WAIMAKARIRI
DISTRICT COUNCIL

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

BC No: 200635

SITE DETAILS:

33 TARA CRESCENT

WOODEND

LEGAL:

LOT 156 DP 525252

APPROVED BUILDING CONSENT DOCUMENTS AND PLANS

(FULL SET SUPPLIED)

- 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 3118906

or

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

- Please refer to your inspection schedule for details of inspections to be carried out.
- 2-3 working day's notice should be given and provision 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

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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)



CONSENT ISSUED BC200635 - Page 3 of 355

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

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BC200635

DWELLING & 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**
- **Certificate of Title or Sales & Purchase Agreement**
- **PIM, Resource Consent –** By Council

PLEASE NOTE

- Although your Consent documentation states 48 hours notice is required, it is not always possible to carry out an inspection within this period.
- 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 and complete and sign *form 6*, application for Code Compliance Certificate which is enclosed with your building consent. You should have this form ready for when the building Inspector arrives on site to carry out the final inspection. 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

Mt Lyford Investments Limited C/- Leigh Adams Architecture Limited 250 King Street Rangiora 7400	No.	BC200635
	Issue date	14 August 2020
	Overseer	Nicola McAnulty

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 Dwelling
Estimated Value	$270000.00
Location	33 Tara Crescent WOODEND
Legal Description	LOT 156 DP 525252 0.040700 Ha
Valuation No.	2161500201

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.

Please give at least 48 hours notice for the next required inspection.

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.

BC200635
Compacted Hardfill - pre DPM -
Foundation / Floor Slab -
Structure Pre Roof Pre Wrap -
Building Wrap & Sill Tape -
Cavity Battens & Flashings -
Mid Height Veneer -
Drains -
Preline & Plumbing -
Prestopping -
Final -

WAIMAKARIRI DISTRICT COUNCIL

Form 5

Building consent BC200635

Section 51, Building Act 2004

The building

Street address of building: 33 Tara Crescent WOODEND

Legal description of land where building is located: LOT 156 DP 525252 0.040700 Ha

Valuation number: 2161500201

Building name:

Location of building within site/block number:

Level/unit number: 1

The owner

Name of owner: Mt Lyford Investments Limited

Contact person: Michael Chernishoff

Mailing address: PO Box 298 Kaiapoi 7644

Street address/registered office:

Phone number: Landline: Mobile: 0274389109

Daytime: After hours:

Facsimile number:

Email address: mike@misco.co.nz

Website:

First point of contact for communications with the council/building consent authority:
Leigh Adams Architecture Limited

Building work

The following building work is authorised by this building consent:

DWELLING WITH ATTACHED GARAGE 33 TARA CRESCENT WOODEND LOT 156 DP 525252

Primary Specified Intended Use: Housing - Detached dwellings

Description of Intended Use: Residential Dwelling

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 condition:

The Building Act 2004, s90, 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.

This building consent is issued with the following advice notes:

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 two full working days in advance of the required inspection date. 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.

Comply with the endorsements on the plan.

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

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.

Occupational Health and Safety and the Labour Department 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

Your consent is issued subject to manufactures 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 building consent authority 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

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

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

Inspection List

Form 6 Application for Code Compliance



Shirley Cresswell
Building Unit Administrator

On behalf of: Waimakariri District Council
Date: 14 August 2020

WAIMAKARIRI
DISTRICT COUNCIL

Private Bag 1005, Rangiora 7440
Phone 0800 965 468 (0800 WMK GOV)
Fax 03 313 4432 - waimakariri.govt.nz

CODE COMPLIANCE CERTIFICATE APPLICATION

Under The Building Act 2004, Section 92

BC No.

Issued by:

THE BUILDING

1. Site address:
   (Street / Road / Township)
2. Legal description of the land where the building is located:
   Lot: DP: Valuation Number:
3. Building Name (if applicable):
4. Location of building within site:
   (Only applicable to multi-development sites)

THE OWNER

5. Owner's name:
   (Company or organisation name if applicable)
6. Contact person:
7. Mailing address:
8. Street address / Registered office:
9. Mobile: Landline: Email:

THE AGENT

PLEASE NOTE - Authorisation is required from the owner to act as agent.

11. Agent's name:
    (Company or Organisation name if applicable)
12. Contact person:
13. Mailing address:
14. Street address / Registered office:
15. Mobile: Landline: Email:

APPLICATION

16. **I request that you issue a Code Compliance Certificate for this work under section 95 of the Building Act 2004.**
The Code Compliance Certificate should be sent to: ☐ Owner ☐ Agent

17. **I wish to receive my certificate in the following format:**
PLEASE NOTE - If Hard copy please confirm if you wish to pick it up from the council or have it posted.
Hard copy: ☐ (post) OR ☐ (pick-up) OR ☐ Email

18. **The following field must be completed when submitting the Code Compliance Certificate application:**
All building work carried out under the Building Consent specified in this form was completed on:

RESTRICTED BUILDING WORK

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

The Licensed Building Practitioner(s) who carried out or supervised the restricted building work is/are as follows:

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.:		Fax No.:	
Email:			

DESIGNER(S)

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

CERTIFYING DRAINLAYER

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

CERTIFYING PLUMBER

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

CERTIFYING GASFITTER

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

REGISTERED ELECTRICIAN

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

STRUCTURAL ENGINEER

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

SPECIFIED SYSTEMS

The following specified systems are contained on the compliance schedule for the building and, in the opinion of the personnel who installed them, are capable of performing to the performance standards set out in the Building Consent. Tick appropriate specified systems below:

- ☐ **There are no specified systems in the building**
- ☐ SS1 Automatic systems for fire suppression
- ☐ SS2 Emergency warning systems
- ☐ SS3/1 Automatic door
- ☐ SS3/2 Access controlled doors
- ☐ SS3/3 Interfaced fire or smoke doors or windows
- ☐ SS4 Emergency lighting systems
- ☐ SS5 Escape route pressurisation systems
- ☐ SS6 Riser mains
- ☐ SS7 Automatic back-flow prevention
- ☐ SS8/1 Passenger carrying lifts
- ☐ SS8/2 Service lifts
- ☐ SS8/3 Escalator and moving walks
- ☐ SS9 Mechanical ventilation or air conditioning systems
- ☐ SS10 Building maintenance units
- ☐ SS11 Laboratory fume cupboards
- ☐ SS12/1 Audio loops
- ☐ SS12/2 FM Radio and infrared beam transmission systems
- ☐ SS13/1 Mechanical smoke control
- ☐ SS13/2 Natural smoke control
- ☐ SS13/3 Smoke curtains
- ☐ SS14/1 Emergency power systems
- ☐ S14/2 Signs for SS1-13
- ☐ SS15/1 Spoken information to facilitate evacuation
- ☐ SS15/2 Final exits
- ☐ SS15/3 Fire separations
- ☐ SS15/4 Signs for facilitating evacuation
- ☐ SS15/5 Smoke separations
- ☐ SS16 Cable cars

ATTACHMENTS

The following documents are attached to this application (where applicable):

- ☐ Certificates that relate to the energy work (e.g. gas and electricity)
- ☐ Evidence that the specified systems are capable of performing to the performance standards set out in the building consent
- ☐ Proof of potability of drinking water from private well, and/or rain water catchment, supply (refer to New Zealand Drinking Water Standards 2005)
- ☐ Memoranda (records of building work) from licenced building practitioner(s) stating what restricted building work they carried out or supervised
- ☐ Other documents from personnel that carried out the work

OWNER / AGENT AUTHORISATION

PLEASE NOTE - By entering your name in the box below you are giving your authority for the application to proceed.

Name: Date:

I am the ☐ Owner ☐ Agent

Note: If acting on behalf, by entering your name above you hereby declare that you are authorised to act as Agent for the Owner.

NB: Ensure Agent Authorisation section is completed - see below.

AGENT AUTHORISATION
(TO BE AUTHORISED BY OWNER)

PLEASE NOTE - By entering your name in the box below you are giving your authority for this application to proceed.

I authorise to act as Agent on my behalf for this Building Consent application under Sections 33 and 45 of the Building Act 2004.

With respect to this Building Consent application, I authorise to act as Agent on my behalf for the application for Code Compliance Certificate under Section 92 of the Building Act 2004.

Name (Owner): Date:

TERMS OF TRADE

I/We understand that:

Building Consents shall be paid for when the consent is collected or if the consent is not collected 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.

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.

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.

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 will need to apply for a time extension*.

*Fees apply

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 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.

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 and if authorised, the application for a Code Compliance Certificate under Section 92 of the Building Act 2004. They will receive all correspondence and must be authorised by the owner - see page 5. All amendments require new authorisation.

FEES

Please note - All work for the issue of a Code Compliance Certificate will be invoiced and must be paid in full before the Code Compliance Certificate will be issued.

NOTICE TO FIX

If a Notice to Fix is issued, it will state the building work that must be carried out and will set a timeframe in which this work must be completed. Once the work listed has been completed a further inspection should be booked by phoning the Council Building Unit on 03 311 8906.

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)*:

At *(address)*:

For *(Owner)*:

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

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 BC200635.02
Received 23/12/2021

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

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

BC No.:

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)*

33 Tara Crescent Ravenswood Woodend

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: 156 DP: 525252 Valuation Number: 2161500201 Resource Consent:

Building name: *(if applicable)* N/A

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

As per sheet 1 of the submitted plans

Number of levels: 1 Unit/Level No.: 1

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

Existing: 0 New: 160 Total: 160

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

Residential

Year building first constructed: 2021 *(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)*

Mt Lyford Investments Ltd

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

Michael Chernishoff

Mailing address: 80 Mariehau Road Marshland Christchurch 8083

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

80 Mariehau Road Marshland Christchurch 8083

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
0274389109	0274389109	0274389109	0274389109	N/A

Email: mike@misco.co.nz Website:

Building Consent BC200635.02
Received 23/12/2021

The following evidence of ownership is attached to this application:

☐ Copy of Record of Title *(formerly Certificate of Title)* OR ☑ Council to provide *(additional charge of $15)*
(Current within 1 month of being issued and must include a deposited plan [diagram])

☐ 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)* As per owners details

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: Leigh Adams Architecture

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

Mailing address: 250 King Street Rangiora 7400

Street address/Registered office: *(if different than above)*
250 King Street Rangiora 7400

Phone number:

Landline:	Mobile:	Daytime:	After hours:	Fax:
033133479	0211631680	033133479	033133479	N/A

Email: leigh@leighadams.co.nz Website:

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

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 BC200635
Please Note: *Amendments must be authorised by the owner*
☐ Building Consent for Above Ground Pool and/or Non-Exempt Small Heated Pool

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

Building Consent BC200635.02
Received 23/12/2021

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: ☐ Post OR ☐ Pick-up

☑ Hard copy (onsite): ☐ post OR ☑ pick-up

PLEASE NOTE - *One set of "On-site" 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: Leigh Adams Date: 6th December 2021

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.*

Single storey dwelling with attached garage - amendment is to change showers from acrylic cabinets to tiled showers with step over sills to both ensuite and bathroom.

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

Residential dwelling

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)*

N/A

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?)*

N/A

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)*

$ 275000

If this is an application to amend a building consent, advise the estimated value of amended building work (incl. GST) $ 0

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	TBC	TBC
Carpentry	TBC	TBC
Exterior Plasterer	TBC	TBC
Bricklayer	TBC	TBC
Blocklayer		
Roofer	TBC	TBC

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Key personnel

Builder

Name: Reg. No.:

Address:

Phone No.: Email:

Designer(s)

Name: Leigh Adams Reg. No.: BP118930

Address: 250 King Street Rangiora 7400

Phone No.: 033133479 Email: leigh@leighadams.co.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:

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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:

N/A

Notes

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

N/A

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.

Application Plans
Application Specification and Supporting Documentation

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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	Please see attached overleaf	
☐ B2 Durability		
☐ C1-C6 Protection from fire		
☐ D1 Access routes		
☐ D2 Mechanical installations for access		
☐ E1 Surface water		
☐ 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		

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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)*

N/A

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

N/A

☑ 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.

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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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Swimming pools (as applicable)

Office use only
These have been provided:

- ☐ 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	4
☑ Corrosion zone (if applicable)	1

- ☐ 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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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

Office use only
These have been provided:

☐

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

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- ☐ 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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Received 23/12/2021

Office use only

Further information required? ☐ Yes ☐ No

WAIMAKARIRI DISTRICT COUNCIL

Date/time received: Officer:

Date/time vetted/accepted: Officer:

Office use only

Amount paid: $ 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.

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.

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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 will need to apply for a time extension*.
*Fees apply

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.

WAIMAKARIRI DISTRICT COUNCIL
215 High Street, Rangiora
Private Bag 1005, Rangiora 7440
Free Phone 0800 965 468
Email office@wmk.govt.nz
waimakariri.govt.nz

BUILDING CONSENT AND/OR PIM APPLICATION
FOR DWELLINGS & OTHER WORK THAT DOES NOT FIT THE CRITERIA FOR SPECIFIED MINOR WORKS FIXED FEE
NOT FOR COMMERCIAL PROJECTS

Under The Building Act 2004, Sections 33, 45 & Schedule 1, Part 1, Section 2, BAA13

BC No. 200635

THE BUILDING

1. Site address: 33 Tara Crescent Woodend
(Street / Road / Township)
2. Legal description of the land where the building is located:
Lot: 156 DP: 525252 Valuation Number: 2161500201
3. Building Name (if applicable): N/A
4. Location of building within site: As per sheet 1 of the plans
(Only applicable to multi-development sites)
5. Number of levels: 1 6. Unit/Level No.: 1
7. Floor area m^2 - Existing: 0 New: 160 Total: 160
8. Current lawfully established use: N/A
(i.e. use on any previous consent for the existing building)
9. Year building first constructed: Will be 2020
(Only applicable to existing buildings, approximate date is acceptable, eg 1920's)

THE OWNER

10. Owner's name: Mt Lyford Investments Ltd
(Company or organisation name if applicable)
11. Contact person: Michael Chernishoff
12. Mailing address: 80 Mairehau Road Marshland Christchurch 8083
13. Street address / Registered office: 80 Mairehau Road Marshland Christchurch 8083
14. Mobile: 0274389109 Landline: 0274389109 Email: mike@misco.co.nz
15. The following evidence of ownership is attached to this application:
☐ Copy of Certificate of Title OR ☑ Council to provide (additional charge of $15)
(Current within 1 month of being issued and must include a deposited plan [diagram])
☐ Signed copy of Sale and Purchase Agreement
(If Certificate of Title is not issued)

THE AGENT

PLEASE NOTE - Authorisation is required from the owner to act as agent.

16. Agent's name: Leigh Adams Architecture
(Company or Organisation name if applicable)
17. Contact person: Leigh Adams
18. Mailing address: 250 King Street Rangiora 7400
19. Street address / Registered office: 250 King Street Rangiora 7400
20. Mobile: 0211631680 Landline: 033133479 Email: leigh@leighadams.co.nz

BC200635

APPLICATION

21. **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 Schedule 1, Part 1, Section 2, BAA13)
- ☐ Amendment to Building Consent
- ☐ Building Consent for Above Ground Pool and/or Non-Exempt Small Heated Pool

22. **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/couriered (couriered will incur an additional cost).

- ☑ Electronically via Sharefile Transfer Portal (You must be set up and registered for this option)
- ☐ USB: ☐ (post) OR ☐ (pick-up) OR ☐ (courier)
- ☑ Hard copy (on site): ☐ (post) OR ☑ (pick-up) OR ☐ (courier)

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

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

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

Company name: (If applicable)

Contact person:

Mailing address:

Mobile: Landline: Email:

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

SPECIFY AND PROVIDE WITH APPLICATION

	APPLICANT TO COMPLETE	*OFFICE USE ONLY*
Building Element – Site information		
Completed application form	☑	☑
Set of plans / specifications (1 copy)	☑	☑
Certificate of Title / Sales & Purchase (1 copy)	☑	☑
ONLY FOR SWIMMING POOL: Building Element – Drawn Information / Specifications / Details		
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	☐	☐

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PROJECT

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

Single story dwelling with attached garage

26. Specify the intended use of the building (e.g. residential/show home) Residential dwelling

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

If yes provide details

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

29. Intended life of the building:

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

30. Is this a staged consent: ☐ Yes ☑ No

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

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

32. Estimated value (incl GST) $ 270000
(i.e. the estimated aggregate of the values of all goods and services to be supplied for the building work and includes GST).

GEOTECHNICAL REPORT

If a geotechnical report has been included in this application, please confirm that it has been uploaded to the Canterbury Geotechnical database by providing its unique report reference number below.

Report number:

PROJECT INFORMATION MEMORANDUM

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
- ☐ Other matters known to the applicant that may require authorisations from the territorial authority:

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NOTES

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

This is almost identical to BC190747 processed by Nicola McAnulty (1of 10 plans that are the same - 5 already processed). We worked through very thoroughly on the first one to allow subsequent consents to be looked at by the same processor if possible.

BUILDING CODE COMPLIANCE

The building work will comply with the building code as follows:
(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; if not applicable, put n/a	**Waiver / modification required** (State nature of waiver or modification of building code required; if not applicable, put n/a)
☐ B1 Structure	Please see attached overleaf	
☐ B2 Durability		
☐ C1 - C6 Protection from fire		
☐ D1 Access routes		
☐ D2 Mechanical installations for access		
☐ E1 Surface water		
☐ 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		

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COMPLIANCE WITH BUILDING CODE CLAUSES

PROJECT: PROPOSED RESIDENCE AT 33 TARA CRESCENT RAVENSWOOD
DATE: 24TH JUNE 2020
JOB No:

CLAUSE:		MEANS OF COMPLIANCE:	WAIVER
HB	NZBC Handbook		N/A
B1	Structure	Alternative Solution - Foundations, AS1- Slab, framing, Bracing, Lintels. VM1& VM4 -Trusses , Garage Door Lintel	N/A
B2	Durability	AS1- Durability evaluation VM1- Durability applications, Maintenance, Generic materials.	N/A
C1-6	Protection From Fire	AS1- Solid Fuel Heater (Heat Transfer)	N/A
	Prevention Of Fire	AS1- Escape Path Lengths. (24m max).	N/A
	Areas Affected Beyond Fire Source	AS1- Distance off boundary (greater than min), Building Height. (Less than max)	N/A
	Movement To Safety		N/A
	Access For Fire Fighting		
	Structural Stability		
D1	Access Routes	AS1-Slip Resistance.	N/A
D2	Mechanical Installations for Access	N/A	N/A
E1	Surface Water	AS1- Protection from flooding, Surface water runoff, Drain leakage test, Minimum floor levels, Down pipes, Gutters.	N/A
E2	External Moisture	AS1- Cladding Systems, roofing systems, Weather-tightness risk factors, flashings, floors, Construction moisture.	N/A
E3	Internal Moisture	AS1- Prevention of fungal growth, overflow, water-splash.	N/A
F1	Hazardous Agent on Site	VM1- Hazardous Materials	N/A
F2	Hazardous Building Materials	AS1- Glazing	N/A
F3	Hazardous Substances and Processes	N/A	N/A
F4	Safety from Falling	AS1- Barriers, Opening windows.	N/A
F5	Construction and Demolition Hazard	AS1- Work site barriers, Safety fencing.	N/A
F6	Lighting for Emergency	N/A	N/A
F7	Warning Systems	AS1- Installation, Description & Location	N/A
F8	Signs	N/A	N/A
G1	Personal Hygiene	AS1- Number of sanitary fixtures, location	N/A
G2	Laundering	AS1- Laundering Facilities	N/A
G3	Food Preparation and Prevention of Contamination	AS1- Appliances & Facilities	N/A
G4	Ventilation	VM1- Ventilation rate, AS1- Air purity & Ventilation	N/A
G5	Interior Environment	N/A	N/A
G6	Airborne and Impact Sound	N/A	N/A
G7	Natural Light	VM1- Illuminance, AS1- Vertical window in external walls, Awareness of outside environment.	N/A
G8	Artificial Light	N/A	N/A
G9	Electricity	AS1- Electrical installation	N/A
G10	Piped Services	AS1- Hazardous Substances Pipe installation	N/A
G11	Gas as an Energy Source	N/A	N/A
G12	Water Supply	VM1- Sanitary plumbing, AS1- Water supply system, requirements for hot water system, materials and installation, Equipotential bonding, Water tightness.	N/A
G13	Foul Water	VM1- Sanitary plumbing, gully traps, pipe gradient & size, drain ventilation materials of pipes & joints, bedding & backfill, Drains under buildings. AS1 & AS2- Water traps, Sanitary plumbing, Discharge pipes, Vent pipes, pipe materials, Support & Thermal movement, Water tightness.	N/A
G14	Industrial Liquid Waste	N/A	N/A
G15	Solid Waste	N/A	N/A
H1	Energy Efficiency	VM1- Thermal envelope. AS1- Control of heat flow, Control of solar heat, Hot water system, Thermal envelope	N/A

COMPLIANCE SCHEDULE

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 ☑

RESTRICTED BUILDING WORK

Does 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	TBC	TBC
CARPENTRY	TBC	TBC
EXTERIOR PLASTERER		
BRICKLAYER	TBC	TBC
BLOCKLAYER		
ROOFER	TBC	TBC

KEY PERSONNEL

BUILDER

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

DESIGNER(S)

Name:	Leigh Adams	Reg. No.:	BP118930
Address:	250 King Street Rangiora 7400		
Phone No.:	033133479 or 0211631680	Fax No.:	
Email:	leigh@leighadams.co.nz		

CERTIFYING DRAINLAYER

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

CERTIFYING PLUMBER

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

CERTIFYING GASFITTER

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

REGISTERED ELECTRICIAN

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

STRUCTURAL ENGINEER

Name:	Powell Fenwick Consultants Ltd - Phil Paterson	Reg. No.:	CPEng 228649
Address:	383 Colombo Street Sydenham Christchurch		
Phone No.:	033661777 or 021507616	Fax No.:	
Email:	philp@pfc.co.nz		

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OWNER / AGENT AUTHORISATION

PLEASE NOTE - By entering your name in the box below you are giving your authority for the application to proceed.

Name: Michael Chernishoff Date: 24th June 2020

I am the ☑ Owner ☐ Agent

Note: If acting on behalf, by entering your name above you hereby declare that you are authorised to act as Agent for the Owner.

NB: Ensure Agent Authorisation section is completed - see below.

