements. Nogs are not required to achieve the above bracing unit loadings.

Sheet Fastenings

50 x 2.8 flat head galvanised nails at 150mm centres around the perimeter of the sheet with fixings at 300 centres on internal stud.

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Frame Connections

GIB Handibrac® with M12 hold down bolts, except 7mm DD F8 200mm wall which uses 1 M12 hold down bolt with 50 x 50 x 3 square washer centered in the frame.

Installation Requirements

bbi® AraucoPly® DD F8 can be installed prior to the building being fully enclosed if H3.2 treated. The building must be fully enclosed within 60 days of installation.

bbi® Redline® and **Blondeline®** must only be installed once the building has been fully enclosed and the moisture content of the supporting timber framing does not exceed 18%.

Finishing System

All visible surfaces, including edges must be finished with three coats of polyurethane or a paint system comprising of a primer/sealer, and two topcoats*.

* Excludes bbi® AraucoPly® DD F8

Durability

bbi® PlyBrace™ Wall Bracing Systems have a serviceable life of at least 50 years providing they remain dry.

Design Considerations

bbi® PlyBrace™ Wall Bracing Systems are for use in dry, internal, protected locations of thermally insulated buildings which are heated, intermittently heated and predominantly unheated in accordance with NZS 3602 Section 110, Table 1E and Section 205. The internal environment must be such that the moisture content of the supporting timber framing does not exceed 18%.

bbi® PlyBrace™ Wall Bracing Systems must be located within the building thermal envelope and must either be exposed to view or be in locations easily accessible for inspection. **bbi® PlyBrace™** Wall Bracing Systems must not be located in any high moisture environment or in areas subject to water splash. They must not be used in areas such as bathrooms, toilets, laundries or kitchens.

bbi® PlyBrace™ sheets must not be used in saunas or steam rooms. **bbi® PlyBrace™** Wall Bracing Systems must not be exposed to temperatures of 50°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

Prevention of Fire Occurring

Separation or protection must be provided to **bbi® PlyBrace™** Wall Bracing Systems from heat sources such as stoves, heaters, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

bbi® PlyBrace™ Wall Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested using the P21 method by Scion Research New Zealand as referenced in NZS3604:2011

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P21 Test Reports

bbi wood products

P21 Test Report

bbi® AraucoPly®
DD F8 Structural Pine Plywood
7mm 200mm Wall, Brackets

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

Te Papa Tipu Innovation Park
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Rotorua
New Zealand
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Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi AraucoPly DD F8 Structural Pine Plywood 7mm 200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 200mm x 2.4m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side Walls with Brackets.

1. BU wind = 8 (41 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 10 (49 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side,
90x45 H1.2 SG8 framing, studs at 200mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates,
No brackets used
One M12 hold down bolt with 50x50x3mm washer to centre of bottom plate
P21 Supplementary restraints used.

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC230758.02 27/02/2024 brennao
Rain water head added and bracing updated

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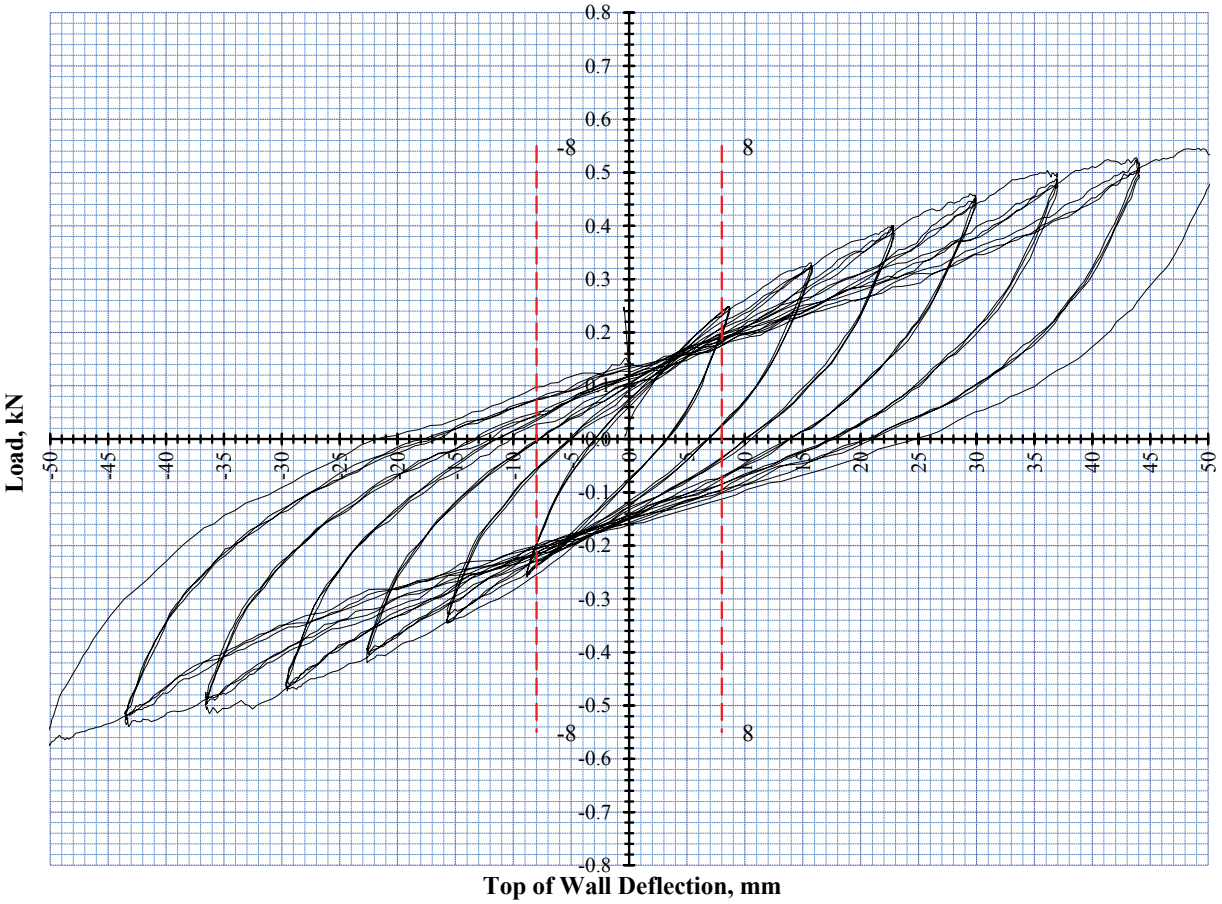

Figure 1: *Wall 289145*

Observations

No obvious signs of failure to framing or plywood

Endless possibilities.

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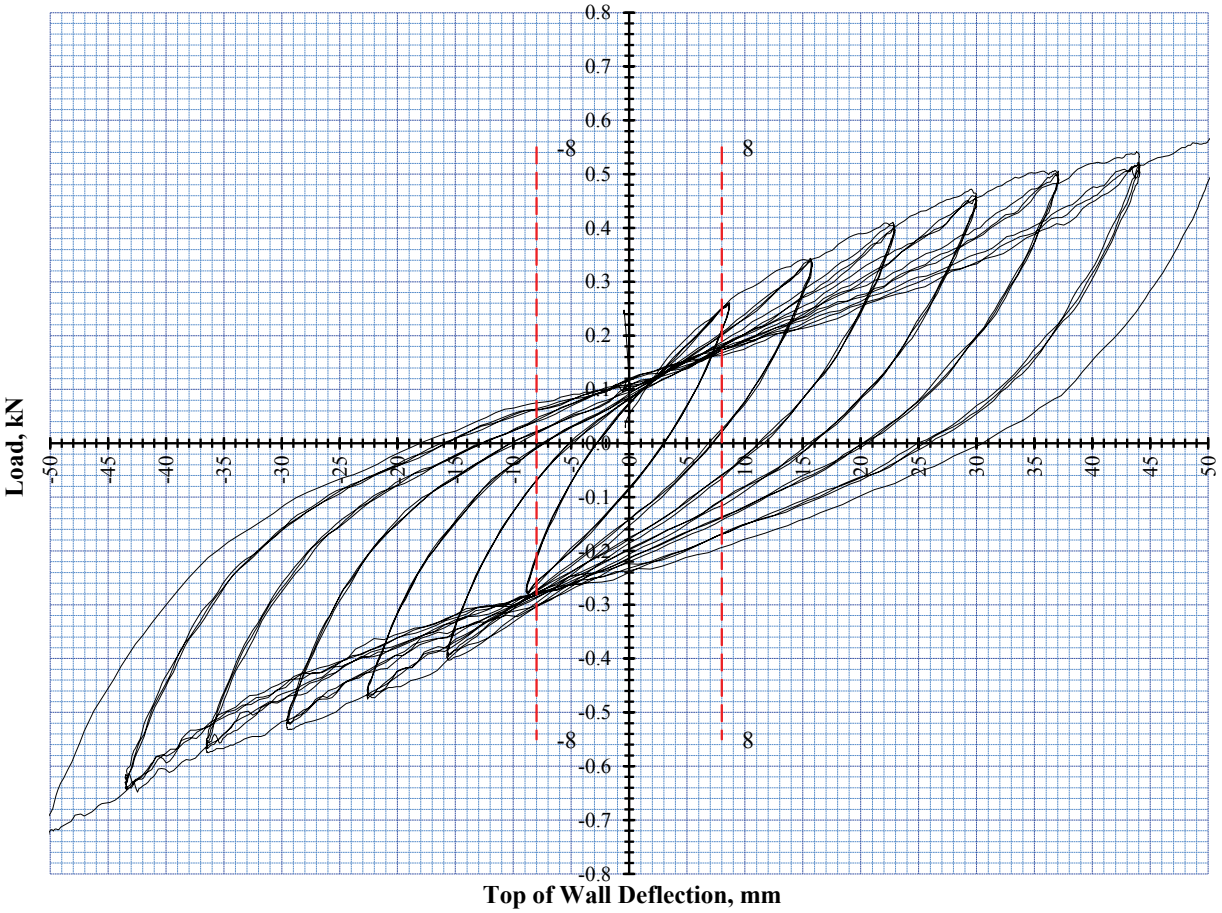

Figure 2: *Wall 289146*

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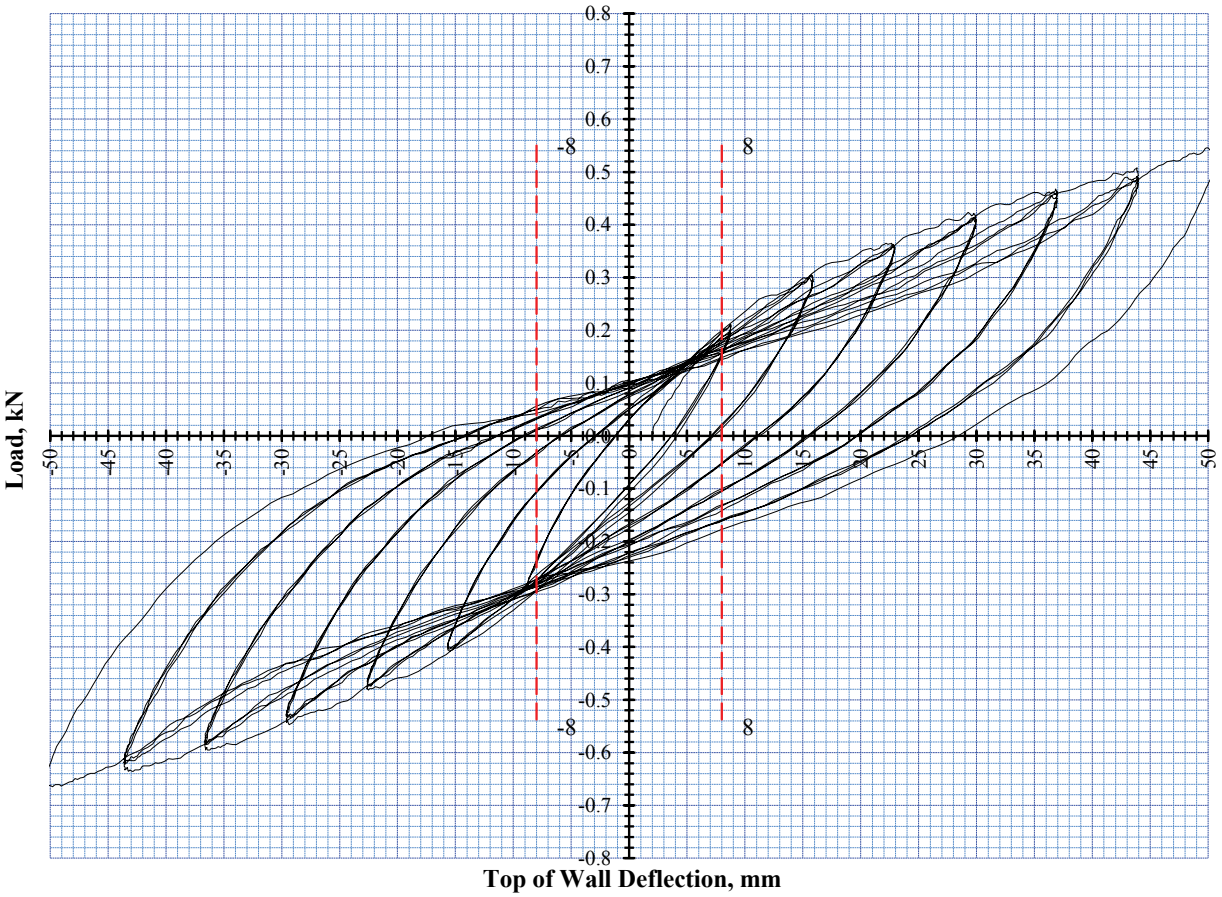

Figure 3: *Wall 289147*

Endless possibilities.

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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

200mm, bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side
90x45 H1.2 SG8 framing, studs at 200mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs
7mm min edge distances all around.
One M12 hold down bolt with 50x50x3mm washer to centre of bottom plate
P21 Supplementary restraints used

Summary		
Earthquake	49 (U)	BU/m
Wind	41 (S)	BU/m

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	30-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

Lab Number	Direction	Serviceability Cycles: Cycle to H/300 or DLQ or DLW 8.0 Loads (P_8) kN	X mm Residual Defln, C mm	Ultimate Cycles: Cycle to Displacement y=(mm) Maximum Load P(kN)	def @ P y (mm)	P/2 (kN)	Wall dimensions L(mm) 200 d at P/2 d mm	H(mm) 2410 4th, R kN
289145	+	0.24	3.20	0.50	36.0	0.25	9.0	0.46
	-	0.24	2.50	0.51	36.0			0.48
289146	+	0.25	3.00	0.50	36.0	0.25	8.0	0.48
	-	0.26	2.80	0.57	36.0			0.52
289147	+	0.20	3.60	0.46	36.0	0.23	9.5	0.44
	-	0.28	1.10	0.59	36.0			0.57
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		0.24	2.70	0.52	36.00	0.24	8.83	0.49
Coefficient of Variation %		9.97	29.32	8.50	0.00	3.97	7.06	8.56

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 4.08
Ductility Modification factor K4 = 1.00
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's Lab Number		K1 (= 1.4 - C/X)	EQ ultimate BU's	EQ service BU's	Wind Ultimate BU's	Wind Service BU's
289145	(BU)	1.00	9.5	10.4	10.1	8.1
	(BU/m)		47	52	51	40
289146	(BU)	1.00	10.0	11.1	10.7	8.6
	(BU/m)		50	56	54	43
289147	(BU)	1.00	10.1	10.5	10.5	8.1
	(BU/m)		51	52	53	41
<20% Result Check		*289145*	*-6% Ok result*	*-4% Ok result*	*-5% Ok result*	*-4% Ok result*
		289146	*2% Ok result*	*6% Ok result*	*4% Ok result*	*6% Ok result*
		289147	*4% Ok result*	*-3% Ok result*	*1% Ok result*	*-3% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**10**	(P8 x K1) x (K2/0.55) =	**11**
	49	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**10**	(P8 x K1) x (K2/0.71) =	**8**
	41	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 200mm x 2.40m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® AraucoPly®
DD F8 Structural Pine Plywood
7mm 400mm Wall, Brackets

Endless possibilities.

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Received 14/02/2024

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Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi AraucoPly DD F8 Structural Pine Plywood 7mm 400mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 400mm x 2.4m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side Walls with Brackets.

1. BU wind = 22 (56 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 23 (58 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side,
90x45 H1.2 SG8 framing, studs at 400mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates,
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

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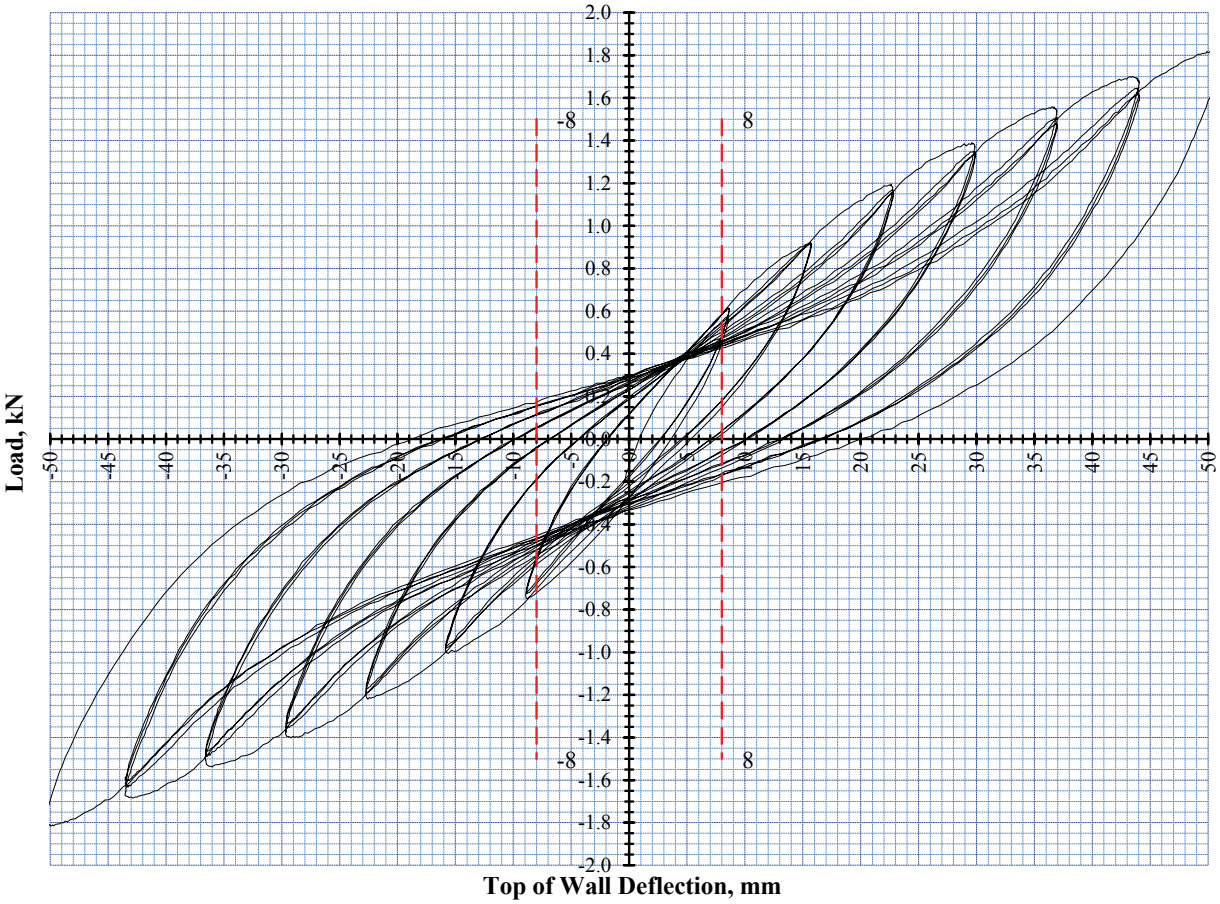

Figure 1: *Wall 289142*

Observations

No obvious signs of failure to framing or plywood

Endless possibilities.

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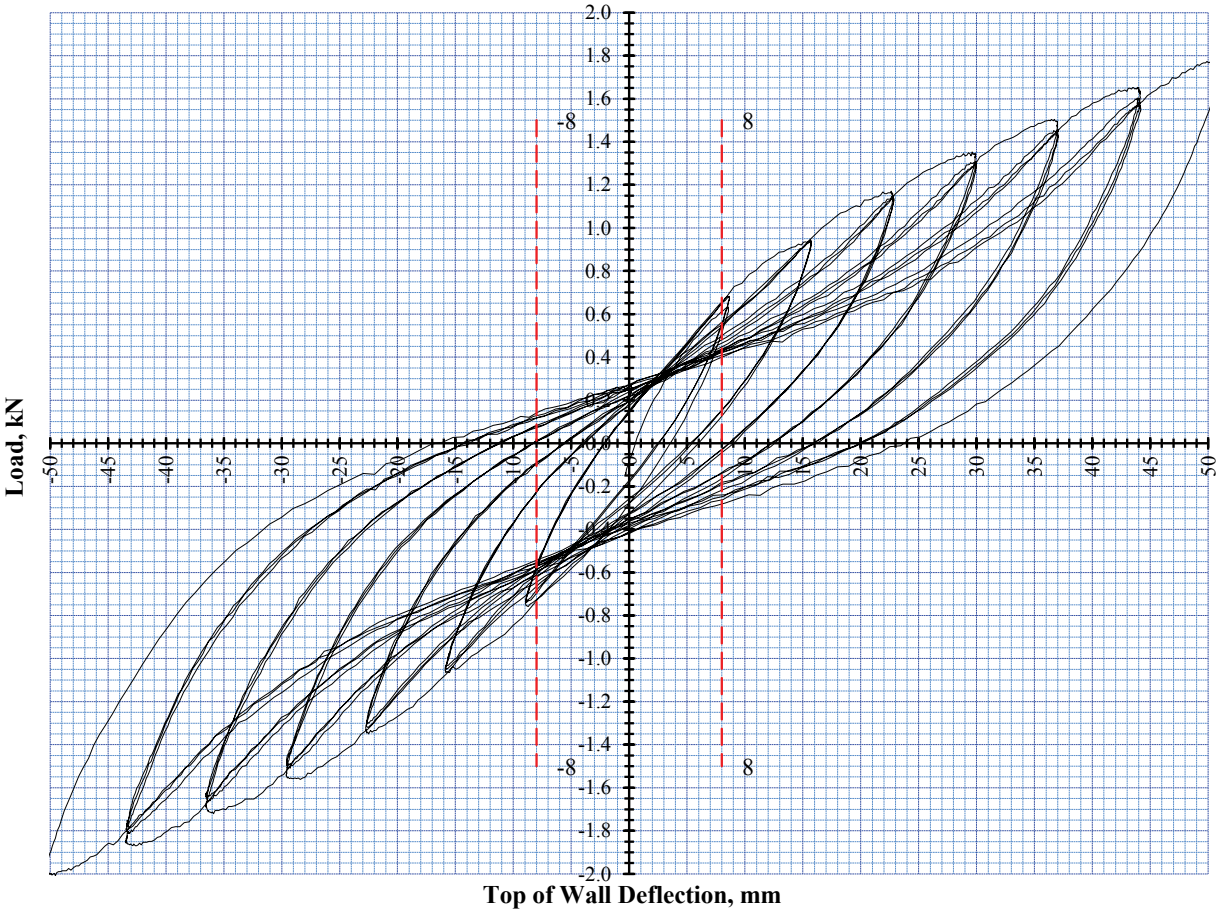

Figure 2: *Wall 289143*

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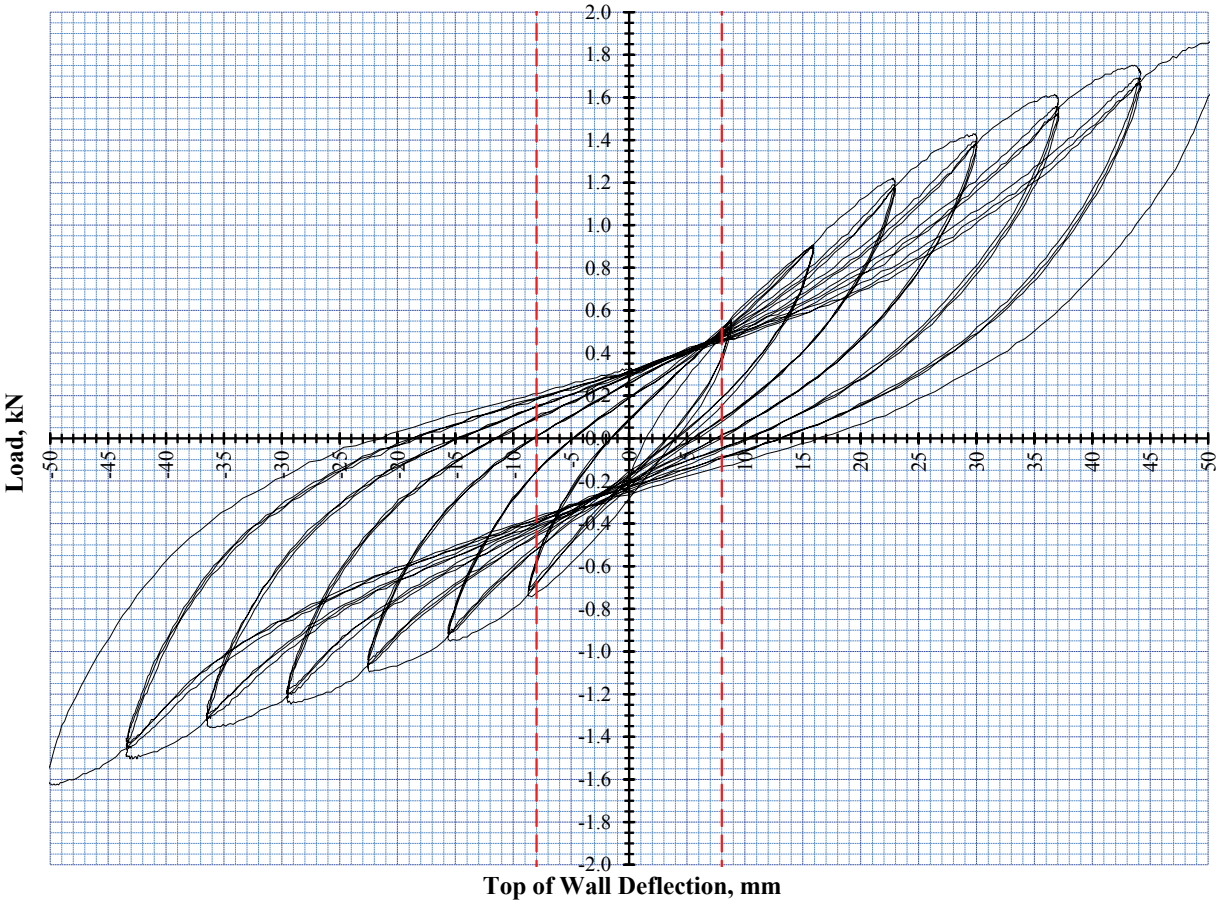

Figure 3: *Wall 289144*

Endless possibilities.

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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

400mm, bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side
90x45 H1.2 SG8 framing, studs at 400mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	58 (U)	BU/m
Wind	56 (S)	BU/m

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	30-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

Lab Number	Direction	Serviceability Cycles: Cycle to H/300 or DLQ or DLW 8.0 Loads (P_8) kN	X mm Residual Defln, C mm	Ultimate Cycles: Cycle to Displacement y=(mm) Maximum Load P(kN)	def @ P y (mm)	P/2 (kN)	Wall dimensions L(mm) 400 d at P/2 d mm	H(mm) 2410 4th, R kN
289142	+	0.58	2.70	1.55	36.0	0.78	11.6	1.44
	-	0.73	1.80	1.53	36.0			1.45
289143	+	0.67	2.40	1.50	36.0	0.75	9.7	1.40
	-	0.73	2.00	1.72	36.0			1.65
289144	+	0.52	3.20	1.60	36.0	0.80	13.3	1.47
	-	0.72	1.60	1.35	36.0			1.27
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		0.66	2.28	1.54	36.00	0.78	11.53	1.45
Coefficient of Variation %		12.32	24.04	7.20	0.00	2.63	12.75	7.75

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.12
Ductility Modification factor K4 = 0.80
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's Lab Number		K1 (= 1.4 - C/X)	EQ ultimate BU's	EQ service BU's	Wind Ultimate BU's	Wind Service BU's
289142	(BU)	1.00	23.1	28.6	30.8	22.1
	(BU/m)		58	71	77	55
289143	(BU)	1.00	24.4	30.5	32.2	23.7
	(BU/m)		61	76	81	59
289144	(BU)	1.00	21.9	27.1	29.5	21.0
	(BU/m)		55	68	74	52
<20% Result Check		*289142*	*0% Ok result*	*-1% Ok result*	*0% Ok result*	*-1% Ok result*
		289143	*8% Ok result*	*9% Ok result*	*6% Ok result*	*9% Ok result*
		289144	*-8% Ok result*	*-9% Ok result*	*-7% Ok result*	*-9% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**23**	(P8 x K1) x (K2/0.55) =	**29**
	58	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**31**	(P8 x K1) x (K2/0.71) =	**22**
	56	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 400mm x 2.40m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® AraucoPly®
DD F8 Structural Pine Plywood
7mm 600mm Wall, Brackets

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

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New Zealand
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Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi AraucoPly DD F8 Structural Pine Plywood 7mm 600mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 600mm x 2.4m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side Walls with Brackets.

1. BU wind = 43 (72 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 48 (80 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates,
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
USE OF NAME: The Client will not use Scion's name in association with the sale and/or marketing of any goods or services

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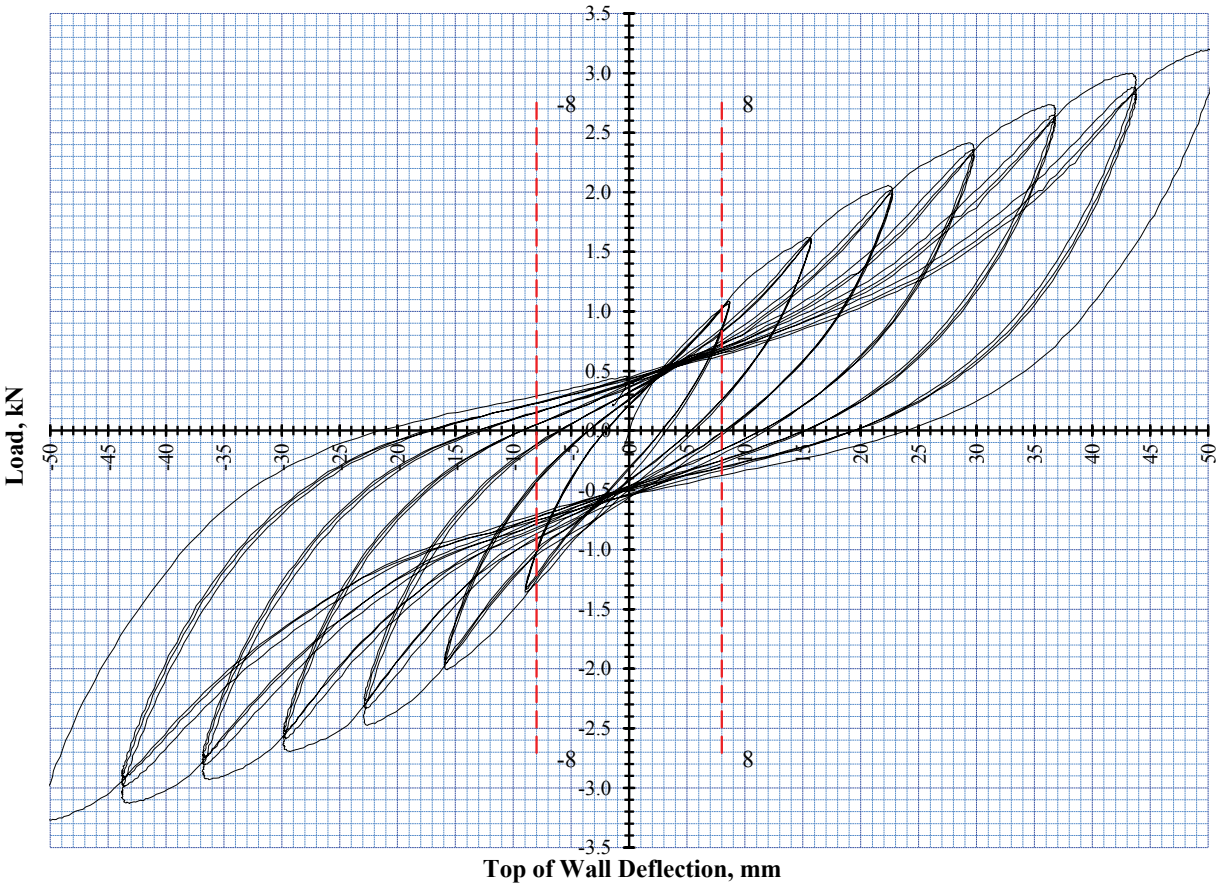

Figure 1: *Wall 289139*

Observations

No obvious signs of failure to framing or plywood

Endless possibilities.

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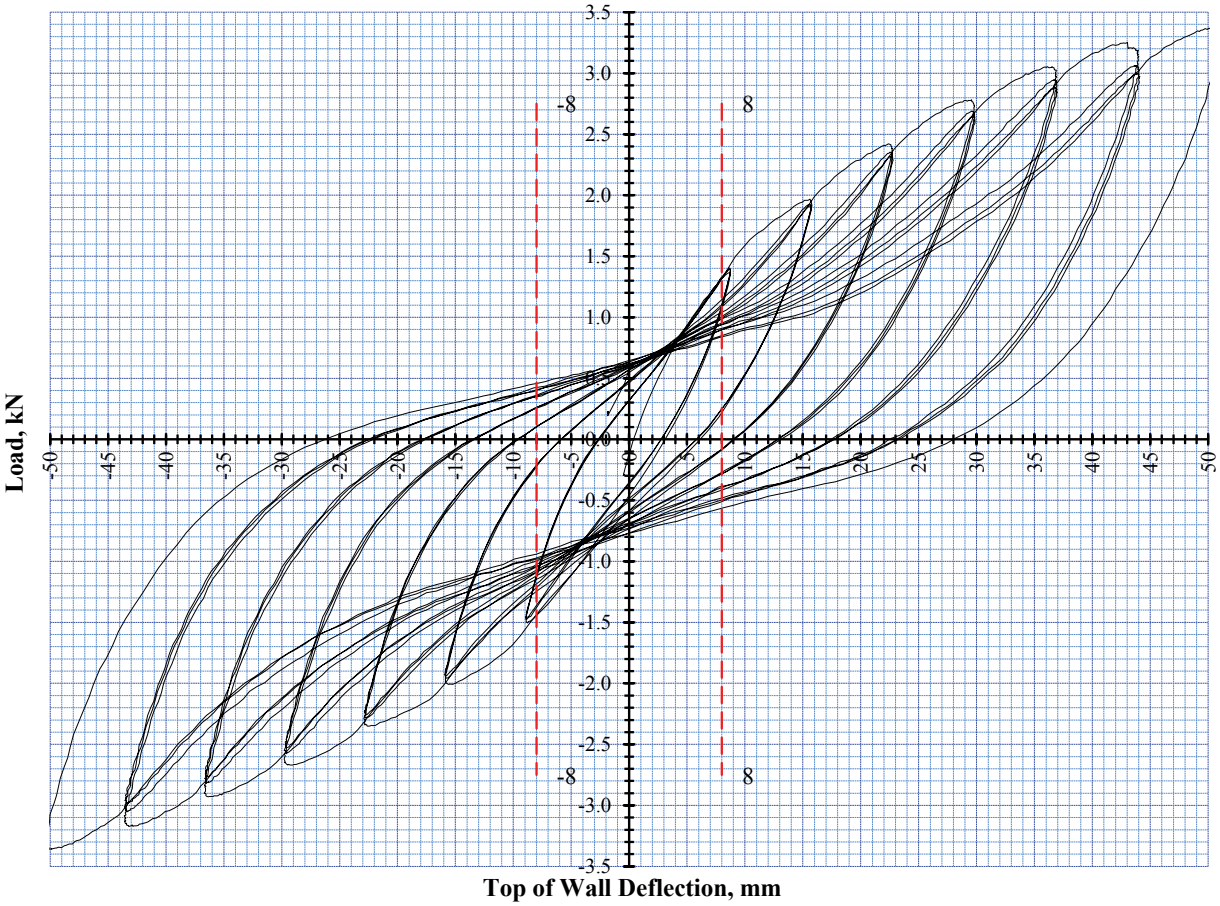

Figure 2: *Wall 289140*

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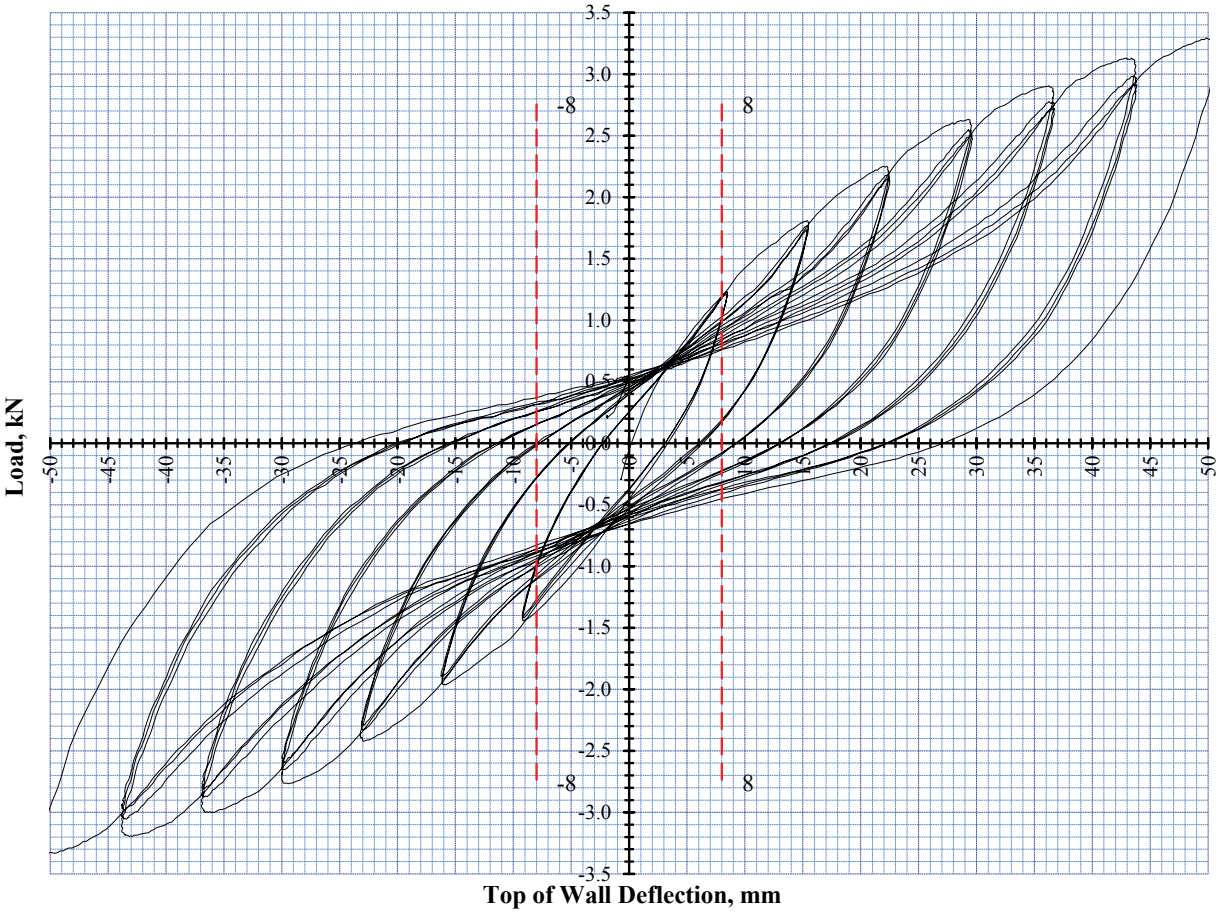

Figure 3: *Wall 289141*

Endless possibilities.

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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

600mm, bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	80 (U)	BU/m
Wind	72 (S)	BU/m

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	30-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

Lab Number	Direction	Serviceability Cycles: Cycle to H/300 or DLQ or DLW 8.0 Loads (P_8) kN	X mm Residual Defln, C mm	Ultimate Cycles: Cycle to Displacement y=(mm) Maximum Load P(kN)	def @ P y (mm)	P/2 (kN)	Wall dimensions L(mm) 600 d at P/2 d mm	H(mm) 2410 4th, R kN
289139	+	1.03	2.80	2.73	36.0	1.37	11.7	2.55
	-	1.28	2.00	2.93	36.0			2.69
289140	+	1.34	2.80	3.05	36.0	1.53	9.4	2.83
	-	1.44	2.60	2.93	36.0			2.73
289141	+	1.20	3.00	2.80	36.0	1.40	9.6	2.69
	-	1.37	2.20	3.00	36.0			2.75
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		1.28	2.57	2.91	36.00	1.43	10.23	2.71
Coefficient of Variation %		10.42	13.81	3.79	0.00	4.80	10.17	3.12

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.52
Ductility Modification factor K4 = 0.88
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's Lab Number		K1 (= 1.4 - C/X)	EQ ultimate BU's	EQ service BU's	Wind Ultimate BU's	Wind Service BU's
289139	(BU)	1.00	46.2	50.4	56.6	39.0
	(BU/m)		77	84	94	65
289140	(BU)	1.00	49.0	60.7	59.8	47.0
	(BU/m)		82	101	100	78
289141	(BU)	1.00	48.0	56.1	58.0	43.4
	(BU/m)		80	93	97	72
<20% Result Check		*289139*	*-5% Ok result*	*-16% Ok result*	*-4% Ok result*	*-16% Ok result*
		289140	*4% Ok result*	*12% Ok result*	*4% Ok result*	*12% Ok result*
		289141	*1% Ok result*	*1% Ok result*	*0% Ok result*	*1% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**48**	(P8 x K1) x (K2/0.55) =	**56**
	80	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**58**	(P8 x K1) x (K2/0.71) =	**43**
	72	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 600mm x 2.40m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

–

bbi® AraucoPly®

DD F8 Structural Pine Plywood 7mm 1200mm Wall, Brackets

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

Te Papa Tipu Innovation Park
49 Sala Street
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DDI: +64 7 343 5763
Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi AraucoPly DD F8 Structural Pine Plywood 7mm 1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side Walls with Brackets.

1. BU wind = 112 (93 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 120 (100 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
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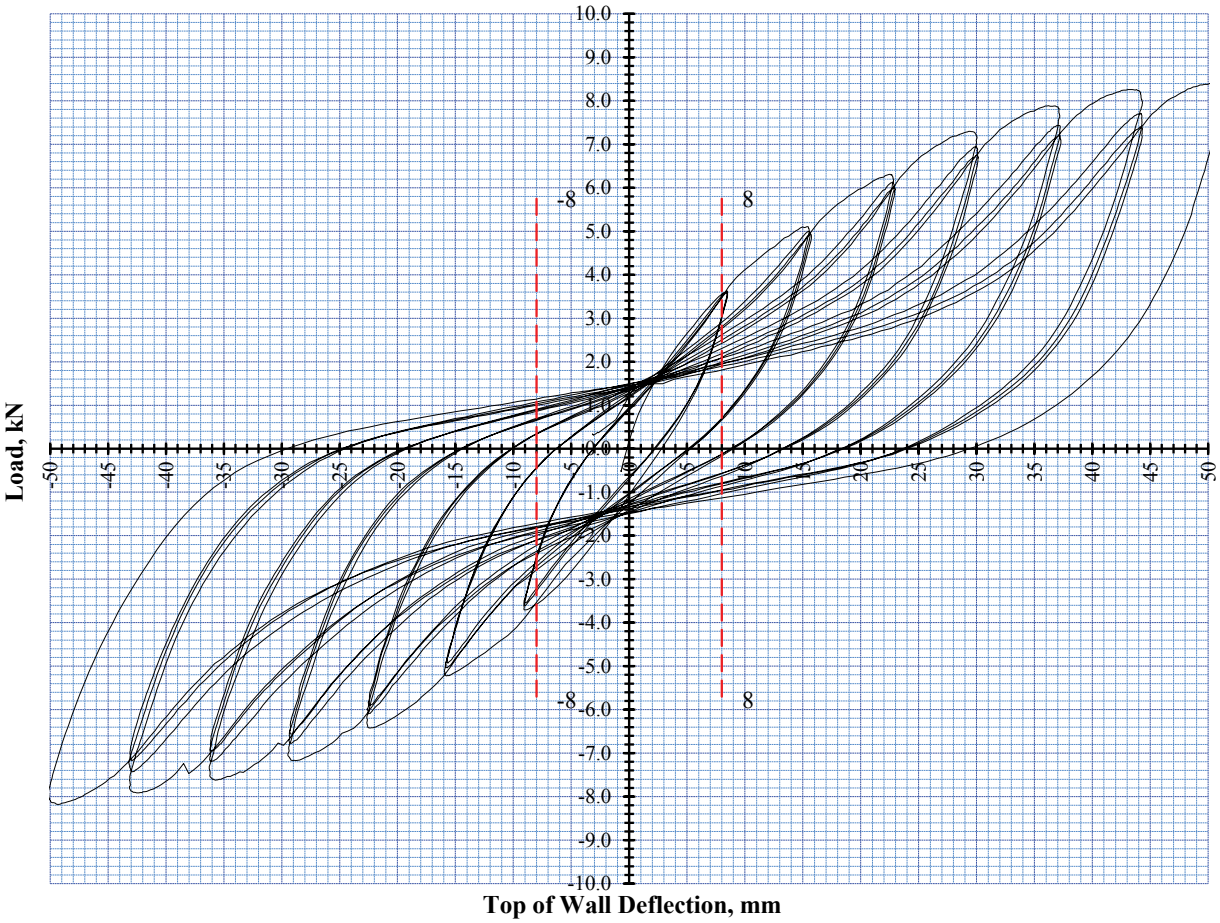

Figure 1: *Wall 289133*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

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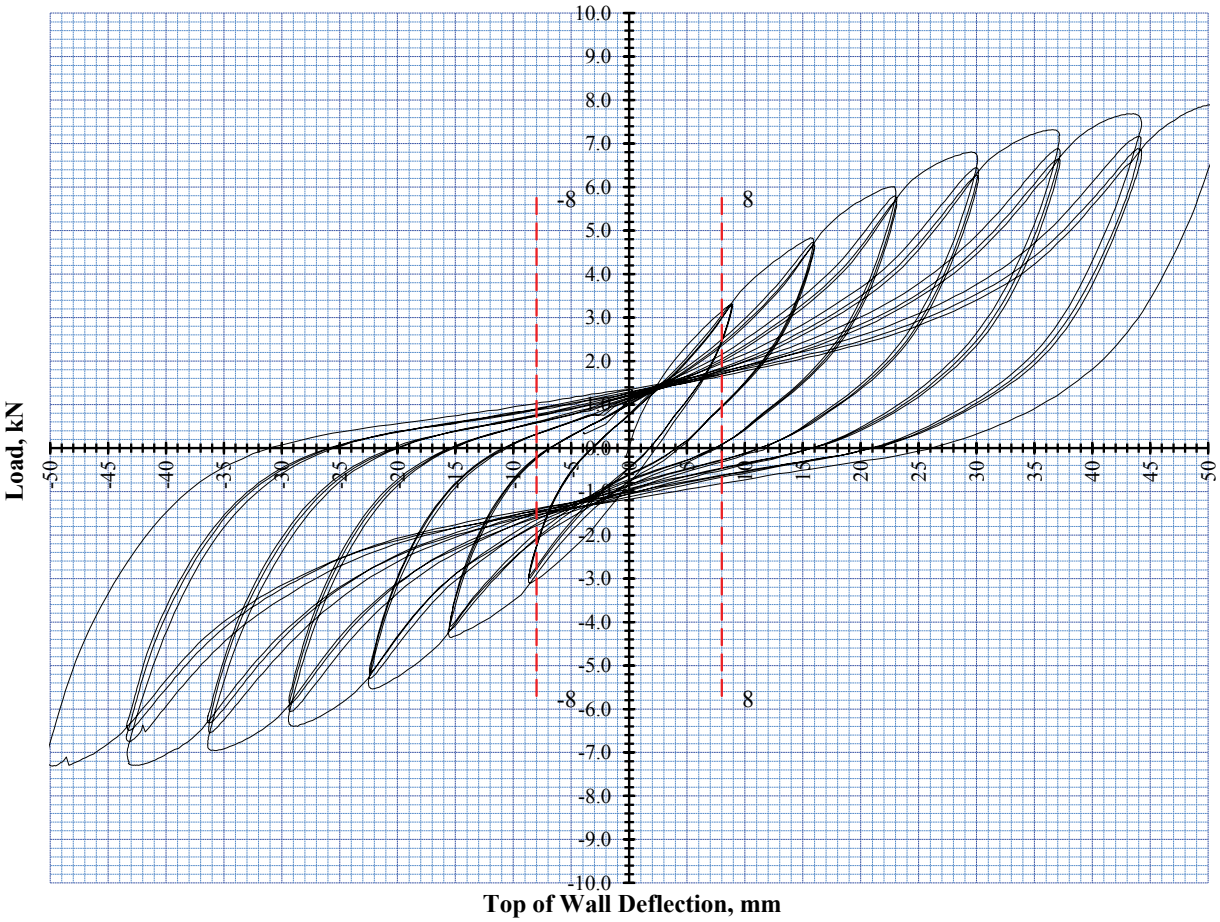

Figure 2: *Wall 289134*

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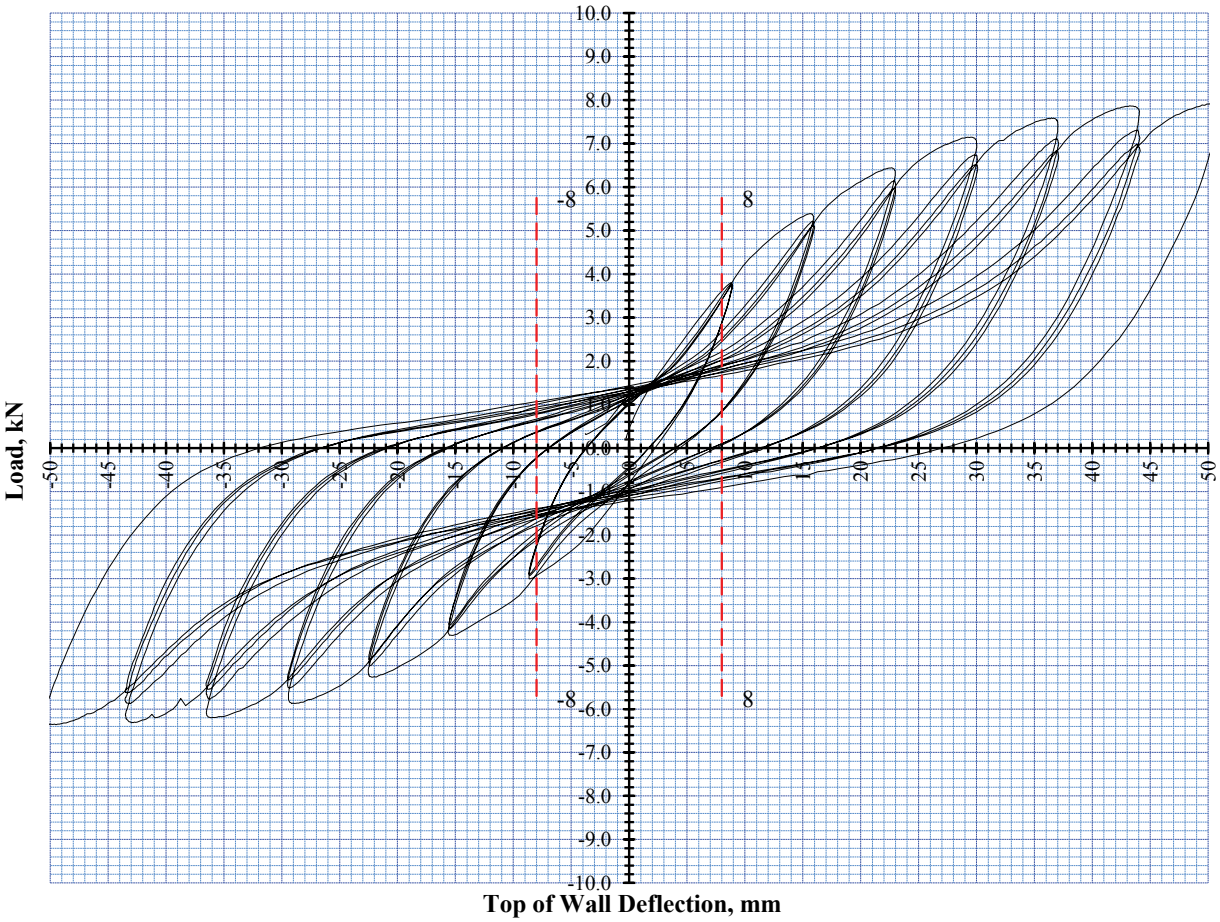

Figure 3: *Wall 289135*

Endless possibilities.

Building Consent BC230758.02
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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	100 (U)	BU/m
Wind	93 (S)	BU/m

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	25-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2410
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th, R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
289133	+	3.55	2.10	7.87	36.0	3.94	9.5	6.80
	-	3.58	3.10	7.80	36.0			6.95
289134	+	3.12	1.70	7.30	36.0	3.65	9.7	6.22
	-	3.04	3.10	6.96	36.0			6.18
289135	+	3.62	1.60	7.55	36.0	3.78	9.0	6.50
	-	2.93	3.60	6.19	36.0			5.35
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		3.31	2.53	7.28	36.00	3.79	9.40	6.33
Coefficient of Variation %		8.55	30.29	7.90	0.00	3.08	3.13	8.23

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.83
Ductility Modification factor K4 = 0.95
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		K1	EQ ultimate	EQ service	Wind Ultimate	Wind Service
Lab Number		(= 1.4 - C/X)	BU's	BU's	BU's	BU's
289133	(BU)	1.00	130.1	155.6	156.7	120.5
	(BU/m)		108	130	131	100
289134	(BU)	1.00	117.3	134.4	142.6	104.1
	(BU/m)		98	112	119	87
289135	(BU)	1.00	112.1	142.9	137.4	110.7
	(BU/m)		93	119	115	92
<20% Result Check		*289133*	*12% Ok result*	*11% Ok result*	*11% Ok result*	*11% Ok result*
		289134	*-3% Ok result*	*-11% Ok result*	*-3% Ok result*	*-11% Ok result*
		289135	*-10% Ok result*	*-1% Ok result*	*-9% Ok result*	*-1% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**120**	(P8 x K1) x (K2/0.55) =	**144**
	100	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**146**	(P8 x K1) x (K2/0.71) =	**112**
	93	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi AraucoPly DD F8 Structural Pine Plywood 7mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® Redline®
Poplar Core Plywood 9mm
1200mm Wall, Brackets

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

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Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi RedLine Poplar Core Plywood 9mm 1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4mm bbi RedLine Poplar Core Plywood 9mm one side Walls with Brackets.

1. BU wind = 130 (109 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 133 (111 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi RedLine Poplar Core Plywood 9mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

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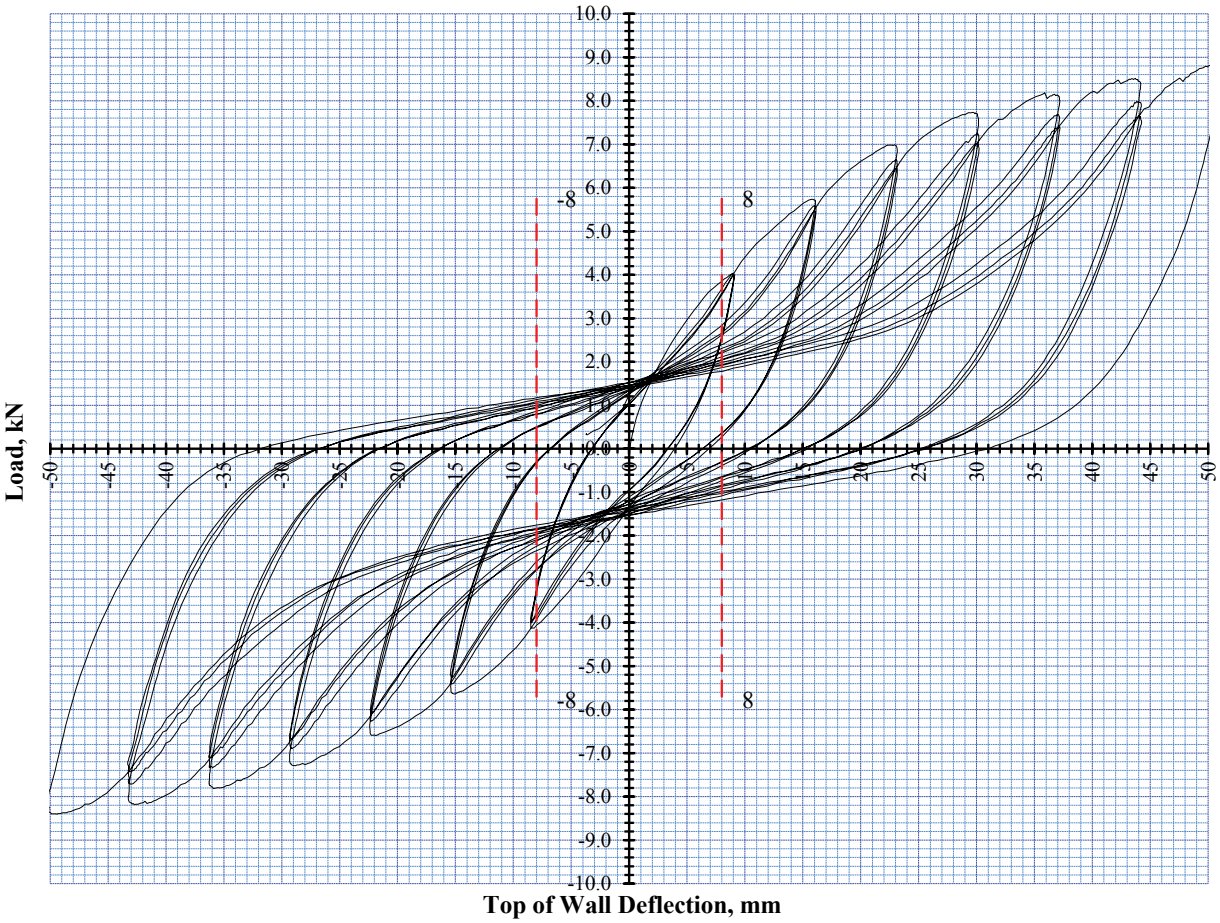

Figure 1: *Wall 289136*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

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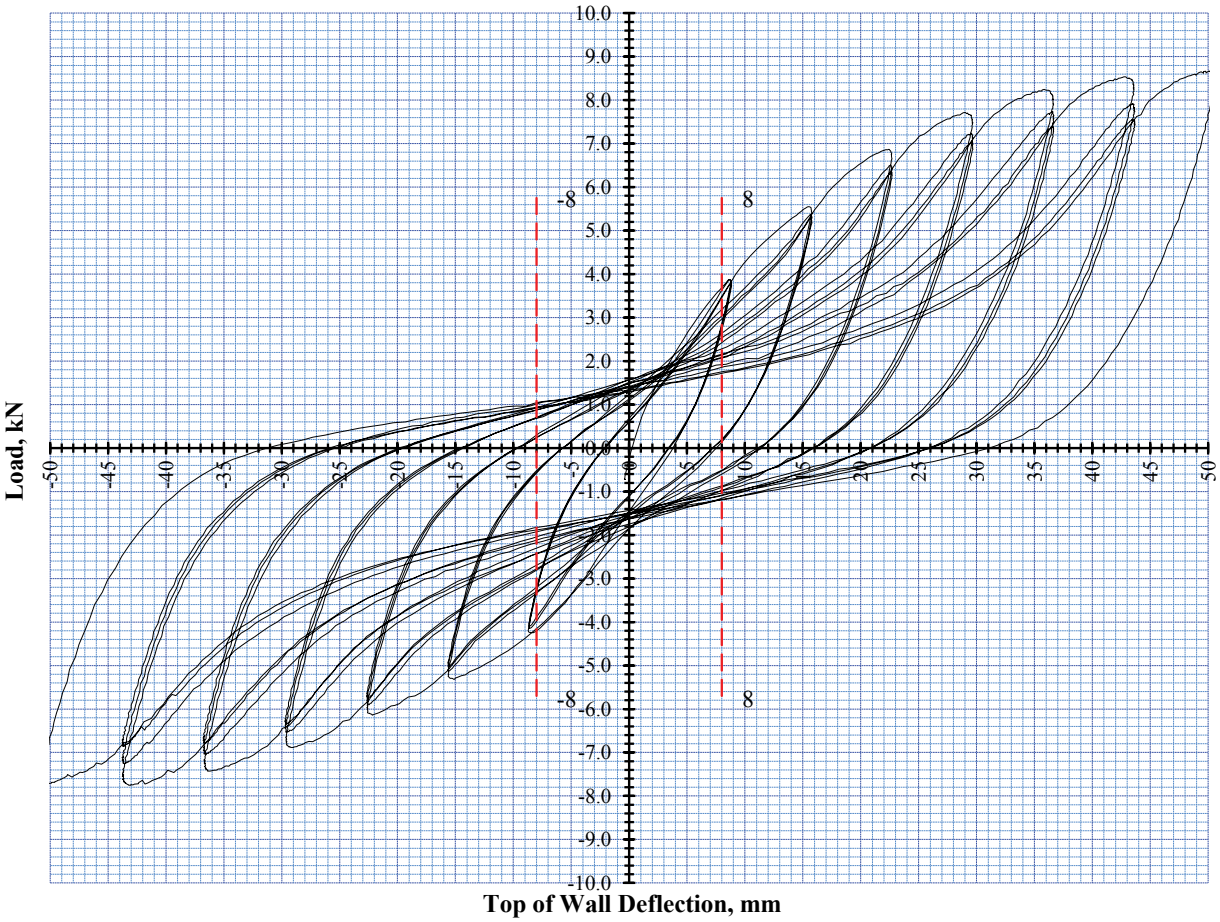

Figure 2: *Wall 289137*

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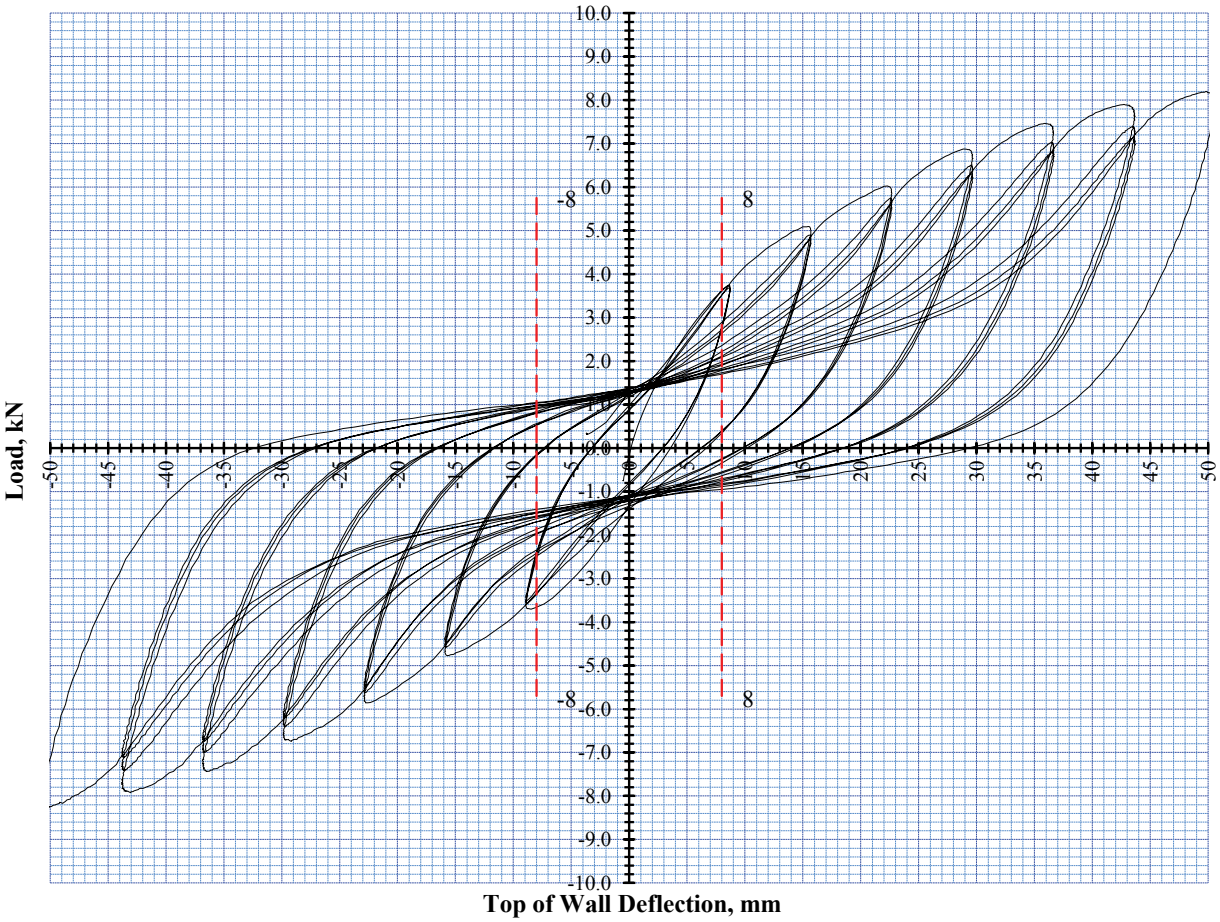

Figure 3: *Wall 289138*

Endless possibilities.

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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, bbi RedLine Poplar Core Plywood 9mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	**111 (U)**	**BU/m**
Wind	**109 (S)**	**BU/m**

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	26-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2410
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th, R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
289136	+	3.83	3.30	8.10	36.0	4.05	9.1	6.97
	-	4.07	3.20	7.80	36.0			7.00
289137	+	3.85	2.90	8.22	36.0	4.11	9.5	7.20
	-	4.08	2.50	7.41	36.0			6.60
289138	+	3.65	2.80	7.45	36.0	3.73	8.5	6.62
	-	3.67	3.10	7.40	36.0			6.45
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		3.86	2.97	7.73	36.00	3.96	9.03	6.81
Coefficient of Variation %		4.41	9.06	4.33	0.00	4.27	4.55	3.90

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.99
Ductility Modification factor K4 = 0.98
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		**K1**	**EQ ultimate**	**EQ service**	**Wind Ultimate**	**Wind Service**
Lab Number		**(= 1.4 - C/X)**	**BU's**	**BU's**	**BU's**	**BU's**
289136	(BU)	1.00	136.7	171.6	159.0	132.9
	(BU/m)		114	143	133	111
289137	(BU)	1.00	135.0	173.0	156.3	134.0
	(BU/m)		113	144	130	112
289138	(BU)	1.00	127.9	159.7	148.5	123.7
	(BU/m)		107	133	124	103
		289136	*4% Ok result*	*3% Ok result*	*4% Ok result*	*3% Ok result*
<20% Result Check		*289137*	*2% Ok result*	*4% Ok result*	*2% Ok result*	*4% Ok result*
		289138	*-6% Ok result*	*-8% Ok result*	*-6% Ok result*	*-8% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**133**	(P8 x K1) x (K2/0.55) =	**168**
	111	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**155**	(P8 x K1) x (K2/0.71) =	**130**
	109	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi RedLine Poplar Core Plywood 9mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® Redline®
Poplar Core Plywood 12mm
1200mm Wall, Brackets

Endless possibilities.

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49 Sala Street
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Rotorua
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Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi RedLine Poplar Core Plywood 12mm 1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4m bbi RedLine Poplar Core Plywood 12mm one side Walls with Brackets.

1. BU wind = 121 (101 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 130 (108 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi RedLine Poplar Core Plywood 12mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
USE OF NAME: The Client will not use Scion's name in association with the sale and/or marketing of any goods or services

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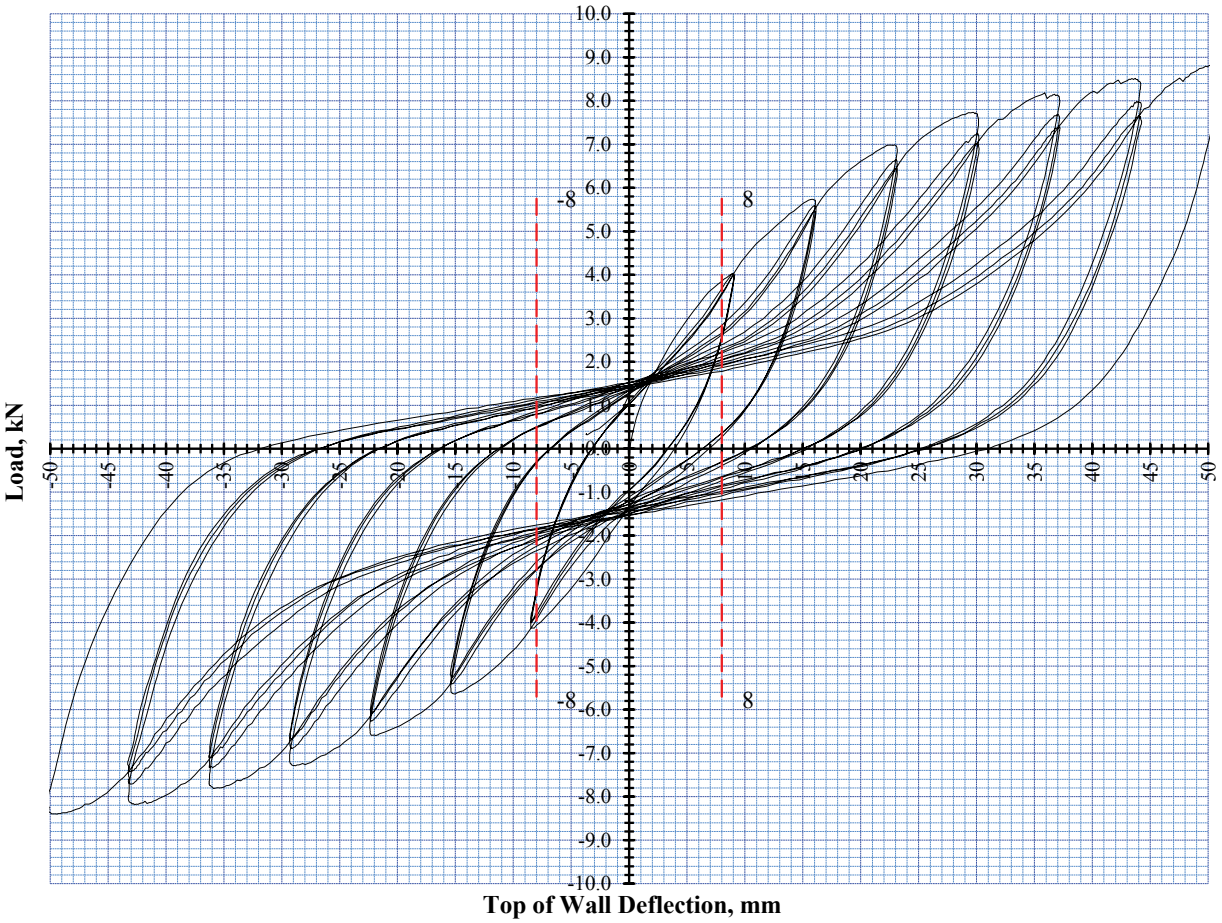

Figure 1: *Wall 289136*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

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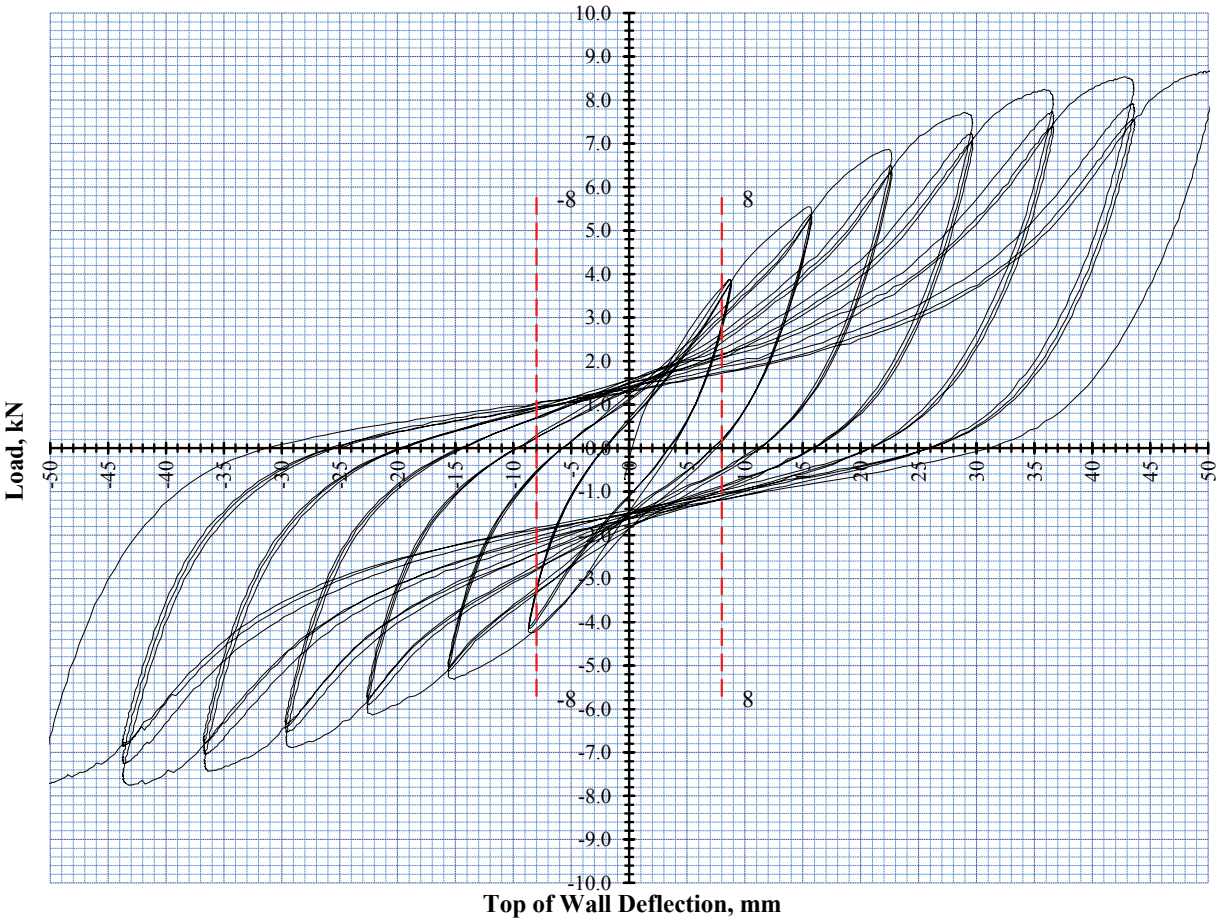

Figure 2: *Wall 289137*

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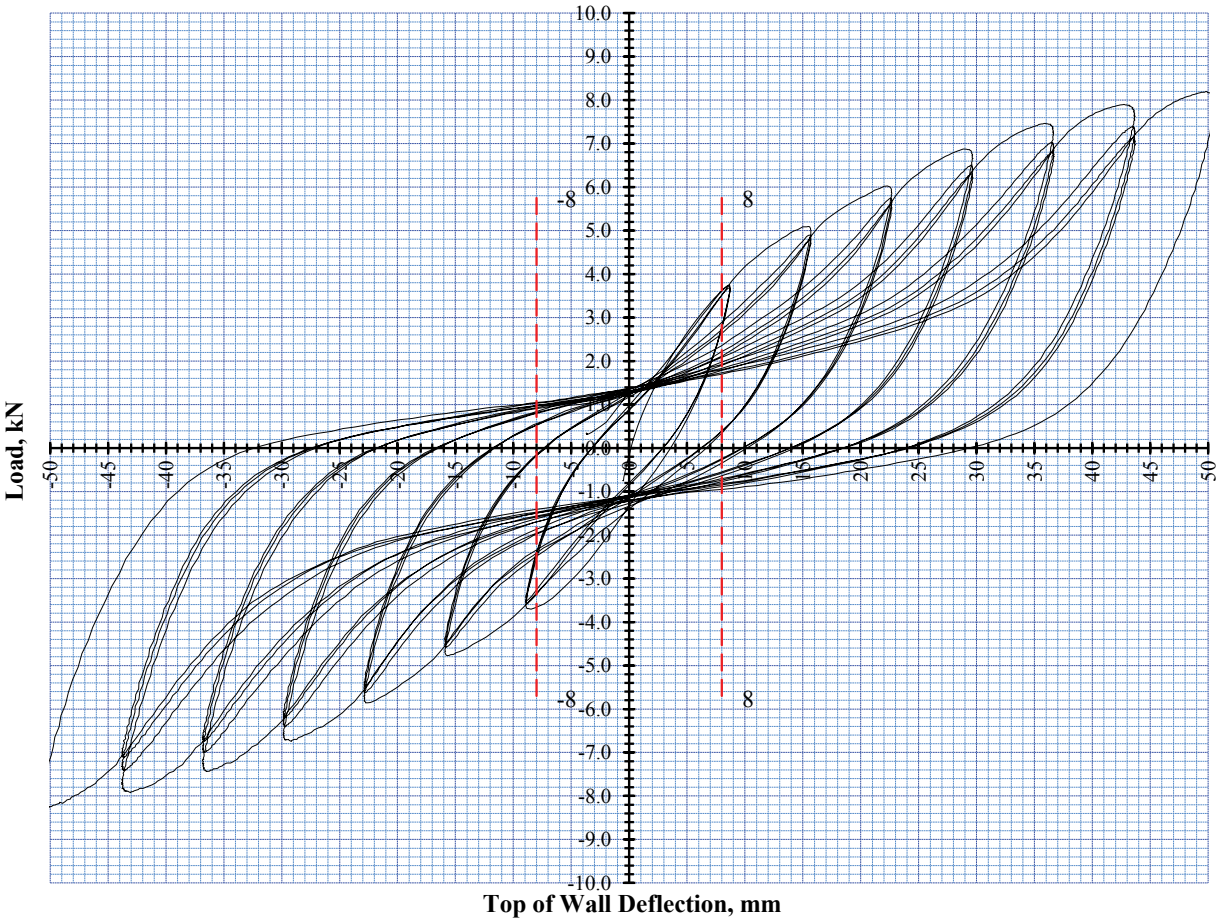

Figure 3: *Wall 289138*

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, bbi RedLine Poplar Core Plywood 9mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	**111 (U)**	**BU/m**
Wind	**109 (S)**	**BU/m**

Date of test:-	25-May-22	Ship No.	3251	Tested by John Lee
Date of calc's:-	26-May-22	Job No.	TE21-068	Analysed by Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2410
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th, R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
289136	+	3.83	3.30	8.10	36.0	4.05	9.1	6.97
	-	4.07	3.20	7.80	36.0			7.00
289137	+	3.85	2.90	8.22	36.0	4.11	9.5	7.20
	-	4.08	2.50	7.41	36.0			6.60
289138	+	3.65	2.80	7.45	36.0	3.73	8.5	6.62
	-	3.67	3.10	7.40	36.0			6.45
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		3.86	2.97	7.73	36.00	3.96	9.03	6.81
Coefficient of Variation %		4.41	9.06	4.33	0.00	4.27	4.55	3.90

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.99
Ductility Modification factor K4 = 0.98
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		**K1**	**EQ ultimate**	**EQ service**	**Wind Ultimate**	**Wind Service**
Lab Number		**(= 1.4 - C/X)**	**BU's**	**BU's**	**BU's**	**BU's**
289136	(BU)	1.00	136.7	171.6	159.0	132.9
	(BU/m)		114	143	133	111
289137	(BU)	1.00	135.0	173.0	156.3	134.0
	(BU/m)		113	144	130	112
289138	(BU)	1.00	127.9	159.7	148.5	123.7
	(BU/m)		107	133	124	103
		289136	*4% Ok result*	*3% Ok result*	*4% Ok result*	*3% Ok result*
<20% Result Check		*289137*	*2% Ok result*	*4% Ok result*	*2% Ok result*	*4% Ok result*
		289138	*-6% Ok result*	*-8% Ok result*	*-6% Ok result*	*-8% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**133**	(P8 x K1) x (K2/0.55) =	**168**
	111	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**155**	(P8 x K1) x (K2/0.71) =	**130**
	109	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi RedLine Poplar Core Plywood 9mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® Redline®
Premium Hardwood Core Plywood 12mm 1200mm Wall, Brackets

Endless possibilities.

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Received 14/02/2024

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Rotorua
New Zealand
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DDI: +64 7 343 5763
Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi RedLine Premium Hardwood Core Plywood 12mm1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4m bbi RedLine Premium Hardwood Core Plywood 12mm one side Walls with Brackets.