AGENT AUTHORISATION
(TO BE AUTHORISED BY OWNER)

PLEASE NOTE - By entering your name in the box below you are giving your authority for this application to proceed.

I authorise Leigh Adams to act as Agent on my behalf for this Building Consent application under Sections 33 and 45 of the Building Act 2004.

With respect to this Building Consent application, I authorise Leigh Adams to act as Agent on my behalf for the application for Code Compliance Certificate under Section 92 of the Building Act 2004.

Name (Owner): Michael Chernishoff Date: 24th June 2020

TERMS OF TRADE

I/We understand that:

Building Consents shall be paid for when the consent is collected or if the consent is not collected 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.

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.

DOCUMENTATION CHECKLIST

Applicants must mark all items provided with ☑ or leave blank if not applicable.

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
- [✔] Certificate of Title, or Sales and Purchase Agreement if C/T is not issued. Current C/T required (current within one month of application)
- [✔] One copy of all information required (all plans to be dimensioned, scaled and accurate. Plans preferred size A3)
- [✔] Application fee (as per Council Fees and Charges Schedule)

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 preferred size A3)
- [✔] 1 copy of each - specifications, producer statements, truss details (refer below)
- [✔] 1 copy - Certificate of Title or Sale and Purchase Agreement if C/T is not issued. Current C/T required (current within one month of application)
- [ ] Project Information Memorandum Development Contribution Notice (if applicable)
- [ ] Certificate attached to Project Information Memorandum (Resource Management Act)
- [✔] Certificate of design work from licensed building practitioner
- [✔] Restricted building work - see page 5
- [✔] Key personnel - see page 6
- [✔] See page 5 for a schedule confirming the building work will comply with the Building Code

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OFFICE USE ONLY
These have been provided:

APPLICATION FORM (One copy)

- [x] Fully complete all sections
- [x] Means of Compliance with NZBC - designer to complete
- [x] Provide the correct legal description (Council can help with this)
- [x] Provide one copy of the current Certificate of Title, or Sales and Purchase Agreement - not more than one month old
- [x] Give name and contact numbers of contact person (if not the owner)
- [x] State the project location (street address or location details as near as possible if no address)
- [x] Sign and date the form
- [x] Agent Authorisation (section completed where applicable)
- [x] Certificate/s of design work (LBP)

DESIGN BASIS (To be completed by the designer)

Please list the following basis for the building design:

[x] Wind zone	High
[x] Earthquake zone	2
[x] Snow zone/altitude	4
[x] Corrosion zone (if applicable)	1

- [ ] Building is specifically engineer-designed
- [ ] Complies with NZS 3604:2011
- [x] Both specific design and NZS 3604:2011

DESIGN DOCUMENTS (One copy)

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

SITE PLAN (One copy)

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

DRAINAGE LAYOUT (One copy to scale usually 1:100 or 1:50)

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

FOUNDATION LAYOUT (One copy to scale usually 1:100 or 1:50)

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

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OFFICE USE ONLY
These have been provided:

FLOOR PLANS (**One copy** to scale usually 1:100 or 1:50)

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

EXTERIOR ELEVATIONS (**One copy** to scale usually 1:100 or 1:50)

- [x] Elevations of all external walls showing claddings
- [x] Doors and windows showing opening sections
- [ ] Show location of solar panels
- [x] Accurate ground levels existing and proposed
- [ ] Subfloor ventilation for timber floors
- [x] 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)

- [x] Roof lines, overhangs, floor levels, ground levels
- [x] Major vertical dimensions
- [x] 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
- [x] Structural connections, posts to footings, beams to posts, trusses or beams to walls
- [x] Component fixing information is to be provided for all structural and framing components
- [x] Foundation and footing details and reinforcing. Show height from finished floor to ground level
- [ ] Pile details for timber floors
- [ ] Floor bracing details
- [x] Timber grade and treatment
- [x] Damp proof membranes, building papers and insulation systems/materials
- [x] Flashing details and documents
- [x] Roof penetrations
- [x] Shower floor details and wall to shower base junction detail
- [x] Sealing to wet area fixtures
- [x] Water splash prevention
- [x] 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. Multichoice specifications will not be accepted. A brief accurate specification is usually best.

- [x] 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
- [x] The specification can be written on the drawings as long as all materials are fully covered

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IMPORTANT THINGS TO INCLUDE IN YOUR APPLICATION (One copy - where relevent)

OFFICE USE ONLY
These have been provided:

- [ ] 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

GEOTECHNICAL REPORT

- [ ] Unique report reference number provided, if applicable [ ]

OFFICE USE ONLY

Further information required? [ ] Yes [✔] No

Date of acceptance: 29/06/2020 Officer: Diana Firth

OFFICE USE ONLY

Amount paid: $ 1635.00 + 15.00 Date: Officer:

[ ] Fee paid on application [✔] Deposit invoice sent

Date payment processed: 01/07/2020 Receipt DC Officer: Lauren Anson

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.

(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 – http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html
Building Levy Order 2005 – http://www.legislation.govt.nz/regulation/public/2005/0033/latest/whole.html#DLM313989
Building Research Levy Act 1969 - http://www.legislation.govt.nz/act/public/1969/0023/latest/whole.html

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 to ensure that this can be arranged.

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 will need to apply for a time extension*.

*Fees apply

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 and if authorised, the application for a Code Compliance Certificate under Section 92 of the Building Act 2004. They will receive all correspondence and must be authorised by the Owner - see page 8. All amendments require new authorisation.

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and section 30C, Building Act 2004

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

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

THE BUILDING	
Street address: Lot 156 - 33 Tara Crescent	
Suburb: Ravenswood	
Town/City: Woodend	Postcode:

THE OWNER(S)		
Name(s): Mt Lyford Investments Ltd - Michael Chernishoff		
Mailing address: 80 Mariehau Road		
Suburb: Marshland	PO Box/Private Bag:	
Town/City: Christchurch		Postcode: 8083
Phone number: 0274389109	Email address: mike@misco.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
BC200635 13/08/2020 nicolah

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

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

I Leigh Adams carried out / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
All RBW design work relating to B1 ☐		☐ Carried out ☐ Supervised	
Foundations and subfloor framing ☑	Concrete foundation and floor slab to Geotechnical report requirements	☑ Carried out ☐ Supervised	Throughout

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Walls ☑	Timber framed walls to NZS 3604 2011	☑ Carried out ○ Supervised	Throughout
Roof ☑	Timber trusses to Mitek design solutions and NZS 3604 2011	○ Carried out ☑ Supervised	Throughout
Columns and beams ☑	Timber framed walls to NZS 3604 2011	☑ Carried out ○ Supervised	Throughout
Bracing ☑	Gib plasterboard and ply bracing systems to Gib Ezybrace 2016	☑ Carried out ○ Supervised	Throughout
Other ○		○ Carried out ○ Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 ○		○ Carried out ○ Supervised	
Damp proofing ✓	DPC and DPM	✓ Carried out ○ Supervised	Throughout
Roof cladding or roof cladding system ✓	Longrun roofing to NZBC E2 AS1	✓ Carried out ○ Supervised	Throughout
Ventilation system (for example, subfloor or cavity) ✓	Cavity systems to NZBC E2 AS1	✓ Carried out ○ Supervised	Throughout
Wall cladding or wall cladding system ✓	70 series brick veneer to NZBC E2 AS1	✓ Carried out ○ Supervised	Throughout
Waterproofing ✓	Wraps & membranes	✓ Carried out ○ Supervised	Throughout
Other ○		○ Carried out ○ Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick ✓ if included. Cross ✗ if excluded	If appropriate, provide details of the RBW	Tick ✓ whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
FIRE SAFETY SYSTEMS: C1 - C6			
Emergency warning systems Evacuation and fire service operation systems ✓ Suppression or control systems Other	Smoke Alarms	✓ Carried out ○ Supervised	Floor Plan of the drawings
Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.			

WAIVERS AND MODIFICATIONS

Waivers or modifications of the Building Code are required. ○ Yes ✓ No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
List relevant clause numbers of building code	Specify nature of waiver or modification of building code required

ISSUED BY

Name and contact details of the licensed building practitioner who is licensed to carry out or supervise design work that is restricted building work.

Name: Leigh Adams	LBP or Registration number: BP 118930
The practitioner is a: ☑ Design LBP ○ Registered architect ○ Chartered professional engineer	
Design Entity or Company (optional):	
Mailing address (if different from below):	
Street address/Registered office: 250 King Street	
Suburb:	Town/City: Rangiora
PO Box/Private Bag:	Postcode: 7400
Phone number: 03 313 3479	Mobile: 021 163 1680
After hours: 03 313 3479	Fax:
Email address: leigh@leighadams.co.nz	Website:

DECLARATION

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

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

Signature: Leigh Adams

Date: 24th June 2020

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

BUILDERS

Ninth Edition 2012 (6)

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

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

DATE: 8th November 2017.

VENDOR: RAVENSWOOD DEVELOPMENTS LIMITED

PURCHASER: MT LYFORD INVESTMENTS LTD and/or nominee

The vendor is registered under the GST Act in respect of the transaction evidenced by this agreement and/or will be so registered at settlement: Yes/~~No~~

PROPERTY

Address: LOT 156 RAVENSWOOD, STATE HIGHWAY 1, WOODEND

Estate: FEE SIMPLE ~~LEASEHOLD~~ ~~STRATUM IN FREEHOLD~~ ~~STRATUM IN LEASEHOLD~~ ~~CROSSLEASE (FEE SIMPLE)~~ ~~CROSSLEASE (LEASEHOLD)~~ (fee simple if none is deleted)

Legal Description:

Area (more or less): 4075sqm *Lot/Flat/Unit:* *DP:* *Unique Identifier or CT:*

Subject to all necessary Easements and Covenants including Land Covenant

PAYMENT OF PURCHASE PRICE

Purchase price: $ 103,478.00

Plus GST (if any) OR ~~Inclusive of GST (if any)~~

If neither is deleted, the purchase price includes GST (if any).

GST date (refer clause 14.0):

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10/0

Deposit (refer clause 2.0): $ 10% of the price is payable upon confirmation of clauses 33 & 34 of the Further Terms of Sale.

The deposit is payable to Berry & Co. Solicitors Trust Account No. 060941 0067207 02

The further 90% is payable by ~~Friday 12th~~ Wednesday January 2018 ~~February~~ 13th

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

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

OR

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

Interest rate for late settlement: 15 % p.a.

~~CONDITIONS (refer clause 10.0)~~

Finance condition

Lender:

Amount required:

~~Finance date:~~

LIM required: (~~refer clause~~ 10.2) Yes/No

Building report required: (refer clause 10.3) Yes/No

OIA Consent required: (refer clause 10.4) Yes/No

~~Land Act/OIA date:~~

~~TENANCIES (if any)~~

Name of tenant:

~~Bond:~~ ~~Rent:~~ ~~Term:~~ ~~Right of renewal:~~

SALE BY: Attachments:

1. Further Terms of Sale 2. Builders Additional Terms and Conditions of Sale
3. Land Covenants
4. Building Covenants or dwelling description (where sale is of a completed building)
5. Ravenswood Plans

Licensed Real Estate Agent under Real Estate Agents Act 2008

It is agreed that the vendor sells and the purchaser purchases the property, and the chattels listed in Schedule 1, on the terms set out above and in the General Terms of Sale and any Further Terms of Sale.

Ninth Edition 2012 (6)

GENERAL TERMS OF SALE

1.0 Definitions, time for performance, notices, and interpretation

1.1 Definitions

(1) Unless the context requires a different interpretation, words and phrases not otherwise defined have the same meanings ascribed to those words and phrases in the Goods and Services Tax Act 1985, the Property Law Act 2007, the Resource Management Act 1991 or the Unit Titles Act 2010.
(2) "Agreement" means this document including the front page, these General Terms of Sale, any Further Terms of Sale, and any schedules and attachments.
(3) "Building Act" means the Building Act 1991 and/or the Building Act 2004.
(4) "Building warrant of fitness" means a building warrant of fitness supplied to a territorial authority under the Building Act.
(5) "Cleared funds" means:
  (a) An electronic transfer of funds that has been made strictly in accordance with the requirements set out in the PLS Guidelines; or
  (b) A bank cheque, but only in the circumstances permitted by the PLS Guidelines and only if it has been paid strictly in accordance with the requirements set out in the PLS Guidelines.
(6) "Default GST" means any additional GST, penalty (civil or otherwise), interest, or other sum imposed on the vendor (or where the vendor is or was a member of a GST group its representative member) under the GST Act or the Tax Administration Act 1994 by reason of non-payment of any GST payable in respect of the supply made under this agreement but does not include any such sum levied against the vendor (or where the vendor is or was a member of a GST group its representative member) by reason of a default or delay by the vendor after payment of the GST to the vendor by the purchaser.
(7) "Electronic instrument" has the same meaning as ascribed to that term in the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
(8) "GST" means Goods and Services Tax arising pursuant to the Goods and Services Tax Act 1985 and "GST Act" means the Goods and Services Tax Act 1985.
(9) "Landonline Workspace" means an electronic workspace facility approved by the Registrar-General of Land pursuant to the provisions of the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
(10) "LIM" means a land information memorandum issued pursuant to the Local Government Official Information and Meetings Act 1987.
(11) "LINZ" means Land Information New Zealand.
(12) "Local authority" means a territorial authority or a regional council.
(13) "OIA Consent" means consent to purchase the property under the Overseas Investment Act 2005.
(14) "PLS Guidelines" means the most recent edition, as at the date of this agreement, of the Property Transactions and E-Dealing Practice Guidelines prepared by the Property Law Section of the New Zealand Law Society.
(15) "Property" means the property described in this agreement.
(16) "Purchase price" means the total purchase price stated in this agreement which the purchaser has agreed to pay the vendor for the property and the chattels included in the sale.
(17) "Regional council" means a regional council within the meaning of the Local Government Act 2002.
(18) "Remote settlement" means settlement of the sale and purchase of the property by way of the purchaser's lawyer paying the moneys due and payable on the settlement date directly into the trust account of the vendor's lawyer, in consideration of the vendor agreeing to meet the vendor's obligations under subclause 3.8(2), pursuant to the protocol for remote settlement recommended in the PLS Guidelines.
(19) "Secure web document exchange" means an electronic messaging service enabling messages and electronic documents to be posted by one party to a secure website to be viewed by the other party immediately after posting.
(20) "Settlement date" means the date specified as such in this agreement.
(21) "Settlement statement" means a statement showing the purchase price, plus any GST payable by the purchaser in addition to the purchase price, less any deposit or other payments or allowances to be credited to the purchaser, together with apportionments of all incomings and outgoings apportioned at the settlement date.
(22) "Territorial authority" means a territorial authority within the meaning of the Local Government Act 2002.
(23) "Unit title" means a unit title under the Unit Titles Act 2010.
(24) The terms "principal unit", "accessory unit", "owner", "unit plan", and "unit" have the meanings ascribed to those terms in the Unit Titles Act 2010.
(25) The term "rules" includes both body corporate rules under the Unit Titles Act 1972 and body corporate operational rules under the Unit Titles Act 2010.
(26) The terms "building", "building consent", "code compliance certificate", "compliance schedule", "household unit", and "commercial on-seller" have the meanings ascribed to those terms in the Building Act.
(27) The term "title" includes where appropriate a computer register within the meaning of the Land Transfer (Computer Registers and Electronic Lodgement) Amendment Act 2002.
(28) The terms "going concern", "goods", "principal place of residence", "recipient", "registered person", "registration number", "supply", and "taxable activity" have the meanings ascribed to those terms in the GST Act.
(29) The terms "tax information" and "tax statement" have the meanings ascribed to those terms in the Land Transfer Act 1952.
(30) The terms "associated person", "conveyancer", "residential land purchase amount", "offshore RLWT person", "RLWT", "RLWT certificate of exemption" and "RLWT rules" have the meanings ascribed to those terms in the Income Tax Act 2007.
(31) The term "Commissioner" has the meaning ascribed to that term in the Tax Administration Act 1994.
(32) "Working day" means any day of the week other than:
  (a) Saturday, Sunday, Waitangi Day, Good Friday, Easter Monday, Anzac Day, the Sovereign's Birthday, and Labour Day;
  (b) If Waitangi Day or Anzac Day falls on a Saturday or Sunday, the following Monday;
  (c) a day in the period commencing on the 24th day of December in any year and ending on the 5th day of January (or in the case of subclause 10.2(2) the 15th day of January) in the following year, both days inclusive; and
  (d) the day observed as the anniversary of any province in which the property is situated.

  A working day shall be deemed to commence at 9.00 am and to terminate at 5.00 pm.
(33) Unless a contrary intention appears on the front page or elsewhere in this agreement:
  (a) the interest rate for late settlement is equivalent to the interest rate charged by the Inland Revenue Department on unpaid tax under the Tax Administration Act 1994 during the period for which the interest rate for late settlement is payable, plus 5% per annum; and
  (b) a party is in default if it did not do what it has contracted to do to enable settlement to occur, regardless of the cause of such failure.

1.2 Time for Performance

(1) Where the day nominated for settlement or the fulfilment of a condition is not a working day, then the settlement date or the date for fulfilment of the condition shall be the last working day before the day so nominated.
(2) Any act done pursuant to this agreement by a party, including service of notices, after 5.00 pm on a working day, or on a day that is not a working day, shall be deemed to have been done at 9.00 am on the next succeeding working day.
(3) Where two or more acts done pursuant to this agreement, including service of notices, are deemed to have been done at the same time, they shall take effect in the order in which they would have taken effect but for subclause 1.2(2).

1.3 Notices

The following apply to all notices between the parties relevant to this agreement, whether authorised by this agreement or by the general law:

(1) All notices must be served in writing.
(2) Any notice under section 28 of the Property Law Act 2007, where the purchaser is in possession of the property, must be served in accordance with section 353 of that Act.
(3) All other notices, unless otherwise required by the Property Law Act 2007, must be served by one of the following means:
  (a) on the party as authorised by sections 354 to 361 of the Property Law Act 2007, or
  (b) on the party or on the party's lawyer:
    (i) by personal delivery; or
    (ii) by posting by ordinary mail; or
    (iii) by facsimile; or
    (iv) by email; or
    (v) in the case of the party's lawyer only, by sending by document exchange or, if both parties' lawyers have agreed to subscribe to the same secure web document exchange for this agreement, by secure web document exchange.
(4) In respect of the means of service specified in subclause 1.3(3)(b), a notice is deemed to have been served:
  (a) in the case of personal delivery, when received by the party or at the lawyer's office;
  (b) in the case of posting by ordinary mail, on the third working day following the date of posting to the address for service notified in writing by the party or to the postal address of the lawyer's office;
  (c) in the case of facsimile transmission, when sent to the facsimile number notified in writing by the party or to the facsimile number of the lawyer's office;
  (d) in the case of email, when acknowledged by the party or by the lawyer orally or by return email or otherwise in writing, except that return emails generated automatically shall not constitute an acknowledgement;

(e) In the case of sending by document exchange, on the second working day following the date of sending to the document exchange number of the lawyer's office;
(f) In the case of sending by secure web document exchange, at the time when in the ordinary course of operation of that secure web document exchange, a notice posted by one party is accessible for viewing or downloading by the other party.

(5) Any period of notice required to be given under this agreement shall be computed by excluding the day of service.
(6) In accordance with section 222 of the Contract and Commercial Law Act 2017, the parties agree that any notice or document that must be given in writing by one party to the other may be given in electronic form and by means of an electronic communication, subject to the rules regarding service set out above.

1.4 Interpretation
(1) If there is more than one vendor or purchaser, the liability of the vendors or of the purchasers, as the case may be, is joint and several.
(2) Where the purchaser executes this agreement with provision for a nominee, or as agent for an undisclosed or disclosed but unidentified principal, or on behalf of a company to be formed, the purchaser shall at all times remain liable for all obligations on the part of the purchaser.
(3) If any inserted term (including any Further Terms of Sale) conflicts with the General Terms of Sale the inserted term shall prevail.
(4) Headings are for information only and do not form part of this agreement.
(5) References to statutory provisions shall be construed as references to those provisions as they may be amended or re-enacted or as their application is modified by other provisions from time to time.

2.0 Deposit

2.1 The purchaser shall pay the deposit to the vendor or the vendor's agent immediately upon execution of this agreement by both parties and/or at such other time as is specified in this agreement.

2.2 If the deposit is not paid on the due date for payment, the vendor may at any time thereafter serve on the purchaser notice requiring payment. If the purchaser fails to pay the deposit on or before the third working day after service of the notice, time being of the essence, the vendor may cancel this agreement by serving notice of cancellation on the purchaser. No notice of cancellation shall be effective if the deposit has been paid before the notice of cancellation is served.

2.3 The deposit shall be in part payment of the purchase price.

2.4 The person to whom the deposit is paid shall hold it as a stakeholder until:
(1) the requisition procedure under clause 6.0 is completed without either party cancelling this agreement; and
(2) where this agreement is entered into subject to any condition(s) expressed in this agreement, each such condition has been fulfilled or waived; and
(3) where the property is a unit title:
(a) a pre-settlement disclosure statement, certified correct by the body corporate, under section 147 of the Unit Titles Act 2010; and
(b) an additional disclosure statement under section 148 of the Unit Titles Act 2010 (if requested by the purchaser within the time prescribed in section 148(2)),
have been provided to the purchaser by the vendor within the times prescribed in those sections or otherwise the purchaser has given notice under section 149(2) of the Unit Titles Act 2010 to postpone the settlement date until after the disclosure statements have been provided; or
(4) this agreement is cancelled pursuant to subclause 6.2(3)(c) or avoided pursuant to subclause 10.8(5) or, where the property is a unit title and the purchaser having the right to cancel this agreement pursuant to section 151(2) of the Unit Titles Act 2010 has cancelled this agreement pursuant to that section, or has waived the right to cancel by giving notice to the vendor, or by completing settlement of the purchase.

3.0 Possession and Settlement

Possession

3.1 Unless particulars of a tenancy are included in this agreement, the property is sold with vacant possession and the vendor shall so yield the property on the settlement date.

3.2 If the property is sold with vacant possession, then subject to the rights of any tenants of the property, the vendor shall permit the purchaser or any person authorised by the purchaser in writing, upon reasonable notice:
(1) to enter the property on one occasion prior to the settlement date for the purposes of examining the property, chattels and fixtures which are included in the sale; and
(2) to re-enter the property on or before the settlement date to confirm compliance by the vendor with any agreement made by the vendor to carry out any work on the property and the chattels and the fixtures.

3.3 Possession shall be given and taken on the settlement date. Outgoings and incomings in respect of the settlement date are the responsibility of and belong to the vendor.

3.4 On the settlement date, the vendor shall make available to the purchaser keys to all exterior doors that are locked by key, electronic door openers to all doors that are opened electronically, and the keys and/or security codes to any alarms. The vendor does not have to make available keys, electronic door openers, and security codes where the property is tenanted and these are held by the tenant.

Settlement

3.5 The vendor shall prepare, at the vendor's own expense, a settlement statement. The vendor shall tender the settlement statement to the purchaser or the purchaser's lawyer a reasonable time prior to the settlement date.

3.6 The purchaser's lawyer shall:
(1) within a reasonable time prior to the settlement date create a Landonline Workspace for the transaction, notify the vendor's lawyer of the dealing number allocated by LINZ, and prepare in that workspace a transfer instrument in respect of the property; and
(2) prior to settlement:
(a) lodge in that workspace the tax information contained in the transferee's tax statement; and
(b) certify and sign the transfer instrument.

3.7 The vendor's lawyer shall:
(1) within a reasonable time prior to the settlement date prepare in that workspace all other electronic instruments required to confer title on the purchaser in terms of the vendor's obligations under this agreement; and
(2) prior to settlement:
(a) lodge in that workspace the tax information contained in the transferor's tax statement; and
(b) have those instruments and the transfer instrument certified, signed and, where possible, pre-validated.

3.8 On the settlement date:
(1) the balance of the purchase price, interest and other moneys, if any, shall be paid by the purchaser in cleared funds or otherwise satisfied as provided in this agreement (credit being given for any amount payable by the vendor under subclause 3.12 or 3.14);
(2) the vendor's lawyer shall immediately thereafter:
(a) release or procure the release of the transfer instrument and the other instruments mentioned in subclause 3.7(1) so that the purchaser's lawyer can then submit them for registration;
(b) pay to the purchaser's lawyer the LINZ registration fees on all of the instruments mentioned in subclause 3.7(1), unless these fees will be invoiced to the vendor's lawyer by LINZ directly; and
(c) deliver to the purchaser's lawyer any other documents that the vendor must provide to the purchaser on settlement in terms of this agreement.

3.9 All obligations under subclause 3.8 are interdependent.

3.10 The parties shall complete settlement by way of remote settlement, provided that where payment by bank cheque is permitted under the PLS Guidelines, payment may be made by the personal delivery of a bank cheque to the vendor's lawyer's office, so long as it is accompanied by the undertaking from the purchaser's lawyer required by those Guidelines.

Last Minute Settlement

3.11 If due to the delay of the purchaser, settlement takes place between 4.00 pm and 5.00 pm on the settlement date ("last minute settlement"), the purchaser shall pay the vendor:
(1) one day's interest at the interest rate for late settlement on the portion of the purchase price paid in the last minute settlement; and
(2) if the day following the last minute settlement is not a working day, an additional day's interest (calculated in the same manner) for each day until, but excluding, the next working day.

Purchaser Default: Late Settlement

3.12 If any portion of the purchase price is not paid upon the due date for payment, then, provided that the vendor provides reasonable evidence of the vendor's ability to perform any obligation the vendor is obliged to perform on that date in consideration for such payment:

(1) the purchaser shall pay to the vendor interest at the interest rate for late settlement on the portion of the purchase price so unpaid for the period from the due date for payment until payment ("the default period"); but nevertheless, this stipulation is without prejudice to any of the vendor's rights or remedies including any right to claim for additional expenses and damages. For the purposes of this subclause, a payment made on a day other than a working day or after the termination of a working day shall be deemed to be made on the next following working day and interest shall be computed accordingly; and

(2) the vendor is not obliged to give the purchaser possession of the property or to pay the purchaser any amount for remaining in possession, unless this agreement relates to a tenanted property, in which case the vendor must elect either to:

(a) account to the purchaser on settlement for incomings in respect of the property which are payable and received during the default period, in which event the purchaser shall be responsible for the outgoings relating to the property during the default period; or

(b) retain such incomings in lieu of receiving interest from the purchaser pursuant to subclause 3.12(1).

3.13 Where subclause 3.12(1) applies and the parties are unable to agree upon any amount claimed by the vendor for additional expenses and damages:

(1) an interim amount shall on settlement be paid to a stakeholder by the purchaser until the amount payable is determined;

(2) the interim amount must be a reasonable sum having regard to all of the circumstances;

(3) if the parties cannot agree on the interim amount, the interim amount shall be determined by an experienced property lawyer appointed by the parties. The appointee's costs shall be met equally by the parties. If the parties cannot agree on the appointee, the appointment shall be made on the application of either party by the president for the time being of the New Zealand Law Society;

(4) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;

(5) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;

(6) the amount determined to be payable shall not be limited by the interim amount; and

(7) if the parties cannot agree on a stakeholder, the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.

Vendor Default: Late Settlement or Failure to Give Possession

3.14 (1) For the purposes of this subclause 3.14:

(a) the default period means:

(i) in subclause 3.14(2), the period from the settlement date until the date when the vendor is able and willing to provide vacant possession and the purchaser takes possession; and

(ii) in subclause 3.14(3), the period from the date the purchaser takes possession until the date when settlement occurs; and

(iii) in subclause 3.14(5), the period from the settlement date until the date when settlement occurs; and

(b) the vendor shall be deemed to be unwilling to give possession if the vendor does not offer to give possession.

(2) If this agreement provides for vacant possession but the vendor is unable or unwilling to give vacant possession on the settlement date, then, provided that the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement:

(a) the vendor shall pay the purchaser, at the purchaser's election, either:

(i) compensation for any reasonable costs incurred for temporary accommodation for persons and storage of chattels during the default period; or

(ii) an amount equivalent to interest at the interest rate for late settlement on the entire purchase price during the default period; and

(b) the purchaser shall pay the vendor an amount equivalent to the interest earned or which would be earned on overnight deposits lodged in the purchaser's lawyer's trust bank account on such portion of the purchase price (including any deposit) as is payable under this agreement on or by the settlement date but remains unpaid during the default period less:

(i) any withholding tax; and

(ii) any bank or legal administration fees and commission charges; and

(iii) any interest payable by the purchaser to the purchaser's lender during the default period in respect of any mortgage or loan taken out by the purchaser in relation to the purchase of the property.

(3) If this agreement provides for vacant possession and the vendor is able and willing to give vacant possession on the settlement date, then, provided the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement, the purchaser may elect to take possession in which case the vendor shall not be liable to pay any interest or other moneys to the purchaser but the purchaser shall pay the vendor the same amount as that specified in subclause 3.14(2)(b) during the default period. A purchaser in possession under this subclause 3.14(3) is a licensee only.

(4) Notwithstanding the provisions of subclause 3.14(3), the purchaser may elect not to take possession when the purchaser is entitled to take it. If the purchaser elects not to take possession, the provisions of subclause 3.14(2) shall apply as though the vendor were unable or unwilling to give vacant possession on the settlement date.

(5) If this agreement provides for the property to be sold tenanted then, provided that the purchaser provides reasonable evidence of the purchaser's ability to perform the purchaser's obligations under this agreement, the vendor shall on settlement account to the purchaser for incomings which are payable and received in respect of the property during the default period less the outgoings paid by the vendor during that period. Apart from accounting for such incomings, the vendor shall not be liable to pay any other moneys to the purchaser but the purchaser shall pay the vendor the same amount as that specified in subclause 3.14(2)(b) during the default period.

(6) The provisions of this subclause 3.14 shall be without prejudice to any of the purchaser's rights or remedies including any right to claim for any additional expenses and damages suffered by the purchaser.

(7) Where the parties are unable to agree upon any amount payable under this subclause 3.14:

(a) an interim amount shall on settlement be paid to a stakeholder by the party against whom it is claimed until the amount payable is determined;

(b) the interim amount shall be the lower of:

(i) the amount claimed; or

(ii) an amount equivalent to interest at the interest rate for late settlement for the relevant default period on such portion of the purchase price (including any deposit) as is payable under this agreement on or by the settlement date.

(c) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;

(d) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;

(e) the amount determined to be payable shall not be limited by the interim amount; and

(f) if the parties cannot agree on a stakeholder the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.

Deferment of Settlement and Possession

3.15 If

(1) this is an agreement for the sale by a commercial on-seller of a household unit; and

(2) a code compliance certificate has not been issued by the settlement date in relation to the household unit,

then, unless the parties agree otherwise (in which case the parties shall enter into a written agreement in the form (if any) prescribed by the Building (Forms) Regulations 2004), the settlement date shall be deferred to the fifth working day following the date upon which the vendor has given the purchaser notice that the code compliance certificate has been issued (which notice must be accompanied by a copy of the certificate).

3.16 In every case, if neither party is ready, willing, and able to settle on the settlement date, the settlement date shall be deferred to the third working day following the date upon which one of the parties gives notice it has become ready, willing, and able to settle.

3.17 If

(1) the property is a unit title;

(2) the settlement date is deferred pursuant to either subclause 3.15 or subclause 3.16; and

(3) the vendor considers on reasonable grounds that an extension of time is necessary or desirable in order for the vendor to comply with the warranty by the vendor in subclause 9.2(3),

(4) then the vendor may extend the settlement date:

(a) where there is a deferment of the settlement date pursuant to subclause 3.15, to the tenth working day following the date upon which the vendor gives the purchaser notice that the code compliance certificate has been issued, provided the vendor gives notice of the extension to the purchaser no later than the second working day after such notice; or

(b) where there is a deferment of the settlement date pursuant to subclause 3.16, to the tenth working day following the date upon which one of the parties gives notice that it has become ready, willing, and able to settle, provided the vendor gives notice of the extension to the purchaser no later than the second working day after such notice.

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New Title Provision

3.18 (1) Where
(a) the transfer of the property is to be registered against a new title yet to be issued; and
(b) a search copy, as defined in section 172A of the Land Transfer Act 1952, of that title is not obtainable by the tenth working day prior to the settlement date,
(c) then, unless the purchaser elects that settlement shall still take place on the agreed settlement date, the settlement date shall be deferred to the tenth working day following the later of the date on which:
(i) the vendor has given the purchaser notice that a search copy is obtainable; or
(ii) the requisitions procedure under clause 6.0 is complete.

(2) Subclause 3.18(1) shall not apply where it is necessary to register the transfer of the property to enable a plan to deposit and title to the property to issue.

4.0 Residential Land Withholding Tax

4.1 If the vendor does not have a conveyancer or the vendor and the purchaser are associated persons, then:
(1) the vendor must provide the purchaser or the purchaser's conveyancer, on or before the second working day before the due date for payment of the first residential land purchase amount payable under this agreement, with:
(a) sufficient information to enable the purchaser or the purchaser's conveyancer to determine to their reasonable satisfaction whether section 54C of the Tax Administration Act 1994 applies to the sale of the property; and
(b) if the purchaser or the purchaser's conveyancer determines to their reasonable satisfaction that section 54C of the Tax Administration Act 1994 does apply, all of the information required by that section and either an RLWT certificate of exemption in respect of the sale or otherwise such other information that the purchaser or the purchaser's conveyancer may reasonably require to enable the purchaser or the purchaser's conveyancer to determine to their reasonable satisfaction the amount of RLWT that must be withheld from each residential land purchase amount;
(2) the vendor shall be liable to pay any costs reasonably incurred by the purchaser or the purchaser's conveyancer in relation to RLWT, including the cost of obtaining professional advice in determining whether there is a requirement to withhold RLWT and the amount of RLWT that must be withheld, if any; and
(3) any payments payable by the purchaser on account of the purchase price shall be deemed to have been paid to the extent that:
(a) RLWT has been withheld from those payments by the purchaser or the purchaser's conveyancer as required by the RLWT rules; and
(b) any costs payable by the vendor under subclause 4.1(2) have been deducted from those payments by the purchaser or the purchaser's conveyancer.

4.2 If the vendor does not have a conveyancer or the vendor and the purchaser are associated persons and if the vendor fails to provide the information required under subclause 4.1(1), then the purchaser may:
(1) defer the payment of the first residential land purchase amount payable under this agreement (and any residential land purchase amount that may subsequently fall due for payment) until such time as the vendor supplies that information; or
(2) on the due date for payment of that residential land purchase amount, or at any time thereafter if payment has been deferred by the purchaser pursuant to this subclause and the vendor has still not provided that information, treat the sale of the property as if it is being made by an offshore RLWT person where there is a requirement to pay RLWT.

4.3 If pursuant to subclause 4.2 the purchaser treats the sale of the property as if it is being made by an offshore RLWT person where there is a requirement to pay RLWT, the purchaser or the purchaser's conveyancer may:
(1) make a reasonable assessment of the amount of RLWT that the purchaser or the purchaser's conveyancer would be required by the RLWT rules to withhold from any residential land purchase amount if the sale is treated in that manner; and
(2) withhold that amount from any residential land purchase amount and pay it to the Commissioner as RLWT.

4.4 Any amount withheld by the purchaser or the purchaser's conveyancer pursuant to subclause 4.3 shall be treated as RLWT that the purchaser or the purchaser's conveyancer is required by the RLWT rules to withhold.

4.5 The purchaser or the purchaser's conveyancer shall give notice to the vendor a reasonable time before payment of any sum due to be paid on account of the purchase price of:
(1) the costs payable by the vendor under subclause 4.1(2) that the purchaser or the purchaser's conveyancer intends to deduct; and
(2) the amount of RLWT that the purchaser or the purchaser's conveyancer intends to withhold.

5.0 Risk and insurance

5.1 The property and chattels shall remain at the risk of the vendor until possession is given and taken.

5.2 If, prior to the giving and taking of possession, the property is destroyed or damaged, and such destruction or damage has not been made good by the settlement date, then the following provisions shall apply:
(1) if the destruction or damage has been sufficient to render the property untenantable and it is untenantable on the settlement date, the purchaser may:
(a) complete the purchase at the purchase price, less a sum equal to any insurance moneys received or receivable by or on behalf of the vendor in respect of such destruction or damage, provided that no reduction shall be made to the purchase price if the vendor's insurance company has agreed to reinstate for the benefit of the purchaser to the extent of the vendor's insurance cover; or
(b) cancel this agreement by serving notice on the vendor in which case the vendor shall return to the purchaser immediately the deposit and any other moneys paid by the purchaser, and neither party shall have any right or claim against the other arising from this agreement or its cancellation;
(2) if the property is not untenantable on the settlement date the purchaser shall complete the purchase at the purchase price less a sum equal to the amount of the diminution in value of the property which, to the extent that the destruction or damage to the property can be made good, shall be deemed to be equivalent to the reasonable cost of reinstatement or repair;
(3) in the case of a property zoned for rural purposes under an operative District Plan, damage to the property shall be deemed to have rendered the property untenantable where the diminution in value exceeds an amount equal to 20% of the purchase price; and
(4) if the amount of the diminution in value is disputed, the parties shall follow the same procedure as that set out in subclause 8.4 for when an amount of compensation is disputed.

5.3 The purchaser shall not be required to take over any insurance policies held by the vendor.

6.0 Title, boundaries and requisitions

6.1 The vendor shall not be bound to point out the boundaries of the property except that on the sale of a vacant residential lot which is not limited as to parcels the vendor shall ensure that all boundary markers required by the Cadastral Survey Act 2002 and any related rules and regulations to identify the boundaries of the property are present in their correct positions at the settlement date.

6.2 (1) The purchaser is deemed to have accepted the vendor's title except as to objections or requisitions which the purchaser is entitled to make and notice of which the purchaser serves on the vendor on or before the earlier of:
(a) the tenth working day after the date of this agreement; or
(b) the settlement date.
(2) Where the transfer of the property is to be registered against a new title yet to be issued, the purchaser is deemed to have accepted the title except as to such objections or requisitions which the purchaser is entitled to make and notice of which the purchaser serves on the vendor on or before the fifth working day following the date the vendor has given the purchaser notice that the title has been issued and a search copy of it as defined in section 172A of the Land Transfer Act 1952 is obtainable.
(3) If the vendor is unable or unwilling to remove or comply with any objection or requisition as to title, notice of which has been served on the vendor by the purchaser, then the following provisions will apply:
(a) the vendor shall notify the purchaser ("a vendor's notice") of such inability or unwillingness on or before the fifth working day after the date of service of the purchaser's notice;
(b) if the vendor does not give a vendor's notice the vendor shall be deemed to have accepted the objection or requisition and it shall be a requirement of settlement that such objection or requisition shall be complied with before settlement;
(c) if the purchaser does not on or before the fifth working day after service of a vendor's notice notify the vendor that the purchaser waives the objection or requisition, either the vendor or the purchaser may (notwithstanding any intermediate negotiations) by notice to the other, cancel this agreement.
(4) In the event of cancellation under subclause 6.2(3), the purchaser shall be entitled to the immediate return of the deposit and any other moneys paid under this agreement by the purchaser and neither party shall have any right or claim against the other arising from this agreement or its cancellation. In particular, the purchaser shall not be entitled to any interest or to the expense of investigating the title or to any compensation whatsoever.

6.3 (1) If the title to the property being sold is a cross lease title or a unit title and there are:
(a) in the case of a cross lease title:
(i) alterations to the external dimensions of any leased structure; or
(ii) buildings or structures not intended for common use which are situated on any part of the land that is not subject to a restricted user covenant;
(b) in the case of a unit title, encroachments out of the principal unit or accessory unit title space (as the case may be):
then the purchaser may requisition the title under subclause 6.2 requiring the vendor:
(c) in the case of a cross lease title, to deposit a new plan depicting the buildings or structures and register a new cross lease or cross leases (as the case may be) and any other ancillary dealings in order to convey good title; or
(d) in the case of a unit title, to deposit an amendment to the unit plan, a redevelopment plan or new unit plan (as the case may be) depicting the principal and/or accessory units and register such transfers and any other ancillary dealings in order to convey good title.

(2) The words "alterations to the external dimensions of any leased structure" shall only mean alterations which are attached to the leased structure and enclosed.

6.4 Except as provided by sections 36 to 42 of the Contract and Commercial Law Act 2017, no error, omission, or misdescription of the property or the title shall enable the purchaser to cancel this agreement but compensation, if claimed by notice before settlement in accordance with subclause 8.1 but not otherwise, shall be made or given as the case may require.

6.5 The vendor shall not be liable to pay for or contribute towards the expense of erection or maintenance of any fence between the property and any contiguous land of the vendor but this proviso shall not enure for the benefit of any subsequent purchaser of the contiguous land; and the vendor shall be entitled to require the inclusion of a fencing covenant to this effect in any transfer of the property.

7.0 Vendor's warranties and undertakings

~~7.1 The vendor warrants and undertakes that at the date of this agreement the vendor has not:~~
~~(1) received any notice or demand and has no knowledge of any requisition or outstanding requirement:~~
~~(a) from any local or government authority or other statutory body; or~~
~~(b) under the Resource Management Act 1991; or~~
~~(c) from any tenant of the property; or~~
~~(d) from any other party; or~~
~~(2) given any consent or waiver;~~
~~which directly or indirectly affects the property and which has not been disclosed in writing to the purchaser.~~

7.2 The vendor warrants and undertakes that at settlement:
(1) The chattels and all plant, equipment, systems or devices which provide any services or amenities to the property, including, without limitation, security, heating, cooling, or air-conditioning, are delivered to the purchaser in reasonable working order, but in all other respects in their state of repair as at the date of this agreement (fair wear and tear excepted) but failure so to deliver them shall only create a right of compensation.
(2) All electrical and other installations on the property are free of any charge whatsoever.
(3) There are no arrears of rates, water rates or charges outstanding on the property.
(4) Where an allowance has been made by the vendor in the settlement statement for incomings receivable, the settlement statement correctly records those allowances including, in particular, the dates up to which the allowances have been made.
(5) Where the vendor has done or caused or permitted to be done on the property any works:
(a) any permit, resource consent, or building consent required by law was obtained; and
(b) to the vendor's knowledge, the works were completed in compliance with those permits or consents; and
(c) where appropriate, a code compliance certificate was issued for those works.
(6) Where under the Building Act, any building on the property sold requires a compliance schedule:
(a) the vendor has fully complied with any requirements specified in any compliance schedule issued by a territorial authority under the Building Act in respect of the building;
(b) the building has a current building warrant of fitness; and
(c) the vendor is not aware of any reason, that the vendor has not disclosed in writing to the purchaser, which would prevent a building warrant of fitness from being supplied to the territorial authority when the building warrant of fitness is next due.
~~(7) Since the date of this agreement, the vendor has not given any consent or waiver which directly or indirectly affects the property.~~
~~(8) Any notice or demand received by the vendor, which directly or indirectly affects the property, after the date of this agreement:~~
~~(a) from any local or government authority or other statutory body; or~~
~~(b) under the Resource Management Act 1991; or~~
~~(c) from any tenant of the property; or~~
~~(d) from any other party;~~
~~has been delivered forthwith by the vendor to either the purchaser or the purchaser's lawyer, unless the vendor has paid or complied with such notice or demand.~~
~~If the vendor fails to so deliver or pay the notice or demand, the vendor shall be liable for any penalty incurred.~~
(9) Any chattels included in the sale are the unencumbered property of the vendor.

7.3 If the property is or includes part only of a building, the warranty and undertaking in subclause 7.2(6) does not apply. Instead the vendor warrants and undertakes at the date of this agreement that, where under the Building Act the building of which the property forms part requires a compliance schedule:
(1) to the vendor's knowledge, there has been full compliance with any requirements specified in any compliance schedule issued by a territorial authority under the Building Act in respect of the building;
(2) the building has a current building warrant of fitness; and
(3) the vendor is not aware of any reason, that the vendor has not disclosed in writing to the purchaser, which would prevent a building warrant of fitness from being supplied to the territorial authority when the building warrant of fitness is next due.

7.4 The vendor warrants and undertakes that on or immediately after settlement:
(1) If the water and wastewater charges are determined by meter, the vendor will have the water meter read and will pay the amount of the charge payable pursuant to that reading; but if the water supplier will not make special readings, the water and wastewater charges shall be apportioned.
(2) Any outgoings included in the settlement statement are paid in accordance with the settlement statement and, where applicable, to the dates shown in the settlement statement, or will be so paid immediately after settlement.
(3) The vendor will give notice of sale in accordance with the Local Government (Rating) Act 2002 to the territorial authority and regional council in whose district the land is situated and will also give notice of the sale to every other authority that makes and levies rates or charges on the land and to the supplier of water.
(4) Where the property is a unit title, the vendor will notify the body corporate in writing of the transfer of the property and the name and address of the purchaser.