1. BU wind = 134 (112 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 157 (131 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi RedLine Premium Hardwood Core Plywood 12mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
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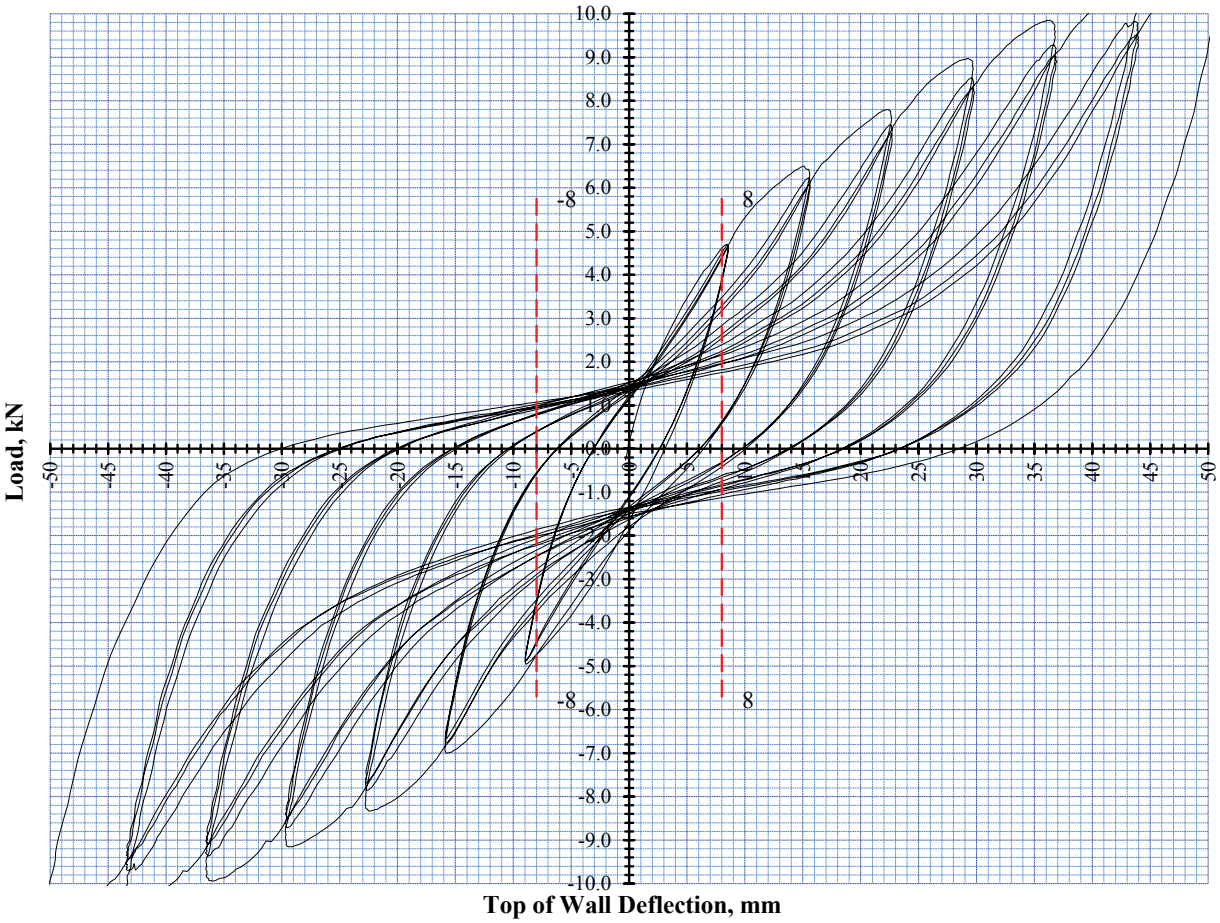

Figure 1: *Wall 289124*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

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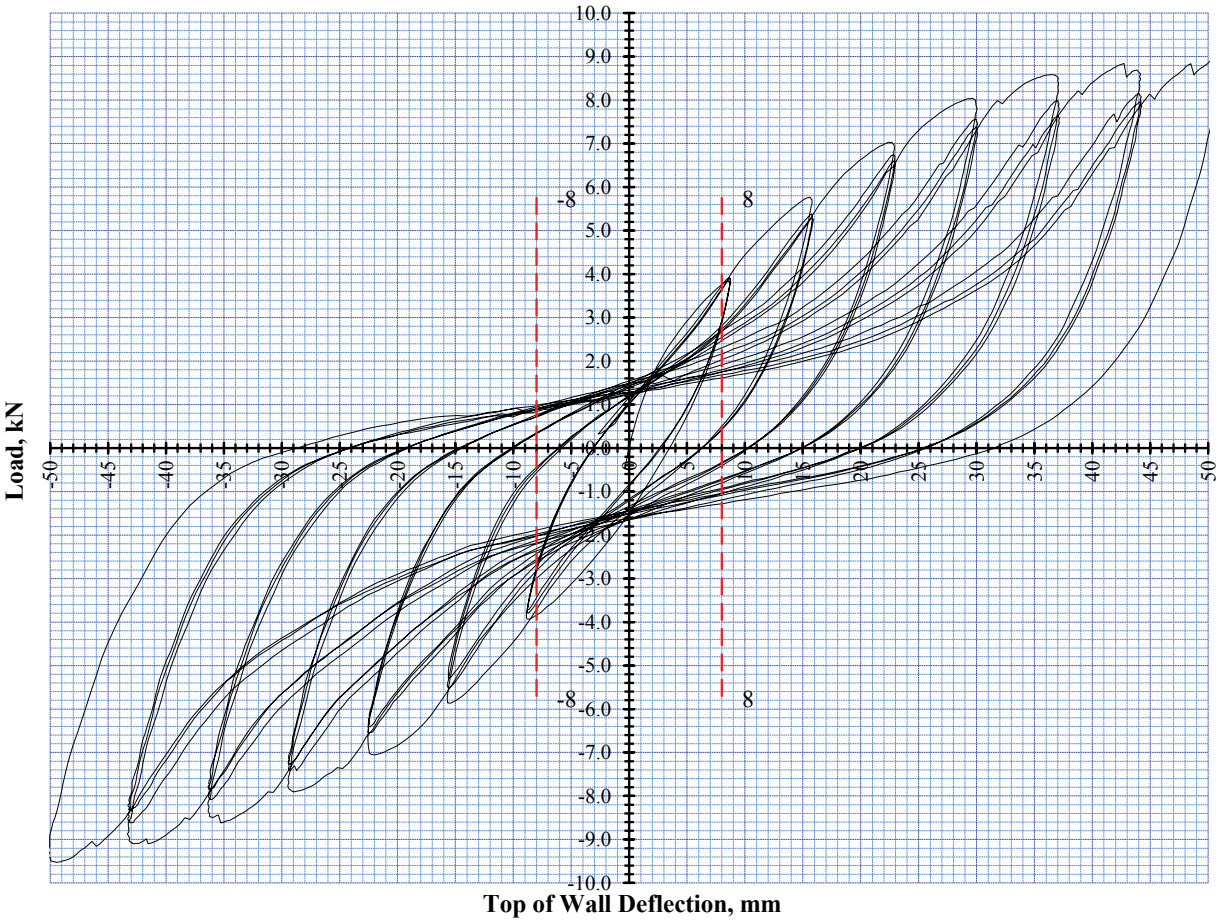

Figure 2: *Wall 289125*

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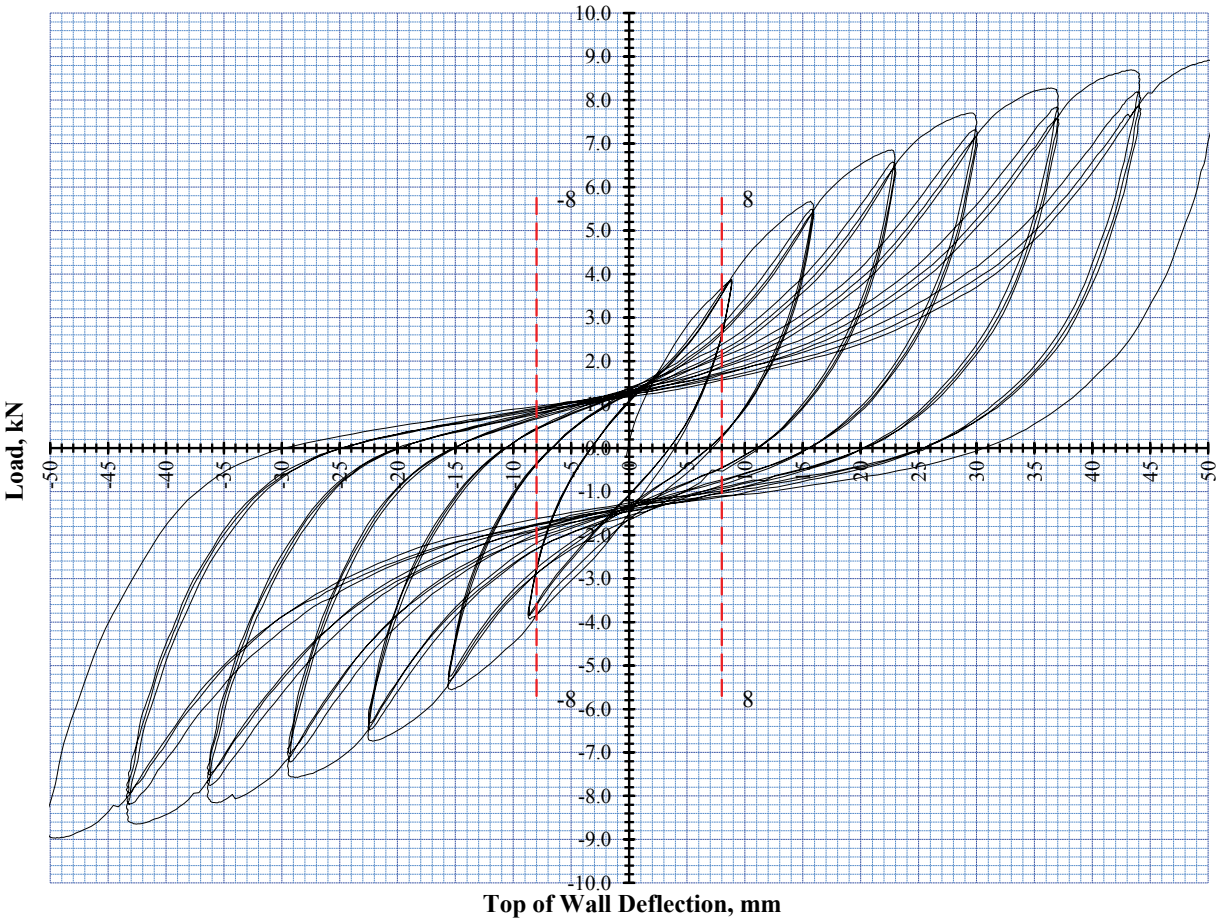

Figure 3: *Wall 289126*

Endless possibilities.

Building Consent BC230758.02
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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, bbi RedLine Premium Hardwood Core Plywood 12mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	**131 (U)**	**BU/m**
Wind	**112 (S)**	**BU/m**

Date of test:-		**24-May-22**	Ship No.	**3251**		Tested by	John Lee
Date of calc's:-		**24-May-22**	Job No.	**TE21-068**		Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2410
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th, R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
289124	**+**	**4.45**	**3.10**	**9.80**	**36.0**	4.90	**7.4**	**8.50**
	-	**4.97**	**2.50**	**9.96**	**36.0**			**9.00**
289125	**+**	**3.75**	**2.50**	**8.60**	**36.0**	4.30	**9.5**	**7.18**
	-	**3.86**	**3.10**	**8.48**	**36.0**			**7.80**
289126	**+**	**3.68**	**3.40**	**8.25**	**36.0**	4.13	**7.4**	**7.20**
	-	**3.80**	**3.30**	**8.15**	**36.0**			**7.48**
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		4.09	2.98	8.87	36.00	4.44	8.10	7.86
Coefficient of Variation %		11.50	11.99	8.21	0.00	7.47	12.22	8.62

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 4.44
Ductility Modification factor K4 = 1.00
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		**K1**	**EQ ultimate**	**EQ service**	**Wind Ultimate**	**Wind Service**
Lab Number		**(= 1.4 - C/X)**	**BU's**	**BU's**	**BU's**	**BU's**
289124	(BU)	1.00	175.0	205.5	197.6	159.2
	(BU/m)		146	171	165	133
289125	(BU)	1.00	149.8	166.0	170.8	128.6
	(BU/m)		125	138	142	107
289126	(BU)	0.98	146.8	160.4	164.0	124.3
	(BU/m)		122	134	137	104
		289124	*15% Ok result*	*192.5*	*15% Ok result*	*149.1*
<20% Result Check		*289125*	*-7% Ok result*	*-10% Ok result*	*-6% Ok result*	*-10% Ok result*
		289126	*-11% Ok result*	*-16% Ok result*	*-12% Ok result*	*-16% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**			**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**157**	(P8 x K1) x (K2/0.55) =		**173**
	131	**BU/m**		**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**			**Serviceability**
Wind (BU's)	20 * P =	**177**	(P8 x K1) x (K2/0.71) =		**134**
	112	**BU/m**		**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi RedLine Premium Hardwood Core Plywood 12mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® Blondeline®
Birch Poplar Core Plywood
9mm 1200mm Wall, Brackets

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

Te Papa Tipu Innovation Park
49 Sala Street
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Rotorua
New Zealand
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DDI: +64 7 343 5763
Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi BlondeLine Birch Poplar Core Plywood 9mm 1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4m bbi BlondeLine Birch Poplar Core Plywood 9mm one side Walls with Brackets.

1. BU wind = 123 (102 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 137 (114 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi BlondeLine Birch Poplar Core Plywood 9mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

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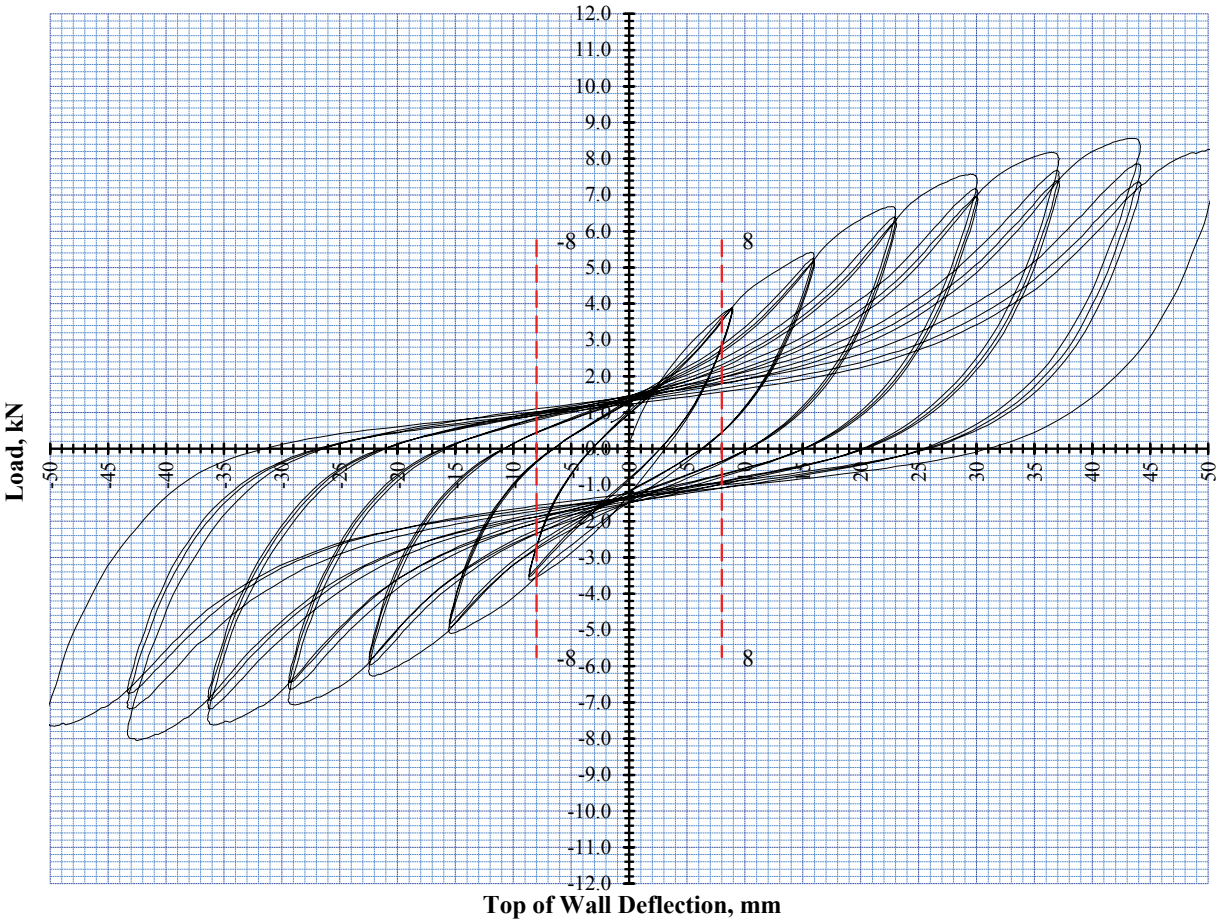

Figure 1: *Wall 289130*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

Building Consent BC230758.02
Received 14/02/2024

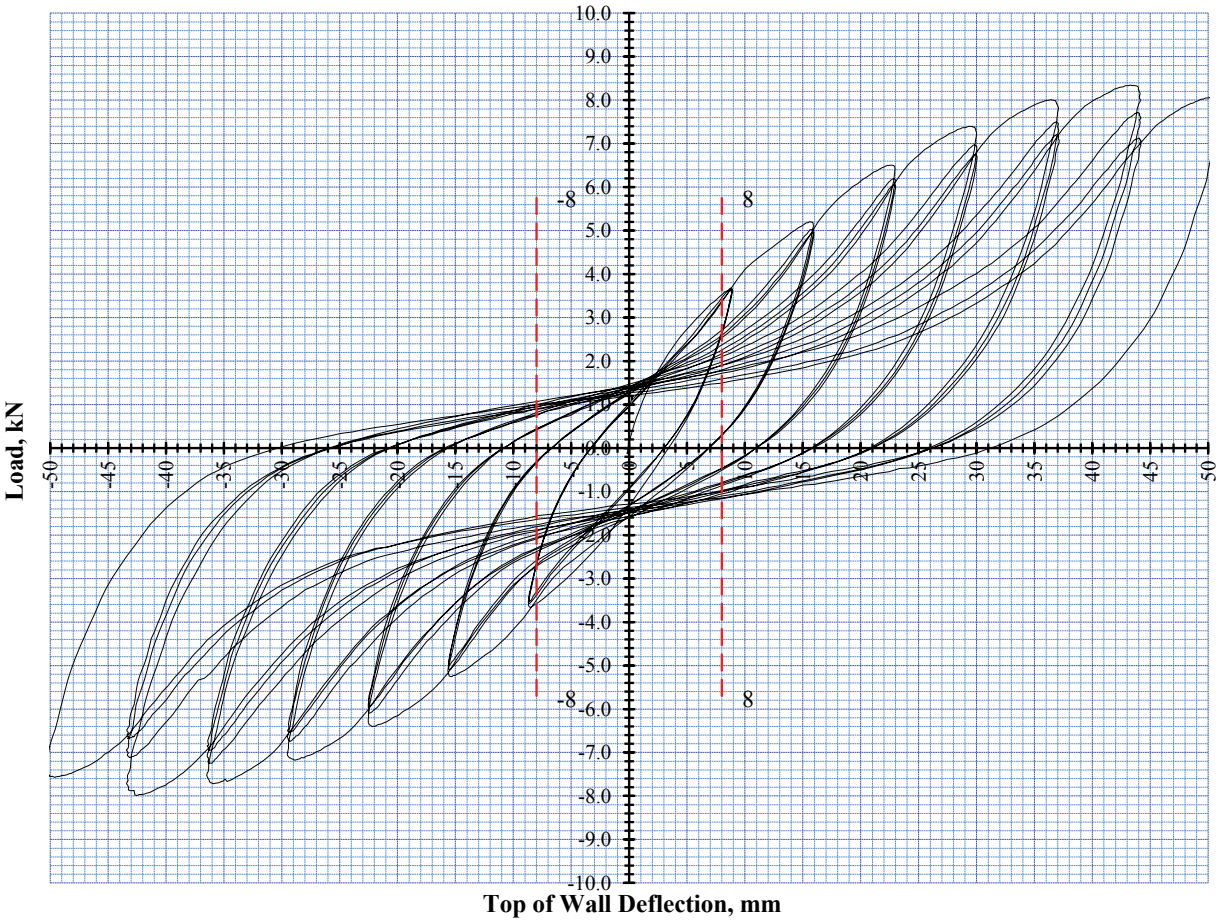

Figure 2: *Wall 289131*

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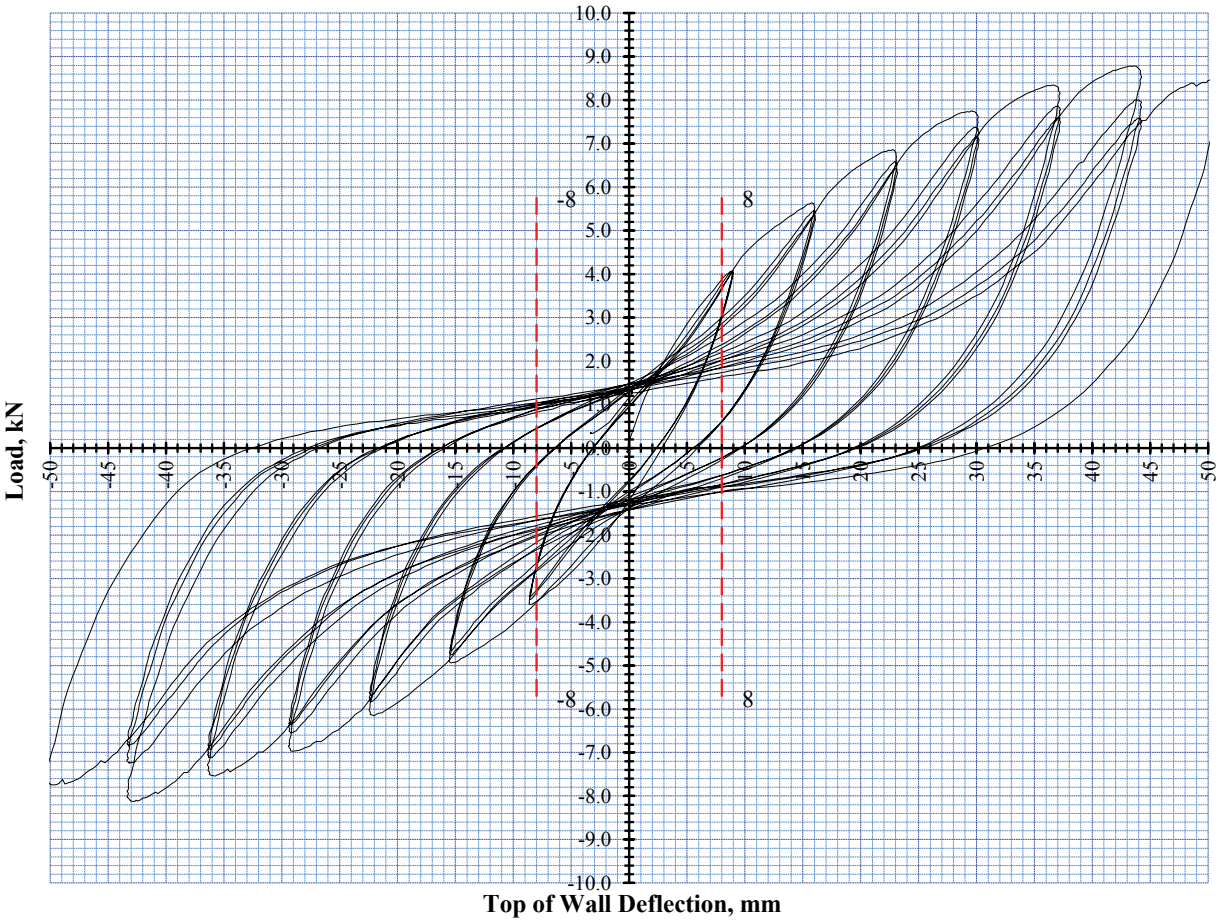

Figure 3: *Wall 289132*

Endless possibilities.

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1200mm, bbi BlondeLine Birch Poplar Core Plywood 9mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	114 (U)	BU/m
Wind	102 (S)	BU/m

Date of test:-	25-May-22	Ship No.	3251	Tested by	John Lee
Date of calc's:-	25-May-22	Job No.	TE21-068	Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

Lab Number	Direction	Serviceability Cycles: Cycle to H/300 or DLQ or DLW 8.0 Loads (P_8) kN	X mm Residual Defln, C mm	Ultimate Cycles: Cycle to Displacement y=(mm) Maximum Load P(kN)	def @ P y (mm)	P/2 (kN)	Wall dimensions L(mm) 1200 d at P/2 d mm	H(mm) 2410 4th, R kN
289130	+	3.70	2.60	8.17	36.0	4.09	7.4	7.00
	-	3.70	3.20	7.61	36.0			6.75
289131	+	3.50	3.00	8.00	36.0	4.00	9.6	6.80
	-	3.55	2.30	7.72	36.0			6.80
289132	+	3.85	2.30	8.33	36.0	4.17	9.1	7.20
	-	3.52	3.20	7.53	36.0			6.58
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		3.64	2.77	7.89	36.00	4.08	8.70	6.86
Coefficient of Variation %		3.43	13.95	3.73	0.00	1.65	10.82	2.87

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 4.14
Ductility Modification factor K4 = 1.00
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		K1	EQ ultimate	EQ service	Wind Ultimate	Wind Service
Lab Number		(= 1.4 - C/X)	BU's	BU's	BU's	BU's
289130	(BU)	1.00	137.5	161.5	157.8	125.1
	(BU/m)		115	135	132	104
289131	(BU)	1.00	136.0	153.8	157.2	119.2
	(BU/m)		113	128	131	99
289132	(BU)	1.00	137.8	160.8	158.6	124.6
	(BU/m)		115	134	132	104
<20% Result Check		*289130*	*0% Ok result*	*3% Ok result*	*0% Ok result*	*3% Ok result*
		289131	*-1% Ok result*	*-5% Ok result*	*-1% Ok result*	*-5% Ok result*
		289132	*1% Ok result*	*2% Ok result*	*1% Ok result*	*2% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**137**	(P8 x K1) x (K2/0.55) =	**159**
	114	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**158**	(P8 x K1) x (K2/0.71) =	**123**
	102	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi BlondeLine Birch Poplar Core Plywood 9mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

bbi wood products

P21 Test Report

bbi® Blondeline®
Birch Poplar Core Plywood
12mm 1200mm Wall, Brackets

Endless possibilities.

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Private Bag 3020
Rotorua
New Zealand
Telephone: +64 7 343 5899
DDI: +64 7 343 5763
Facsimile: +64 7 348 0952
Email: douglas.gaunt@scionresearch.com

Results

To:	Martin Wallace	**From:**	Doug Gaunt
Organisation:	bbi Wood Products	**Subject:**	P21:2010 bbi BlondeLine Birch Poplar Core Plywood 12mm 1200mm Wall, Brackets
Location:	Hastings	**Date:**	30 May 2022
Fax No.:	021 745783	**No. of Pages:**	5
Tel No.:	06 8715539		

Martin

Please find below the P21 bracing results for your three 1200mm x 2.4m bbi BlondeLine Birch Poplar Core Plywood 12mm one side Walls with Brackets.

1. BU wind = 127 (106 BU/m) as limited by the serviceability load capacity.
2. BU Earthquake = 127 (106 BU/m) as limited by the ultimate load capacity.

Figures 1, 2 & 3 show the load deflection plots, Figure 4 shows the P21:2010 calculations.

Wall Construction

bbi BlondeLine Birch Poplar Core Plywood 12mm one side,
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed with 50x2.8mm Galv clouts at 150 centres to end studs and plates, 300mm centres on internal stud
GIB Handibracs brackets used
M12 hold down bolts to bottom plate and brackets
P21 Supplementary restraints used.

RISK AND LIMITATION OF LIABILITY: Scion's liability to the Client arising out of all claims for any loss or damage resulting from this work will not exceed in aggregate an amount equal to two times the Service Fees actually paid by the Client to Scion. Scion will not be liable in any event for loss of profits or any indirect, consequential or special loss or damage suffered or incurred by the Client as a result of any act or omission of Scion under this Agreement.
USE OF NAME: The Client will not use Scion's name in association with the sale and/or marketing of any goods or services

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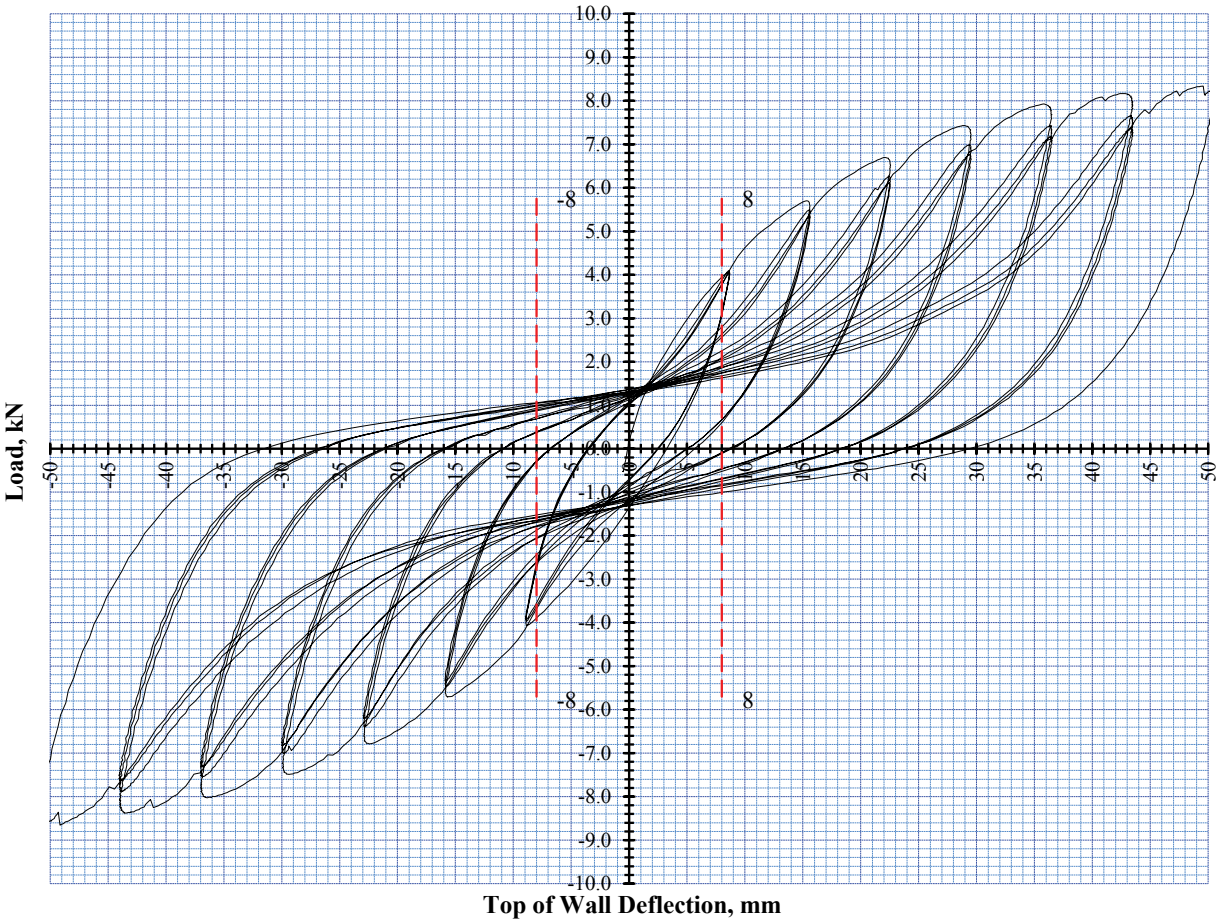

Figure 1: *Wall 289127*

Observations

No obvious signs of failure to framing or plywood
Plywood pulling on bottom plate nails.

Endless possibilities.

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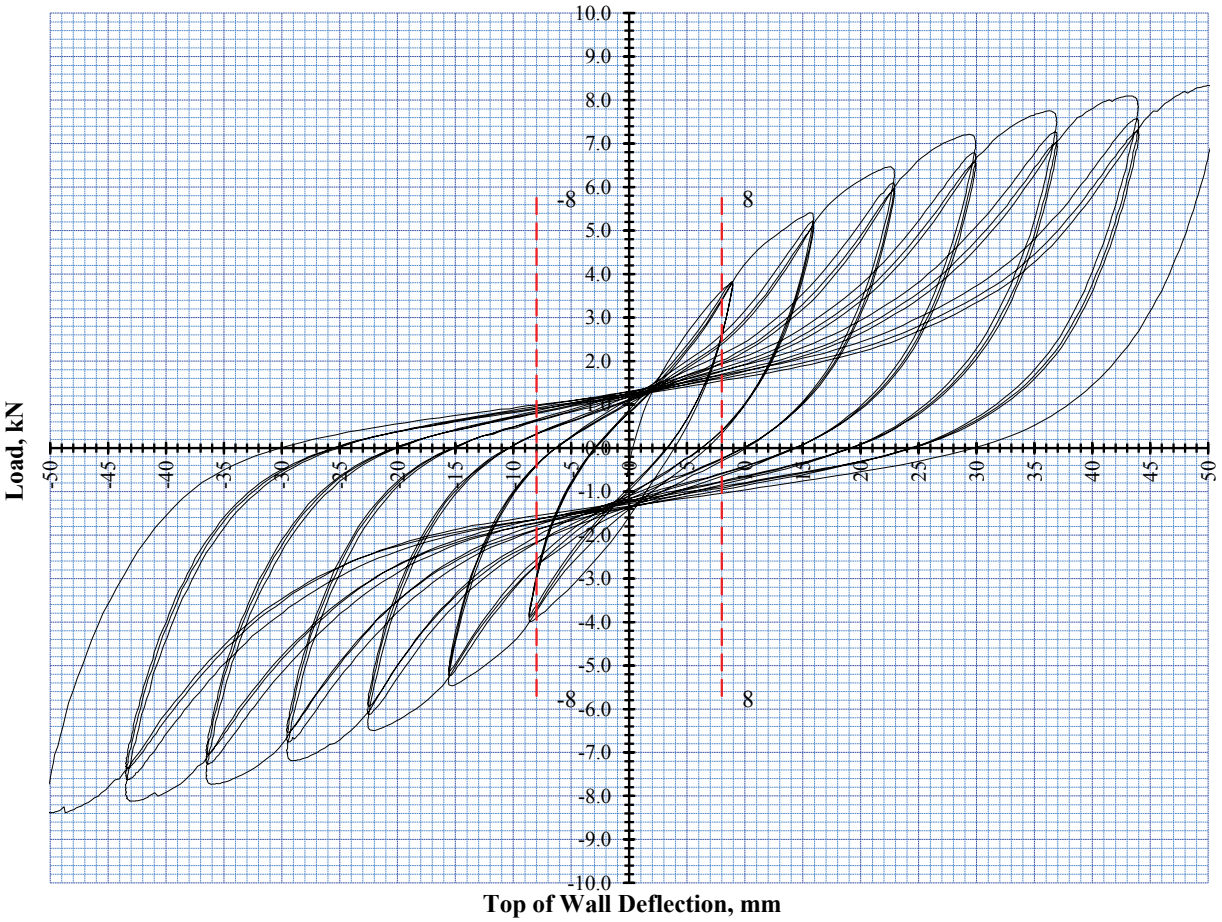

Figure 2: *Wall 289128*

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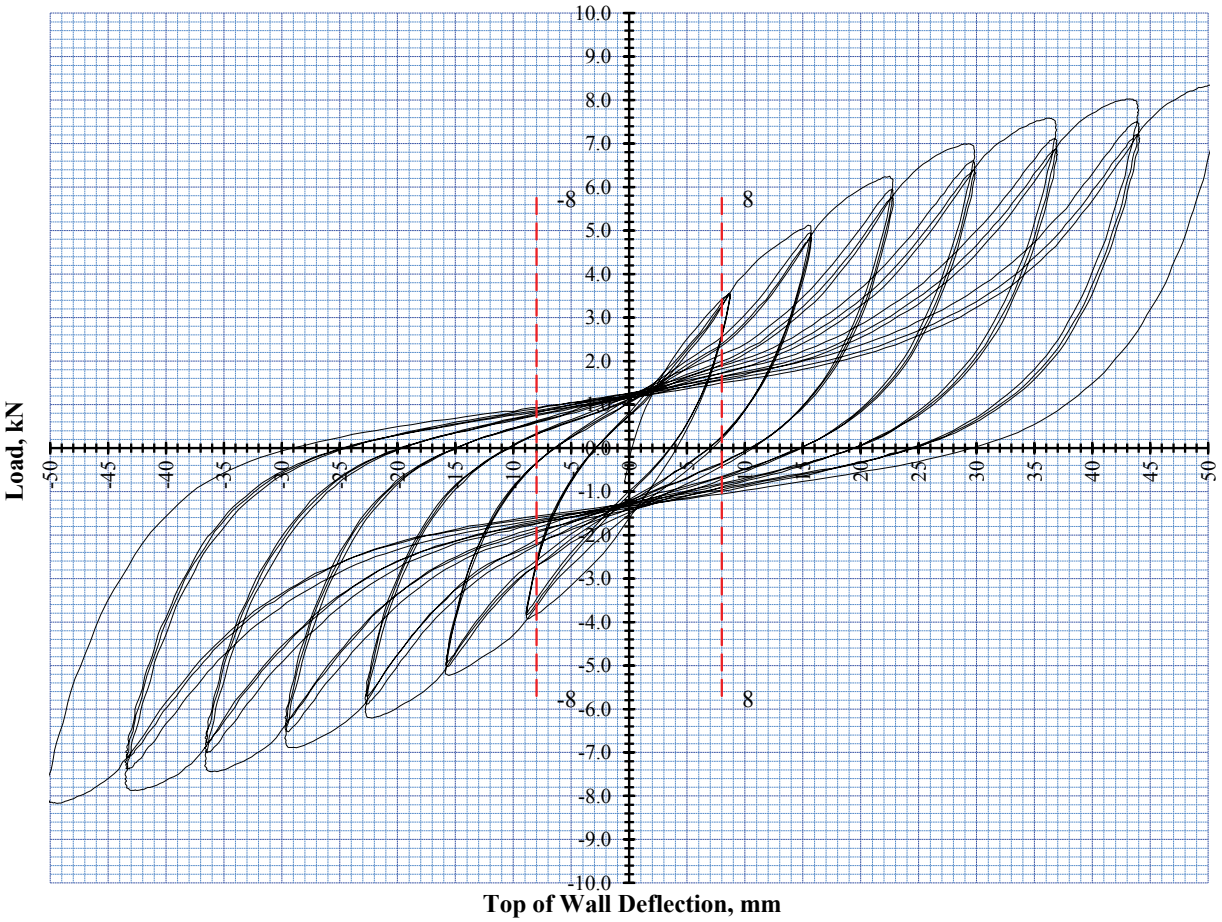

Figure 3: *Wall 289129*

Endless possibilities.

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P21:2010 BRACING RACKING TEST RESULT EVALUATION

Wall Construction

1200mm, bbi BlondeLine Birch Poplar Core Plywood 12mm one side
90x45 H1.2 SG8 framing, studs at 600mm centres, no nogs
Plywood fixed 50mmx2.8mm Galv Steel Nails at 150mm centres
to plates and external studs, 300mm to internal studs,
7mm min edge distances all around. GIB Handibracs used each end
M12 hold down bolts to bottom plate & brackets
P21 Supplementary restraints used

Summary		
Earthquake	106 (U)	BU/m
Wind	106 (S)	BU/m

Date of test:-		25-May-22	Ship No.	3251		Tested by	John Lee
Date of calc's:-		25-May-22	Job No.	TE21-068		Analysed by	Doug Gaunt

Calculated to BRANZ P21:2010, AS/NZS1170.2&5, NZS3604:2011 *Scion, Private Bag 3020 Rotorua.*

		Serviceability Cycles		Ultimate Cycles				
		Cycle to H/300 or DLQ or DLW		Cycle to Displacement			Wall dimensions	
		8.0	X mm	y=(mm)			L(mm)	H(mm)
Lab Number	Direction	Loads	Residual	Maximum			1200	2410
		(P_8)	Defln, C	Load	def @ P		d at P/2	4th, R
		kN	mm	P(kN)	y (mm)	P/2 (kN)	d mm	kN
289127	+	3.92	2.40	7.90	36.0	3.95	8.2	7.05
	-	3.90	3.50	8.00	36.0			7.05
289128	+	3.62	3.30	7.75	36.0	3.88	12.2	6.70
	-	3.88	3.00	7.72	36.0			6.96
289129	+	3.52	3.00	7.55	36.0	3.78	8.7	6.80
	-	3.75	3.30	7.45	36.0			6.80
		(P_8)	(C)	(P)	(y)	P/2 (kN)	(d)	(Ry)
Averages		3.77	3.08	7.73	36.00	3.87	9.70	6.89
Coefficient of Variation %		4.01	11.45	2.44	0.00	1.85	18.35	1.95

y = average failure deflection or peak deflection of the three tests.
d= average first cycle displacement at half peak, (the very first cycle wall reaches the load)
R = Residual load, P = Peak Load, S = Serviceability load
Displacement Recovery Factor (K1), (0.8 <= K1 <= 1.0) Systems factor K2 = 1.2
Average Structural Displacement Ductility factor u = y/d 3.71
Ductility Modification factor K4 = 0.92
DLW = Selected deflection limit for wind forces DLQ = Selected deflection limit for earthquake forces

P21:2010 BR Calc's		**K1**	**EQ ultimate**	**EQ service**	**Wind Ultimate**	**Wind Service**
Lab Number		**(= 1.4 - C/X)**	**BU's**	**BU's**	**BU's**	**BU's**
289127	(BU)	1.00	130.0	170.6	159.0	132.2
	(BU/m)		108	142	133	110
289128	(BU)	1.00	125.9	163.6	154.7	126.8
	(BU/m)		105	136	129	106
289129	(BU)	1.00	125.4	158.6	150.0	122.9
	(BU/m)		104	132	125	102
<20% Result Check		*289127*	*3% Ok result*	*6% Ok result*	*4% Ok result*	*6% Ok result*
		289128	*-1% Ok result*	*-1% Ok result*	*0% Ok result*	*-1% Ok result*
		289129	*-2% Ok result*	*-5% Ok result*	*-5% Ok result*	*-5% Ok result*

Note: Where the value of BR Wind or BR EQ for any specimen is more than 20% greater than either of the other two specimens, assign it a value of 1.2 times the lower value before averaging.

Average Earthquake BR		**Ultimate**		**Serviceability**
EQ (BU's)	20 x K4 x Ry =	**127**	(P8 x K1) x (K2/0.55) =	**164**
	106	**BU/m**	**Limited by**	**Ultimate limit state**
Average Wind BR		**Ultimate**		**Serviceability**
Wind (BU's)	20 * P =	**155**	(P8 x K1) x (K2/0.71) =	**127**
	106	**BU/m**	**Limited by**	**Serviceability limit state**

Figure 4: *P21:2010 calculations for 1200mm x 2.40m bbi BlondeLine Birch Poplar Core Plywood 12mm one side wall*

Please feel free to contact me to discuss this information.

Doug Gaunt

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Notes

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Notes

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BC230758

GIB®

EzyBrace® Systems

Specification and installation manual

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

CBI 5113
AUGUST 2016

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BC230758

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

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

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

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

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

PATENTS

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

Beware of substitution

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

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

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

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

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

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

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

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Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

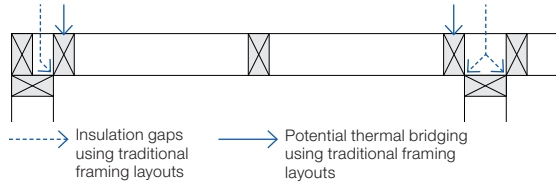
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

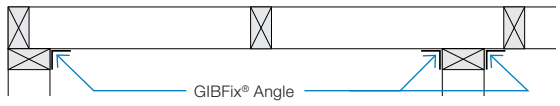
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

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

1. Actual savings dependent on building and bracing design.

Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

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

NZBC CLAUSE B2 — DURABILITY

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

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

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 — ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

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

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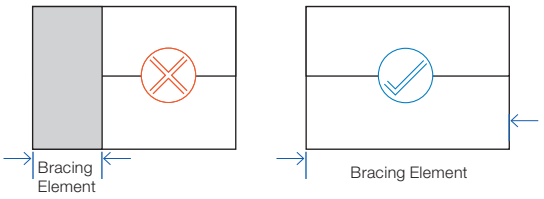
Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

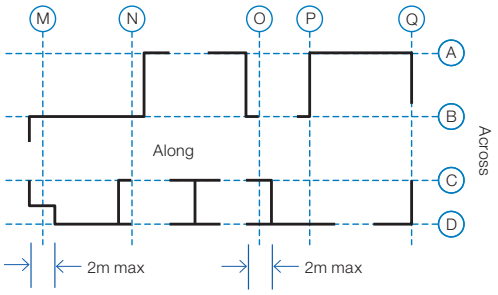
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

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Bracing demand

GIB EZYBRACE® CALCULATOR

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

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

DEMAND

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

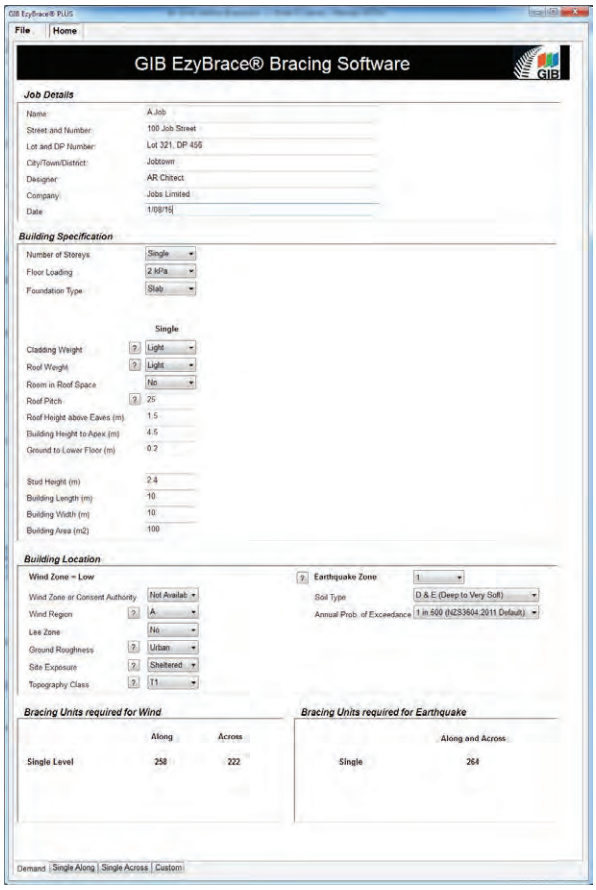
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

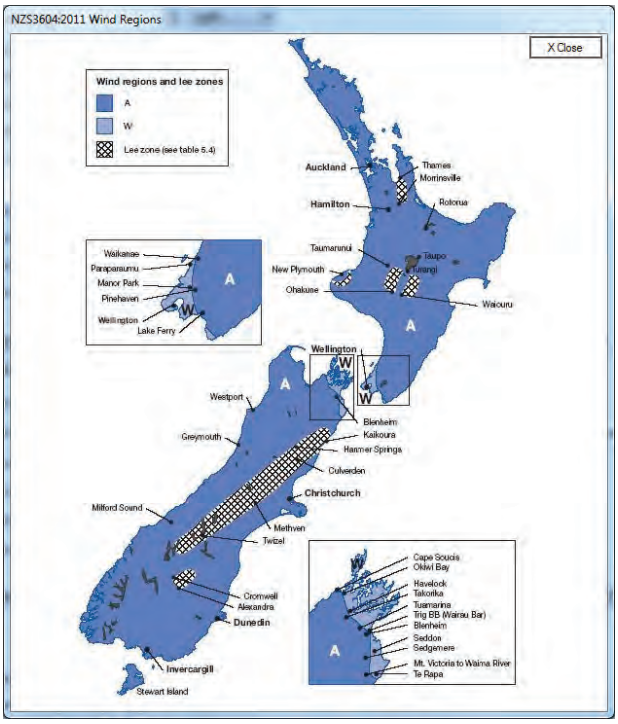
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design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

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

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

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





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

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Software functionality

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

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

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

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

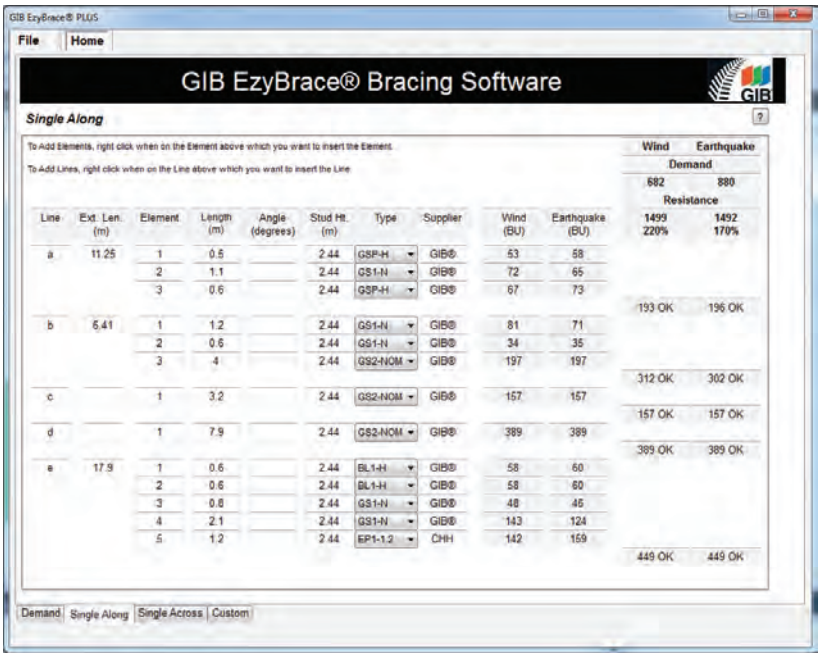
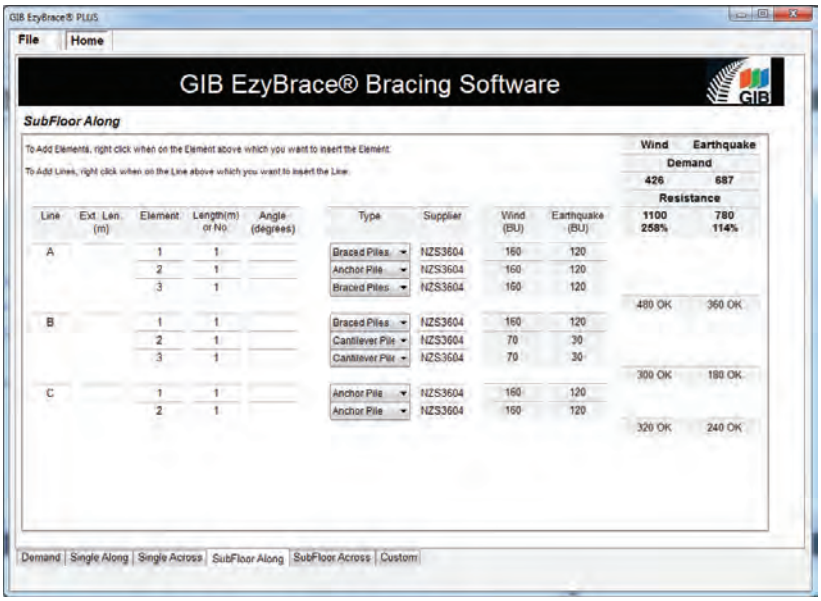


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET



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

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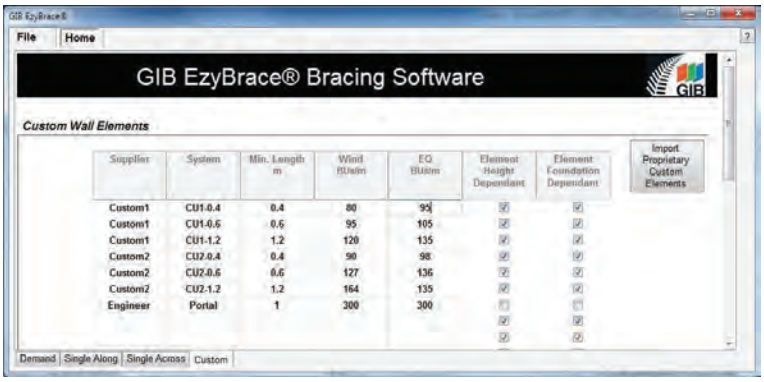
Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



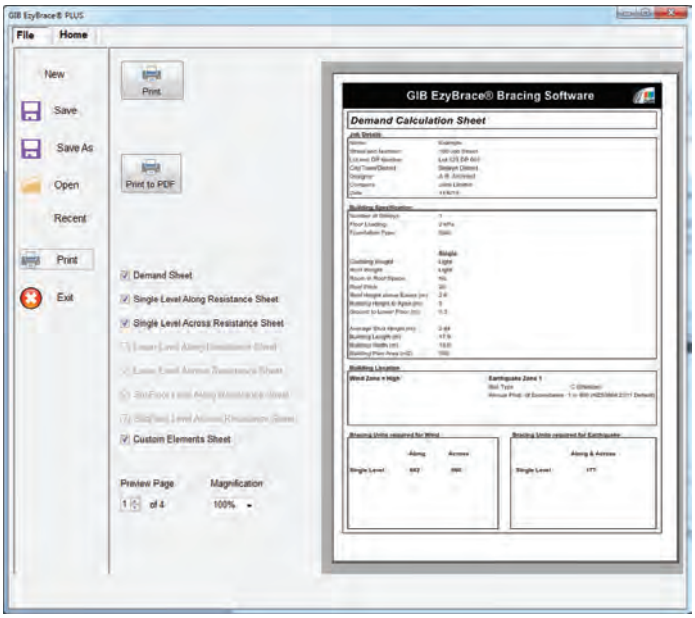
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

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

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

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

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



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

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GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

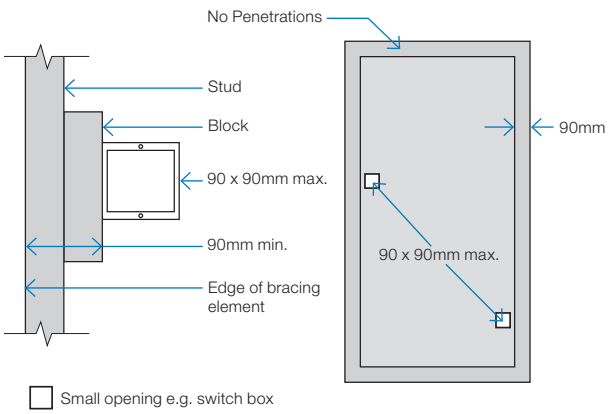
SMALL OPENINGS

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

LARGE OPENINGS

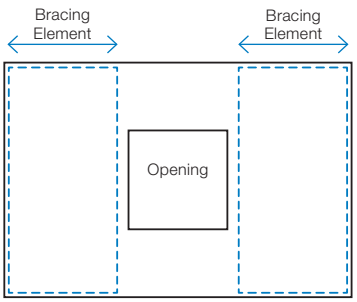
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



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Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

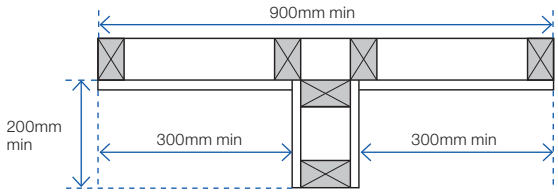
Guidelines for intersection walls

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

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

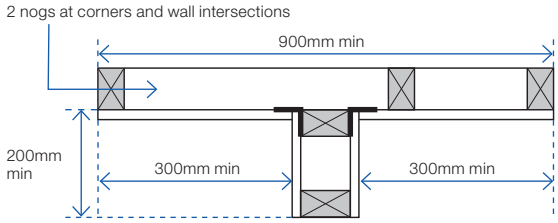
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



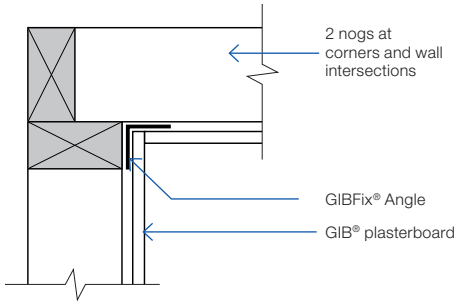
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



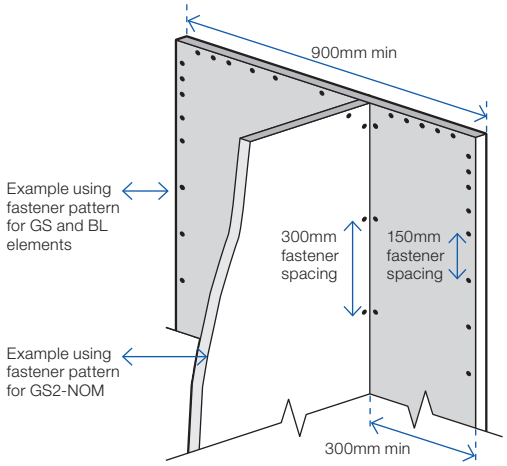
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

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Top plate connections

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

Parapets and gable end walls

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

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

or

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

Bottom plate fixing

TIMBER FLOOR

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

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

CONCRETE FLOOR — EXTERNAL WALL BRACING ELEMENTS

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

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

CONCRETE FLOOR — INTERNAL WALL BRACING ELEMENTS

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

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

FIGURE 16: PARAPETS AND GABLE ENDS WITH RIBBON PLATE

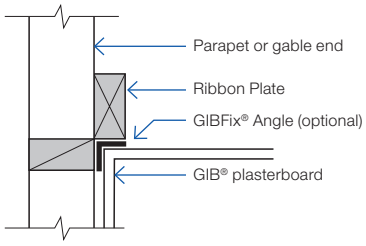
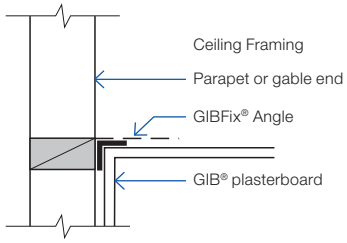


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



GFS003

BOTTOM PLATE FIXINGS FOR GIB® BRACING ELEMENTS

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

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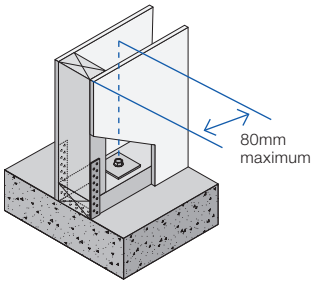
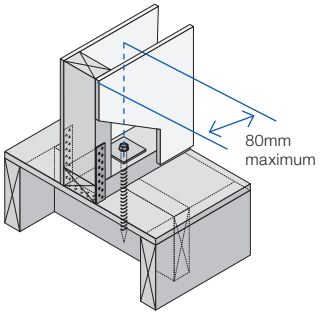
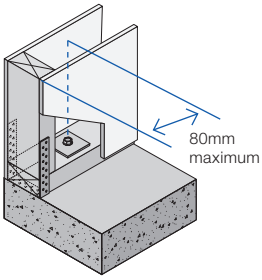
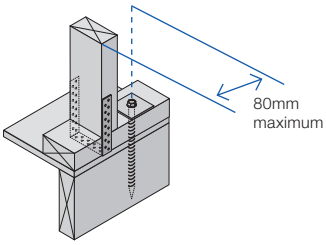
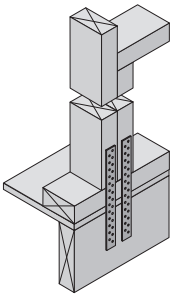
Bracing strap installation

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

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

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

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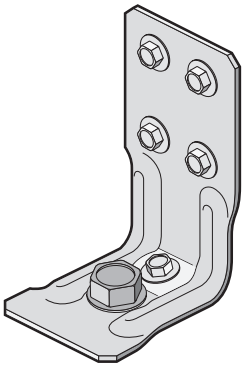
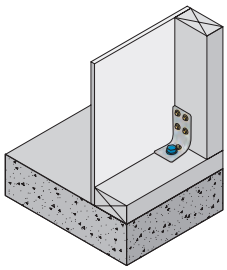
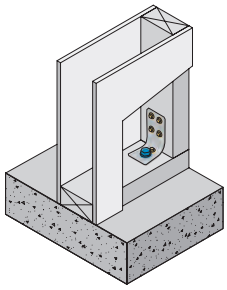
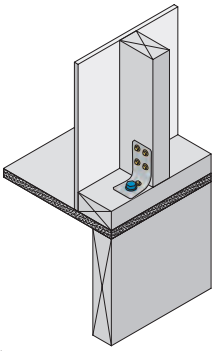
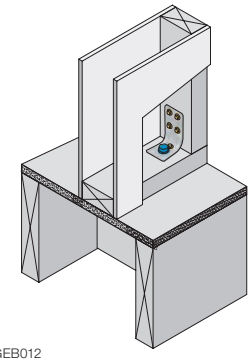
GIB HandiBrac® installation



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

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

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

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

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

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

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

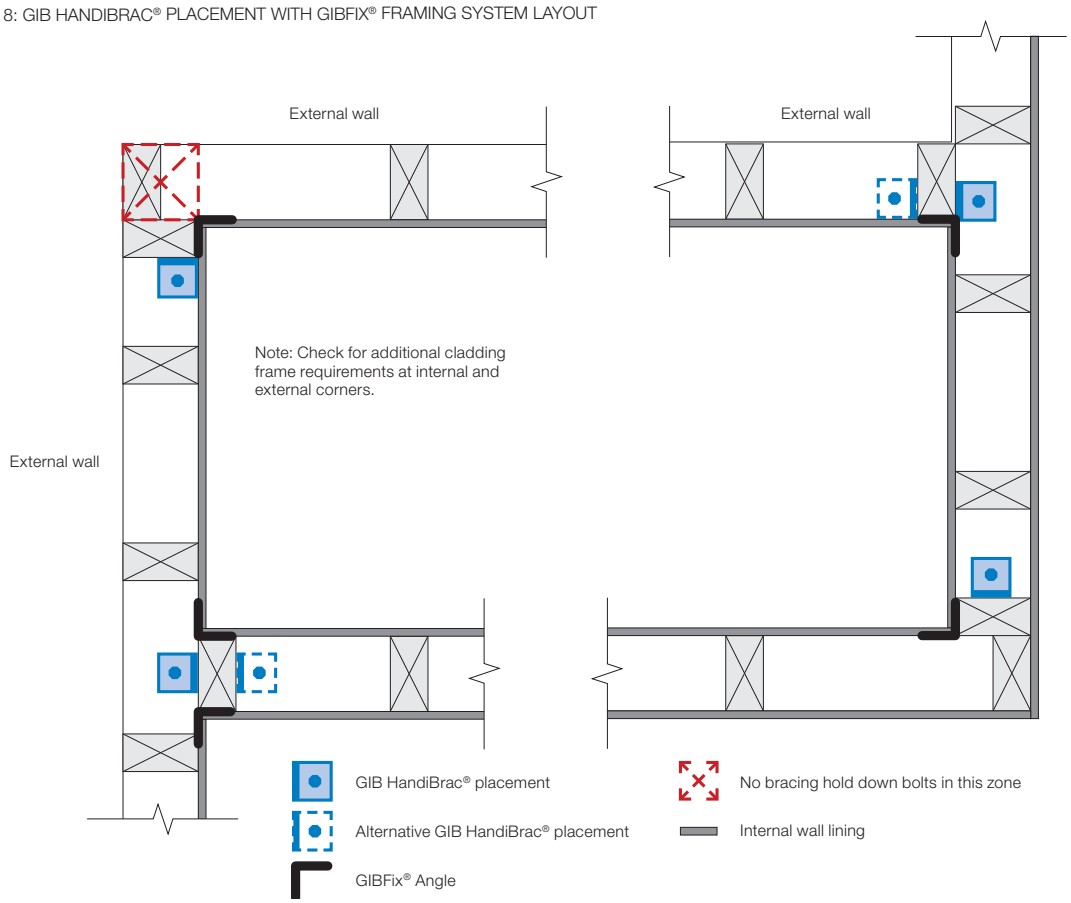
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

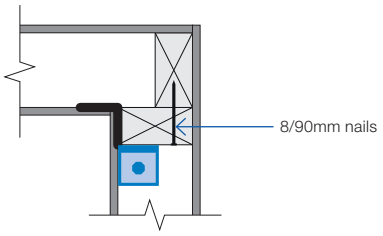
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

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Ceiling diaphragms

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

Limitations for GIB® plasterboard ceiling diaphragms

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

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

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

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

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

FIGURE 20: PROTRUSIONS AND CUTOUTS

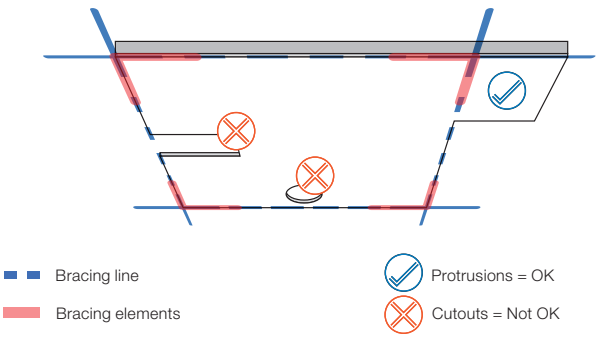


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

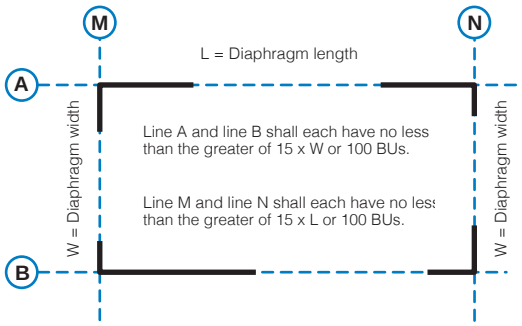
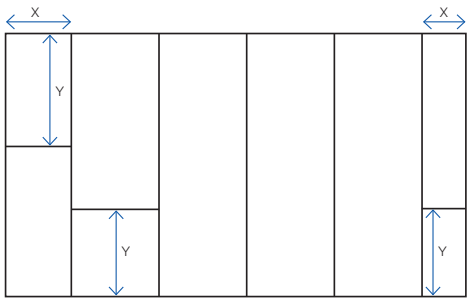


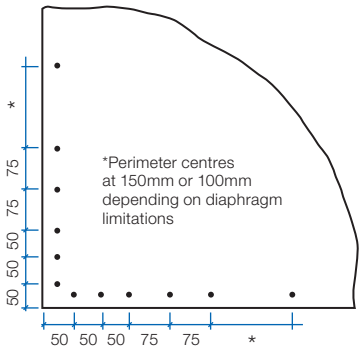
FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.

Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

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Ceiling battens in ceiling diaphragms

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

Battens shall be spaced at a maximum of:
- 500mm for 10mm GIB® plasterboard.
- 600mm for 13mm GIB® plasterboard.

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

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

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

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

For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

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

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

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION

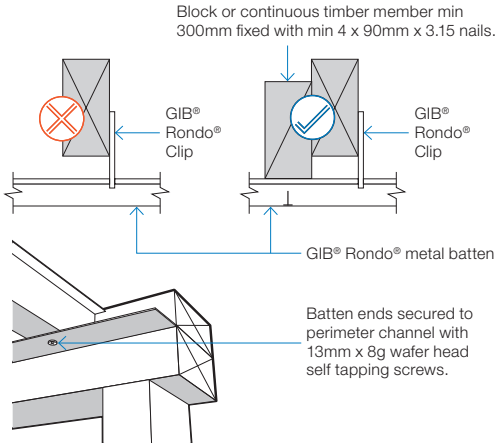

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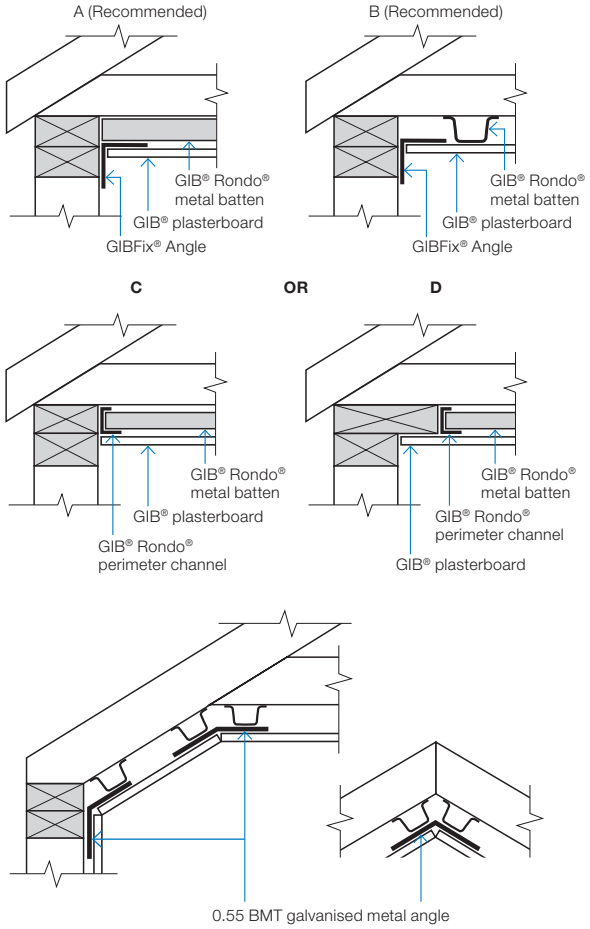
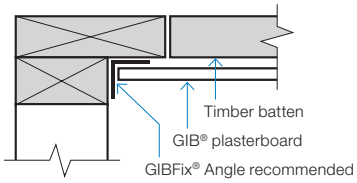
FIGURE 27: GIB® RONDO® METAL CEILING BATTENS WITH CORNER ANGLES



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



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Openings in ceiling diaphragms

SMALL OPENINGS

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

LARGE OPENINGS

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

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

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

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

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

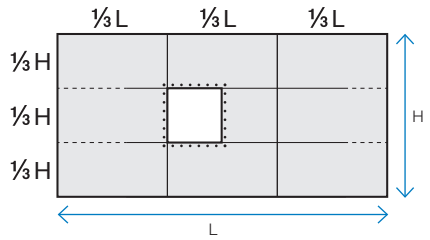
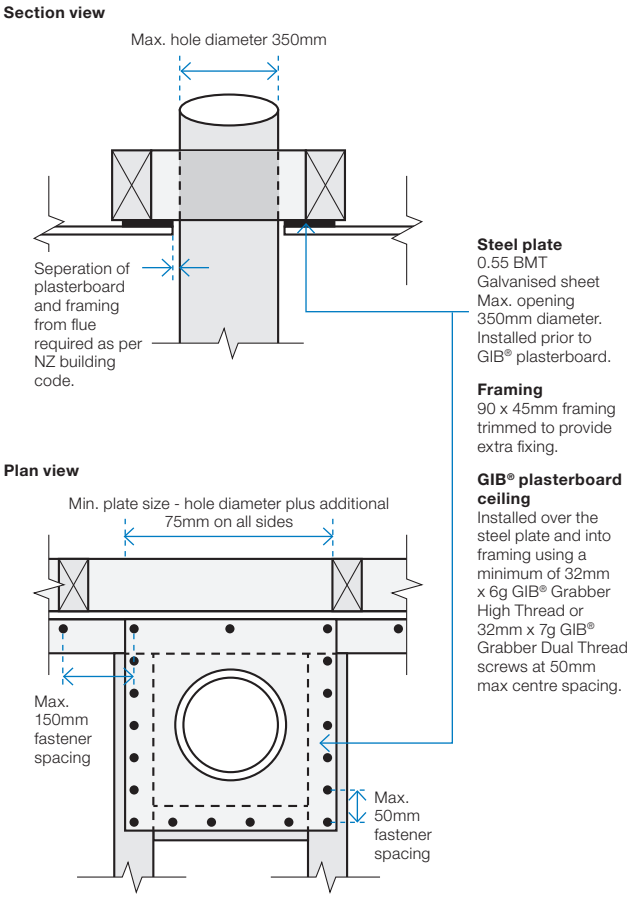


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS



Plasterboard ceiling not shown in plan view

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

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

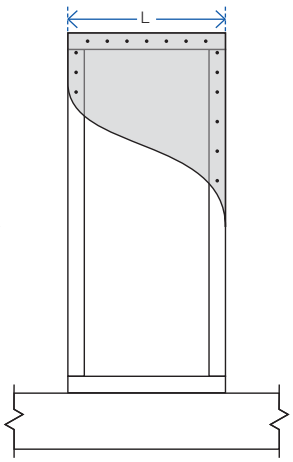
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

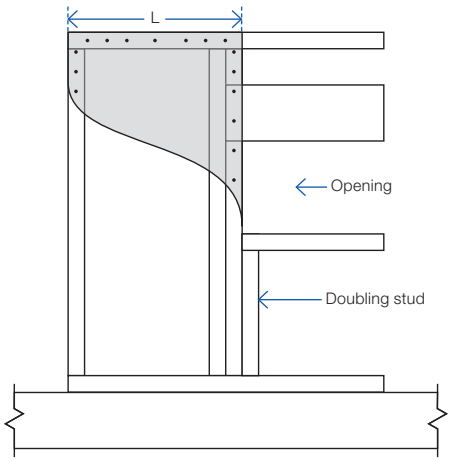
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



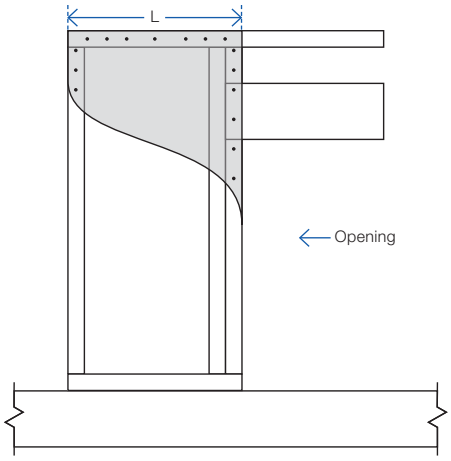
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



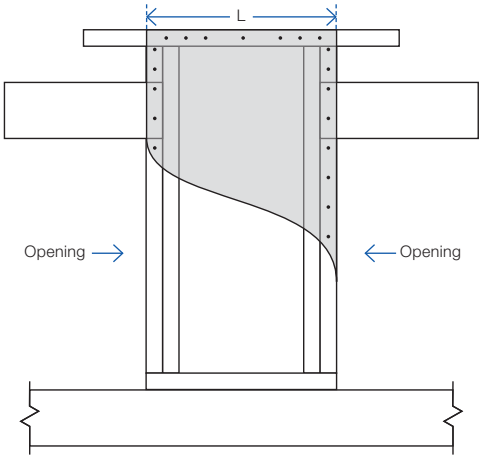
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

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

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

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

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

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

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

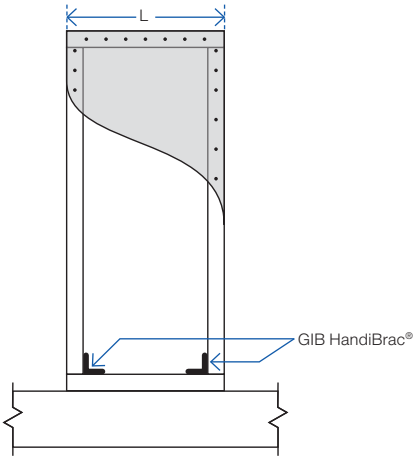
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

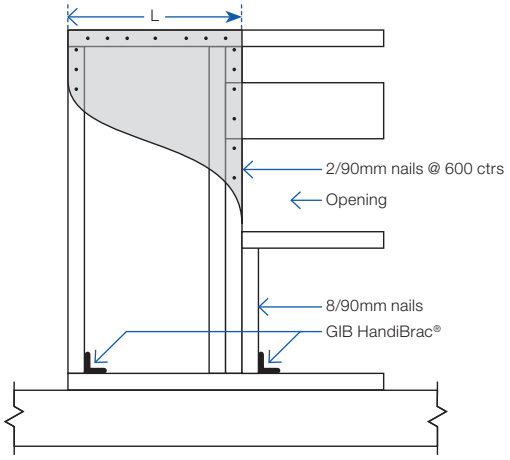
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



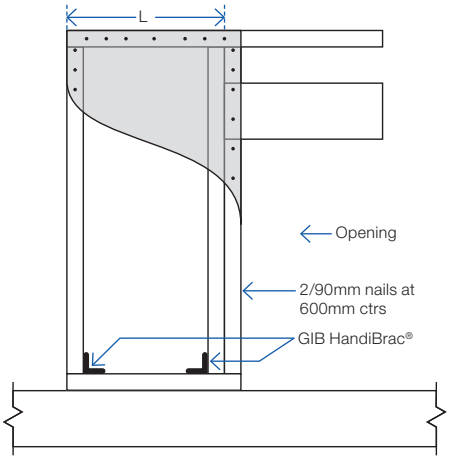
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



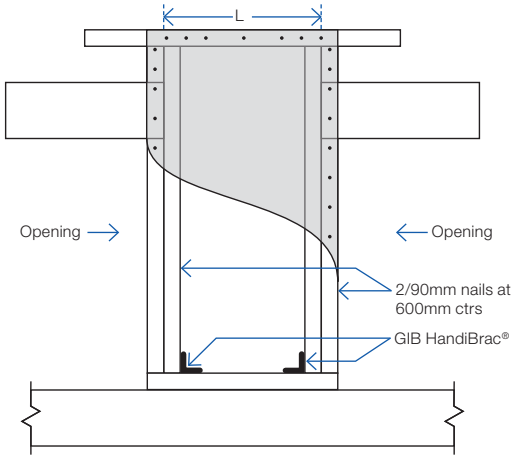
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

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GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

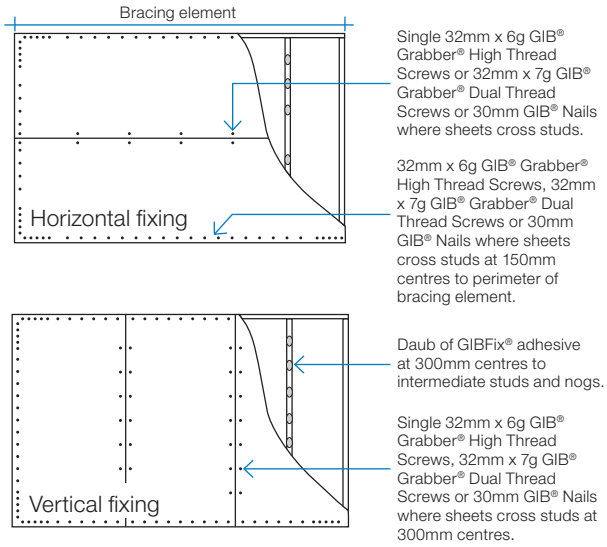
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

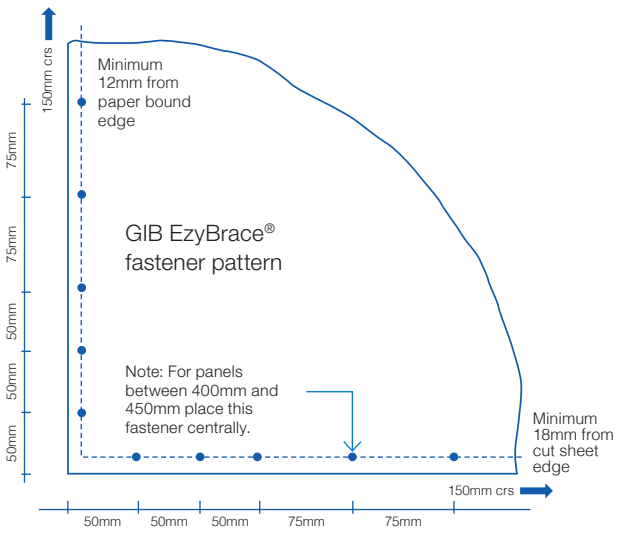
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GS2-NOM

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

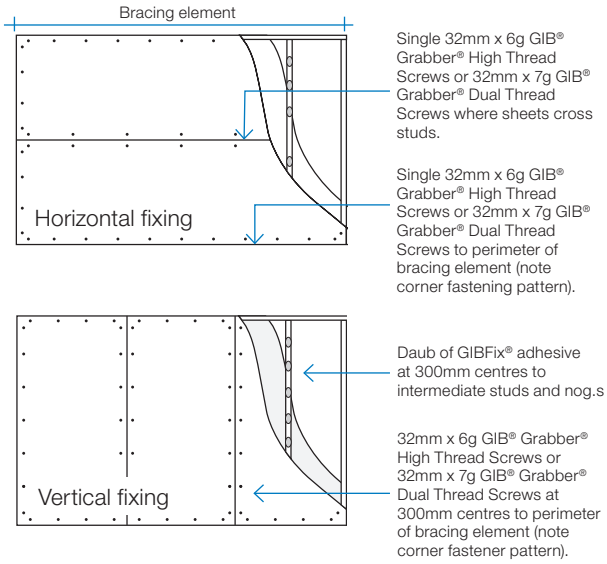
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Angle use 32mm x 7g GIB® Grabber® Dual Thread Screws.

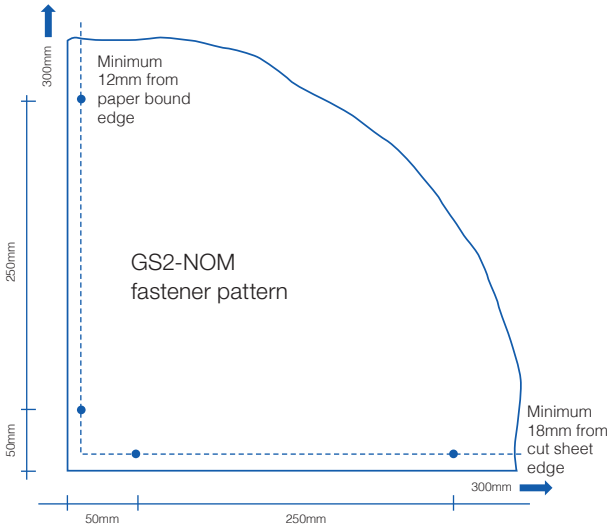
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GS2-NOM ADHESIVE FIXING OPTION AT DOOR JAMBS

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

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

FIGURE 37: SCREW FIX FOR OPENINGS

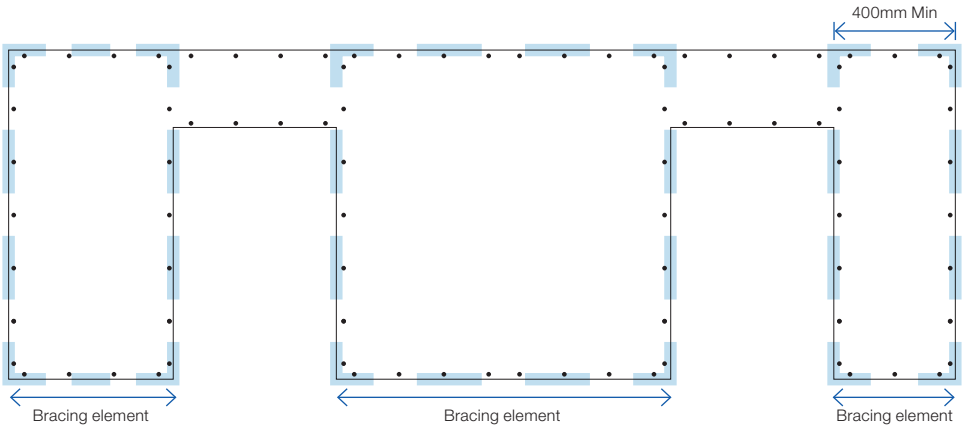
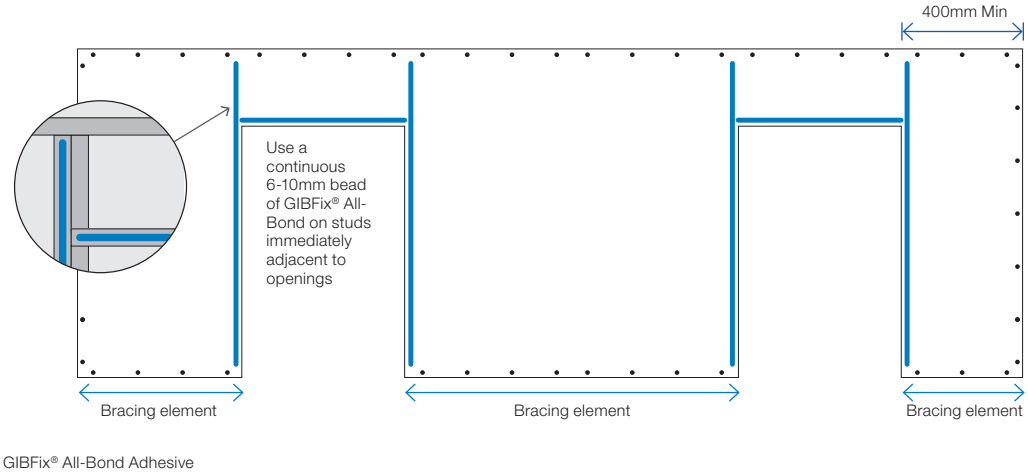
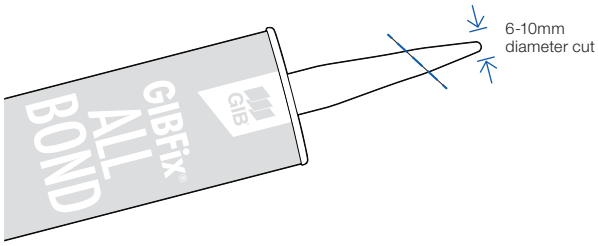


FIGURE 38: SCREW AND ADHESIVE FIX FOR OPENINGS



ADHESIVE NOZZLE APERTURE



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GIB EzyBrace® Systems specification GS2-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber Floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

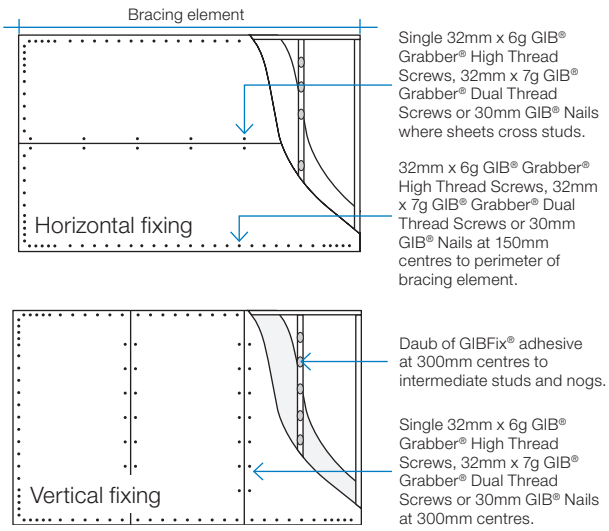
32mm x 6g GIB® Grabber® High Thread Screws,32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

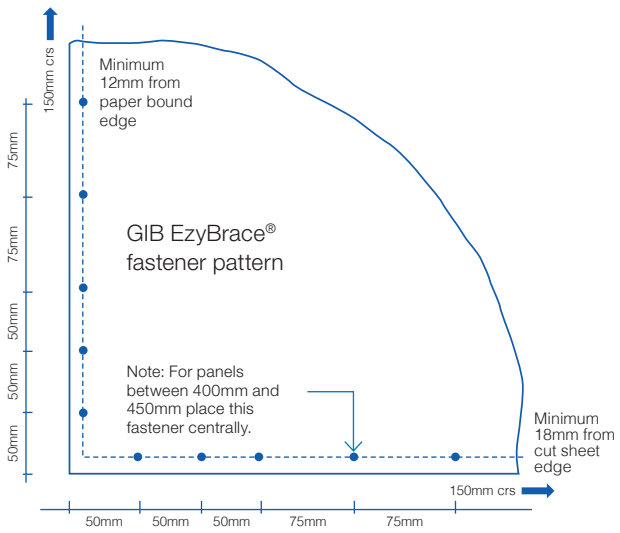
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification GSP-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

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

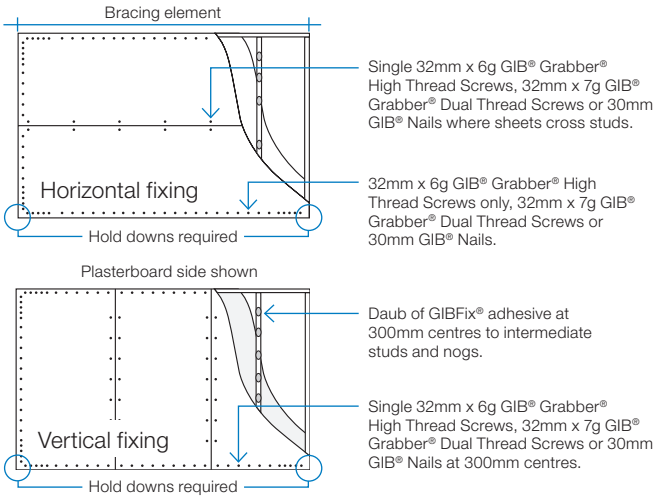
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails.

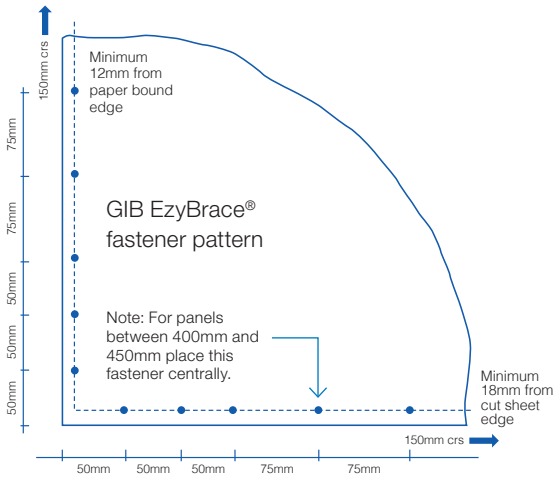
Fastener centres

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

JOINTING

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





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

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GIB EzyBrace® Systems specification BL1-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

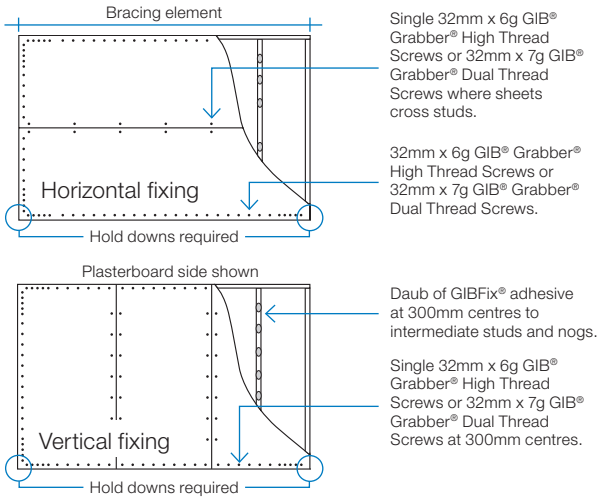
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

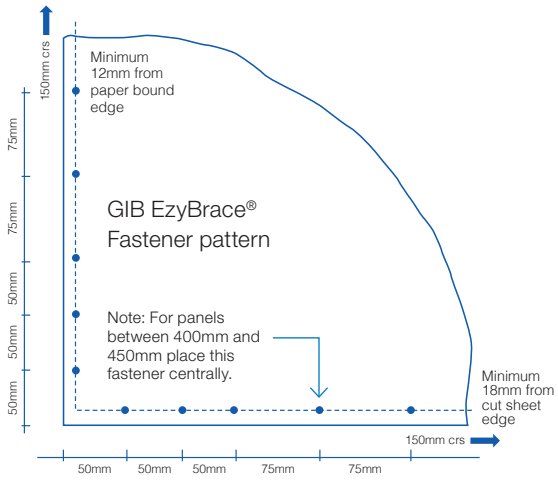
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

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GIB EzyBrace® Systems specification BLG-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

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

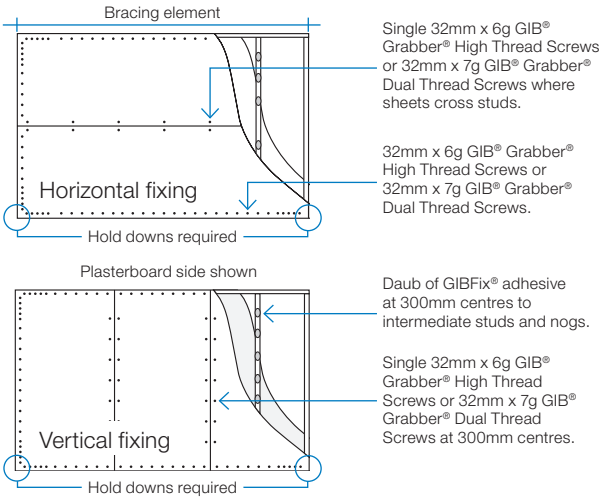
If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

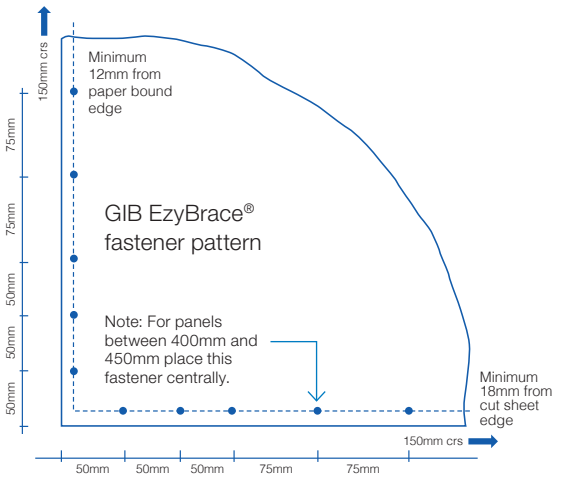
Fastener centres

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

JOINTING

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





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GIB EzyBrace® Systems specification BLP-H

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

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

Concrete floor

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

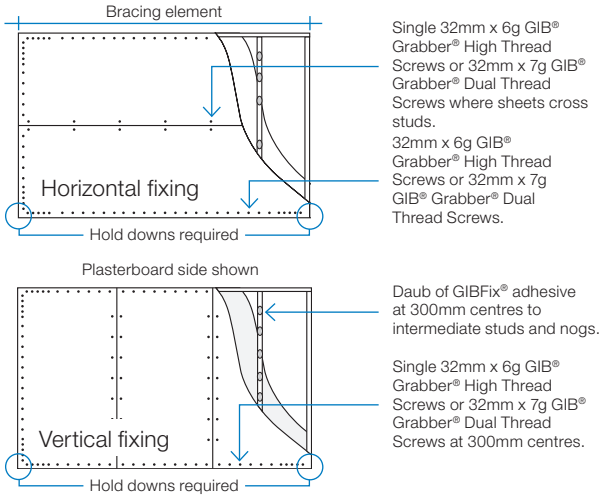
GIB Braceline® side: 32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. Plywood: 50 x 2.8mm Galv or Stainless steel annular grooved FH nails. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread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

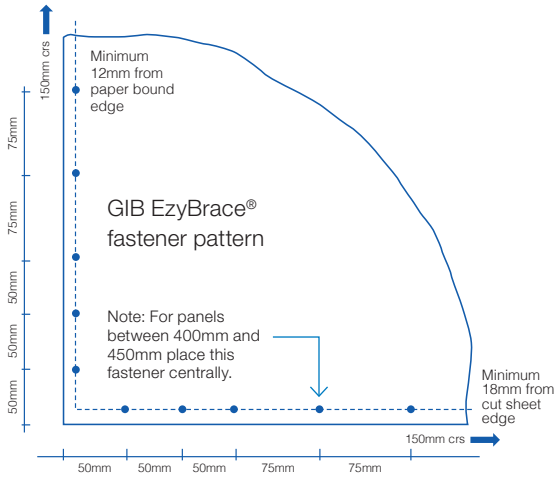
Fastener centres

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

JOINTING

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





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

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

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

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

GLOBAL GREENTAG CERTTM

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

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

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

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

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

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

TRADEMARKS

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

PATENTS

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

GIB®

FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

Section 4
H1 Calculations
Risk Matrix

Building Consent BC230758
Received 13/09/2023

NZBC H1 - Calculation Method

Client	Baddock
Address	175 Townsend Rd
	Rangiora

REFERENCE BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	132.21	6.60	20.03	
Roof Type 2	500mm Ceiling Edge Insulation area	30.23	6.60	4.58	
Wall Type 1	70% Total Wall Area	122.36	2.00	61.18	
Wall Type 2		0.00	2.00	0.00	
Wall Type 3		0.00	2.00	0.00	
Floor	Concrete slab on ground	162.44	1.60	101.53	
Glazing (30%)	Double Glazed Windows	52.44	0.50	104.88	
Glazing (>30%)	Double Glazed Windows	0.00	0.63	0.00	
Sklights	Skylight	0.00	0.62	0.00	
				292.19	TOTAL LOSS

Note: Total area of glazing (including Skylights) must be 50% or less than the total wall area

PROPOSED BUILDING

Component	Description	Area sq m	Construction R-value	Heat Loss	(Heat loss = Area/R-value)
Roof Type 1	Corrugated on trusses @ 900crs	132.21	7.00	18.89	
Roof Type 2	R3.6 500mm Ceiling Edge Insulation	30.23	3.37	8.97	
Wall Type 1	Clad-X Cladding	94.91	2.32	40.91	
Wall Type 2	Linea Cladding	25.64	2.22	11.55	
Wall Type 3	Internal Garage Wall	22.90	2.18	10.50	
Floor	Concrete slab on ground	162.44	1.23	132.07	
Glazing (30%)	Double Glazed Windows	31.35	0.50	62.70	
Glazing (>30%)	Double Glazed Windows	0.00	0.63	0.00	
Sklights	Skylight	0.00	0.62	0.00	
				285.58	TOTAL LOSS

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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H1 Solution

385mm Slab using RibRaft® 300mm 90-140mm wall frame no foundation insulation

The minimum R-value for this zone is 1.6

With a calculated A/P ratio of 2.2

The R-value for your selected solution is:

1.23

Exterior Area	162.44m²
Exterior Perimeter	71.20m
Embedded floor heating	No
Wall Width	90mm
No Edge Insulation Percentage	13.1%

For a full set of CAD drawings for RibRaft solutions, please refer to the Firth Resources web page
https://www.firth.co.nz/resources/drawings/
Check the RibRaft Foundations filter to show only relevant files.

Firth's H1 Online Solution Calculator uses the specification data entered by the user and applies the methodology, as described in the Building Code amendment H1 Energy Efficiency Acceptable Solution H1/AS1 - 5th Edition for all housing, and buildings (up to 300m²), to recommend concrete slab foundation insulation solutions using CodeMark certified Firth products and systems (only).

The recommended solution in this pdf document, can be used as part of a Building Consent application however, Firth accepts no liability for Building Code compliance or thermal performance of the house or building. Firth also accepts no liability through misrepresentation or improper use of the Firth H1 Online Solution Calculator to obtain or prove Building Code compliance.

Firth has worked to ensure the accuracy of the solution provided by its H1 Online Solution Calculator. Firth cannot guarantee the accuracy of the recommend solution under any other methodology than that described in H1/AS1 5th Edition.

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Construction R-value Calculator

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

I have recently implemented some changes to the way assemblies with multiple adjacent insulation layers such as truss roofs with a second layer of insulation are calculated. Check out the details here.

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

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

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

- Floors ○
- Walls ◉
- Roofs ○

Date: 03/03/2023

Element Name (optional) **2.32** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity [view detail]

external surface 0.03

Cladding : generic - aerated Concrete (10% moisture) 50mm
R-value: 0.28

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

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

- Floors
- Walls
- Roofs

Date: 03/03/2023

Element Name (optional) **2.22** m²°C/W

Type: Wall: Timber Frame with vented Cavity

Timber Frame with vented Cavity view detail

external surface 0.03

Cladding : James Hardie Linea weatherboard
R-value: 0.08

Air Barrier : generic - Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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I have recently implemented some changes to the way assemblies with multiple adjacent insulation layers such as truss roofs with a second layer of insulation are calculated. Check out the details here.

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

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

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

- Floors ○
- Walls ◉
- Roofs ○

Date: 30/05/2023

Element Name (optional) **2.18** m²°C/W

Type: Wall: Timber Frame (direct fixed Cladding)

Timber Frame (direct fixed Cladding) view detail

external surface 0.03

Cladding : generic - Gypsum plasterboard 10mm into still air (garage, etc.)
R-value: 0.10

Air Barrier : generic - none
R-value: 0.00

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%

Framing :
R-value: 0.75

Cavity Area: 85.6%

Insulation : 2.6

still Airgap: none
R-value: 0.00

Wall Lining : generic - gypsum Plasterboard 10mm
R-value: 0.04

internal surface 0.09

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Construction R-value Calculator

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

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

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

- Floors
- Walls
- Roofs

When entered correctly with 2 layer R3.6 result is R7.21
R7.0 used in calculations

Date: 18/07/2023

Element Name (optional) ~~5.41~~ m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 7.0

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 132.2 Number of downlights: Clearance from lamp holder side [m]:

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Construction R-value Calculator

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

I have recently implemented some changes to the way assemblies with multiple adjacent insulation layers such as truss roofs with a second layer of insulation are calculated. Check out the details here.

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

If your construction is not listed, please send an e-mail to designnavigator@gmail.com with a description and a detail drawing (pdf) of it.

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

- Floors ○
- Walls ○
- Roofs ◉

Date: 18/07/2023

Element Name (optional) — 3.37 m²°C/W

Type: Roof: Timber framed truss Roof, direct fixed or battened flat Ceiling

Timber framed truss Roof, direct fixed or battened flat Ceiling [view detail]

external surface 0.03

Roofing : generic - Metal corrugate Iron with building paper
R-value: 0.01

Insulation :

Timber Frame & Cavity :
90mm rafters or joists @ 900mm, battens covered with insulation

Roof Frame Area: 5.0%	*Cavity Area: 95.0%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Framing : *R-value: 0.75*	Insulation : 3.6

Roof Lining : generic - gypsum Plasterboard 13mm
R-value: 0.06

internal surface 0.09

Non-IC-rated recessed downlights
Ceiling Area [m²]: 30.23 Number of downlights: Clearance from lamp holder side [m]:

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NZBC E2 - Risk Matrix	
Client	Baddock
Address	Lot 115 Townsend
	Rangiora

Risk Factor	Low	Medium	High	Very H	Score	Select
Wind Zone	0	0	1	2	1	Wind High
No. of Storeys	0	1	2	4	0	1 Storey
Roof / Wall	0	1	3	5	0	Roof/Wall Low
Eaves Width	0	1	2	5	0	Eaves Low
Envelope	0	1	3	6	1	Envelope Medium
Decks/Balcony	0	2	4	6	0	Deck/Balcony Low
				Total Score	2	

Note: Claddings in Extra High Wind Zones require Rigid Underlays & Drained Cavities.
Scores are the same as Very High Wind Zone

	Cladding	Cavity	Risk Score
North Elevation	AAC	Drained Cavity	2
East Elevation	Bevel-back Weatherboards	Drained Cavity	2
South Elevation	Bevel-back Weatherboards	Drained Cavity	2
West Elevation	AAC	Drained Cavity	2

Wind Zone	
Low Risk	NZS3604 Low Wind Zone
Medium Risk	NZS3604 Medium Wind Zone
High Risk	NZS3604 HIgh Wind Zone
Very High Risk	NZS3604 Very High Wind Zone
Extra High Risk	NZS3604 Extra HIgh Wind Zone

Number of Storeys	
Low Risk	One Storey
Medium Risk	Two Storey in part
High Risk	Two Storey
Very High Risk	More than Two Storeys

Roof / Wall Junctions	
Low Risk	Roof/wall intersections fully protected eg hip & gable roof with eaves
Medium Risk	Roof/wall intersections partly protected eg hip & gable roof no eaves
High Risk	Roof/Wall intersection fully exposed eg parapets, reverse slope eaves
Very High Risk	Roof elements finishing within wall clad eg lower ends of aprons, chimneys

Eaves Width	
Low Risk	Greater then 600mm at first level
Medium Risk	450-600mm at first level or greater than 600mm at second level
High Risk	100-450mm at first level or 450-600mm at second level
Very High Risk	0-100mm at first level or 100-450mm at second level of 450-600mm at third level

Envelope Complexity	
Low Risk	Simple rectangle, L, T or bommerang shape, single cladding
Medium Risk	Complex, angular or curved building shapes, single wall claddings
High Risk	Complex, angular or curved building shapes, multiple wall claddings
Very High Risk	As for High Risk but with junctions not covered in Table 1C or !F, box windows, pergolas

Decks & Balconies	
Low Risk	None or timber slatted deck or porch at ground level
Medium Risk	Fully roofed waterproof deck or timber slatted deck at 1sy or 2nd level
High Risk	1st level waterproof deck or 1st level cantilevered slatted deck
Very High Risk	2nd level waterproof deck or 2nd level cantilevered slatted deck

Suitable Wall Claddings		
Risk Score	**Direct Fix**	**Drained Cavity**
0 - 6	Timber Weatherboards Fibre Cement Weatherboards Vertical Profiled Metal - Corro or Trim Fibre Cement Sheet (Jointed) Plywood Sheet	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Fibre Cement Sheet (flush finish) EIFS
7 - 12	Bevel-backed Timber Weatherbds Vertical Timber Board & Batten Vertical Profiled Metal - Corro Only	Masonry Stucco Horizontal Profiled Metal - Corro or Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS
13 - 20	Vertical Profiled Metal - Corro Only	Masonry Stucco Horiz Profiled Metal - Corro/Trim Rusticated Weatherboards Fibre Cement Weatherboards Fibre Cement Sheet (flush & jointed) Plywood Sheet EIFS Bevel-back Weatherboards
Over 20	Redesign Specific Design	

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Section 5
Specifications

BADDOCK

175 TOWNSEND ROAD

RANGIORA

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PRELIMINARY AND GENERAL

BUILDING CONTRACT:

The general conditions governing the contract shall be generally as set out by the Canterbury Masters Association and shall be prepared by the Contractor.

SPECIFICATION:

This specification shall be read in conjunction with the drawings and the contract and shall be taken to be a record of the materials used and the standard of workmanship expected from the Contractor and Sub-contractors.

Anything not specifically mentioned will be carried out to the New Zealand Standard Specification 3604 and New Zealand Building Code and NZS 4229 Concrete Masonry Buildings nor requiring specific design.

FOREMAN:

The Contractor is to have a competent foreman in charge of the contract from start to completion of work.

EXAMINE THE SITE:

The Contractor is advised to familiarise himself/herself with the site, specifications and drawings and to obtain generally their own information on all matters affection the execution of the works before submitting their quote.

The submission of a quote will be taken to mean that this has been done and that any matter that might affect the works has been taken into consideration and that allowance has been made accordingly. Any uncertainties shall be brought to the attention of the client.

BY-LAWS AND REGULATIONS:

All work and materials shall be in accordance with the requirements of the Building Regulations and with the New Zealand Building Code Handbook and approved documents and NZS 3604 Code of Practice for light timber frame buildings not requiring specific design. The contractor and subcontractors undertaking with work shall obtain copies of the relevant sections of the New Zealand Building Code and documents relating to acceptable solutions and verification methods and shall be conversant with their contents as these documents become part of each section of this specification.

Provision shall be made within the quotation of tender to comply with the by-laws and regulations of any authority, which relates to the works and to obtain all necessary permits to complete the work. The acquisition of the building Consent shall be the responsibility of the Client.

INSURANCE:

Before commencement of work the Contractor shall supply the Client with cover notes from the insurance company certifying that all the insurances required are covered by valid policies. The Contractor will be required to effect and maintain over the duration of this contract an insurance against loss or damage by fire to property, loss of life, accident, injury or damage to property arising out of, or caused or contributed to either directly or indirectly by the operation of the Contractor.

WORKMANSHIP:

All workmanship shall be in accordance with good trade practices and such that a good standard of end result will be obtained.

PROTECTION OF EXISTING BUILDINGS, PATHS, ETC:

Protect existing buildings, paths, driveways, services and roadways from damage due to contractual operations. Properly make good or repair any damage that may occur.

VARIATIONS:

No variations to the contract shall be made without the prior written permission of the client.

TEMPORARY POWER SUPPLY:

The Contractor will be responsible for arranging “Contractors Power Supply” connection on site and arranging all necessary fees to be paid.

PROVIDE PLANT:

Provide all plant, scaffolding, hoists, tackle etc and a foreman plus sufficient number of men for the proper expeditions and the complete execution of the works, supply and cartage, workmanship and materials, which although not specifically mentions, may be nevertheless incidentally necessary for the proper completion of the work described herein.

SETTING OUT:

The Contractor is to do the setting out of all work and is to be responsible for its accuracy and must amend any errors. Check all dimensions on the site in particular siting and set out of foundations before pouring any concrete. Any doubt in setting out shall be reported to the Designer.

ATTENDANCE:

Contractor shall ascertain from each sub-contractor all particulars relating to his work with regard to the order of its execution and the position in which chases, holes etc shall be required before the work is started. No claim shall be allowed for extra cost of cutting away work already executed in consequence of any neglect by the Contractor to ascertain these particulars before hand.

CLEANING AND PROTECTION:

The Contractor shall at frequent intervals and in any case whenever so required by the owner and at completion, remove from the building and site all rubbish litter and surplus materials which may accumulate and shall take all reasonable precaution to protect finished surfaces from damage or disfigurement of the finished work of other trades and will be responsible for the cost of restoring any surfaces harmfully affected. Particular care shall be taken by all trades to avoid scratching, denting or bruising finished or exposed joinery timbers. All paint or plaster splashes or other marks shall be removed and cleaned off immediately.

PURCHASE OF SPECIAL GOODS:

The Owner reserves the right to purchase all fittings etc for which P.C. prices or Lump Sums are specified. The P.C. Sums quoted shall be P.C prices in Christchurch and the Contractor shall be entitled only to the usual trade discount. Where Lump Sums are specified the amounts allowed are net and the Contractor must add his own profit to such sums specified as no discount will be allowed.

SHEDS AND STORAGE:

The Contractor shall supply ass necessary temporary sheds and toilet for the use of his men and for storage of materials on the site.

CARE OF WORKS:

The Contractor is to keep all persons on the works (including those employed by sub-contractors) under his control and within the boundaries of the works generally until their completion including all work executed and materials deposited on the site by himself or sub-contractors and suppliers. The Contractor shall be responsible for all damage arising from weather carelessness of the operatives, damage or loss and shall be held solely responsible for all damage to adjoining buildings or property caused by him or his employees including sub-contractors and shall indemnify the principal against all claims on account thereof.

PROTECTION FROM WEATHER:

The Contractor is to cover up and protect the works from the weather and is to suspend all operations during weather, which would be detrimental to the work.

COMPLETION:

At completion the Contractor shall remove all refuse and debris from and around the building and off the site. Leave the whole site tidy and fit for gardening and leave the entire buildings, including paths, steps, terraces etc ready for use. All floors shall be left broom clean, all glass work left sound and clean inside and out and all painted and stained or polished work left free from spots and dirt. All bench tops and basin, pans, etc shall be left clean and free from paint, varnish or other spots.

MAINTENANCE:

The Contractor shall make good all defects, shrinkage or other faults whatsoever which may arise or appear within a period of ninety (90) days after the certified completion of the works. Maintenance retention shall be 2.5% if the contract price and shall be retained until the completion of the 90 day maintenance period.

CERTIFICATES:

The Contractor shall obtain from the Territorial Authority, Network Utility Authority or Building Certifier all required certificates and approvals.

Where Producer Statements are required by the Territorial Authority prior to the issue of a Code Compliance Certificate, the Contractor shall obtain and deliver such required statements.

The Contractor shall uplift a Code Compliance Certificate (covering the whole of the building work) from the Territorial Authority or the Building Certifier as applicable prior to completion of the contract.

FOUNDATIONS/EXCAVATIONS

SETTING OUT:

The Contractor/Sub-Contractor shall be responsible for the accurate setting out of all construction work and services required to be executed under this contract.

EXCAVATIONS:

The Contractor/Sub-Contractor shall organise the removal of all vegetation etc until firm ground, free from organic matter, is reached. The actual ground level shall be measured and agreed to between the Contractor/Sub-Contractor and the Engineer prior to any work being carried out. Excavate for driveway and retaining walls. All excavations shall be maintained where necessary by planking and strutting to prevent the sides of trenches collapsing. In all excavations the Contractor/Sub-Contractor shall ensure that all trenches are kept free of water. If water intake should occur pumping or other means shall be taken to completely remove the water.

BACKFILLING:

All backfilling shall be placed and compacted in layers of 150mm max thickness and compacted by suitable powered mechanical compaction equipment and the ground excavated beyond the building line shall be backfilled to marry into the existing ground level.

SERVICES:

Allow for the excavation of all required service lines inside or under the building that are required to be buried in or under concrete or timber floors in collaboration with the various trades, before the construction and placing of any concrete, hard fill or timber floors.

FOUNDATIONS:

Foundations to be constructed as detailed on the drawings. Provide openings, chases, pockets etc in foundations for electric cables, telephone cables, water supply, waste pipes and sewer as required.

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CONCRETOR

MATERIALS AND WORKMANSHIP

Concrete shall be manufactured and placed in accordance with the requirements of NZS 3604.

CONCRETE

Concrete shall be thoroughly and continuously compacted during placement by internal vibration so as to produce a dense uniform mass with the surface finish specified. Immersion or poker type vibrations shall be of suitable diameters and of sufficient number to ensure that at the required rate of placement of each part of the structure the entire volume of each layer of concrete is thoroughly vibrated and complete compaction is achieved. The minimum strength of concrete is as follows:

1. Foundations 25 Mpa
2. Floor Slabs 25 Mpa

BUILT-IN ITEMS:

Provide and build in to the concrete work all necessary anchors, holding down bolts, ties plugs etc for securing of other work to the concrete. Provide and build in all sleeves, pipes, wires, conduits and other requirements necessary for the provision of services to the building.

REINFORCING STEEL

MATERIALS AND WORKMANSHIP:

All reinforcing steel shall be Ductility Grade E steel. The bending, cleaning, placing and lapping of reinforcing steel shall be carried out in accordance with the appropriate standards, the best trade practises and as indicated on the drawings.

All Reinforcing steel to NZS 4671

PLACING AND COVER:

All reinforcing steel shall be placed and securely fixed in accordance with the drawings. Reinforcement shall be accurately supported by concrete or other approved chairs, spaces or ties. The use of bricks, stones or timber for the support of reinforcing steel is strictly forbidden.

CARPENTER

GENERAL:

All carpentry work is to be set out to the dimensions given and attend upon all other trades. All work shall comply with the N.Z.B.C and acceptable solutions and N.Z.S 3604

TIMBER:

All timber is to be the best of its respective kind, free from loose knots, shakes and other imperfections and to hold to the sizes specified.

KINDS OF TIMBER:

Timber shall be graded according to the NZS 3631 : "Classification and Grade of Timber." Framing timber shall be dry to 20% moisture content before being enclosed and finishing timber to 12%-18% moisture content. Structural timber shall be standard engineering grade.

FINISH:

Framing timbers shall be gauged. Timber exposed to view or touch, shall be machine dressed. Interior finishing's shall be with sandpaper. Remove all arises, rough or uneven patches, hammer marks and other surface defects before painting or other surface finishing.

WORKMANSHIP AND CONTRUCTION:

Workmanship and construction shall be of the best trade practice, and shall comply with the relevant provisions of N.Z.B.C and NZS 3604. The best trade practice shall be deemed to include those methods, practises and processes contained in the current syllabuses for the New Zealand Trade Certificates in Carpentry, Joinery and Timber machinery.

BUILDING PAPER:

Building paper shall be as noted on drawings. Torn or punctured sheets shall be rejected and must be replaced. Adjacent sheets shall have a minimum lap of 150mm. B2 durability. N.Z.B.C.

DAMPCOURSE:

A damp course of 3 ply bitumen fabric weighing not less than 3.66kg per sq metre shall be laid under all timbers in contact with concrete.

WALL FRAMING:

Framing is generally laserframe.

1. Plates – All plates shall be in long lengths laid flat and shall have dovetail halvings at all connecting points, corners and junctions.

2. Studs - All studs shall be cut to lengths as required, having square ends and shall be spaced to suit wall linings centres as shown on drawings. At all corners and junctions, sufficient studs shall be provided to give a 50mm bearing to a linings.

3. Dwangs - Dwangs shall be 90x45mm timber in rows spaced at a maximum of 800mm apart and securely nailed to studs with two nails at each end. Provide all extra dwangs required to support fittings and at all joints of lining sheets.

ROOF CONSTRUCTION:

a) **Trussed Roofs:** Drawings showing clearly the type, pitch, span, spacing and overhangs of roof trusses and details of roof claddings shall be provided to the truss manufacturer. Thereafter, the Contractor shall match construction with the drawings and details provided by the truss manufacturer throughout all stages of fixing and bracing. The Contractor shall especially accord with the manufacturer's instructions for tying down where over-hangs exceed 750mm. In all cases anchorage of all trusses to plates shall be with not less than 2/100mm skew nails plus 2/4.0mm wire dogs.

EAVES:

Construct boxed eaves (unless otherwise shown on plans) and fit timber fascia or leave ready for fixing of Stratco spouting and fascia or Taylor Fascia. Line underside of soffits (unless otherwise detailed) with 4mm flat hardieflex sheets.

METER RECESS:

Provide recess for Electric meter Board where directed to the satisfaction of the Local Electric Supply Authority.

MAN HOLE:

Provide manhole in ceiling 800 x 800mm where directed.

WARDROBES:

To be lined full height. Provide inside each with 300 x 25mm full width shelf at 1.7m from floor and 20mm galvanised pipe coat rail at 75mm below shelf. Provide cupboards over wardrobe where required.

LINEN:

Lined full height inside and to have 25mm helving. Full depth for linen at approximately 400mm c.c.

ARCHITRAVES, SKIRTINGS ETC:

Finish all windows internally, door openings and wherever required with 50 x 12mm rounded or splayed architraves. Finish at junction of floor and well with 75 x 12mm Rimu or Custom wood skirting neatly mitred at angels and scribed to floor. Supply and fix beads, half rounds where required.

INSTALLATION:

Install bath tub, shower cabinet/s, w.c., hand basin, vanity units and all other joinery as supplied by joiner.

SHOWERS:

Construct shower cabinet as shown on Plan, if not a one-piece unit. Fit shower floor (floors) and line walls with an approved wet area wall lining. Owner to choose colour.

SHOWER DOORS:

Supply and install sliding shower doors and screens where required, with clear safety glass.

GARAGE DOORS:

Supply and install Tilta or Roller door as shown on plan.

PRIMING TIMBERS:

Allow to Prime or Stain any exterior timbers where necessary before erection.

INSULATION:

Refer to NZBC Clause H.1 Install insulation as required in NZBC acceptable solution H1/ASI. All insulation materials are to be installed in accordance with manufacturers recommendations and the NZBC.

2 x R3.6 – fibreglass batts to ceilings
R2.6 – fibreglass batts to exterior walls

ALUMINIUM JOINERY

GENERAL:

All window and door frames shall be built from selected powder coated aluminium sections/profiles. All aluminium to comply with NZS 4211 “Specification for Performance of Window” and NZS 3504 “Specifications for Aluminium Windows” and NZS4223 Parts 3: 2016 and to be to sizes shown on plans.

Windows to be fitted with H3.1 25mm Pine Reveals grooved to take Gibraltor Board and lockable double tongued latches to sashes. The colour of the aluminium frames shall be selected by Owner.

All glass shall comply with N.Z.S.4667 & 4223 Parts 3: 2016

Double glaze units as shown.

All windows & doors to be fitted with WANZ bars as per drawings & manufactures specifications

TIMBER JOINERY

GENERAL:

Refer to General Conditions of Contract, which shall apply to this section of work.

Supply all joinery as required and shown on the plans, including trim, pelmets, stairs etc.

All materials and fittings must be top quality and shall be supplied to the site pre-finished or ready for finishing as indicated.

The Joiner must discuss the joinery details with the main Contractor/Owner at the time of pricing to clarify any queries he may have and prior to manufacture if necessary.

The Joiner must site measure and verify all opening heights, for fitted joinery and confirm final appliances sizes and models, and tolerances required for all built-in fittings. Joiner shall liaise with the Main Contractor and Carpenter to allow all necessary tolerances, shadow margins etc to allow building in.

KITCHEN JOINERY:

Kitchen joinery to be built up as shown, for the supply of kitchen joinery including all bench tops, etc.

Joiner to liaise with Main Contractor/Owner to discuss final details before manufacture.

INTERIOR DOORS:

All interior doors to be 810mm paint grade/Rimu in ex 150 x 35mm Rimu DA back grooved for Gibraltor Board.

All other cupboard doors and front to be as shown on plan.

Aluminium wardrobe panels fitted into 150 x 35mm Rimu DA Reveals grooved for Gibraltor Board.

EXTERIOR DOOR:

Supply of main entry door to be hung in aluminium frame with sidelights or heart rimu timber frame with sidelights as shown on plan.

INTERIOR LININGS

WALLS:

Line all walls with 10.0 mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

OTHER LININGS:

CEILINGS:

Line ceilings with 13.0mm Gibraltor Board and stop all joints and nails to a paint finish. Level 4 finish.

GIB COVE:

PLASTER CORNICES:

ROOFER

TYPE OF ROOF:

Corrugated roofing at 25”

GENERAL:

The roofer shall co-operate with and co-ordinate their work with that of the Plumber in the provision of gutters brackets, flashing, downpipes, etc. All roofing and flashing shall be laid by tradesmen wearing soft footwear and experienced in this type of work. On completion of this part of the contract, all surplus materials, debris and rubbish shall be removed from the site and the roof shall be left in a thoroughly watertight and weatherproof condition.

Workmanship: All roofing materials shall be laid in strict accordance with the manufacture instructions and to NZS3604 & NZ Metal Roofing Manufactures Inc: NZ metal roofing & cladding code of practice

Guarantees: The Roofer is to provide all standard guarantees for the materials and workmanship as offered by the manufactures/suppliers of the roofing.

PLUMBER

ACCORDANCE WITH BY-LAWS:

All plumbing work to be in accordance with the Building Act, the Building Act and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the H.Z.B.C. Chapters B2, G10, G12, G13 and E1. All pipe materials are to be to AS/NZS 1260

CONSENTS AND FEES:

Arranged for and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials.

MATERIALS:

All materials to be of the best of their respective kinds and to approval before being used.

DOWNPIPES:

Where shown supply and fix DP as per plans. Downpipes secured with standoff brackets – 2 per downpipe. All downpipes shall be plumb and straight without offsets into spigots/sumps.

SPOUTING AND FASCIA:

Provide and fix type of spouting and metal fascia as shown on plans. All materials shall be laid in strict accordance with the manufacturers instructions. Colour to be selected.

FLASHINGS:

Liaise with the Carpenter to supply all flashings as required for the complete weatherproofing of the building and appurtenances. All flashings shall be shop formed and to approval.

ROOF FLASHINGS:

Flash all roof penetrations as necessary. Liaise with roofing contractors.

COLD WATER SUPPLY:

Bring in 20mm diameter cold water supply from lateral to house, provide meter and stopcock control/toby box as required by local Authorities. Provide taps at a suitable position to allow the complete system to be drained and shut down due to frost if not being used.

Pipe work shall be Polybutylene or similar to the approval of the Owners and shall be smooth full bore, seamless free from defects and suitable for the plumbing system. All pipe work shall be lagged to suit conditions.

HOT WATER SUPPLY:

Install Hot Water as shown on plans

All hot water piping shall be copper, generally 15mm diam. (20mm to bath_ shall be carefully formed with a smooth internal bore and shall be lagged and strapped tightly to the framing.

The hot and cold water supply lines to all fittings shall be taken off to give the best uninterrupted flows and pressures to fittings, e.g. showers first, then bath, basins, sinks, etc.

TRAPS AND WASTES:

Provide pvc wastes, pipes and raps to all fittings as required by regulation. Conceal all vents within wall space. Refer also to drawings. Wastes cast under slab shall be wrapped in "Denso" tape and plumbers felt.

All first floor back vents from fittings are to combine in ceiling space and connect in to soil stack vent before passing through roof.

TAPS, ETC:

Taps, mixers, shower rose, etc shall be covered by a P.C sum of $……..

SANITARY FITTINGS:

1. W.C Pans – Caroma Concorde Sovereign 2000 pans and cisterns. Colours to be selected.

2. Shower Trays – supply shower trays to sizes shown on plan. Colour to be selected.

3. Bath – supply bath/spa bath as shown on plan. Colours to be selected.

4. W.C. Hand basin – Caroma Valet Hand Rinse Basin. Colour to be selected.

5. Vanities: Allow for the supplying of vanity units.

6. Tub – Rotec Super Tub, complete with taps.

HOSE TAPS:

Supply and install two hose taps.

ADDITIONAL PLUMBING FOR FOLLOWING APPLIANCES AND INSTALLATION AS SUPPLIED BY OWNERS:

1. Dishwasher

ELECTRICIAN

GENERAL:

The electrical work shall be carried out in accordance with the Building Act, The New Zealand Building Code, The NZ Wiring Rules (AS/NZS 3000:2007), NZECP & Electrical Safety Regulations 2010 and Approved Documents, and to the complete satisfaction of their Inspector. All wiring shall be concealed.

CONNECTION TO MAINS:

Make all necessary connections to the Local Authority main, all wiring shall be underground within the site boundary.

Allow to provide temporary power to site for construction.

CONSENTS:

The Electrician shall obtain all Consents and pay all fees for the above work before commencing any work.

MATERIALS AND ARTICLES:

Except where specified otherwise, all materials and articles shall be of New Zealand Manufacture. All articles and materials not specified by makers catalogue number, shall be of the best quality.

WORKMANSHIP:

The whole of the work shall be carried out by skilled Tradesmen using adequate equipment and methods in accordance with best Trade practice.

FINISH:

Particular care shall be taken with this section of the work, as none but a high class finish shall be accepted.

SETTING OUT:

Where not specifically shown on the drawings or noted in the specification, the exact position of points and lights shall be determined on the job by the owner.

POINTS:

Allow for double outlets and single outlets as shown on plan

LIGHTS:

Allow for light points as shown on drawings. If light fittings are to be supplied allow a P.C. sum of $ ……. For the supply of fittings. If fittings supplied by owners, owners shall liaise with Main Contractor/Electrician for installation of fittings.

SHAVING POINTS:

Allow for shaving points to all vanities.

TELECOM, TELEVISION AND SECURITY WIRING:

Refer to Electrical plan.

BATHROOM HEATERS AND TOWEL RAILS:

Allow for and install heated towel rail to Bathroom and ensuite.

ADDITIONAL WIRING AND INSTALLATION OF FOLLOWING APPLIANCES AS SUPPLIED BY OWNERS:

1. Range hood as shown on plan
2. Dishwasher as shown on plan
3. Front Door Bell
4. Garage Door Opener (supplied with garage door)

DRAINLAYER

GENERAL:

All work shall comply with the Building Code, the Building Act, and the New Zealand Building Code. All work shall be carried out to the acceptable solutions as shown in the N.Z.B.C. Chapters B2, G10, G12, G13 and E1.

The general Contractor is to collaborate with the Drainage Contractor and arrange with him for carrying out his work at such times and in such a manner as will cause the minimum amount of inconvenience and delay.

All stormwater and sewer pipes where possible are to be run in the same trench.

CONSENTS AND FEES:

The drain layer shall apply and uplift all necessary consents, give all notices, pay all fees and arrange for the inspection of the works and materials. On completion, the whole of the drainage is to be tested and handed over to thorough working order, according to the requirements of the Local By-Laws and to the satisfaction of their Inspector. The Drain layer shall supply any necessary records of works carried out as required by the New Zealand Building Code.

CO-OPERATE WITH CONCRETOR/CARPENTER:

Co-operate with the Concretor for the forming of opening of foundations, pads, etc. Co-operate with Concretor in placing all necessary pipe work before concrete is placed.

PIPES:

All sewer and stormwater pipes shall be uPVC complying with NZS 7643

GULLY TRAPS:

All gully traps shall be uPVC with cast aluminium grates. Set gully trap in concrete haunched around pipe.

Surround gully dish with concrete 100mm above finished ground level properly boxed with a plaster finish.

LAYING OF DRAINS:

All drains shall be commenced at the point of outfall and worked back to the highest part with at least 500mm earth cover.

All branches and other connections, cleaning eyes etc to be connected in as work proceeds. All joints shall be made as per Manufactures instructions.

If cover is less than 500mm pipes shall be covered with concrete to the requirements of the Local Authority. Soil and stormwater pipes under slab shall be run in ABS pvx.

SEWER MAIN:

Excavate and lay drain to connect into existing sewer Lateral as indicated on drawings to the approval of the Local Authorities.

STORMWATER MAIN:

Excavate and lay stormwater disposal system to discharge into side channel as indicated on drawings to the approval of the Local Authorities.

DOWNPIPE SUMPS:

Form downpipe sumps using 100mm dia. uPvc riser set into concrete surround haunched around pipe.

Surround riser with concrete properly boxed 100mm above finished ground level with a plaster finish and cast aluminium grate.

PLASTERER

GENERAL:

All work shall be carried out by suitably qualified and competent tradesmen who shall supply all materials, plant and equipment necessary to complete the works.

All work shall comply with the NZS 4251 “Code of Practice for Solid Plastering”.

SCOPE:

Allow to plaster area as shown on plan. Plaster finish to be discussed with Owners.

Allow to smooth plaster exposed surfaces of foundations.

PAINTING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC 1992:B2, E2, G7

Scope:

Soffits
Exterior cladding
Front door & sidelights
Interior walls & ceilings
Interior doors & window reveals
Skirtings & trims

Materials:

Dulux Tradeline in unopened containers.

External:

1 undercoat, 2 top coats acrylic high gloss or stain or oil as selected

Internal:

All Gibraltor board shall have sealer applied over No. 4 stopping finish, all in accordance with the Gib Board Manufacturer's specification.

1 coat Gib sealer or 1 undercoat, 2 top coats acrylic semi gloss or high gloss as selected.3 coats polyurethane for clear finish

GIB Aqualine to all wet area with 2 Coat Enamel

Colours:

All colours to be as selected and approved by Owner (maximum of 4 colours from white base)

Application:

Thoroughly prepare all surfaces, rub down between coats and leave a first class finish. Stop all cracks and nail holes, etc. No painting shall be done under adverse weather conditions. All paintwork shall be 3 coats in 1 undercoat and 2 top coats.

All work shall be of the highest standard, performed by skilled tradesmen in accordance with best trade practice, using tools and equipment suitable for ensuring a first class job.
No external work shall be done during frosty or inclement weather.
Any work damaged by dust, rain or any other cause shall be rubbed down and recoated. The top and bottom edges of all doors etc. shall be painted to the same number of coats as the exposed faces.

No coat of paint, varnish or polish shall be applied until the undercoat is perfectly dry and hard. All finished surfaces shall be left smooth, even and free from brush marks, lap marks, corner dribbles or other trades.

All fittings, fixings and hardware shall be removed before preparatory processes are commenced and shall be refixed on completion of the painting. Adequately protect all finished work, including glass from paint splashes.

On completion, clean down all surfaces involved, including glass, rubbish, splashes and blemishes, etc. Remove all rubbish and leave ready for occupation.

TILING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Scope:

This section of work includes supplying, laying, grouting and sealing of tiles to as shown on Floor Plan and in conjunction with Client

Laying:

Tiling shall be carried out following the guidelines and practices described in the BRANZ publication: Good Tiling Practice

Set out is to be confirmed at the time of selecting tiles and before work is commenced. Tiles shall be fixed straight and even with no ridges. Cracked or chipped tiles shall not be used. Where required tiles shall be cut using a saw to produce straight edges with no chips or cracks. Cut tiles shall be laid with cut edges concealed from view.

Joints to tiles shall be finished smooth and be sealed against moisture. Seal bottom edge of tiles at benches with selected colour-matched silicone type sealant. Sealant to be fungus resistant. Grouting of tiles to be sealed once dry to stop moisture penetration inwards.

Interior tiles shall be laid over Gib Aqualine generally, Villaboard to Tiled Shower areas

Guarantees:

The tiles shall provide a Guarantee to cover against defective workmanship and materials supplied by him for a period of not less than 2 years after Certified Practical Completion.

Section 6
Technical Information

- ~~Septic Tank & Effluent Design incl. fencing~~
- ~~ECan Approval Documents~~
- ~~Gas Fire~~
- ~~Heating Unit~~
- ~~Solar Panels~~
- ~~Central Heating Systems~~
- Manufacturer's Literature
- A4 Details/Acceptable Solution Extract
- ~~Well/Water Test~~

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Received 13/09/2023

INSTALLATION GUIDE

Thermakraft™
WATERGATE
Plus

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Thermakraft™

WATERGATE PLUS

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

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

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

CODEMARK
BRANZ-CM-1002-Rev 2

BRANZ Appraised
Appraisal No.695 [2017]

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Kingspan®

Building Consent BC230758
Received 13/09/2023

Watergate Plus

Premium Synthetic Wall Wrap

Application Method

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

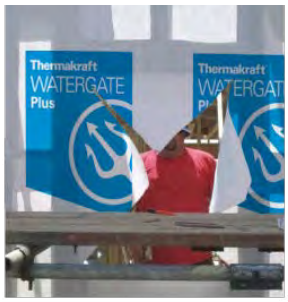
  Note: Check adhesive compatibility with Watergate Plus and the steel framing materials before use.

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

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

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

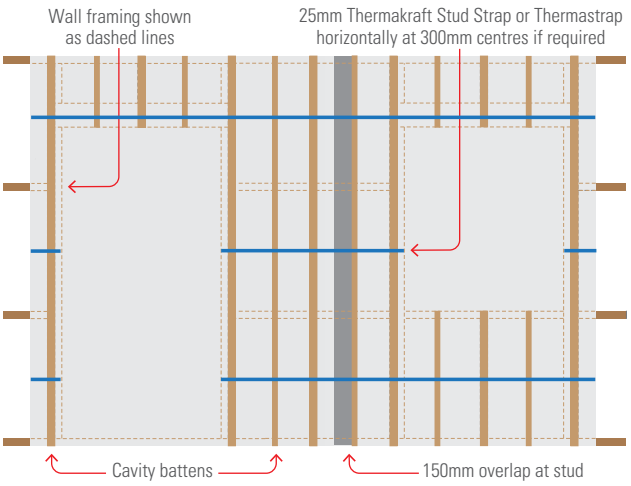
Fix Watergate Plus securely to the frame.



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

Application Tips

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



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Received 13/09/2023

Watergate Plus

Premium Synthetic Wall Wrap

Handling and Storage

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

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

The recommendations contained in Kingspan'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 Kingspan (for example quality of workmanship and design), Kingspan 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 online. E&OE.

Issue 5.0, September 2022

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Building Consent BC230758
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PRODUCT DATA SHEET

Thermakraft™
WATERGATE
Plus

Thermakraft™
ONE WRAP SYSTEM
10 Products - One system
One warranty

Thermakraft™

WATERGATE PLUS

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

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

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

CODEMARK
BRANZ-CM-1002-Rev 2

BRANZ Appraised
Appraisal No.695 [2017]

Kingspan®

Building Consent BC230758
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Watergate Plus

Premium Synthetic Wall Wrap

Watergate Plus comes in five roll sizes and two soffit roll sizes:

Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP1370025	1370mm wide	18.5m long	25m2 coverage*
WGP1370050	1370mm wide	37.0m long	50m2 coverage*
WGP1370100	1370mm wide	73.0m long	100m2 coverage*
WGP2740050	2740mm wide	18.5m long	50m2 coverage*
WGP2740100	2740mm wide	36.5m long	100m2 coverage*

Soffit Roll Dimensions			
Product Code	**Width**	**Length**	**Coverage**
WGP600025SOF	685mm wide	36.5m long	25m2 coverage*
WGP600050SOF	685mm wide	73.0m long	50m2 coverage*

* **Note:** m^2 is the roll size. For actual coverage, allow for laps and joins.

Custom Branding Available – Contact your Kingspan Insulation Representative for more details

Product Description

Watergate Plus is a two-layer laminated wall underlay combining a Polyester non-woven layer with a high quality vapour permeable film. This allows water vapour to pass through from inside the wall cavity whilst water from the exterior is kept out.

The product is simply fixed to timber framing using construction staples and is made to stretch around corners providing a tight fit and reducing the risk of staple tear. It will provide temporary weather protection during construction. (Max 90 Days).

Scope of Use

Watergate Plus can be used as a wall underlay on both residential and commercial buildings within the following scope:

- 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 timber and steel framing, either directly fixed or in conjunction with an 18mm minimum drained cavity.
- With masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 and E2/AS4.
- Situated in NZS3604 and NASH Building Wind Zones up to (and including) 'Very High' when used as a standalone flexible underlay, and "Extra High" when used as a flexible underlay over a rigid wall underlay.
- Is suitable as an air barrier in unlined wall spaces.
- Is suitable to be used in conjunction with thermal breaks on steel framed buildings.
- Refer to BRANZ Appraisal No 695 (2017) and CodeMark Certificate BRANZ-CM-1002-Rev 2 for full details.

General

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

Limitations

- Must NOT be used as a roof underlay.
- Must NOT be exposed to the weather or UV for more than 90 days.
- Watergate Plus is NOT a vapour barrier.

Compliance

- Watergate Plus has been appraised with the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 and E2/AS4, with regards to building height and floor plan area.
- Watergate Plus has also been BRANZ appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Ltd.

Building Consent BC230758
Received 13/09/2023

Watergate Plus

Premium Synthetic Wall Wrap

Flammability Index

Watergate Plus Wall Underlay has an AS 1530 Part 2 Flammability Index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Durability

Meets the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 (a) 50 years, B2.3.1 (b) 15 years and B2.3.2), E2 External Moisture (E2.3.2), and F2 Hazardous Building Materials F2.3.1, providing:

- It is not damaged.
- Installed in accordance with instruction guide.
- Is not left exposed for more than 90 days.
- Installed by or under guidance of Licensed Building Practitioners.
- Is compatible with cladding system used.*

* **Note:** specifiers and product user must confirm wall cladding system compatibility with the underlay before installation.

Product Warranty

Standard Kingspan Insulation Warranty applies. Refer to Kingspan Insulation Warranty statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

Property Performance

The following data represents the minimum pass rates required by the NZBC. This product tests well beyond the minimum standards. If you require actual performance results, please contact your local Kingspan Insulation representative.

NZBC E2/AS1 Table 23 (NZS2295) Wall Underlay Properties	Absorbency	Vapour Resistance	pH of Extract	Shrinkage	Water Resistance	Air Resistance
Property Performance Requirement	≥ 100gsm	≤ 7 MN.s/g	≥ 5.5 and ≤ 8	≤ 0.5%	≥ 20mm	≥ 0.1 MN.s/m^3
Property Performance	Pass	Pass	Pass	Pass	Pass	Can be used as an air barrier

CODEMARK BRANZ-CM-1002-Rev 2

BRANZ Appraised Appraisal No.695 [2017]

0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

Kingspan®

The recommendations contained in Kingspan'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 Kingspan (for example quality of workmanship and design), Kingspan 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 online. E&OE.

Issue 10.0, September 2022

Building Consent BC230758
Received 13/09/2023

BRANZ Appraised

Appraisal No. 695 [2023]

WATERGATE PLUS WALL UNDERLAY

Appraisal No. 695 (2023)

This Appraisal replaces BRANZ Appraisal No. 695 (2017)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 Watergate Plus is a fire retardant, flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel-framed buildings. The product is manufactured from coated, non-woven polyolefin and is coloured white.

Scope

Flexible Wall Underlay

2.1 Watergate Plus has been appraised for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
- with direct fixed absorbent and non-absorbent wall claddings; or,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or to NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 Wind Zones up to, and including, Very High.

Use over Rigid Wall Underlay

2.2 Watergate Plus has been appraised for use as a flexible wall underlay over rigid wall underlays on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and,
- situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 Watergate Plus has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Watergate Plus into their design in accordance with the declared properties and the instructions of Kingspan Insulation NZ Limited.

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

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Watergate Plus, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Watergate Plus meets these requirements. See Paragraphs 9.1 and 9.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c). Watergate Plus meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Watergate Plus will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watergate Plus meets this requirement.

Technical Specification

4.1 Watergate Plus is a white, 105 g/m^2 non-woven, microporous polyolefin fabric underlay.

4.2 The product is supplied in various sizes. Refer to Table 1. The product is printed with the Watergate Plus logo repeated along the length of the roll and can also be co-branded with custom printing. The rolls are wrapped in clear polythene film.

Table 1: Roll Dimensions

Width (mm)	Length (m)	Coverage (m^2)
1,370	18.5	25
1,370	37	50
1,370	73	100
2,740	18.5	50
2,740	36.5	100

Accessories

4.3 Accessories used with Watergate Plus which are supplied by the installer are:

- **Fixings** - 6-8 mm staples, large head clouts minimum 20 mm long, self-drilling screws, proprietary underlay fixings, double sided tape (for steel framing) or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay restraint (timber frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- **Wall underlay restraint (steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NASH Building Envelope Solutions, Paragraph 9.1.9.5. Thermal break sheathing installed in accordance with NASH Building Envelope Solutions Paragraph 11.4.3.2.

Handling and Storage

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

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

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Watergate Plus, Issue 5.0, September 2022.
- Product Data Sheet - Watergate Plus, Issue 10.0, September 2022.

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

Design Information

7.1 Watergate Plus is intended for use as an alternative to conventional building papers which are fixed over timber or steel-framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain. Refer to Table 2 for material properties.

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

7.3 Watergate Plus must not be exposed to the weather or ultraviolet (UV) light for a total of more than 90 days before being covered by the wall cladding.

7.4 Watergate Plus is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.1.4 (c).

7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber framing or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel framing. Wall underlay restraint options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens or thermal break sheathing (steel framing only).

Table 2: Material Properties

NZS 2295 Property	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m^2	Pass
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear (Average):** Machine direction = 77 N Cross direction = 56 N **Tensile strength (Average):** Machine direction = 2.5 kN/m Cross direction = 1.8 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass. Watergate Plus can be used as an air barrier.

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

Claddings

7.6 Watergate Plus is suitable for use under wall claddings as a wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

Stucco Plaster

7.7 Watergate Plus is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1 for timber framing or NASH Building Envelope Solutions Paragraph 9.3.5.1 for steel framing. The underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.

7.8 Watergate Plus may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3.1 b) for timber framing or NASH Building Envelope Solutions, Paragraph 9.3.3.1 b) for steel framing.

Structure

8.1 Watergate Plus is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid wall underlays.

Durability

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

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 90 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Watergate Plus is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Watergate Plus has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watergate Plus from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.

12.2 Watergate Plus, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

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

Installation Information

Installation Skill Level Requirement

13.1 All design and building work must be carried out in accordance with the Watergate Plus Wall Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with wall underlays. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Underlay Installation

14.1 Watergate Plus must be fixed to all framing members at maximum 300 mm centres with clouts, staples, self drilling screws or proprietary underlay fixings. For steel framing, double-sided tape may be used which is applied to each stud in continuous strips. The underlay must be pulled taut over the framing before fixing.

14.2 Watergate Plus must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.

14.4 Watergate Plus can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.

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

Inspections

14.7 The Technical Literature must be referred to during the inspection of Watergate Plus installations.

Basis of Appraisal

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

Tests

15.1 The following tests have been carried out on Watergate Plus in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Watergate Plus was exposed to UV light.

15.2 The flammability index of Watergate Plus has been evaluated in accordance with AS/NZS 1530.2.

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

Other Investigations

16.1 A durability opinion has been given by BRANZ technical experts.

16.2 An evaluation of the expected performance of Watergate Plus in direct contact with metal wall cladding has been completed by BRANZ.

16.3 The practicability of installation of Watergate Plus has been assessed by BRANZ and found to be satisfactory.

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

Quality

17.1 The manufacture of Watergate Plus has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.

17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Kingspan Insulation NZ Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.1:1994 Pliable building membranes and underlays - Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2:1994 Pliable building membranes and underlays - Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays - Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays - Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994 Pliable building membranes and underlays - Methods of test – Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295:2006 Pliable, permeable building underlays.
- NZS 3604:2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel-framed buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

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

BRANZ

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

The Appraisal is issued only to Kingspan Insulation NZ Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Kingspan Insulation NZ Limited:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Kingspan Insulation NZ Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Kingspan Insulation NZ Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
08 February 2023

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

Building Consent BC230758
Received 13/09/2023

CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

Expiry Date: 17 February 2025

CERTIFICATE HOLDER

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Client signature

William Lin

Customer Name William Lin
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CERTIFICATION BODY

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Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

PRODUCT CERTIFICATE

THIS IS TO CERTIFY

WATERGATE PLUS WALL UNDERLAY

KEY INFORMATION

1. DESCRIPTION OF BUILDING METHOD OR PRODUCT

1.1 Watergate Plus is a white coloured flexible synthetic wall underlay. The product is printed with the Watergate Plus logo repeated along the length of the roll.

2. USE OF BUILDING METHOD OR PRODUCT

2.1 Watergate Plus is for use as a flexible wall underlay for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber framed buildings; or,
- the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel framed buildings; and
- with direct fixed wall claddings, or with wall claddings installed over a drained cavity; or,
- with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or in accordance with NASH Building Envelope Solutions for steel framed buildings; and,
- situated in NZS 3604: 2011 Wind Zones up to and including Very High when fixed directly to framing, and Extra High when fixed over a rigid air barrier.

2.2 Watergate Plus is also for use:

- as an air barrier in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions Paragraph 9.1.4 (c); or,
- as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.3.5.1, or;
- as a slip layer over a rigid backing for stucco cladding in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, Paragraph 9.3.3.1 (b).

3. COMPLIES WITH THE FOLLOWING PROVISIONS OF THE NEW ZEALAND BUILDING CODE (NZBC)

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years (for when the cladding durability requirement is not less than 50 years), B2.3.1 (b), 15 years (for when the cladding durability requirement is 15 years) and B2.3.2 (a).

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 (c).

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2 (contributes to), E2.3.5 (contributes to) and E2.3.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

JAS-ANZ
www.jas-anz.org/register

The Certificate Holder must maintain compliance with the conditions set out in Regulation 15 of the Building (Product Certification) Regulations 2008.

This Certificate is issued by BRANZ Limited, an independent certification body accredited by the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment (MBIE) under the Building Act 2004. MBIE does not in any way warrant, guarantee or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. MBIE 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 products(s) referred to in this certificate.

It is advised to check that this Product Certificate is currently valid and not withdrawn, suspended or superseded by a later issue, by referring to the MBIE website, www.mbie.govt.nz

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Information regarding BRANZ's complaints process can be found at the following link: Complaints Process

Building Consent BC230758
Received 13/09/2023

CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

Expiry Date: 17 February 2025

CERTIFICATE HOLDER

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Client signature

William Lin

Customer Name William Lin
Customer Position Head of Engineering and Inventory Thermakraft Limited

CERTIFICATION BODY

BRANZ

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Web: branz.nz

Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

4. CONDITIONS AND LIMITATIONS OF USE

4.1 Watergate Plus Wall Underlay must not be exposed to the weather or ultra violet light for more than 90 days before being covered by the wall cladding.

4.2 Framing studs must be at a maximum of 600 mm centres. Timber framing must be in accordance with NZS 3604: 2011 or to a specific design. Steel framing must be in accordance with NASH Standard Part Two: May 2019.

5. HEALTH AND SAFETY INFORMATION

5.1 Watergate Plus is a synthetic wall underlay. The supplier's instructions and typical practices for working with and handling synthetic wall underlays should be observed.

6. REFERENCE DOCUMENTS

6.1 This Product Certificate must be read in conjunction with:

- BRANZ Appraisal No. 695 Watergate Plus Wall Underlay.
- Technical Literature: Product Data Sheet Watergate Plus, Issue 9, dated September 2021; and,
- Technical Literature: Installation Guide Watergate Plus, Issue 4, dated September 2021.

SCHEDULE: INFORMATION THAT SUPPORTS KEY INFORMATION

7. SUPPORTING INFORMATION ABOUT DESCRIPTION OF THE BUILDING METHOD

PRODUCT SPECIFICATION

7.1 Watergate Plus is for use as a flexible wall underlay fixed over timber or steel framed walls to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.

7.2 Watergate Plus is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1 Table 23 for timber framed buildings and NASH Building Envelope Solutions Table 23 for steel framed buildings. This includes non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.

7.3 Watergate Plus is a synthetic building underlay manufactured from a film coated, non-woven, laminated flexible synthetic fabric. Watergate Plus is coloured white on the top and bottom faces and is printed with the Watergate Plus logo, and can also be co-branded with custom printing.

7.4 The product is supplied in rolls 1.370 m wide x 18.5 m, 37.0 m and 73.0 m long; 2.740 m wide x 18.5 m and 36.5 m long. The rolls are wrapped in clear polythene film.

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The Certificate Holder must maintain compliance with the conditions set out in Regulation 15 of the Building (Product Certification) Regulations 2008.

This Certificate is issued by BRANZ Limited, an independent certification body accredited by the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment (MBIE) under the Building Act 2004. MBIE does not in any way warrant, guarantee or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. MBIE 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 products(s) referred to in this certificate.

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Building Consent BC230758
Received 13/09/2023

CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

Expiry Date: 17 February 2025

CERTIFICATE HOLDER

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William Lin

Customer Name William Lin
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CERTIFICATION BODY

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Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

TABLE 1: NZBC E2/AS1 TABLE 23 (NZS 2295:2006) REQUIREMENTS

NZBC E2/AS1 Table 23 (NZS 2295: 2006) Wall Underlay Properties	Property Performance Requirement	Actual Property Performance
Vapour Resistance	≤ 7 MN s/g	Pass
Absorbency	≥ 100 g/m²	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 6.0 and ≤ 9.0	Pass
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear (Average): Machine direction = 77 N (Note 1) Cross direction = 56 N (Pass) Tensile strength (Average): Machine direction = 2.5 kN/m (Pass) Cross direction = 1.8 kN/m (Pass)
Flammability Index	≤ 5	Fire retardant
Air Resistance	≥ 0.1 MN s/m³	Pass

Note 1: Pass of BRANZ criteria for edge tear resistance.

8. SUPPORTING INFORMATION ABOUT INTENDED USE OF THE PRODUCT

DESIGN REQUIREMENTS

8.1 Separation or protection must be provided to Watergate Plus Wall Underlay from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

INSTALLATION REQUIREMENTS

8.2 Installation must be carried out in accordance with the following:

- Technical Literature: Product Data Sheet Watergate Plus, Issue 9, dated September 2021; and,
- Technical Literature: Installation Guide Watergate Plus, Issue 4, dated September 2021.
- NZBC Acceptable Solution E2/AS1; or

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The Certificate Holder must maintain compliance with the conditions set out in Regulation 15 of the Building (Product Certification) Regulations 2008.

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Building Consent BC230758
Received 13/09/2023

CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

Expiry Date: 17 February 2025

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Client signature

William Lin

Customer Name William Lin
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Web: branz.nz

Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

- NASH Building Envelope Solutions.

MAINTENANCE REQUIREMENTS

8.3 No maintenance can be performed on Watergate Plus once the cladding is installed.

BUILDING CODE

B1 STRUCTURE

8.4 Watergate Plus is suitable for use in all Wind Zones of NZS 3604: 2011 up to, and including, Very High when used as a stand-alone flexible wall underlay and all Wind Zones of NZS 3604: 2011 up to, and including, Extra High when used as an overlay for rigid building underlays.

B2 DURABILITY

8.5 Watergate Plus meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building underlays used where the cladding durability requirement is 15 years. Watergate Plus is expected to have a serviceable life equal to that of the cladding.

C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE

8.6 Watergate Plus has an AS 1530 - 1993 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solution C/AS2, Paragraph 4.17.8 b) for suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

E2 EXTERNAL MOISTURE

8.7 Watergate Plus must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions.

9. SUPPORTING INFORMATION ABOUT CONDITIONS AND LIMITATIONS OF USE

9.1 All conditions and limitations provided as stated in this Product Certificate.

10. BASIS FOR CODEMARK CERTIFICATION

10.1 The following tests have been carried out on Thermakraft Watergate Plus Wall Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23:

- tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1: 1994
- shrinkage in accordance with AS/NZS 4201.3:1994
- resistance to water penetration in accordance with AS/NZS 4201.4: 1994
- surface water absorbency in accordance with AS/NZS 4201.6: 1994
- pH of extract in accordance with AS/NZS 1301.421s: 1998
- air resistance to BS 6538.3:1987.

10.2 Ultraviolet (UV) light ageing of wall underlays is a critical evaluation requirement to verify a products continued performance after site construction exposure. UV aging of Watergate Plus equivalent to 90 days construction site exposure was completed and the range of tests detailed above were repeated after aging.

10.3 The Flammability Index of Thermakraft Watergate Plus Wall Underlay has been tested in accordance with AS 1530.2 - 1993.

10.4 BRANZ Expert Judgement (Materials Scientist) confirmation of compliance to the NZBC Clause B2 Durability Performance Requirements.

10.5 The practicability of installation of Thermakraft Watergate Plus Wall Underlay has been assessed by BRANZ and found to be satisfactory.

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www.jas-anz.org/register

The Certificate Holder must maintain compliance with the conditions set out in Regulation 15 of the Building (Product Certification) Regulations 2008.

This Certificate is issued by BRANZ Limited, an independent certification body accredited by the product certification body appointed by the Chief Executive of the Ministry of Business, Innovation and Employment (MBIE) under the Building Act 2004. MBIE does not in any way warrant, guarantee or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. MBIE 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 products(s) referred to in this certificate.

It is advised to check that this Product Certificate is currently valid and not withdrawn, suspended or superseded by a later issue, by referring to the MBIE website, www.mbie.govt.nz

This certificate may only be reproduced in its entirety.

Information regarding BRANZ's complaints process can be found at the following link: Complaints Process

Building Consent BC230758
Received 13/09/2023

CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

Expiry Date: 17 February 2025

CERTIFICATE HOLDER

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Web: www.thermakraft.co.nz

Client signature

William Lin

Customer Name William Lin
Customer Position Head of Engineering and Inventory Thermakraft Limited

CERTIFICATION BODY

BRANZ

BRANZ Limited
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand

Tel: 04 237 1170
Email: assuranceservices@branz.co.nz
Web: branz.nz

Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

10.6 The referenced Technical Literature has been examined by BRANZ and found to be satisfactory.

11. RESPONSIBILITIES FOR USE OF CERTIFIED PRODUCT

- The quality of supply to the market is the responsibility of Thermakraft Limited.
- Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Thermakraft Limited.
- Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

12. DOCUMENTATION SUPPORTING CERTIFICATION

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- ASTM E96: 2005 Standard test methods for water vapor transmission of materials.
- ASTM G155:2013 Standard practice for operating xenon arc light apparatus for exposure of non-metallic underlays.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NASH Building Envelope Solutions: 2019 Light Steel Framed Buildings.
- NASH Standard Part Two: 2019 Light Steel Framed Buildings.
- NZS 2295: 2006 Pliable, permeable building underlays.
- NZS 3604: 2011 Timber-framed buildings.
- TAPPI T470:1986 Edge tearing resistance of paper (Edge-tear stirrup method)
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

13. CONDITIONS RELATING TO NOTIFICATION

13.1 The certificate holder Thermakraft Ltd must notify the product certification body (BRANZ) in writing, of any intended change to any of the following particulars:

- The name, address, or contact details of the certificate holder;
- Any address of a location where a certified product is produced or manufactured.

13.2 The certificate holder shall notify the Product Certification body in writing of any intended change, modification, or alteration to any of the following:

- The certified building method or product;
- The method of its production or manufacture;
- The Product Quality Plan prepared in respect of the certified building method or product;

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Building Consent BC230758
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CODEMARK®

Certificate No: BRANZ-CM-1002-Rev 2

Date of Issue: 17 February 2022

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CERTIFICATE HOLDER

Thermakraft

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Client signature

William Lin

Customer Name William Lin
Customer Position Head of Engineering and Inventory Thermakraft Limited

CERTIFICATION BODY

BRANZ

BRANZ Limited
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New Zealand

Tel: 04 237 1170
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Web: branz.nz

Chelydra Percy

Chelydra Percy
Chief Executive Officer
BRANZ Limited

- The application or installation instructions for the certified building method or product;
- Any documentation relating to the use and maintenance of the certified building method or product.

13.3 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 shall notify the product certification body in writing of the reason for that suspicion.

13.4 If the certificate holder or the product certification body 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 shall disclose that fact in a published disclosure statement in a form that is acceptable to the product certification body and to MBIE.

13.5 If the certificate is suspended or revoked, the certificate holder—

- Shall notify all customers to whom the building method or product is regularly supplied; and
- Immediately cease using the certificate, the mark of conformity, and any reference to the number of this certificate.

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The Certificate Holder must maintain compliance with the conditions set out in Regulation 15 of the Building (Product Certification) Regulations 2008.

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Received 13/09/2023

INSTALLATION GUIDE

Thermakraft
ALUBAND
Window Flashing Tape

Thermakraft
ONE WRAP SYSTEM
10 Products - One system
One warranty

Thermakraft™ ALUBAND

Bituminous adhesive flexible window flashing tape.

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

Product usage

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

BRANZ Appraised
Appraisal No.878 [2019]

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Kingspan®

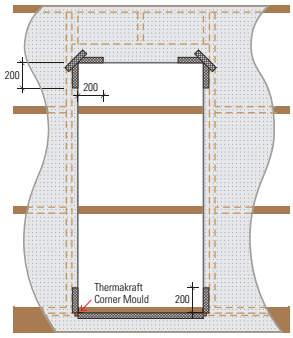
Building Consent BC230758
Received 13/09/2023

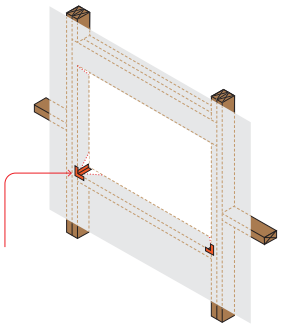
Aluband

Bituminous adhesive flexible window flashing tape

Application Method

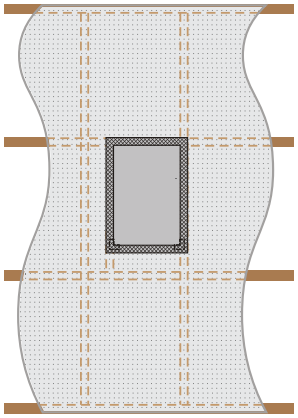
- Cut the wall underlay/air barrier at a 45° angle away from each corner. Fold flaps tightly into the window or door opening and fix with staples on the back faces of the framing.
- Fix the Corner Moulded Piece to the bottom corners by way of staples or clouts to the two jambs. Always ensure that Aluband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

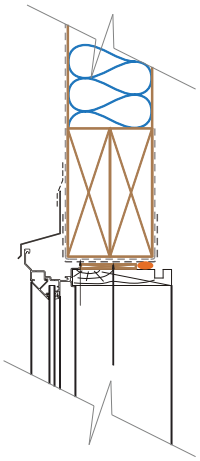




Window and door frames

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





Application Tips

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

Building Consent BC230758
Received 13/09/2023

Aluband

Bituminous adhesive flexible window flashing tape

Important Information

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

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

Application of Heat:

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

Difficult to Bond Substrates Surface Preparation:

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

Adhesives and Sealants:

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

Handling and Storage

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

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

BRANZ Appraised
Appraisal No.878 [2019]

0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

The recommendations contained in Kingspan'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 Kingspan (for example quality of workmanship and design), Kingspan 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 online. E&OE.

Issue 5.0, September 2022

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PRODUCT DATA SHEET

Thermakraft™
ALUBAND
Window Flashing Tape

Thermakraft™
ONE WRAP SYSTEM
10 Products - One system
One warranty

Thermakraft™ ALUBAND

Bituminous adhesive flexible window flashing tape

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

Aluband comes in four roll sizes:

Product Code	Roll Size	Rolls Per Carton
ALU075025	75mm x 25m	12
ALU150010	150mm x 10m	6
ALU150025	150mm x 25m	6
ALU200025	200mm x 25m	4

BRANZ Appraised
Appraisal No.878 [2019]

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Kingspan®

Building Consent BC230758
Received 13/09/2023

Aluband

Bituminous adhesive flexible window flashing tape

Scope of Use

Aluband Window Flashing Tapes can be used within the following scope:

- Installed into and around frame joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing as a secondary weather resistant barrier.
- Installed at joinery heads to seal flashing upstands to the wall underlay.
- To assist the overall weathertightness performance of window and door joinery installations.
- To be used in conjunction with air seals and joinery flashing systems. Installer must check for air seal product compatibility with Aluband Window Flashing Tape.
- Aluband Window Flashing Tape must be used with Thermakraft Corner Moulded Pieces (on windowsill corners).
- Situated in NZS3604 Wind Zones up to, and including 'Extra High'.

General

- Compatible with all Thermakraft building underlays.
- 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.
- Thermakraft corner moulds MUST be used at flashing corners (see installation guide).

Limitations

- Must NOT be exposed to the weather/UV for more than 42 days.
- Should be installed when temperatures are above 5°C.
- NOT designed to overcome poor detailing and workmanship of the window or door joinery installation.
- Bitumen may react with window sealants. Always check compatibility before use.

Compliance:

- Aluband should be used within the product scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1;
- Can be used on buildings constructed with timber and steel framing complying with the NZBC;
- With a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- Can be used with wall cladding systems complying with NZBC Acceptable Solution E2/AS1.

Durability:

- Aluband Window Flashing Tape will meet the Performance Requirements of NZBC Clauses B2, Durability (B2.3.1 [a] 50 years*, B2.3.1 [b] 15 years* and B2.3.2), E2 External Moisture Performance and F2 Hazardous Building Materials.

* **Note:** When the external cladding is maintained according to the cladding manufacturer's instructions and the cladding remains weather resistant, Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

- Aluband Window Flashing Tape has a serviceable life expectancy equal to that of the cladding, when installed in accordance with this technical specification and in accordance to the product installation guide, provided it is not exposed to the weather or ultra-violet (UV) light for more than 42 days, or is not damaged upon installation.
- Aluband Window Flashing Tape is designed to work on all building underlays that meet the requirements of NZBC E2/AS1 Table 23, and on all Thermakraft BRANZ Appraised wall underlays.

Product Warranty

Standard Kingspan Insulation Warranty applies. Refer to Kingspan Insulation Warranty statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

BRANZ Appraised
Appraisal No.878 [2019]

0800 806 595
www.thermakraft.co.nz

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Issue 6.0, September 2022

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Building Consent BC230758
Received 13/09/2023

BRANZ Appraised

Appraisal No. 878 [2019]

THERMAKRAFT ALUBAND WINDOW FLASHING TAPE

Appraisal No. 878 (2019)

This Appraisal replaces BRANZ Appraisal No. 878 (2014)

Amended 08 February 2023

BRANZ Appraisals

Technical Assessments of products for building and construction.

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BRANZ
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New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 Thermakraft Aluband Window Flashing Tape in conjunction with the Thermakraft Corner Moulded Piece is a flexible flashing tape system for use around framed joinery openings as a secondary weather resistant barrier.

1.2 The system is installed into and around the framed joinery opening over the wall underlay and exposed frame to cover both the face and edge of the opening framing. Thermakraft Aluband Window Flashing Tape is also used at joinery heads to seal flashing upstands to the wall underlay.

Scope

Timber Framing

2.1 The Thermakraft Aluband Window Flashing Tape has been appraised for use as a flexible flashing tape with external wall cladding for timber-framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; and
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

Steel Framing

2.2 The Thermakraft Aluband Window Flashing Tape has also been appraised for use as a flexible flashing tape with external wall cladding for steel-framed buildings within the following scope:

- the scope limitations of NASH Building Envelope Solutions Paragraph 1.1 for steel-framed buildings; and,
- with a risk score of 0-20, calculated in accordance with NASH Building Envelope Solutions; and,
- situated in NASH Standard Part 2 Wind Zones up to, and including, Extra High.

Specific Design

2.3 The Thermakraft Aluband Window Flashing Tape has also been appraised for weathertightness when used on buildings subject to specific design up to an ultimate limit state (ULS) wind pressure of 2.5 kPa with wall cladding systems complying with NZBC Acceptable Solution E2/AS1 or a valid BRANZ Appraisal that specifies a flexible flashing system; and, with flexible wall underlays compatible with the flashing tape and complying with the NZBC; and, situated in NZS 3604 Wind Zones up to, and including, Extra High (refer to Paragraph 7.3).

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

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape, 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. Thermakraft Aluband Window Flashing Tape meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Thermakraft Aluband Window Flashing Tape contributes to meeting this requirement. See Paragraphs 7.1-7.4 and 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Aluband Window Flashing Tape meets this requirement.

Technical Specification

4.1 System components and accessories supplied by Kingspan Insulation NZ Ltd are:

- **Thermakraft Aluband Window Flashing Tape** is a polymeric faced, bituminous modified, self-adhesive tape with a release backing paper. The tape is supplied in rolls 200, 150 and 75 mm wide x 25 m long and 150 mm wide x 10 m long. The rolls are wrapped in clear polythene film.
- **The Thermakraft Corner Moulded Piece** is made from inert polyethylene and is coloured orange. It is used in conjunction with the Thermakraft Aluband Window Flashing Tape and building underlays as part of the Thermakraft Aluband Window Flashing Tape system.

4.2 Accessories used with the system which are supplied by the installer are:

- **Thermakraft Corner Moulded Piece Fixings** - staples, clouts or other temporary fixings to attach the corner mould to the framing prior to the installation of the Thermakraft Aluband Window Flashing Tape.
- **Scotch® Super 77™ Multipurpose Adhesive** - a clear spray primer.

Handling and Storage

5.1 Handling and storage of all materials supplied by Kingspan Insulation NZ Ltd, whether on-site or off-site, is under the control of the installer. Thermakraft Aluband Window Flashing Tape and accessories must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions away from direct exposure to sunlight.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Installation Guide - Thermakraft™ ALUBAND, Issue 5.0, September 2022.
- Product Data Sheet - Thermakraft™ ALUBAND, Issue 6.0, September 2022.

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

Design Information

General

7.1 Thermakraft Aluband Window Flashing Tape meets the requirements of AC 148: 2001 which is an alternative solution to the version of AC 148 referenced by NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5 b) and NASH Building Envelope Solutions Paragraph 9.1.5 b). The installation method for Thermakraft Aluband Window Flashing Tape is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figures 72A and 72B and NASH Building Envelope Solutions, Figures 72A and 72B.

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

7.2 The use of flexible flashing systems around window and door joinery openings is critical to assist the overall weathertightness performance of window and door joinery installations.

7.3 Thermakraft Aluband Window Flashing Tape is suitable for use over flexible wall underlays compatible with the flashing tape in NZS 3604 Wind Zones up to, and including, Extra High. In the Extra High Wind Zone, the flexible underlay must be installed over a rigid underlay complying with NZBC Acceptable Solution E2/AS1, Table 23 or NASH Building Envelope Solutions, Table 23.

7.4 Thermakraft Aluband Window Flashing Tape is designed to prevent air leakage and water penetration around window and door openings at framing junctions (e.g. at the sill trimmer and opening stud junction), and to keep any water that gets past the cladding, or through the joinery, from direct contact with the framing timber.