7.5 If the purchaser has not validly cancelled this agreement, the breach of any warranty or undertaking contained in this agreement does not defer the obligation to settle but that obligation shall be subject to the rights of the purchaser at law or in equity, including any rights under subclause 6.4 and any right of equitable set-off.

8.0 Claims for compensation

8.1 If the purchaser claims a right to compensation either under subclause 6.4 or for an equitable set-off:
(1) the purchaser must serve notice of the claim on the vendor on or before the last working day prior to settlement; and
(2) the notice must:
(a) in the case of a claim for compensation under subclause 6.4, state the particular error, omission, or misdescription of the property or title in respect of which compensation is claimed;
(b) in the case of a claim to an equitable set-off, state the particular matters in respect of which compensation is claimed;
(c) comprise a genuine pre-estimate of the loss suffered by the purchaser; and
(d) be particularised and quantified to the extent reasonably possible as at the date of the notice.

8.2 For the purposes of subclause 8.1(1), "settlement" means the date for settlement fixed by this agreement unless, by reason of the conduct or omission of the vendor, the purchaser is unable to give notice by that date, in which case notice may be given on or before the last working day prior to the date for settlement fixed by a valid settlement notice served by either party pursuant to subclause 11.1.

8.3 If the amount of compensation is agreed, it shall be deducted on settlement.

8.4 If the amount of compensation is disputed:
(1) an interim amount shall be deducted on settlement and paid by the purchaser to a stakeholder until the amount of the compensation is determined;
(2) the interim amount must be a reasonable sum having regard to all of the circumstances;
(3) if the parties cannot agree on the interim amount, the interim amount shall be determined by an experienced property lawyer appointed by the parties. The appointee's costs shall be met equally by the parties. If the parties cannot agree on the appointee, the appointment shall be made on the application of either party by the president for the time being of the New Zealand Law Society;
(4) the stakeholder shall lodge the interim amount on interest-bearing call deposit with a bank registered under the Reserve Bank of New Zealand Act 1989 in the joint names of the vendor and the purchaser;
(5) the interest earned on the interim amount net of any withholding tax and any bank or legal administration fees and commission charges shall follow the destination of the interim amount;
(6) the amount of compensation determined to be payable shall not be limited by the interim amount; and
(7) if the parties cannot agree on a stakeholder, the interim amount shall be paid to a stakeholder nominated on the application of either party by the president for the time being of the New Zealand Law Society.

8.5 The procedures prescribed in subclauses 8.1 to 8.4 shall not prevent either party taking proceedings for the specific performance of the contract.

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9.0 Unit title and cross lease provisions

Unit Titles

9.1 If the property is a unit title, sections 144 to 153 of the Unit Titles Act 2010 ("the Act") require the vendor to provide to the purchaser a pre-contract disclosure statement, a pre-settlement disclosure statement and, if so requested by the purchaser, an additional disclosure statement.

9.2 If the property is a unit title, the vendor warrants and undertakes as follows:

(1) The information in the pre-contract disclosure statement provided to the purchaser was complete and correct.

(2) Apart from regular periodic contributions, no contributions have been levied or proposed by the body corporate that have not been disclosed in writing to the purchaser.

(3) Not less than five working days before the settlement date, the vendor will provide:

(a) a certificate of insurance for all insurances effected by the body corporate under the provisions of section 135 of the Act; and

(b) a pre-settlement disclosure statement from the vendor, certified correct by the body corporate, under section 147 of the Act. Any periodic contributions to the operating account shown in that pre-settlement disclosure statement shall be apportioned. There shall be no apportionment of contributions to any long-term maintenance fund, contingency fund or capital improvement fund.

(4) There are no other amounts owing by the owner under any provision of the Act or the Unit Titles Act 1972.

(5) There are no unsatisfied judgments against the body corporate and no proceedings have been instituted against or by the body corporate.

(6) No order or declaration has been made by any Court against the body corporate or the owner under any provision of the Act or the Unit Titles Act 1972.

(7) The vendor has no knowledge or notice of any fact which might give rise to or indicate the possibility of:

(a) the owner or the purchaser incurring any other liability under any provision of the Act or the Unit Titles Act 1972; or

(b) any proceedings being instituted by or against the body corporate; or

(c) any order or declaration being sought against the body corporate or the owner under any provision of the Act or the Unit Titles Act 1972.

(8) The vendor is not aware of proposals to pass any body corporate resolution relating to its rules nor are there any unregistered changes to the body corporate rules which have not been disclosed in writing to the purchaser.

(9) No lease, licence, easement, or special privilege has been granted by the body corporate in respect of any part of the common property which has not been disclosed in writing to the purchaser.

(10) No resolution has been passed and no application has been made and the vendor has no knowledge of any proposal for:

(a) the transfer of the whole or any part of the common property;

(b) the addition of any land to the common property;

(c) the cancellation of the unit plan; or

(d) the deposit of an amendment to the unit plan, a redevelopment plan, or a new unit plan in substitution for the existing unit plan,

which has not been disclosed in writing to the purchaser.

(11) As at settlement, all contributions and other moneys payable by the vendor to the body corporate have been paid in full.

9.3 If the property is a unit title, in addition to the purchaser's rights under sections 149 and 150 of the Act, and if the vendor does not provide the certificates of insurance and the pre-settlement disclosure statement under section 147 in accordance with the requirements of subclause 9.2(3), the purchaser may:

(1) postpone the settlement date until the fifth working day following the date on which that information is provided to the purchaser; or

(2) elect that settlement shall still take place on the settlement date.

9.4 If the property is a unit title, each party specifies that:

(1) the facsimile number of the office of that party's lawyer shall be an address for service for that party for the purposes of section 205(1)(d) of the Act; and

(2) if that party is absent from New Zealand, that party's lawyer shall be that party's agent in New Zealand for the purposes of section 205(2) of the Act.

9.5 If the property is a unit title, any costs owing by the purchaser to the vendor pursuant to section 148(5) of the Act for providing an additional disclosure statement shall be included in the moneys payable by the purchaser on settlement pursuant to subclause 3.8(1). Such costs may be deducted from the deposit if the purchaser becomes entitled to a refund of the deposit upon cancellation or avoidance of this agreement.

Unauthorised Structures – Cross Leases and Unit Titles

9.6 (1) Where structures (not stated in clause 6.0 to be requisitionable) have been erected on the property without:

(a) in the case of a cross lease title, any required lessors' consent; or

(b) in the case of a unit title, any required body corporate consent,

the purchaser may demand within the period expiring on the earlier of:

(i) the tenth working day after the date of this agreement; or

(ii) the settlement date,

that the vendor obtain the written consent of the current lessors or the body corporate (as the case may be) to such improvements ("a current consent") and provide the purchaser with a copy of such consent on or before the settlement date.

(2) Should the vendor be unwilling or unable to obtain a current consent then the procedure set out in subclauses 6.2(3) and 6.2(4) shall apply with the purchaser's demand under subclause 9.6(1) being deemed to be an objection and requisition.

10.0 Conditions and mortgage terms

Particular Conditions

10.1 If particulars of any finance condition(s) are inserted on the front page of this agreement, this agreement is conditional upon the purchaser arranging finance in terms of those particulars on or before the finance date.

10.2 (1) If the purchaser has indicated on the front page of this agreement that a LIM is required:

(a) that LIM is to be obtained by the purchaser at the purchaser's cost;

(b) the purchaser is to request the LIM on or before the fifth working day after the date of this agreement; and

(c) this agreement is conditional upon the purchaser approving that LIM provided that such approval must not be unreasonably or arbitrarily withheld.

(2) If, on reasonable grounds, the purchaser does not approve the LIM, the purchaser shall give notice to the vendor ("the purchaser's notice") on or before the fifteenth working day after the date of this agreement stating the particular matters in respect of which approval is withheld and, if those matters are capable of remedy, what the purchaser reasonably requires to be done to remedy those matters. If the purchaser does not give a purchaser's notice the purchaser shall be deemed to have approved the LIM. If through no fault of the purchaser, the LIM is not available on or before the fifteenth working day after the date of this agreement and the vendor does not give an extension when requested, this condition shall not have been fulfilled and the provisions of subclause 10.8(5) shall apply.

(3) The vendor shall give notice to the purchaser ("the vendor's notice") on or before the fifth working day after receipt of the purchaser's notice advising whether or not the vendor is able and willing to comply with the purchaser's notice by the settlement date.

(4) If the vendor does not give a vendor's notice, or if the vendor's notice advises that the vendor is unable or unwilling to comply with the purchaser's notice, and if the purchaser does not, on or before the tenth working day after the date on which the purchaser's notice is given, give notice to the vendor that the purchaser waives the objection to the LIM, this condition shall not have been fulfilled and the provisions of subclause 10.8(5) shall apply.

(5) If the vendor gives a vendor's notice advising that the vendor is able and willing to comply with the purchaser's notice, this condition is deemed to have been fulfilled, and it shall be a requirement of settlement that the purchaser's notice shall be complied with, and also, if the vendor must carry out work on the property, that the vendor shall obtain the approval of the territorial authority to the work done, both before settlement.

10.3 If the purchaser has indicated on the front page of this agreement that a building report is required, this agreement is conditional upon the purchaser obtaining at the purchaser's cost on or before the tenth working day after the date of this agreement a report on the condition of the buildings and any other improvements on the property that is satisfactory to the purchaser, on the basis of an objective assessment. The report must be prepared in good faith by a suitably-qualified building inspector in accordance with accepted principles and methods. Subject to the rights of any tenants of the property, the vendor shall allow the building inspector to inspect the property at all reasonable times upon reasonable notice for the purposes of preparation of the report. The building inspector may not carry out any invasive testing in the course of inspection without the vendor's prior written consent. If the purchaser avoids this agreement for non-fulfilment of this condition pursuant to subclause 10.8(5), the purchaser must provide the vendor immediately upon request with a copy of the building inspector's report.

10.4 (1) If the purchaser has indicated on the front page of this agreement that OIA Consent is required, this agreement is conditional upon OIA Consent being obtained on or before the Land Act/OIA date shown on the front page of this agreement, the purchaser being responsible for payment of the application fee.

(2) If the purchaser has indicated on the front page of this agreement that OIA Consent is not required, or has failed to indicate whether it is required, then the purchaser warrants that the purchaser does not require OIA Consent.

10.5 If this agreement relates to a transaction to which the Land Act 1948 applies, this agreement is subject to the vendor obtaining the necessary consent by the Land Act/OIA date shown on the front page of this agreement.

10.6 If the Land Act/OIA date is not shown on the front page of this agreement that date shall be the settlement date or a date 65 working days from the date of this agreement whichever is the sooner.

10.7 If this agreement relates to a transaction to which section 225 of the Resource Management Act 1991 applies then this agreement is subject to the appropriate condition(s) imposed by that section.

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Operation of Conditions

10.8 If this agreement is expressed to be subject either to the above or to any other condition(s), then in relation to each such condition the following shall apply unless otherwise expressly provided:
(1) The condition shall be a condition subsequent.
(2) The party or parties for whose benefit the condition has been included shall do all things which may reasonably be necessary to enable the condition to be fulfilled by the date for fulfilment.
(3) Time for fulfilment of any condition and any extended time for fulfilment to a fixed date shall be of the essence.
(4) The condition shall be deemed to be not fulfilled until notice of fulfilment has been served by one party on the other party.
(5) If the condition is not fulfilled by the date for fulfilment, either party may at any time before the condition is fulfilled or waived avoid this agreement by giving notice to the other. Upon avoidance of this agreement, the purchaser shall be entitled to the immediate return of the deposit and any other moneys paid by the purchaser under this agreement and neither party shall have any right or claim against the other arising from this agreement or its termination.
(6) At any time before this agreement is avoided, the purchaser may waive any finance condition and either party may waive any other condition which is for the sole benefit of that party. Any waiver shall be by notice.

Mortgage Terms

10.9 Any mortgage to be arranged pursuant to a finance condition shall be upon and subject to the terms and conditions currently being required by the lender in respect of loans of a similar nature.

10.10 If the vendor is to advance mortgage moneys to the purchaser then, unless otherwise stated, the mortgage shall be in the appropriate "fixed sum" form currently being published by Auckland District Law Society Incorporated.

11.0 Notice to complete and remedies on default

11.1 (1) If the sale is not settled on the settlement date, either party may at any time thereafter serve on the other party a settlement notice.
(2) The settlement notice shall be effective only if the party serving it is at the time of service either in all material respects ready, able, and willing to proceed to settle in accordance with this agreement or is not so ready, able, and willing to settle only by reason of the default or omission of the other party.
(3) If the purchaser is in possession, the vendor's right to cancel this agreement will be subject to sections 28 to 36 of the Property Law Act 2007 and the settlement notice may incorporate or be given with a notice under section 28 of that Act complying with section 29 of that Act.

11.2 Subject to subclause 11.1(3), upon service of the settlement notice the party on whom the notice is served shall settle:
(1) on or before the twelfth working day after the date of service of the notice; or
(2) on the first working day after the 13th day of January if the period of twelve working days expires during the period commencing on the 6th day of January and ending on the 13th day of January, both days inclusive,
time being of the essence, but without prejudice to any intermediate right of cancellation by either party.

11.3 (1) If this agreement provides for the payment of the purchase price by instalments and the purchaser fails duly and punctually to pay any instalment on or within one month from the date on which it fell due for payment then, whether or not the purchaser is in possession, the vendor may immediately give notice to the purchaser calling up the unpaid balance of the purchase price, which shall upon service of the notice fall immediately due and payable.
(2) The date of service of the notice under this subclause shall be deemed the settlement date for the purposes of subclause 11.1.
(3) The vendor may give a settlement notice with a notice under this subclause.
(4) For the purpose of this subclause a deposit is not an instalment.

11.4 If the purchaser does not comply with the terms of the settlement notice served by the vendor then, subject to subclause 11.1(3):
(1) Without prejudice to any other rights or remedies available to the vendor at law or in equity, the vendor may:
(a) sue the purchaser for specific performance; or
(b) cancel this agreement by notice and pursue either or both of the following remedies namely:
(i) forfeit and retain for the vendor's own benefit the deposit paid by the purchaser, but not exceeding in all 10% of the purchase price; and/or
(ii) sue the purchaser for damages.
(2) Where the vendor is entitled to cancel this agreement, the entry by the vendor into a conditional or unconditional agreement for the resale of the property or any part thereof shall take effect as a cancellation of this agreement by the vendor if this agreement has not previously been cancelled and such resale shall be deemed to have occurred after cancellation.
(3) The damages claimable by the vendor under subclause 11.4(1)(b)(ii) shall include all damages claimable at common law or in equity and shall also include (but shall not be limited to) any loss incurred by the vendor on any bona fide resale contracted within one year from the date by which the purchaser should have settled in compliance with the settlement notice. The amount of that loss may include:
(a) interest on the unpaid portion of the purchase price at the interest rate for late settlement from the settlement date to the settlement of such resale; and
(b) all costs and expenses reasonably incurred in any resale or attempted resale; and
(c) all outgoings (other than interest) on or maintenance expenses in respect of the property from the settlement date to the settlement of such resale.
(4) Any surplus money arising from a resale as aforesaid shall be retained by the vendor.

11.5 If the vendor does not comply with the terms of a settlement notice served by the purchaser, then, without prejudice to any other rights or remedies available to the purchaser at law or in equity the purchaser may:
(1) sue the vendor for specific performance; or
(2) cancel this agreement by notice and require the vendor forthwith to repay to the purchaser any deposit and any other money paid on account of the purchase price and interest on such sum(s) at the interest rate for late settlement from the date or dates of payment by the purchaser until repayment.

11.6 The party serving a settlement notice may extend the term of the notice for one or more specifically stated periods of time and thereupon the term of the settlement notice shall be deemed to expire on the last day of the extended period or periods and it shall operate as though this clause stipulated the extended period(s) of notice in lieu of the period otherwise applicable; and time shall be of the essence accordingly. An extension may be given either before or after the expiry of the period of the notice.

11.7 Nothing in this clause shall preclude a party from suing for specific performance without giving a settlement notice.

11.8 A party who serves a settlement notice under this clause shall not be in breach of an essential term by reason only of that party's failure to be ready and able to settle upon the expiry of that notice.

12.0 Non-merger

12.1 The obligations and warranties of the parties in this agreement shall not merge with:
(1) the giving and taking of possession;
(2) settlement;
(3) the transfer of title to the property;
(4) delivery of the chattels (if any); or
(5) registration of the transfer of title to the property.

13.0 Agent

13.1 If the name of a licensed real estate agent is recorded on this agreement, it is acknowledged that the sale evidenced by this agreement has been made through that agent whom the vendor appoints as the vendor's agent to effect the sale. The vendor shall pay the agent's charges including GST for effecting such sale.

13.2 The agent may provide statistical data relating to the sale to the Real Estate Institute of New Zealand Incorporated.

14.0 Goods and Services Tax

14.1 If this agreement provides for the purchaser to pay (in addition to the purchase price stated without GST) any GST which is payable in respect of the supply made under this agreement then:
(1) the purchaser shall pay to the vendor the GST which is so payable in one sum on the GST date;
(2) where the GST date has not been inserted on the front page of this agreement the GST date shall be the settlement date;
(3) where any GST is not so paid to the vendor, the purchaser shall pay to the vendor:
(a) interest at the interest rate for late settlement on the amount of GST unpaid from the GST date until payment; and
(b) any default GST;
(4) it shall not be a defence to a claim against the purchaser for payment to the vendor of any default GST that the vendor has failed to mitigate the vendor's damages by paying an amount of GST when it fell due under the GST Act; and
(5) any sum referred to in this clause is included in the moneys payable by the purchaser on settlement pursuant to subclause 3.8(1).

14.2 If the supply under this agreement is a taxable supply, the vendor will deliver a tax invoice to the purchaser on or before the GST date or such earlier date as the purchaser is entitled to delivery of an invoice under the GST Act.

14.3 The vendor warrants that any dwelling and curtilage or part thereof supplied on sale of the property are not a supply to which section 5(16) of the GST Act applies.

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14.4 (1) Without prejudice to the vendor's rights and remedies under subclause 14.1, where any GST is not paid to the vendor on or within one month of the GST date, then whether or not the purchaser is in possession, the vendor may immediately give notice to the purchaser calling up any unpaid balance of the purchase price, which shall upon service of the notice fall immediately due and payable.
(2) The date of service of the notice under this subclause shall be deemed the settlement date for the purposes of subclause 11.1.
(3) The vendor may give a settlement notice under subclause 11.1 with a notice under this subclause.

15.0 Zero-rating

15.1 The vendor warrants that the statement on the front page regarding the vendor's GST registration status in respect of the supply under this agreement is correct at the date of this agreement.

15.2 The purchaser warrants that any particulars stated by the purchaser in Schedule 2 are correct at the date of this agreement.

15.3 Where the particulars stated on the front page and in Schedule 2 indicate that:
(1) the vendor is and/or will be at settlement a registered person in respect of the supply under this agreement;
(2) the recipient is and/or will be at settlement a registered person;
(3) the recipient intends at settlement to use the property for making taxable supplies; and
(4) the recipient does not intend at settlement to use the property as a principal place of residence by the recipient or a person associated with the recipient under section 2A(1)(c) of the GST Act,
GST will be chargeable on the supply under this agreement at 0% pursuant to section 11(1)(mb) of the GST Act.

15.4 If GST is chargeable on the supply under this agreement at 0% pursuant to section 11(1)(mb) of the GST Act, then on or before settlement the purchaser will provide the vendor with the recipient's name, address, and registration number if any of those details are not included in Schedule 2 or they have altered.

15.5 If any of the particulars stated by the purchaser in Schedule 2 should alter between the date of this agreement and settlement, the purchaser shall notify the vendor of the altered particulars and of any other relevant particulars in Schedule 2 which may not have been completed by the purchaser as soon as practicable and in any event no later than two working days before settlement. The purchaser warrants that any altered or added particulars will be correct as at the date of the purchaser's notification. If the GST treatment of the supply under this agreement should be altered as a result of the altered or added particulars, the vendor shall prepare and deliver to the purchaser or the purchaser's lawyer an amended settlement statement if the vendor has already tendered a settlement statement, and a credit note or a debit note, as the case may be, if the vendor has already issued a tax invoice.

15.6 If
(1) the particulars in Schedule 2 state that part of the property is being used as a principal place of residence at the date of this agreement; and
(2) that part is still being so used at the time of the supply under this agreement,
the supply of that part will be a separate supply in accordance with section 5(15)(a) of the GST Act.

15.7 If
(1) the particulars stated in Schedule 2 indicate that the recipient intends to use part of the property as a principal place of residence by the recipient or a person associated with the recipient under section 2A(1)(c) of the GST Act; and
(2) that part is the same part as that being used as a principal place of residence at the time of the supply under this agreement,
then the references in subclauses 15.3 and 15.4 to "the property" shall be deemed to mean the remainder of the property excluding that part and the references to "the supply under this agreement" shall be deemed to mean the supply under this agreement of that remainder.

16.0 Supply of a Going Concern

16.1 If there is a supply under this agreement to which section 11(1)(mb) of the GST Act does not apply but which comprises the supply of a taxable activity that is a going concern at the time of the supply, then, unless otherwise expressly stated herein:
(1) each party warrants that it is a registered person or will be so by the date of the supply;
(2) each party agrees to provide the other party by the date of the supply with proof of its registration for GST purposes;
(3) the parties agree that they intend that the supply is of a taxable activity that is capable of being carried on as a going concern by the purchaser; and
(4) the parties agree that the supply made pursuant to this agreement is the supply of a going concern on which GST is chargeable at 0%.

16.2 If it subsequently transpires that GST is payable in respect of the supply and if this agreement provides for the purchaser to pay (in addition to the purchase price without GST) any GST which is payable in respect of the supply made under this agreement, then the provisions of clause 14.0 of this agreement shall apply.