7.5 Thermakraft Aluband Window Flashing Tape is not designed to overcome poor detailing and workmanship of the window or door joinery installation. The system must not be considered in isolation, but be considered as part of the wall cladding system. Thermakraft Aluband Window Flashing Tape is designed to be used in conjunction with air seals and joinery flashing systems, not as a substitute.

7.6 When Thermakraft Aluband Window Flashing Tape is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate (generally at least one week) prior to the installation of the system.

Durability

8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of Thermakraft Aluband Window Flashing Tape both during normal use and maintenance of the building.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultraviolet (UV) light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Thermakraft Aluband Window Flashing Tape is expected to have a serviceable life equal to that of the cladding.

Maintenance

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

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Thermakraft Aluband Window Flashing Tape 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 Where a cladding manufacturer specifies the use of generic flashing tapes around window and door joinery openings at framing junctions as part of their system, or they specify the use of flexible flashing tapes that comply with NZBC E2/AS1, Paragraph 9.1.5 b) or NASH Building Envelope Solutions Paragraph 9.1.5 b), Thermakraft Aluband Window Flashing Tape may be used.

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Installation Information

Installation Skill Level Requirements

12.1 All design and building work must be carried out in accordance with the Thermakraft Aluband Window Flashing Tape Technical Literature and this Appraisal by competent and experienced tradespersons conversant with flashing tapes. 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.

General

13.1 The selected wall underlay must be installed in accordance with the manufacturer's instructions, and must completely cover the joinery opening. The underlay is then cut on a 45° angle away from each corner of the opening so the flaps can be folded into the opening and secured to the interior face of the timber framing.

13.2 Fit a Thermakraft Corner Moulded Piece into each of the bottom corners to create a seal at the corner junction. The corner piece must be fixed to the framing with staples or clouts.

13.3 Before the Thermakraft Aluband Window Flashing Tape is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion. When installing Thermakraft Aluband Window Flashing Tape on difficult to bond substrates, Scotch® Super 77™ Multipurpose Adhesive may be used. Ensure that the wall underlay/substrate is dry and free of dirt before applying the spray adhesive. Apply a light spray/coating of the spray adhesive onto the underlay/substrate. Wait for a minute to allow the spray adhesive to become tacky. When tacky to the touch, apply the flashing tape in the normal manner.

13.4 A length of Thermakraft Aluband Window Flashing Tape must be cut to the length of the sill plus 400 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 200 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the building underlay. Ensure that adequate adhesion of the tape is achieved and that the tape is installed tight into the sill/jamb junction.

13.5 A 400 mm length of Thermakraft Aluband Window Flashing Tape must be installed 200 mm down the jamb and 200 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 100 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.

13.6 Thermakraft Aluband Window Flashing Tape must not be stretched. To avoid wastage, the tape can be lapped 100 mm minimum onto itself without reducing the performance of the Thermakraft Aluband Window Flashing Tape system.

13.7 If the Thermakraft Aluband Window Flashing Tape is exposed to the weather or UV light for more than 42 days, then it must be replaced with new material.

Installation Temperature

13.8 Thermakraft Aluband Window Flashing Tape must not be installed at temperatures of less than 5°C.

Inspections

13.9 The Technical Literature must be referred to during the inspection of Thermakraft Aluband Window Flashing Tape installations.

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

Basis of Appraisal

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

Tests

14.1 Testing of Thermakraft Aluband Window Flashing Tape has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC 148: 2001. The adhesion of Thermakraft Aluband Window Flashing Tape to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 or NASH Building Envelope Solutions Table 23 and selected other synthetic wall underlays has been tested and found to be satisfactory.

Other Investigations

15.1 An assessment was made of the durability of Thermakraft Aluband Window Flashing Tape by BRANZ technical experts.

15.2 Site inspections were carried out by BRANZ to examine the practicability of installation.

15.3 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.

Quality

16.1 The manufacture of Thermakraft Aluband Window Flashing Tape has not been examined by BRANZ, but details of the quality and composition of the materials used were obtained and found to be satisfactory.

16.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Ltd.

16.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and wall underlays in accordance with the instructions of the designer.

16.4 The quality of installation, handling and storage on site is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Ltd.

Sources of Information

- ICC Evaluation Service, Inc, AC148 Acceptable Criteria for Flexible Flashing Materials, July 2001.
- NZS 3604: 2011 Timber-framed buildings.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light steel framed buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No 1, dated 26 March 2021

This Appraisal has been amended to include NASH Standards and update the technical specifications.

Amendment No 2, dated 08 February 2023

This Appraisal has been amended to update the company name and technical literature, and to remove the Thermakraft tool.

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

BRANZ

In the opinion of BRANZ, Thermakraft Aluband Window Flashing Tape is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Kingspan Insulation NZ 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. Kingspan Insulation 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 Kingspan Insulation 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 Kingspan Insulation NZ Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:

18 December 2019

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INSTALLATION GUIDE

Thermakraft™
THERMAKRAFT
215

Thermakraft™

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

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

WAIMAKARIRI DISTRICT COUNCIL
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Thermakraft 215

Self-supporting bituminous wall and roof underlay

Application Method (Roofing)

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

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

Long-run metal roofing/vertical or horizontal installation method

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

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

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

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

Concrete/Metal tile roofing

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

Application Method (Wall)

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

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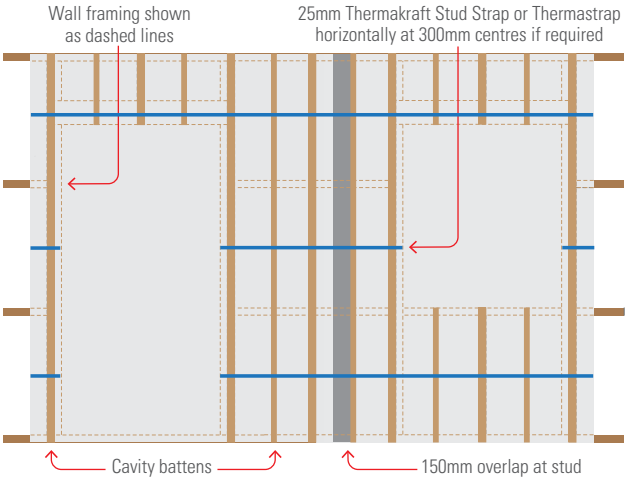
Thermakraft 215

Self-supporting bituminous wall and roof underlay

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



Application Tips

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

Handling and Storage

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

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

0800 806 595
www.thermakraft.co.nz

Thermakraft and Ausmesh products are brought to you by Kingspan Insulation NZ Limited.

The recommendations contained in Kingspan'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 Kingspan (for example quality of workmanship and design), Kingspan 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 online. E&OE.

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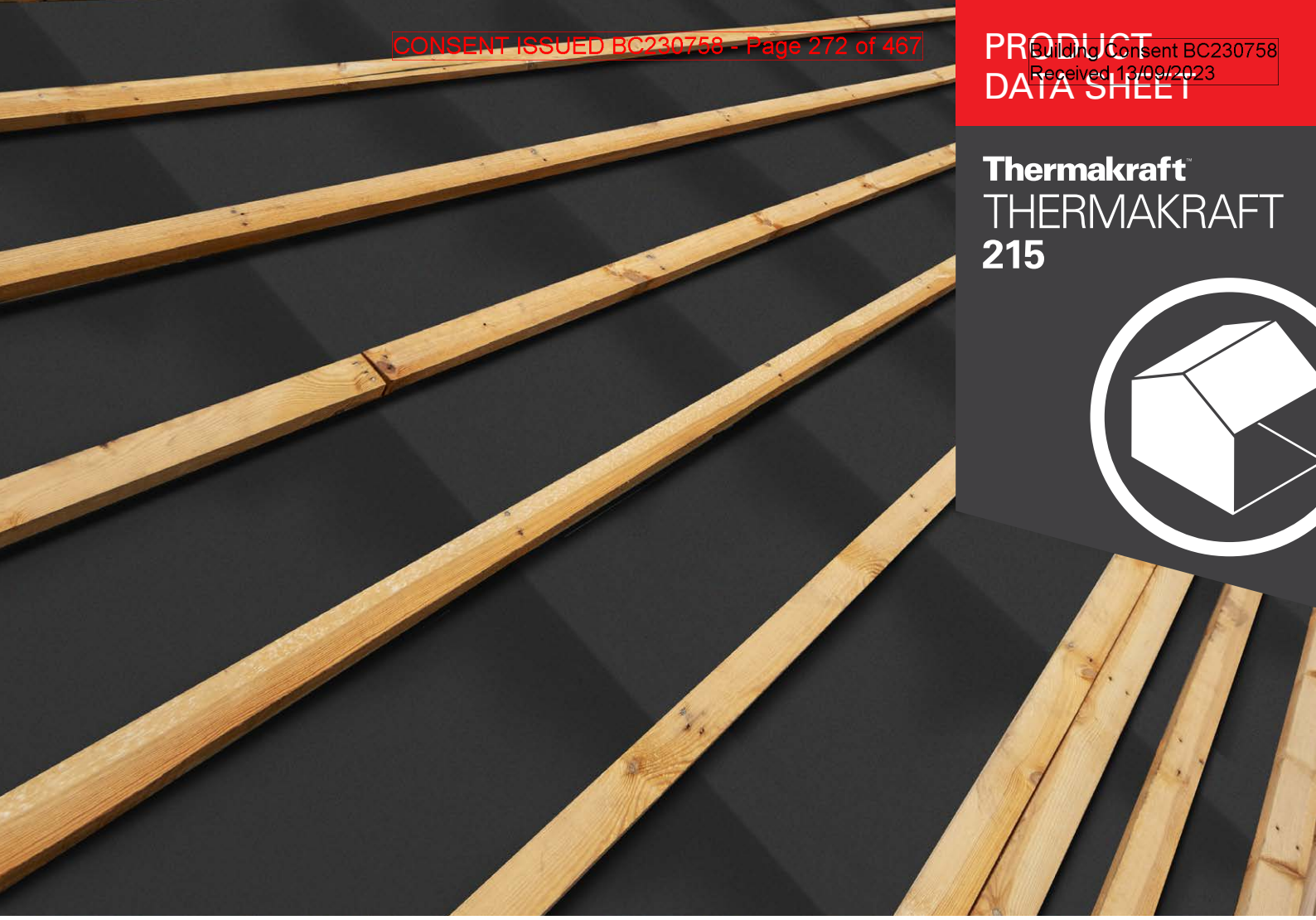
PRODUCT DATA SHEET

Thermakraft™
THERMAKRAFT
215



Thermakraft™

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

Commonly referred to as "Building Paper" Kingspan 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:** m^2 is the roll size for actual coverage, allow for laps and joins.

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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 7 day exposure), same day coverage recommended.

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.

Limitations

- In roof and wall applications must NOT be exposed to the weather or UV for more than 7 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 Installation Guide.
- Run length is no greater than 10 meters.
- Is not exposed to weather or UV for more than 7 days.
- 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.

Property Performance

The following data represents the minimum pass rates required by the NZBC. This product tests well beyond the minimum standards. If you require actual performance results, please contact your local Kingspan Insulation representative.

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

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Thermakraft 215

Self-supporting bituminous wall and roof underlay

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

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 Kingspan Insulation Warranty applies. Refer to Kingspan Insulation Warranty statement for further details. This is available online at **thermakraft.co.nz** or call **0800 806 595.**

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June 2010
(Replaces November 2005)

NEW ZEALAND STEEL

SPECIFIERS AND BUILDERS GUIDE

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
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GALVSTEEL™ Axxis® STEEL FOR FRAMING COLORSTEEL® Zincalume®

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DESCRIPTION

New Zealand Steel produces a range of coated steel products.

COLORSTEEL®

COLORSTEEL® prepainted steel describes those steel building materials which have oven-cured paint applied to a galvanised or ZINCALUME® steel base on a continuous 'coil to coil' operation at the New Zealand Steel Glenbrook works.

The prepainting process gives excellent adhesion of the coating to the substrate, allowing rollforming to be performed after painting without delamination or deterioration of the paint film.

A variety of COLORSTEEL® prepainted steel coating types is offered. All COLORSTEEL® products are produced using either a ZINCALUME® steel substrate with an AZ150 or AZ200 coating class, (i.e.: 150 g/m^2 or 200 g/m^2 of zinc/aluminium alloy), or a galvanised steel substrate with a ZM275 coating class (i.e. 275 g/m^2 of zinc).

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

COLORSTEEL® Maxx™

COLOUR FOR THE EXTREME

COLORSTEEL® MAXX™ products have a ZINCALUME® coated steel base. This product is intended for Very Severe environments.

COLORSTEEL® Endura™

COLOUR FOR THE FUTURE

COLORSTEEL® ENDURA™ prepainted steel has a ZINCALUME® coated steel base and is available in a range of colours, selected for their ability to provide optimum performance, durability and appeal.

Zincalume®

ZINCALUME® zinc/aluminium alloy–coated steel has a 45% zinc, 55% aluminium alloy coating which offers superior corrosion resistance compared to galvanised steel in most environments (particularly coastal environments).

GALVSTEEL™

Traditional galvanised steel is offered under the trade name of GALVSTEEL™. This material has a 100% zinc coating and is available in a range of dimensions, grades, zinc coating weights and types.

AXXIS® STEEL FOR FRAMING

AXXIS® Steel for Framing is a brand of galvanised, high-tensile steel supplied for steel frames and trusses, used in residential and similar construction.

Data sheets on each of the COLORSTEEL® prepainted steel coating types may be obtained from New Zealand Steel Limited or any stockists of COLORSTEEL® prepainted steel.

Where there is a requirement for a very durable product with high aesthetic appeal and low costs of installation and maintenance, then COLORSTEEL® prepainted steel products should be specified.

Each product is designed for application in a specific environment. These applications are discussed under the heading “The New Zealand Building Code” later in this publication.

QUALITY ACCREDITATION

The New Zealand Steel Limited Paint Line received accreditation to ISO 9002 in April 1992 and has subsequently been upgraded to ISO 9001 since July 1993. An on-going programme of continuous improvement will ensure that practice at New Zealand Steel Limited continues to reflect the best available international technology.

DESIGN FOR DURABILITY

Design has a major impact on the durability of the building. A good design will ensure that you will get the best possible life from your building and reduce maintenance costs.

The following design elements are presented alphabetically with guides to provide improved durability.

ANIMAL SHELTERS

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

ZINCALUME®, COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ should not be used for this application.

Design Guide:

1. Contact New Zealand Steel Limited for specialist advice.
2. ZINCALUME® STEEL OR COLORSTEEL® SHOULD NOT BE USED IN THIS ENVIRONMENT DUE TO EXTREME CORROSION RISK.

CORROSION

Dissimilar Metals Corrosion

When two different metals are in contact and moisture is present, one metal is relatively protected while the other suffers accelerated corrosion. This is known as galvanic or bi-metallic corrosion. A similar effect commonly occurs with water flowing over dissimilar metals.

This form of corrosion is commonly found:

1. Where water is discharged from copper or brass systems over a galvanised, or COLORSTEEL® prepainted steel or ZINCALUME® coated steel roof.
2. Where unpainted lead flashings are applied directly to ZINCALUME® coated steel products. (Refer Information Bulletin No. 2 “Flashing Materials”).
3. Where fasteners are incompatible with the roofing material. (See Fixings and Fasteners, page 5).

Design Guide:

1. Separate dissimilar metals by using a barrier such as PVC tape, neutral cure silicone sealant or an appropriate paint system.
2. Prevent potential run-off from copper or brass pipes over GALVSTEEL™, ZINCALUME® coated steel or COLORSTEEL® prepainted steel surfaces by diverting the discharge clear of the roofing. Copper pipes must be isolated from AXXIS® Steel for Framing.

Note: Coastal areas with high salt levels and high humidity will increase the possibility of dissimilar metals corrosion.

Compatibility

More Active Metals

ZINC
ZINCALUME®
ALUMINIUM

STEEL

LEAD

COPPER

STAINLESS STEEL

More Noble Metals

This chart lists commonly used metals in a “Galvanic Series”. If any of these metals are in damp contact or a run–off situation, the metal higher on the table will sacrifice itself to protect the metal lower on the scale. Therefore the simple rule is to remember that you can run water down but not uphill. For example, zinc to copper is alright but copper to zinc is not.

RUN-OFF FROM INERT MATERIALS

The zinc coating on galvanised steel products develops a protective surface film as a result of natural weathering. This provides the longevity of performance which we have come to expect from GALVSTEEL™ products.

When flowing over galvanised roofing, rainwater dissolves small amounts of minerals and salts from the zinc surface. These minerals and salts promote and maintain the protective film and enhance the corrosion resistance of downstream galvanised steel products (eg: lean-to roofs, gutters and valleys).

However when rainwater flows over, or is collected from roofing materials which do not promote this protective film (INERT MATERIALS), accelerated corrosion of unpainted galvanised steel roofs and gutters can occur.

Some Examples of Inert Materials:

• ZINCALUME® steel • Glass • Fibreglass • COLORSTEEL® prepainted steel • Glazed Tiles • PVC • Acrylic • Aluminium

Design Guide:

1. On galvanised roofing, run skylights down to the gutter.
2. To achieve maximum life from your rainwater goods we recommend that they are manufactured from either ZINCALUME® steel or COLORSTEEL® prepainted steel products.
3. Unpainted galvanised steel must not be used for roofing or rainwater goods, including valleys and gutters, to collect water run-off from ZINCALUME® coated steel products or any other inert material.

DRINKING WATER

Rainwater collected from roofs clad with products made from GALVSTEEL™, ZINCALUME® coated steel and COLORSTEEL® prepainted steel, will comply with the provisions of NZBC G12.3.1, provided the water is not contaminated from other sources.

The first 25mm of rainfall from a newly installed roof must be discarded before drinking water collection starts.

Where a paint or paint system is applied to the roof, its suitability for the collection of drinking water must be established.

EDGE SEALING OF COLORSTEEL® PRODUCTS

Edge sealing of COLORSTEEL® products is not recommended. (See Environmental Categories and Product Recommendations section).

EXPANSION ALLOWANCE AND TEMPERATURE

All roofing and cladding is subject to expansion and contraction due to temperature extremes. This is particularly evident with darker colours and long spans where the expansion may be as much as 8.0mm for a 10.0 metre sheet. Fixing systems must allow for expansion and accommodate the longitudinal movement which results.

Design Guide:

Typical Roof Temperatures Summer Average - Calm Conditions

	INSULATED	UNINSULATED
Light Colours (eg Titania)*	58˚C	48˚C
Medium Colours (eg Mist Green)	79˚C	67˚C
Dark Colours (eg Karaka)	92˚C	77˚C

Typical Roof Expansions

Based on 0.01mm/m/˚C

	8 METRE RUN	12 METRE RUN	18 METRE RUN
Light Colours*	5mm	7mm	11mm
Medium Colours	6mm	10mm	14mm
Dark Colours	7mm	11mm	17mm

**Light Colours include unpainted galvanised and ZINCALUME® steel material.*

FIXINGS AND FASTENERS

The selection of the appropriate form of fastener is a task which should not be solely influenced by cost. Fastener costs are minimal relative to the overall project and there is no benefit to be gained through the use of inferior fixings. The fastener durability should equal or exceed that of the roofing or cladding product.

The "Metal Roofing and Wall Cladding Code of Practice" provides some information on selection, fixing methods and placement of fasteners. This handbook is available on request from members of the New Zealand Metal Roofing Manufacturers Incorporated or New Zealand Steel Limited. More detailed information can also be obtained from fastener manufacturers.

Design Guide:

1. Fastener performance should conform with the requirements of AS3566 (and Amendments) "Screws – Self Drilling for the Building and Construction Industries".
2. Stainless steel and stainless steel capped fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments due to incompatibility.
3. Low carbon, non conducting sealing washers are required for use with COLORSTEEL® prepainted steel products and ZINCALUME® coated steel products.

   The advice of specialist fastener manufacturers is readily available and these manufacturers should be consulted, particularly where COLORSTEEL® prepainted steel products are to be fixed in Very Severe or Severe Environments. (see Environmental Categories and Product Recommendations, page 15).
4. Fasteners with heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566 Class 3 and 4 are fully compatible with all products.
5. Fasteners used on COLORSTEEL® prepainted steel products should be factory coated to provide an accurate colour match with COLORSTEEL® prepainted finishes.
6. ***Rivets:***

- Use aluminium rivets for joining all New Zealand Steel Limited roofing products. (Ensure rivet is of a suitable strength for the purpose. Refer to your rivet supplier).
- Monel rivets are not recommended as they are incompatible due to their copper content.

Fastener Recommendations

Environmental Category*	ISO	GALVSTEEL™	ZINCALUME®	COLORSTEEL® ENDURA™	COLORSTEEL® MAXX™
Coastal:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Industrial:					
Very Severe	C5	NR	NR	NR	4
Severe	C4	NR	NR	4	4
Moderate	C3	3,4	3,4	3,4	3,4
Inland:					
Moderate	C2	3	3	3	3,4

NR: New Zealand Steel product not recommended for exterior applications for these Environmental Categories.

4: Heavy zinc or zinc-tin coatings or zinc alloy coated heads complying with AS3566.2–2002 Class 4.

3: Heavy zinc or zinc-tin coatings complying with AS3566.2–2002 Class 3.

* See page 16 for definitions of Environmental Categories.

Note:

1. Stainless steel fasteners are not recommended for use with ZINCALUME® coated steel or COLORSTEEL® prepainted steel products in all environments.
2. Sealing washers that contain carbon black filler levels of more than 15% by volume may lead to corrosion of ZINCALUME® steel and COLORSTEEL® prepainted steel products. Therefore, all fasteners for New Zealand Steel roofing products should have low carbon, non-conducting sealing washers.
3. Refer to Information Bulletin 10.

FLUES – DOMESTIC/INDUSTRIAL

Natural gas, wood, coal or oil-fired heaters generate high levels of sulphur compounds. When vented over a roof, particularly in damp conditions, sulphuric acid forms which will lead to premature corrosion of the roof, guttering and downpipes.

Design Guide:

1. Design the height of the flue to allow combustion by-products to be dissipated.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments.
3. Ensure that heaters are run as efficiently as possible to allow complete combustion.
4. Regularly wash the roof to remove contaminants.

FOOT TRAFFIC ON ROOFS

Repeated foot traffic and the dragging of maintenance or cleaning equipment, may damage the roof which will reduce its life expectancy.

Design Guide:

1. Design and install catwalks and platforms over the roof where necessary.
2. Aluminium or galvanised steel catwalks are recommended.
3. Design catwalks and platforms so as not to create an unwashed or ponding area on the roof.
4. Timber catwalks and platforms will cause preferential corrosion of underlying roof.

FUME EXTRACTORS AND VENTS

Corrosive dust and particles can be released through roof vents and discharged onto the roof surface. The immediate area of the roof adjacent to the vent is then at increased risk of corrosion.

Design Guide:

1. Install filter elements to contain hazardous material.
2. Specify a COLORSTEEL® prepainted steel product designed for very severe environments to be installed adjacent to the vent.
3. Consider applying a suitable protective coating to the affected area of the roof.
4. Maintain coal or oil fired boilers or incinerators so that they do not discharge high sulphur levels over the roof surface.
5. Regularly wash the roof to remove contaminants.

GEOTHERMAL AREAS

In areas of geothermal activity, hydrogen sulphides associated with bore emissions can cause corrosion problems. Although heavier than air, hydrogen sulphide can be drawn into rainwater down-pipes and accumulate in gutters. This can lead to corrosion of the gutters and the roof overhangs.

Design Guide:

1. Install a water trap at the base of down-pipes.
2. Specify the appropriate COLORSTEEL® prepainted steel product.
3. Contact New Zealand Steel Limited for specialist advice.

MIXING OF BRANDS

Where different brands of prepainted material are used on the same building, differences in colour, gloss and weathering performance may appear obvious within a short period of time. This will be due to the different paint formulations used by different manufacturers.

New Zealand Steel Limited will not accept liability for problems caused by the mixing of brands.

Design Guide:

1. Specify either COLORSTEEL® ENDURA™ or COLORSTEEL® MAXX™ products.

OVERPAINTING OF COLORSTEEL® PREPAINTED STEEL PRODUCTS

COLORSTEEL® prepainted steel products are designed for durability. However, all paint coatings will deteriorate over time. Therefore, at some stage, it will be necessary to repaint to avoid serious deterioration of the product.

The main consideration is the paint coating integrity to perform a suitable bond for the overpainted system so that the durability of the new coating system is maintained.

New Zealand Steel's experience would indicate that this period to first repaint is around 15 years. However, local climatic conditions, building design and paint colour can have a significant influence on the performance of the paint system. Therefore you may need to consult New Zealand Steel or our paint suppliers, PPG Industries NZ Ltd, to help assess the most suitable time to repaint.

COLORSTEEL® prepainted steel products may be readily overpainted, after suitable preparation, for aesthetic reasons. Detailed information is available in the New Zealand Steel Limited Information Brochure: Overpainting New and Weathered Steel Roofing.

PROCESSING PLANTS

(Including Swimming Pools)

Some commercial applications may create internal environments in which the build-up of pollutants or fumes are a potential source of corrosion. Plants where chlorine vapours are released (including enclosed swimming pools) should have adequate ventilation to minimise the risks.

Design Guide:

1. Where pollutants or humidity levels are likely to be high, allow for frequent air changes.
2. Passive ventilation may be inadequate to cope with the problem and the installation of fan systems should be considered and incorporated at the design stage.
3. Contact New Zealand Steel Limited for specialist advice.

PROFILE BEND DIAMETERS – ROOFING, WALL CLADDING AND ACCESSORIES

New Zealand Steel Limited products are custom designed to ensure maximum compatibility with the roll-forming process. The paint systems are designed to be durable and adhere to the metal substrate so that they are not affected by good roll-forming practices. However, tight tension bends in the finished product should be avoided as small cracks may be formed which expose the metal substrate to the atmosphere.

For optimum corrosion performance no visible microcracking should be present in the finished product. There are many factors, substrate, paint, bend diameter and forming practice, that affect the tendency to microcrack. Therefore, it is not practical to have a fixed bend diameter that guarantees no microcracking.

Most products, formed in well designed and operated equipment, will not have microcracks at tension bends. It is important that visual checks for microcracking be made on the finished product to ensure a high quality standard is maintained.

Products with microcracking on the tension bends will show earlier signs of corrosion when used in unwashed areas in severe environments.

Design Guide:

1. The use of corrugated profiles in severe and 'special conditions' (e.g. Geothermal) will help to ensure greater durability.

SOLAR HEATING PANELS OR RUBBER MATS

During the installation of solar heating systems, care should be taken to prevent any damage to the roofing material. Because of the high temperatures created and the increased condensation which may result, care should be taken to maintain an air space between the roof and the heating unit. Follow manufacturers' recommendations concerning tube direction and the use of fixing support brackets.

Failure to do this may invalidate a COLORSTEEL® prepainted steel product warranty.

Design Guide:

1. Never place heating elements or plumbing units directly on the roof surface. Follow the system supplier's recommendations concerning installation.

SWARF STAINING OF ROOFING AND CLADDING

Swarf is the term given to steel debris arising from cutting or piercing operations when using friction saws, abrasive discs, drills etc., on steel roofing and cladding products. Whilst comprising mostly fine steel particles mixed with abrasive, in this context swarf may also be taken to include any other discarded steel objects such as rivet shanks, nails, screws and nuts, which may come into contact with coated products; ie: COLORSTEEL® prepainted steel, ZINCALUME® zinc/aluminium alloy-coated steel and galvanised steel.

Swarf particles, if left on the surface, will corrode and cause rust stains which will detract from the finished appearance of a project. These stains are often mistaken for early deterioration of the roofing and cladding itself.

Design Guide:

1. Never leave swarf material on the coated surface. Follow the recommendations included in the New Zealand Steel Limited Installers Guide or Information Bulletin 7.

UNWASHED AREAS

When contaminants such as windblown salt and dust accumulate on painted surfaces and become damp, corrosion will take place. Many windblown contaminants absorb moisture when exposed to high humidity and their presence on steel accelerates corrosion.

For this reason, areas on a building which are seldom washed by rain are particularly prone to early breakdown of the material.

This effect may first be noticed as a white corrosion product, typically seen on the underside of gutters, canopies, roof vents or on sheltered areas and the underside of profiles used horizontally as wall cladding. It will be more noticeable where tighter radius bends have been used in roll forming.

Even on coated steel where corrosion reactions are much slower, the presence of contaminants over long periods of time will increase the rate of corrosion.

The maintenance regimes for unwashed areas, necessary to meet the durability requirements of the Building Code, are shown on pages 17 and 18 of this publication.

When the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel products is exposed in an unwashed area, e.g.: canopies, verandas, eaves, lean to buildings etc., additional maintenance, above that specified on pages 17 and 18, is required to ensure satisfactory performance of the product.

Design Guide:

1. Every effort must be made during the design of the building to eliminate or minimise sheltered or overhanging areas.
2. Consideration should be given during the design stage to ensure the underside of ZINCALUME® steel and COLORSTEEL® prepainted steel is enclosed and therefore not exposed to the environment.
3. Where unwashed areas cannot be designed out, specify regular washing of these areas as part of an ongoing maintenance programme. Refer to pages 17 and 18 for New Zealand Steel Limited recommendations.
4. Design consideration for easy access must be given to areas that require regular maintenance.
5. Ensure profile bends are not tighter than those recommended under the heading of “Profile Bend Diameters – Roofing, Wall Cladding and Accessories”, and that there are no microcracks in the finished product.

WATER PONDING

Roofs

Where the roof pitch is low, changes in roof loadings may result in a negative pitch and consequently lead to water ponding. Water ponding is detrimental to the performance of COLORSTEEL® prepainted steel products. The following conditions commonly cause water ponding:

- Over-spaced purlins.
- Deformation of timber purlins.
- Placement of external loads such as air conditioning units.
- Rigid fixing on long spans which causes deformation of the profile as a result of thermal expansion.

Design Guide:

1. Never use a pitch of less than 3 degrees or the minimum recommended for the profile, whichever is greater. Pitches of less than this invalidate the warranty.
2. Design the roof according to the profile manufacturer's specifications.
3. On minimum pitch roofs, ensure that the gutter end of profiled sheets is turned down.
4. Allow for thermal expansion to prevent profile distortion.
5. Consider the use of walkways to prevent damage where the roof may be subject to heavy foot traffic.
6. Ensure roof penetrations do not block the flow of water from the roof.

Note: Please refer to "New Zealand Steel Limited Products and the New Zealand Building Code" on page 13 of this publication under "E2/AS1 External Moisture"

Gutters

Gutters must be installed with adequate fall to ensure all water is transported to appropriately located downpipes. Ponding occurs when water remains in the gutter when the fall is inadequate. Over time, this causes degradation to the coating and ultimately leads to gutter perforation. Perforation of the gutter as a consequence of inadequate fall or ponding invalidates both the manufacturer and producer warranties. The installation and downpipe construction should allow the gutter to drain completely.

Regular gutter cleaning and maintenance is required to remove leaves and other debris that may restrict water flow to downpipes. Particular care should be taken at the entrance to downpipes and corners, to avoid blockages leading to water ponding.

A gutter protection system (or any other product) that entraps water between itself and any steel product surfaces, restricting the coated steel's ability to dry, is not recommended and is an exclusion in the product warranty.

WEATHERING OF COLORSTEEL® PRODUCTS

All building products will weather over time. The weathering of COLORSTEEL® prepainted steel products will result in changes to gloss and colour. Factors which influence the change are environmental pollution, UV levels, building orientation and paint colour.

Design Guide:

1. When adding to an existing building, consideration should be given to the weathered appearance of the COLORSTEEL® prepainted steel products in the older part of the building.

NEW ZEALAND STEEL LIMITED PRODUCTS AND THE NEW ZEALAND BUILDING CODE

The New Zealand Building Code defines durability requirements for many elements of buildings. These requirements are outlined in section B2 Durability. In general, most roofing and cladding is required to last a minimum of 15 years (or a nominated period), to water penetration, but in some cases where the material has a structural function, the requirement may be for 50 years. This can be achieved with suitable maintenance.

The New Zealand Building Code calls for durability performance which is relative to both maintenance and to working environments. The following information will assist specifiers to relate these variables to New Zealand Steel Limited products.

CONFORMING WITH THE BUILDING CODE

ZINCALUME® steel and the substrate used to produce COLORSTEEL® prepainted steel products, have met the requirements of AS1397:2001 and are manufactured under a quality management system to monitor ongoing compliance with this Standard. ZINCALUME® steel has been appraised by BRANZ as being suitable as feed stock for the manufacture of roof and wall cladding systems, cladding accessories, spouting, downpipes and other rainwater goods.

EXTERNAL MOISTURE E2/AS1

Adequate Pitch

The New Zealand Building Code provides an Acceptable Solution to the problem of roof pitch. The pitch figures shown in paragraph 8·4·5 of Acceptable Solution E2/AS1 are reproduced, in part, below for your convenience.

Refer specific enquiries to the Profile Manufacturer who may have an Alternative Solution.

ROOF PITCH REQUIREMENTS

Product	Minimum Pitch	
For profiled metal roof cladding	Sheet Length ≤18m	> 18m
Corrugated (with end laps present)	≥ 10°	Refer manufacturer
Corrugated (no end laps present)	≥ 8°	Refer manufacturer
Trapezoidal (where the crest height is less than 27mm)	≥ 4°	Refer manufacturer
Trapezoidal (where the crest height is 27mm or higher)	≥ 3°	Refer manufacturer
Trough profile	≥ 3°	Refer manufacturer

Source: New Zealand Building Code: Acceptable Solution E2/AS1

Note: Where manufacturers have more stringent requirements, these should be followed to optimise performance and to avoid invalidating guarantees.

OUTBREAK OF FIRE

ZINCALUME® steel and COLORSTEEL® prepainted steel need not be separated from flues and chimneys. However, when formed into cladding products and associated accessories that are used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9 for the protection of combustible materials.

CONTROL OF EXTERNAL FIRE SPREAD

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into roof cladding profiles are suitable for use as an external roof cladding in all purpose groups in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·1.

ZINCALUME® steel and COLORSTEEL® prepainted steel formed into wall cladding profiles are suitable for use as an external wall cladding on all buildings in accordance with NZBC Acceptable Solution C/AS1 Paragraph 7·11·2a. This statement is conditional on any applied surface finish being no more than 1mm in thickness.

Specifiers should be familiar with the Acceptable Solution C/AS1 Part 7: Control of External Fire Spread, which covers vertical and horizontal spread of fire.

MAINTENANCE

All roofing and cladding products are subject to the cumulative effects of weather, dust and other deposits. Normal rain washing will remove most accumulated atmospheric contaminants from roofs. For wall cladding, manual washing every 3 to 12 months, depending on the paint system, is recommended in moderate to very severe environments to prevent accumulation of dirt, debris or other material not removed by rain washing. For areas that do not receive any or adequate rain washing (called unwashed areas) such as soffits, wall cladding under eaves, underside of gutters, fascias, sheltered areas of garage doors and unwashed roof areas, more extensive manual washing is required. Similarly, other High Risk areas, around flues, under television aerials or overhanging trees and sites prone to mould, lichen, bird droppings or debris, need to have regular manual washing.

Regular washing of COLORSTEEL® prepainted steel products increases the durability by reducing attack from airborne salts and pollutants. GALVSTEEL™ products and ZINCALUME® steel products will also benefit from routine washing.

COLORSTEEL® prepainted steel surfaces should be manually washed with water and a sponge or a soft nylon-bristled brush. For large areas it may be more appropriate to use water blasting at pressures up to 20MPa.

Overpainting of COLORSTEEL® prepainted steel products is discussed on Page 8 of this publication.

If New Zealand Steel Limited products are maintained according to the following recommendations, the requirements of the New Zealand Building Code B2 for 15 year durability for roofs and exterior walls will be met or exceeded.

Note:

1. The New Zealand Building Code durability requirement does not include aesthetic appearance.
2. The New Zealand Building Code requires a durability of 15 years minimum (with maintenance) for roofing, including valleys, and wall cladding products. This means no moisture penetration due to product failure.
3. The New Zealand Building Code requires a durability of 5 years minimum (with maintenance) for rainwater products, gutters and downpipes. This means no perforation due to product failure.
4. New Zealand Steel Limited products are designed to exceed the New Zealand Building Code B2: durability requirements. Continued maintenance and overpainting will greatly extend the ultimate life of all products.
5. Where a 50 year durability is required **OR** where a product is to be used in aggressive internal environments, New Zealand Steel Limited should be consulted.
6. In Industrial Environments, the type of pollution generated may alter the above recommendations. If in doubt, consult New Zealand Steel Limited.

The following maintenance information in the Environmental Chart is for guidance only. Each proprietary building product should carry its own manufacturers' recommendations for usage.

New Zealand Steel Limited will not accept responsibility for proprietary roofing and cladding products which do not conform to our recommendations for manufacturing, environmental use or maintenance.

ENVIRONMENTAL CATEGORIES AND PRODUCT RECOMMENDATIONS

Important: As product use is dictated by local conditions, seek advice from your roofing supplier or fixer for the best New Zealand Steel Limited product to suit your specific environment.

The following four pages present a guide to New Zealand's environmental categories, the products recommended for specific conditions and residential roofing warranties.

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INTRODUCTION

New Zealand has a wide range of environmental conditions, from the harsh West Coast beaches, to the relative shelter of the Waikato farming region. Therefore, New Zealand Steel Limited offers a range of steel products which are suitable for most locations.

VERY SEVERE – ISO CATEGORY 5

50m from high water on East Coast, 100m from high water on West Coast.

Characterised by:

- Heavy salt deposits.
- The almost constant smell of salt spray in the air.
- Close to breaking surf (typically 50-100 metres) such as is found on exposed coasts.

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

Roofing

Wall Cladding

Gutters/downpipes

Fascia

SEVERE – ISO CATEGORY 4

Characterised by:

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

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

Roofing

Wall Cladding

Gutters/downpipes

Fascia

MODERATE COASTAL – ISO CATEGORY 3

Characterised by:

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

MODERATE INLAND – ISO CATEGORY 2

Characterised by:

- No obvious marine or industrial influences.
- Typically more than 1000 metres from the exposed coasts or more than 500 metres from industrial emissions.

Roofing

Wall Cladding

Gutters/downpipes

Fascia

COMMERCIAL WARRANTY

Such as schools, warehouses and buildings, refer to New Zealand Steel Limited for details of commercial warranties. Maximum warranty offered on commercial buildings is 15 years.

IMPORTANT

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

0 metres

50 metres

Greater than 50m from breaking surf on the East Coast.
Greater than 100m from breaking surf on the West Coast.

COLORSTEEL® Maxx™ COLOUR FOR THE EXTREME		COLORSTEEL® Endura™ COLOUR FOR THE FUTURE		Zincalume®		GALVSTEEL™	
WARRANTIES	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**	**WARRANTIES**	**MAINTENANCE**
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 3 months.						
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every month.						
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every month.						
15 years: covering the paint surface against flaking, peeling and excessive fade. **20 years:** against perforation as a result of corrosion.	• Rain washing	**15 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing	Not recommended	Not recommended	Not recommended	Not recommended
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.	**Not recommended**	• Rain washing plus manual washing every 6 months.				
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.	**5 years:** covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.				
10 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.	**5 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.				
15 years: covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing	**18 years:** covering the paint surface against flaking, peeling and excessive fade. **30 years:** against perforation as a result of corrosion.	• Rain washing	**15 years:** against perforation as a result of corrosion.	• Rain washing	No warranty applies	• Rain washing
15 years: covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.	**15 years:** covering the paint surface against flaking, peeling and excessive fade. **15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every year.	**15 years:** against perforation as a result of corrosion.	• Rain washing plus manual washing every 6 months.		• Rain washing plus manual washing every 6 months. Painting may be advisable depending on the specific location.
10 years: covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** covering the paint surface against flaking, peeling and excessive fade. **10 years:** against perforation as a result of corrosion.	• Manual washing every 6 months.	**10 years:** against perforation as a result of corrosion.	• Manual washing every 3 months.		• Manual washing every 3 months. Painting may be advisable depending on the specific location.
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VERY SEVERE COASTAL — 100 metres — SEVERE COASTAL — 500 metres — MODERATE COASTAL — 1000 metres — MODERATE INLAND

COLORSTEEL® Maxx™ COLOUR FOR THE EXTREME | COLORSTEEL® Endura™ COLOUR FOR THE FUTURE | Zincalume® | GALVSTEEL™

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SPECIAL ENVIRONMENTS

In New Zealand there are areas where local conditions create an increased likelihood of corrosion. Special consideration should be given to material selection in these areas. They include:

1. **Geothermal Areas**
   Hydrogen sulphide associated with geothermal activity creates a corrosive environment. Variations in natural activity or draw-off from steam bores plus the effects of weather conditions make the high risk areas hard to define. Please consult New Zealand Steel Limited for further details.

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

   This area combines the most severe features of both industrial and coastal environments. Please contact your local supplier for the best COLORSTEEL® prepainted steel product to use.

3. **Internal Environments**
   Some commercial or agricultural applications may create internal environments in which the build-up of pollutants or fumes is a potential source of corrosion. Similarly a corrosive environment can develop within sheds used for intensive animal farming. Please consult New Zealand Steel Limited for further details.

4. **Industrial Environments**
   Close to corrosive industrial emissions and subject to heavy fallout from them. Please consult New Zealand Steel Limited for further details.

Further Assistance
Further advice on the selection of the appropriate product to suit your particular location can be obtained from New Zealand Steel Limited or your local COLORSTEEL® prepainted steel supplier.

VERY SEVERE SPECIAL ENVIRONMENTS

COMMERCIAL WARRANTIES

Commercial warranties are issued through the Rollformer by New Zealand Steel Limited and the terms are specific to each contract.

In order to ensure the appropriate product is specified for the intended service life in any given environment, New Zealand Steel Limited is keen to be consulted as early as possible in the design stage to ensure correct material selection and backing by an appropriate warranty.

Warranty applications are generally made through the roofing manufacturer and warranty periods and conditions are assessed by New Zealand Steel Limited.

Factors such as roof design, roof pitch, profile, coating type, internal and external environments and special conditions (such as requirement for “Clean in Place”) are all assessed at the time of the warranty application. Maintenance requirements will be specified as part of the warranty.

Draft warranties are available from New Zealand Steel Limited to support tenders for specific projects. The terms and conditions of the draft will remain unchanged providing that the terms of the project are unaltered.

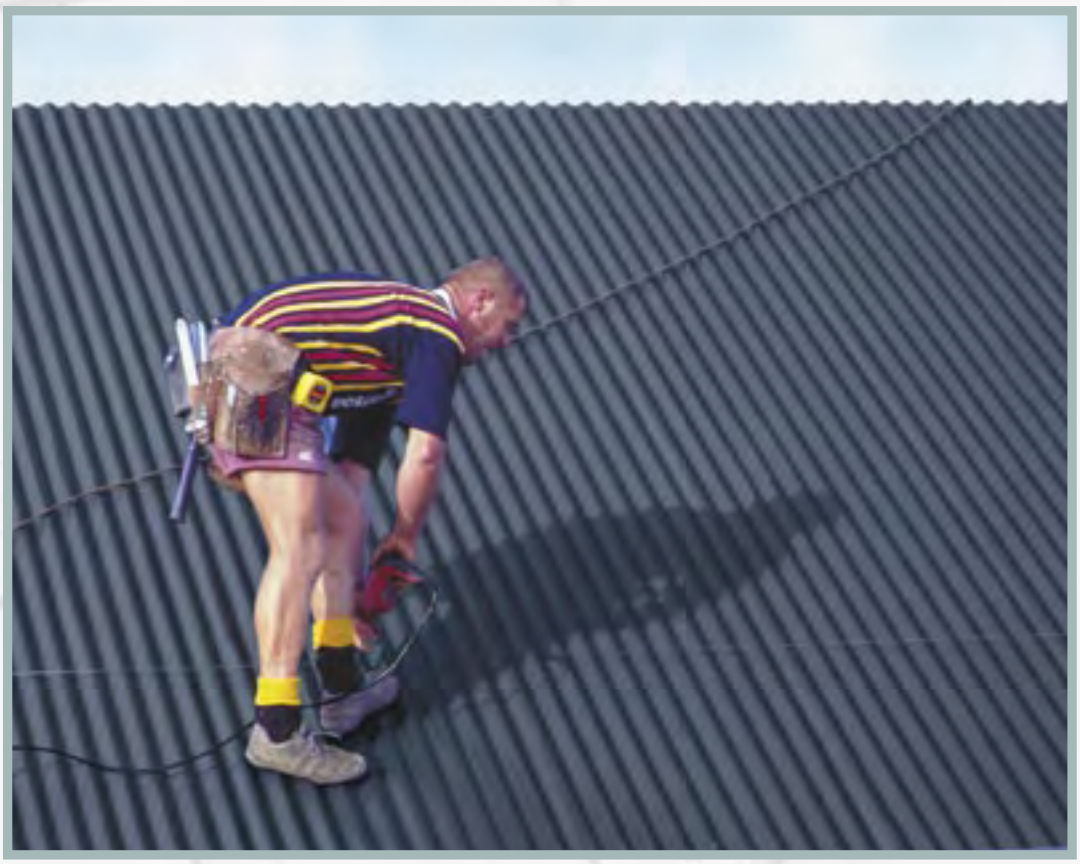
A warranty is issued on the satisfactory completion of the contract. Installation must be carried out in accordance with New Zealand Steel Limited’s requirements and according to good trade practices as detailed in the “Metal Roofing and Wall Cladding Code of Practice”.

A site inspection by New Zealand Steel Limited may be carried out prior to the issuing of any warranty.

The maintenance programme specified in the warranty must be complied with to validate the warranty.

INSTALLATION INFORMATION

Details relating to the installation of all products are provided in the “Installers Guide”. This booklet covers New Zealand Steel Limited’s recommendations for handling, cutting, fixing, sealing, site storage, etc. Additional copies of this publication may be obtained from New Zealand Steel Limited.



INFORMATION TO HELP YOU AVOID PROBLEMS

In almost all applications, ZINCALUME® coated steel and COLORSTEEL® prepainted steel will out-perform galvanised steel. There are however, a small number of applications for which galvanised steel is more suitable.

ZINCALUME® coated steel and COLORSTEEL® prepainted steel products must not be used for:

- Formwork in contact with wet concrete.
- Products to be embedded in concrete. However, where very small volumes of concrete are involved (e.g. splashes) which are able to cure quickly, there is little corrosive effect.
- Fertiliser storage sheds and containers.
- Culverts, or where ZINCALUME® coated steel material is buried in the ground.
- Water tanks.
- Highly alkaline environments (e.g. cement manufacture).
- Coolroom products.
- Buildings for intensive animal farming.

TECHNICAL FEATURES

CORROSION PROTECTION

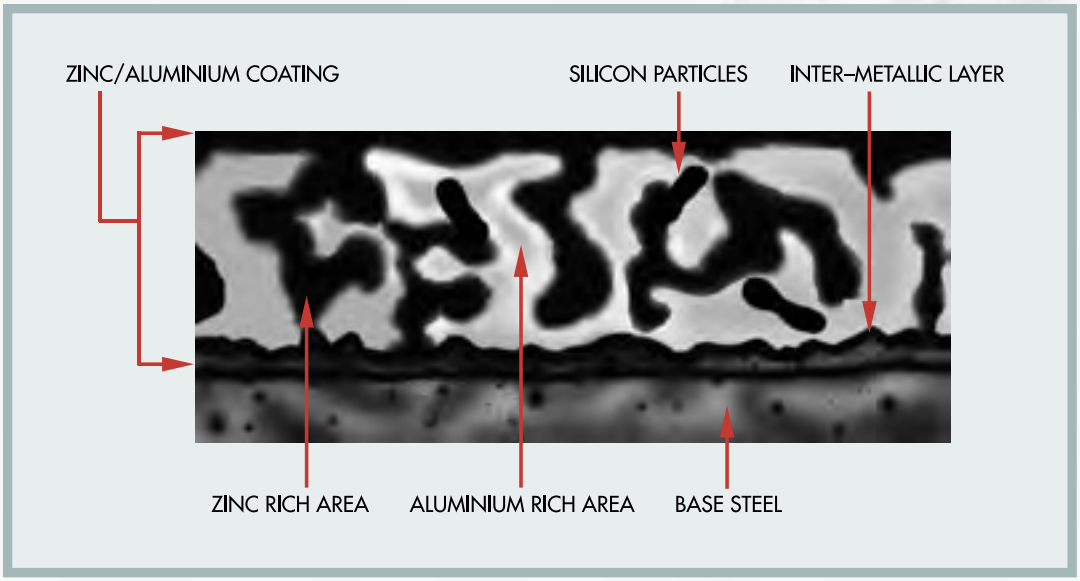
The long established method of protecting steel against corrosion has been to apply a coating of zinc (galvanising). The zinc surface forms a hard, impervious layer which limits further corrosion. This provides for the longevity of performance which we have come to expect from galvanised steel products.

The zinc coating also possesses another very useful property. Small exposed surfaces of the underlying steel such as scratches or cut edges do not corrode because of an effect known as sacrificial protection.

ZINCALUME® steel, a zinc/aluminium alloy coating, provides a superior performance to that of galvanised steel. It combines the barrier protection of aluminium and the sacrificial protection of zinc, thus giving the best of both worlds.

It follows that by coating these substrates with an added paint system, the steel core will be protected for a longer period. It is for this reason that the COLORSTEEL® prepainted steel coating systems were developed. Each coating is designed to protect the substrate from specific environmental conditions.

Cross Section of ZINCALUME® Coated Steel



UV PROTECTION

New Zealand experiences some of the most extreme UV conditions in the world. UV light can cause breakdown of the resin used in some paints. This leads to erosion and chalking of the paint film. UV light can also cause the breakdown of pigments (particularly organic based pigments) resulting in fading.

In response to this threat, an on-going programme of product improvement has led to the formulation of the current COLORSTEEL® prepainted steel paint systems. These systems utilise pigments and resins which have been selected for their colour stability, flexibility and durability.

PROFILE DESIGN INFORMATION

Specifications relating to roofing and cladding profiles and pricing details should be sought from the specialist roofing manufacturers concerned. **New Zealand Steel Limited does not provide a rollforming service.**

Profile designs from your local supplier will specify the grade and BMT appropriate to any contract.

Definitions

1. BMT: Base metal thickness is the thickness of the uncoated steel core. The finished thickness of the material will increase by the accumulation of coatings during manufacture by New Zealand Steel Limited.
2. Grade: The mechanical strength of the steel substrate is expressed in yield strength values measured in MPa. Low strength steel may be rated as G1, G250 or G300. As the yield strength of the material increases, so do the values, so that G550 has the highest strength.
3. Span: The distance between purlins, as recommended by the Rollformer for each particular profile.

ZINCALUME®

Steel Cladding.

HOW TO SPECIFY NEW ZEALAND STEEL LIMITED ROOFING AND CLADDING PRODUCTS

- Product (ZINCALUME®, GALVSTEEL™, COLORSTEEL® ENDURA™, COLORSTEEL® MAXX™)
- Profile
- Colour (Where applicable)
- BMT (eg: 0.40 or 0.55mm)
- Grade (eg: G300 or G550)

FURTHER COATING/SURFACE OPTIONS

In addition to the products making up the standard COLORSTEEL® prepainted steel product range, New Zealand Steel Limited produce non-standard coatings for special applications (eg: high reflectance finishes). For specialised options please contact New Zealand Steel Limited.

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FURTHER INFORMATION

For additional information, literature or technical assistance, please contact:

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Private Bag 92 121, Auckland 1142
Telephone: 0-9-375 8999
Facsimile: 0-9-375 8213
Free Phone: 0800 100 523
Email Address: info@colorsteel.co.nz
http://www.colorsteel.co.nz

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GALVSTEEL™

GALVSTEEL™ is a trademark of New Zealand Steel Limited.

Axxis® STEEL FOR FRAMING

AXXIS® is a registered trademark of New Zealand Steel Limited.

COLORSTEEL® Maxx™
COLOUR FOR THE EXTREME

MAXX™ is a trademark of New Zealand Steel Limited.

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COLOUR FOR THE FUTURE

ENDURA™ is a trademark of New Zealand Steel Limited.

COLORSTEEL®

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COLORSTEEL®
THE ROOF OF NEW ZEALAND®
is a registered trademark of New Zealand Steel Limited.

NOTE: With New Zealand Steel Limited's commitment to continuous improvement, information provided in this publication may be subject to modification. At the time of publication we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique, equipment or statement to reflect improvements in the manufacture and application of coil coated products. The information is supplied without prejudice to New Zealand Steel Limited's standard terms and conditions of sale. In the event of any conflict between this information and the standard terms and conditions, the standard terms and conditions shall prevail.

This edition of the New Zealand Steel Specifiers and Builders Guide supersedes all previous editions.

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NEW ZEALAND STEEL 100% RECYCLABLE
Kiwi to the core

NEW ZEALAND STEEL

NEW ZEALAND MADE

New Zealand Steel Limited, Private Bag 92 121, Auckland 1142, New Zealand. Ph 0-9-375 8999 Fax 0-9-375 8213

YOUR LOCAL SUPPLIER

BH957795
W4347

TECHNICAL MANUAL

Wall System Descriptions and
Building Details

May 13, 2013

V1.3

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E-Mail: mark@cladx.co.nz
Web Site: www.cladx.co.nz
Contact: 027 600 1234

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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1 GENERAL DESCRIPTION

Clad-X AAC wall panel system is an exterior wall cladding system that provides light weight, high quality, and highly durable cladding solutions perfectly suited to the needs of residential housing and light commercial buildings. With the exterior coating solutions provided by the Wattyl Granosite reinforced exterior plaster system, Clad-X AAC wall panel system is a sensitive cladding system on the New Zealand market.

This technical manual document outlines the typical installation and application of the Clad-X AAC Wall Panel system, if specifiers require additional or modified details please contact Clad-X.

Clad-X AAC Wall Panel is an exterior wall panel which is made from 50mm Autoclaved Aerated Concrete (AAC) masonry panel with corrosion protected vertical/horizontal steel reinforcing suitable for exterior cladding of residential housing and light commercial buildings. AAC panels are coated with the Wattyl Granosite reinforced plaster system to produce the selected texture finish.

Clad-X AAC wall panel properties:

Dry Density:	520kg/m^3*
Compressive Strength	4.0 MPa*
Dry Shrinkage Value:	0.015%*
Water Absorption:	up to 36% (by volume) *
Dry mass of 50mm Clad-x panel:	31 kg/m^2 coating and substrate, considered a medium weight cladding in terms of NZS 3604
Windzone:	up to Very High wind zones defined in NZS 3604

*note: the information is supplied by manufacturer.

2 COMPLIANCE WITH THE BUILDING CODE

2.1 COMPLIANCE OF SCOPE

The Clad-X AAC Wall Panel System complies with the following clauses of the New Zealand Building Code:

B1 - Structure
B2 - Durability
E2 - External Moisture
F2 - Hazardous Building Materials

2.2 B1 STRUCTURE

Clad-X AAC wall panel system installed as per this manual is able to withstand up to VH wind zone described in NZS 3604:2011.

2.3 B2 DURABILITY

Clad-X wall panel fixing's used in accordance with this manual will meet the requirements of NZBC Clause B2.

The nominal 20mm or 40mm cavities are provided to:

- Allow moisture to run down the inside of the Clad-X AAC panel and escape through the vents/vermin tray without bridging the cavity.
- Provide sufficient air space permitting air to circulate within the cavity and dry the AAC wall panels.

2.4 E2 EXTERNAL MOISTURE

The Wattyl Granosite plaster system used on Clad-X AAC wall panel system contributes to the requirements of NZBC E2 relating to the resistance of water penetration, provides the integrity of the specified external system is maintained.

2.5 F2 HAZARDOUS BUILDING MATERIALS

In reference to NZBC Clause F2 regarding Hazardous Building Materials, Clad-X AAC wall panels are non-hazardous, all safety precautions adhered to are provided in this technical manual.

3 LIMITATIONS & CONSIDERATION

3.1 LIMITATIONS

Clad-X AAC wall panel cladding system is applied to residential housing and light commercial buildings complying with NZS 3604 or NASH 3405. If specifiers require additional or modified details please contact Clad-X.

3.2 CONSIDERATIONS

Clad-X AAC panels must be installed by trained installers as per the details shown in this manual to ensure the quality of the cladding system. They must not be installed in any situation where they will come into contact with the ground, and cannot be used as retaining walls.

Clad-X AAC panels are Autoclaved Aerated Concrete, same with all concrete and fiber cement products, the dust produced when cutting or grinding them contains crystalline silica, is irritating to the eyes, skin and respiratory system. Inhalation of this dust can cause irreversible damage to health. Wear suitable protective clothing and gloves at all times. When cutting, drilling or grinding panels do so in an open air environment or areas that are well ventilated and wear approved safety glasses and dust mask.

All aspects of cutting, drilling or grinding must comply with the latest regulations of the Occupational Safety and Health division of the labour department.

Clad-X AAC panels should be stored on site on the pallets which they were delivered on and kept covered & free of dampness until required. Care should be taken to limit damage to edges or corners when handling.

Any damage incurred to the coating or the AAC panels must be addressed immediately. The panel is not to be left exposed through damage to the coating.

The Wattyl Granosite plaster system must be maintained annually, to ensure the integrity of the whole system. (Refer to Wattyl Granosite Maintenance Schedule)

3.3 CONSTRUCTION REQUIREMENTS

Steel and timber framed wall studs should be placed at not more than 600mm crs. Framing strength must comply with relevant NZ Standards for general framing construction suitability for the building.

Steel and timber framed walls are to be braced in accordance with wall claddings shown in NZS 3604: 2011 and are to be based on the combined weight of the AAC panel and the coating system used.

Prior to installation of Clad-X AAC panels and battens. The wall underlay/ building paper compliant with NZBC E2/AS1 table 23 must be fixed to the exterior wall framing and dressed into all openings with flexible flashing tape. Ensure wrap is continuous around corners, installed horizontally, and has its edges and laps taped.

Internal and external corners as per details following, if the distance between corners exceeds 8.0 meters, then extra control joints at a maximum of 8.0m centers are formed as per details. Responsibility for the locations of these controls joints is with the designer.

3.4 CONSTRUCTION GUIDANCE

3.4.1 Pre-installation check: ensure the builder has completed items set out in the pre-cladding check list. (See section 7 for details)

3.4.2 Installation:

- Cavity battens: the EPS 20 x 40 (or 40 x 40) cavity battens are attached to the framing element using PB Nailbond adhesive or nails, the typical batten layout refer to the detail drawing 1.
- Cutting: AAC panels are cut using a metal cutting blade. Zinc rich primer compliant with AS/NZS 2311:2009 is to be applied to all exposed reinforcing in the panels.
- Fixing: AAC panels are fixed using min. 14x100 bugle head type 17 class 4 screws which are to be embedded 10mm max. A minimum of 6 screws are required per AAC panel. Where 40mm cavity is used, min. 14x120 bugle head type 17 class 4 screws shall be used.
- Laying: Once the cavity batten are fixed to the studs, fix the bottom row of Clad-X AAC panel, AAC panels are placed in a stretcher bond pattern as per the typical layout detail on drawing 2. Any imperfections on the face of the panels and the screws hole can be repaired and filled with the panel adhesive MCB A20, which is a rigid, high strength cement based adhesive.

- Corners: at this point check the level and alignment of the panels, all internal & external corners shall be installed as per detailed in drawing 10&11. Corners should be placed with an overhang to line up flush with the connecting corner panel while making sure the control joint can be achieved.
- Flashings: Ensure all flashings have been placed correctly as per the details in this manual, cut the panels to suit the openings.
- Plastering & coating: Ensure the panels are dry, clean and free of any dirt, dust or foreign matter before carrying out any plastering work, Wattyl Granosite plaster system is the only approved system for application over the Clad-X AAC panel system, and it must be applied by LBP. For more information, see the manufacturer's specifications.

4 LISTS OF NOMINATED COMPONENTS

Panel Size:	2200mm x 600mm x 50mm
Batten:	20 x 40mm EPS cavity batten, 40 x 40mm EPS cavity batten
Screws:	min. 14 x 100 bugle head galvanized screws; class 4 type 17 for 20mm cavity min. 14 x 120 bugle head galvanized screws; class 4 type 17 for 40mm cavity all screws shall comply with compliance document E2/AS1 table 20.
Panel adhesive:	MCB A20, high strength cement based adhesive
Sealants:	BOSTIK SAFE-TECH (BRANZ approved)
Anti-corrosion paint:	Zinc Rich primer compliant with AS/NZS 2311:2009
Vents:	30x30mm Clad-X vent
Tapes:	Approved flexible flashing tape (refer to a product that complies with the performance requirements of the NZBC)
Adhesive:	PB NailBond SIKA
Flashings:	Clad-X PVC sill flashing Powder coated aluminum head flashing (installed by others) Clad-X PVC jamb flashing Clad-X PVC corner soaker Clad-X PVC base cap flashing

Plaster system:	First Coat:	Grano Adhesive Mortar Coarse @	5mm (mesh embedded)
	Second Coat:	Grano Adhesive Mortar Coarse @	2mm
	*Third Coat:	GranoSponge 1mm @1mm	
	Primer:	GranoPrime	
	Coatings:	GranoImpact x 2 coats	
	Others:	Granobond Keycoat	

Notes: * Different textures are available, more details refer to Wattyl website: www.wattyl.co.nz.

5 MAINTENANCE AND WARRANTY

5.1 MAINTENANCE

The Wattyl Granosite plaster system should be regularly cleaned, at least annually, with chemical / detergent wash. Have the entire coated area inspected by a person with sufficient experience to identify any maintenance requirements to ensure weathertightness. Undertake all necessary repairs immediately. For more information, please refer to Wattyl Maintenance Schedule.

Inspections of the complete cladding surface must be carried out at least annually at the end of summer. Because of settling after disturbances to the ground during construction, and the slow moisture-loss shrinkage of concrete slabs, it is recommended that six-monthly inspections be made for the first three years.

Any cracks or damaged areas, including flashings and seals that have deteriorated, must be repaired immediately to ensure the integrity of the building envelope is maintained.

Any damage to the substrate must be repaired in accordance with the substrate manufacturer's instructions followed by re-plastering and recoating to the same standard as the original Granosite Plaster System installation.

If chemical free framing timber has been used, it is imperative that the maintenance of the cladding system is followed rigorously to ensure the minimum moisture ingress takes place to prevent expensive and extensive structural repair work.

As part of the Warranty conditions the finish coat(s) will need to be re-applied between years seven and eight as specified by Wattyl (NZ) Ltd. For exposed locations washing and re-painting may be required more frequently.
For hard to remove stains, refer to the Wattyl Granosite stain removal guide.
Failure to correctly maintain the system may void any long term warranties offered with the system

5.2 WARRANTY

Clad-X Panel and associate materials, when installed as per this manual, are guaranteed for a minimum life period of 15 years (from date of completion).
The Wattyl Granosite plaster system is guaranteed a period of 15 years (from date of completion) to perform and meet the requirements of NZBC, where all material components of the plaster system have been prepared and installed in accordance with this manual, technical specifications and carried out by trained contractor, and where the system has been properly maintained.
For more condition and details please refer to Wattyl website.

6 CHECKLISTS OF CLAD-X PANEL WALL SYSTEMS

6.1 PRE-CLADDING CHECKLIST
6.2 PRE-PLASTERING CHECKLIST
6.3 WATTYL GRANOSITE QUALITY ASSURANCE CHECKLIST

PRE-CLADDING CHECK LIST

For builders, trained installers and building inspectors

Consent No: _____

Commence Date: _____

Client Name: _____ phone: _____

Builder: _____ phone: _____

Architect: _____ phone: _____

Owner/Builder must have the framing and other components of the building correctly installed to enable the installation of the Clad-X AAC wall panel

Floor slab lay out

- In the case of over-hanging slab, the framing should be flush with the slab — Yes or No
- In the case of rebated slab, ensure distance from outside of framing to outside of concrete footing is exactly 70mm or 90mm (when 40mm cavity system is designed) on all sides of building — Yes or No
- Ensure approved DPC is installed as per manufacturer's specification — Yes or No
- Ensure minimum 300mm out around the base to allow for plastering — Yes or No
- Ensure the surface of rebated slab are smooth and level — Yes or No

Framings

- All straight and level — Yes or No
- Studs straightened for wall lining before Clad-X AAC panels are installed — Yes or No
- Internal corners-supply and install 1 stud or full length H3.2 batten, 200 from internal corner. — Yes or No

Wall underlay

- Exterior timber framed walls must be wrapped with wall underlay that complies compliance document E2/AS1 table 23. — Yes or No
- Wall wrap must be fixed to the exterior wall framing and dressed into openings with flexible flashing tape, prior to installation of AAC panel battens. — Yes or No
- Ensure wall wrap is continuous around corners and installed horizontally and has its edges and laps taped. — Yes or No
- Ensure that all penetrations such as waste water pipes and the like have been flashed to the building wrap using flexible flashing tape. — Yes or No

Windows

- Window distance from framing –5 mm from outside of framing to inside flange of windows. — Yes or No
- The manual states throughout that continuous support bars are to be used on all windows, however if for any reason there is a requirement to use short support bars then approved DPC must be placed underneath the bottom of the windows. — Yes or No

Joinery:

- All joinery must be set into openings minimum 30mm from outside of framing to inside flange of window. These allow 10mm of the joinery bearing over the AAC panels. Where the 40mm cavity batten system is designed, 50mm offset shall be set. Yes or No
- The builder is also responsible for the application of approved flexible flashing tape around openings and all other penetrations prior to the installation of any joinery. Yes or No

Plumbing

- All plumbing including gas lines need to be pressure tested prior to installation of internal and external linings. Yes or No

Variables/ Concerns/ Comments:

_____

_____

_____

_____

_____

Builder/ Owner: _____

Signature: _____

PRE-PLASTERING CHECK LIST

For trained installers and building inspectors

Consent No: _____

Commence Date: _____

Client Name: _____ phone: _____

Builder: _____ phone: _____

Architect: _____ phone: _____

Clad-X recommends an inspection by Building Inspector prior to plastering

- Panels must be flat and straight with min. 6 screws per sheet, countersunk 10mm and no closer than 50mm from edge of panel — Yes or No
- Ensure all exposed steel ends are treated with CRC zinc it anti corrosion paint — Yes or No
-
- All external and internal corners and vertical control joints are installed as required in this technical manual — Yes or No
- Ensure that sill and jamb flashings are in place and sealed with corner soakers as required in this technical manual — Yes or No
- Ensure window head flashing is fixed in place, level and straight — Yes or No
- Cavity closer should be adhered with BOSTIK sealant and fixed in a straight line to bottom edge of panel where required — Yes or No
- Sill and base shoe flashings keycoated with Wattyl products — Yes or No
- Ensure roof lashing are in place and checked by builder and building inspector prior to plastering where relevant — Yes or No
- All pipe work/penetrations through cladding are filled with low expandable foam and sealed flush with surface nominated sealant — Yes or No

Variables/ Concerns/ Comments:

_____

_____

_____

_____

_____

TRAINED INSTALLER: _____ **Signature:** _____

Approved by: _____ **signature:** _____

Wattyl Granosite Plaster Quality Assurance Checklist

Specification No.:_____ Building Consent No.:_____
Site Address:_____ Area: _____
Owner:_____ Phone: _____
Builder:_____ Phone: _____
Architect: _____ Phone: _____
Applicator/Co:_____ Phone: _____
Project Start Date:_____ Project Finish Date: _____ Area Mz: _____
Rep:_____

PRE INSTALLATION	***YES***	***NO***	***COMMENTS***
Has building paper been installed correctly	☐	☐	_____
Flashing tape used at edges, laps and openings	☐	☐	_____
Penetration flashed	☐	☐	_____
Windows head flashing installed correctly	☐	☐	_____
Has a 25mm gap been left for windows flashing	☐	☐	_____
Is the base of cladding 50mm below the bottom plate	☐	☐	_____
Is there ground clearance for foot flashings	☐	☐	_____
All ground clearance meet building requirements	☐	☐	_____
Is wall framing within tolerance	☐	☐	_____
Control joints installed where specified	☐	☐	_____
	☐	☐	_____

Framing type: _____ Moisture content: _____ %
Builders Signature:_____ Territorial Authorities Signature:_____

SYSTEM TO BE APPLIED : Granosite ***SUBSTRATE: AAC*** ☐
1st coat: _____ Batch No. _____ 2nd coat:_____ Batch No._____
3rd coat: _____ Batch No. _____ 4th coat: _____ Batch No._____
5th coat: _____ Batch No. _____
Type of Batten used: cavitybat: ☐ Polystyrene ☐ other, please state: _____

APPLICATORS CHECKLIST	***YES***	***NO***	***COMMENTS***
Battens installed correctly	☐	☐	_____
Flashings installed correctly	☐	☐	_____
Flashing keycoated	☐	☐	_____
Control joint installed where specified	☐	☐	_____
Colour specified with LRV restrictions	☐	☐	_____

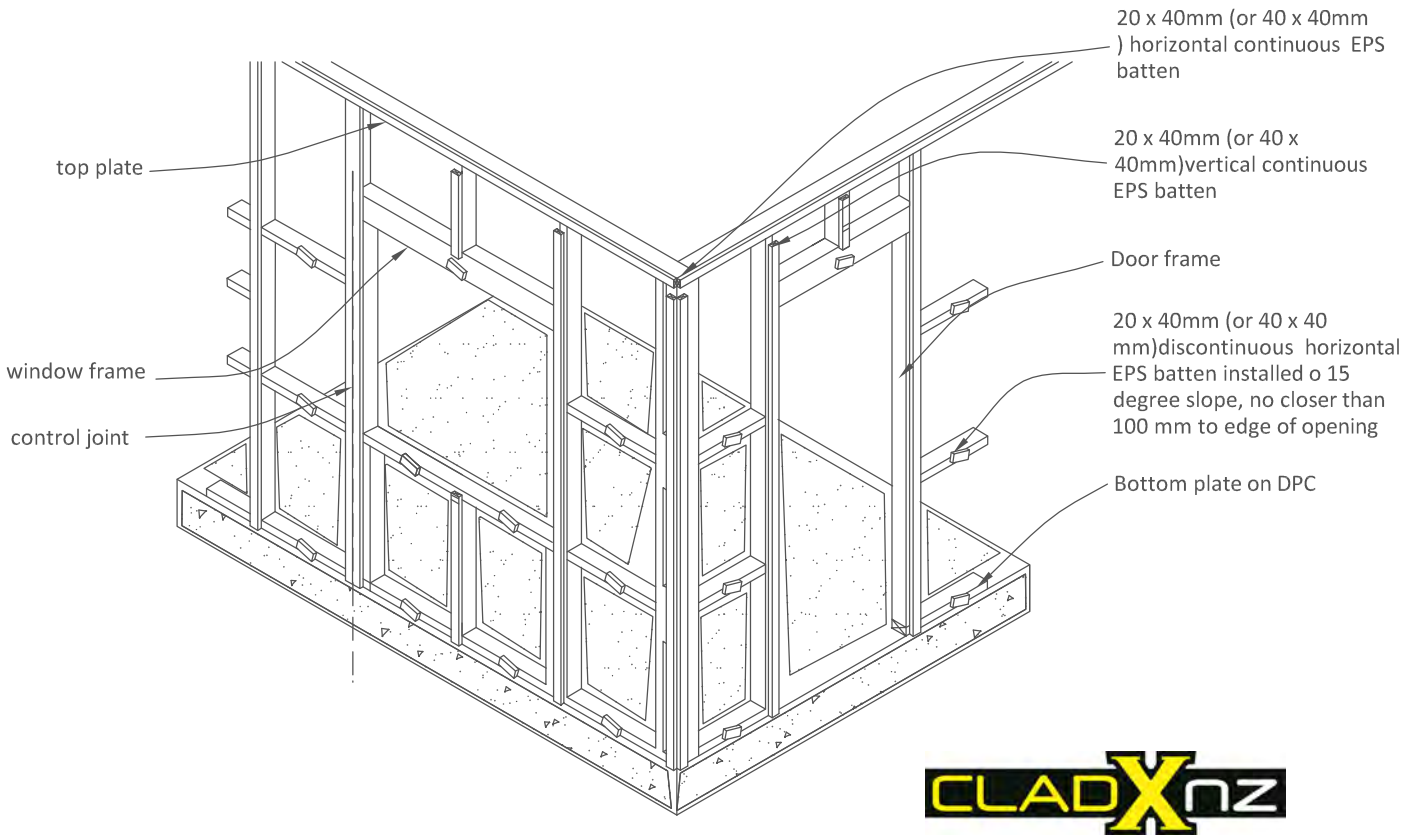
Application Method: Pump ☐ Trowel ☐ Roller ☐ spray ☐
Texture Type: _____ Paint/Colour_____ LRV %_____
Paint Contractor:_____ Phone:_____ Rep: _____

TYPE OF WARRANTY REQUIRED

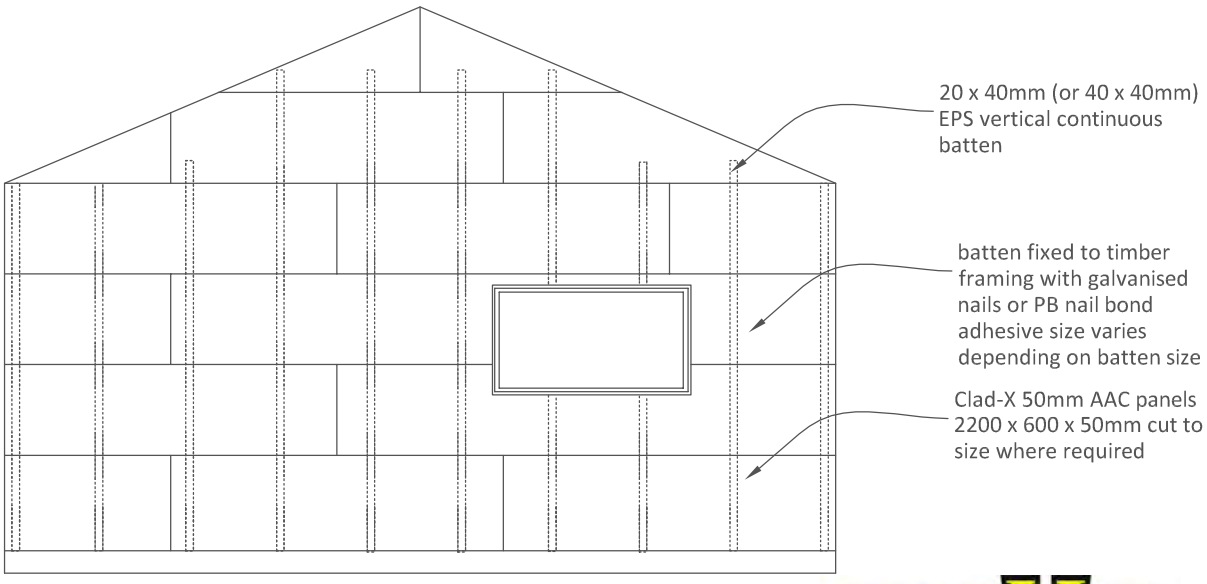
Ten Years over Solid Substrate ☐ *Fifteen years renewable* ☐
Product Producer Statement only ☐ *other: Please state:*_____

Applicater: _____ *Signed:* _____
Painter: _____ *Signed:* _____
License # _____ *Signed:* _____

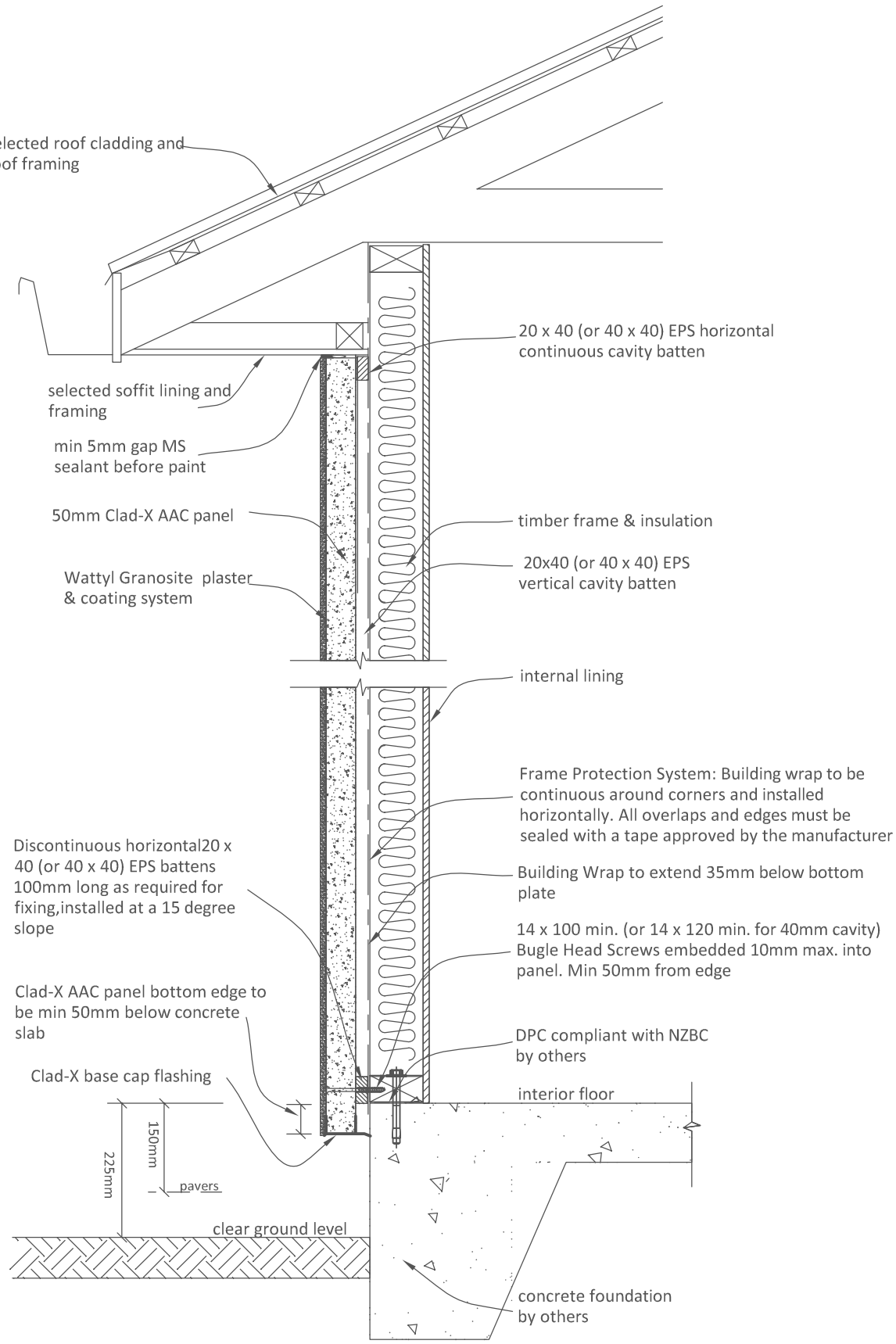
7 CONSTRUCTION GUIDANCE AND DETAIL DRAWINGS



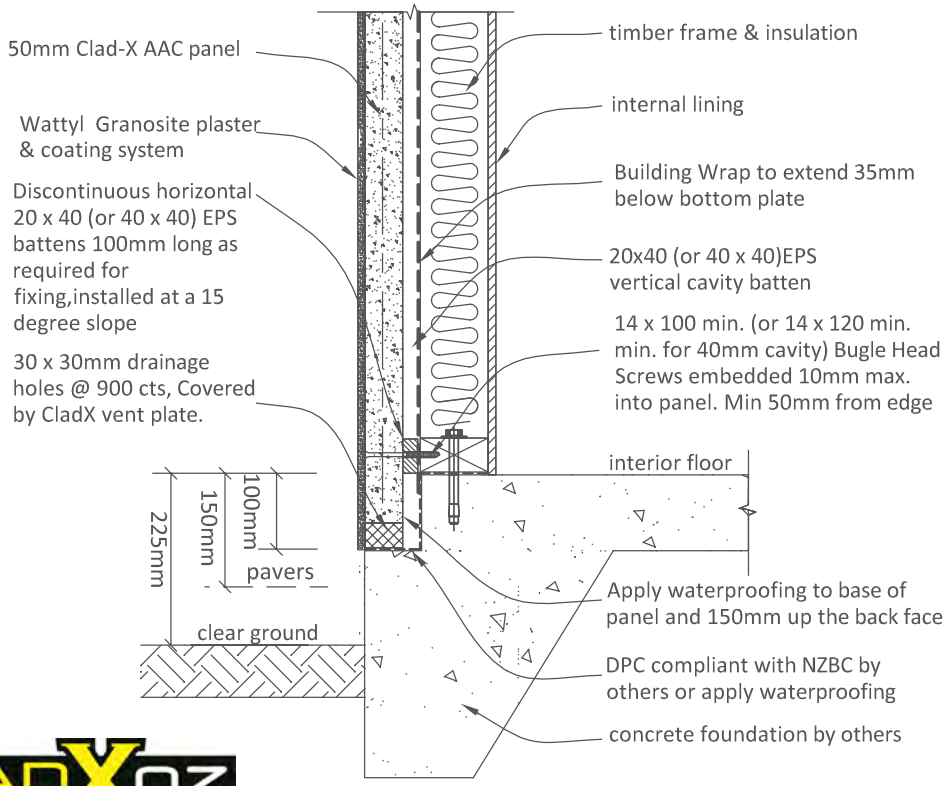
Typical Clad-X AAC Cavity Batten Layout			Scale	NTS
Dwg No. 01	Date	April 2013	www.cladx.co.nz	



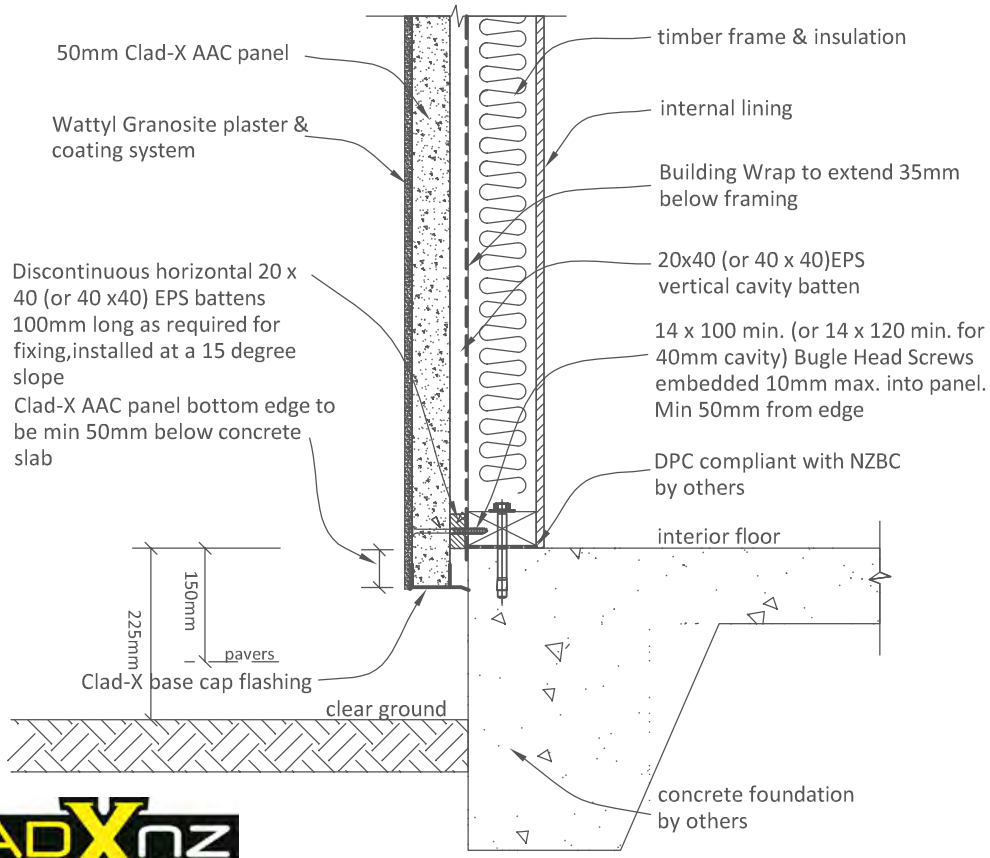
Typical Clad-X AAC Panel layout			Scale	NTS
Dwg No. 02	Date	April 2013	www.cladx.co.nz	



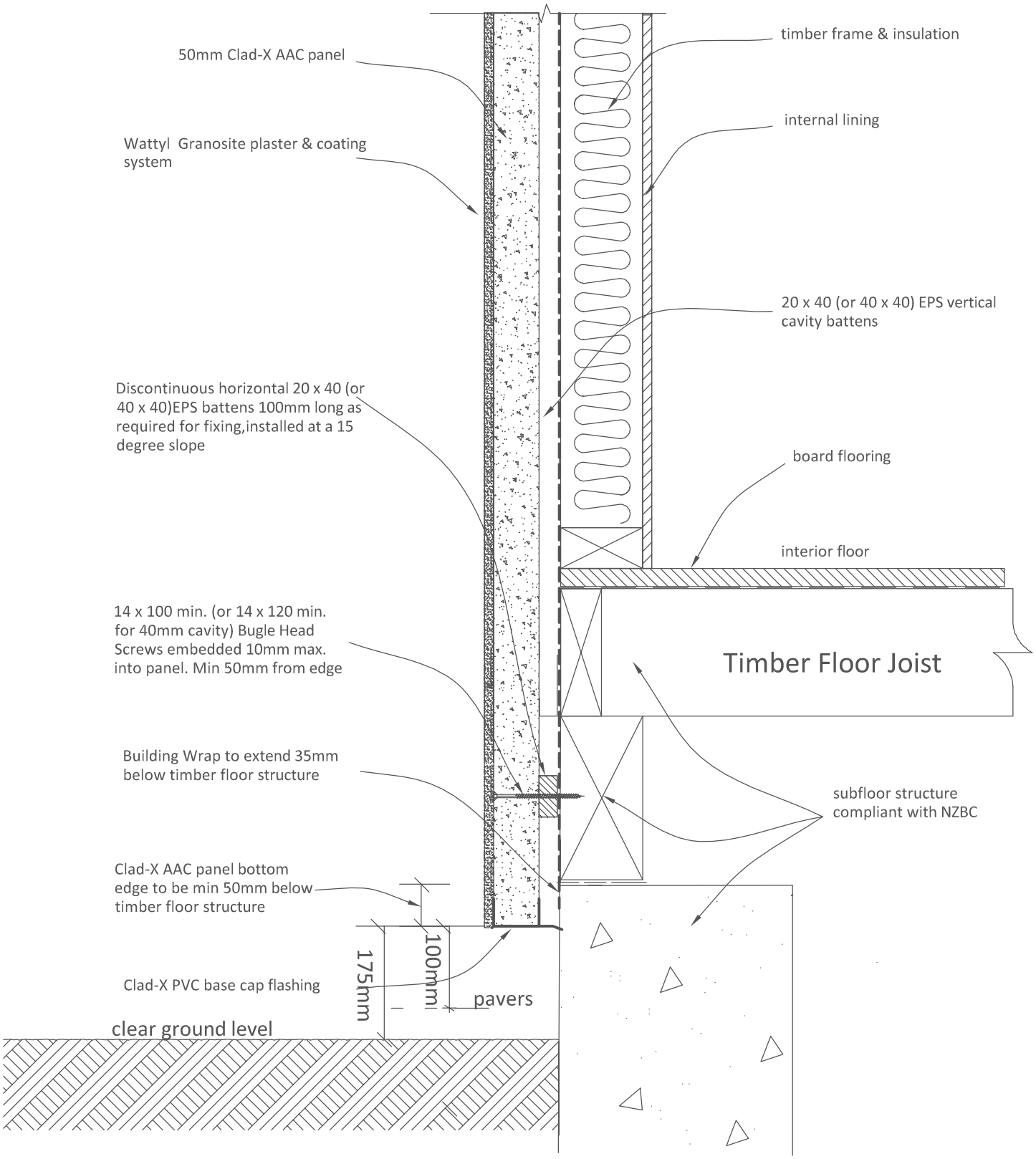
Typical Clad-X AAC wall cross section			Scale	1:10
Dwg No. 03	Date	April 2013	www.cladx.co.nz	



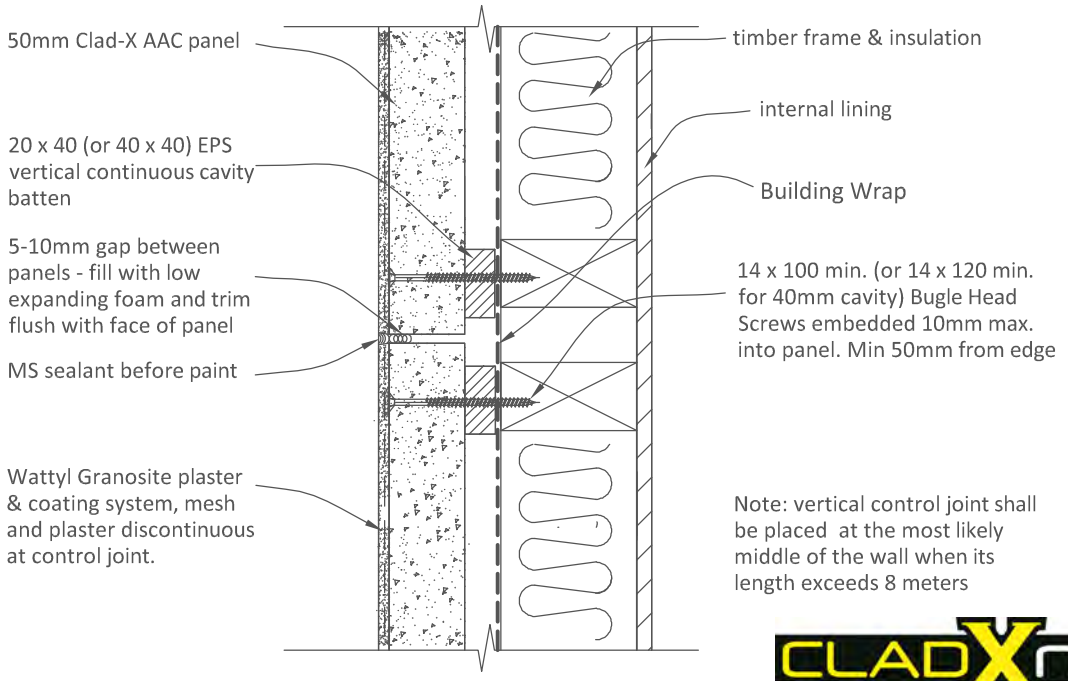
Rebated Concrete foundation detail			Scale	1:10
Dwg No. 04	Date	April 2013	www.cladx.co.nz	



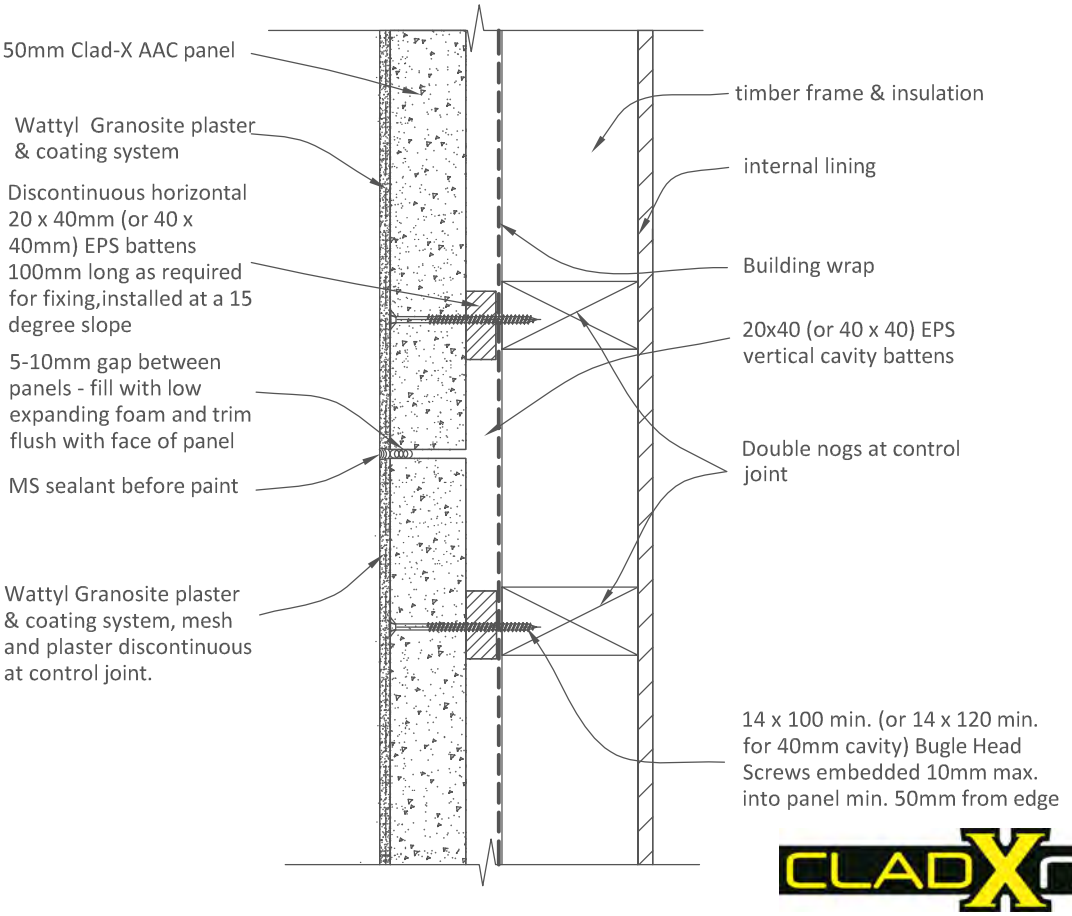
Over-hang concrete foundation detail			Scale	1:10
Dwg No. 05	Date	April 2013	www.cladx.co.nz	



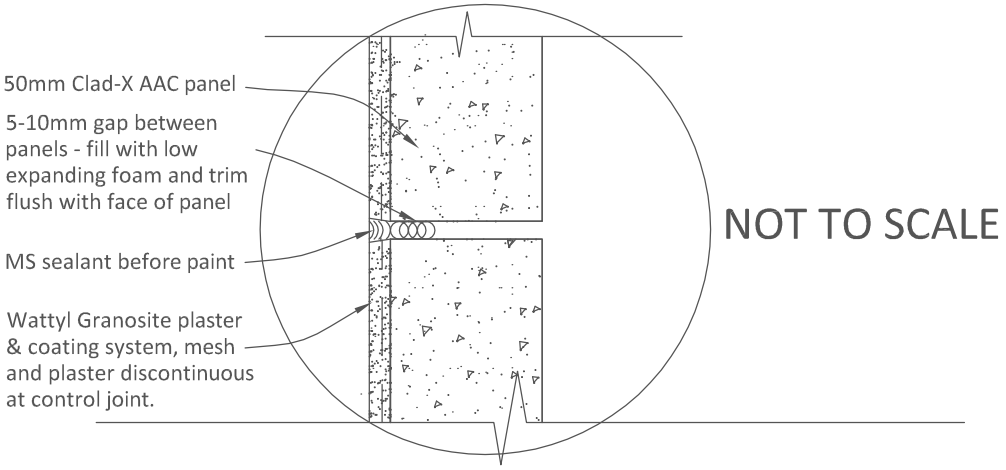
Timber subfloor foundation detail			Scale	1:6
Dwg No. 06	Date	April 2013	www.cladx.co.nz	

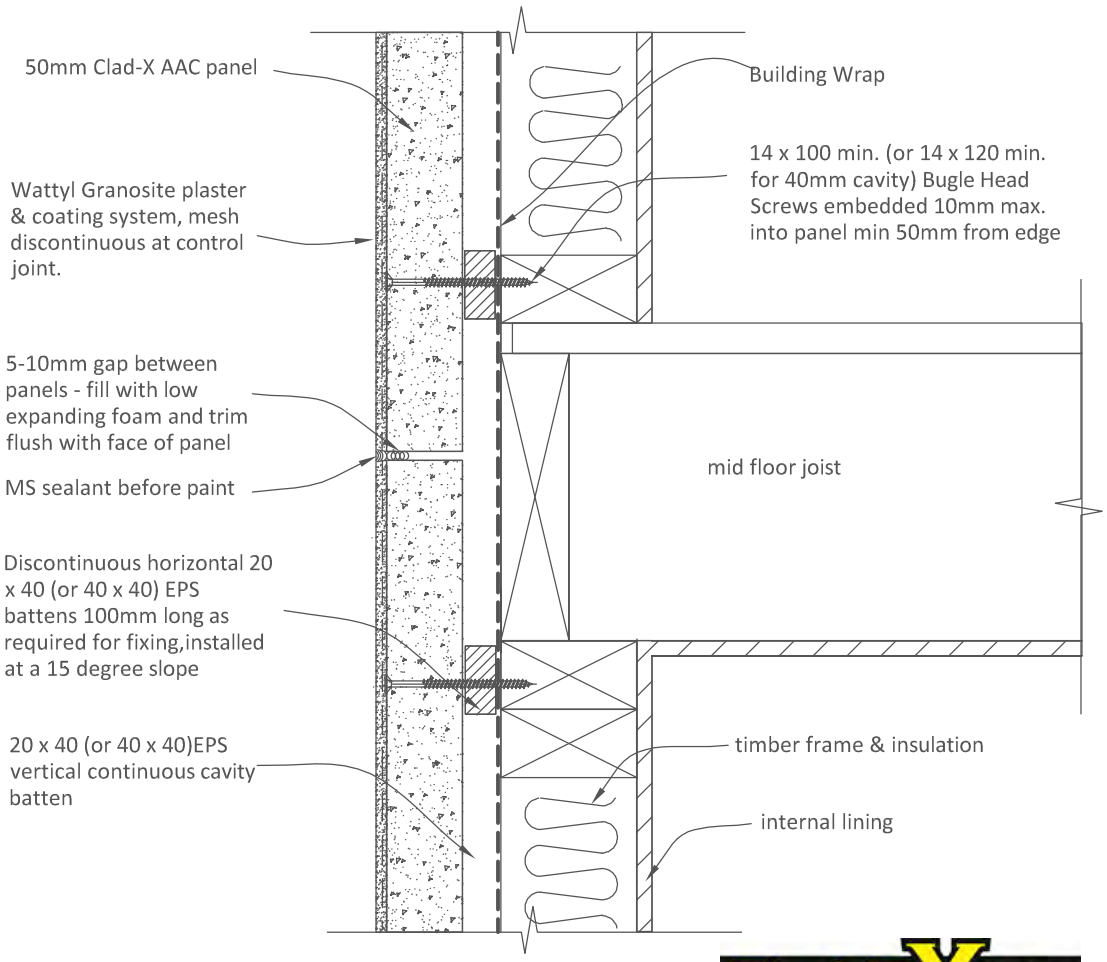


Vertical control Joint detail			Scale	1:5
Dwg No. 07	Date	April 2013	www.cladx.co.nz	

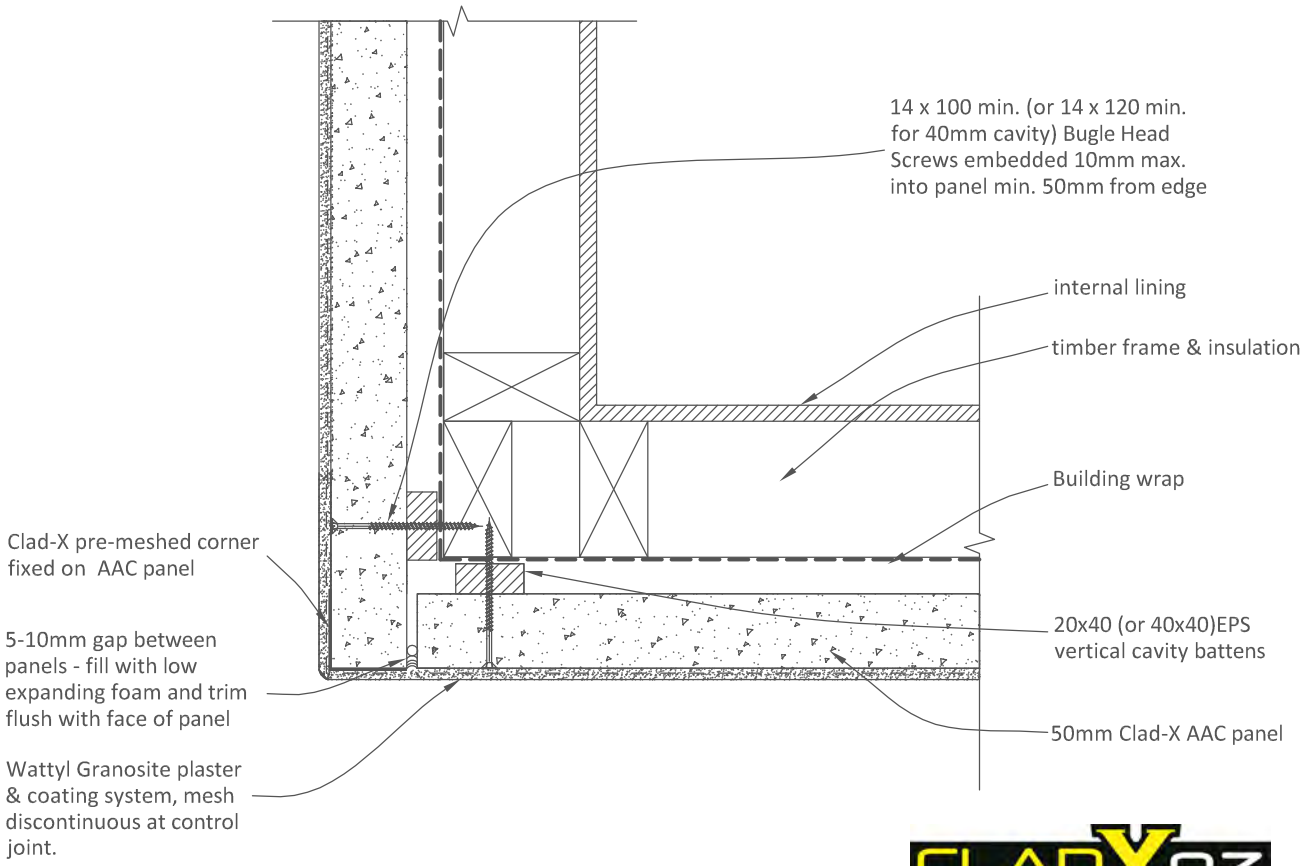


Horizontal control joint detail			Scale	1:5
Dwg No. 08	Date	April 2013	www.cladx.co.nz	

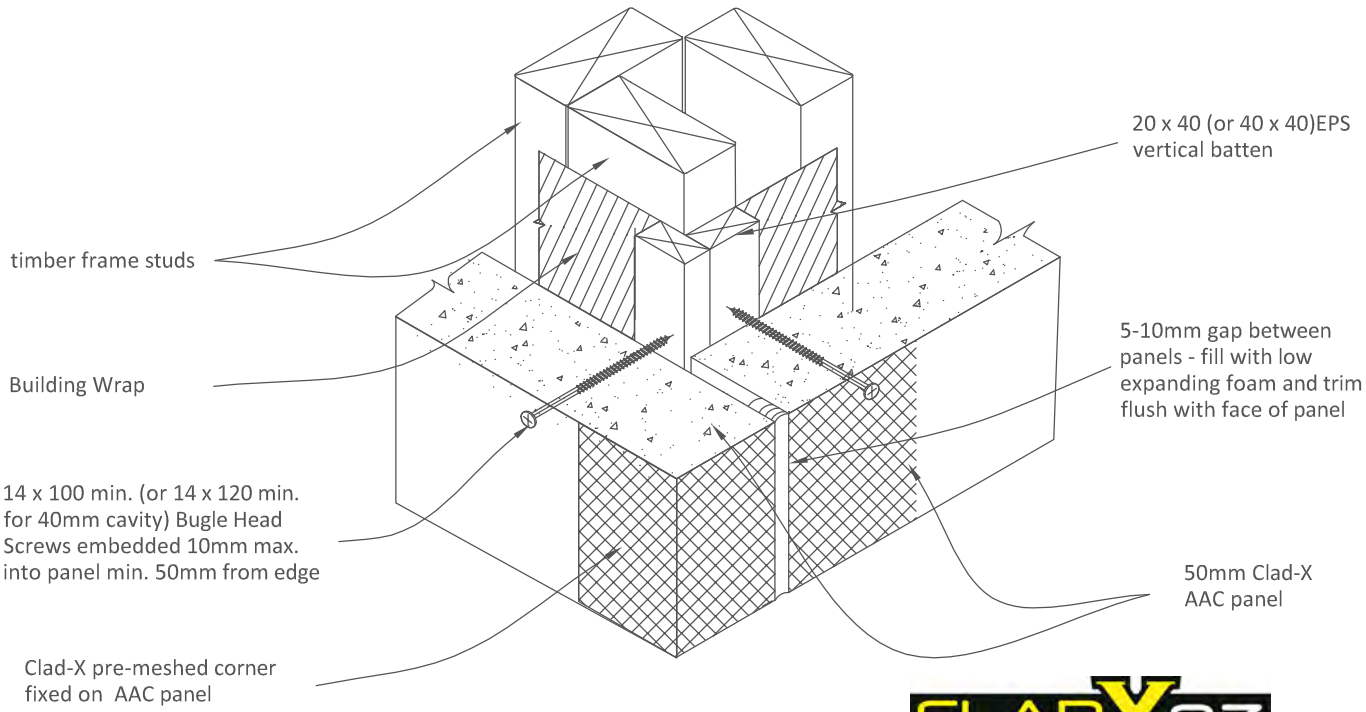




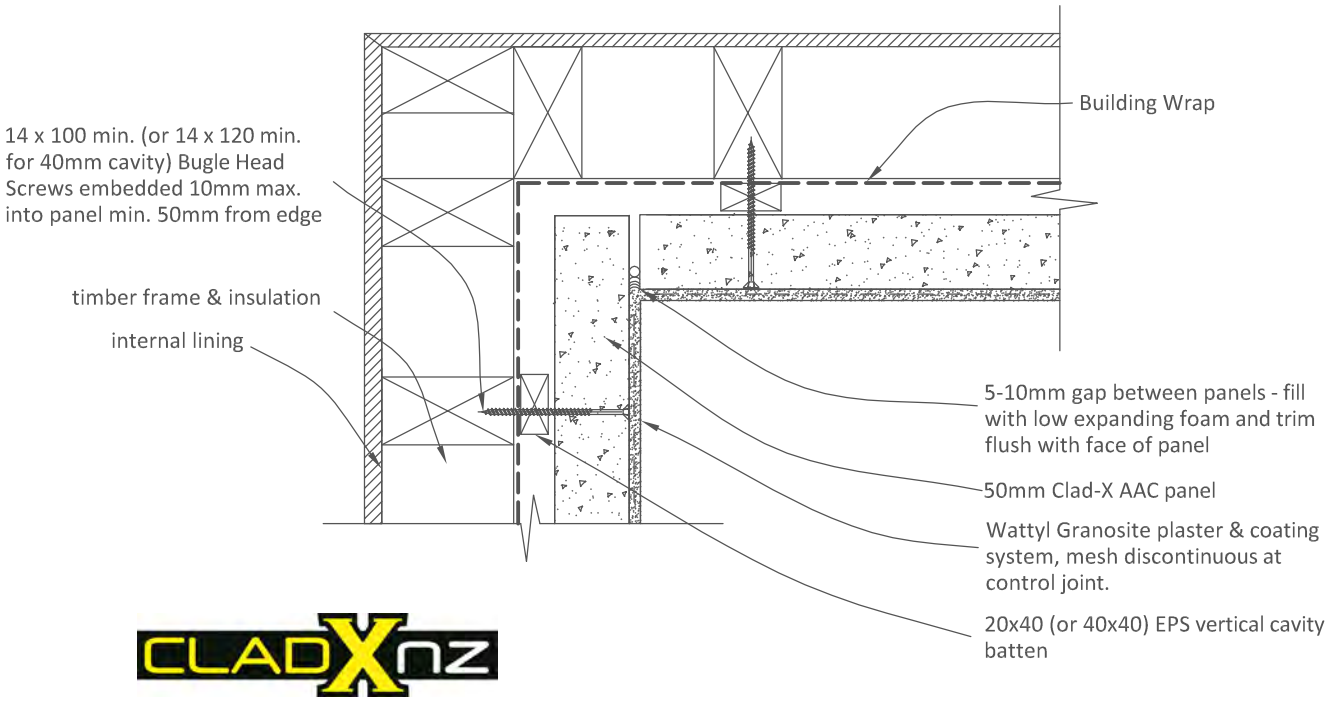
Mid-floor horizontal control joint detail			Scale	1:5
Dwg No. 09	Date	April 2013	www.cladx.co.nz	



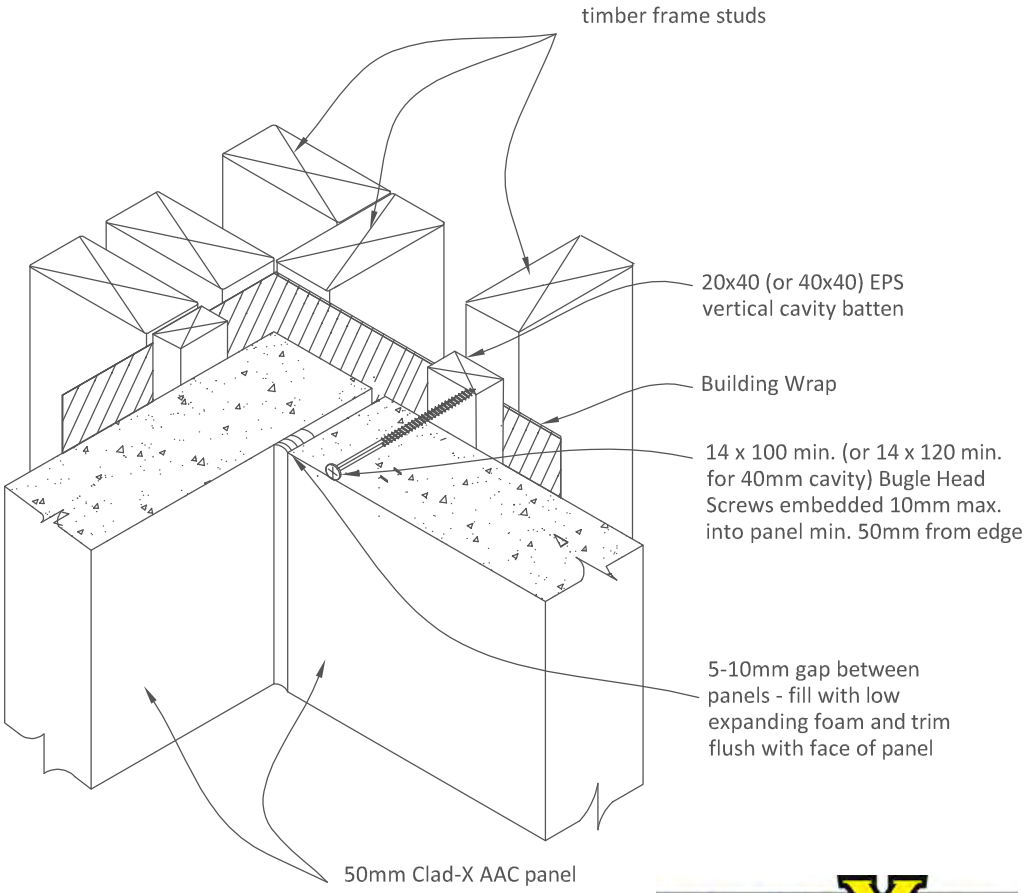
External corner detail - plan view			Scale	1:5
Dwg No. 10	Date	April 2013	www.cladx.co.nz	



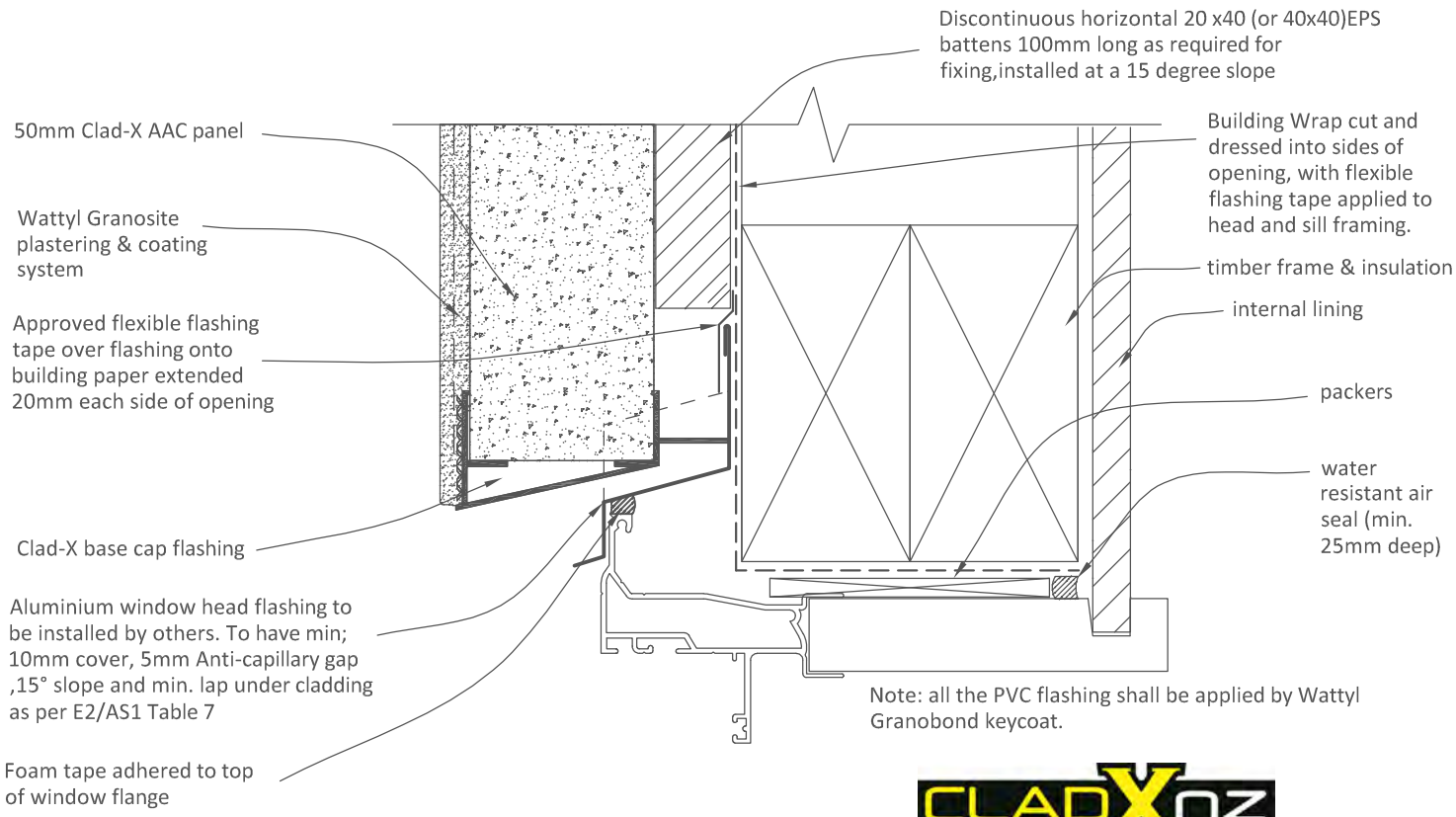
External corner detail - 3D view			Scale	NTS
Dwg No. 11	Date	April 2013	www.cladx.co.nz	



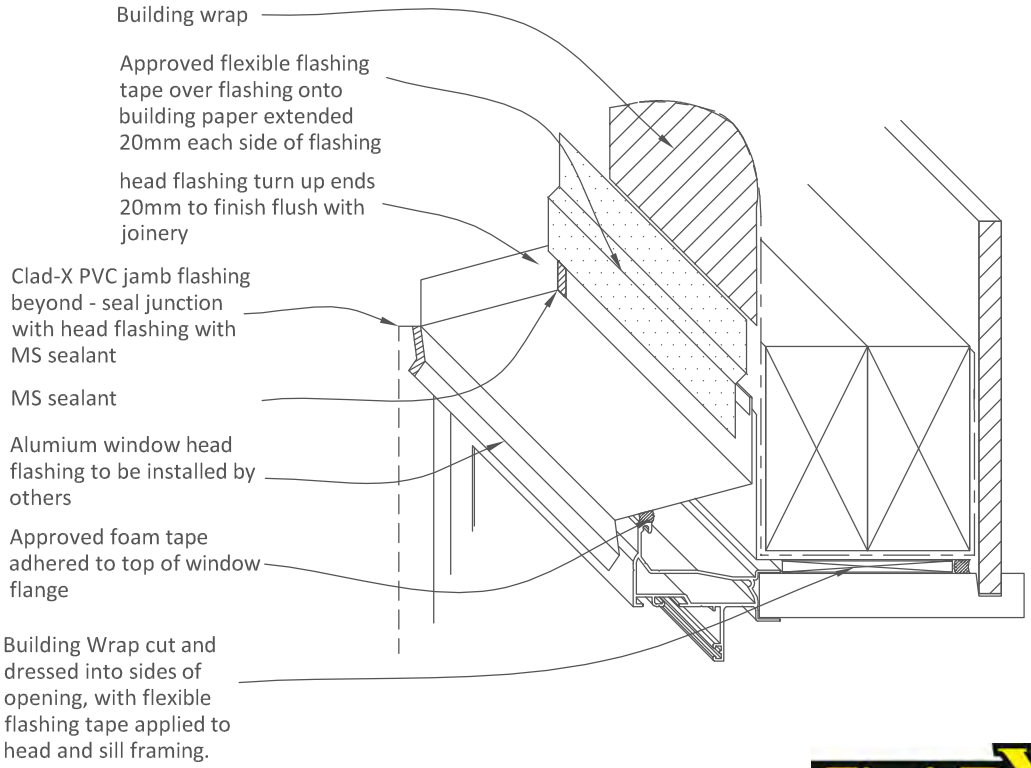
Internal corner detail - plan view			Scale	1:5
Dwg No. 12	Date	April 2013	www.cladx.co.nz	



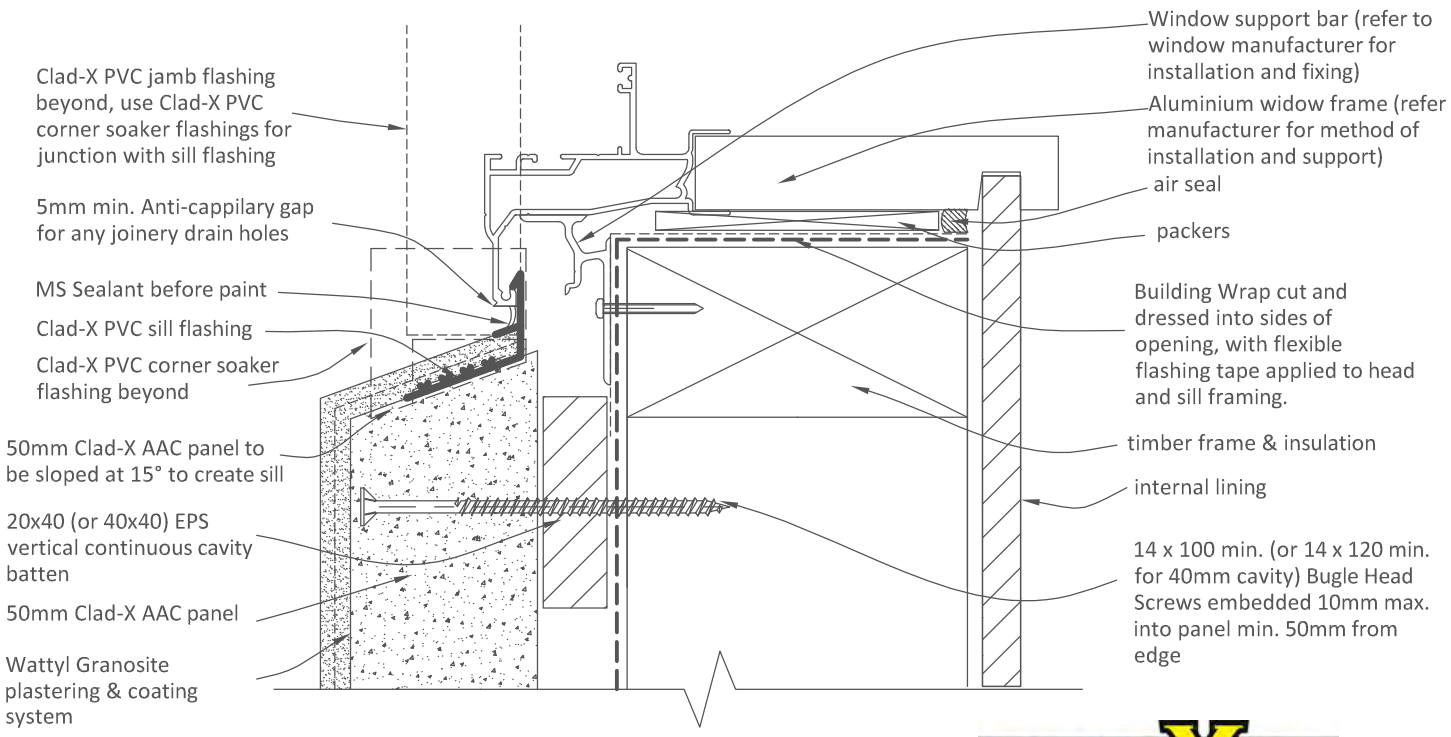
Internal corner detail - 3D view			Scale	NTS
Dwg No. 13	Date	April 2013	www.cladx.co.nz	



Window head detail			Scale	1:2
Dwg No. 14	Date	April 2013	www.cladx.co.nz	

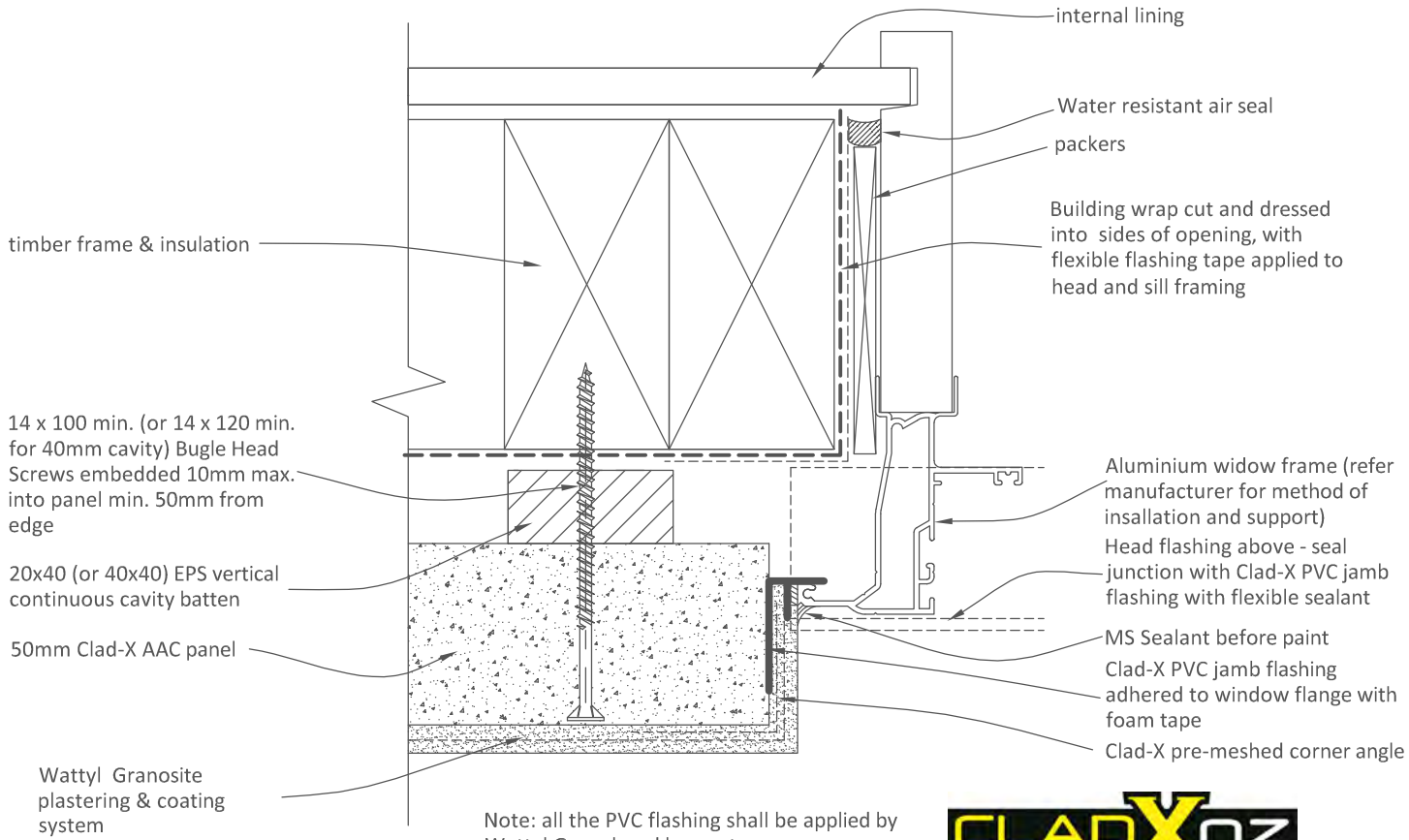


Window head flashing 3D detail			Scale	NTS
Dwg No. 15	Date	April 2013	www.cladx.co.nz	



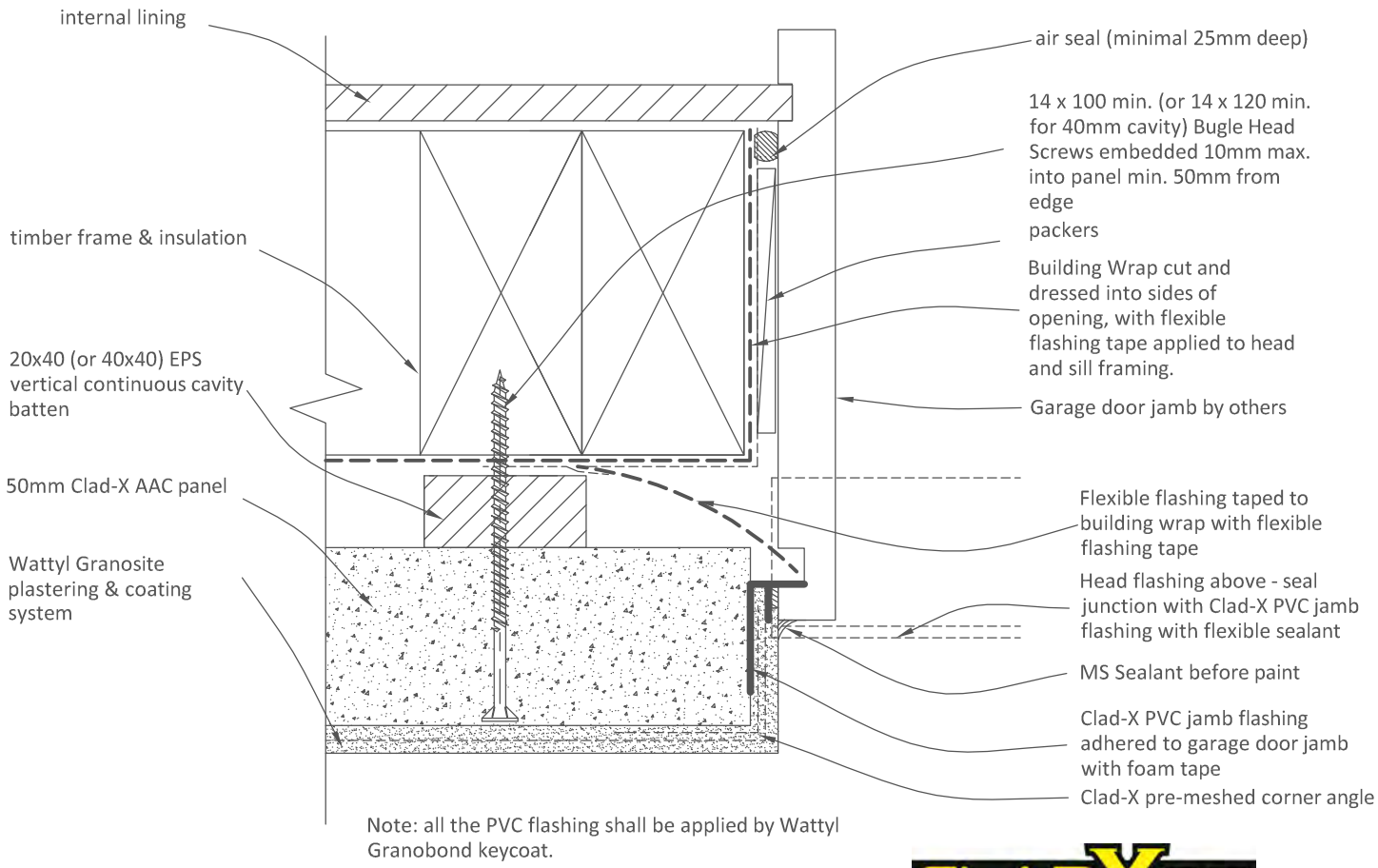
Note: all the PVC flashing shall be applied by Wattyl Granobond keycoat.

Window sill detail			Scale	1:2
Dwg No. 16	Date	April 2013	www.cladx.co.nz	

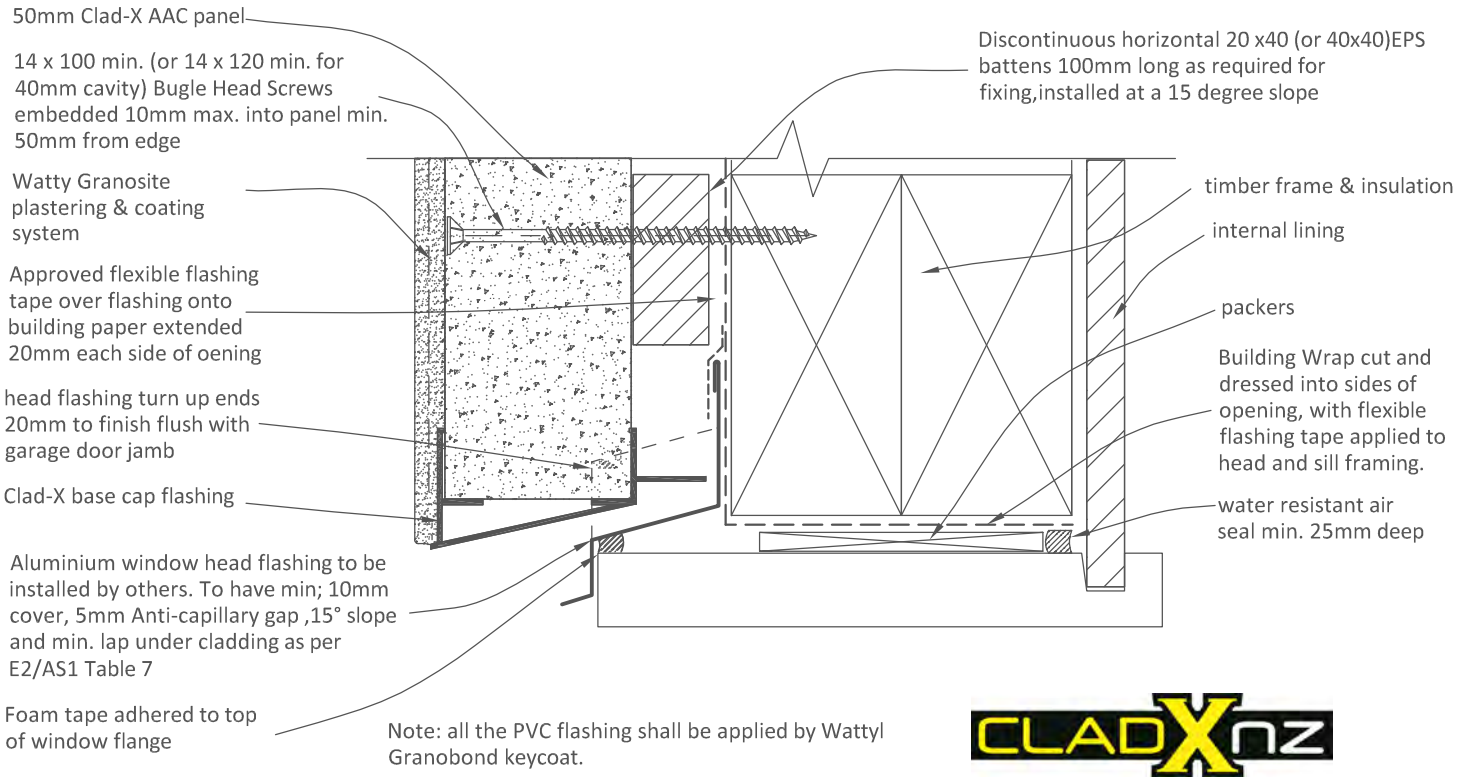


Note: all the PVC flashing shall be applied by Wattyl Granobond keycoat.

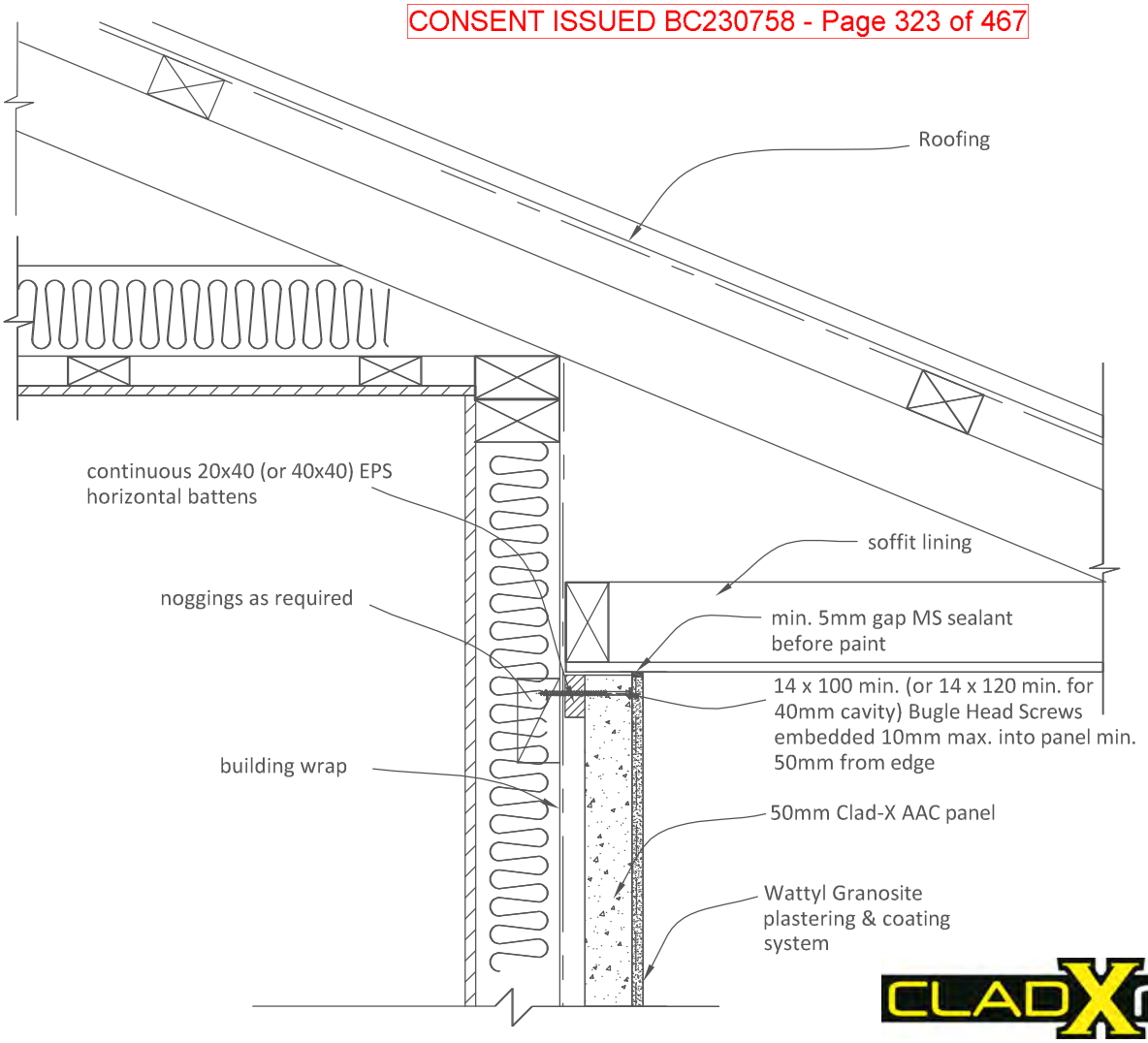
Window jamb detail			Scale	NTS
Dwg No. 17	Date	April 2013	www.cladx.co.nz	



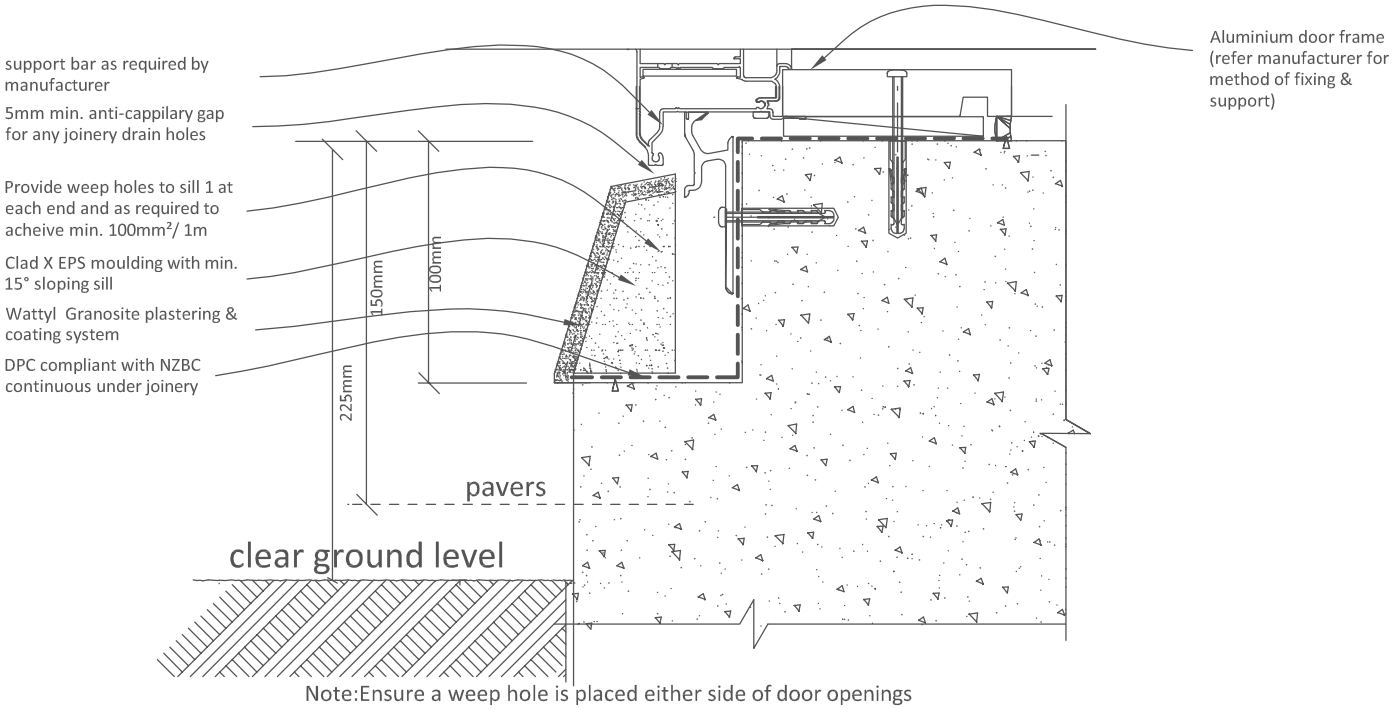
Garage door jamb detail			Scale	1:2
Dwg No. 18	Date	April 2013	www.cladx.co.nz	



Garage door head detail			Scale	1:2
Dwg No. 19	Date	April 2013	www.cladx.co.nz	

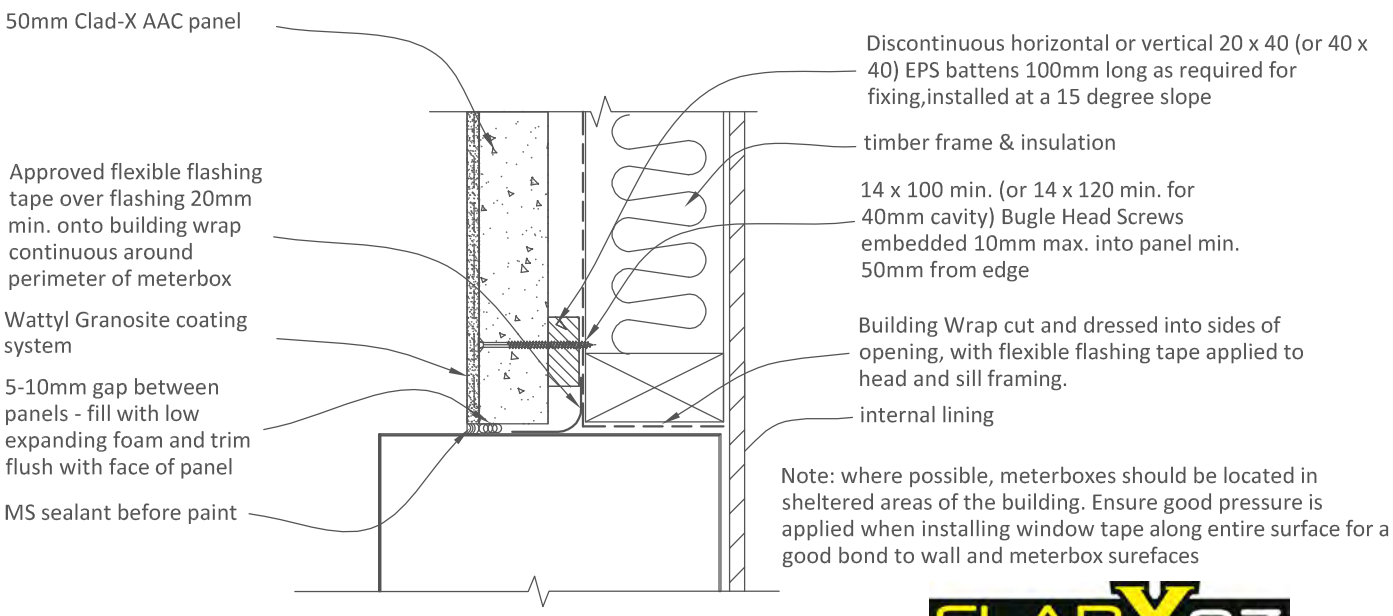


Soffit junction detail			Scale	1:8
Dwg No. 20	Date	April 2013	www.cladx.co.nz	

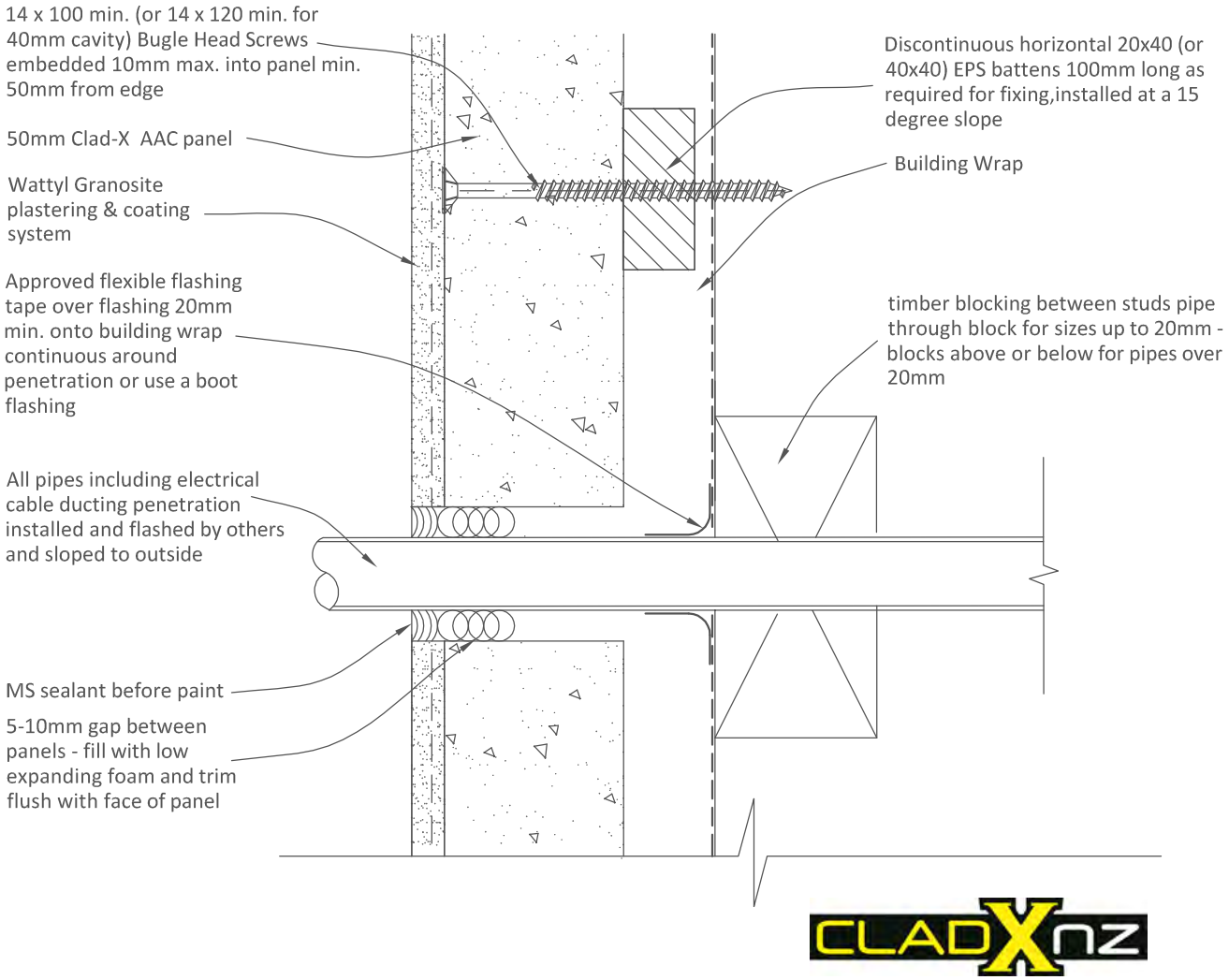


Note:Ensure a weep hole is placed either side of door openings

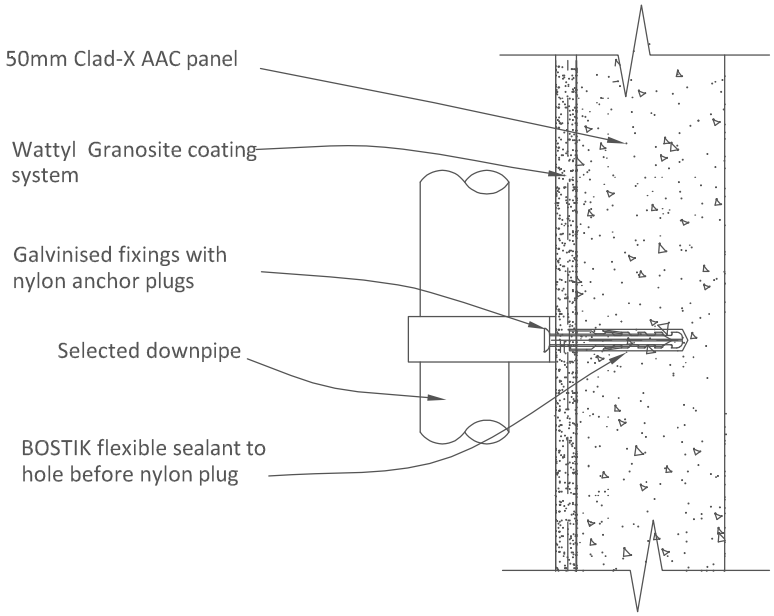
Sill detail @ slab			Scale	1:3
Dwg No. 21	Date	April 2013	www.cladx.co.nz	



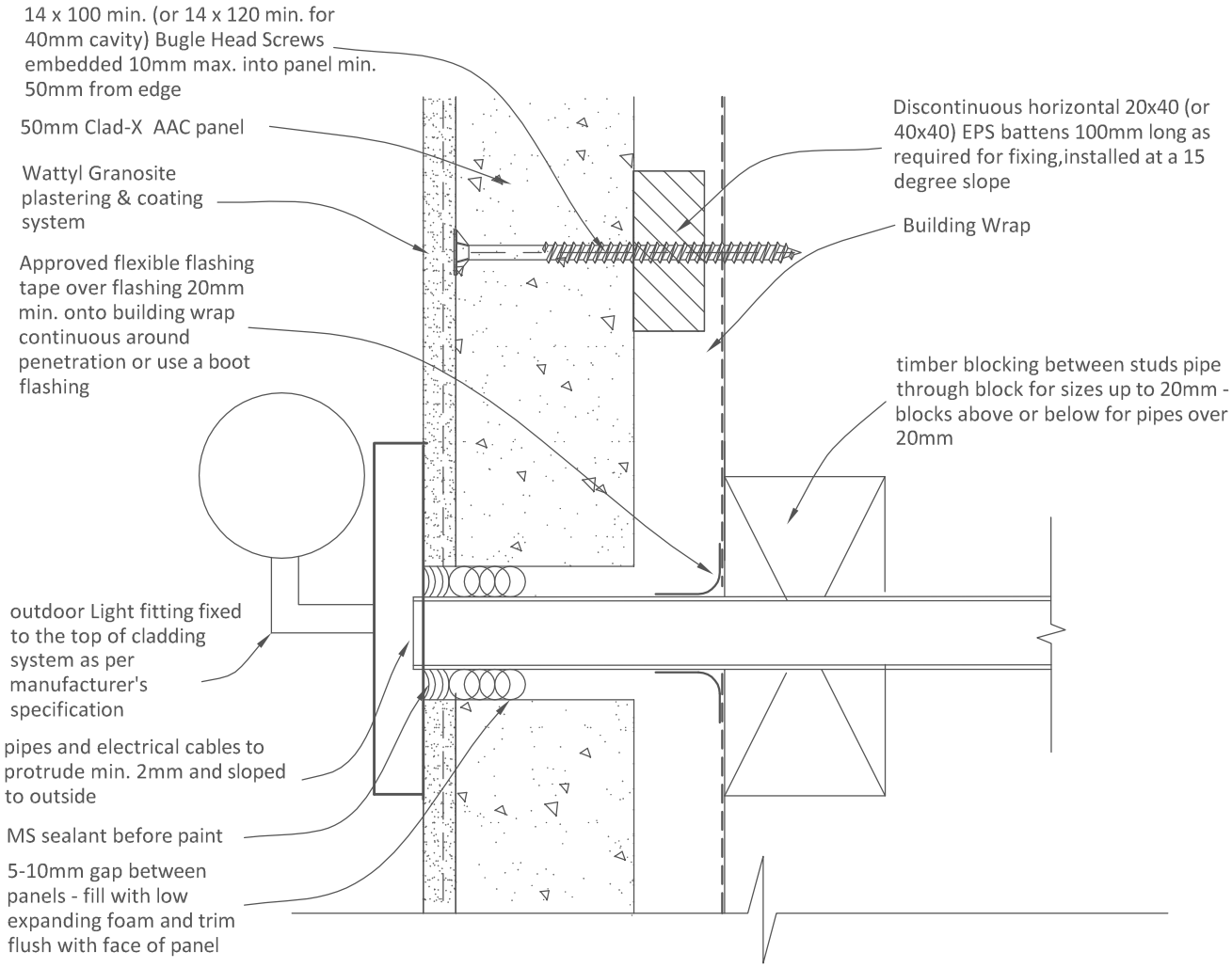
Meterbox (head/jamb/sill) detail			Scale	1:5
Dwg No. 22	Date	April 2013	www.cladx.co.nz	



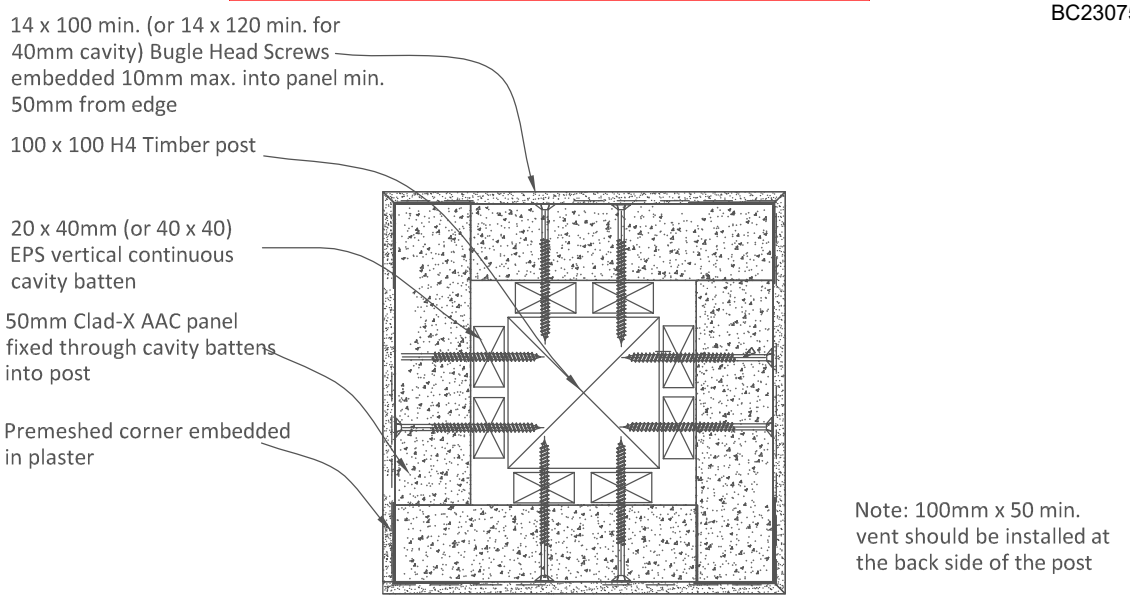
Penetration (pipe/cable) details			Scale	1:2
Dwg No. 23	Date	April 2013	www.cladx.co.nz	



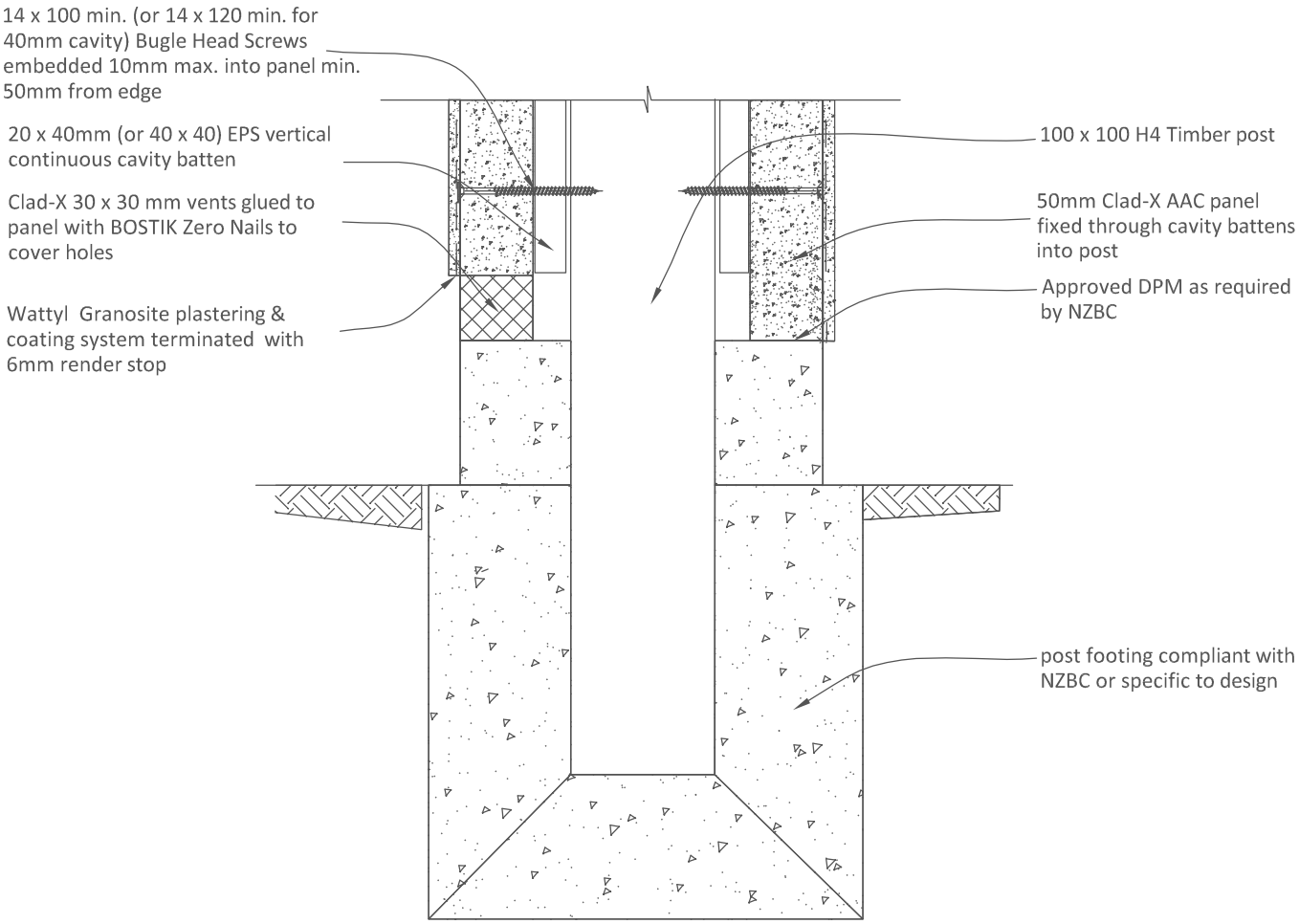
Down Pipe Fixing Details			Scale	NTS
Dwg No. 24	Date	April 2013	www.cladx.co.nz	



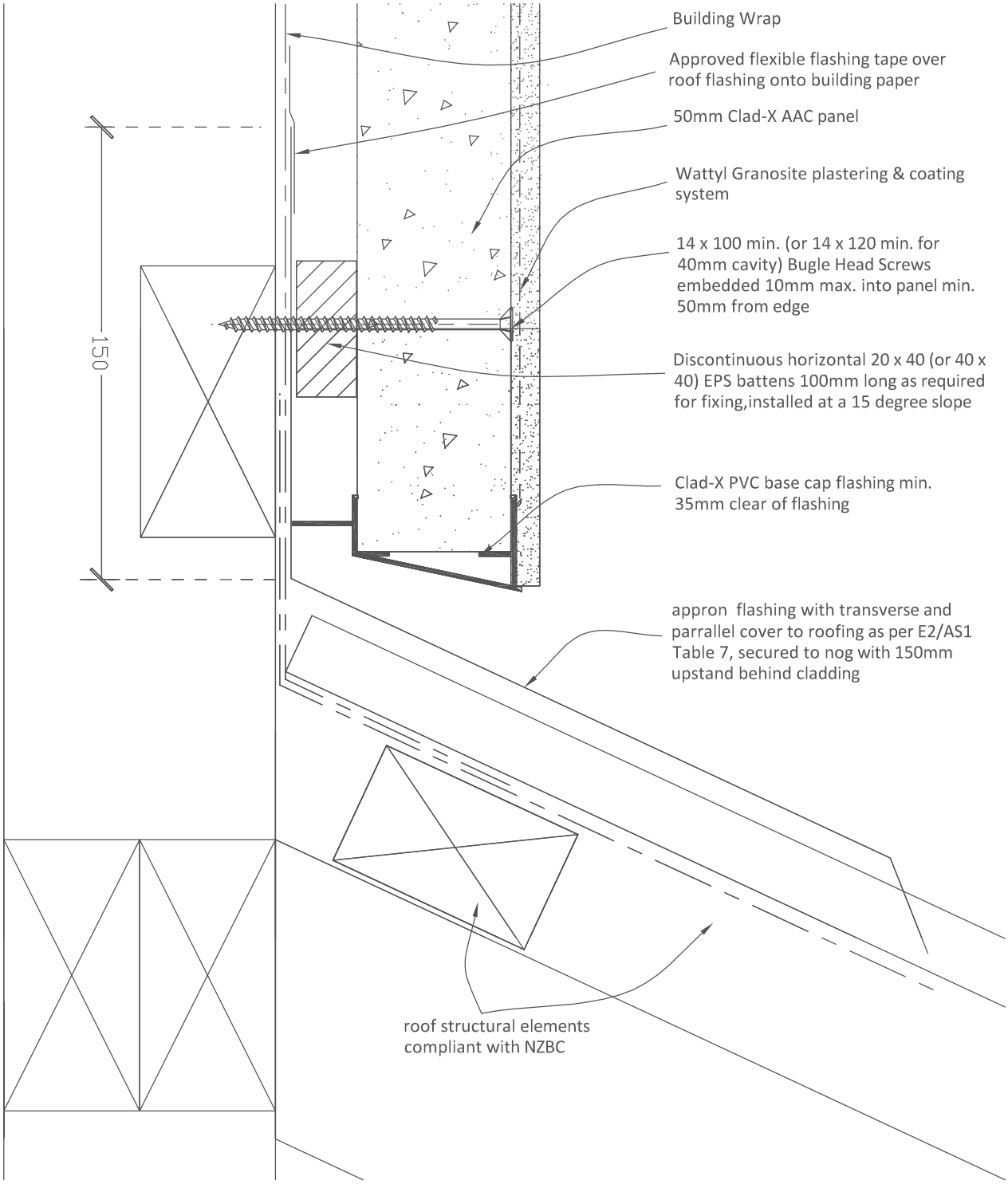
outdoor lighting fixing detail			Scale	1:2
Dwg No. 25	Date	April 2013	www.cladx.co.nz	



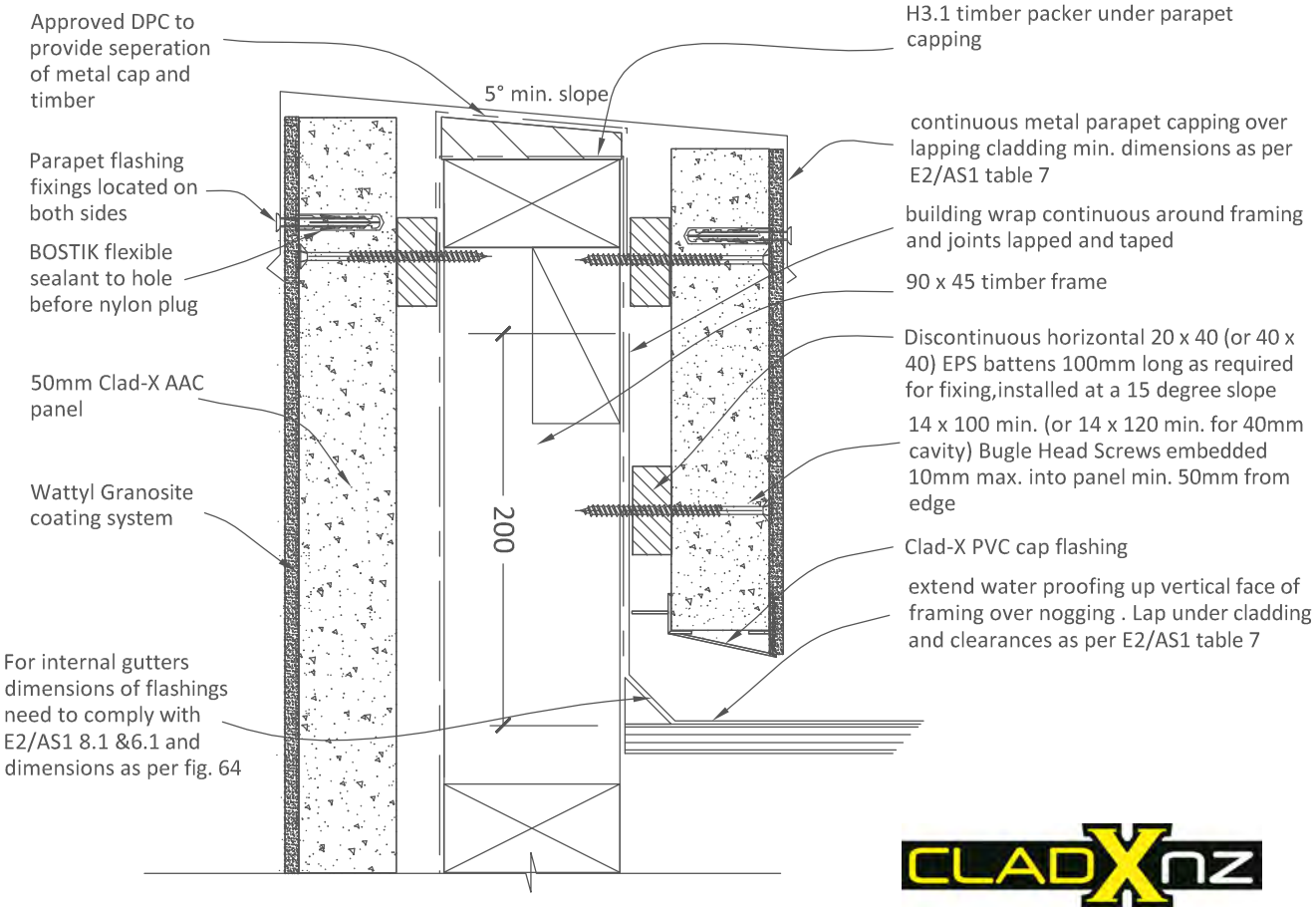
Timber post plan detail			Scale	1:5
Dwg No. 26	Date	April 2013	www.cladx.co.nz	