17.0 Limitation of Liability

17.1 If any person enters into this agreement as trustee of a trust, then:
(1) That person warrants that:
(a) the person has power to enter into this agreement under the terms of the trust;
(b) the person has properly signed this agreement in accordance with the terms of the trust;
(c) the person has the right to be indemnified from the assets of the trust and that right has not been lost or impaired by any action of that person including entry into this agreement; and
(d) all of the persons who are trustees of the trust have approved entry into this agreement.
(2) If that person has no right to or interest in any assets of the trust except in that person's capacity as a trustee of the trust, that person's liability under this agreement will not be personal and unlimited but will be limited to the actual amount recoverable from the assets of the trust from time to time ("the limited amount"). If the right of that person to be indemnified from the trust assets has been lost or impaired, that person's liability will become personal but limited to the extent of that part of the limited amount which cannot be recovered from any other person.

18.0 Counterparts

18.1 This agreement may be executed in two or more counterparts, all of which will together be deemed to constitute one and the same agreement. A party may enter into this agreement by signing a counterpart copy and sending it to the other party, including by facsimile or e-mail.

Ninth Edition 2012 (6)

FURTHER TERMS OF SALE

SEE FURTHER TERMS OF SALE ATTACHED

Copyright
September 2017

SCHEDULE 1

List all chattels included in the sale

(strike out or add as applicable)

Stove Fixed floor coverings Blinds Curtains Light fittings

Ninth Edition 2012 (6)

SCHEDULE 2
(GST Information – see clause 15.0)

This Schedule must be completed if the vendor has stated on the front page that the vendor is registered under the GST Act in respect of the transaction evidenced by this agreement and/or will be so registered at settlement. Otherwise there is no need to complete it.

Section 1

1.	The vendor's registration number (if already registered): 97-780-242	
2.	Part of the property is being used as a principal place of residence at the date of this agreement. That part is: (e.g. "the main farmhouse" or "the apartment above the shop")	~~Yes~~/No
3.	The purchaser is registered under the GST Act and/or will be so registered at settlement.	Yes/No
4.	The purchaser intends at settlement to use the property for making taxable supplies.	Yes/No

If the answer to either or both of questions 3 and 4 is "No", go to question 7

5.	The purchaser's details are as follows:	
(a)	Full name:	
(b)	Address:	
(c)	Registration number (if already registered):	
6.	The purchaser intends at settlement to use the property as a principal place of residence by the purchaser or by a person associated with the purchaser under section 2A(1)(c) of the GST Act (connected by blood relationship, marriage, civil union, de facto relationship or adoption). OR The purchaser intends at settlement to use part of the property (and no other part) as a principal place of residence by the purchaser or by a person associated with the purchaser under section 2A(1)(c) of the GST Act. That part is: (e.g. "the main farmhouse" or "the apartment above the shop")	Yes/No Yes/No
7.	The purchaser intends to direct the vendor to transfer title to the property to another party ("nominee").	Yes/No

If the answer to question 7 is "Yes", then please continue. Otherwise, there is no need to complete this Schedule any further.

Section 2

8.	The nominee is registered under the GST Act and/or is expected by the purchaser to be so registered at settlement.	Yes/No
9.	The purchaser expects the nominee at settlement to use the property for making taxable supplies.	Yes/No

If the answer to either or both of questions 8 and 9 is "No", there is no need to complete this Schedule any further.

10.	The nominee's details (if known to the purchaser) are as follows:	
(a)	Full name:	
(b)	Address:	
(c)	Registration number (if already registered):	
11.	The purchaser expects the nominee to intend at settlement to use the property as a principal place of residence by the nominee or by a person associated with the nominee under section 2A(1)(c) of the GST Act (connected by blood relationship, marriage, civil union, de facto relationship or adoption). OR The purchaser expects the nominee to intend at settlement to use part of the property (and no other part) as a principal place of residence by the nominee or by a person associated with the nominee under section 2A(1)(c) of the GST Act. That part is: (e.g. "the main farmhouse" or "the apartment above the shop").	Yes/No Yes/No

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

This is a binding contract. **Read the information set out on the back page before signing.**

Acknowledgements

Where this agreement relates to the sale of a residential property and this agreement was provided to the parties by a real estate agent, or by a licensee on behalf of the agent, the parties acknowledge that they have been given the guide about the sale of residential property approved by the Real Estate Agents Authority.

Where this agreement relates to the sale of a unit title property, the purchaser acknowledges that the purchaser has been provided with a pre-contract disclosure statement under section 146 of the Unit Titles Act 2010.

Signature of purchaser(s) .....

.....

Signature of vendor(s) .....

P. Wasser

Signature of Guarantor .....

Further Terms of Sale

19. **Agreement Subject to all Necessary Consents and Subdivisional Approvals**

19.1 The Vendor undertakes with all due diligence and at the Vendor's expense to seek the necessary consents and on approval to lodge for deposit in the office of Land Information New Zealand plan of subdivision to enable the Vendor to give to the Purchaser Fee Simple Title to the property in accordance with the subdivision stage of the proposed development which relates to the property.

19.2 This agreement is subject to:

(a) the Vendor obtaining the necessary consents (including subdivisional consent) in accordance with the subdivision stage of the proposed development which relates to the property;

(b) the Vendor being satisfied as to all Corporate, Engineering, Planning and Subdivisional aspects of the proposed development.

19.3 If either of clause 19.2(a) or 19.2(b) are not (in the Vendor's opinion) satisfactorily obtainable or satisfied within one year of the date of this agreement or such later date as may be mutually agreed, the Vendor may cancel this agreement and refund all deposit moneys paid by the Purchaser with interest received on such deposit and this contract shall then be at an end and neither party shall have any claim against the other.

19.4 The Vendor shall supply roading, water, sewage, electricity and telecommunication services to the boundary of the property in accordance with Waimakariri District Council subdivision consent requirements.
All measurements and areas of property for which title has not yet issued are subject to approval of Land Information New Zealand and to any variation which may be found necessary upon such check or which may be required by Land Information New Zealand or the Waimakariri District Council. Precise area of the property, boundaries, level and dimensions are subject to minor variation in course of development and survey. Neither party shall be entitled to any variation in price of the property nor compensation for any such variation unless it shall exceed 5% of the Lot area shown in Attachment A. No compensation to the Purchaser or reparation to the Vendor is otherwise payable in relation to any adjustment.

19.5 The Vendor reserves the right to develop the property and the Vendor's land in and adjoining the subdivision of which the property forms part as it deems necessary or desirable in the interests of progressing and completing the development of Ravenswood as the Vendor may require and to do and maintain all such works and things as the Vendor may require for such purposes including clearing and excavation storage and filling of soil and substrata and landscaping and re-contouring of Lots and provisions of services for roading, access ways, stormwater, sewerage, telephone, electric power, gas and water services.

19.6 The property is sold subject to all covenants, drainage or water rights, building line restrictions or other easements, consent notices, reservations and exceptions of any kind shown on the head titles. The Vendor reserves the right to grant the covenants as set out in the schedule attached herein and to alter or add to those covenants if required to meet conditions of the Subdivision Consent and to grant or receive the benefit of easements, consents notices, or other encumbrances that may be required to meet the conditions of the Subdivision Consent provided that any such charges, easements, consent notices or other encumbrances are in accordance with conventional residential subdivision practice and that the amenity of the Purchaser's property is not negatively impacted to any material degree and the Purchaser agrees to take title subject to or with the benefit of such easements, consent notices or other encumbrances. The Purchaser agrees to do all things and sign all documents that are required for the Purchaser to carry out its obligations under this agreement.

19.7 The Vendor reserves the right to alter or vary the Ravenswood Master Plan and Provisional Layout and Design Plans (including the right to add, alter or vary or cancel any easements and/or covenants) in such manner as the Vendor thinks necessary to allow the subdivision to proceed in accordance with conventional residential subdivision practice and the Purchaser shall not be entitled to make any objection or requisition or claim for compensation provided that any amended plan shall not substantively alter the the specific property the Purchaser has contracted to buy.

19.8 The Purchaser (including the Purchaser's successors in title and subsequent assignees of the property) covenants with the Vendor (including any subsidiary or associated company of the Vendor or successor or assigns to the Vendor) that they will not oppose, object to, frustrate or take any action, or encourage or

cause others to oppose, object to, frustrate or take any action, that might in any way prevent or hinder the Vendor from progressing and completing the Vendor's Ravenswood development plans and/or effecting any zone change and/or subdivision and/or resource consents needed to generally give effect to the Ravenswood Development. This covenant by the Purchaser applies (without limitation) to any Resource Consent application, Environment Court application or Territorial Authority Building Consent application or other necessary consent process involving such development, and the benefit of this covenant also applies to any adjoining or neighbouring property the Vendor may own or subsequently purchase to progress any such development. The Purchaser acknowledges that this requirement shall be reserved by Land Covenant to be registered against the title of the land on or prior to settlement.

20. Exclusion of Warranties

20.1 The Purchaser acknowledges that the Purchaser purchases the property solely in reliance upon its own judgment and not upon any representation or warranty made by the Vendor or any agent of the Vendor other than as specifically stated in this Agreement.

21. Covenants Apply

21.1 The Purchaser acknowledges and agrees that land covenants ("Land Covenants") as settled by the Vendor are intended to establish and maintain a high quality residential amenity for the property. Such covenants are attached and (to the extent not already registered) will be registered against title to the property as a covenant instrument at or prior to settlement.

22. Accruals

22.1 The Vendor and Purchaser agree that for all tax related purposes the purchase price set out herein is the "lowest price" the parties would have agreed upon (at the date of this agreement) for the sale and purchase of the property.

23. No Onsale Prior to House Construction

23.1 The Purchaser acknowledges and agrees that the property will not be on-sold or otherwise disposed of by the Purchaser until a dwelling has been constructed on the property. Such construction must be commenced within two (2) years from the date of settlement of this Agreement.

24. GST

24.1 The purchaser (if GST Registered) will not request a tax invoice (within the meaning of Section 2 of the Goods & Services Tax Act 1985) from the Vendor prior to title being available.

24.2 Should the Vendor be required to pay GST in respect of this sale prior to Settlement the obligations of the Vendor's solicitor to hold moneys received from the Purchaser as stakeholder shall terminate and such moneys will be paid to the Vendor.

25. Guarantee

25.1 Where the Purchaser is a company, in consideration of the Vendor entering into this agreement at the request of the directors and shareholders of the Purchaser, each of those directors and shareholders jointly and severally guarantees to the Vendor the performance of all the Purchaser's obligations under this agreement, and undertakes to execute this agreement in that capacity in recognition of this obligation.

26. Vendor Approval of Site Works

26.1 No development or site works may be commenced on the property prior to settlement unless all necessary consents and approvals required under the Land Covenants have been obtained and the Vendor has approved and agreed in writing to the work involved.

27. Maintenance of Bare Lots

27.1 Until a dwelling is erected on the land and if the grass cover is over 150mm in length, having given the Purchaser at least 7 days prior notice, the Vendor shall be entitled to enter onto the property and carry out any mowing of grass needed to ensure the Lot is kept tidy and to recover the cost from the Purchaser.

28. Entire Agreement

28.1 This agreement comprises the entire agreement between the Vendor and Purchaser and is not binding on the Vendor until signed by the Vendor or the Vendor authorised representative. No variation representation or undertaking by the Vendor or any person purporting to be acting on behalf of the Vendor shall be binding on the Vendor unless in writing and signed by an authorised director of the company. No person is authorised to commit the Vendor in any way in relation to this agreement or matters supplemental to it unless signed off in writing by an authorised director of the Vendor company. This agreement shall not be binding on the Vendor unless signed off in such manner.

29. Governing Law and Jurisdiction

29.1 This agreement and transactions contemplated by it are governed by New Zealand Law. The parties accept the exclusive jurisdiction of the New Zealand Courts.

30. Execution of this agreement

30.1 This agreement shall be deemed to be signed by a party if that party has executed any of the following formats of this agreement:

(a) an original;
(b) a copy;
(c) a facsimile or email copy; or
(d) a photocopy of any of the above.

31. Purchaser Not to Lodge Caveat

31.1 The Purchaser shall not prior to the deposit of the plan for the property lodge any Caveat against the title to the property. Should a Caveat be lodged the Vendor may:

(a) at the option of the Vendor declare this agreement null and void;
(b) take all necessary steps to secure the immediate removal of any such Caveat;
(c) by a director of the Vendor as the Purchaser's duly appointed agent and Attorney sign and register withdrawal of such Caveat and presentation of a signed copy of this agreement to the District Land Registrar shall be sufficient authority to such Registrar to register the withdrawal of such Caveat signed by the Vendor as the Vendor's Attorney of the Purchaser.

32. Sunset Clause

32.1 Either party shall be entitled to cancel this agreement where titles have not been issued within 3 years of the date of this Agreement. In the event of such cancellation the Purchaser shall be entitled to a refund of the deposit paid (plus the net interest received on such deposit) and neither party shall have any claim in respect of this agreement or any associated matter.

DUE DILIGENCE

33. This agreement is entirely conditional upon:

The Purchaser and/ or its nominee being satisfied in all respects that the property is suitable for the Purchasers and/ or his nominees requirements following the Purchaser carrying out a due and diligent investigation of all aspects of the property which the Purchaser considers appropriate.

The date for satisfaction of these conditions shall be ~~10~~ 15 working days from the date of this agreement. This is for the sole benefit of the Purchaser and/ or its nominee.

34. Discount on Purchase Price

In consideration of the Purchaser entering into Agreements for Sale and Purchase of 5 separate lots in Ravenswood Stage 1B Residential, the Vendor agrees to reduce the Purchase Price by 10% from $103,478 plus GST (if any) to $93,130 plus GST (if any) upon execution of this Agreement by the Vendor, Purchaser and Guarantors and the execution of Agreements for Sale and Purchase for Lots 5, 9,131, 155 and 156 PROVIDED HOWEVER the 10% discount on the Purchase Price will only apply if the Purchaser confirms all of the Purchaser's conditions on each Agreement for Sale and Purchase for all 5 lots being lots 5,9, 131, 151 and 156 and does not cancel any of the Agreements for Sale and Purchase for the said 5 lots.

35. The Purchaser shall be entitled to cancel the agreement by notice in writing to the Vendor, if the Vendor shall not have commenced earthworks at Ravenswood Stage 1A residential by 31 ~~March~~ August 2018. In the event of such cancellation the Purchaser shall be entitled to a refund of the deposit paid (plus the net interest received on such deposit) and neither party shall have any claim in respect of this agreement or any associated matter.

BUILDERS ADDITIONAL TERMS & CONDITIONS OF SALE

Ravenswood - Stage 1

1. **Sale and Purchase of Builder Lots**

1.1 The Special Terms of Sale applicable to the Builder as Purchaser in respect of the Sale & Purchase Agreement (The Builders Additional Terms & Conditions of Sale) are as follows:

2. **Deposit Payment**

2.1 The deposit of 10% of the purchase price is payable to Berry & Co Trust Account as stakeholder pending title (and will remain there in trust until ownership transfers to the Purchaser).

3. **Deferment of Settlement Date**

3.1 Ravenswood's standard terms of sale specify that settlement of the sale and the balance of the purchase price is payable in cash five (5) working days after certificate of title is issued by Land Information New Zealand. Notwithstanding this, the Builder is only obliged to effect settlement of the sale and pay the balance of the Purchase Price in cash upon the earlier of:

(a) 3 months from the date each individual lot's certificate of title is issued; or

(b) the date of settlement of the on-sale to a third party as part of a Home and Land Package or otherwise.

4. **Sunset Clause**

4.1 The Purchaser shall be entitled to cancel this agreement where titles have not been issued within three (3) years of the date of this Agreement. In the event of such cancellation the Purchaser shall be entitled to a refund of the deposit paid (plus the net interest received on such deposit) and neither party shall have any claim in respect of this agreement or any associated matter.

5. **Warranty on Land Condition**

5.1 The Vendor warrants that the residential Lot purchased by the Vendor will be suitable for TC1 or TC2 equivalent foundation.

6. **On Sale**

6.1 The Builder may not on-sell the residential Lot(s) without having entered into an agreement with an on-sale Purchaser which includes the Lot as part of a home and land package.

7. **Construction Bond**

7.1 The Builder agrees to execute and pay a Construction Bond of $2,000 as part of this Agreement. The construction bond is to cover any damage or costs incurred as a result of actions by the Builder and/or its subcontractors and, if not rectified, needs to be paid out of the construction bond. The Construction Bond must be paid to Berry & Co Trust Account as stakeholder prior to the commencement of construction on the site, and upon completion of the dwelling, will be returned to the Builder within five (5) working days after the Vendor receives a written request by the Builder as long as no damage has occurred.

8. **Conflict**

8.1 In the event that there is a conflict or inconsistency between any of the provisions of this Builders Additional Terms and Conditions of Sale and the Sale and Purchase Agreement including Covenants, and Further Terms of Sale, then the provision of this Builders Additional Terms and Conditions of Sale shall take precedence and prevail.

9. **Notices**

9.1 All notices given hereunder may be delivered by hand, facsimile copier, post mail or email. In the case of notices sent by facsimile copier or email the notice shall be deemed to have been received on the following business day and in the case of post mail shall be deemed to have been received on the fourth day following posting. Notices shall be given to the parties at the following addresses or such other addresses as they may from time to time advise in writing:

BUILDERS ADDITIONAL TERMS & CONDITIONS OF SALE

In the case of Ravenswood:

Ravenswood Developments Limited
c/o Infinity Investment Group
78 Ardmore St
P O Box 390
Wanaka
Telephone: (03) 443 0088,
Fax: (03) 443 0089
Email: pcroft@infinitywanaka.com

In the case of the Builder:

Name:

Address

P O Box

Telephone:

Fax:

Email:

10. **Marketing and Publicity**

10.1 The Vendor will allow the Purchaser to utilise the Vendor's "Ravenswood" name and brand and their derivatives in the Purchaser's marketing and publicity material for the Purchaser's promotion and on-sale of the property on the following basis:

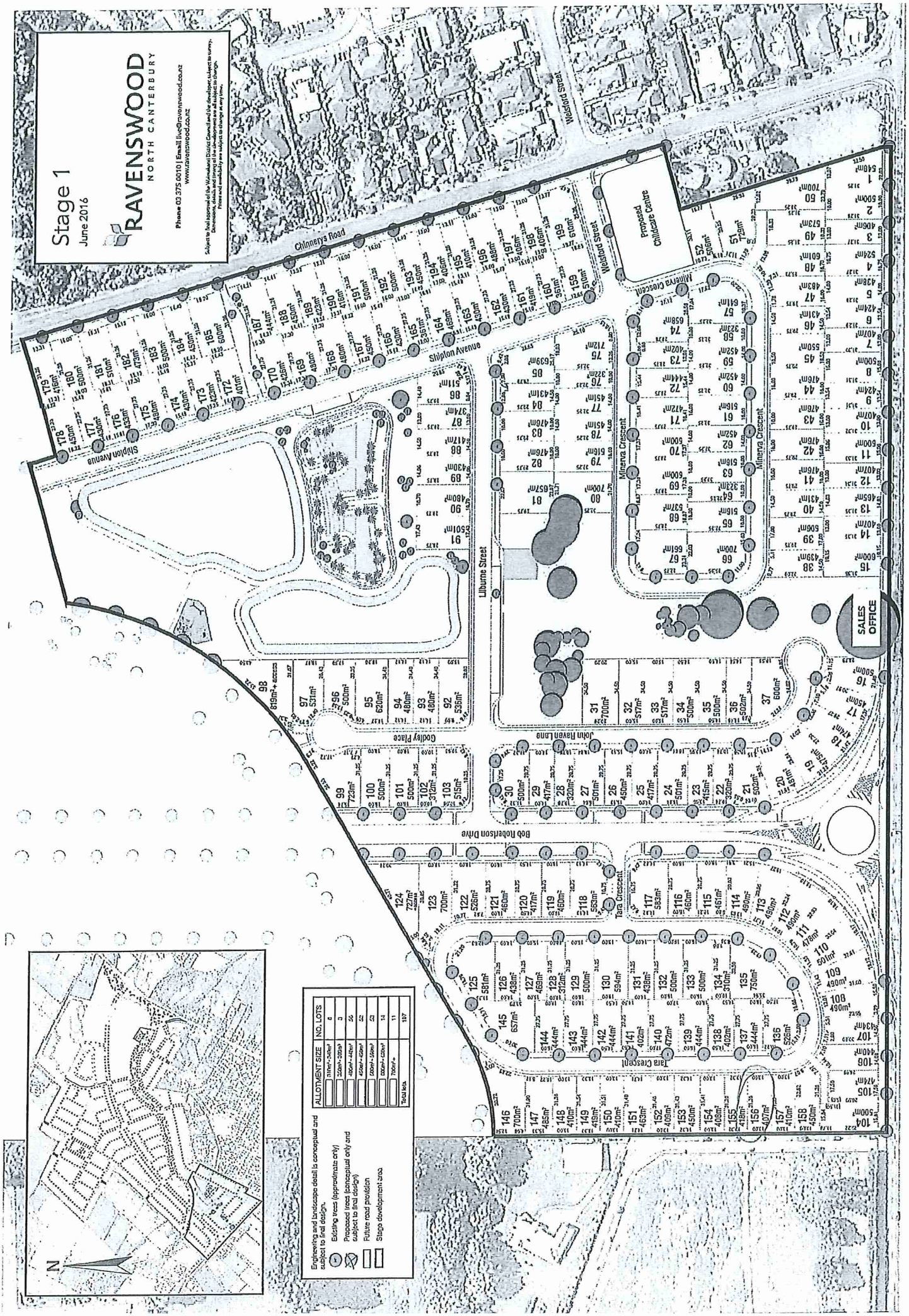
(a) Such use is limited to promotion and marketing directly connected to sales of property in the Vendor's Ravenswood development.

(b) All such material or use (whether written or verbal) must be approved by the Vendor prior to use, public release, or public distribution or publication to ensure the quality, timeliness, and co-ordination with the Vendor's marketing and publicity campaigns and activities.

(c) Any terms and conditions of use specified by the Vendor must be strictly observed.

ATTACHMENT A

SUBDIVISIONAL PLANS


Stage 1
June 2016
RAVENSWOOD
NORTH CANTERBURY
Phone 03 375 0010 | Email live@ravenswood.co.nz
www.ravenswood.co.nz
Subject to final approval of the Waimakariri District Council and the developer, subject to survey. Dimensions and areas are approximate and subject to change. Prices and availability are subject to change at any time.
Chinneys Road
Welsford Street
Proposed Childcare Centre
Minerva Crescent
Shipton Avenue
Liliburne Street
Godley Place
John Haven Lane
Bob Robertson Drive
Tara Crescent
SALES OFFICE
ALLOTMENT SIZE
NO. LOTS
Engineering and landscape detail is conceptual and subject to final design.
Existing trees (approximate only)
Proposed trees (conceptual only and subject to final design)
Future road provision
Stage development area
N

ATTACHMENT B

MASTER PLAN

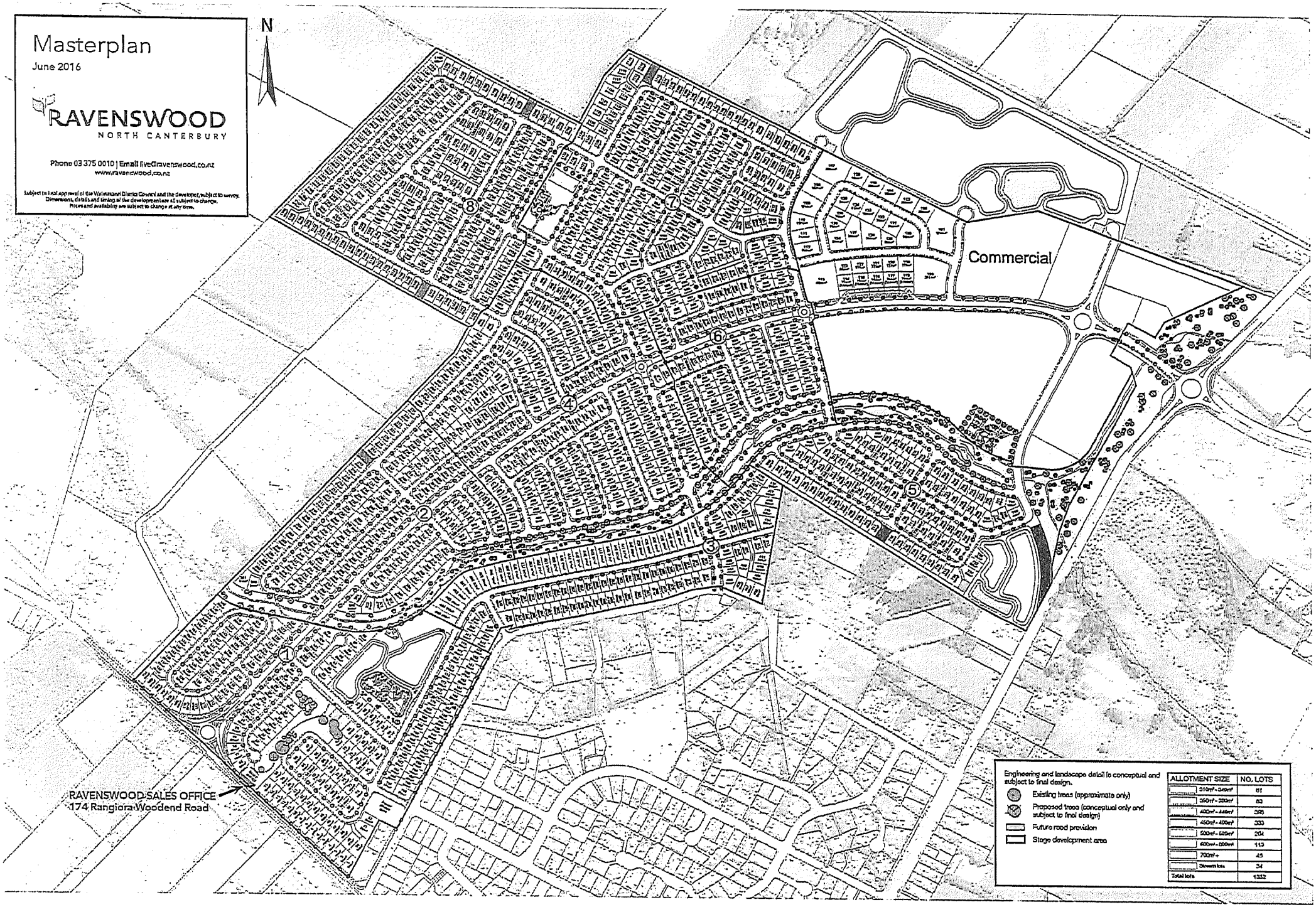
Masterplan

June 2016

RAVENSWOOD
NORTH CANTERBURY

Phone 03 375 0010 | Email five@ravenswood.co.nz
www.ravenswood.co.nz

Subject to final approval of the Waimakariri District Council and the Developer, subject to survey. Dimensions, details and timing of the development are all subject to change. Prices and availability are subject to change at any time.



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ATTACHMENT C

LAND COVENANTS

RAVENSWOOD
NORTH CANTERBURY

Land Covenants.

1. PURPOSE

1.1 The purpose of these covenants is to protect the market and aesthetic value of the Dominant Lots, the privacy, peace and security of the occupants of the Dominant Lots, and the quality of the environment affecting the Dominant Lots for the benefit of the Dominant Lots, Ravenswood, and its associated Community in general.

2. DEFINITIONS

In the following covenants:

2.1 Headings are for ease of reference only and do not form part of any covenant nor affect the meaning of any covenant.

2.2 Words imputing the singular include the plural and vice versa.

"Approved" means approved by Ravenswood either in accordance with clause 4.1 or as may otherwise be required by any of the covenants.

"Building" comprises a building as defined by the Building Act 2004 (or latest version).

"Dwelling or Dwellinghouse" means and includes a residential dwelling house, or family residence.

"Landscape Feature" means any visible structural or landscape design or enhancement feature or utility to be provided on any Lot.

"Lot" means any Lot that is subject to these covenants.

"Lot Owner" means the owner of any Lot.

"Ravenswood" means Ravenswood Developments Limited and any successor party or organisation nominated by it or by any successor party or organisation to deal with applications required for approvals by Ravenswood under any of these covenants.

"Ravenswood Design Guidelines" means the Ravenswood Design Guidelines document published and maintained by Ravenswood.

3. COVENANTS

Building Construction and Lot Development

3.1 No more than one Dwellinghouse may be constructed on any Lot.

3.2 All Buildings to be used as a Dwellinghouse must have a ground floor area of not less than 90m² (inclusive of any garage under the same roof structure).

3.3 No re-locatable Buildings may be brought onto any Lot nor any other previously used Building be transported to or re-erected on any Lot unless previously agreed in writing by a duly authorised representative of Ravenswood.

3.4 All Buildings must be constructed on-site from new or high quality recycled materials unless previously agreed in writing by a duly authorised representative of Ravenswood.

3.5 Exterior cladding for all Buildings on any Lot (except for the cladding of soffits or gable ends) shall be of the following materials:

a. Brick, or

b. Natural stone, or

c. River rock, or

d. Textured plaster over brick, or polystyrene or other suitable sub-base for plaster, or

e. Stained or painted timber weather-board, wooden shingles, timber board & batten, or

f. Surface coated concrete block, or

g. Solid plaster or glazing or

h. Such other materials as may be approved by Ravenswood.

3.6 All roofing material on any Building shall be either:

a. Tiles, (including clay, ceramic, concrete, decramastic, pre-coated or pressed steel), or

b. Steel (comprising pre-painted, longrun pressed or rolled steel), or

c. Shingle, or

d. Slate, or

e. Membrane roofing, or

f. Such other roofing material as may be approved by Ravenswood.

3.7 No reflective or visually obtrusive roof, wall or joinery materials, colours or mirror glass may be used for any Building.

3.8 There shall be no copper, galvanised, unpainted zincalume or any other unpainted metal on roof material, gutters, down pipes or external cladding of any Building.

3.9 No Buildings shall be erected on any Lot using concrete or treated wooden piles without providing a solid and durable skirting board or other enclosure around the exterior of the Building(s) from ground height to the underside of the wall cladding.

3.10 No garages or subsidiary Buildings shall be erected on any Lot except in conjunction with or following construction of the main Building and all such Buildings shall be constructed with permanent materials comprising timber, stone or other permanent materials in character with the main Building on each Lot.

3.11 A Dwellinghouse must be constructed on the Lot in compliance with these Covenants, the Ravenswood Building Covenants, the Ravenswood Design Guidelines document and all relevant regulatory requirements and in accordance with the Building Plans approved in accordance with Clause 4. Construction of the Dwellinghouse must commence within two (2) years of settlement of purchase by the Lot Owner. The Lot Owner acknowledges and Ravenswood gives no warranty or undertaking that similar conditions or requirements will be imposed in respect of other Lots within Ravenswood.

3.12 No Lot (or any part of the Lot) may be sold or otherwise disposed of until a Dwellinghouse has been constructed on the Lot in compliance with Clause 3.11. In exceptional circumstances Ravenswood may grant a dispensation to this requirement. Any dispensation must be confirmed in writing by an authorised representative of Ravenswood. If Ravenswood consents to the sale or transfer of the Lot to a third party prior to the construction of a Dwellinghouse on the Lot, on-sale purchasers of the Lot will be bound by this covenant and Clause 3.11.

3.13 All construction works required to complete a dwelling on any Lot including any required painting or staining of exterior surfaces shall be completed within a period of twelve (12) months from the date of commencement of construction work. Earthworks and landscaping works associated with such development (including lawns, drives, paths and fencing) visible from the street similarly shall be completed within three (3) months of receipt of Code Compliance Certificate for the dwelling.

3.14 No Building on any Lot may be occupied as a residence in any way until:

a. The Code Compliance Certificate(s) has been issued by either the Waimakariri District Council or an approved Building Certifier; and

b. The Buildings have been completed in accordance with all the terms of these Covenants; and

c. All exterior work, decoration and final interior window coverings are completely installed; and

d. All areas viewable from the street are in a tidy state. These areas must be completed in accordance with your approved landscape plan within three (3) months of receipt of Code of Compliance.

3.15 Any external air conditioning units must be properly screened and noise proofed to ensure they are not a nuisance to neighbours.

3.16 Diesel, petrol, oil or gas tanks which have a capacity of over 100 litres are prohibited on any Lot or within any Building unless approved by Ravenswood.

3.17 Driveways, driveway crossings and entranceway locations and plans and specifications must be approved by Ravenswood prior to construction.

3.18 Lots that have rear vehicular access available from a lane or right of way may not have vehicular access to the Lot from the street frontage. Parking is prohibited on any access lane or right of way unless approved by Ravenswood.

3.19 No Building shall be erected, altered, placed or permitted to remain on any Lot other than Buildings designed for residential use and associated garage(s) and outbuildings. Ravenswood and its designated representative(s) and/or builders approved by Ravenswood may use residential Buildings as show homes or offices, provided such use is in furtherance of the primary purpose of construction and sale of Lots and dwellings within the Ravenswood development.

3.20 No Lot Owner shall oppose, object to, frustrate, or take any action, or encourage or cause others to oppose, object to, frustrate or take any action that might in any way prevent or hinder Ravenswood from progressing or completing the present Ravenswood development or any future development of Ravenswood. Such covenant extends to and includes (without limitation) development planning, zone changes, resource consents for land uses and subdivisions, Consent Authority or Environment Court applications, Territorial Authority Building Consent matters, or any other necessary consent process involving Ravenswood and/or the parent company. The benefit of this covenant also applies to Ravenswood and for any adjoining or neighbouring properties now or hereafter owned by Ravenswood and/or the parent company.

Landscape Features

3.21 Construction of any Landscape Features on any Lot shall not be commenced until the plans and specifications have been approved by Ravenswood.

3.22 No Landscape Feature may exceed a height of 2m above the original sub-division ground level of a Lot without the express written approval of Ravenswood.

3.23 Clotheslines and letterboxes must be unobtrusive and of good quality in terms of design and location. The positioning of any clothesline shall be on the rear half of each Lot with appropriate screening to ensure it will not be highly visible from the street. The positioning of any letterbox shall be adjacent to but not on the road reserve.

3.24 All attachments to any Buildings or structures on any Lot (including television antenna, solar hot water panels, satellite dish, mast, garden statues, fountains or any other exterior ornamental decoration or similar garden or Landscape Feature) must not be of a nature that would devalue the neighbouring properties in the opinion of Ravenswood. Any such offending item must be removed or screened to Ravenswood's satisfaction.

3.25 The location of and construction of swimming pools (including fencing and screening on any Lot), must be approved by Ravenswood.

Building & Lot Maintenance

3.26 No Lot Owner shall display or permit to be displayed on any Lot or Building any advertisement, sign or hoarding (except for compulsory statutory signage, real estate signage pending sale and builder's signage during construction and pending sale). All such signage (including its construction and location) must comply with relevant Waimakariri District Council requirements and first be approved by Ravenswood.

3.27 No livestock, poultry or animals which may be likely to cause a nuisance to any other Ravenswood resident shall be raised, bred or kept on any Lot or in any Buildings; provided, however, that dogs and cats, or other common domesticated household pets that are not dangerous or annoying may be raised and kept. Such permitted pets shall be kept on the owner's Lot and if a dog it shall not be allowed off the owner's Lot except under controlled supervision. Any dog which in whole or in part, resembles any of the Pit Bull Terrier, the Japanese Tosa, the Dogo Argentino or the Fila Brasileiro breeds and any other potentially aggressive or noisy breed of animal is prohibited if it causes a nuisance in any way. No permitted pet shall be allowed to make noise in a manner or of such volume as to annoy or disturb other Lot Owners. Any Lot Owner who allows or keeps a pet on their Lot is responsible for any loss or liability of any kind arising from the keeping of such pet. The keeping of pets by a Lot Owner shall be subject to any other restrictions required by Ravenswood from time to time in the interests of maintaining a good residential environment.

3.28 Buildings and Landscape Features must be maintained and not be allowed to deteriorate to a point where the standard of presentation is either:

a. Less than that represented in the rest of the Ravenswood developed residential area, or

b. Inadequate, taking into account fair wear and tear and the original condition at the time that the residential Building on the Lot was occupied as a residence and the condition of its neighbourhood properties.

3.29 Lots must otherwise be kept and maintained in a neat and tidy condition at all times, including the grounds, lawns, gardens and the Local Authority owned road frontage to each of the Servient Lots. Grass and other ground cover must not exceed a height of 120mm.

3.30 Lot Owners must not alter the original subdivision contour and levels of the Lots without prior approval from Ravenswood.

3.31 No tree shrub or other vegetation shall:

a. Protrude beyond 3m in height within 2m of any Lot boundary.

b. Protrude beyond 5m in height within the area of any Lot between 2m and 5m on the easternmost and southernmost boundary of any Lot.

c. Protrude beyond an absolute height of 7m elsewhere on the Lot.

"height" is to be taken from original subdivision ground level of a Lot.

To ensure reasonable amenity to each Lot, if any tree shrub or other vegetation on any Lot is very substantially shading or very materially affecting the outlook or view from any neighbouring Lot or is creating any significant nuisance and that Lot Owner neglects or refuses for a period of thirty (30) days following notice in writing to them from the affected Lot Owner(s) requesting reduction to the height and/or the canopy area or remedying of the nuisance involved with such tree, shrub or other vegetation, then the parties involved shall be bound to resolve the same by arbitration in accordance with Clause 5 (Dispute Resolution).

Fencing Provisions

3.32 The Lot Owner shall be bound by a Fencing Covenant within the meaning of Section 2 of the Fencing Act 1978 in that neither Ravenswood nor the Waimakariri District Council shall be liable to pay for or contribute towards the cost of the construction or maintenance of any fence between any Lot and any adjoining land owned by Ravenswood or the Waimakariri District Council.

3.33 A Lot Owner who takes title to a Lot having a boundary fence already constructed on a Lot boundary which has been paid for in full by an adjoining Lot Owner(s) shall be liable to reimburse each such Lot Owner for one half of the actual cost of that boundary fence (if not already

reimbursed by any other party). Such cost shall not exceed $90.00 (plus GST) per linear metre for the fence. The cost shall be annually adjusted based on the all groups Consumer Price Index effective from 1st January 2016.

3.34 All fences on the side and rear Lot boundaries shall be constructed and maintained in accordance with the Ravenswood Design Guidelines and:

a. Shall not exceed 1.8m.

b. Side fences and rear fences must be erected prior to any building construction.

c. There shall be no fencing across the street frontage of any Lot unless otherwise approved by Ravenswood.

d. Must be contiguous with neighbouring fencing.

e. Any Lot which abounds a reserve must be fenced to a maximum height of 1.2m and have a minimum visual permeability/openness of 50% (eg. Warner fence) - except where required to screen a bin storage area as detailed in the Design Guidelines, or unless otherwise approved by Ravenswood. No exceptions can be granted by Ravenswood for Lots bordering reserves that are less than 400m² or greater than 35% site coverage (WDC requirement).

3.35 Fencing requirements may be varied by Ravenswood where desirable to ensure a high standard of appearance or where fencing is undesirable or unnecessary in the view of Ravenswood.

Land Use Restrictions

3.36 No Lot shall be used for any form of temporary residential purposes either by the construction of temporary Buildings or by the placement of caravans, modular homes, mobile homes, motor homes, house trailers, buses, tractors, huts, tents and/or vehicles able to be used for human habitation except for a builder's shed at the commencement of, and for the duration of construction, of any dwelling being erected on the Lot.

3.37 Lot Owners must not use any Lot for any primary purpose other than for residential occupation unless previously agreed in writing by a duly authorised representative of Ravenswood. Ancillary purposes are governed by the planning provisions under any regulatory land use controls applicable from time to time.

3.38 No Lot shall be sold, leased, transferred, assigned or otherwise disposed of to any Governmental agency or Territorial Authority for the purposes of public or institutional housing without the prior approval of Ravenswood.

3.39 No inflammable, explosive or noxious materials are to be stored or used on any Lot or in any Building. The Lot Owner must not allow any offensive activity to be conducted or permitted to exist upon any Lot, or in any Building, nor shall anything be done or permitted to exist on any Lot or in any Building that may be or may become an annoyance or private or public nuisance. An annoyance or private or public nuisance includes loud sounds or noises or offensive smells.

3.40 No Lot, driveway or common area shall be used for the purpose of long term vehicle parking, repair or maintenance. No unregistered, non-licensed or expired license or inoperable vehicles of any kind shall be permitted to remain on any Lot (unless parked inside the garage).

3.41 No recreational or commercial vehicles boats or trailers are to be regularly located on the road or in front of the Building line of the main Building constructed or to be constructed on the Lot.

3.42 No Lot may be further subdivided nor shall any further easements be agreed to, granted or registered on any Lot, including rights of way.

Enforcement

3.43 Ravenswood may enforce these covenants in the same manner as a Lot Owner and in Particular, where a Lot Owner does not comply with any covenant Ravenswood may request such owner in writing to remedy such non-compliance within a specified time (not to be less than fourteen (14) days from the date of such request). At the end of the specified time and where the Lot Owner remains in default in remedying such non-compliance, Ravenswood may employ a suitably qualified or experienced person to enter such Lot and carry out work necessary to achieve compliance with the covenant(s) involved, and may recover as a debt due from the

defaulting Lot Owner all costs incurred by Ravenswood in such remedial work.

3.44 Ravenswood will use its best endeavours to ensure observance of these covenants but shall not have any legal responsibility or liability for any lack of enforcement or enforceability or application of any of these Covenants. The Lot Owners agree to keep Ravenswood fully indemnified from any claim, liability, loss or action arising against it or its agents in respect of these covenants having regard to their intent to provide for the interests of Lot Owners inter se and their individual obligations of observance and rights of enforcement of the covenants.

4. APPROVAL PROCESS FOR BUILDINGS AND SITE DEVELOPMENT

4.1 Prior to submitting Building plans and Building consent applications to any Consent Authority for any necessary approvals and prior to the commencement of building construction the Lot Owner of each Lot shall obtain the written approval of Ravenswood (such approval to be considered in an impartial and reasonable manner) in respect of:

a. Site plan (location of building on the lot showing proposed access from the streets or rights of way and off-street parking);

b. Floor plan (with dimensions and elevations);

c. Completed exterior finishes checklist;

d. A landscape plan for the Lot;

e. Proposed fencing (shown either on the site plan or landscape plan).

Ravenswood undertakes to use its best endeavours to respond to each application submitted no later than four (4) working days after receipt of items (a) to (c) above.

4.2 All building construction work must be carried out in accordance with and comply with the Ravenswood Building Covenants and each Lot Owner is required to enter into and agree to comply with such Covenants (intended to ensure all on site works are undertaken in a safe and competent manner) as a requirement for approval of Ravenswood to all building works.

4.3 Each Lot Owner agrees to execute and comply with the Ravenswood Design Guidelines and Ravenswood Building Covenants which are provided and maintained by Ravenswood. It is the responsibility of each Lot Owner to ensure that builders, sub-contractors, workmen and suppliers fully comply with these covenants.

4.4 Ravenswood may delegate such approval process to a nominated and suitably qualified party.

5. DISPUTE RESOLUTION

5.1 Should any dispute arise concerning any aspects of these covenants that cannot be resolved by agreement between the parties involved, the Lot Owners are bound to resolve the same by arbitration in accordance with the Arbitration Act 1996 ("the Act"), and the following provisions shall apply:

a. There shall be a single arbitrator who shall be appointed by the President for the time being of the Canterbury District Law Society (or any successor organisation) as a sole arbitrator.

b. The arbitrator shall determine all questions in issue between the parties including questions as to the scope of the dispute and as to procedure.

c. The arbitrator's award shall be binding on all parties to the dispute.

d. Any party to a dispute may initiate arbitration in accordance with the provisions of the Act.

ATTACHMENT D

BUILDING COVENANTS

RAVENSWOOD
NORTH CANTERBURY

Building Covenants.

1. PURPOSE

To ensure that all on-site building construction work is undertaken in a safe and competent manner. All infrastructure services and facilities of the subdivision are fully protected and remain operational, and that the peace, privacy and security of each property owner is not adversely affected.

2. HEALTH & SAFETY

It is a requirement that the Lot Owner ensures that the Builder (including all Builders' sub-contractors) maintains an effective Health & Safety Policy for work carried out within Ravenswood.

3. NOISE RESTRICTIONS AND ON-SITE HOURS OF WORK

3.1 Allowable Hours of Normal Construction Noise

The allowed hours of work in clause 3.3 are subject to the following. Normal construction activity and associated noise is only allowable between the hours of:

Monday to Friday	8.00am to 6.30pm
Saturday	9.00am to 5.30pm
Sunday	9.00am to 1.00pm
Statutory Holidays	9.00am to 3.00pm

Particularly noisy work activity must be scheduled to avoid the earlier and latter part of the day. All unavoidable noise in the earlier and latter part of the day must be very carefully controlled and monitored.