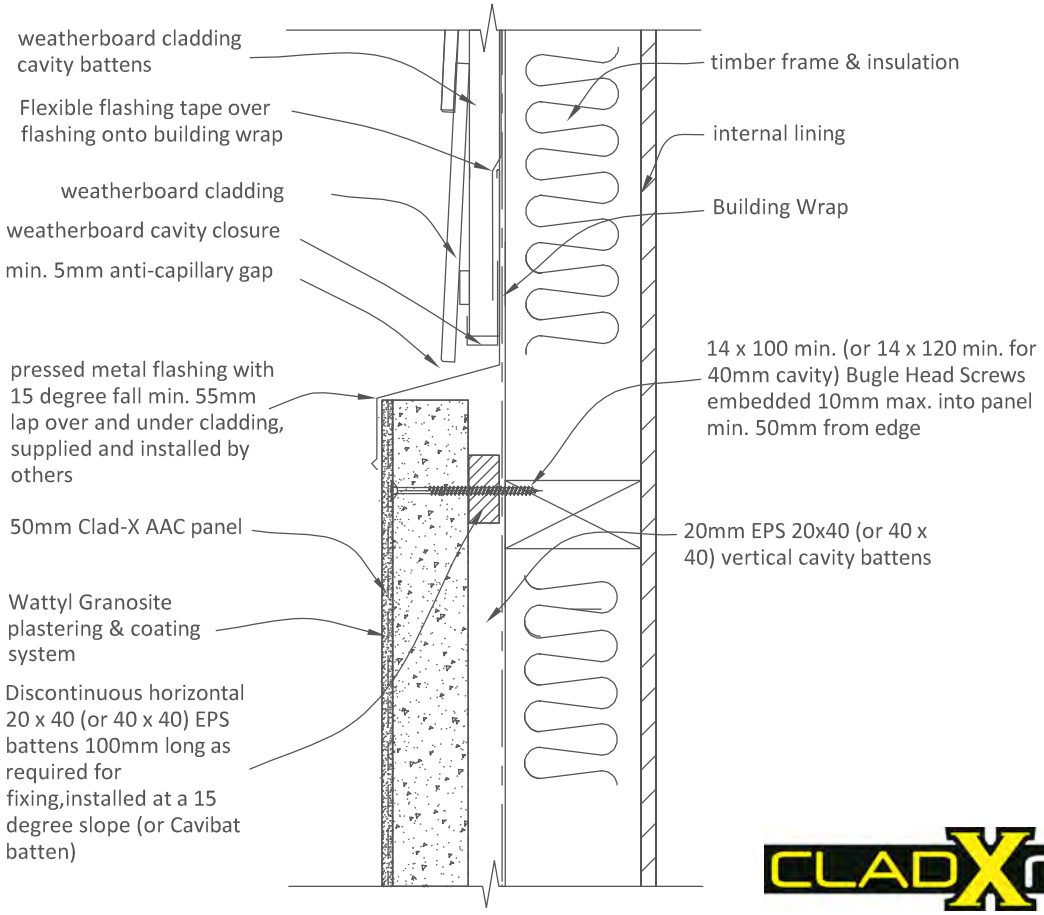
Timber post ground connection detail			Scale	1:5
Dwg No. 27	Date	April 2013	www.cladx.co.nz	



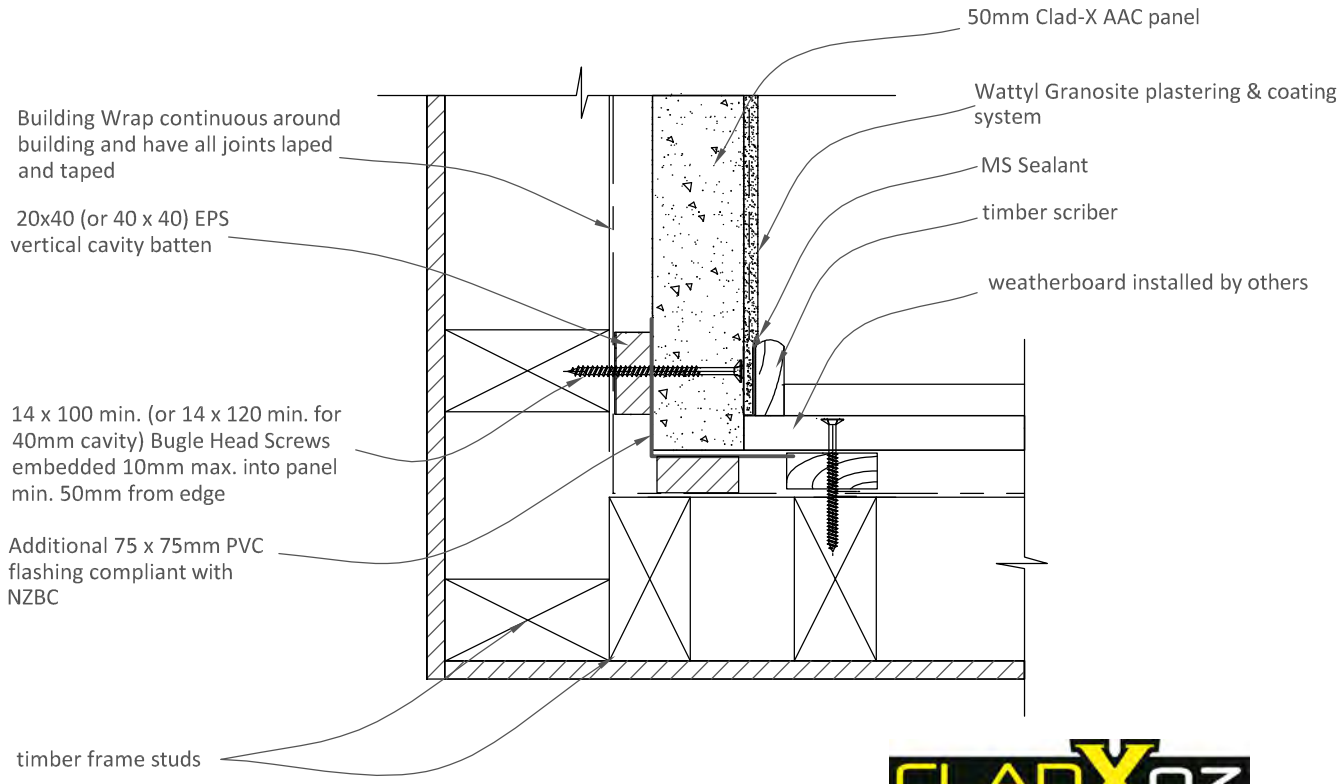
Roof/wall Junction detail			Scale	1:2
Dwg No. 28	Date	April 2013	www.cladx.co.nz	



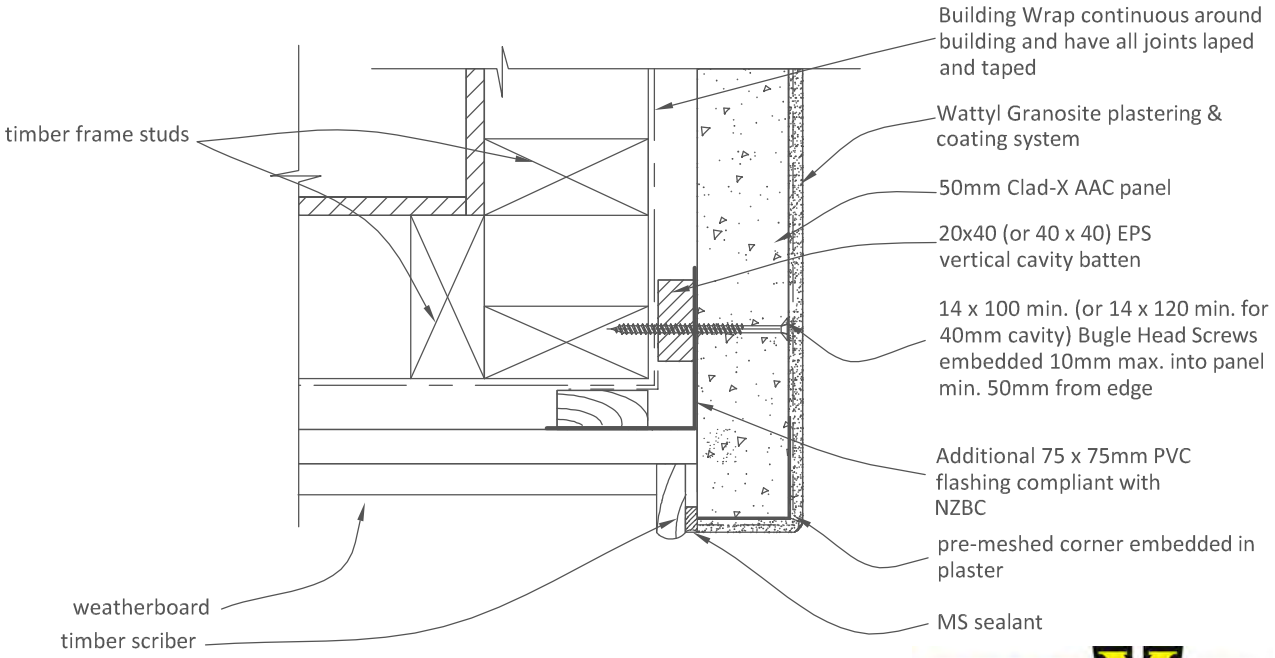
AAC panel parapet (metal capping) detail			Scale	1:4
Dwg No. 29	Date	April 2013	www.cladx.co.nz	



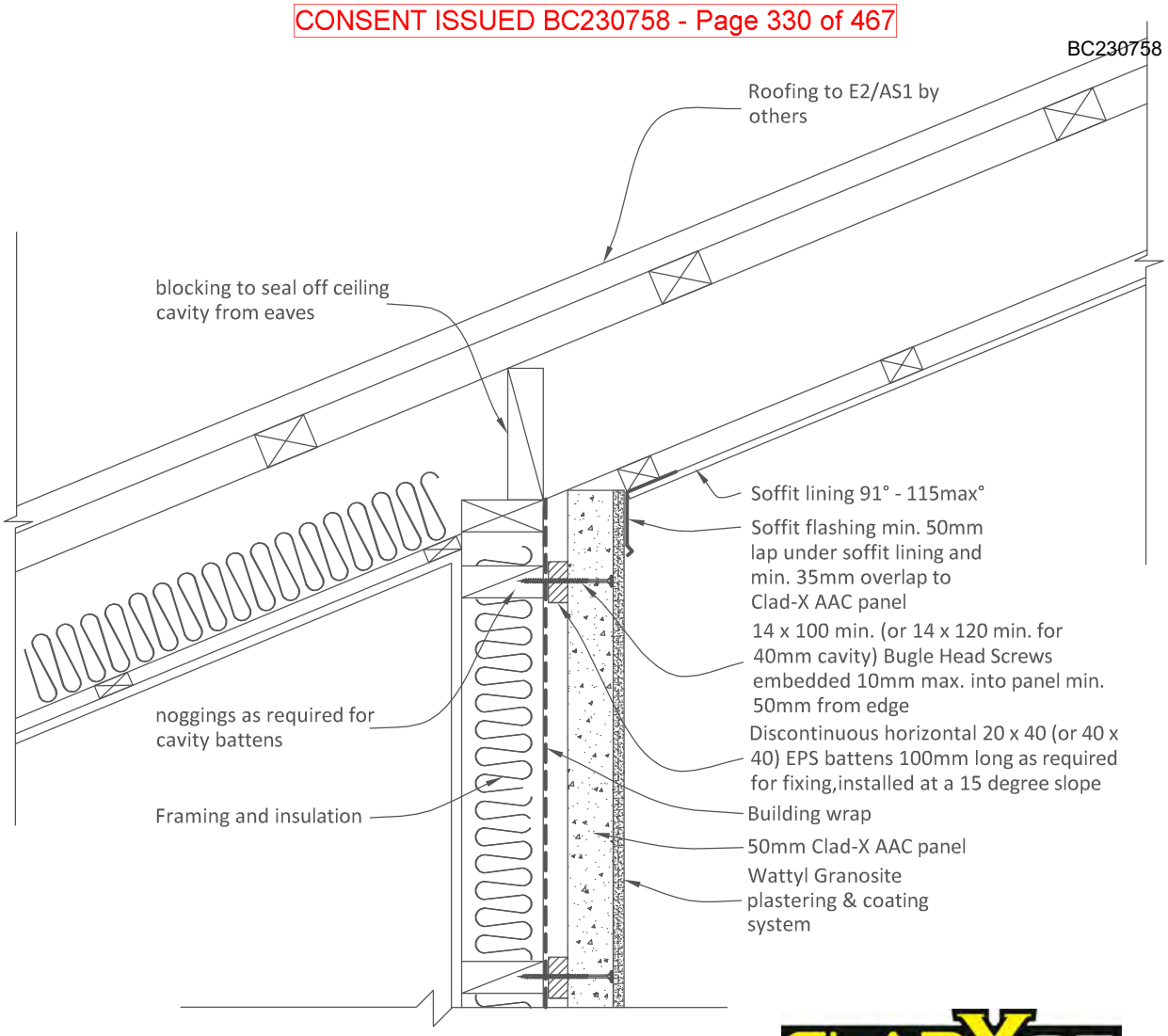
AAC panel/weatherboard junction detail			Scale	1:5
Dwg No. 30	Date	April 2013	www.cladx.co.nz	



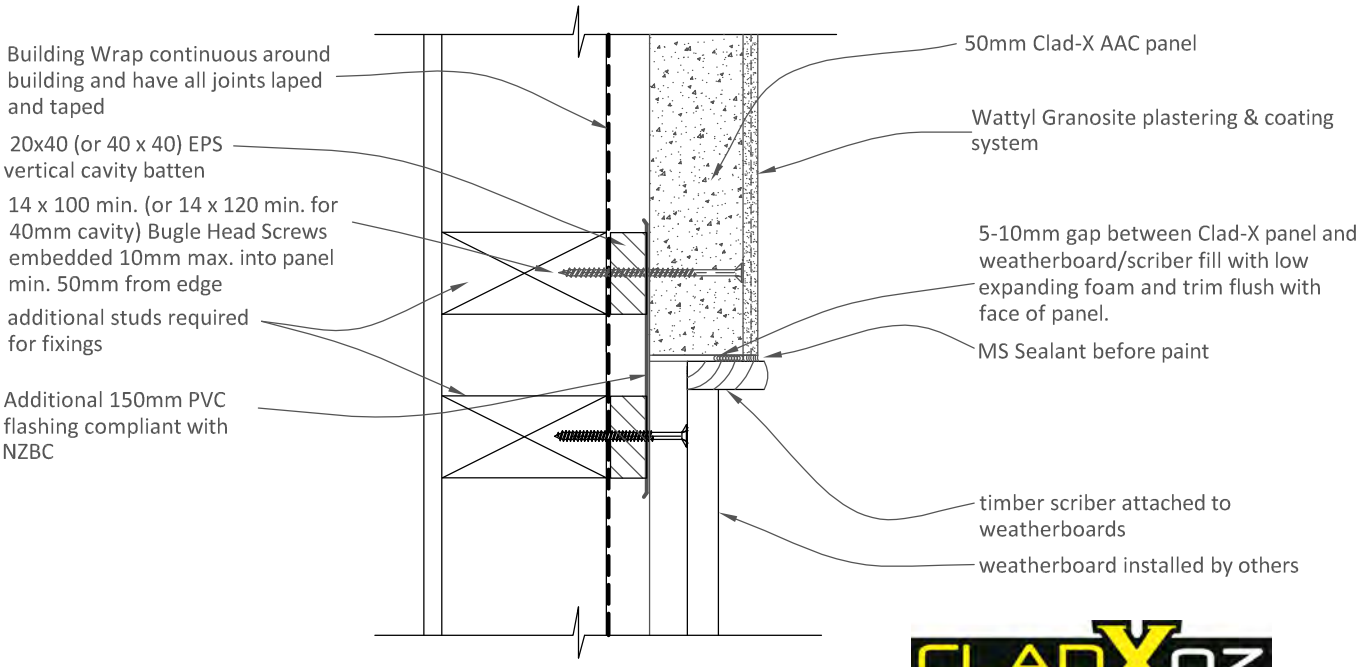
weatherboard internal corner junction			Scale	1:4
Dwg No. 31	Date	April 2013	www.cladx.co.nz	



Weatherboard external corner junction			Scale	1:4
Dwg No. 32	Date	April 2013	www.cladx.co.nz	



Sloping Soffit Detail			Scale	1:8
Dwg No. 33	Date	April 2013	www.cladx.co.nz	



Weatherboard Vertical Junction			Scale	1:4
Dwg No. 34	Date	April 2013	www.cladx.co.nz	

Building Consent BC230758
Received 13/09/2023

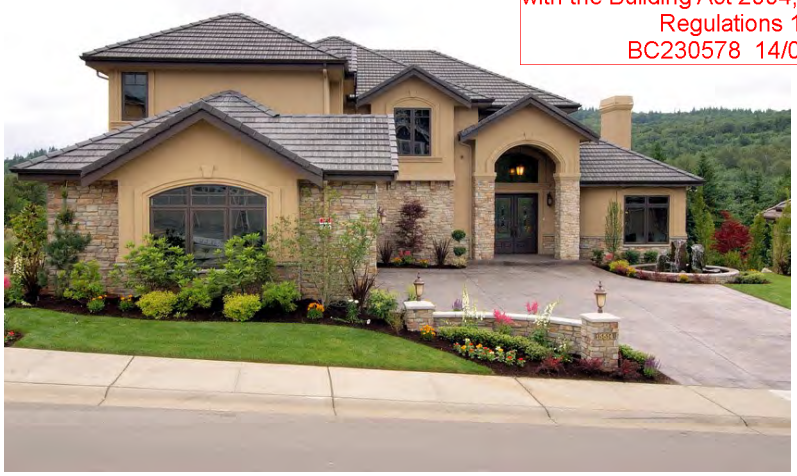
C1216

EXPIRES 31 MAY 2024

BEAL Appraisal Certificate

The Clad X NZ Ltd AAC Wall Panel System

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao



Product

1.1 The Clad X NZ AAC Wall Panel System (CAWPS) is a drained and ventilated masonry veneer wall cladding with a plastered then painted / textured finish. It is designed to be used as an external wall cladding system for residential and light commercial type buildings where residential construction techniques are used.

1.2 The system consists of 50mm thick autoclaved aerated concrete (AAC) panels fixed over polystyrene battens to form a 20mm cavity. The coating system from Wattyl consists of 5 mm thick Grano Adhesive Mortar Coarse with fibre-glass mesh imbedded into it, followed by the application of a 2mm thick Grano Adhesive Mortar Coarse, followed by the application of a 1mm thick coat of Grano Sponge. A coat of Grano Prime primer/sealer is then applied followed with the application of 2 coats of Wattyl's Grano Impact coating system.

1.3 The system incorporates a drained and ventilated cavity by way of 40mm x 20mm EPS cavity battens .

NZ Building Regulations

2.1 In the opinion of BEAL, the CAWPS, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the NZBC.

2.2 Clause B1 STRUCTURE

Performance B1.3.1 and B1.3.3. The CAWPS meets the requirements for loads arising from self weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See paragraphs 10.1-10.4

2.3 Clause B2 DURABILTY

Performance B2.3.1 (b), 15 years, B2.3.1 (c), 5 years, and B2.3.2. The CAWPS meets this requirement. See paragraphs 11.1-11.5

2.4 Clause E2 EXTERNAL MOISTURE

Performance E2.3.2. The CAWPS meets this requirement. See paragraph 13.1-13.7

2.5 Clause F2 HAZARDOUS BUILDING M ATERIALS

Performance F2.3.1. The CAWPS meets this requirement and will not present a health hazard to people.

2.6 The CAWPS has been appraised as an **Alternative Solution** in terms of New Zealand Building Code Compliance.

Applicant:

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North Canterbury
Tel: 027 600 1234, mark@cladx.co.nz
Tel: 027 600 1238, james@cladx.co.nz
www.cladx.co.nz

Appraiser:

BEAL
6B Cedric Street
Plimmerton, Porirua, NZ
Tel: +64 233 6661
E-Mail: sales@beal.co.nz
www.beal.co.nz

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Building Consent BC230758
Received 13/09/2023

Scope and Limitations

3.1 The CAWPS System has been appraised for use as an external wall cladding system for buildings within the following scope:

- Scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- Constructed with timber framing complying with the NZBC; and,
- Constructed with steel framing complying with the NZBC; and,
- With a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- Can be situated in up to and including Very High wind zones as described in NZS 3604 Building Wind Zones.

3.2 The CAWPS System must only be installed on vertical framing.

3.3 The system is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The Appraisal of the CAWPS System relies on joinery meeting the requirements of NZS 4211 for the relevant building wind zone or being specifically designed for use in specifically designed buildings).

3.4 Installation of components and accessories supplied by Clad X NZ Ltd must be carried out only by personnel trained and certified by Clad X NZ Ltd.

Technical Literature

4.1 Refer to the Clad-X Technical Manual. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal Certificate must be followed.

4.2 For a copy of this Technical Literature and any updates please refer to www.cladx.co.nz

Technical Details

5.1 System components and accessories supplied by Clad X NZ Ltd as follows:

Cavity Battens

20mm EPS Cavity Battens

- Cavity battens are manufactured from very high density (Class VH) EPS with a density of no less than 28kg/m³. The battens are 40mm wide by 20mm thick and are supplied in 1200mm lengths.

Clad X AAC Panel

- The Clad X AAC Panel Panels are 50mm thick, manufactured from autoclaved aerated concrete with an approximate density of 520kg/m³. The panels are supplied in lengths of 2200mm long by 600mm wide and subject to the Clad X Building Product Quality Plan (BPQP).

Accessories

- MCB A20 cement based panel adhesive
- uPVC Components include:
  - Clad X PVC sill flashing
  - Powder coated aluminium head flashing (installed by the owner)
  - Clad X PVC jamb flashing
  - Clad X PVC base cap flashing
  - PVC base cap moulding 50mm
- Vents - PVC vent 30mm x 30mm
- Bostik Safe-Tech sealant
- Zinc-rich primer compliant with AS/NZS 2311
- 14 -10 x 100mm long AS3566 corrosion class 3 or 4 Bugle head screws for use in NZS 3604 defined corrosion zones 1,2, 3 and 4. Grade 304 stainless steel shall be used in the sea spray zone.
- Reinforcing Mesh - High quality alkali resistant fibreglass mesh with a nominal size of approx. 4mm square and a weight of 150g/m² for use in domestic and light commercial situations.

Wattyl Granosite Plaster and Coating System

5.2 All Plaster components used for the protection and weatherproofing of the AAC Panels are to be supplied by Wattyl New Zealand Ltd. The Wattyl Granosite Plaster and Coating System has been assessed by BEAL.

Base Coat Plasters

- ***Grano Adhesive Mortar Coarse*** is a polymer-modified, cementitious rendering material specifically designed for thin section rendering over AAC. It is applied as a base coat, in a minimum 5mm layer followed by the embedment of high quality alkali resistant fibre glass mesh reinforcement, followed by a further 2mm layer.
- ***Grano Sponge*** is a pre-blended polymer-modified, cement-based texturing plaster designed to be applied 1-2mm over Grano Adhesive Mortar Coarse.

Finishing Coatings

- ***Grano Prime*** is an acrylic primer sealer applied over the Grano Sponge to enhance adhesion.
  Grano Prime can be applied by brush, roller, conventional or airless spray. The primer is applied over the levelling coat, and also used as a primer/adhesion promoter for flexible sealant application.
- ***Grano Impact*** is an is a high performance elastomeric coating able to be applied in a variety of styles over the sealed Grano Sponge plaster.
  A minimum of two coats of Wattyl Grano Impact must be used over the finishing plasters to make the system weathertight and produce the desired finish to exterior walls.
- Proprietary paint systems not supplied by Wattyl New Zealand Ltd have not been assessed and are therefore outside the scope of this Appraisal Certificate.

5.3 Accessories used with the system which are sup plied by Clad X NZ Ltd certified installers are:

- VH grade 40mm x 20mm EPS cavity battens.
- Sika PB Nailbond adhesive to adhere the EPS battens to the Wall Wrap.
- MCB A20 AAC panel adhesive.
- Screws shall be 14-10 x 100mm Bugle head, Type 17, Class 3 or 4 galvanized screws, complying with Compliance document E2/AS1 Table 20.
- Flexible sealant shall be Bostik SAFE-TECH complying with NZBC Acceptable Solution E2/AS1 for use as a weather sealing sealant for exterior use.
- Anti-corrosion paint for exposed steel wire shall be a zinc-rich primer compliant with AS/NZS 2311.
- The range of Clad X flashings to suit the particular layout of the cladding
- The Clad X Vent is a proprietary product with an opening of 30mm x 30mm and is installed when the cladding sits into a rebate in the floor slab.

5.4 Accessories used with the system which are supplied by the building contractor are:

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- Head flashing - Head flashing complying with NZBC Acceptable Solution E2/AS1 paragraph 4.6.1.6 and table 7 with a minimum stop end of 10mm, installed in accordance with the Technical Literature
- Foam tape to be installed under the head flashing onto the top of the Aluminium window or door joinery shall be Inseal 3259 single sided foam tape 3mm wide by 3mm thick length cut to suit.
- Building wrap - paper or wrap complying with the requirements of NZBC Acceptable Solution E2/AS1 Table 23.
- Flexible flashing sill and jamb tapes - flexible flashing tapes complying with AAMA 711-07, or a flexible flashing tape covered by a valid BEAL and/or BRANZ Appraisal for use around window and door joinery openings.
- Air seals around windows and doors - air seals complying with NZBC Acceptable Solution E2/AS1 9.1.6, or low foaming self expanding, moisture cure polyurethane foam air seals covered by a valid BEAL and/or BRANZ Appraisal for use around window, door and other wall penetration openings or manufactured to comply with AAMA 812-04.
- Building wrap strapping - Polypropylene tape for securing the building wrap in place and preventing bulging of the insulation into the drain cavity where cavity battens are installed at greater than 450mm centres as per NZBC Acceptable Solution E2/AS1 9.1.8.5 (b).

Handling and Storage

5.5 Handling and storage of all the materials supplied by Clad X NZ Ltd or the licensed contractor, both on and off site are under the control of Clad X NZ Ltd licensed contractors.

5.6 Dry storage must be provided on site for the AAC Cladding Panel, fibreglass mesh and bags of render with the AAC panels stored flat and protected from physical damage. EPS battens, uPVC flashing and mouldings must be protected from direct sunlight, physical damage and stored flat and under cover. All liquid components shall be stored in dry, frost free conditions.

5.7 Handling of the AAC panels require care to prevent damage to corners or excessive flexing.

5.8 Handling and storage of all the materials supplied by the building contractor, both on and off site is the responsibility of the building contractor. Materials must be handled and stored in accordance with the manufacturers instructions.

Advice for Designers

Framing

Timber Framing

6.1 Timber used in timber framing shall be treated as required by NZS 3602

6.2 Timber framing must comply with NZS 3604 for both buildings or parts of buildings within the scope limitations of NZS 3604. Where buildings or parts of buildings are outside the scope of NZS 3604 then they must be to specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least the equivalent stiffness to the framing provisions of NZS 3604. In all cases, studs must be at a maximum of 600mm centres.

6.3 Timber framing must have a maximum moisture content of 18% at the time of cladding application. *(Problems could arise later on due to timber shrinkage if over 18%)*

Steel Framing

6.4 Steel framing must be to a specific design meeting the requirements of the NZBC. (NASH Standard for Residential and Low-rise Steel Framing, Parts 1 and 2).

6.5 The minimum steel framing specification is 'C' section studs and nogs of overall section dimensions of 76mm web by 40mm flange. Steel thickness must be a minimum 0.75mm.

6.6 For steel framed buildings situated within NZS 3604 defined wind zones up to and including Very High, studs must be at maximum 600mm centres. All other buildings studs must be at maximum 400mm centres. Dwangs must be fitted flush with the stud.

AAC Panel Layout

6.7 AAC panels are installed horizontally in a stretcher-bond pattern. Vertical panel edges may be jointed on stud or off stud. AAC Panels must be supported at fixing locations with vertical cavity battens or cavity spacers 100mm long maximum in accordance with the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.8.2(f).
At the base of the wall the AAC Panel can be either rested on DPM on a concrete rebate (75mm below finished floor level) or hung 50mm below the finish floor level.

General

6.8 Openings in the slotted base cavity closer provide a minimum ventilation opening area of 1000mm² per lineal metre of wall as per the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.8.3 (b).

6.9 The Clad X Vents provide a minimum ventilation opening area of 1000mm² per lineal metre of wall, when fixed at 900mm centres respectively as per the requirements of NZBC Acceptable Solution E2/AS1 paragraph 9.1.8.3 (b).

6.10 The ground clearance between the finished floor level and ground level as outlined in NZS 3604 must be adhered to at all times. At ground level, paved surfaces must be kept clear from the bottom edge of the CAWPS System by a minimum of 100mm, and unpaved surfaces by 175mm in accordance with the requirements of NZBC Acceptable Solutions E2/AS1, Table 18.

6.11 At balcony, deck or roof to wall junctions, the bottom edge of the AAC panel must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.3.

6.12 Where the CAWPS System abuts other cladding systems, designers must detail the junction to meet their own requirements whilst meeting performance requirements of the NZBC.
The Technical Literature does provide some guidance. Details not included within the Technical Literature have not been assessed and are therefore outside the scope of this Appraisal.

6.13 All buildings must have barriers to airflow consisting of interior linings with all joints stopped, or where walls are not lined, such as attic spaces at gable end, a rigid sheathing or air barrier, complying with Acceptable Solutions E2/AS1 Table 23, must be fixed to framing prior

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to fixing cladding or cavity battens in accordance with the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.4.

6.14 PVC sheathed electrical cables must be prevented from direct contact with the EPS cavity battens. When cables must penetrate the EPS cavity battens for electrical connections, the cable must be directly supported by passing through an electrical conduit.

Control Joints

6.15 Control joints where AAC Panels are used must be constructed in accordance with the Technical Literature and as follows;

- Horizontal control joints - To be installed when intermediate floor joists are not seasoned and/or when the height of the wall exceeds 6m.
- Vertical Control Joints - at maximum 8m centres; aligned with any control joint within the structural framing, or where the system abuts other cladding systems. Located at both internal and external corners.

(Note: Where possible control joints shall not be located in line with window and door openings. Horizontal and vertical control joints must be located over structural supports. The Technical Literature provides some guidance for the design of vertical control joints where the system abuts different cladding types. Details not included within the Technical literature or those that are marked as 'Specific Design Only' are outside the scope of this Appraisal Certificate and are the responsibility of the designer.)

Structure - Clause B1

Mass

6.16 The mass of CAWPS System (panel and coating system) has a approximate mass of 32kg/m², considered a medium wall cladding in terms of NZS 3604.

Impact Resistance

6.17 The system has adequate resistance to impact loads that the cladding system is likely to be subjected to when used in a residential situation. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, with appropriate protection provided such as bollards or barriers where necessary.

Wind Zone

6.18 The CAWPS System is suitable for use in up to, and including 'Very High' wind zones as per NZS 3604, where buildings are designed to meet the performance requirements of NZBC Acceptable Solution E2/AS1

AAC Panel Fixing

6.19 Where a 20mm cavity is produced the respective cavity battens are fixed through to the wall framing at 600mm centres vertically. The AAC Panel must then be fixed through the cavity batten and/or cavity spacers and into the framing with a bugle head screw. (refer to 5.1) at 600mm centres.

Note: 600mm centres is applicable to both Low to Very High NZS 3604 defined building wind zones with studs at maximum 600mm centres, and;

- *Fixings to be positioned minimum 50mm in from the edge of the panel giving an overall layout of 500mm centres per panel.*
- *Fixings are also required horizontally at 600mm centres.*
- *A minimum of 6 bugle head screws per full panel (2200 x 600mm) is required.*
- *Bugle head screws must be embedded a minimum of 5mm into the AAC Panel and a maximum of 10mm.*

Durability– Clause B2

6.20 The CAWPS System when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use will meet the performance requirements of NZBC B2.3.1 (b), 15 years for the cladding system and plaster finish, and the performance requirements of NZBC B2.3.1 (c), 5 years for the exterior paint system (the life of the product not being less than 5 years).

Maintenance

6.21 Regular maintenance is essential to ensure the performance requirements of the NZBC are met and to ensure the maximum serviceability of the CAWPS System.

6.22 Regular cleaning (at least annually) of the paint coating is required to remove grime, dirt and organic growth as per the Technical Literature in order to maximize the life and appearance of the acrylic paint coating. Paint coatings must be reapplied every 10 years in accordance with the paint manufacturers instructions. Re-coating colours shall have an LRV (light reflectance value) of 40% or greater.

6.23 Regular inspections (at least annually) must be made on the system to ensure that all aspects of the CAWPS System including the (textured) coating system, plasters, flashings and any sealed joints remain in a weatherproof condition. Any cracks, damaged areas or areas showing signs of deterioration that could allow water ingress, must be repaired immediately. The CAWPS System must be maintained and repaired in accordance with the instructions from Clad X NZ Ltd.

6.24 Minimum ground clearance as set out in this Appraisal and Technical Literature must be maintained at all times during the life of the system to maintain the durability and weathertightness of the system.

External Fire spread - Clause C3

6.25 The CAWPS System is considered to meet the performance requirements of NZBC C3.5 for use as an external wall cladding when restricted to:

- Building height ≤10m and up to 2 levels, and;
- Building importance levels 1, 2, & 3.

6.26 The CAWPS System is also considered to meet the performance requirement NZBC C3.7 (a) as a not combustible building material for use on external walls closer than 1m to the relevant boundary.

6.27 Clearance separations from chimneys and flues are not required for the AAC Panel. Where the panel is used with or attached to a heat sensitive material, the heat sensitive materials must be separated from chimneys and flues in accordance with the performance requirements of NZBC Acceptable solution C/AS1, part 7 for protection of combustible materials.

External Moisture - Clause E2

6.28 When installed in accordance with this Appraisal Certificate and Technical Literature, the CAWPS System will prevent the penetration of water that could cause

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undue dampness and/or damage to building elements and will therefore comply with clause E2.3.2.

6.29 The cavity must be sealed off from the roof and subfloor space in order to meet the performance requirement of E2.3.5.

6.30 The CAWPS System allows any excess moisture present at the completion of construction to be dissipated without causing permanent damage to the building elements to meet the performance requirement of Clause E2.3.6.

6.31 The details provided within the Technical Literature for weather resistance are based on the design principle of employing both a first and second line of defence against moisture entry for joints, penetrations and junctions. Moisture ingress must be prevented by detailing any joinery or wall junctions as shown in the CAWPS System technical manual. Any weathertightness details developed by a designer are outside the scope of this Appraisal Certificate and are the responsibility of the designer.

6.32 The presence of a drained cavity does not reduce the requirement to ensure the cladding wall and all the relevant junctions, penetrations etc remain weather resistant in order to comply with Clause E2.3.6.

Water Vapour

6.33 The CAWPS System is not a barrier to the passage of water vapour, and when correctly installed in accordance with both this Appraisal and Technical Literature will not create or increase the risk of moisture damage resulting from condensation. When installed over steel frame please refer to 13.7.

6.34 When the CAWPS System is installed over a steel frame, 10mm (VH) expanded polystyrene thermal break sheeting with a R value of at least 0.3, must be installed over the steel frame (stud, nog, top and bottom plate) to provide a thermal break in accordance with the requirements of NZBC Acceptable Solution E3/AS1, Paragraph 1.1.4(d). Building wrap is then dressed over the top of the sheeting followed by the installation of the cavity battens.

Installation Requirements

Installation Skill Level Requirement

7.1 Installation and finishing of the components and accessories supplied by Clad X NZ Ltd and the licensed contractors must be completed by trained installers / applicators, certified by Clad X NZ Ltd.

7.2 Installation of the accessories supplied by the building contractor must be completed by a tradesperson who has an understanding of cavity based cladding construction, in accordance with instructions given within the CAWPS System Technical Manual and this Appraisal Certificate.

System Installation

7.3 The selected building wrap and flexible flashing tape must be installed by the building contractor in accordance with the wrap and tape manufacturer's instructions, prior to the installation of the cavity battens and the rest of the CAWPS System.
The building wrap shall be run horizontally and be continuous around corners. The wrap must be lapped and sealed with a Clad X approved tape not less than 75mm at horizontal joints and not less than 100mm over studs at vertical joints.
The edges of the installed wall wrap shall also be sealed with tape to ensure the wall wrap provides a complete barrier to the ingress of air into the framing.
Care must be taken in the installation of the building wrap and flashing tape around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

7.4 Aluminium joinery must be installed by the building contractor in accordance with the Clad X Technical Literature. A 7.5 -10mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place. The joinery must be spaced approx 25mm in from the outside of the panel face.

Clad X AAC Wall Panel System

7.5 Must be installed in accordance with the Technical Literature by Clad X NZ Ltd trained contractors.

7.6 The Technical Literature must be referred to during the inspection of the CAWPS System installations.

Finishing System

7.7 The application of the Wattyl Plaster and Coating systems must be applied in accordance with the manufacturers instructions at all times. The plaster must be cured for a minimum of 2-3 days and must be dry before painting may commence.

Health and Safety

7.8 When cutting, drilling or grinding the AAC panel, this must be carried out in an open air or well ventilated area, and a dust mask, eye protection and gloves must be worn.

7.9 All aspects of cutting, drilling or grinding must comply with requirements of the Health and Safety at Work Act, and Worksafe, www.worksafe.govt.nz.

7.10 Refer to the Technical Literature from the relevant manufacturer for the safe use and handling of the components that make up the CAWPS System.

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Basis of this Appraisal

BEAL use the compliance verification procedure to demonstrate compliance with the relevant clauses of the NZBC based on a risk analysis procedure. The following is a summary of the technical investigations carried out

Tests

8.1 The following testing of the CAWPS System and its respective components has been undertaken by BEAL unless otherwise noted:

- BEAL opinion on NZBC E2 code compliance was based on the evaluation of all details within the scope of this Appraisal and testing of the Clad X AAC Wall System to E2/VM1 Amendment 4, 2008. The testing assessed the performance of the window head, jamb and sill details, meter box head, jamb and sill details, vertical control joints, internal and external corners. BEAL have also reviewed the details contained within the Technical Manual, and an opinion has been given by BEAL that the system will meet the performance levels of E2/AS1 for a drained cavity system.
- Adhesion and compatibility testing of the Wattyl Granosite plaster products with the AAC panel in accordance with ASTM C297.
- The flexural ability of the Wattyl Granosite plaster products were also assessed to verify durability.
- Testing undertaken by BEAL in determining the compressive strength, dry bulk density and drying shrinkage of the AAC panel to verify the structural and durability performances of the system.

Other Investigations

8.2 Wind loadings, self weight, seismic loadings, shear force, panel capacity, fastener pull through testing and calculations for the system were determined by an independent Chartered Engineer in respect to the requirements of compliance document B1 Structure. Structural and durability opinions were provided.

8.3 Ease of application has been assessed.

8.4 The Technical Literature for the CAWPS System has been examined by BEAL and found to be satisfactory.

Quality

8.5 The manufacture of the renders has been assessed by BEAL, including quality control measures. Details regarding the quality and composition of the materials used were obtained by BEAL and found to be satisfactory.

8.6 The quality of materials, components and accessories supplied by Clad X NZ Ltd is managed through the use of the Building Product Quality Plan.

8.7 The Clad X NZ Ltd's Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

8.8 Clad X NZ Ltd's Building Product Quality Plan is reviewed at least annually by BEAL.

8.9 Quality on site is the responsibility of the Clad X NZ Ltd approved contractors.

8.10 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems, joinery, building wrap, flashing tapes, head flashings and air seals in accordance with the instructions of Clad X NZ Ltd and this Appraisal Certificate.

8.11 For a copy of this Technical Literature and any subsequent updates please refer to www.cladx.co.nz.

8.12 Building owners are responsible for maintenance of the Clad X AAC Wall System in accordance with instructions of Clad X NZ Ltd and this Appraisal Certificate.

Sources of Information

- AS 3566 Self drilling screws for the building and construction industries.
- AS 3730 Guide to the properties of paints for buildings
- AS/NZS 1170:2002 Structural design actions
- ASTM B117 Standard practice for operating salt spray apparatus
- ASTM C 297: Standard test method for flatwise tensile strength of sandwich constructions.
- ASTM C 1386: Standard specification for precast autoclaved aerated concrete (AAC)
- NASH Standard for Residential and Low-rise Steel Framing, Parts 1 & 2.
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard
- NZS 3604:1999 Timber framed Buildings
- NZS 4211:1985 Specification for performance of windows
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third edition May 2008, incorporating amendments 1 to 4.
- New Zealand Building Code Handbook and Approved Documents, Building industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.

Concluding Statement

9.1 In the opinion of BEAL, the Clad X AAC Wall Panel System is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

The Appraisal Certificate is issued only to Clad X NZ Ltd, and is valid until further notification, subject to the conditions of this Appraisal.

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Conditions of Appraisal

10.1 This Appraisal Certificate :

A) Relates only to the Clad X AAC Panel Wall System 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 revalidated by BEAL on an annual basis;
E) Is copyright of BEAL.

10.2 The Appraisal Certificate holder continues to meet the quality requirements of the Clad X NZ Ltd's Building Product Quality Plan and has the plan audited by BEAL on an annual basis unless agreed otherwise.

10.3 Clad X NZ Ltd, shall notify BEAL and obtain approval of any changes in product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.

10.4 BEAL makes no representation as to:

A) The nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
B) The presence or absence of any patent or similar rights subsisting in the product or any other product;
C) Any guarantee or warranty offered by the Appraisal Certificate holder

10.5 BEAL's verification of the building product or system complying with one or more above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

10.6 Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory

C R Prouse - Director

BEAL
BUILDING ELEMENT ASSESSMENT LABORATORY LIMITED

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Linea™ WEATHERBOARD

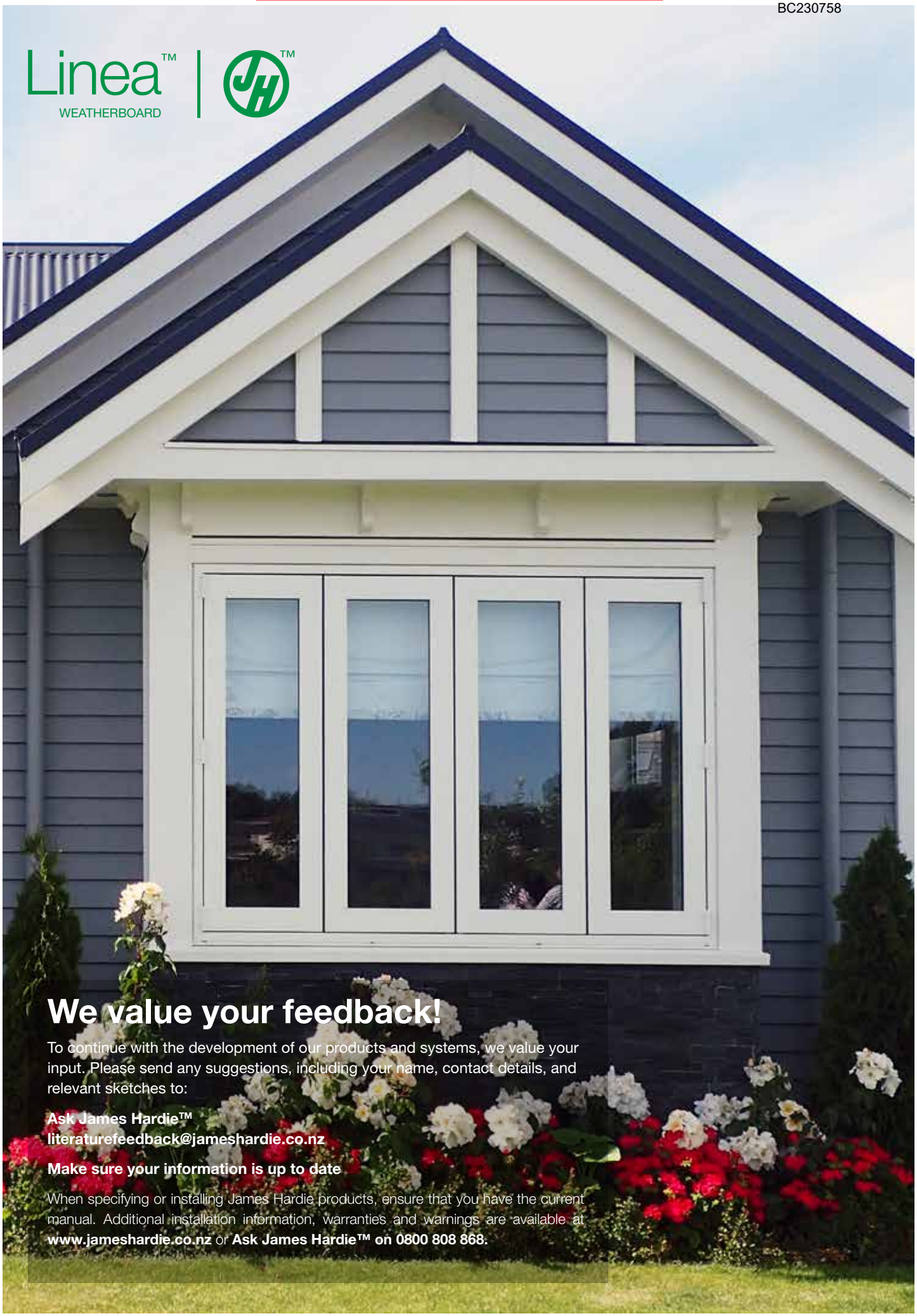
jameshardie.co.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

Cavity Fix

Technical Specification

May 2020 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™
literaturefeedback@jameshardie.co.nz

Make sure your information is up to date

When specifying or installing James Hardie 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.**

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Product Warranty 51

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 135mm, 150mm and 180mm widths.

James Hardie also has available:

- Axent™ Fascia is a 16mm thick, pre-primed fibre cement product available in two widths. It's designed to accommodate James Hardie soffit linings.
- Axent™ Trim is a 16mm 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 James Hardie cladding to steel framing technical supplement about the installation of Linea Weatherboard to steel frame.

Table 1

Linea Weatherboard and 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 135	401844	4200	135	16	T & G	105	9.5	2.62	25.70
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
Axent Trim 84mm	401943	2600	84	16	Square	N/A	N/A	1.6	N/A
Axent Trim 100mm	401930	2600	100	16	Square	N/A	N/A	1.9	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 and water. The product is easily identified by the name 'Linea' printed on the back.

Axent Trim is an advanced lightweight cement composite cladding manufactured using a basic composition of Portland cement, ground sand, cellulose fibre and water. The product is easily identified by the name 'Axent' printed on the back. The trims are factory sealed and primed.

Linea Weatherboard and Axent Trim products are manufactured to 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 Weatherboards 180mm • Aluminium • Copper • Stainless Steel	200 long	 **301186** **301188** **301197**
	External corner soaker 135° for Linea Weatherboards 180mm • Aluminium	200 long	 **301178**
	External corner soaker 90° for Linea Weatherboards 150mm • Aluminium • Stainless Steel	170 long	 **302820** **302821**
	External corner soaker 90° for Linea Weatherboards 135mm • Aluminium • Stainless Steel	155 long	 **301185** **301196**
	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 extrustion used to create 900 internal corner	2700 long 4000 long	**301184** **305807**
	Internal 'W' Mould 135° Etched primed aluminium extrustion used to create 135° internal corner	2700 long	**301183**
Accessories/tools supplied by James Hardie			

Table 2 contd.

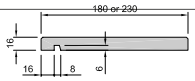
Accessories	Description	Size (mm)	Code
	JH Corner Under Flashing 50 x 50mm PVC moulding used as under fashing for internal and external corners	3000 long	**303745**
	Axent Trim 84mm	84 x 2600 long	**401943**
	Axent Trim 100mm	100 x 2600 long	**401930**
	**Axent Fascia** - 180mm - 230mm	4200 long	**401843** **402230**
	HardieFlex™ Galvanised nail - 5kg	60 x 3.15mm	**302784**
	HardieFlex™ Stainless steel nail - 5kg	60 x 3.15mm	**302782**
	HardieBlade™ Saw Blade Diamond tip fibre cement circular saw blade. Spacers not included	4 tooth - 184mm	**300660**
	HardieBlade™ 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 and Axent Trim. 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.

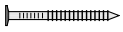
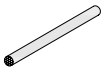
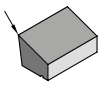
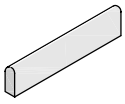
Accessories	Description	Size (mm)	Material/ appearance
	Flexible Underlay To comply with Table 23 of E2/AS1		
	**D head or RounDrive Nail** Gun nail for concealed fixing Linea Weatherboard.	60 x 2.87	Hot Dip Galvanised/ Stainless Steel
	HardieFlex™ Hot Dip Galv. Nails For concealed fixing by hand nail	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 Scriber** 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 2.5kPa (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.

CODEMARK™
30018

Please refer to www.building.govt.nz for a copy of the certificate.

Linea Weatherboard cavity fixed cladding also has a BRANZ Appraisal number 447 (2010) available at www.branz.co.nz or www.jameshardie.co.nz.

BRANZ Appraised
Appraisal No.447 [2010]

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 James Hardie Technical Specification. 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 Linea Weatherboard or Axent Trim supplied are 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 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 ratings up to 60/60/60 when constructed in accordance with the James Hardie Fire and Acoustic Design Manual. Linea Weatherboard must be face fixed for fire rated applications.

Refer to the Fire and Acoustic Design Manual for further information about fire rated systems.

4.7 Control of External Fire Spread

External spread of fire (clause C3.5 and C3.7) apply where:

- Building height is greater than 10m and upper floors have sleeping uses or are different property (C3.5), and
- Where the building is located within 1m of a relevant boundary (C3.7)

Refer to Table 5.1 of Section 5.4 of C/AS1 for group SH or table 5.5 of Section 5.8.1 of C/AS2 for the other risk groups to identify the external fire spread requirement applicable to the external cladding material and surface finish.

For the other situations where 'no requirement' is listed, Linea Weatherboard installed as per the details published in this specification complies.

For buildings that are >10m high and contain tenancies above as per Table 5.5. of C/AS2, Linea Weatherboard installed over timber cavity battens in conjunction with RAB™ Board with R2.2 fibreglass/James Hardie mineral insulation complies. Refer to Figure 38 and 39 for RAB™ Board and cavity batten layout. For the complete set of suitable Linea Weatherboard cavity construction details with RAB™ Board for this application, refer to www. jameshardie.co.nz.

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

James Hardie products contain sand, a source of respirable crystalline silica may cause cancer if dust from product is inhaled. Causes damage to lungs and respiratory system through prolonged or repeated inhalation of dust from product.

Intact fibre cement products are not expected to result in any adverse toxic effects. The hazard associated with fibre cement arises from the respirable crystalline silica present in dust generated by activities such as cutting, rebating, drilling, routing, sawing, crushing, or otherwise abrading fibre cement, and when cleaning up, disposing of or moving dust.

When doing any of these activities in a manner that generates dust, follow James Hardie instructions and best practices to reduce or limit the release of dust.

If using a dust mask or respirator, use an AS/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 HardieBlade™ logo or one with at least equivalent performance – connected to an M Class or higher vacuum

- ✓ Before cutting warn others in the area to avoid dust
- ✓ ALWAYS follow tool manufacturers' safety recommendations
- ✓ ALWAYS expose only the minimum required depth of blade for the thickness of fibre cement to be cut
- ✓ ALWAYS wear a properly-fitted, approved dust mask or respirator P1 or higher in accordance with applicable government regulations and manufacturer instructions
- ✓ Consider rotating personnel across cutting tasks to further limit respirable silica exposures.

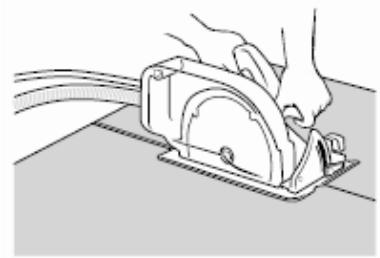
When cutting

- ✓ 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 HardieBlade Saw Blade (or equivalent) and a dust reducing circular saw connected to a M Class or higher vacuum
- ✓ When sawing, sanding, rebating, drilling or machining fibre cement products, always:
  - Wear your P1 or higher (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.

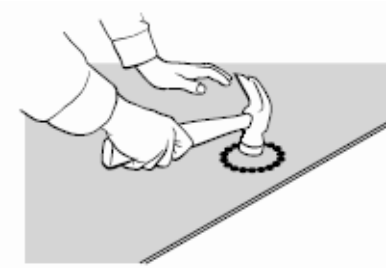
Working Instructions

HardieBlade™ Saw Blade



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

Hole-Forming



For smooth clean cut circular holes:

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

For irregular holes:

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

5.1 Storage and delivery

Keeping products and people safe

Off loading

✓ James Hardie products should be off-loaded carefully by hand or by forklift

✓ James Hardie products should not be rolled or dumped off a truck during the delivery to the jobsite

Storage

James Hardie products should be stored:

✓ In their original packaging

✓ Under cover where possible or otherwise protected with a waterproof covering to keep products dry

✓ Off the ground – either on a pallet or adequately supported on timber or other spacers

✓ Flat so as to minimise bending

James Hardie products must not be stored:

✗ Directly on the ground

✗ In the open air exposed to the elements

James Hardie is not responsible for damage due to improper storage and handling.

5.2 Tips for safe and easy handling of weatherboard products

Weatherboard products

✗ Do not lift planked products flat and in the middle

✓ Carry the products on the edge

✓ If only one person is carrying the product, hold it in the middle and spread arms apart to better support the product

✓ If two people are carrying the plank, hold it near each end and on edge

✓ Exercise care when handling weatherboard products to avoid damaging the edges/corners

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 and Axent Trim 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 HardieFlex™ 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 HardieFlex™ 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 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 Weatherboards 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 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 (uPVC) must be installed at the bottom of all walls constructed using the drained and ventilated for cavity construction method. James Hardie Linea 35mm cavity closer vent strip has an opening area of 1000mm^2/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 figures 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:

- 90º corner soaker in aluminium, copper or stainless steel
- 135º corner soaker 180mm aluminium
- Aluminium boxed corners
- Box corners using 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:

- 90º or 135º 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 and Axent Trim is required in order to meet the durability requirements of the NZBC.

7.1 Preparation and Priming

The Linea Weatherboard and Axent Trim must be dry before painting. Punch and fill all exposed 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 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 gap 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 and Axent Trim 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, Axent Trim 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 over a period of time. Special paints/coatings are required in certain harsh environments.

Stainless steel soakers are generally left natural. For painting over stainless steel soakers, refer to paint manufacturer as special preparation and paints are required.

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
- 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

*Do not use a water blaster to wash down the cladding. Refer to your paint manufacturer for washing down requirements.

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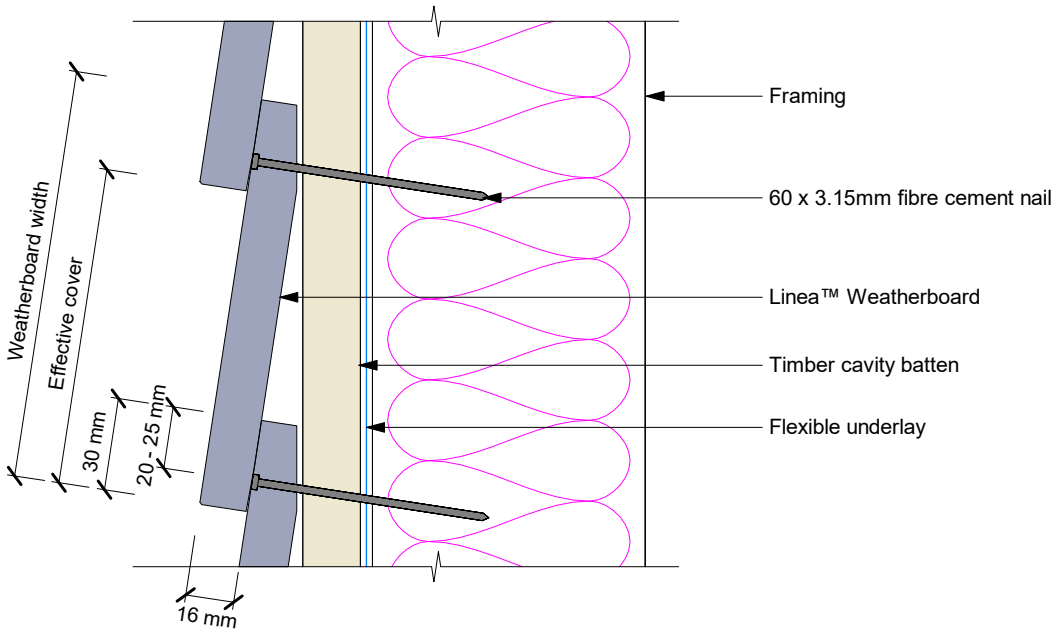
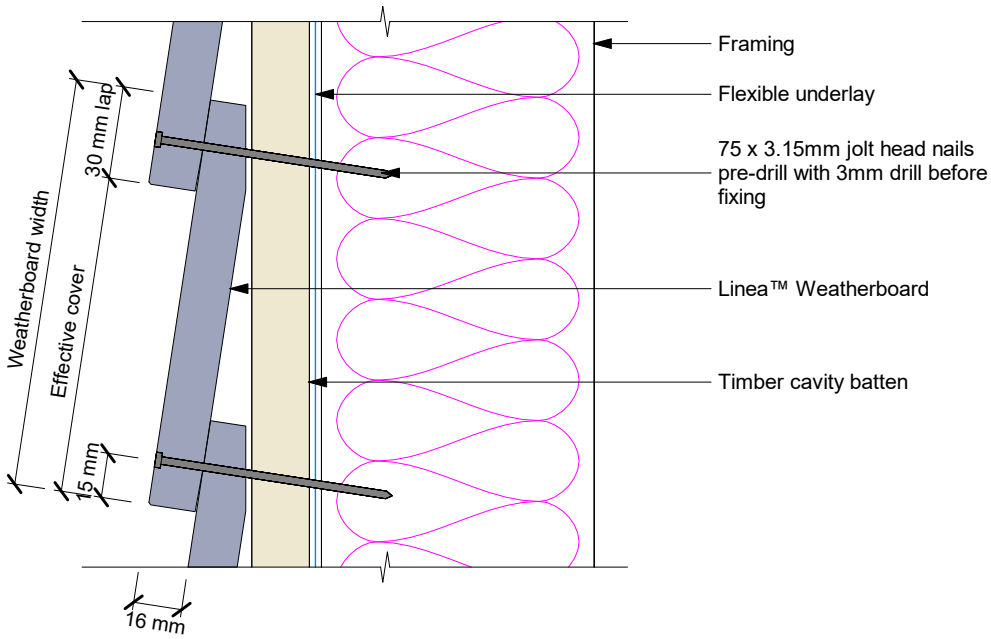
Figure 1: Weatherboard fixing



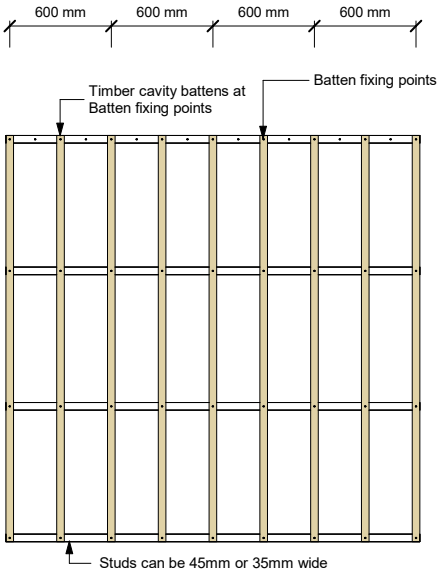
Concealed Nailing

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



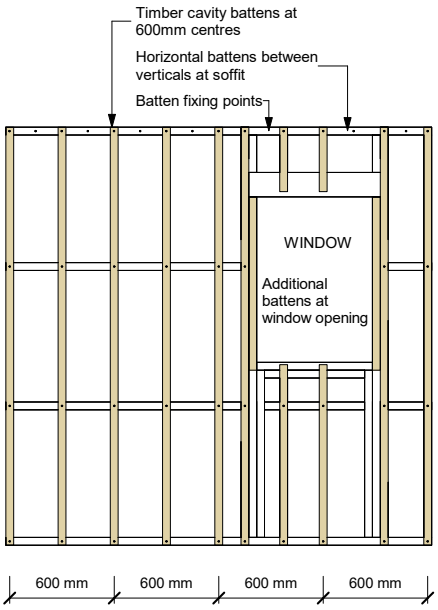
Exposed Nailing

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.

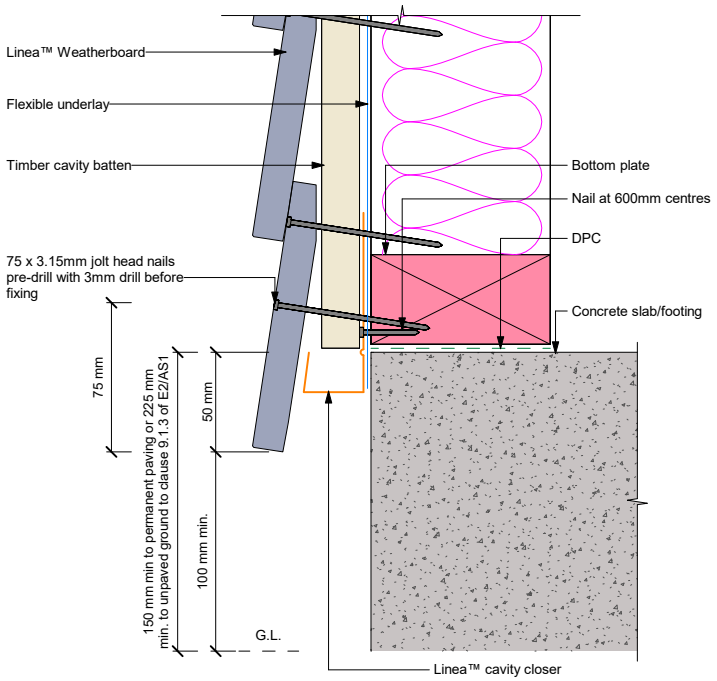
Figure 3: Batten layout at window opening



- Studs can be 45mm or 35mm wide

-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



Note:
Drain holes in James Hardie uPVC vent strip are sufficient to achieve ventilation openings of 1000mm² per lineal metre

Figure 5: Enclosed Deck

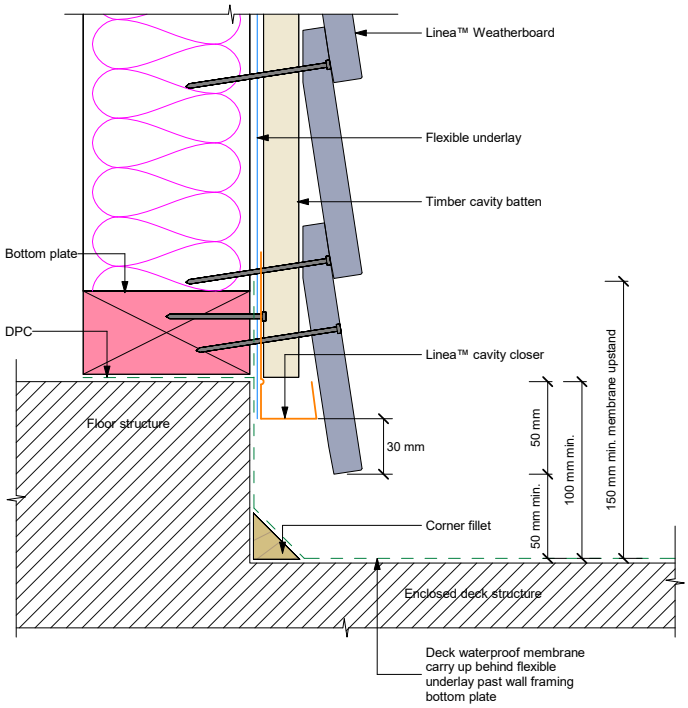


Figure 6: Jointing off stud

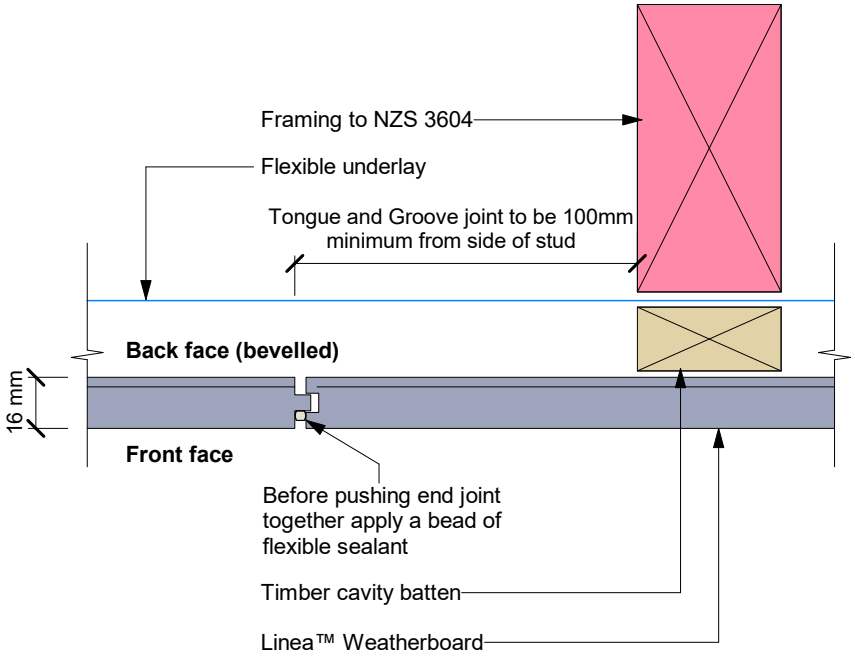


Figure 7: External corner soaker

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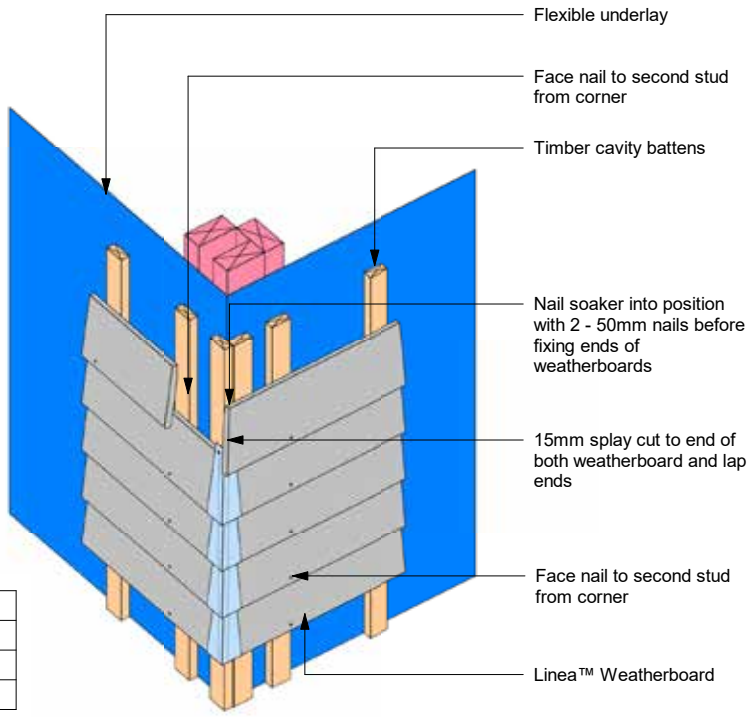
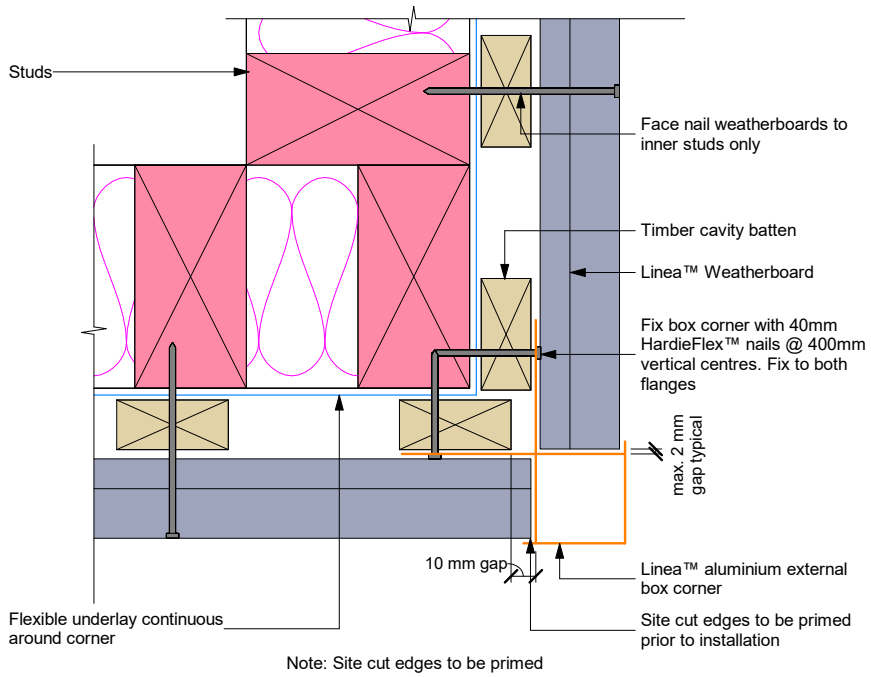


Soaker material	Nail material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised
Stainless steel	Stainless steel

Figure 8: Aluminium box corner



Note: Site cut edges to be primed

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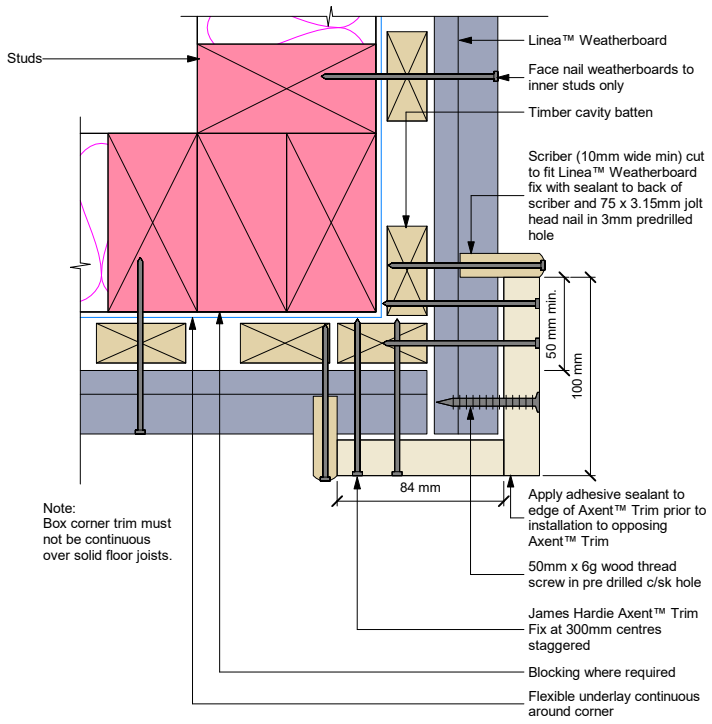
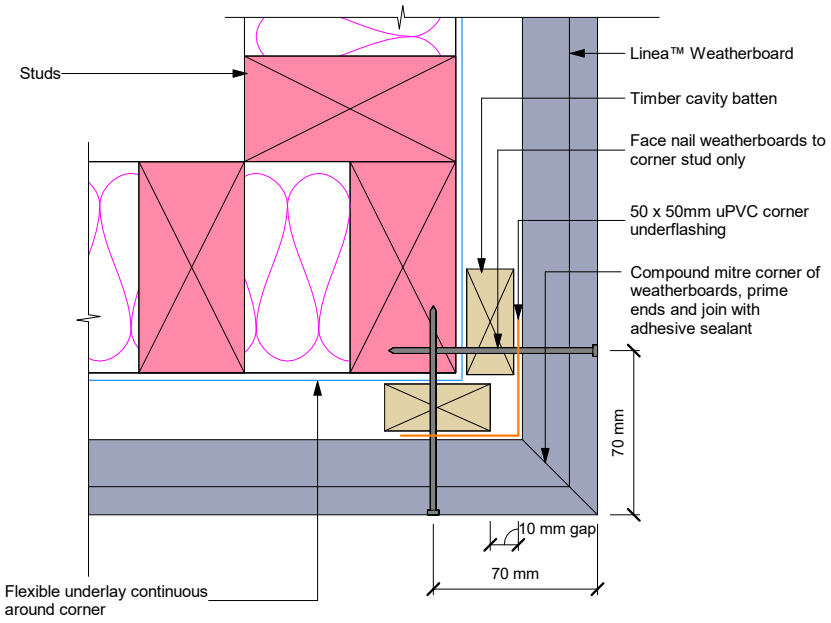
Figure 9: Boxed corner



Note:
Box corner trim must not be continuous over solid floor joists.