3.2 Unacceptable Noise Levels

Ravenswood reserves the right to enter onto the lot and require the immediate cessation of building activity that in Ravenswood's sole determination is causing unacceptable noise or nuisance. The Builder shall immediately comply with any Ravenswood requirement to cease the building activity causing unacceptable noise or nuisance.

3.3 On-Site Work Hours

Subject to restrictions on the creation of construction noise or nuisance above, the allowable hours of onsite work are as follows:

Monday to Friday	7.00am to 8.00pm
Saturday	8.00am to 8.00pm
Sunday	8.00am to 8.00pm
Statutory Holidays	8.00am to 8.00pm

It should be noted that the on-site work hours are longer than the allowable hours of normal construction activity and noise under clause 3.1. On-site work outside of the times in clause 3.1 must be quiet. All these times may be varied by written agreement with Ravenswood, in particular a specific work activity that requires a longer than usual working day, such as a concrete slab pour.

4. FENCING

The side fences and rear fences must be erected prior to any building construction. There shall be no fencing across the street frontage of any Lot unless approved by Ravenswood. All fencing must comply with the locations, design criteria, and materials specified in the Ravenswood Design Guidelines (as appropriate). (Refer to the Land Covenants.)

5. LOT ACCESS

No use may be made of adjacent land, footpaths or recreation areas abutting any Lot for access (other than the access approved by Ravenswood) or for dumping of rubbish. Lot Owners shall be responsible to Ravenswood for all costs arising from damage to any landscaping, swales, roads, footpaths, kerbing, berms, concrete or other structures arising directly or indirectly from any access or use by the Lot Owner or their contractors and invitees.

6. VEHICLE CROSSINGS

When a vehicle crossing from the road to any residential Lot at Ravenswood is constructed, any irrigation line in this location is to be protected and shall not be damaged, removed nor be modified in any way. To ensure this condition is met the Lot Owner or Builder shall:

a. When the crossing is excavated and before back-filling, make a thorough examination of the irrigation pipe network. Any signs of damage must be reported immediately to Ravenswood and no repairs are to be made by the Builder or Lot Owner.

b. If repairs are required, ensure there are no joins under the vehicle crossing. New sections of pipe must be installed with joiners fitted at least 500mm either side of the concrete nib for easy access. The Lot Owner is liable for the cost of any repairs.

c. Before back-filling arrange with Ravenswood for the irrigation system to be tested to ascertain if there is unseen damage. Lot Owners or Builders shall contact the Ravenswood office and notify them of the Lot number, upon which the system will be tested prior to back-fill. If the Lot Owner or Builder fails to notify the Ravenswood office as required above and damage to the irrigation line becomes apparent, the Lot Owner and Builder shall be liable for repairs to the irrigation system. If the vehicle crossing has been backfilled and/or sealed the area may require re-excavation. In this case, the Lot Owner and Builder are each responsible for the cost of reinstatement by Ravenswood Developments Limited or its contractor undertaking such works.

7. BUILDERS' SITE SHEDS

All Builders' site sheds shall be placed on the respective building Lot no earlier than the commencement of the building works. All sheds and other structures necessary for storage shall be painted in a consistent colour. The sheds and other structures must be immediately removed from the building Lot upon completion of the building works.

8. LOADING, UNLOADING & STORAGE OF MATERIALS DURING CONSTRUCTION

All loading, unloading delivery and storage of materials shall take place within the bounds of the Lot. No unloading delivery and storage of materials is permitted on any swale, footpath, verges, berm areas or adjacent lots.

9. PARKING OF TRADES AND DELIVERY VEHICLES DURING CONSTRUCTION

All vehicles whether they are contractors, tradesmen or a delivery must not park on the swale, footpath, verges, berm areas or adjacent lots. Any vehicle that deposits oils or other damaging material must be removed from the area and the damage made good.

10. TOILET FACILITIES

No toilets other than porta-loo style toilets will be allowed on a Lot during the building construction period. They should be located as far from the lot entrance as practical and screened from neighbouring Lots and roadways.

11. EROSION CONTROL

All exposed earth and disturbed areas of the Lot must be protected from wind and water erosion during and after construction. Exposed areas should be covered with matting and/or replanted as soon as possible. Special attention should be given to preventing any material being deposited, or run off of silt and other debris into waste water pipes, lakes and waterways.

12. NO ANIMALS

During the building construction period no animals of any kind are permitted on the building Lots or within the confines of the Ravenswood development.

13. RUBBISH, RUBBISH REMOVAL & STREET CLEANING

Appropriate rubbish skips shall be kept within the Lot (or in a designated area as approved by Ravenswood) for all rubbish and shall be cleared at regular intervals. At no time shall rubbish be permitted to escape outside of the building Lot, or be permitted to cause an unsightly mess within the Lot. The Builder shall ensure that all employees, contractors, sub-contractors or sub-trades conduct a daily clean up of the Lot, including a sweep up of any excess material in the road, gutters and on the footpath. Burning of rubbish or any other material on the Lot is expressly prohibited. If Ravenswood provides a dedicated rubbish skip set down and disposal facility and/or dedicated rubbish disposal and collection facility, then the Lot Owner and/or Builder must, if requested by Ravenswood Limited, use that dedicated facility.

14. WASHING DOWN & CLEANING OF VEHICLE SPILLAGE

The washing down of any vehicle used during the building construction period in respect of any Lot is not permitted unless Ravenswood provides a dedicated wash down & cleaning facility. In this case, wash down & cleaning of vehicles is permitted within that facility. All spillages of any material must be removed immediately from swales, footpaths, berms and roads. The cost of repairing any resultant damage including scuffing or road surface damage will be the responsibility of the offending Builder and the Lot Owner.

15. SIGNAGE & STREET OR LOT NUMBERS

No sign shall be constructed or displayed on the Lot unless it is a standard Builder's sign, in which case such sign or signs must be removed upon completion of the construction works. Each sign must be kept in good condition.

16. REMEDIAL CLAUSE

Ravenswood reserves the right to request the immediate correction of any or all of the above items and if need be, to instruct other parties to correct any infringement at the expense of the Builder and/or Lot Owner and to claim recovery of all costs associated with the correction of any infringements to the above items from the Builder and/or Lot Owner, or offset any incurred cost against the Construction Bond.

17. LAND COVENANTS

The Lot Owner confirms that they have read and understand the requirements of the Land Covenants and the Building Covenants, and confirms that they will fully acquaint their Builder of the Builders obligations and responsibilities in respect of these covenants.

18. CONSTRUCTION BOND

The parties agree to execute the Construction Bond as part of these Covenants.

19. BUILDING COVENANTS, LAND COVENANTS AND DESIGN GUIDELINES

Ravenswood reserves the right to adopt, promulgate, amend, revoke and enforce the Building Covenants, Land Covenants and Design Guidelines for the purposes of:

a. governing the form and content of plans and specifications to be submitted to Ravenswood for approval pursuant to the provisions of the Construction Bond Agreement;

b. governing the procedure for such submission of plans and specifications;

c. establishing guidelines with respect to the approval and disapproval of design features, architectural styles, exterior colours and materials, details of construction, location and size of structures and all other matters that require approval by the Vendor pursuant to this Agreement; and

d. assuring the conformity and harmony of external design and general quality of the Ravenswood Development.

Neither Ravenswood nor its representatives shall be liable for any structural, functional or safety aspects in respect of any dwelling design as the Design Guidelines relate to aesthetic compatibility. The Builder and Lot Owner shall ensure that the Building work fully complies in all respects of the Land Covenants and the Building Covenants, and with all applicable New Zealand standards and regulations and local authority ordinances and bylaws, the New Zealand Building Code and all applicable statutes.

20. ENFORCEMENT

Notwithstanding the provisions of the dispute resolution clause, if there is any breach or non-observance of any of the Building Covenants then Ravenswood (or its agent) has the right to give written notice to the party or parties in breach. If Ravenswood (or its agent) gives written notice to the party or parties in breach then the party or parties in breach agrees to and shall at their cost:

a. Forthwith upon receipt of the Ravenswood (or its agent's) notice make every endeavour and take all reasonable steps to remedy the breach or non-observance of any of the Building Covenants; and

b. Carry out such other remedial work specified in the Ravenswood (or its agent's) notice and any other work required to remedy the breach or non-observance of any of the Building Covenants; and

c. Pay liquidated damages of $200 per day for every day that such breach or non-observance of any of the Building Covenants continues beyond 10 days after the date upon written notice is given by Ravenswood (or its agent) to the party or parties in breach.

21. DEFINITIONS

The words defined in the Land Covenants have the same meaning as the words in the Ravenswood Building Covenants. The following further expressions have the meanings as set out:

"Builder" means the party undertaking the Building works on the Lot Owner's lot.

"Ravenswood" means Ravenswood Developments Limited and/or its appointed agent.

"Ravenswood" "Builder" and "Lot Owner" means where appropriate the executors, administrators, successors and permitted assignees.

"Liability" means the liability of the Lot Owner and the Builder under these covenants shall be joint and several.

22. DISPUTE RESOLUTION

Any dispute arising concerning any aspects of these covenants that cannot be resolved by agreement between the parties shall be resolved in accordance with the Dispute Resolution clause of the Land Covenants.

Lot Number: .....

Lot Owner Name: .....

SIGNED by the Lot Owner: .....

Date: .....

Signed by Ravenswood Developments Limited: .....

Ninth Edition 2012 (6)

BEFORE SIGNING THE AGREEMENT

- It is recommended both parties seek professional advice before signing. This is especially so if:
  - there are any doubts. Once signed, this will be a binding contract with only restricted rights of termination.
  - property such as a hotel or a farm is being sold. The agreement is designed primarily for the sale of residential and commercial property.
  - the property is vacant land in the process of being subdivided or there is a new unit title or cross lease to be issued. In these cases additional clauses may need to be inserted.
  - there is any doubt as to the position of the boundaries.
  - the purchaser wishes to check the weathertightness and soundness of construction of any dwellings or other buildings on the land.
- The purchaser should investigate the status of the property under the Council's District Plan. The property and those around it are affected by zoning and other planning provisions regulating their use and future development.
- The purchaser should investigate whether necessary permits, consents and code compliance certificates have been obtained from the Council where building works have been carried out. This investigation can be assisted by obtaining a LIM from the Council.
- The purchaser should compare the title plans against the physical location of existing structures where the property is a unit title or cross lease. Structures or alterations to structures not shown on the plans may result in the title being defective.
- In the case of a unit title, before the purchaser enters into the agreement:
  - the vendor must provide to the purchaser a pre-contract disclosure statement under section 146 of the Unit Titles Act 2010;
  - the purchaser should check the minutes of the past meetings of the body corporate, enquire whether there are any issues affecting the units and/or the common property, check the body corporate's long term maintenance plan and enquire whether the body corporate has imposed or proposed levies for a long term maintenance fund or any other fund for the maintenance of, or remedial or other work to, the common property.
- The vendor should ensure the warranties and undertakings in clauses 7.0 and 9.0:
  - are able to be complied with; and if not
  - the applicable warranty is deleted from the agreement and any appropriate disclosure is made to the purchaser.
- Both parties should ensure the chattels list in Schedule 1 is accurate.
- Before signing this agreement, both parties should seek professional advice regarding the GST treatment of the transaction. This depends upon the GST information supplied by the parties and could change before settlement if that information changes.

THE ABOVE NOTES ARE NOT PART OF THIS AGREEMENT AND ARE NOT A COMPLETE LIST OF MATTERS WHICH ARE IMPORTANT IN CONSIDERING THE LEGAL CONSEQUENCES OF THIS AGREEMENT.

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

THE PURCHASER IS ENTITLED TO A COPY OF ANY SIGNED OFFER AT THE TIME IT IS MADE.

AGREEMENT FOR SALE AND PURCHASE OF REAL ESTATE

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DATE: 8th November 2017.

VENDOR:
RAVENSWOOD DEVELOPMENTS LIMITED

Contact Details:

VENDOR'S LAWYERS:

Firm: BERRY & CO

Individual Acting: E M JACKSON

Contact Details:
20 Eden Street, Oamaru
P O Box 10 Oamaru 9444
Tel: (03) 433 0007
Fax: (03) 433 0612
E: ejackson@berryco.co.nz

PURCHASER:
Mt Lyford Investments Ltd

Contact Details:
62 Williams Street
Kaiapoi

PURCHASER'S LAWYERS:
Firm: Malley & Co.
Individual Acting: Carolyn Fuss
Contact Details:
PO Box 8011
Christchurch 8140
Ph: 03 363 6316

LICENSED REAL ESTATE AGENT:

Agent's Name:

Manager:

Salesperson:

Contact Details:

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**840108**
Land Registration District	**Canterbury**
Date Issued	04 September 2019

Prior References
839992

Estate	Fee Simple
Area	407 square metres more or less
Legal Description	Lot 156 Deposited Plan 525252

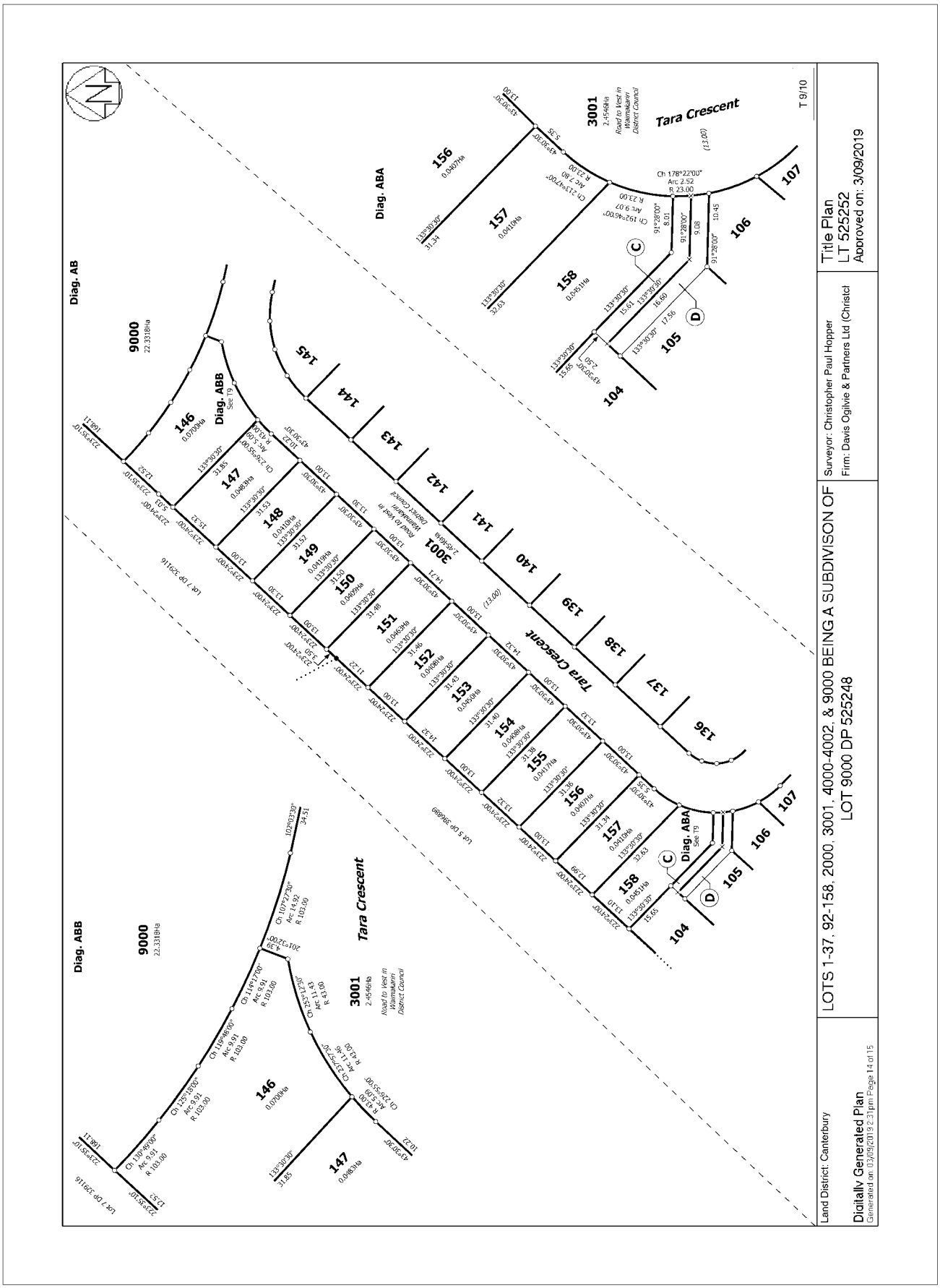
Registered Owners
Mt Lyford Investments Limited

Interests

Land Covenant in Covenant Instrument 11543274.21 - 4.9.2019 at 4:35 pm

11558342.1 Variation of Land Covenant created in Land Covenant Instrument 11543274.21 - 20.9.2019 at 3:44 pm

Identifier 840108



MT LYFORD INVESTMENTS LIMITED *(1931570) Registered*

To maintain this company log on here

Last updated on 04 Nov 2019

Company Summary | Addresses | Directors (2) | Shareholdings (3) | Documents (41) | PPSR Search | NZBN

Company number:	1931570
NZBN:	9429033464503
Incorporation Date:	10 Apr 2007
Company Status:	Registered
Entity type:	NZ Limited Company
Constitution filed:	Yes
AR filing month:	October , last filed on 04 Nov 2019
Ultimate holding company	No
Company addresses:	**Registered Office** Allott Reeves & Co Limited, Unit 1b, 55 Epsom Road, Sockburn, Christchurch, 8443 , New Zealand **Address for service** Allott Reeves & Co Limited, Unit 1b, 55 Epsom Road, Sockburn, Christchurch, 8443 , New Zealand View all addresses
Directors	Showing 2 of 2 directors Michael CHERNISHOFF 62 Holleth Hills Road, Rd 2, Amberley, 7482 , New Zealand Glenn COLENSO 154 Onepunga Road, Rd 2, Amberley, 7482 , New Zealand
Company record link:	http://app.companiesoffice.govt.nz/co/1931570

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Additional NZBN Information

Trading Name(s):

Phone Number(s):

Email Address(es):

Website(s):

Industry Classification(s):

View all NZBN details

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SECTION 2

Geotech, Engineer Reports & Conditions PS1 & 2

- Calculations
- A4 Details

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BC200635

FCH:FCH

Our Ref: 190998/S/1

P 03 366 1777
W www.pfc.co.nz

383 Colombo St, Sydenham,
Christchurch

PO Box 7110, Sydenham 8240
Christchurch

24 July 2019

Tomkies Construction Limited
P O Box 303
RANGIORA 7440

ATTENTION: MARK TOMKIES

Dear Mark

RE: LOT 156 RAVENSWOOD SUBDIVISION RESIDENCE, WOODEND

Enclosed please find a copy of our test bore and penetrometer test results for the above site.

Tonkin & Taylor Limited's geotechnical report, 'Ravenswood Development Stage 1 Geotechnical Interpretive Report - Rev. A', reference number 53214 dated November 2014 states, indicates lot 156 is equivalent to technical category 1 (TC1)

The bore results show the site is covered with 400mm of silty topsoil to depths of 0.4m below the surface level where our bores was terminated in gravels.

The penetrometer results indicate an allowable bearing in excess of 155kPa at foundation depths of 400mm founding on the gravel layer. This equates to an Ultimate Limit State (ULS) bearing capacity in excess of 465kPa for use when compared to quoted values given in the Ministry of Business, Innovation & Employment's guidelines.

As this bearing value exceeds the minimum bearing values given in NZS 3604, "Timber Framed Buildings", the foundations as specified in this standard may be used, founding at a lower level of 400mm, for a complying structure on this site.

Yours faithfully
POWELL FENWICK

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

PHIL PATERSON
Encl.

Cc: Leigh Adams, Leigh Adams Architecture Limited, leighadams@leighadams.co.nz (email)

This report has been prepared solely for the benefit of our client. No liability is accepted by this firm or by any principal, or director, or any servant or agent of this firm, in respect of its use by any other person. Any other person who relies upon any matter contained in this report does so entirely at their own risk.

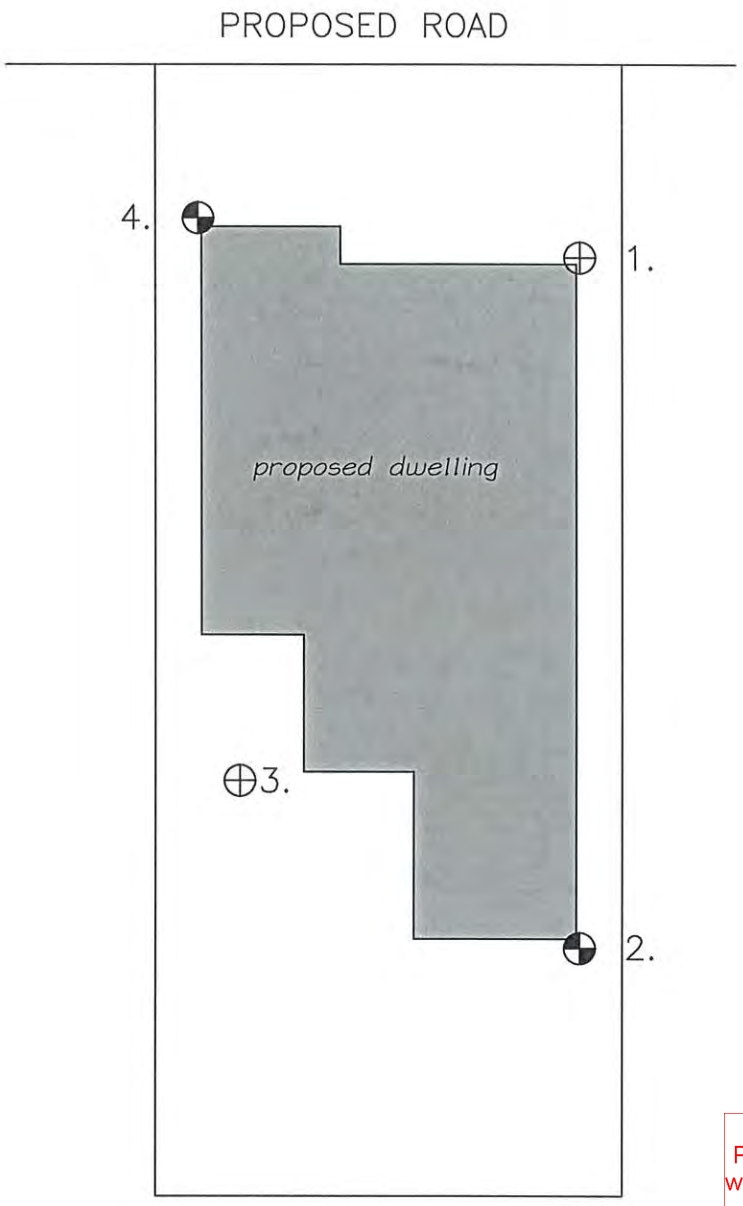
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BC200635

JOB NAME: Lot 156 Ravenswood Subdivision Residence
JOB LOCATION: Lot 156 Ravenswood Subdivision, Woodend
JOB NUMBER: 190998
DATE: 24.07.19

Powell Fenwick

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383 Colombo St, Sydenham, Christchurch
PO Box 7110, Sydenham 8240 Christchurch



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

SITE PLAN

(N.T.S.)