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 º aluminium 'W' mould corner

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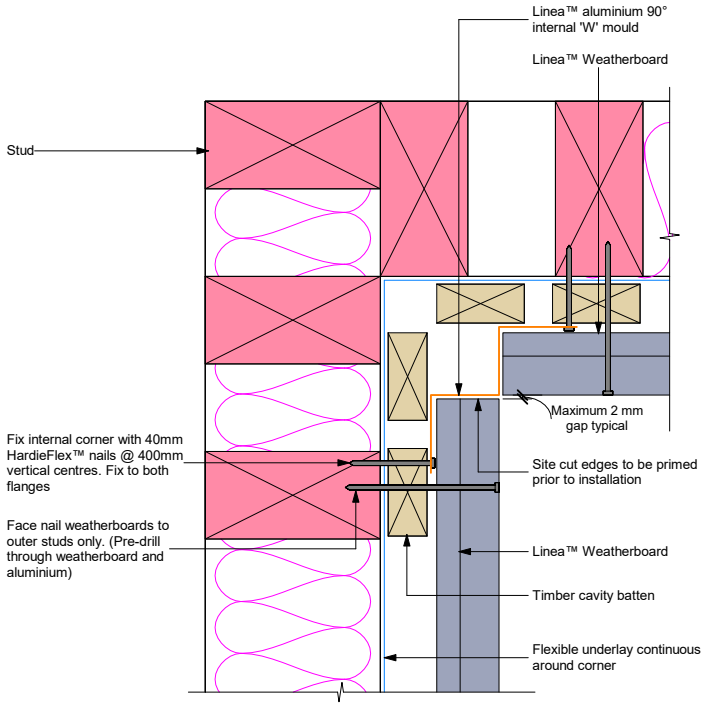
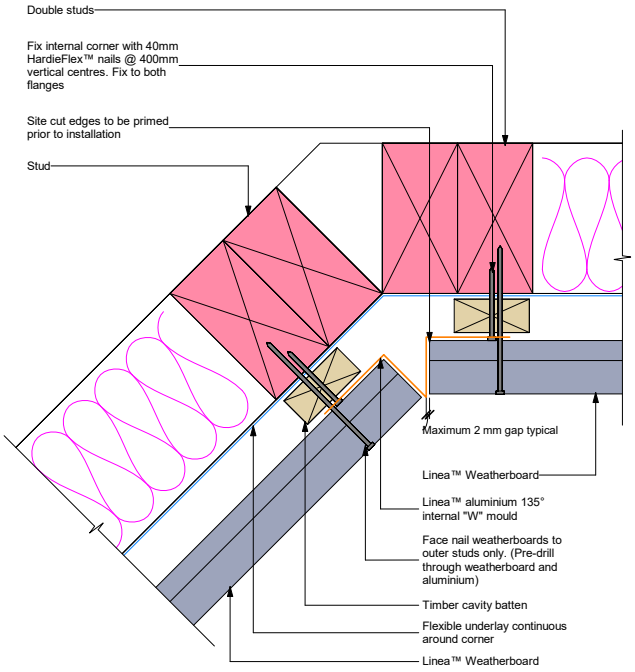


Figure 12: Internal 135 ° aluminium 'W' mould corner



Note:
Aluminium extrusion must not be continuous over solid floor joists

Figure 13: Internal corner joint flashing

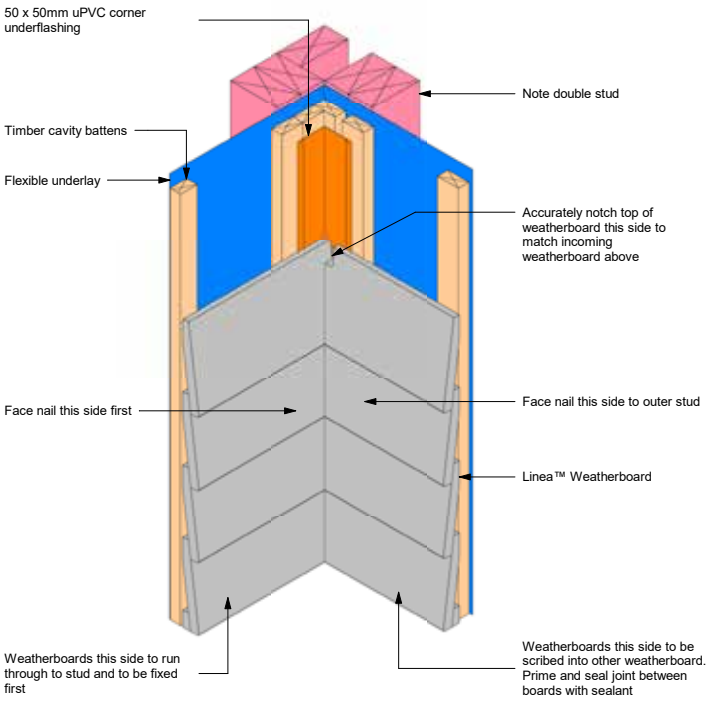
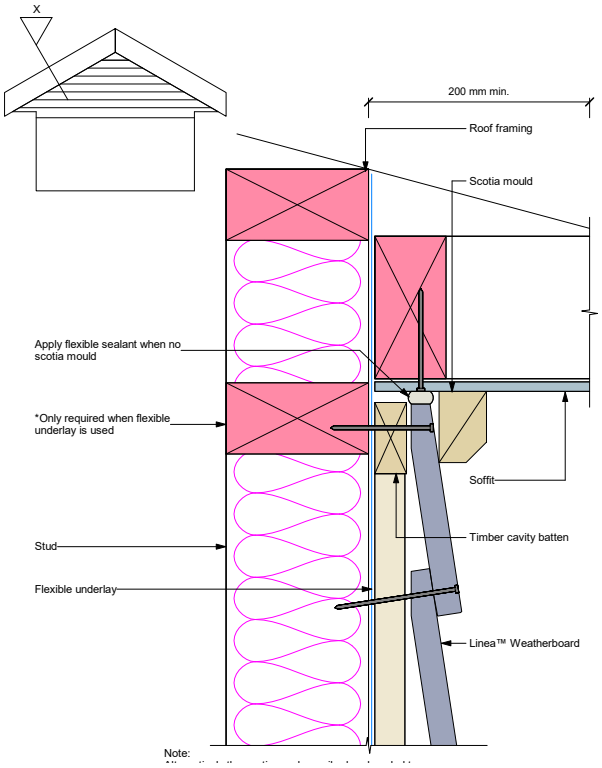


Figure 14: Wall to soffit junction 'X'



Note:
Alternatively the scotia can be scribed and sealed to Linea™ Weatherboard and the soffit lining

For soffits more than 200mm the Linea™ Weatherboard can be neat cut and silicone sealed to angle of soffit

Figure 15: Nil soffit detail

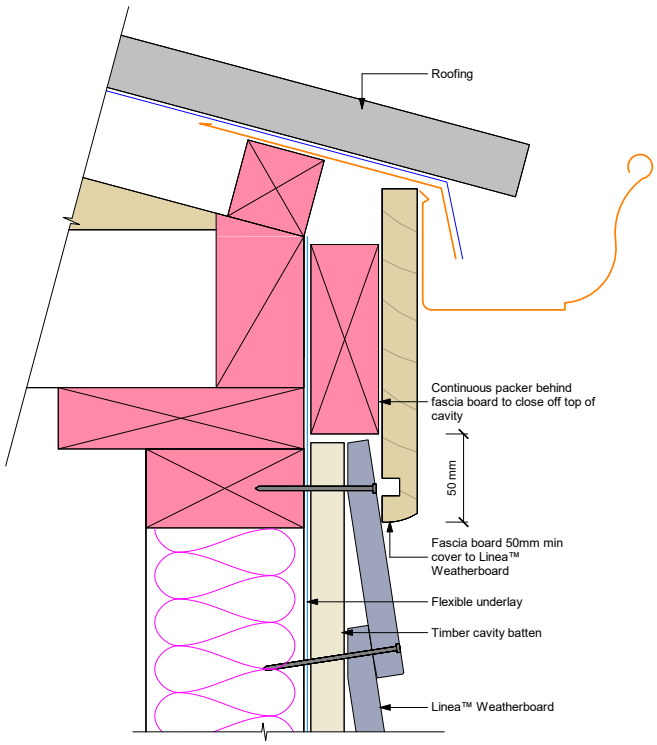


Figure 16: Sloping soffit and wall junction

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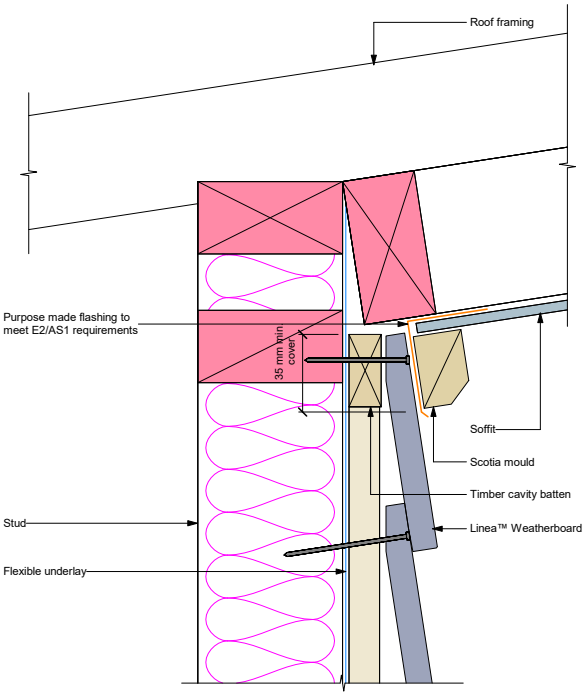

Note: Site cut edges to be primed

Figure 17: Window and door sill

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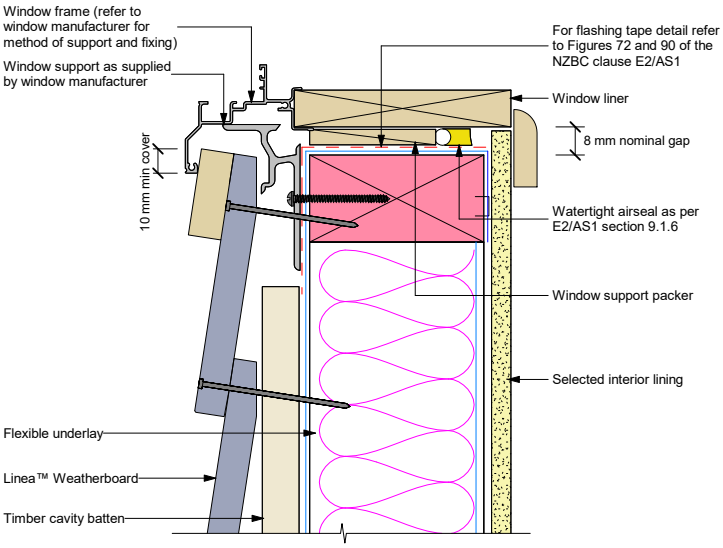
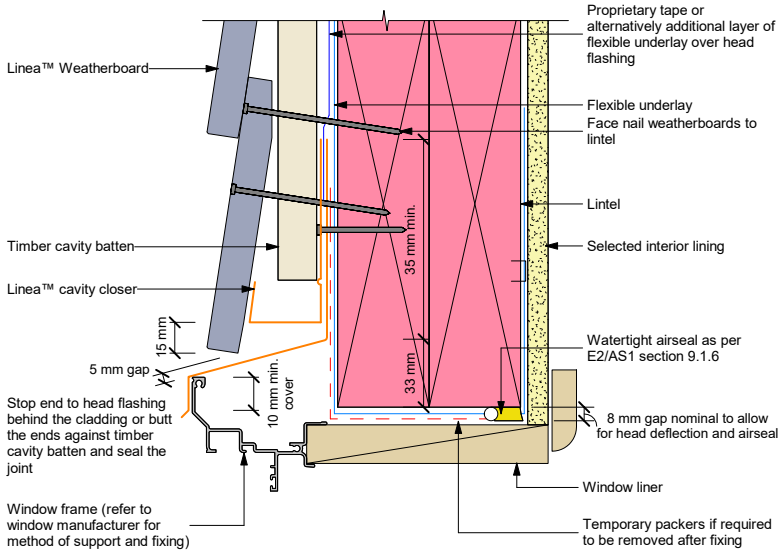


General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. 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 18: Window head



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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
- Site cut edges to be primed

Figure 19: Window jamb

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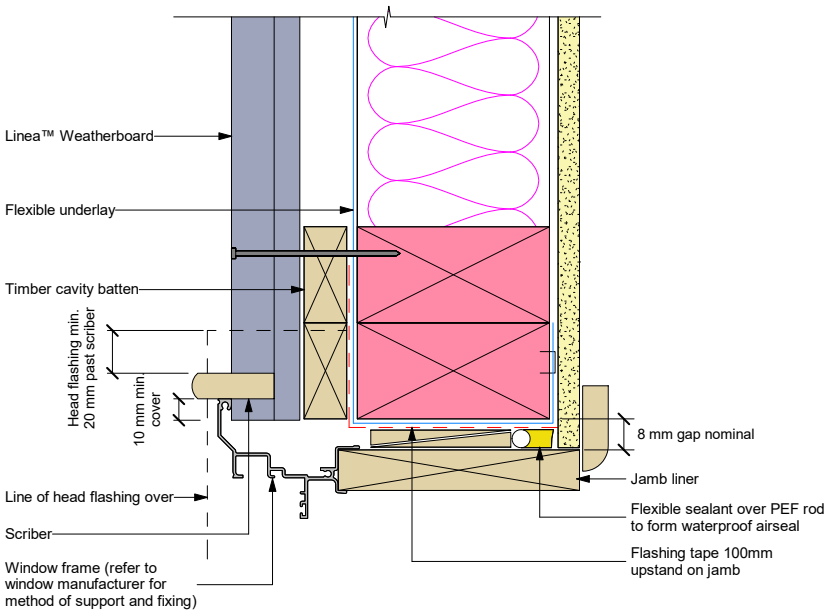

Figure 20: Window head stop end

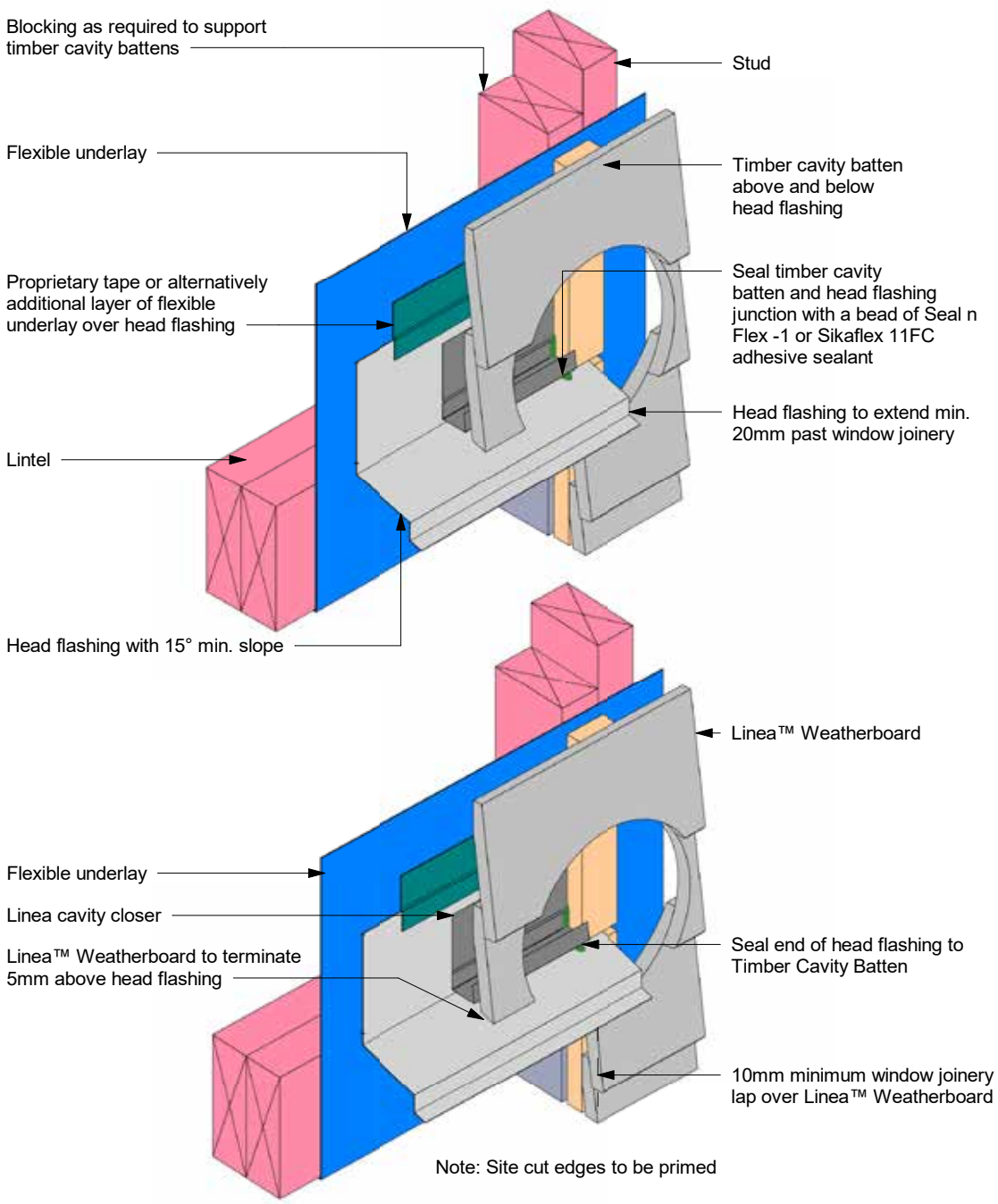

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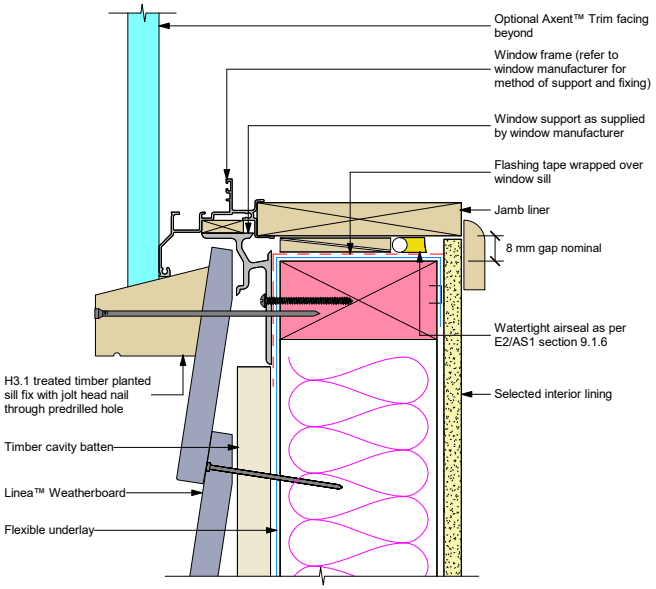
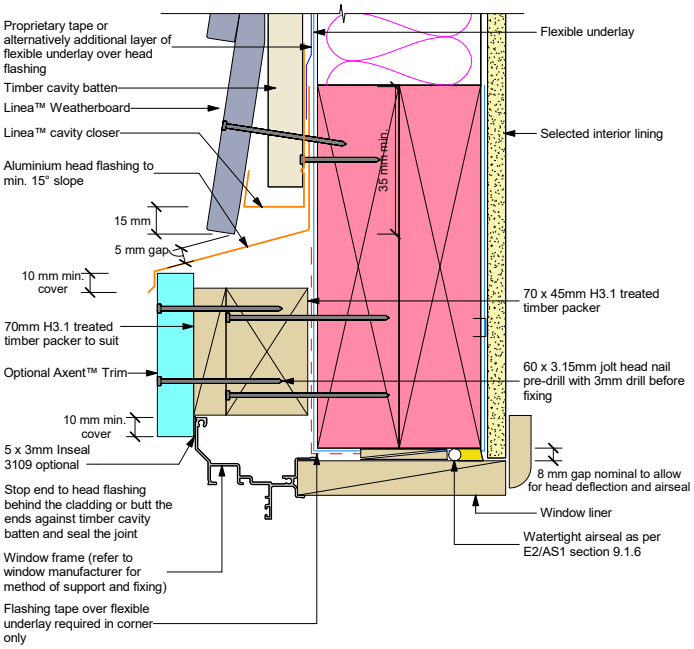
Figure 21: Window sill with facing



General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact

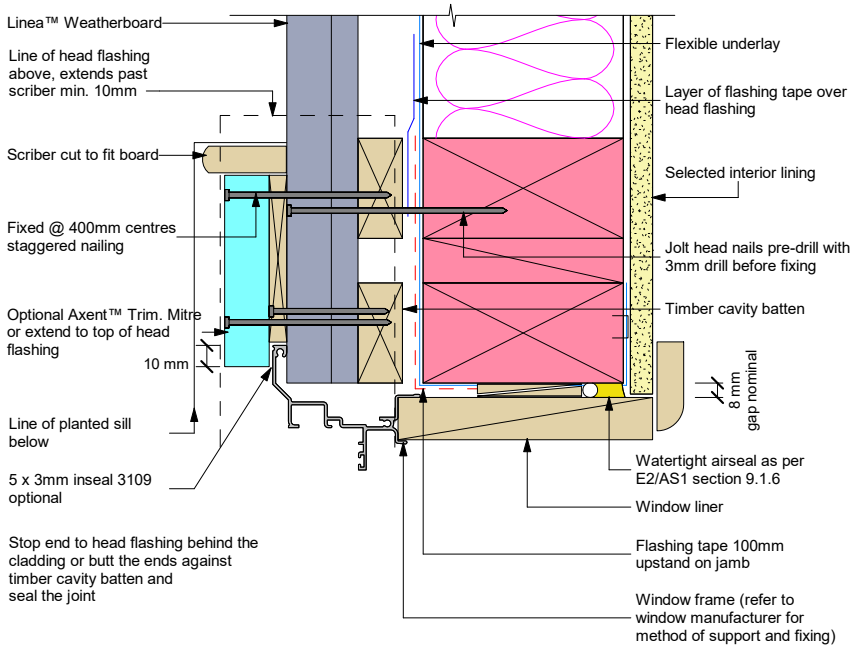
Refer to the manufacturer or supplier for technical information for these materials

Figure 22: Window head with facings



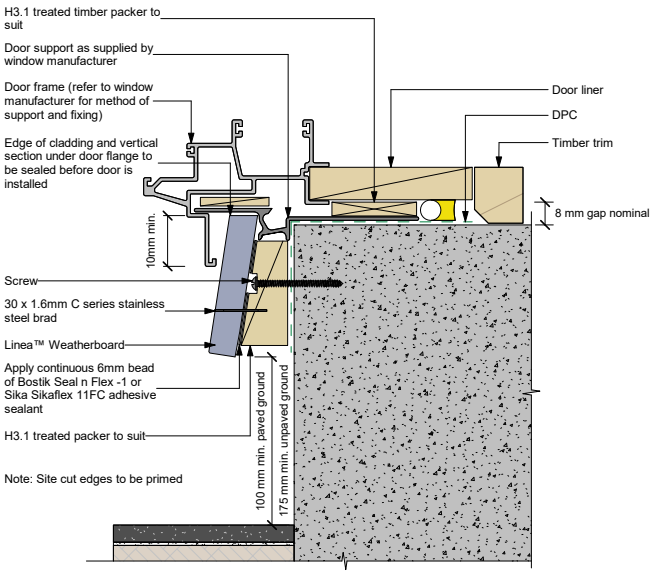
Note:
- Sealant must be installed between head flashing and window flange in VH and EH wind zones and SED pressures
- Alternatively, the head flashings can be formed with stop ends as per E2/AS1
- Refer to Figure 22 for sealing end battens to head flashing

Figure 23: Window jamb with facings



Note:
- Site cut edges to be primed

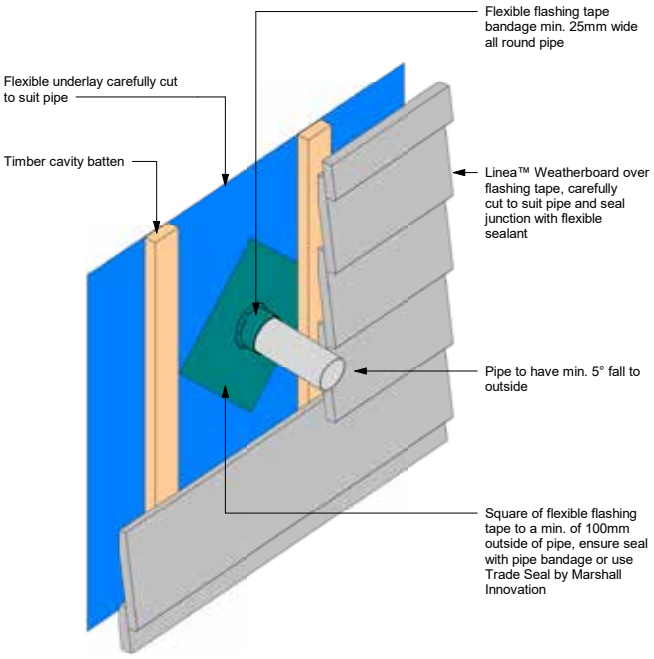
Figure 24: Door sill support detail



Refer to the manufacturer or supplier for technical information for these materials

General notes for materials selection
1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of the NZBC E2/AS1
2. Flexible underlay must comply with acceptable solution E2/AS1
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact
4. 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

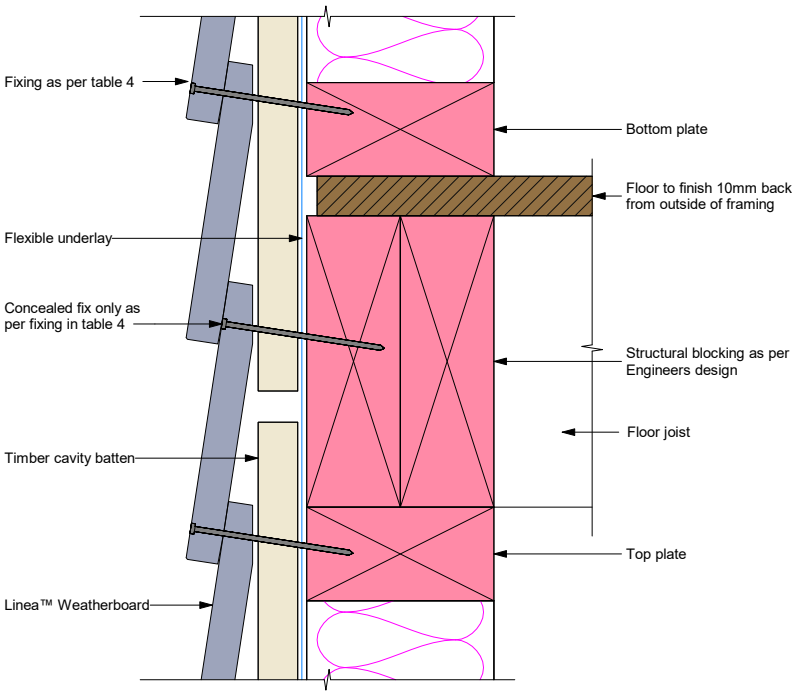


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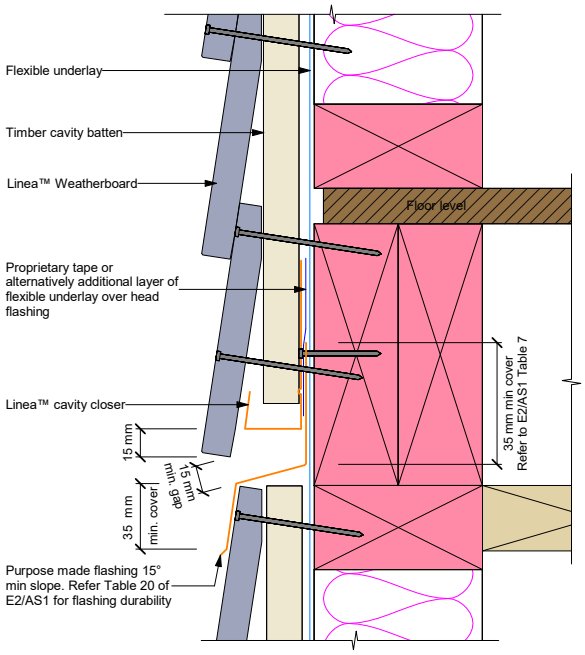
Figure 27: Drained flashing joint at floor level



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

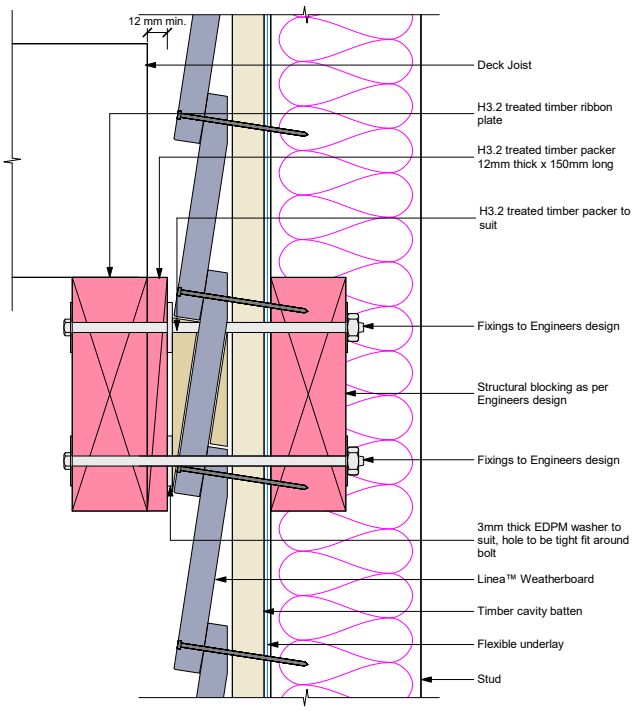


Figure 29: One piece apron flashing joint

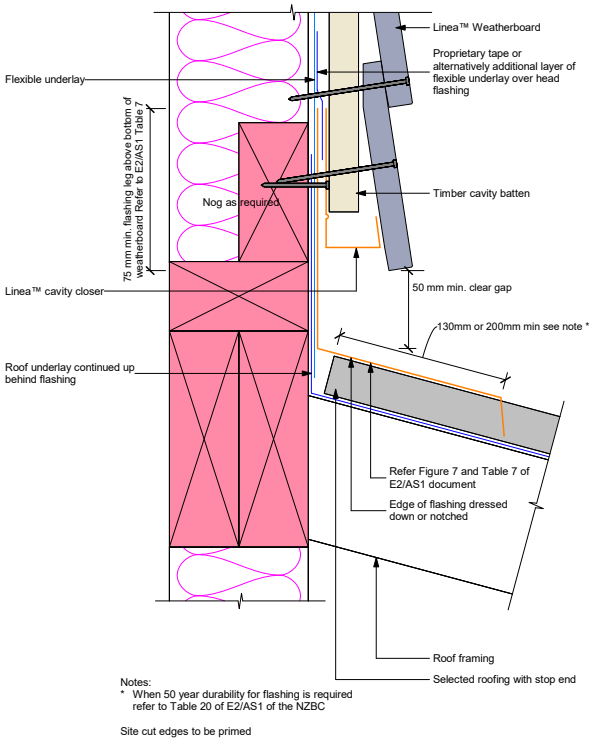


Figure 30: Roof to wall junction detail

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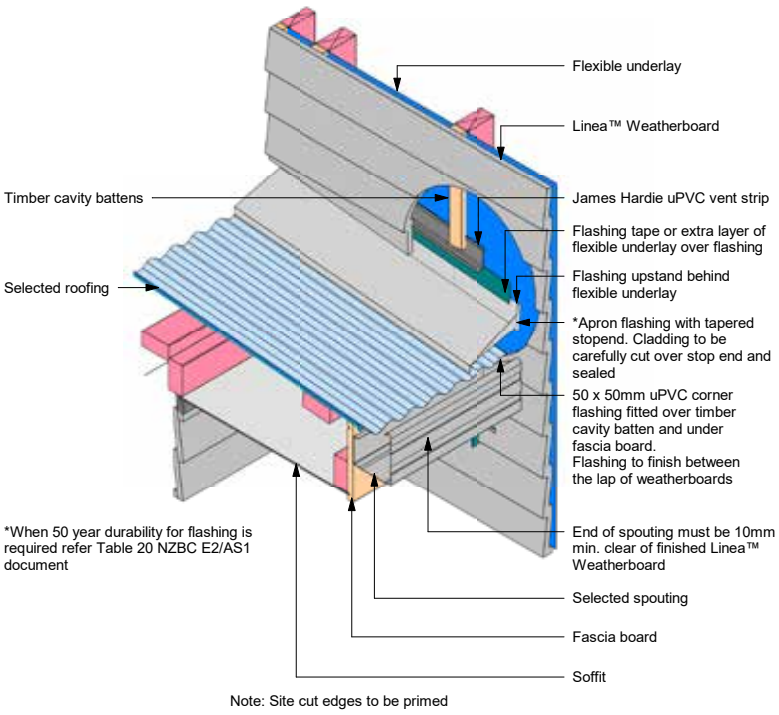


Figure 31: Parapet flashing

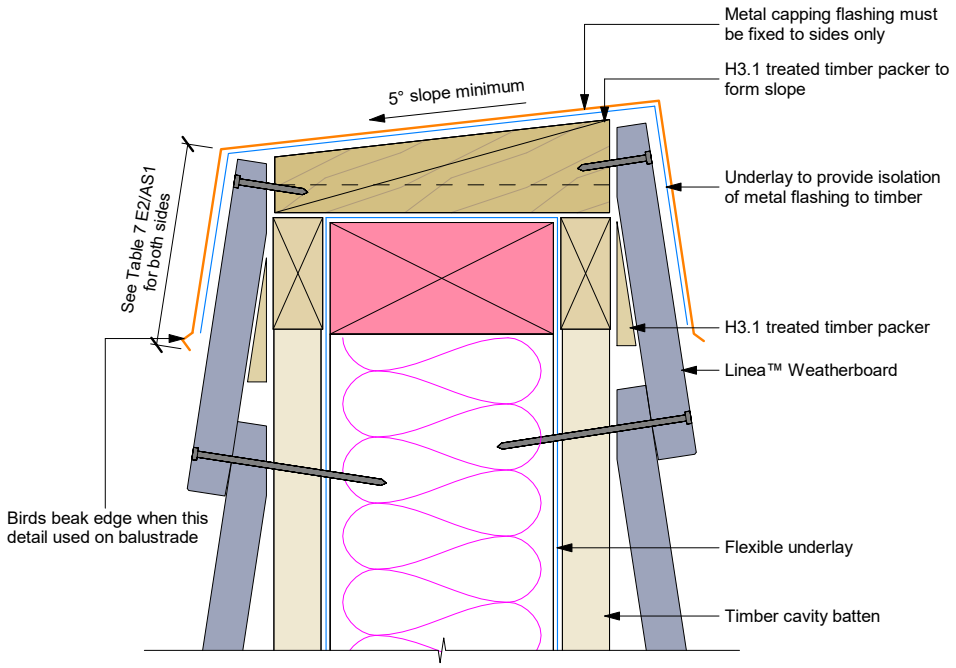


Figure 32: Enclosed deck balustrade to wall

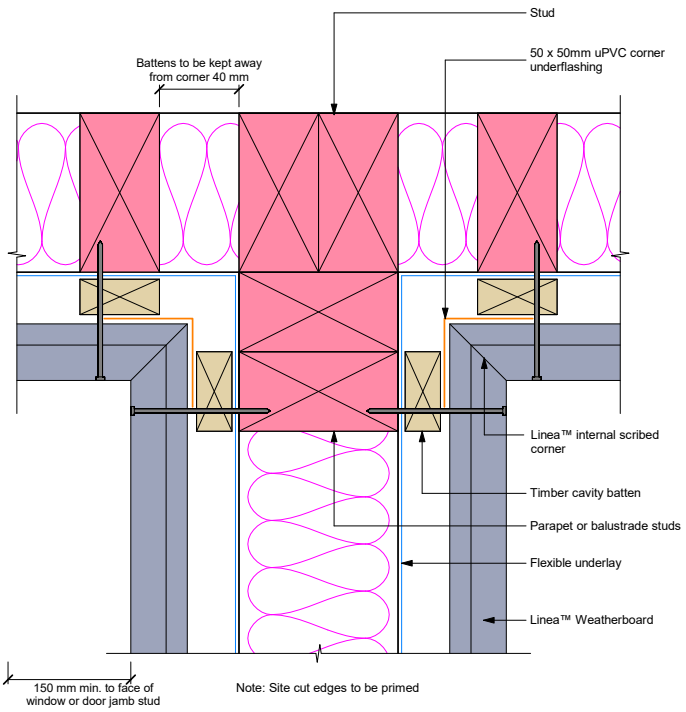


Figure 33: Enclosed balustrade to wall

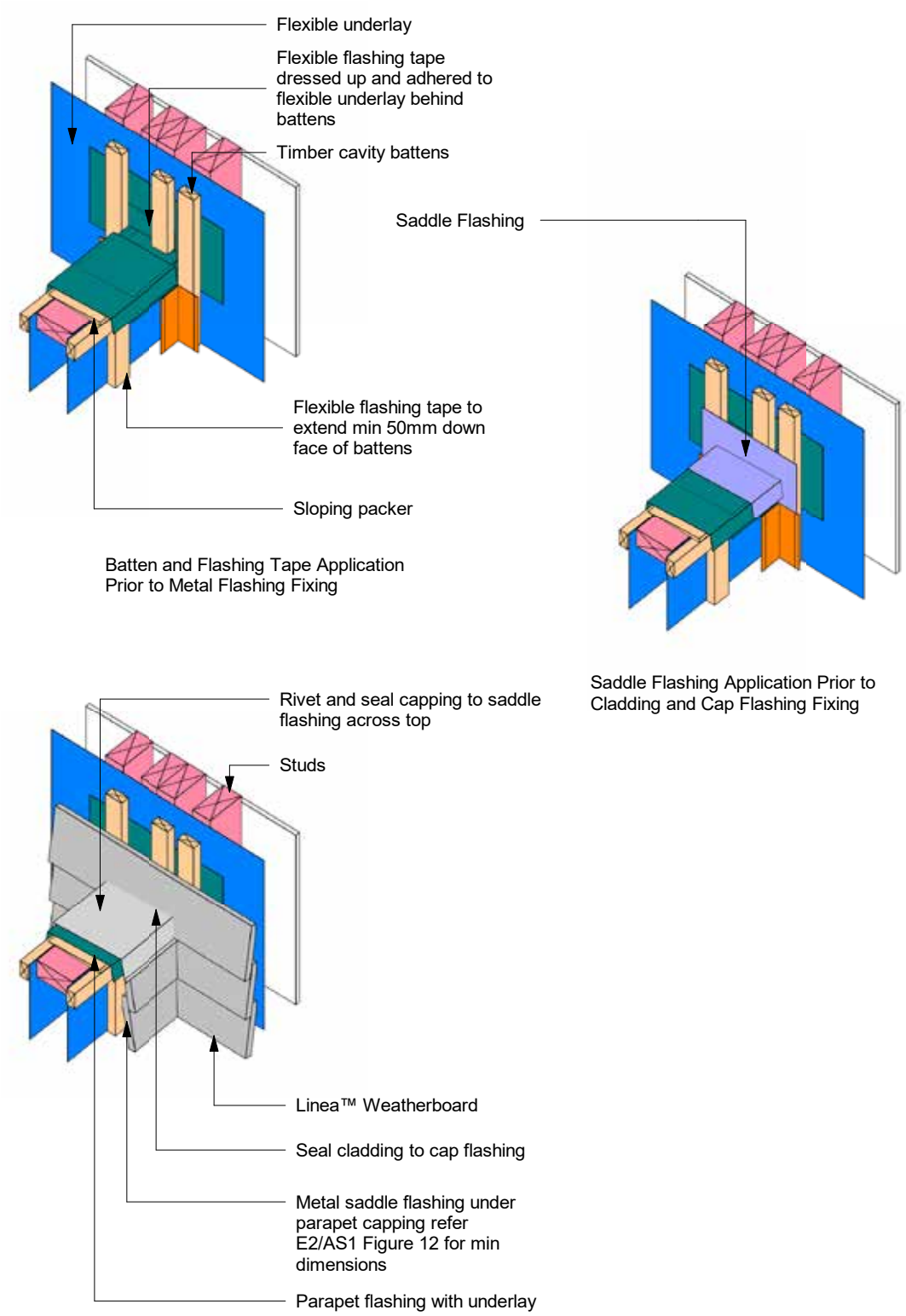
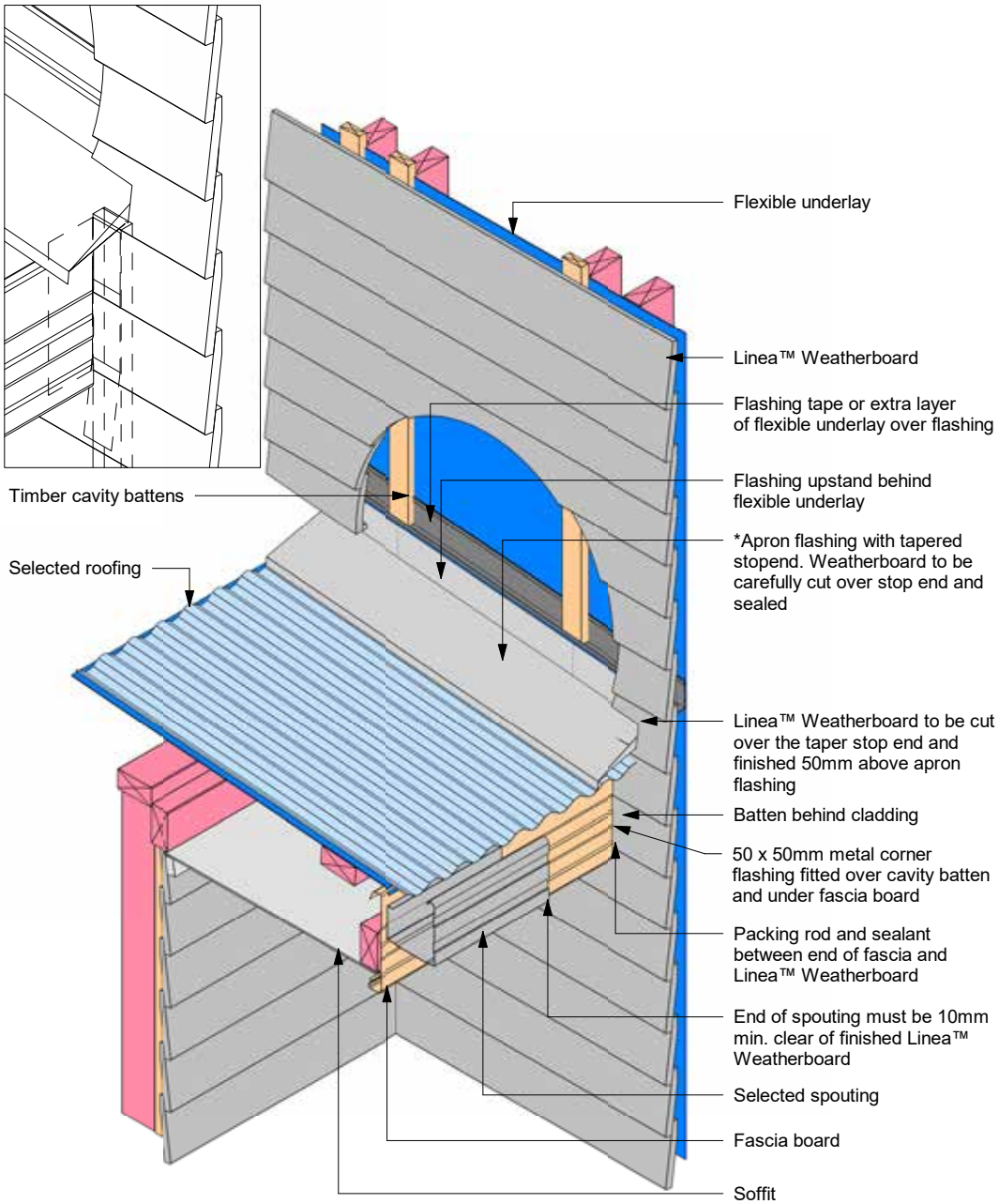


Figure 34: Junction Linea™ Weatherboard and fascia board



*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

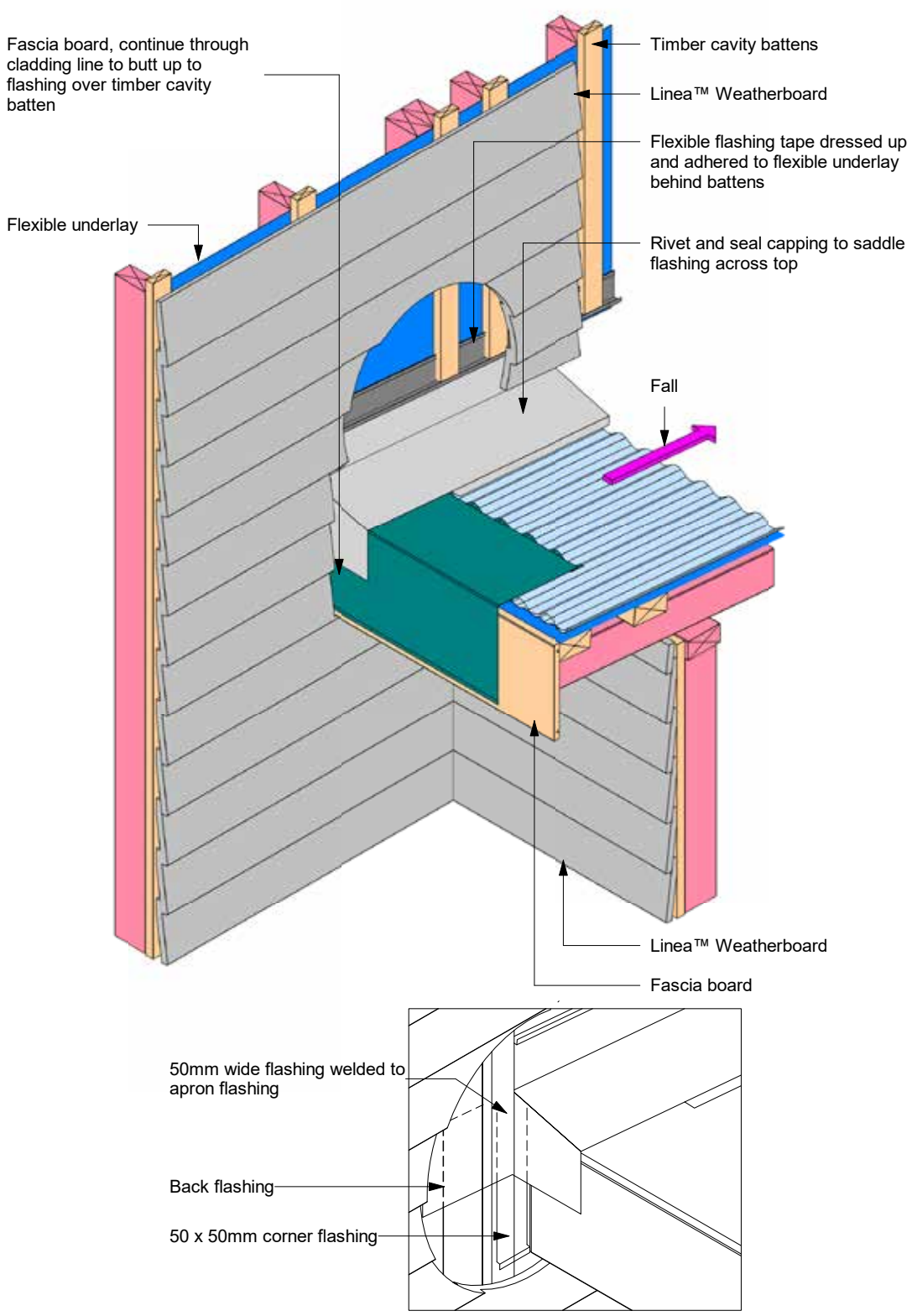
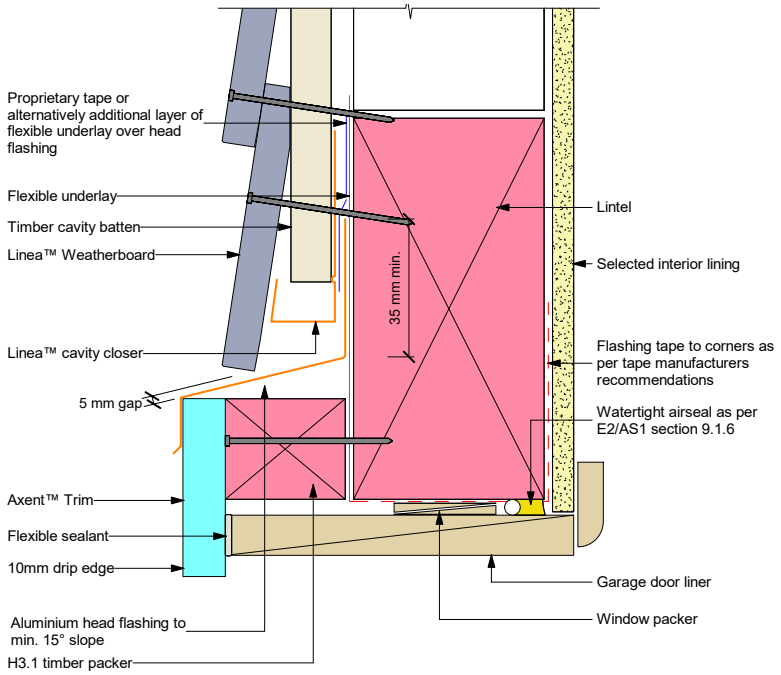
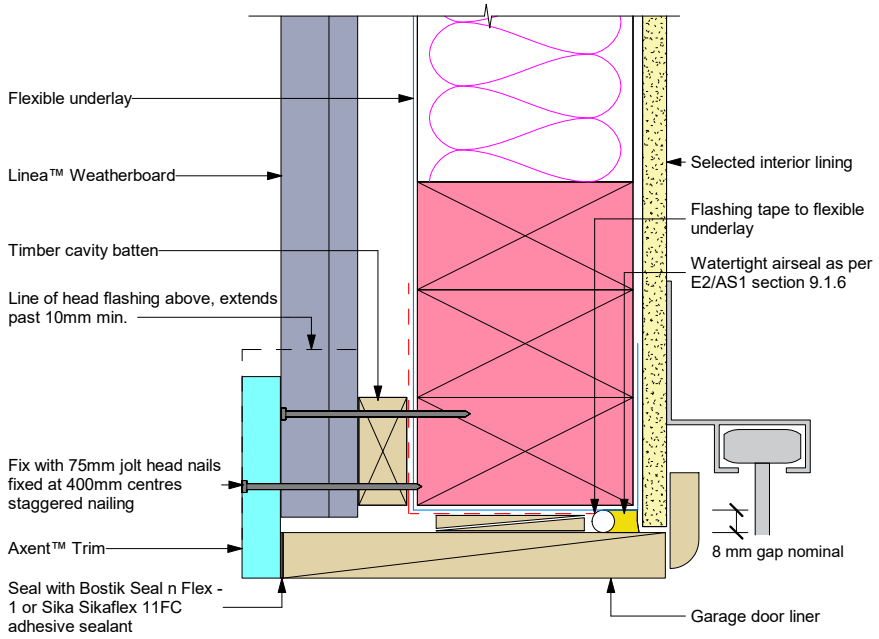


Figure 36: Garage door head



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

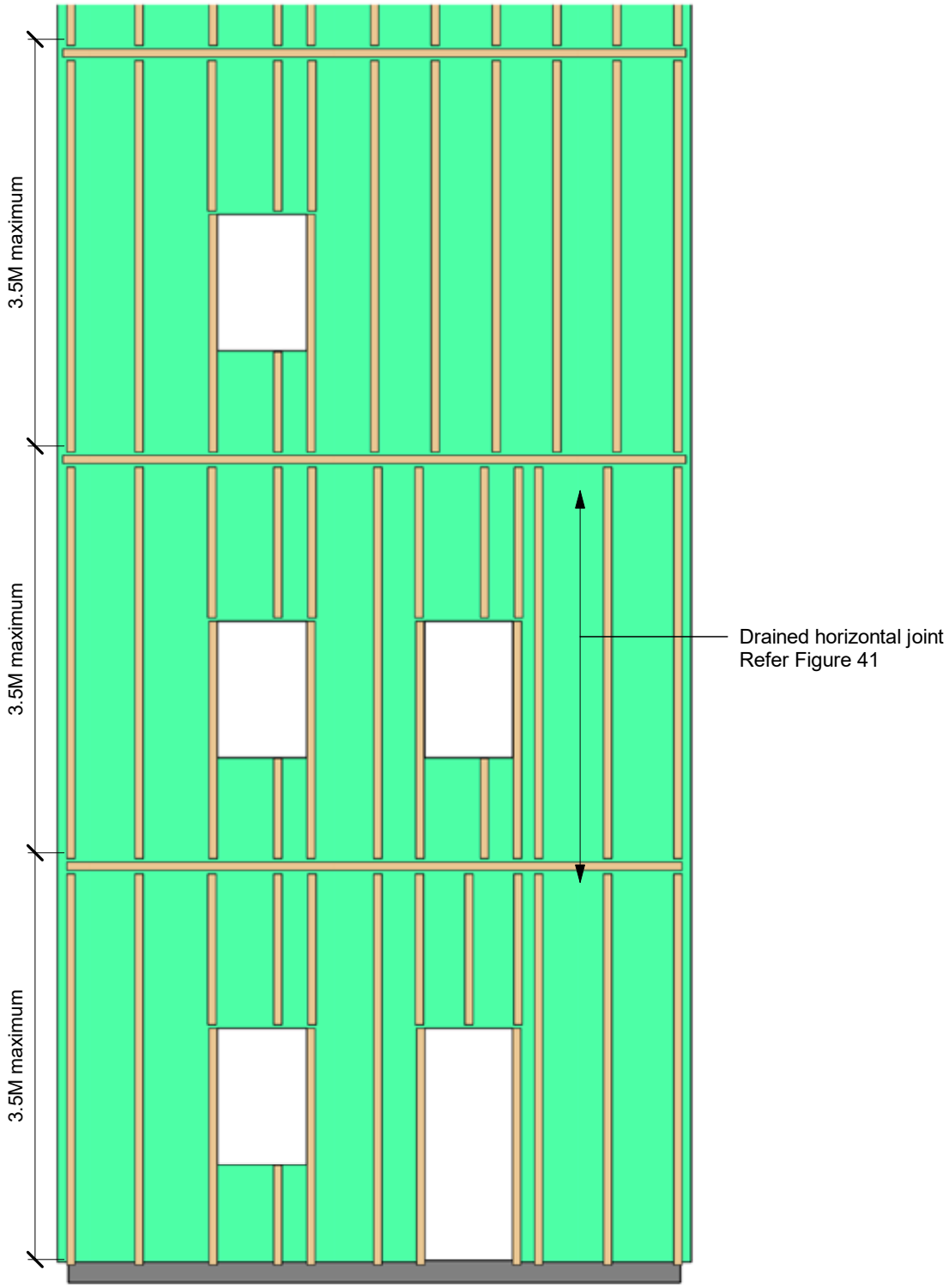
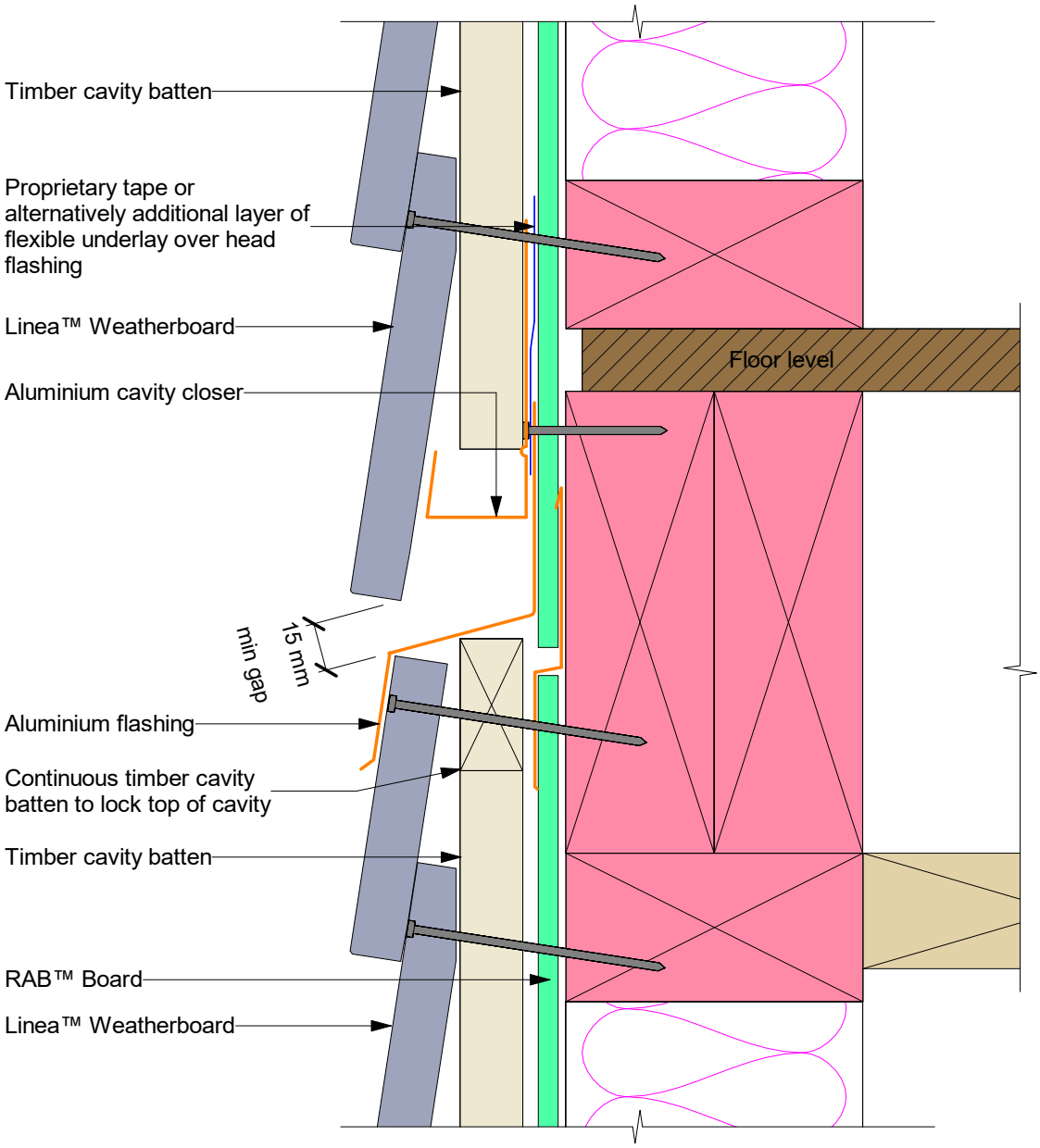


Figure 39: Intertenancy vertical fire separation



Notes

Notes

Notes

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 Axent™ Trim and 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.

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BC230758

BRANZ Appraised
Appraisal No. 447 [2020]

LINEA™ WEATHERBOARD CAVITY CLADDING

Appraisal No. 447 (2020)

This Appraisal replaces BRANZ Appraisal No. 447 (2010)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Linea™ Weatherboard Cavity Cladding is a cavity-based bevel-back fibre cement weatherboard wall cladding. It is designed to be used as part of an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 Linea™ Weatherboard Cavity Cladding consists of Linea™ Weatherboard, which is a bevel-back fibre cement weatherboard, fixed over timber battens to form the cavity. The cladding is finished with a latex paint system.

Scope

2.1 Linea™ Weatherboard Cavity Cladding has been appraised as an external wall cladding for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

2.2 Linea Weatherboard Cavity Cladding has also been appraised for weathertightness and structural wind loading when used as an external horizontally fixed wall cladding solution for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

2.3 Linea™ Weatherboard must only be installed horizontally on vertical surfaces.

2.4 Linea™ Weatherboard Cavity Cladding is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *(Note: The Appraisal of Linea™ Weatherboard Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.)*

(Note: Linea™ Weatherboard Cavity Cladding can be used to provide fire resistance rated construction, but these aspects have not been assessed by this Appraisal and are outside its scope.)

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Linea™ Weatherboard Cavity Cladding if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Linea™ Weatherboard Cavity Cladding meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1-9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Linea™ Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1-10.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Linea™ Weatherboard Cavity Cladding meets this requirement. See Paragraphs 14.1-14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Linea™ Weatherboard Cavity Cladding meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 System components and accessories for Linea™ Weatherboard Cavity Cladding supplied by James Hardie New Zealand Limited are:

- **Linea™ Weatherboards** are bevel-back weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Linea™ Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4,200 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 bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Linea™ Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- **Axent™ Trim** - a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2,600 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 135 mm, 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, plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.

4.2 System components and accessories used with Linea™ Weatherboard Cavity Cladding which are supplied by the building contractor are:

- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as 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.]*

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

- **Flexible sill, head and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **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.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Planted sill and scribers** - timber treated to Hazard Class H3.1, pre-primed before installation.
- **Window and door trim cavity air seal** - air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Cavity batten fixings** - 40 x 2.8 mm flathead hot-dip galvanised nails.
- **Linea™ Weatherboard fixings** - 60 x 3.15 mm flathead hot-dip galvanised HardieFlex nails or stainless steel ring shank HardieFlex 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 2.5 kPa).

(Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680).

- **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.
- **Aluminium joinery head flashing** - as supplied by the joinery manufacturer or the contractor.
- **Flashings** - balustrade and parapet cap flashings, and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.

Paint System Specification

4.3 Paint systems are not supplied by James Hardie New Zealand Limited and have not been assessed, therefore they are outside the scope of this Appraisal.

4.4 All exposed faces, including top edges at sills and all bottom edges of Linea™ Weatherboard, Axent™ Trim and accessories must be finished with at least 2 coats of an exterior grade latex acrylic paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730.

Handling and Storage

5.1 Handling and storage of all materials supplied by James Hardie New Zealand Limited or the building contractor, whether on-site or off-site, is under the control of the building contractor. Linea™ Weatherboards 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. Weatherboards must always be carried on edge.

5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

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

Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind Linea™ Weatherboard Cavity Cladding must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones and maximum 400 mm centres for the NZS 3604 Extra High Wind Zone and specifically designed buildings. Nogs must be fitted flush between the studs at maximum 800 mm centres (for studs at 600 mm centres) when a flexible wrap is used. The nogs may be omitted when a rigid air barrier is used.

7.3 Timber framing must have a maximum moisture content of 20% at the time of the cladding application. *(Note: If weatherboards are fixed to framing with a moisture content of greater than 20%, problems may occur at a later date due to excessive timber shrinkage.)*

General

8.1 When Linea™ Weatherboard Cavity Cladding is used for specifically designed buildings up to 2.5 kPa ULS wind pressure, only the weathertightness and structural aspects of the cladding are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1,000 mm² per lineal metre of wall in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 b).

8.3 At ground level, the bottom edge of Linea™ Weatherboards must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.

8.4 At balcony, deck or low pitch roof/wall junctions, the bottom edge of Linea™ Weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.

8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for Wind Zones up to, and including, Very High, a rigid underlay must be used for buildings in the Extra High Wind Zone and SED buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and unlined walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where Linea™ Weatherboard Cavity Cladding abuts other cladding systems, designers must detail the junction 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.

Inter-storey Junctions

8.7 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 m in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 b).

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

Structure

Mass

9.1 The mass of the 135 mm wide Linea™ Weatherboard when installed on the wall is 25.7 kg/m² at equilibrium moisture content (EMC). The mass of the 150 mm wide board is 24.93 kg/m² at EMC and the mass of the 180 mm wide board is 23.92 kg/m² at EMC. Linea™ Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

9.2 Linea™ Weatherboard Cavity Cladding will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

9.3 Linea™ Weatherboard Cavity Cladding is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa ULS wind pressure where buildings are specifically designed.

Durability

Serviceable Life

10.1 Linea™ Weatherboard Cavity Cladding installations are expected to have a serviceable life of at least 50 years provided the paint coating system is maintained in accordance with this Appraisal to ensure the Linea™ Weatherboards and fixings remain dry in service. Linea™ Weatherboards must be painted within 3 months of fixing.

10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604, Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Linea™ Weatherboards must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.

10.3 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Linea™ Weatherboards in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential for Linea™ Weatherboard Cavity Cladding installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.

11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the sealant or paint coating manufacturer's instructions.

11.3 Regular cleaning (at least annually) of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be re-coated at approximately 7-15 yearly intervals in accordance with the paint manufacturer's instructions.

11.4 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding. *(Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Linea™ Weatherboard Cavity Cladding.)*

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

Fire Affecting Areas Beyond the Fire Source

Vertical Fire Spread

12.1 This Appraisal only covers buildings 10 m or less in height. NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10 m. Control of external vertical fire spread is therefore outside the scope of this Appraisal.

Horizontal Fire Spread

12.2 Linea™ Weatherboards have a peak heat release rate of less than 100 kw/m^2 and a total heat released of less than 25 MJ/m^2. Testing was carried out as per Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of NZBC Acceptable Solution C/AS2, achieving a Type A performance. Linea™ Weatherboards can therefore be used within 1 m of the relevant boundary.

12.3 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and Verification Method C/VM2 for fire resistance rating and control of external fire spread requirements for external walls.

Prevention of Fire Occurring

13.1 Separation or protection must be provided to the Linea™ Weatherboards from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

14.1 Linea™ Weatherboard Cavity Cladding, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with NZBC Clause E2.3.5.

14.3 Linea™ Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with NZBC Clause E2.3.6.

14.4 The details given in the Technical Literature for weather sealing are based on the 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 joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

14.5 The use of Linea™ Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 Linea™ Weatherboard Cavity Cladding is not a barrier to the passage of water vapour, and when installed in accordance with the Technical Literature and this Appraisal will not create or increase the risk of moisture damage resulting from condensation.

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

Installation Information

Installation Skill Level Requirements

16.1 All design and building work must be carried out in accordance with the Linea™ Weatherboard Cavity Cladding Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the cladding system. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence class.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Linea™ Weatherboard Cavity Cladding system. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Cavity Battens

17.2 Cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The battens must be fixed in place with 40 x 2.8 mm hot-dip galvanised flathead nails at maximum 800 mm centres.

17.3 Where studs are at greater than 400 mm centres, a building underlay support must be installed over the building underlay between the cavity battens at maximum 300 mm centres.

Linea™ Weatherboard Installation

17.4 Linea™ Weatherboards may be cut on-site by power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

17.5 Linea™ Weatherboards must be dry prior to installation. Before the weatherboards are installed, cut ends exposed to the exterior such as at aluminium box corners or internal corners must be sealed with an acrylic sealer to reduce the absorbency of the fibre cement.

17.6 Linea™ Weatherboards must be installed starting at the bottom of the wall. A cant strip (H3.1 treated timber or fibre cement) must be fixed behind the bottom course of weatherboards to ensure the weatherboards are set at the correct angle. The cant strip must be continuous around the perimeter of the building. The bottom course of weatherboards must overhang the bottom plate by a minimum of 50 mm.

17.7 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, corner soaker. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing.

17.8 The first course of weatherboards must be full length, i.e. 4,200 mm and commence from an external corner. Jointing of Linea™ Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

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

17.9 Linea™ Weatherboards must have a minimum lap of 30 mm, and should be set out so as near to a full board as possible will finish under and over windows and doors and at the top of the wall. A storey rod can be used to accurately position weatherboard courses.

17.10 Linea™ Weatherboards must be fixed to each stud using concealed fixings behind the lap of the boards or face nailing, except that face nailing must be provided at all corners and vertical edges of openings.

17.11 Concealed fixing must be carried out using 60 x 2.8 mm hot-dip galvanised or stainless steel Hardieflex nails depending on the location, see Paragraph 10.2. Nails must be fixed 25 mm from the top edge of the board and must be driven flush with the board surface.

17.12 Face nailing must be carried out using 75 x 3.15 mm hot-dip galvanised or stainless steel jolthead nails in NZS 3604 Wind Zones up to, and including, Very High, or 90 x 4.0 mm hot-dip galvanised or stainless steel jolthead nails in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa, depending on the location, see Paragraph 10.2. Nails must be fixed 15 mm up from the bottom of the board and punched a maximum of 2 mm below the surface of the board. The top board must be pre-drilled for fixing.

17.13 Linea™ Weatherboards can be hand or gun nailed. Nails must not be closer than 25 mm to the end of the board when hand nailing, or closer than 50 mm when gun nailing. *(Note: Gun nailing must only be used for concealed nailing.)*

Aluminium Joinery Installation

17.14 Aluminium joinery and associated head and sill (for direct fixed) flashings must be installed by the building contractor in accordance with the Technical Literature. An 8 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

17.15 After installing the window and door joinery, Axent™ Trim, planted sills and scribers may be installed in accordance with the Technical Literature to provide additional weatherproofing for the joinery/weatherboard junction.

Inspections

17.16 The Technical Literature must be referred to during the inspection of Linea™ Weatherboard Cavity Cladding installations.

Finishing

17.17 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Linea™ Weatherboards and trim must be clean and dry before commencing painting.

Health and Safety

18.1 Cutting of Linea™ Weatherboards must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.

18.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Technical Literature must be observed because of the amount of dust generated.

18.3 Safe use and handling procedures for Linea™ Weatherboards and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

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

Basis of Appraisal

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

Tests

19.1 The following testing has been completed by BRANZ:

- BRANZ expert opinion on NZBC E2 code compliance for Linea™ Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea™ Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5).
- Uniform wind face load tests to simulate wind pressures on 12 mm thick Linea™ Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Linea™ Weatherboard used in Linea™ Weatherboard Cavity Cladding.
- Cone calorimeter testing to determine the peak rate of heat release and total heat release of Linea™ Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.

19.2 Linea™ Weatherboards have been tested by a National Association of Testing Authorities (NATA) accredited laboratory in accordance with AS/NZS 2908.2. The results have been reviewed by BRANZ and found to be satisfactory.

19.3 Testing has been carried out by James Hardie New Zealand Limited to determine the modulus of rupture and inter-laminar bond strength of carbonated and non-carbonated Linea™ Weatherboard. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

20.1 Weathertightness, structural, fire and durability opinions have been provided by BRANZ technical experts.

20.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of Linea™ Weatherboards 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.

21.2 The quality of materials, components and accessories supplied by James Hardie New Zealand Limited is the responsibility of James Hardie New Zealand Limited. The quality control system of James Hardie New Zealand Limited has been assessed and registered as meeting the requirements of ISO 9001: 2015.

21.3 Quality on site is the responsibility of the installer.

21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the building underlay, cavity battens, Linea™ Weatherboard and accessories in accordance with the instructions of James Hardie New Zealand Limited.

21.5 Building owners are responsible for the maintenance of Linea™ Weatherboard Cavity Cladding in accordance with the instructions of James Hardie New Zealand Limited.

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

Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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

BRANZ

In the opinion of BRANZ, Linea™ Weatherboard Cavity Cladding 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 James Hardie New Zealand 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. James Hardie New Zealand 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 James Hardie New Zealand 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 James Hardie New Zealand Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
02 September 2020

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

BC230758

PRODUCT CERTIFICATE

Linea™ Weatherboard by James Hardie Direct Fixed and Cavity Cladding systems

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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	VERSION DATE	RECERTIFICATION
26/05/2020	06/10/2022	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

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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

BC230758

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

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CERTIFICATE V2

BC230758

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

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CERTIFICATE V2

BC230758

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

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CERTIFICATE V2

BC230758

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			

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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 grove 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 revel profile is machined on the back face of the weatherboard, the bottom of the board is chamfered and the tongue and grove 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 scribers - timber treated to Hazard Class H3.1, pre-primed before installation.

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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

BC230758

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

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CERTIFICATE V2

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BC230758

GIB®

Wet Area Systems

Specification and installation manual

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

CBI 5113
FEBRUARY 2021

NATIONAL SUPPORT

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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.

BRANZ Appraised
Appraisal No.427 [2021]

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This publication

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

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

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

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

WET AREAS

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

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

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

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

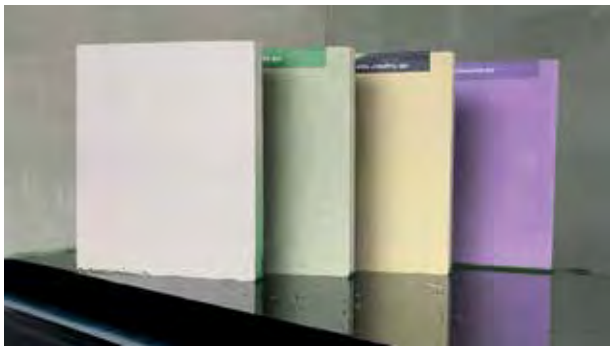
Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

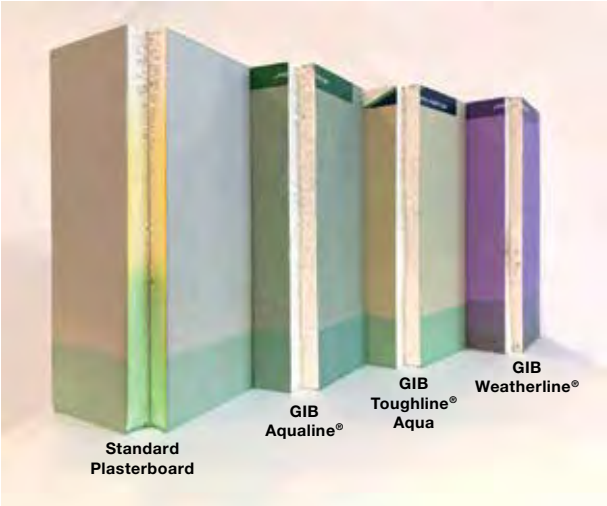
The NZ Building Code does not call for water resistant linings in wet areas but it is desirable to specify lining materials which will maintain their integrity longer when exposed more frequently to moisture, and to one-off events such as leaks or flooding.

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

WATER ABSORPTION TEST

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





WHERE TO USE GIB® WET AREA LININGS

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

BENEFITS

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

HANDLING AND STORAGE

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

LIMITATIONS

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

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

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

BOARD SUBSTITUTION OPTIONS

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

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

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

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

RIGID SHEET SHOWER LININGS

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

WATERPROOF MEMBRANE SYSTEMS AND TILING

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

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

PENETRATIONS AND SEALANTS

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

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

RENOVATIONS

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

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

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

MAINTENANCE

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

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

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

Compliance with the NZ Building Code

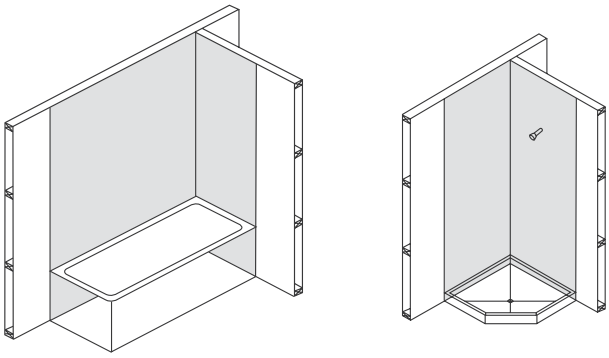
STRUCTURE – CLAUSE B1

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

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

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

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



No bracing in the shaded areas.

DURABILITY – CLAUSE B2

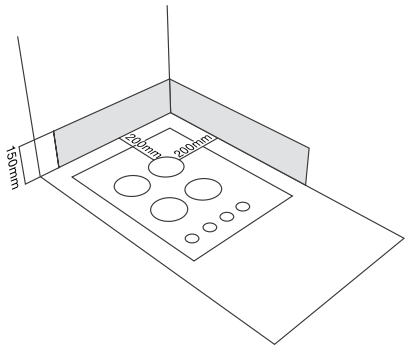
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers,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

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

FIRE AFFECTING AREAS BEYOND THE SOURCE – CLAUSE C3

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

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



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

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

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

INTERNAL MOISTURE – CLAUSE E3

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

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

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

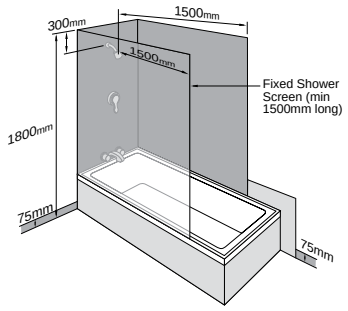
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

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

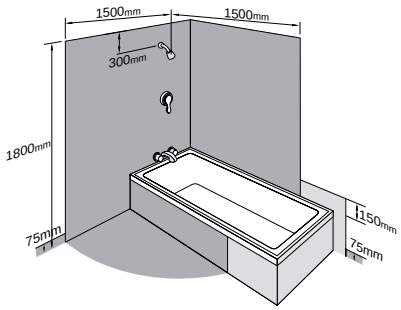
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

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

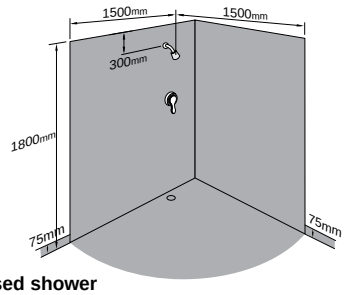
Enclosed shower over bath



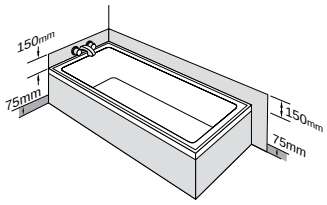
Unenclosed shower over bath



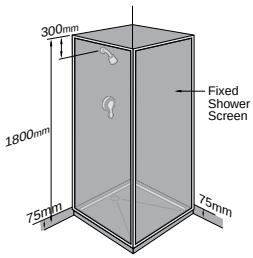
Unenclosed shower



Bath



Enclosed shower



HAZARDOUS BUILDING MATERIALS – CLAUSE F2

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

VENTILATION – CLAUSE G4

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

AIRBORNE AND IMPACT SOUND – CLAUSE G6

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

TIMBER WALL FRAMING

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

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

FASTENERS

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

FASTENER CENTRES

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

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

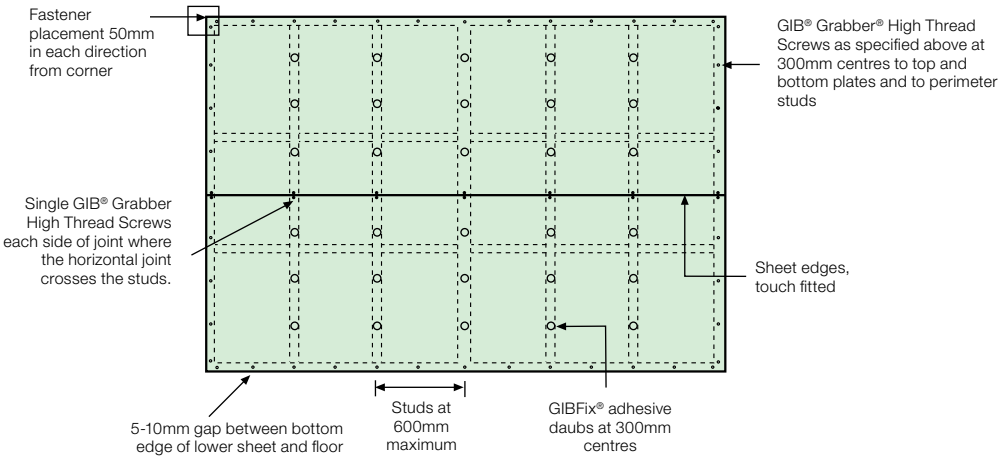
LINING

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

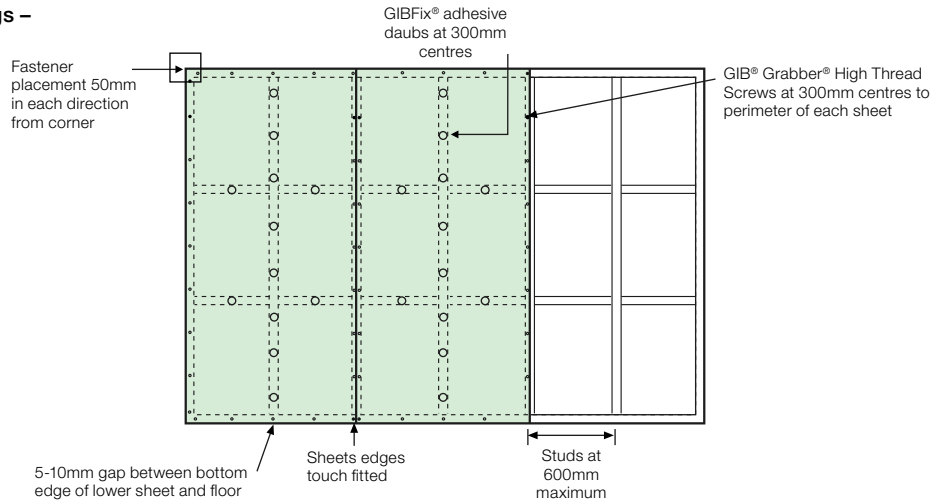
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



STEEL WALL FRAMING

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

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

FASTENERS

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

FASTENER CENTRES

- 300mm centres to top and bottom channels and to end studs
- Single screws to each stud where the horizontal joint crosses the studs
- Place fasteners 12mm from sheet edges and 18mm from sheet ends
- Daubs of GIBFix® All-Bond adhesive or screws at 300mm centres to intermediate studs
- Do not place adhesive at sheet edges or under fasteners.
- Sheet edges at door or window openings can be adhesive fixed.

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

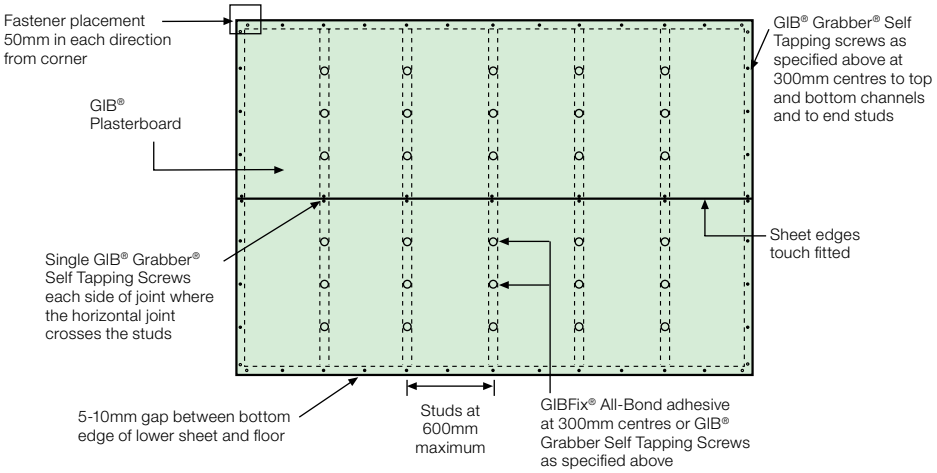
LINING

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

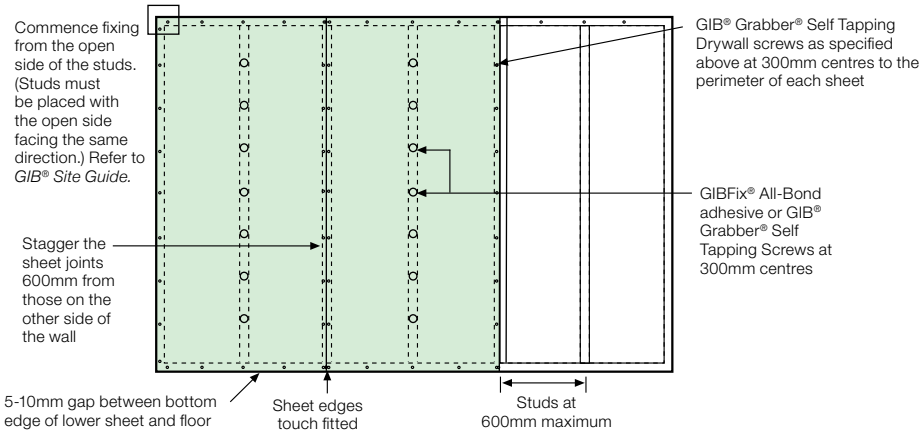
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



TIMBER WALL FRAMING

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

NOGS

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

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

CORNER REINFORCING

- Prior to lining in tiled areas (shower cubicles and shower over bath only) the internal corners shall be reinforced with a minimum
- 32 x 32 x 0.55mm NZ18 or 45 x 45 x 0.55mm GIBFix® Angle. 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.

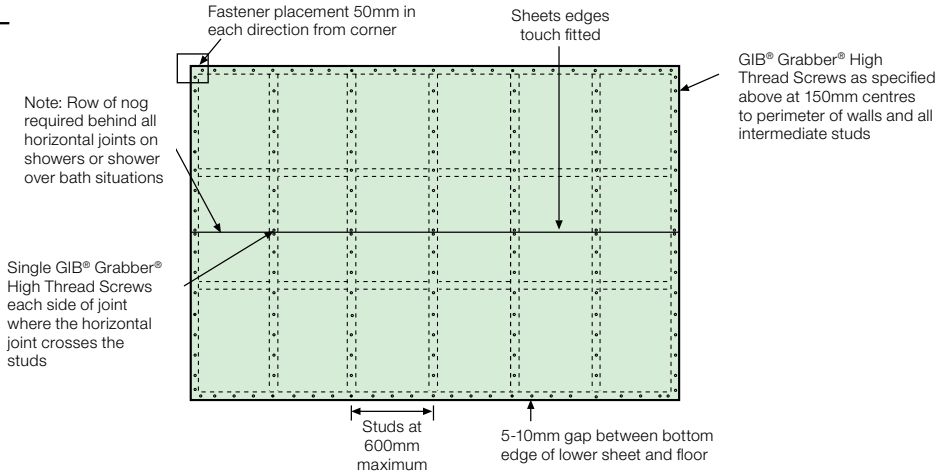
LINING AND TILE WEIGHTS

- 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

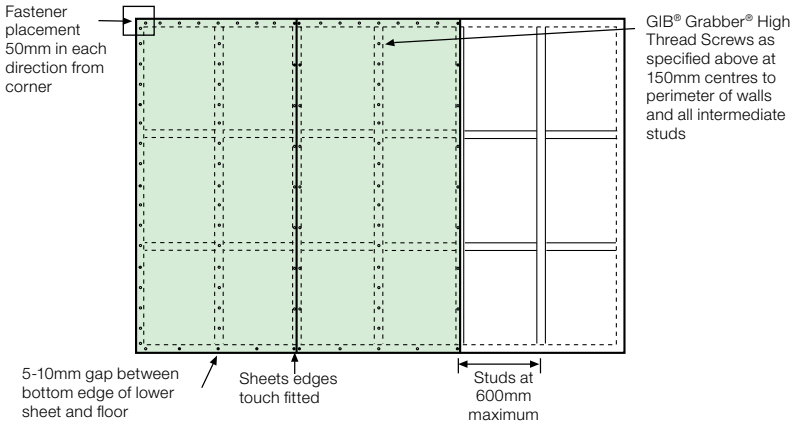
JOINTING

- 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.

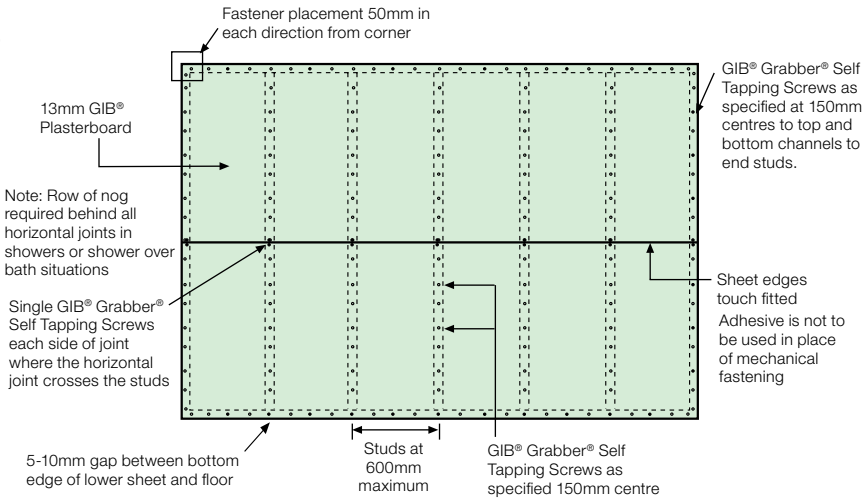
LINING AND TILE WEIGHTS

- 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

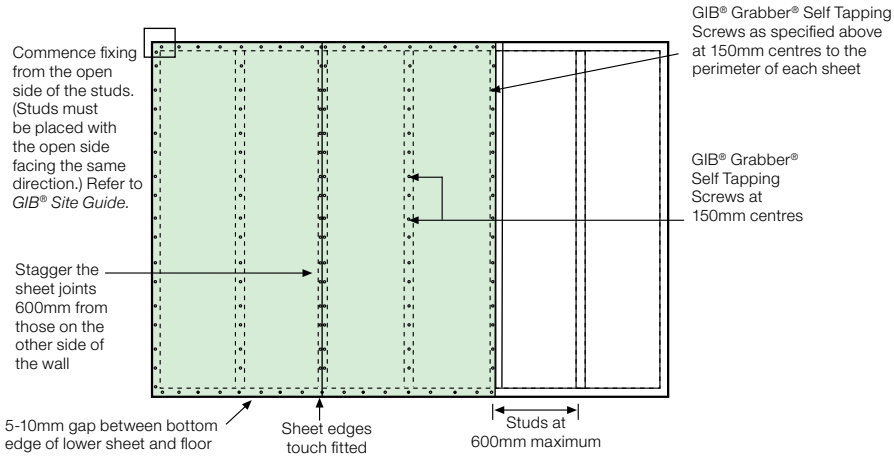
JOINTING

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

Fastening the Linings – Horizontal Fixing Only

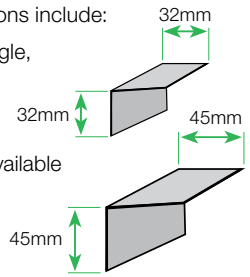


Fastening the Linings – Vertical Fixing Only

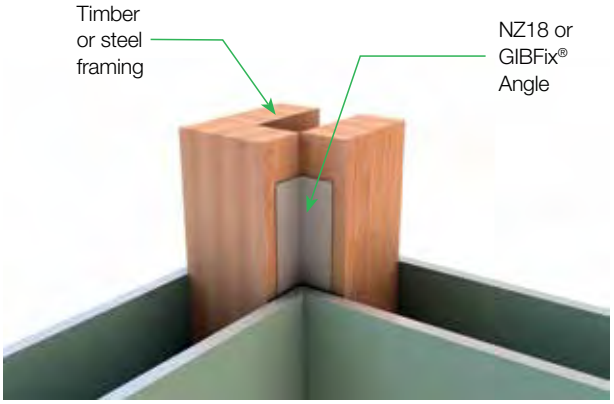


METAL ANGLES FOR TILED INTERNAL CORNERS

- 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/m²
		13mm	40kg/m²

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

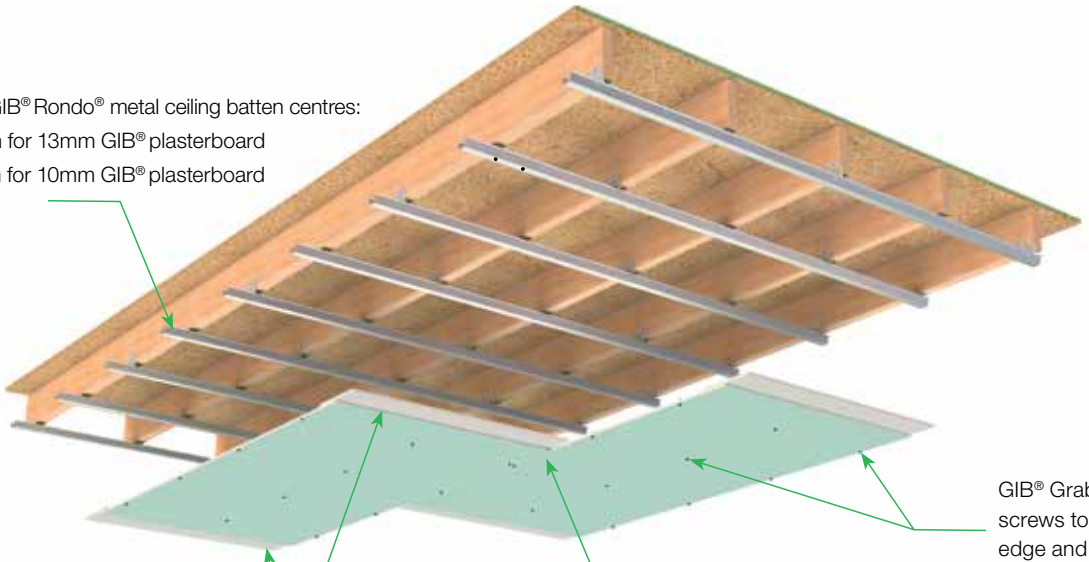
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

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

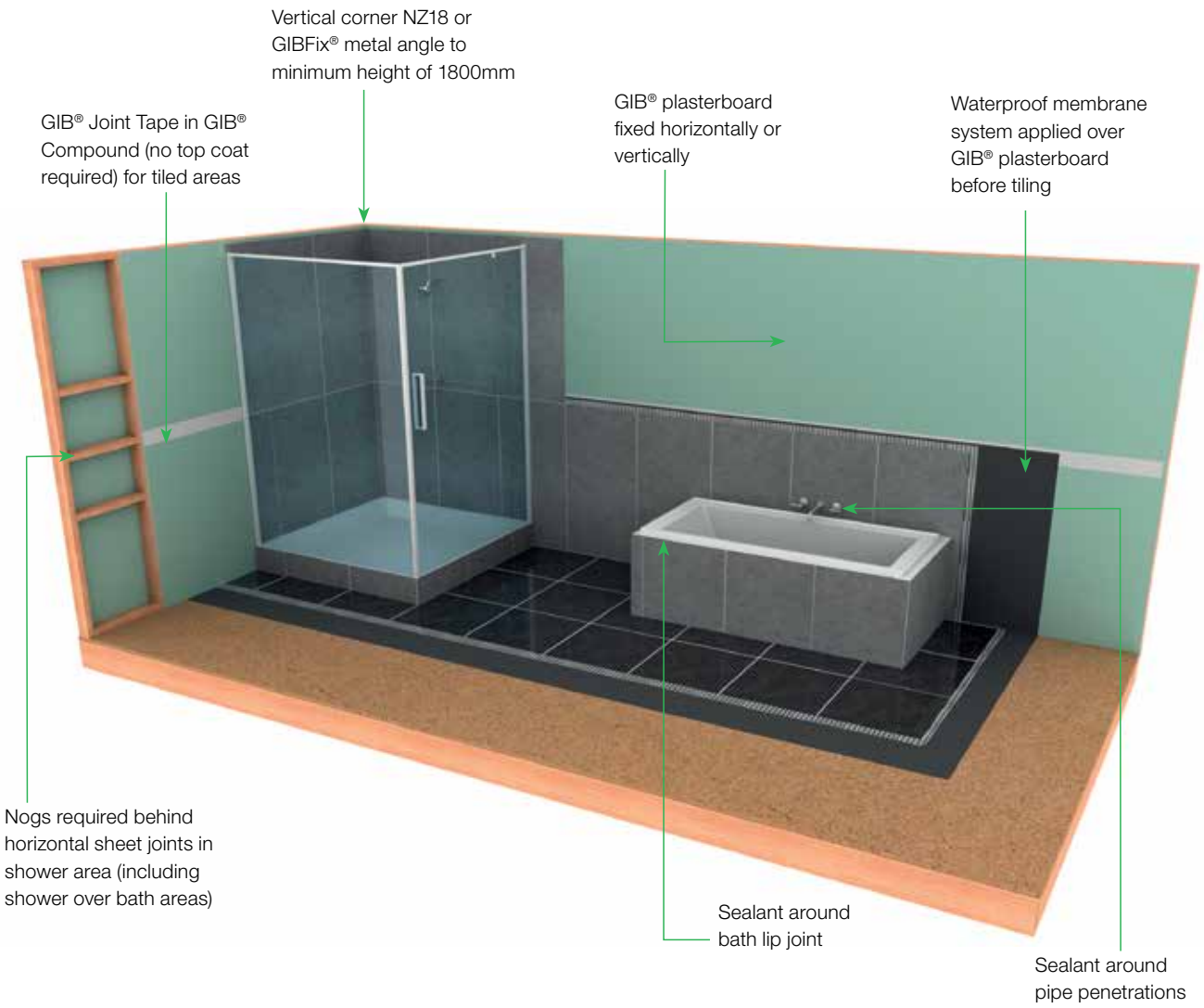


GIB® Grabber® screws to sheet edge and sheet centre at each batten intersection

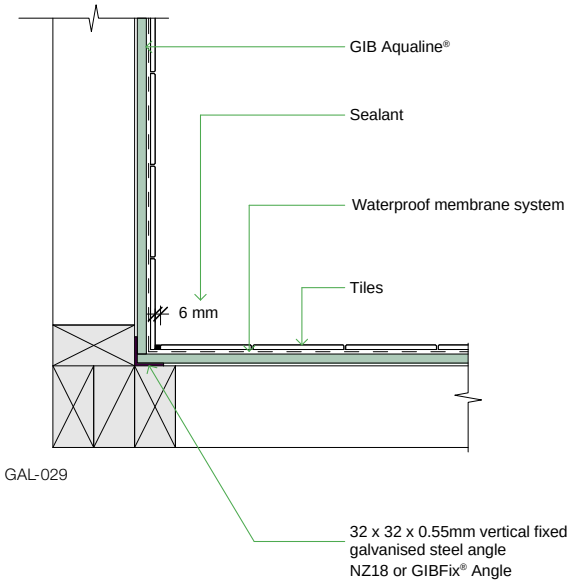
Back-block sheet end joints (see GIB® Site Guide)

Stagger sheet end joints by 600mm or nearest batten

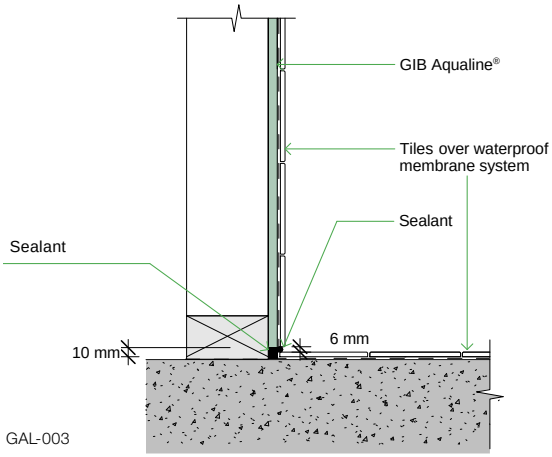
SHOWER AND BATH - TILED WALLS DETAILS



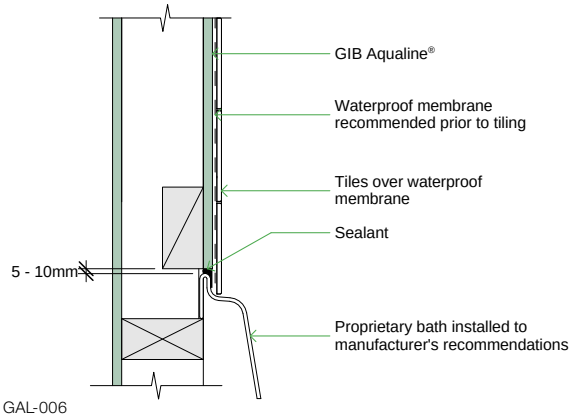
A: TILED INTERNAL CORNER



B: CERAMIC FLOOR LINING JUNCTION



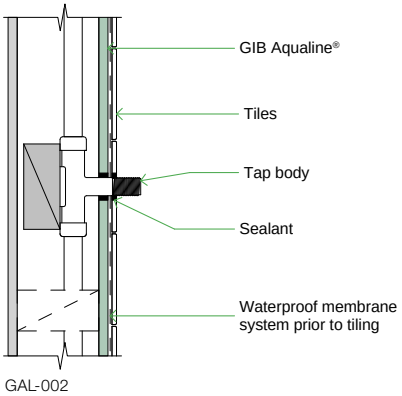
C: BATH LINING JUNCTION



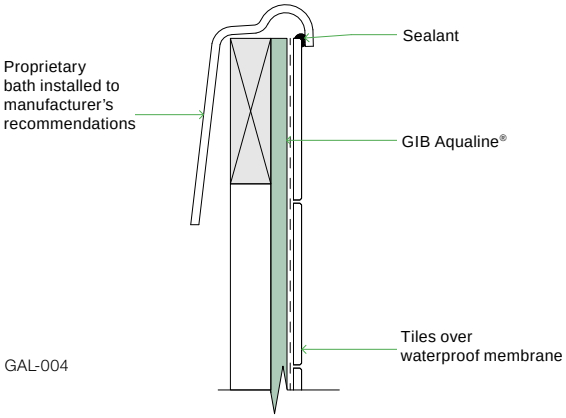
G: SHOWER MIXER PENETRATION IN WET WALL LININGS

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.

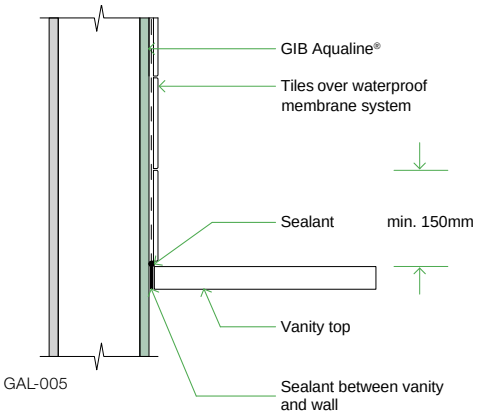
D: SEALING WET AREA PENETRATION

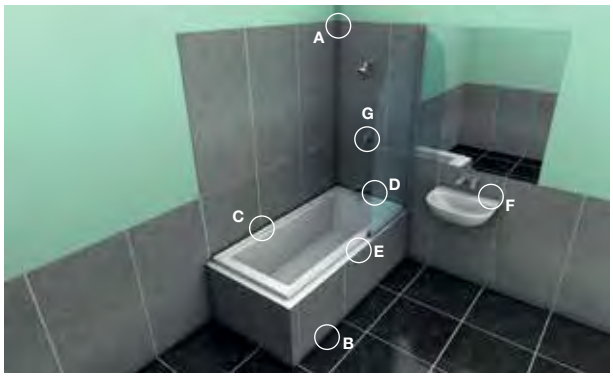


E: BATH CRADLE LINING DETAIL

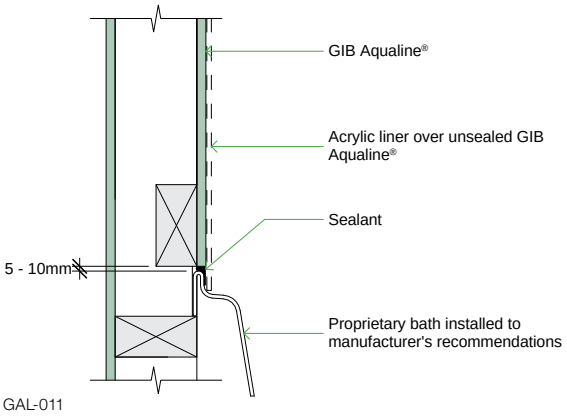


F: VANITY TOP LINING JUNCTION

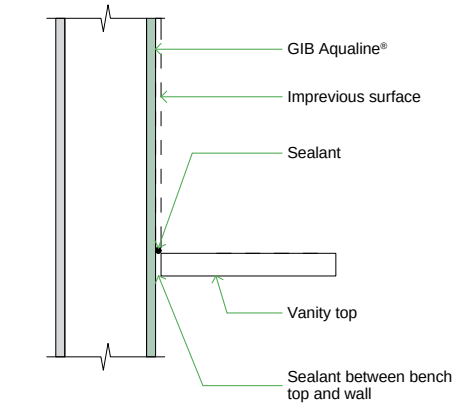




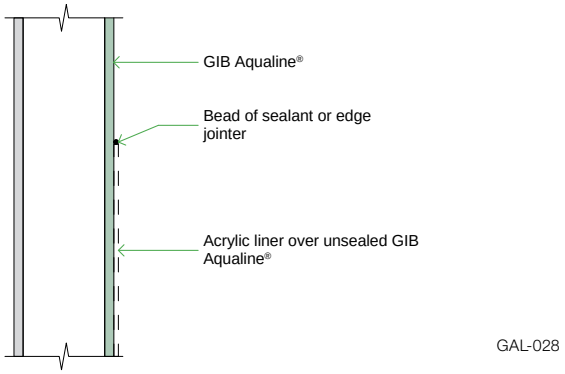
A: BATH LINING JUNCTION



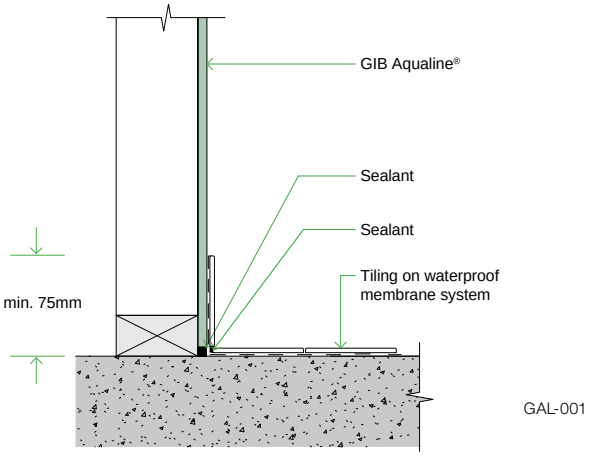
B: VANITY TOP LINING JUNCTION



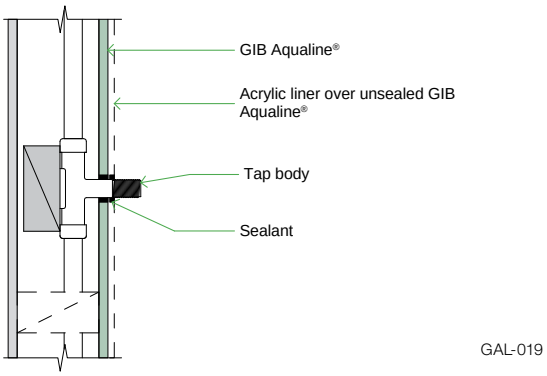
C: UNSEALED PLASTERBOARD LINING



D: CERAMIC FLOOR SKIRTING LINING JUNCTION



E: SEALING SEMI WET AREA PENETRATION

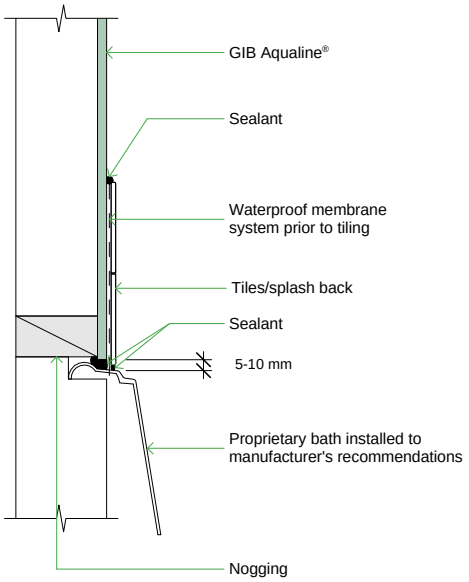


F: SHOWER MIXER PENETRATION IN WET WALL LININGS

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.

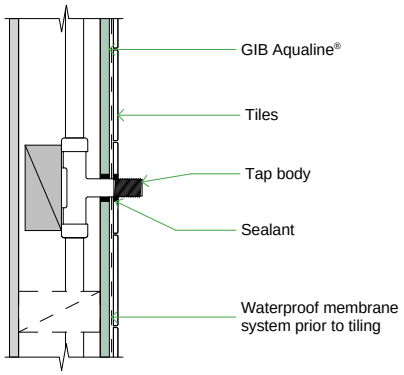
BATH – TILED UPSTAND DETAILS

A: BATH LINING JUNCTION



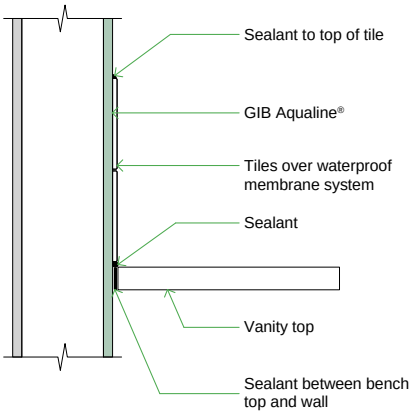
GAL-009

B: SEALING SEMI WET AREA PENETRATION



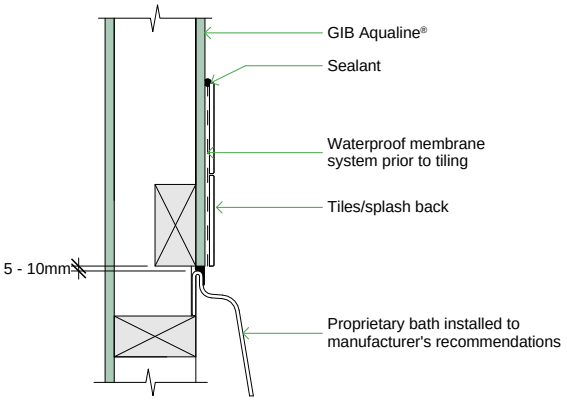
GAL-020

C: VANITY TOP LINING JUNCTION



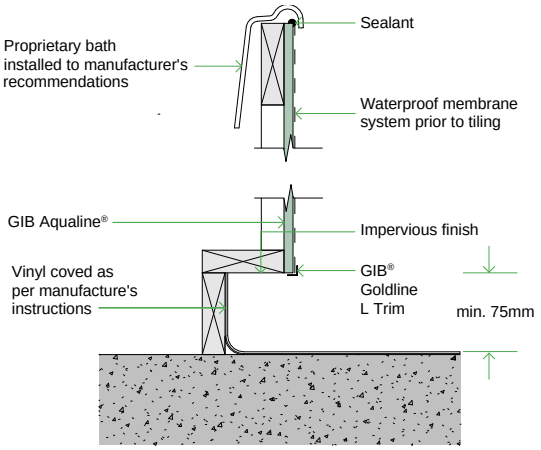
GAL-024

D: BATH LINING JUNCTION

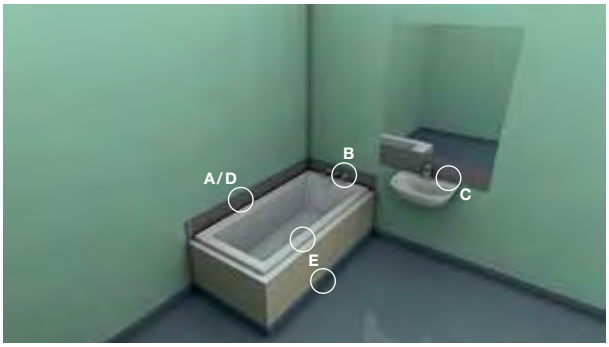


GAL-010

E: CRADLE VINYL LINING JUNCTION

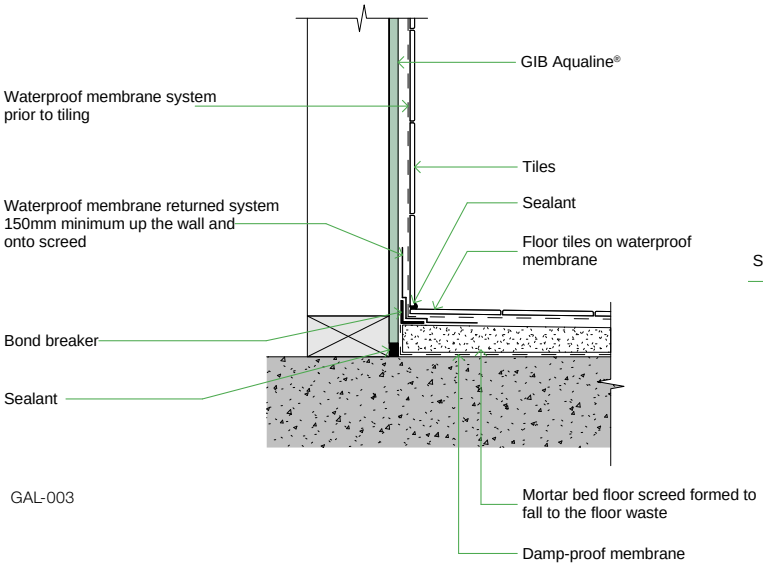


GAL-008



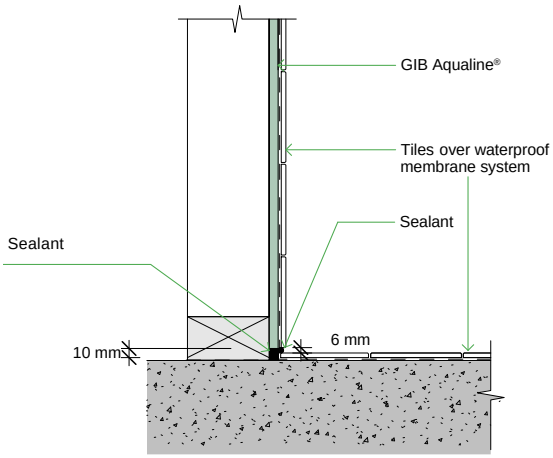
CONSENT ISSUED BC230758 - Page 429 of 467

A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



GAL-003

C: CERAMIC FLOOR LINING JUNCTION

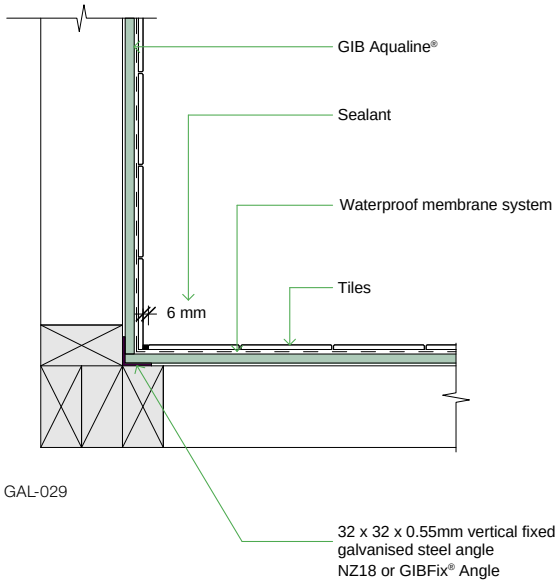


GAL-002A

PREFORMED SHOWER BASE JUNCTIONS

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

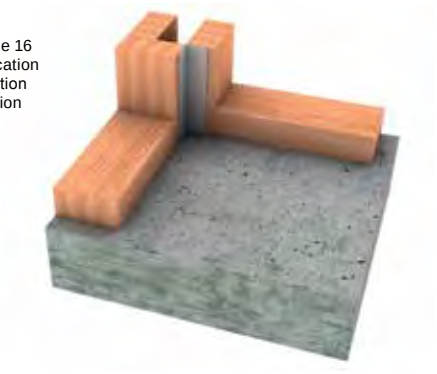
B: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

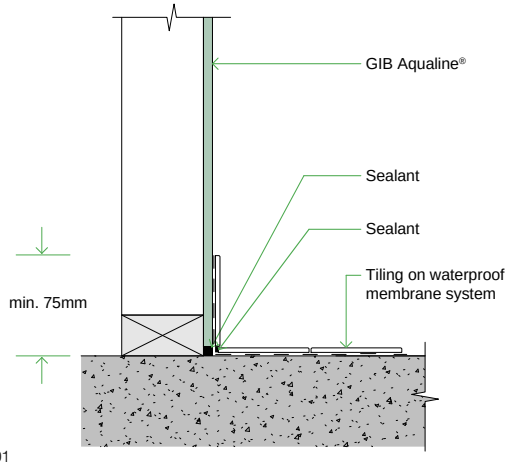
Refer to page 16 of this publication for specification and installation guidance.



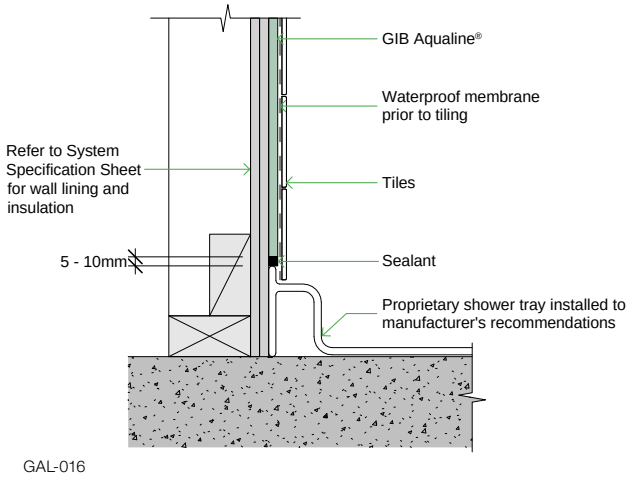
E: SHOWER MIXER PENETRATION IN WET WALL LININGS

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

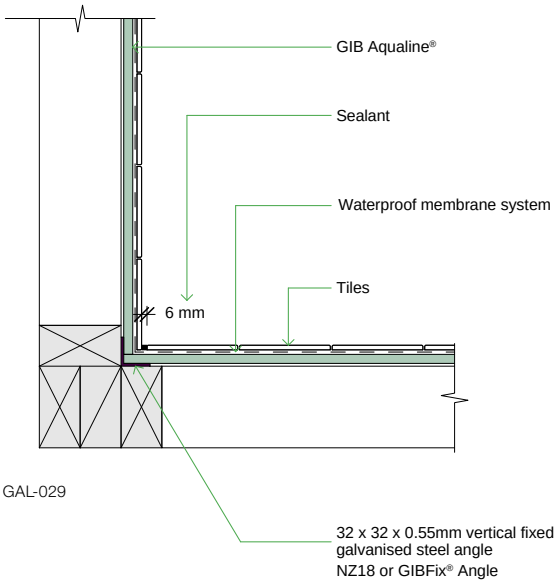
A: CERAMIC FLOOR SKIRTING LINING JUNCTION



B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



C: TILED INTERNAL CORNER



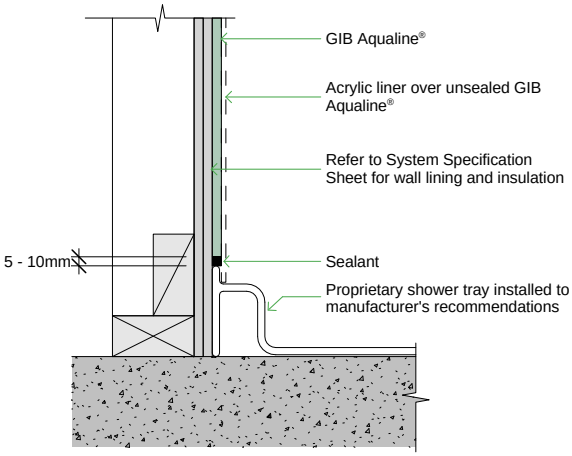
D: TILED INTERNAL CORNER METAL ANGLE POSITION

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

E: SHOWER MIXER PENETRATION IN WET WALL LININGS

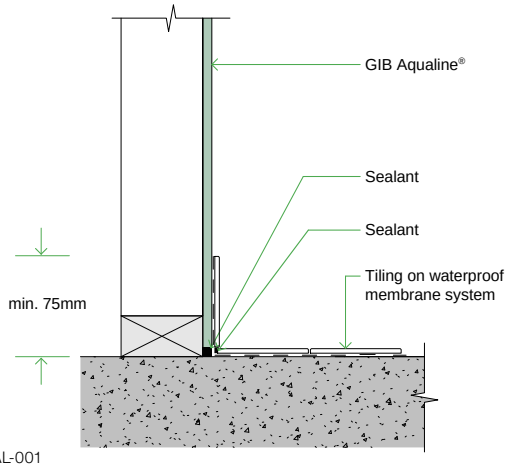
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



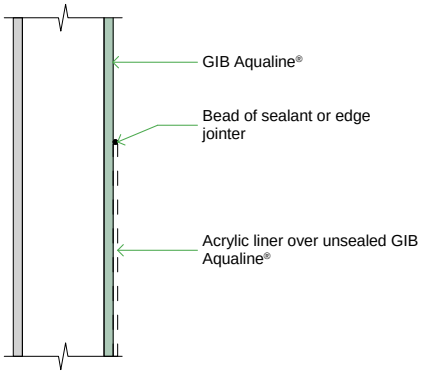
GAL-015

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

C: UNSEALED PLASTERBOARD LINING

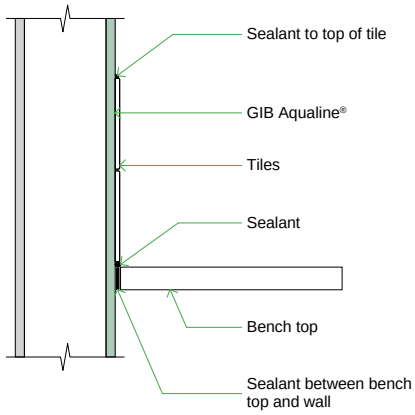


GAL-028

D: SHOWER MIXER PENETRATION IN WET WALL LININGS

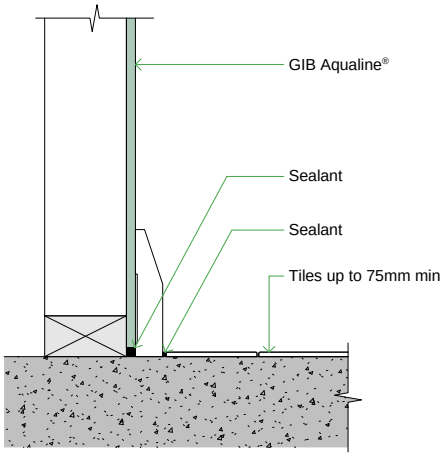
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

A: BENCH TOP LINING JUNCTION



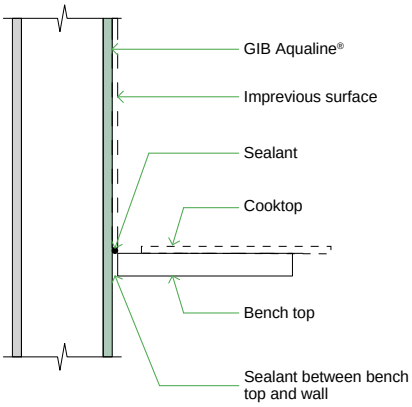
GAL-024

CERAMIC FLOOR SKIRTING LINING JUNCTION



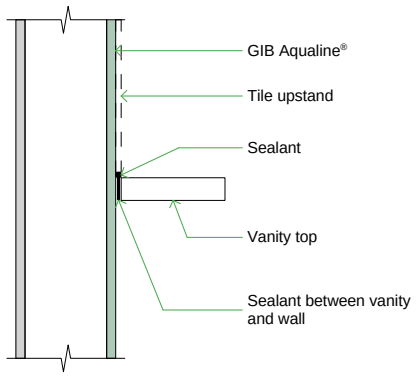
GAL-001A

B: COOKTOP LINING JUNCTION



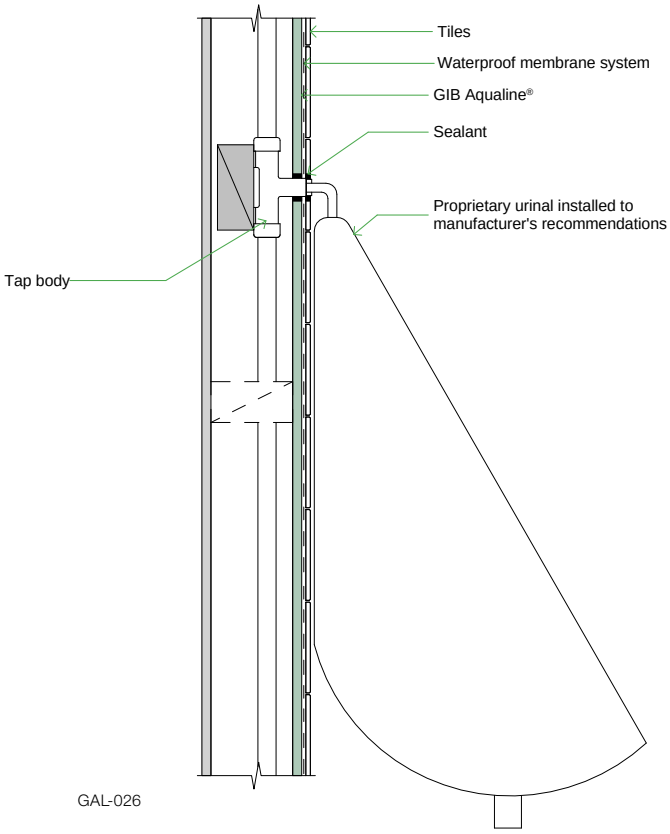
GAL-023B

A: VANITY TOP LINING JUNCTION



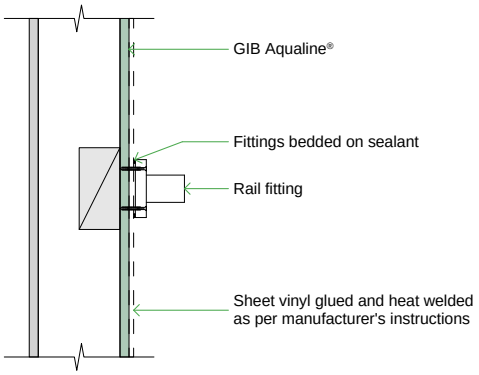
GAL-022

B: SEALING WET AREA PENETRATION LINING JUNCTION



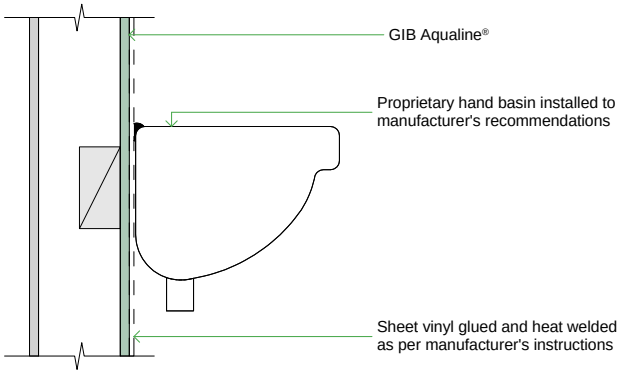
GAL-026

A: SURFACE MOUNTED WITH NOG



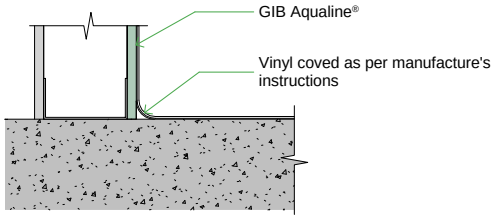
GAL-027

C: BASIN LINING JUNCTION



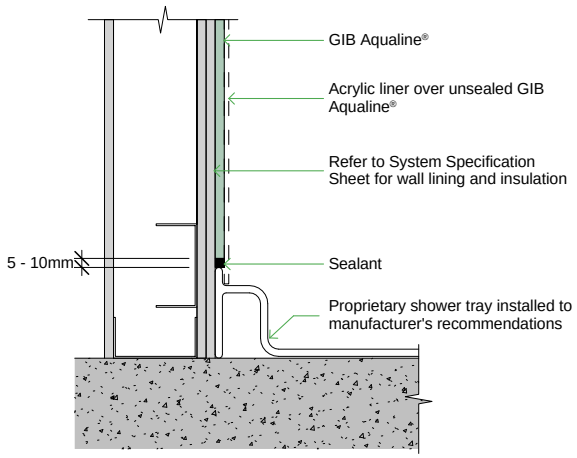
GAL-025

B: VINYL FLOOR LINING JUNCTION



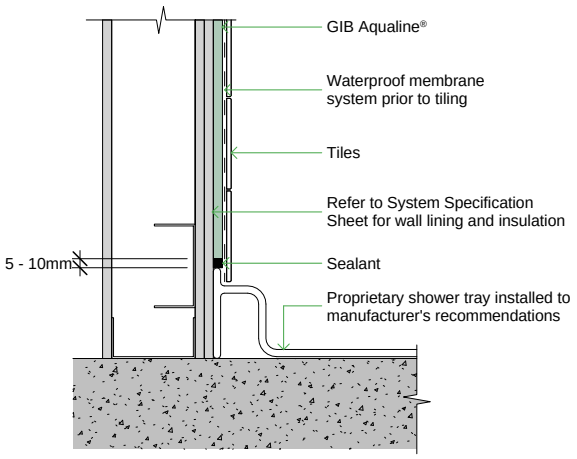
GAL-006A

A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



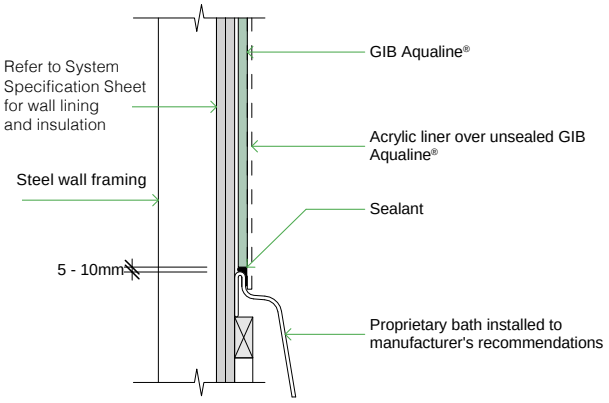
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



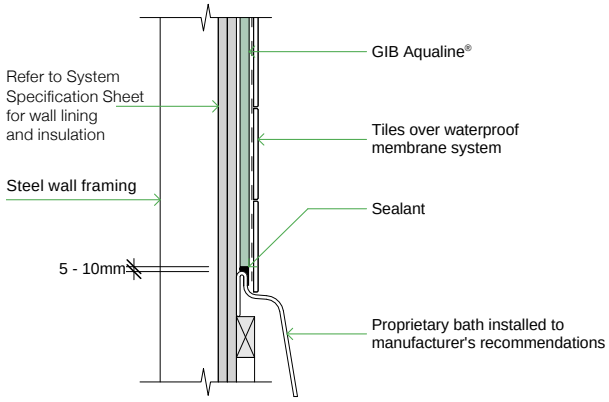
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



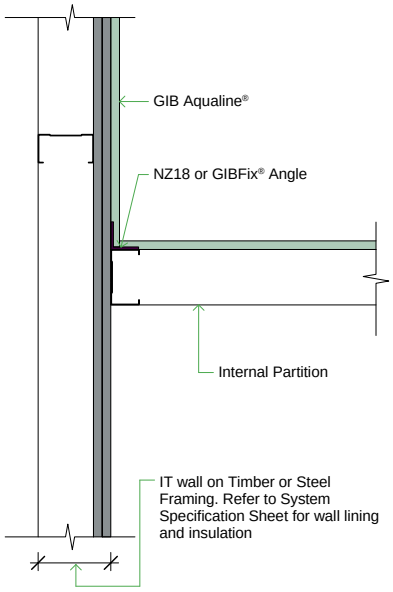
GAL-014

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.

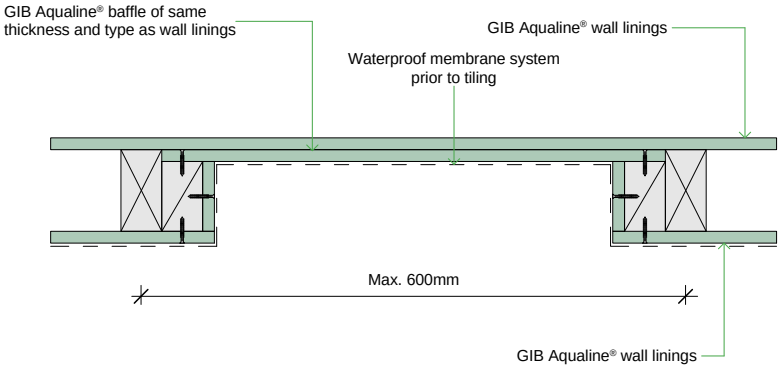
Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

E: INTERTENANCY WALL AND WET AREA WALL JUNCTION

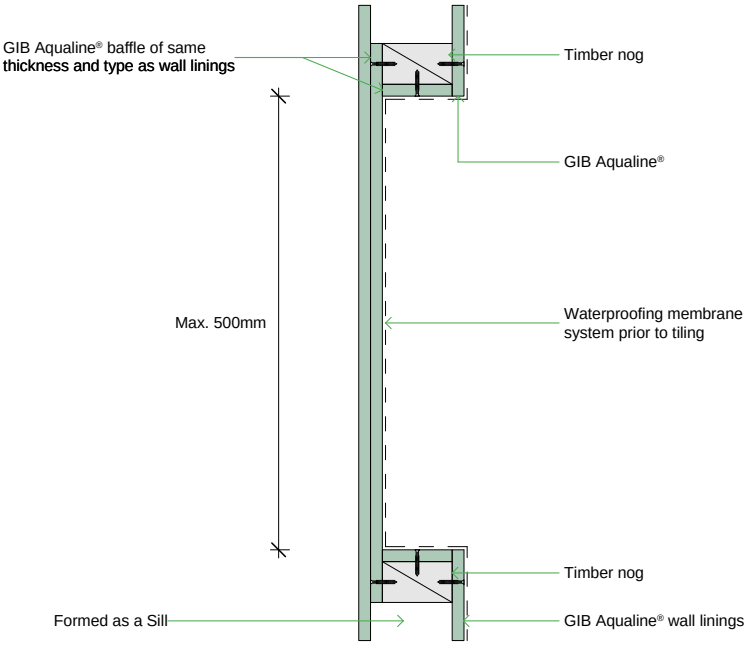


GAL-031C

TIMBER FRAME TILE RECESS

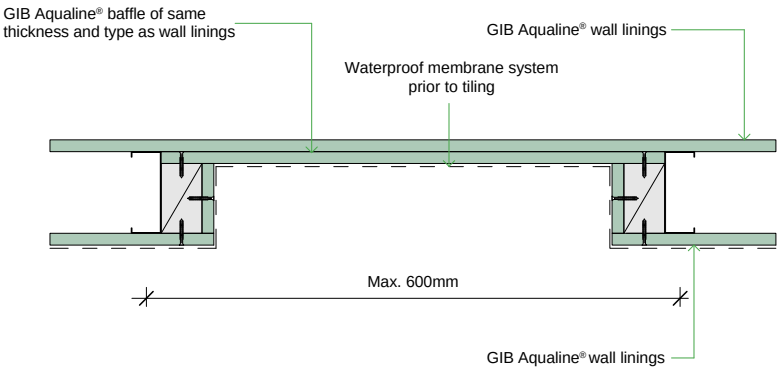


Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.

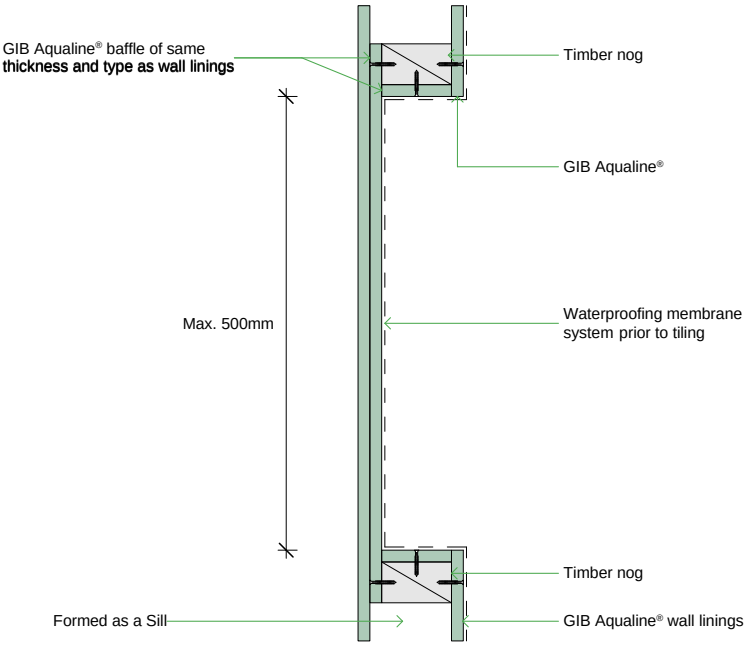


GAL-029B

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

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BC230758

GIB® Wet Area Systems, February 2021

LIMITATIONS

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

USE ONLY THE CURRENT SPECIFICATION

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

SUBSTITUTION

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

TRADEMARKS

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

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OR CALL THE GIB® HELPLINE

0800 100 442

February 2021

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed)

Single component undertile waterproofing membrane

Low VOC content – meets Green Building Council of Australia Green Star IEQ-13 requirements

Fast drying one part acrylic membrane

Class III membrane, conforms to the requirements of AS4858:2004 Wet Area Membranes

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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Internet: www.ardex.com

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

PRODUCT DESCRIPTION

ARDEX WPM 001 (Superflex Premixed) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. ARDEX WPM 001 has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. ARDEX WPM 001 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification once cured.

ARDEX WPM 001 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. ARDEX WPM 001 is one of the fastest drying one part acrylic membranes on the market – normally ready to tile in 48 hours @ 23°C.

WPM 001 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

- Fast drying ARDEX WPM 001 can be tiled over in 48 hours in non critical areas*.
- Fibre reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement class 3 membrane as per AS 4858: 2004 Wet Area Membranes.
- Advanced acrylic: Will not re-emulsify once cured.
- Designed for tiling – Fully compatible with ARDEX tile adhesive systems.
- Water based, safe to use, low odour and easy cleaning.
- Conforms to the requirements of Australian Standards 4858: 2004 Wet Area Membranes.

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance levels

Commercial and residential.

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls and floors.

Substrates

Concrete	Cured for min. 28 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. External wet concrete should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Renders and screeds	Cured for min. 7 days or sealed when set with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of ARDEX HydrEpoxy WPM 300 as above.
Fibre cement	Wet area grade fibre cement.
Plasterboard	Wet area grade only.
Plywood	Structural plywood (PAA branded), marine grade or other wet area grade only. Special preparation is required – contact ARDEX. Not recommended for external use (refer ARDEX).
Particleboard	Wet area grade, internal use only (special preparation is required – contact ARDEX). Not recommended for external use (refer ARDEX).
Permanent Immersion	In conditions of permanent immersion, it is recommended that ARDEX WPM 002 (Superflex Two Part) is used. Must be covered with tiles for full immersion.

Contact ARDEX for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

ARDEX WPM 001 (Superflex Premixed)

The waterproofing membrane shall be ARDEX WPM 001: a one part acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Single component: 20kg (approx 15 litres) or 6.5kg (approx 5 litres).

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

TABLE 1

	Thickness per coat		Total dry film thickness (2 coats)	Theoretical coverage		Per unit
	Dry film	Wet film		Per coat	For 2 coats	
FLOORS	0.5mm	1.0mm	1.0mm	15m²	7.5m²	20kg(15L) unit
WALLS	0.25mm	0.5mm	0.5mm	30m²	15m²	20kg(15L) unit

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 20kg (15 litre) unit will cover approximately 7.5–15m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated. Refer Table 1.

DRYING TIMES

Recoat time

1–2 hours at (23°C / 50% RH) between first and second coats. Alternatively, if a woven cloth reinforcement mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. ARDEX WPM 001 is totally dry in 48 hours at 23°C / 50% RH, but can take up to 72 hours at 10°C / 50% RH in corners or for thick films.

Fully cured

The shower should not be used until the membrane has reached its full strength. ARDEX WPM 001 membrane is fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with ARDEX HydrEpoxy WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of ARDEX HydrEpoxy WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the ARDEX WPM 001.

For substrates or situations other than those listed contact ARDEX.

SAFETY DATA

ARDEX WPM 001 is non-hazardous and non dangerous. In case of skin contact, flush with running water. In case of irritation seek medical advice. If swallowed, immediately give a glass of water.

Additional information is listed in the Material Safety Data Sheet.

QUALITY PRODUCT

ARDEX WPM 001 is manufactured and tested to ARDEX procedures which are maintained in accordance with Quality System Standard ISO 9001.

ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with ARDEX instructions and in applications for which they are intended.

APPLICATION

Apply ARDEX WPM 001 by brush or roller. A medium nap (12–15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat, application must consist of laying the product onto the surface and lightly finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25–40 micrometers wet film thickness while ARDEX WPM 001 needs to be applied at between 0.5 and 1.0mm per coat depending on product and application (Refer Table 1).

Critical areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian Standards 3740 – 2004 Waterproofing of wet areas within residential buildings.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall and floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does not slope outwards.
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2mtr) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cure silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS 3740 and the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.
12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 100mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.
14. Apply the membrane 1800mm up the walls or 80mm above the height of the shower rose within the shower recess.
15. Install the shower screen to inside edge of the hob.

Fig.1 – Shower recess – Critical areas

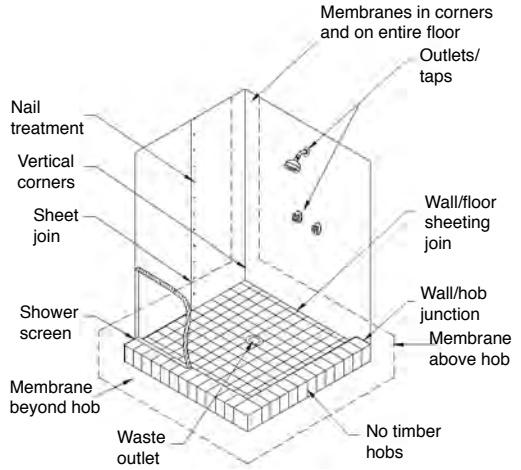
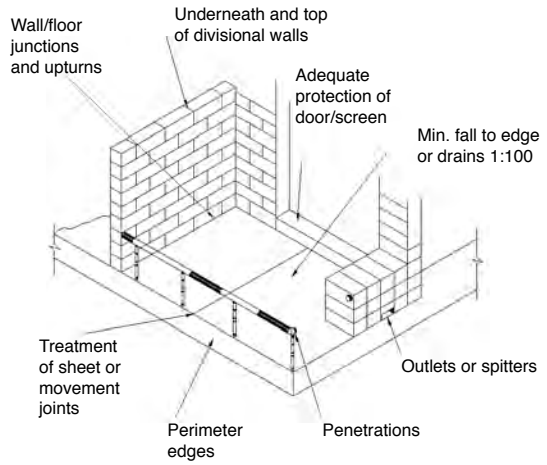


Fig.2 – Balcony – Critical areas



BALCONIES AND DECKS

1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
3. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
4. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
5. Apply the membrane as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
6. Where possible, apply the membrane prior to building divisional walls.
7. Apply the membrane to the entire balcony floor and at least 100mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
8. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
9. Apply the membrane down over the front edge of the balcony onto the drip rail.
10. Carefully seal any gaps around balcony penetrations with a neutral cure silicone prior to applying the membrane.
11. Apply the membrane down into outlets and drains, ensuring excess material is removed.
12. Ensure all weep holes are above the membrane application area.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm in 2 metre (wet areas) or 1:100 externally, must be achieved prior to tiling.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of ARDEX WPM 265 water based primer by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to completely dry prior to the application of the ARDEX WPM 001 membrane. This will take around 20–30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m^2 per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with ARDEX WPM 265 water based primer and allow to dry before applying two coats of ARDEX WPM 001 membrane in a band at least 200mm wide equidistantly across the crack and along the length of the crack.

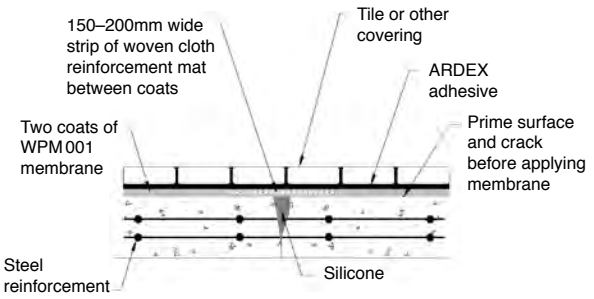
Cracks 2–6mm:

(Refer Fig.3) Prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth preferably using a fluted roller, and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

Contact your local ARDEX representative.

Fig.3 – Crack treatments



ARDEX WPM 001

(Superflex Bathroom and Balcony Premixed) Single Component Undertile Waterproofing Membrane

MOVEMENT/CONSTRUCTION JOINTS

Movement joints (<6mm)

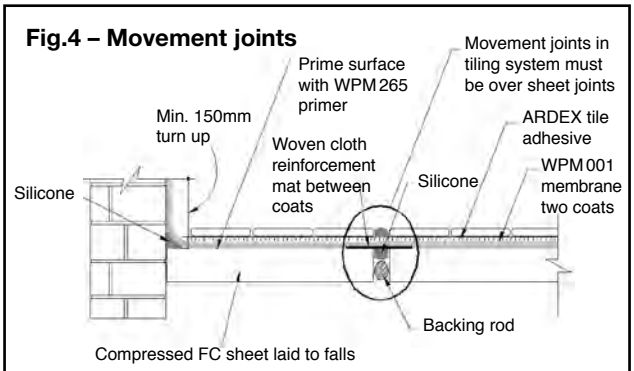
Use same procedure as in crack preparation.

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of ARDEX WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of ARDEX Deckweb woven cloth reinforcement over the applied membrane. Thoroughly wet out the mat and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of ARDEX Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)

Fig.4 – Movement joints



Corners and coving areas

After priming with ARDEX WPM 265 water based primer and allowing it to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates in coving areas and corners. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry.

Apply a first coat of ARDEX WPM 001 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be minimum of 1.0mm). Alternatively, if a reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry. Place a 190mm wide band of ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The ARDEX WPM 001 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of ARDEX WPM 001 to floors.

Walls

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with ARDEX WPM 265 water based primer and allowing to dry, apply two coats of ARDEX WPM 001 (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheet joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of ARDEX WPM 001 are required to achieve a minimum total dry film thickness of 1.0mm. The flooring recommendations should be extended at least 150 mm up all perimeter walls.

Prime the surface with ARDEX WPM 265 water based primer and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1–2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone sealant. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

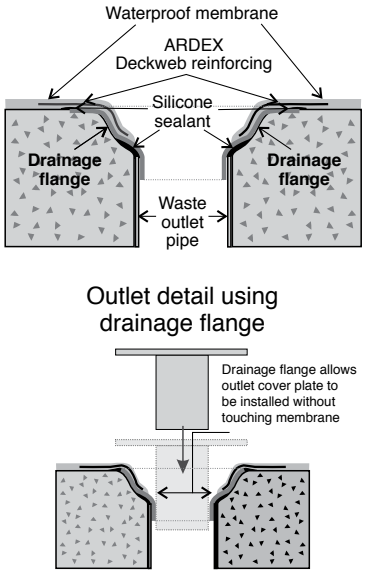
Waste outlet

Prime the surface with ARDEX WPM 265 water based primer and allow to dry. Surfaces of the outlet flange must be primed with an appropriate primer.

Plastic (eg. PVC) fittings should be primed with a solvent based plumbers primer. Prime metal surfaces with a suitable metal primer.

Apply ARDEX WPM 001 over the adjacent floor surface extending down into the waste outlet flange overlapping the edge of flange by at least 30 mm. Place ARDEX Deckweb woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig.5)

Fig.5 – Waste outlet



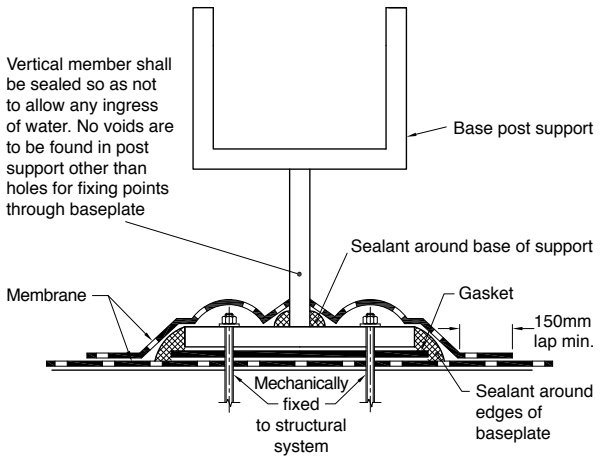
Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.

Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 12mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of ARDEX WPM 001 on the substrate and the flanged metal.

Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.0mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Fig.6 – Post membrane installation



Tiling systems

It is advisable to conduct a flood test of the waterproofed area once the membrane has cured (normally after 72 hours), and before the tiling commences. A broad range of ARDEX tile adhesives can be used over ARDEX membranes. Contact ARDEX or your nearest ARDEX stockist for advice on the most suitable system.

TECHNICAL DATA

ARDEX WPM 001 (Superflex Premixed)
Characteristics of liquid

Form and colour	Blue viscous paste
Type	Single part
Specific gravity	Approx. 1.3kg/litre
pH of liquid	8.5
Tensile strength 7 days dry AS1145	1.04 MPa
Full cure	1.92 MPa
Elongation at break 7 days dry AS1145	780%

Conforms to requirements of class 3 membrane of AS/NZ 4858: 2004 Wet Area Membranes.

VOC content	18g/L

NOTE: Most of the tests have been carried out in the ARDEX laboratory under standard conditions (23±2°C, 50±5% R.H).

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program.

Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations.

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

ARDEX Australia Pty Ltd

Technical Services Toll Free: 1800 224 070

New South Wales	Ph (02) 9851 9100	Fax (02) 9838 7970
Queensland	Ph (07) 3817 6000	Fax (07) 3881 3188
Victoria/Tasmania	Ph (03) 8339 3100	Fax (03) 9308 9332
South Australia	Ph (08) 8406 2500	Fax (08) 8345 3207
Western Australia	Ph (08) 9256 8600	Fax (08) 9455 1227

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October 2010

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Received 13/09/2023

PRODUCT DATA SHEET

Wall | PINK® BATTS® WALL INSULATION

Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily into standard wall constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R4.3 to assist in keeping homes above 18°C as per the World Health Organization's recommendation for a healthy and comfortable home
- Easy to install – lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from over 80% recycled glass making sustainable use of waste
- Made in New Zealand - designed for New Zealand building conditions and reduces emissions associated with the importing of overseas manufactured product

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using over 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months[1]
- Manufactured in Auckland, minimising shipping distances compared to imported products

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Environmental Choice. Further information is available at **nzgbc.org.nz.**

Environmental Choice

All Pink® Batts® Wall insulation products have Environmental Choice New Zealand Accreditation (refer to the Product Specifications)

Building Insulants
Licence No. 2504017

Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

While only BRANZ appraised products are eligible for Environmental Choice, all Pink® Batts® thermal insulation products are manufactured in the same environmentally considerate way.

[1] (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)

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Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body

Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments

General Health

- Pink® Batts® insulation will assist in meeting the World Health Organization recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation[2]

[2] Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	 = 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2018	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2018-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2018-Glass wool exempt	

*Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum levels. See table on page 5.

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New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

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

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® wall insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing bulk thermal Insulation in Residential Buildings
- Pink® Batts® wall insulation should NOT be crushed or folded

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily.
Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

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Wall | PINK® BATTS® WALL INSULATION

Product Specifications

WALL - Thermal Insulation	PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m^2)	APPROX. COVERAGE PER BALE* (m^2)	ENVIRONMENTAL CHOICE
Masonry						
R1.0 Pink® Batts® Masonry R1.0	7160110	1220 x 580	40	21.2	-	✓
R1.2 Pink® Batts® Masonry R1.2	7160134	1220 x 580	50	17.0	-	✓
70mm Wall Range						
R2.2 Pink® Batts® Classic R2.2 70mm Wall	7160248	1140 x 560	70	6.4	7.5	✓
90mm Wall Range						
R1.8 Pink® Batts® Classic R1.8 Wall	7127118	1140 x 560	90	16.6	19.6	✓
R2.2 Pink® Batts® Classic R2.2 Wall	7127122	1140 x 560	90	13.4	15.8	✓
R2.2 Pink® Batts® Steel R2.2 Wall	7160214	1220 x 610	90	15.6	15.6	✓
R2.2 Pink® Batts® R2.2 Narrow Wall	7160243	1140 x 360	90	9.0	11.2	✓
R2.4 Pink® Batts® Classic R2.4 Wall	7127124	1140 x 560	90	10.2	12.1	✓
R2.6 Pink® Batts® Ultra® R2.6 Wall	7127126	1140 x 560	90	9.6	11.3	✓
R2.6 Pink® Batts® Ultra® Steel R2.6 Wall	7160215	1220 x 610	90	9.7	9.7	✓
R2.6 Pink® Batts® Ultra® R2.6 Narrow Wall	7160244	1140 x 360	90	7.4	9.2	✓
R2.8 Pink® Batts® Ultra® R2.8 Wall	7127128	1140 x 560	90	6.4	7.5	✓
R2.8 Pink® Batts® Ultra® R2.8 Narrow Wall	7160247	1140 x 360	90	4.5	5.6	✓
140mm Wall Range						
R3.2 Pink® Batts® Ultra® R3.2 140mm Wall	7127132	1140 x 560	140	9.6	11.3	✓
R3.2 Pink® Batts® Ultra® R3.2 140mm Narrow Wall	7160245	1140 x 360	140	7.0	8.6	✓
R3.6 Pink® Batts® Ultra® R3.6 140mm Wall	7127136	1140 x 560	140	7.0	8.3	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Wall	7127140	1140 x 560	140	5.1	6.0	✓
R4.0 Pink® Batts® Ultra® R4.0 140mm Narrow Wall	7160246	1140 x 360	140	4.1	5.0	✓
R4.3 Pink® Batts® Ultra® R4.3 140mm Wall	7127143	1140 x 560	140	3.2	3.8	✓
R4.3 Pink® Batts® Ultra® R4.3 140mm Narrow Wall	7160262	1140 x 360	140	2.9	3.6	✓

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.
\# For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.

Accreditations/Appraisals/Certifications

BRANZ Appraised
Appraisal No. 238 [2018]

Building Insulants
Licence No. 2504017

Tasman Insulation New Zealand Ltd
Certified QMS

GREENGUARD

Lifetime Warranty #

TASMAN INSULATION NEW ZEALAND

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9-15 Holloway Place, Penrose, Auckland,
New Zealand

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PRODUCT DATA SHEET

Roof | PINK® BATTS® CEILING INSULATION

Application

Pink® Batts® ceiling insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate ceilings in new homes, be retrofitted into existing homes without insulation, or over existing insulation for better performance
- Fit easily into standard ceiling constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R7.0 to assist in keeping homes above 18°C as per the World Health Organisation's recommendation for a healthy and comfortable home
- Easy to install – lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from over 80% recycled glass-making sustainable use of waste
- Designed for New Zealand building conditions

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Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using over 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months[1]
- Manufactured in New Zealand and Australia, reducing shipping distances
- Recycleable packaging

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Environmental Choice. Further information is available at **nzgbc.org.nz.**

Environmental Choice

All Pink® Batts® ceiling insulation products have Environmental Choice New Zealand Accreditation (refer to Product Specifications on page 5 for accredited products)

Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

Licence No 2504017.
Thermal Building Insulants

While only BRANZ appraised products are eligible for Environmental Choice, all Pink® Batts® thermal insulation products are manufactured in the same environmentally considerate way.

Note that Pink® Batts® R3.6 and Pink® Batts® R3.2 ceiling insulation is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made product only.

[1] (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)

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Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies the glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body

Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments

General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18ºC to provide a healthy and comfortable home
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation[2]

[2] Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	 = 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glass wool exempt	

* Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum values. See table on Page 5.

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Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in ceilings and walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® ceiling insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

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

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® ceiling insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing bulk thermal Insulation in Residential Buildings

Pink® Batts® ceiling insulation should NOT be crushed, folded or compressed.

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Roof | PINK® BATTS® CEILING INSULATION

Product Specifications

ROOF - Thermal Insulation		PRODUCT CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER BALE (m^2)	APPROX. COVERAGE PER BALE* (m^2)	ENVIRONMENTAL CHOICE
R1.8	Pink® Batts® Classic R1.8 Ceiling	7110118	1220 x 432	95	13.7	14.4	✓
R2.2	Pink® Batts® Classic R2.2 Ceiling	7110122	1220 x 432	115	12.6	13.3	✓
R2.6	Pink® Batts® Classic R2.6 Ceiling	7110126	1220 x 432	140	10.5	11.1	✓
R3.2	Pink® Batts® Classic R3.2 Ceiling‡	7110132	1220 x 432	170	8.4	8.8	✓‡
R3.2	Pink® Batts® Skillion Roof R3.2	7110232	1220 x 432	115 max	3.7	3.9	✓
R3.6	Pink® Batts® Classic R3.6 Ceiling‡	7110136	1220 x 432	180	7.4	7.7	✓‡
R3.6	Pink® Batts® Skillion Roof R3.6	7110236	1220 x 432	165 max	6.3	6.6	✓
R4.0	Pink® Batts® Ultra® R4.0 Ceiling	7110140	1220 x 432	195	6.3	6.6	✓
R5.0	Pink® Batts® Ultra® R5.0 Ceiling	7110150	1220 x 432	220	4.2	4.4	✓
R6.0	Pink® Batts® Ultra® R6.0 Ceiling	7110160	1220 x 432	235	3.7	3.9	✓
R6.3	Pink® Batts® Ultra® R6.3 Ceiling	7110163	1220 x 432	250	3.2	3.3	✓
R7.0	Pink® Batts® Ultra® R7.0 Ceiling	7110170	1220 x 432	260	2.6	2.8	✓
ROOF - Thermal Retrofit Insulation							
R2.9	Pink® Batts® R2.9 Retrofit Ceiling	7110129	1220 x 432	150	9.5	10.0	✓
R3.3	Pink® Batts® R3.3 Retrofit Ceiling	7110133	1220 x 432	175	8.4	8.8	✓
ROOF and WALL - Thermal Insulation							
R2.4	Pink® Batts® HandyPack R2.4^	7200158	7000 x 580	90	4.06	-	

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary.
‡ This product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made product only.
\# For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty.
^ Product does not have the Pink® Batts® Lifetime Warranty or BRANZ Appraised Accreditation.

Accreditations/Appraisals/Certifications

BRANZ Appraised
Appraisal No. 238 [2012]
Appraisal No. 632 [2012]
Appraisal No. 767 [2012]

Licence No 2504017.
Thermal Building Insulants

Tasman Insulation New Zealand Ltd
Certified QMS

TASMAN INSULATION NEW ZEALAND

DISTRIBUTED BY
Tasman Insulation New Zealand Ltd
9-15 Holloway Place, Penrose, Auckland,
New Zealand

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Building Consent BC230758
Received 13/09/2023

BRANZ Appraised
Appraisal No. 238 [2018]

PINK® BATTS® INSULATION

Appraisal No. 238 [2018]

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

Amended 26 November 2018.

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

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

Scope

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

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Pink® Batts® Insulation, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:**

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years and B2.3.1 (b) 15 years. Pink® Batts® Insulation meets these requirements. See Paragraph 8.1.

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

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

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

TASMAN

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WFTAO

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC230578 14/09/2023 brennao

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

Building Consent BC230758
Received 13/09/2023

Technical Specification

4.1 Pink® Batts® Insulation is a resin bonded fibrous glasswool insulation manufactured from recycled and/or virgin glass and cured urea extended phenolic resin.

4.2 Pink® Batts® Insulation is manufactured in a range of sizes to suit framing centres and cavity depths. Building Insulation Blanket (BIB) is supplied in rolls for commercial applications. Pink® Batts® Insulation is available as set out in Table 1.

Table 1: Pink® Batts® Insulation product table.

R-value	Length (mm)	Width (mm)	Nominal Thickness (mm)	Nominal Total Area (m^2)	Density (kg/m^3)
Roof - Thermal Insulation					
1.8[1]	1220	432	95	13.7	8.3
2.2[1]	1220	432	115	12.6	8.2
2.6[1]	1220	432	140	10.5	7.7
3.2[1]	1220	432	170	8.4	8.4
3.2[1]	1220	432	170	8.4	6.9
3.6[1]	1220	432	180	7.4	7.4
3.6	1220	432	180	7.4	8.8
4.0[1]	1220	432	195	6.3	8.1
5.0[1]	1220	432	220	4.2	10.0
6.0[1]	1220	432	235	3.7	13.0
6.3[1]	1220	432	250	3.2	12.3
7.0[1]	1220	432	260	2.6	15.8
Roof - Building Insulation Blanket					
1.2	12,000	1200	50	28.8	12.0
1.8	8000	1200	75	19.2	12.0
2.2	8000	1200	100	19.2	9.1
2.4	8000	1200	100	19.2	11.5
2.6	6000	1200	110	14.4	11.0
3.2	8000	1200	135	9.6	10.9
Roof - Pink® Batts® Retrofit Insulation					
2.9[1]	1220	432	150	9.5	7.7
3.3[1]	1220	432	175	8.4	7.1
Wall - Masonry Insulation					
1.0[1]	1220	580	40	21.2	14.0
1.2	1220	580	50	17.0	12.8
70 mm Wall Range - Thermal Insulation					
2.2	1140	560	70	6.4	30.0
90 mm Wall Range - Thermal Insulation					
1.8[1]	1140	560	90	16.6	9.0
2.2[1]	1140	560	90	13.4	11.6
2.4[1]	1140	560	90	10.2	14.7
2.4[1]	1140	560	90	10.2	17.4
2.6[1]	1140	560	90	9.6	19.4
2.8[1]	1140	560	90	6.4	27.1

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

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

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

[1] Pink® Batts® Insulation products that have the Environmental Choice license.

4.3 Pink® Batts® Insulation is pink in colour and is baled in polythene bags with labelling in compliance with AS/NZS 4859.1.

4.4 Pink® Batts® Retrofit Ceiling Insulation is pink in colour and is baled in teal polythene bags with labelling in compliance with AS/NZS 4859.1.

4.5 Accessories used with Pink® Batts® Insulation, which are supplied by the insulation installer, are wire netting, plastic strapping and fixings.

Handling and Storage

5.1 Pink® Batts® Insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the bales. The bales must be stored in an orientation that avoids excessive compression of the product.

5.2 In general, insulation products are sensitive to the length of time they are stored under compression packaging. Product that does not recover to its nominal thickness may not achieve the stated R-value.

Technical Literature

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

Design Information

General

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

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

7.2 Pink® Batts® Insulation thermal resistance (R-value) has been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.

7.3 Pink® Batts® Insulation is designed to be friction-fitted between wall, ceiling or roof framing. They can also be laid directly on a ceiling lining, over ceiling battens or joists/truss chords. In other horizontal situations, the insulation must be adequately supported by galvanised wire netting or some other suitable durable material.

7.4 Where the insulation is installed in exterior walls, the insulation material nominal thickness must be selected to provide a snug close fit which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.

7.5 Where the insulation is retrofitted in external walls without a wall underlay, and with direct-fixed claddings, the insulation must be at least 20 mm thinner than the framing to allow a gap of at least 20 mm between the insulation and the wall cladding. Horizontal straps must be stapled into the sides of the wall studs at 300 mm centres maximum as support before the insulation is installed. Refer also to NZS 4246, Section 5.4.2.

7.6 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

7.7 Building Insulation Blanket is designed specifically for commercial roof and commercial wall applications. In residential applications, installation must be completed in line with NZS 4246.

7.8 To prevent moisture transfer and to provide roof ventilation, a separation of 25 mm minimum is required between the insulation and any rigid substrate or flexible roof underlay. Selecting specifically designed skillion roof insulation products with a controlled nominal thickness can assist with this requirement.

7.9 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.

7.10 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturer's instructions and NZS 4246. See Paragraphs 10.1 – 10.3.

Durability

Serviceable Life

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

Maintenance

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

Prevention of Fire Occurring

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

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

Downlights

10.2 Recessed luminaires shall be of type and be installed in accordance with NZBC Acceptable Solution C/AS1 to C/AS6, Section 7.4.

10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires in existing buildings.

Control of Internal Fire and Smoke Spread

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

External Moisture

12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.

12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2 (a), or a lower moisture content if required by the lining manufacturer.

Internal Moisture

13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.

13.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2 E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

14.1 Pink® Batts® Insulation will contribute to meeting the requirements of NZBC Clause H1, Performance H1.3.1 (a) and H1.3.2 E by compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraphs 7.1 - 7.8.

14.2 Pink® Batts® Insulation R-values have been determined by BRANZ testing to AS/NZS 4859.1 and are given in Table 1.

Installation Information

Installation Skill Level Requirements

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

General

16.1 Installation of Pink® Batts® Insulation must be in accordance with the Technical Literature, Installation Instructions and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.

16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.

16.3 Pink® Batts® Insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.

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

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

16.5 The clearance requirements for heating appliances and downlights must be followed. Refer also to NZS 4246.

Inspections

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

Health and Safety

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

Basis of Appraisal

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

Tests

18.1 BRANZ has carried out thermal resistance testing of Pink® Batts® Insulation in accordance with AS/NZS 4859.1.

18.2 Tests have been carried out in accordance with AS 1530.1. Pink® Batts® Insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.

Other Investigations

19.1 An assessment of the durability of Pink® Batts® Insulation has been made by BRANZ technical experts.

19.2 The manufacturer's Technical Literature including installation instructions have been reviewed by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of Pink® Batts® Insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.

20.2 The range of Pink® Batts® Insulation products have been assessed for their environmental impact by the New Zealand Ecolabelling Trust and comply with the requirements of the Environmental Choice Specification, Licence No. 2504017 - Thermal (resistive type) Building Insulants. The products that have the Environmental Choice license are noted in Table 1.

20.3 Tasman Insulation New Zealand Ltd is responsible for the quality of the product supplied.

20.4 Quality of installation of the product on site is the responsibility of the installer.

20.5 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.

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

Sources of Information

- AS 1530.1: 1994 Combustibility test for materials.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- NZS 4246: 2016 Energy efficiency - Installing bulk thermal insulation in residential buildings.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- Acceptable Solution and Verification Methods for New Zealand Building Code Energy Efficiency Clause H1, Ministry of Business, Innovation and Employment, Fourth Edition, [including Amendment 3, 1 January 2017].
- Ministry of Business, Innovation and Employment record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 05 September 2018.

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

Amendment No. 2, dated 26 November 2018.

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

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

BRANZ

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

The Appraisal is issued only to Tasman Insulation New Zealand Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product as described herein;
   b) must be read, considered and used in full together with the Technical Literature;
   c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
   d) is copyright of BRANZ.
2. Tasman Insulation New Zealand Ltd:
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
   a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
   b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
   c) any guarantee or warranty offered by Tasman Insulation New Zealand Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Tasman Insulation New Zealand Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
03 August 2018

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

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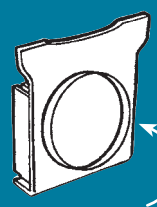
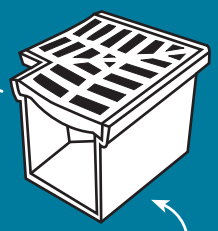
Drainage made simpler.

RELN

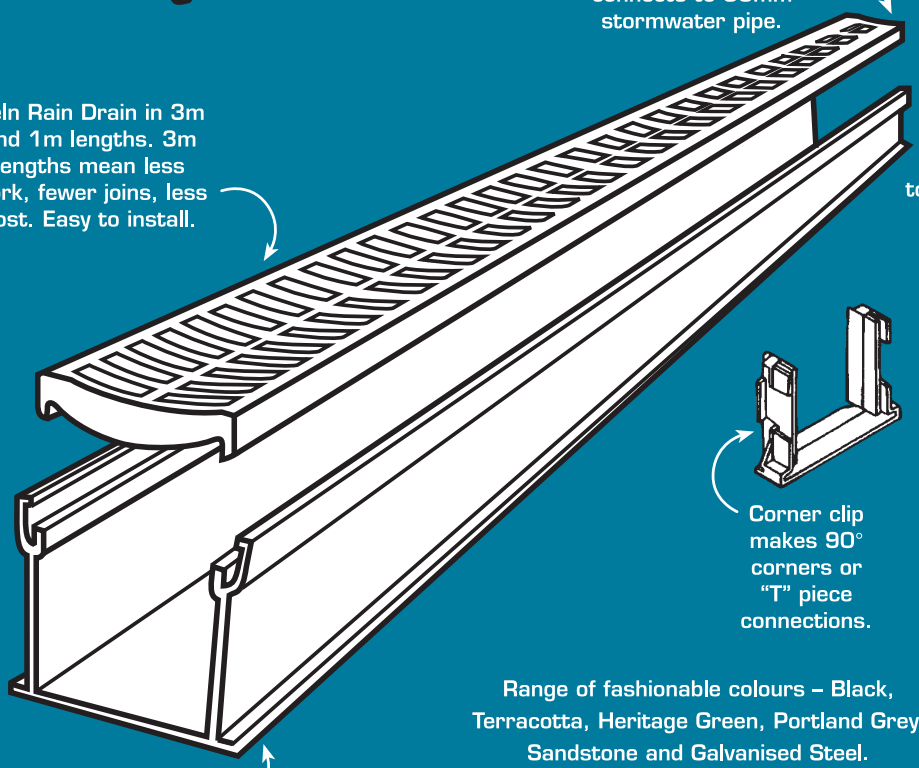


End Cap finishes off end of drain or connects to 90mm stormwater pipe.

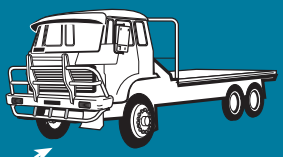


The quick easy way to create 90° corners.

Reln Rain Drain in 3m and 1m lengths. 3m lengths mean less work, fewer joins, less cost. Easy to install.



Corner clip makes 90° corners or "T" piece connections.

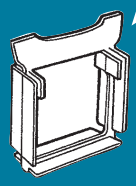


Reln Rain Drain withstands 5 tonne vehicle without moving in the concrete.

Range of fashionable colours – Black, Terracotta, Heritage Green, Portland Grey, Sandstone and Galvanised Steel.

Hold down feet stop movement once concrete sets.

Feet also prevent flotation during concrete pour.



FREE joiner allows easy joining of lengths and reuse of offcuts to avoid waste.

RELN RAIN DRAIN

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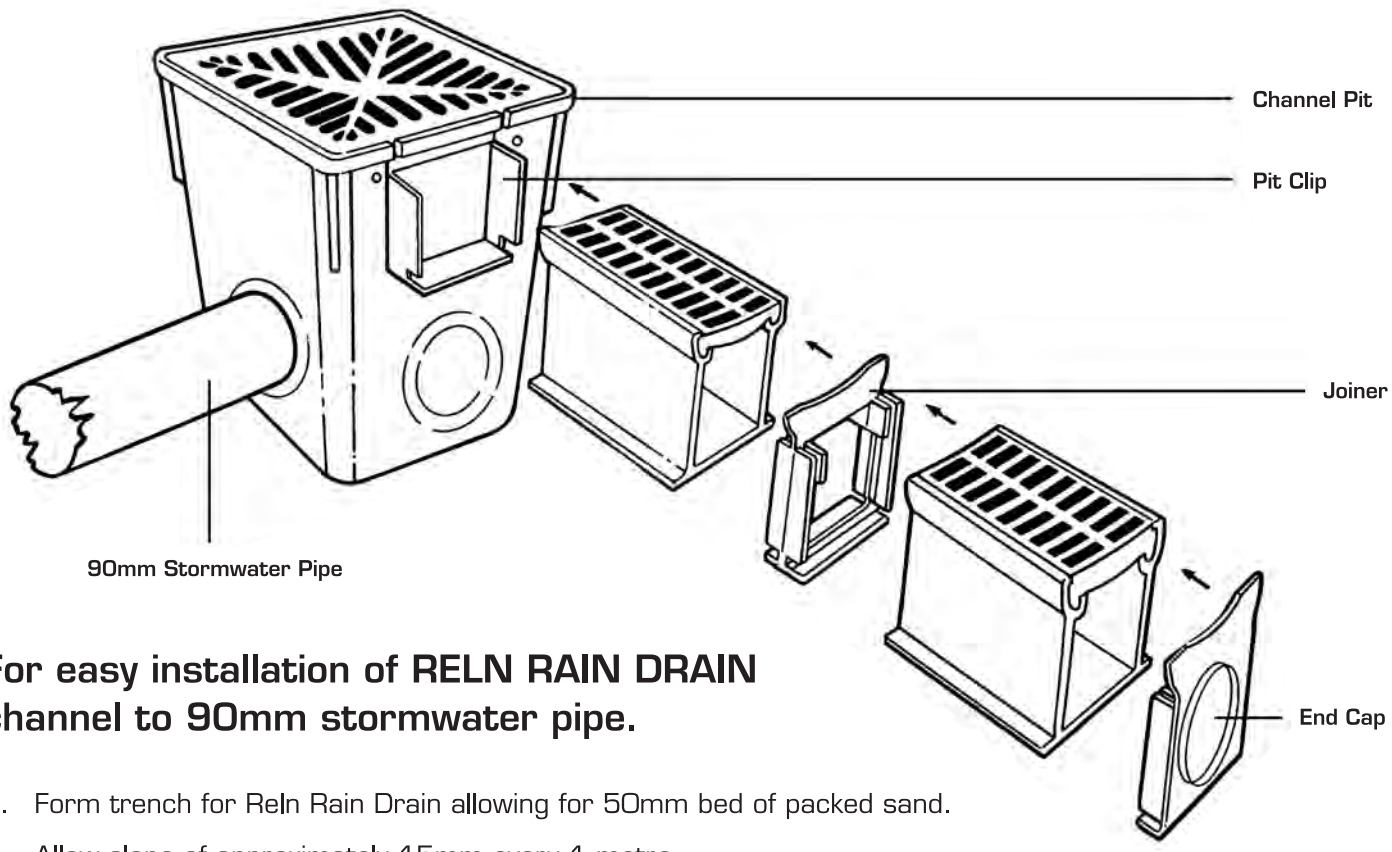
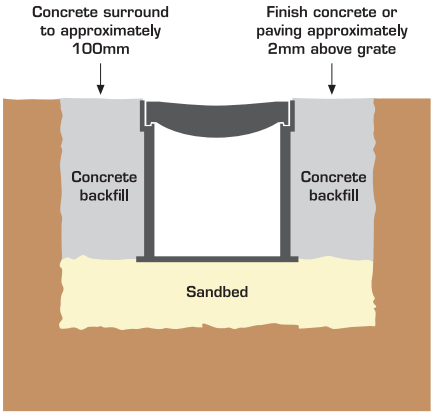
Use this simple Rain Drain system



For easy installation of RELN RAIN DRAIN channel to 90mm stormwater pipe.

1. Form trench for Reln Rain Drain allowing for 50mm bed of packed sand.
2. Allow slope of approximately 15mm every 1 metre.
3. Join lengths with free Joiner supplied.
4. Use End Cap at highest end of installation.
5. At lowest end use Pit Clip to join channel to Channel Pit which connects to the stormwater pipe to clear away water.
6. Seal joints with silicone.
7. Use Reln Leafguard inside the Channel Pit to collect debris.
8. Install with grate fitted. Protect grate from concrete splash with masking tape.
9. Pour concrete to fill trench on each side of the Rain Drain channel. For efficient water flow into grates, set grates 2mm below concrete or paver surface.
10. Allow 72 hours cure before vehicle use. Remove tape from grates.



RELN RAIN DRAIN

Note: The Reln Rain Drain range is subject to intellectual property protection.

RELN