- Approximate position of scala penetrometer and test bore tests.
- Approximate position of scala penetrometer tests only.

BC200635

TEST BORES AT: Lot 156 Ravenswood Subdivision, Woodend 7676

FOR: Tomkies Construction Limited, P O Box 303, Rangiora

DATE: 24.07.19
JOB No: 190998
WEATHER: Fine
OPERATOR: CWC
MACHINE: 55ϕ Auger

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383 Colombo St, Sydenham, Christchurch
PO Box 7110, Sydenham 8240 Christchurch

BORE AT LOCATION 2.

POSITION:

DEPTH / RL=	STRATA	DESCRIPTION	W.T.
0.0		silty topsoil	
0.5		abandoned bore at 0.4m in gravels	
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			

BORE AT LOCATION 4.

POSITION:

DEPTH / RL=	STRATA	DESCRIPTION	W.T.
0.0		silty topsoil	
0.5		abandoned bore at 0.4m in gravels	
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			

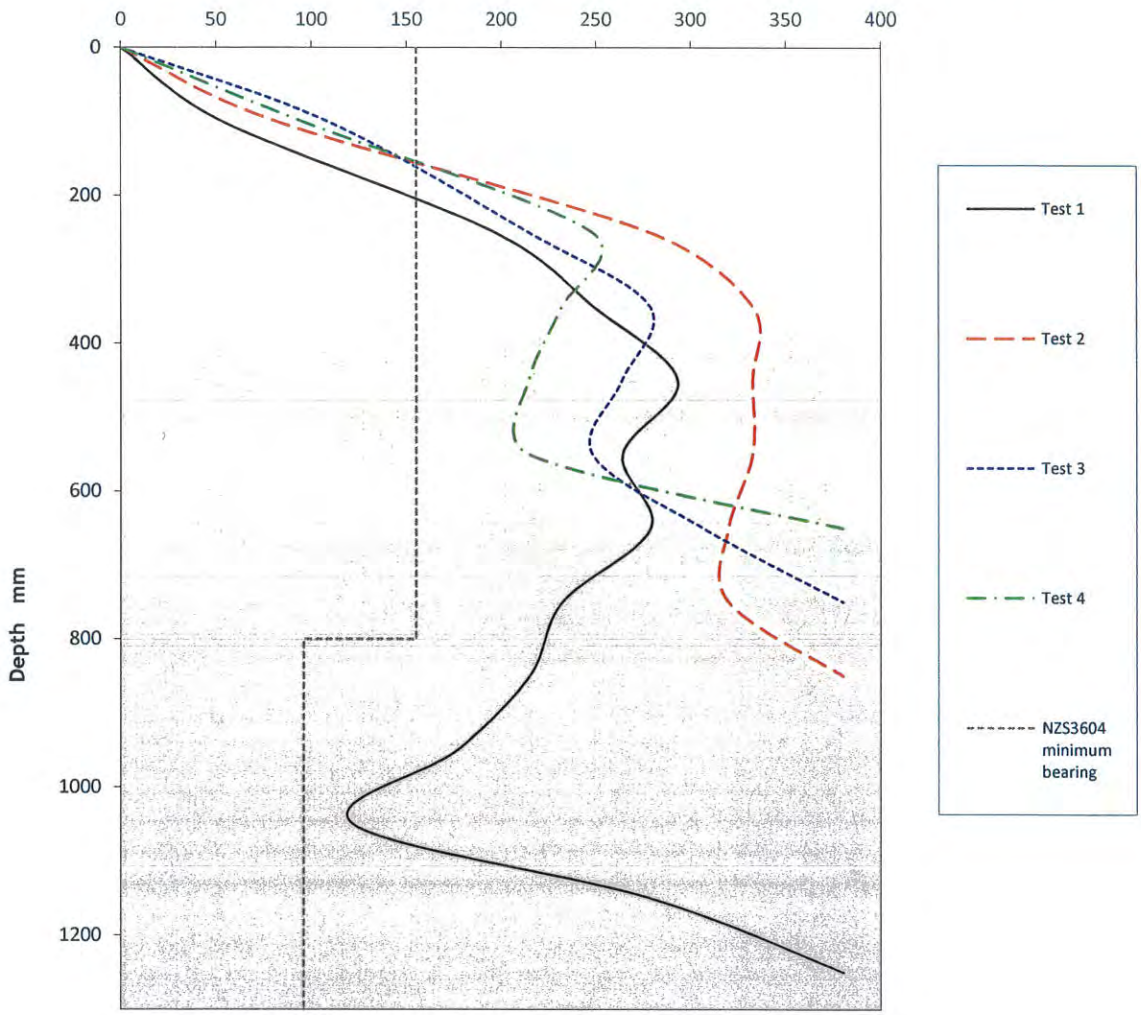
Job Number: 190998
Job Name: Lot 156 Ravenswood Subdivision Residence
Address: Lot 156 Ravenswood Subdivision, Woodend
Date: 24/07/2019
Weather: Fine
Operator: CWC

Powell Fenwick

P 03 366 1777
W www.pfc.co.nz

383 Colombo St, Sydenham, Christchurch
PO Box 7110, Sydenham 8240 Christchurch

Scala Penetrometer Results



This report is prepared solely for the client who commissioned it and Powell Fenwick Consultants Ltd will not accept any liability of any kind for the use of its contents by any other person.
Bore logs and scala penetrometer tests are discrete tests of the ground at the location of the tests only. While they are representative of typical conditions, they do not identify variations in the ground in locations away from the test areas.

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SECTION 3

Truss Details & Bracing Details

(Include Fixings of Gib & Ecoply)

- Design IT Calcs
- Hyspan etc.

-- 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

Building Consent BC200635
Received 13/8/20

Precut Construction Limited

PHONE: (03) 3237687
FAX: (03) 3238103
EMAIL: andre@precut.co.nz

-- 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

Pre-Consent Sheet

E-MAILED

Date:	**13/02/2020**	Job Ref#:	**PC20041**
Client:	**Mt Lyford Investments**		
Job Address:	**Lot 156, 33 Tara Crescent, Ravenswood**		
Building Consent Number:	**TBC** BC200635		
To Be Provided By:	**Waimakariri District Council**		

We have been engaged to provide the Trusses and/or Framing for the above project.
To allow completion of the consent application we have supplied the following information:

(a) Consent Sheet
(b) Truss Layout
(c) Producer Statement
(d) Truss Fixings Report as per Mitek version 20/20 4.7
(e) Slab Thickenings for Point Loads - Not required
(f) Beam Design Layout as per Mitek SAPPHIRE version 8.3.1
(g) Beam Producer Statement as per Mitek SAPPHIRE version 8.3.1 & Spanman Beam Design Systems.

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

Wind Zone:	**High @ 44.0m/s**	Snow Zone:	**0.9 kPa @ 100m**
Earthquake Zone:	**2**	Roof Materials:	**Longrun Iron**

External Framing : **90*45 Sg8 H1.2**

Internal Framing: **90*45 Sg8 H1.2**

Roof trusses: **90*45 Sg8 H1.2**

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

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

1. A full 'as built' layout and producer statement .
2. Specific Truss Fixings as per Mitek version 20/20 4.7.
3. Specific stud to top plate fixings to comply with NZS3604:2011
4. Specific lintel fixings to comply NZS3604:2011
5. Beam Designs as per Mitek version 20/20 4.7
6. Producer Statement for any beams outside NZS3604:2011

Our company requires acknowledgement of this letter , along with the building consent number , as soon as possible.

CONSENT ISSUED BC200635 - Page 58 of 355

MiTek New Zealand Limited

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

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

www.miteknz.co.nz

Building Consent BC200635
Received 13/8/20

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

-- 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

ISSUED BY: **MiTek New Zealand Limited**

TO: **Precut Construction**

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 **PC20041** 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: Thursday, 13 February 2020**



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

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

Job: PC20041
Description:
Building Consent No.:

CONSENT ISSUED BC200635 - Page 99 of 355

Client: MILLFORD INVESTMENT LTD
Phone:

Site:
Lot 156, 33 Tara Crescent
Ravenswood

Building Consent BC200635
Received 13/8/20
Phone:

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **Precut Construction**, 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:	MSG8,10,LVL11,13,15	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Galv Iron 0.55mm	Material:	Standard Plaster Board 10mm	Area:	High (44.0 m/s)
Dead Load:	0.220 kPa	Dead Load:	0.190 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Restraints:	900 mm centres	Restraints:	600 mm centres	**Snow**	
Live Load:	Qur = 0.250 kPa Qc = 1.100 kN	Live Load:	Qc = 1.400 kN	Location:	Christchurch (N4) at 100 m
				Open Ground Load:	0.900 kPa
				Basic Roof Load:	0.441 kPa

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

MiTek® Truss List

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

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
*HB01	2	3791	18.249	900	TR01	1	6487	25.000	900	*R04A	5	913	25.000	900
*HB02	1	5976	18.249	900	TR02	1	10010	25.000	900	T06A	3	4270	25.000	900
*HB03	2	2438	18.249	900	V01	1	2145	25.000	900	T07A	2	4270	25.000	900
*HB04	2	7850	18.249	900	V02	1	1290	25.000	900	J01	1	2112	25.000	900
*HB05	1	4594	18.249	900	V03	1	2268	25.000	900	J03	1	2757	25.000	900
*HB06	2	3289	18.249	900	V04	1	1368	25.000	900	J06	1	2282	25.000	900
J02	1	1212	25.000	900	V05	1	1279	25.000	900	T05	1	3560	25.000	900
J04	1	1857	25.000	900	V06	1	1004	25.000	900	J01A	1	2112	25.000	900
J05	2	3182	25.000	900	J02A	1	1212	25.000	900	J01B	1	2112	25.000	900
J07	2	1382	25.000	900	J02B	1	1212	25.000	900	J03A	1	2757	25.000	900
J08	1	1757	25.000	900	J02C	1	1212	25.000	900	J06A	1	2282	25.000	900
*R01	1	925	25.000	900	J04A	1	1857	25.000	900	J06B	1	2282	25.000	900
*R02	1	901	25.000	900	J05A	1	3182	25.000	900	J06C	1	2282	25.000	900
*R03	1	1570	25.000	900	J05B	2	3182	25.000	900	J05C	1	3182	25.000	900
*R04	5	913	25.000	900	J05D	1	3182	25.000	900	J05G	1	3182	25.000	900
*R05	2	1095	25.000	900	J05E	1	3182	25.000	900	T01	1	4270	25.000	900
*R06	1	968	25.000	900	J05F	1	3182	25.000	900	TG01	1	7360	25.000	900
*R07	1	1470	25.000	900	J05H	2	3182	25.000	900	T03	1	6487	25.000	900
T02	1	7360	25.000	900	J07A	2	1382	25.000	900	TG02	1	8308	25.000	900
T04	2	10010	25.000	900	J08A	1	1757	25.000	900	T05A	1	3560	25.000	900
T06	2	4270	25.000	900	J08B	1	1757	25.000	900	T08	1	4270	25.000	900
T07	1	4270	25.000	900	*R01A	1	925	25.000	900					

Total quantity : 88

-- 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
BC200635 13/08/2020 nicolah

The computer design input has been carried out by:

Signed: .....

Date: ...Thursday, 13 February 2020...

Name of Detailer: .....

Qualifications and Title:

On behalf of: Precut Construction
Ph: 03 323 7687

Job: PC20041
Description:
Building Consent No.:

CONSENT ISSUED BC200635 - Page 100 of 355

Client: MR JEFFORD HAMES SEMENTINO
Phone:

Site:
Lot 156, 33 Tara Crescent
Ravenswood

Phone:

Building Consent BC200635
Received 13/8/20

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
*HB01	2	3791						Refer NZS3604:2011 Tables 15.6
*HB02	1	5976						Refer NZS3604:2011 Tables 15.6
*HB03	2	2438						Refer NZS3604:2011 Tables 15.6
*HB04	2	7850						Refer NZS3604:2011 Tables 15.6
*HB05	1	4594						Refer NZS3604:2011 Tables 15.6
*HB06	2	3289						Refer NZS3604:2011 Tables 15.6
J02	1	1212	B	2.397	0.613	Cross	1	Pair of Wire Dog Staples
			D	0.544	0.210	Butt	1	Pair of 3.15d Nails
J04	1	1857	B	2.841	0.865	Cross	1	Pair of Wire Dog Staples
			E	0.978	0.621	Butt	1	JH 47x90
J05	2	3182	B	2.881	1.240	Cross	2	Pair of Wire Dog Staples
			G	1.766	1.342	Butt	2	JH 47x90
			E	0.597	0.646	Butt	2	Pair of 3.15d Nails
J07	2	1382	B	2.396	0.675	Cross	2	Pair of Wire Dog Staples
			D	0.627	0.312	Butt	2	Pair of 3.15d Nails
J08	1	1757	B	2.731	0.828	Cross	1	Pair of Wire Dog Staples
			E	0.899	0.557	Butt	1	JH 47x90
*R01	1	925						Refer NZS3604:2011 Tables 15.6
*R02	1	901						Refer NZS3604:2011 Tables 15.6
*R03	1	1570						Refer NZS3604:2011 Tables 15.6
*R04	5	913						Refer NZS3604:2011 Tables 15.6
*R05	2	1095						Refer NZS3604:2011 Tables 15.6
*R06	1	968						Refer NZS3604:2011 Tables 15.6
*R07	1	1470						Refer NZS3604:2011 Tables 15.6
T02	1	7360	A	5.342	3.186	Cross	1	Pair of Wire Dog Staples
			G	6.423	3.368	Cross	1	CT400
			J	1.276	0.850	Cross	1	Pair of Wire Dog Staples
T04	2	10010	A	4.590	2.630	Cross	2	Pair of Wire Dog Staples
			I	6.413	3.280	Cross	2	CT400
			N	6.587	4.141	Cross	2	CT400
T06	2	4270	B	4.357	2.182	Cross	2	Pair of Wire Dog Staples
			F	4.357	2.182	Cross	2	Pair of Wire Dog Staples
T07	1	4270	H	4.147	1.625	Cross	1	Pair of Wire Dog Staples
			F	4.093	1.992	Cross	1	Pair of Wire Dog Staples
			J	1.193	0.415	Cross	1	Pair of Wire Dog Staples
TR01	1	6487	H	5.489	3.485	Butt	1	JH 47x90
			F	6.169	3.049	Cross	1	Pair of Wire Dog Staples
TR02	1	10010	B	6.986	3.919	Cross	1	CT400
			I	5.446	3.485	Cross	1	CT400
			M	0.640	0.254	Cross	1	Pair of Wire Dog Staples
			N	4.710	2.073	Cross	1	Pair of Wire Dog Staples
V01	1	2145	A			Wide		No fixing selected
V02	1	1290	A			Wide		No fixing selected
V03	1	2268	A			Wide		No fixing selected
V04	1	1368	A			Wide		No fixing selected
V05	1	1279	A			Wide		No fixing selected
V06	1	1004	A			Wide		No fixing selected
J02A	1	1212	B	2.397	0.613	Cross	1	Pair of Wire Dog Staples
			D	0.544	0.210	Butt	1	Pair of 3.15d Nails
J02B	1	1212	B	2.525	0.511	Cross	1	Pair of Wire Dog Staples
			D	0.347	0.041	Butt	1	Pair of 3.15d Nails
			C	0.763	0.677	Butt	1	Pair of 3.15d Nails
J02C	1	1212	B	2.525	0.511	Cross	1	Pair of Wire Dog Staples
			D	0.347	0.041	Butt	1	Pair of 3.15d Nails
			C	0.763	0.677	Butt	1	Pair of 3.15d Nails
J04A	1	1857	B	3.124	0.754	Cross	1	Pair of Wire Dog Staples
			D	0.543	0.064	Butt	1	Pair of 3.15d Nails
			C	1.446	1.087	Butt	1	JH 47x90
J05A	1	3182	B	2.621	0.988	Cross	1	Pair of Wire Dog Staples
			F	0.295	0.336	Butt	1	Pair of 3.15d Nails
			E	2.381	2.131	Cross	1	Pair of Wire Dog Staples
			H	0.690	0.772	Cross	1	Pair of Wire Dog Staples
J05B	2	3182	B	2.830	0.968	Cross	2	Pair of Wire Dog Staples
			F	0.293	0.338	Butt	2	Pair of 3.15d Nails
			E	2.763	2.735	Cross	2	Pair of Wire Dog Staples
J05D	1	3182	B	2.881	1.240	Cross	1	Pair of Wire Dog Staples
			G	1.766	1.342	Butt	1	JH 47x90
			E	0.597	0.646	Butt	1	Pair of 3.15d Nails
J05E	1	3182	B	2.830	0.968	Cross	1	Pair of Wire Dog Staples
			F	0.293	0.338	Butt	1	Pair of 3.15d Nails
			E	2.763	2.735	Cross	1	Pair of Wire Dog Staples
J05F	1	3182	B	2.753	1.320	Cross	1	Pair of Wire Dog Staples
			F	1.436	1.083	Butt	1	JH 47x90
J05H	2	3182	B	2.833	0.733	Cross	2	Pair of Wire Dog Staples
			G	0.364	0.411	Butt	2	Pair of 3.15d Nails
			E	2.707	2.664	Cross	2	Pair of Wire Dog Staples
			F	0.912	1.095	Cross	2	Pair of Wire Dog Staples

Precut Construction

Job: PC20041

CONSENT ISSUED BC200635 - Page 101 of 355

Client: MR VICTOR NIVESEMENTO
Phone:

Site:
Lot 156, 33 Tara Crescent
Ravenswood

Building Consent BC200635
Received 13/8/20

Phone:

Description:
Building Consent No.:

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	Fixing Qty	Fixing Selected
J07A	2	1382	B	2.666	0.571	Cross	2	Pair of Wire Dog Staples
			D	0.397	0.047	Butt	2	Pair of 3.15d Nails
			C	0.942	0.780	Butt	2	JH 47x90
J08A	1	1757	B	2.731	0.828	Cross	1	Pair of Wire Dog Staples
			E	0.899	0.557	Butt	1	JH 47x90
J08B	1	1757	B	3.030	0.717	Cross	1	Pair of Wire Dog Staples
			C	1.631	1.087	Butt	1	JH 47x90
*R01A	1	925						Refer NZS3604:2011 Tables 15.6
*R04A	5	913						Refer NZS3604:2011 Tables 15.6
T06A	3	4270	A	3.475	2.127	Cross	3	Pair of Wire Dog Staples
			E	4.412	2.189	Cross	3	Pair of Wire Dog Staples
T07A	2	4270	G	3.489	1.608	Cross	2	Pair of Wire Dog Staples
			E	4.121	1.972	Cross	2	Pair of Wire Dog Staples
			I	1.194	0.414	Cross	2	Pair of Wire Dog Staples
J01	1	2112	B	3.347	1.287	Cross	1	Pair of Wire Dog Staples
			F	1.271	0.907	Butt	1	JH 47x90
J03	1	2757	B	4.605	1.881	Cross	1	Pair of Wire Dog Staples
			F	2.706	1.807	Butt	1	JH 47x90
J06	1	2282	B	3.705	1.459	Cross	1	Pair of Wire Dog Staples
			F	1.614	1.122	Butt	1	JH 47x90
T05	1	3560	A	3.852	2.626	Cross	1	Pair of Wire Dog Staples
			E	4.813	2.690	Cross	1	Pair of Wire Dog Staples
J01A	1	2112	B	3.347	1.287	Cross	1	Pair of Wire Dog Staples
			F	1.271	0.907	Butt	1	JH 47x90
J01B	1	2112	B	3.366	0.847	Cross	1	Pair of Wire Dog Staples
			C	2.026	1.312	Butt	1	JH 47x90
J03A	1	2757	B	3.365	1.051	Cross	1	Pair of Wire Dog Staples
			F	1.991	1.179	Butt	1	JH 47x90
			D	0.822	0.549	Butt	1	JH 47x90
J06A	1	2282	B	3.257	0.894	Cross	1	Pair of Wire Dog Staples
			E	1.565	0.965	Butt	1	JH 47x90
			D	0.718	0.460	Butt	1	Pair of 3.15d Nails
J06B	1	2282	B	3.705	1.460	Cross	1	Pair of Wire Dog Staples
			F	1.614	1.122	Butt	1	JH 47x90
J06C	1	2282	B	3.530	0.908	Cross	1	Pair of Wire Dog Staples
			E	1.550	0.959	Butt	1	JH 47x90
			D	0.746	0.462	Butt	1	Pair of 3.15d Nails
J05C	1	3182	B	4.147	2.315	Cross	1	Pair of Wire Dog Staples
			F	3.440	2.570	Butt	1	JH 47x90
J05G	1	3182	B	5.611	2.315	Cross	1	Pair of Wire Dog Staples
			F	4.033	2.572	Butt	1	JH 47x90
T01	1	4270	B	6.215	3.500	Cross	1	CT400
			F	6.215	3.500	Cross	1	CT400
TG01	1	7360	B	4.292	2.040	Cross	1	Pair of Wire Dog Staples
			I	3.928	1.818	Cross	1	Pair of Wire Dog Staples
			P	10.304	6.689	Cross	1	CT400
T03	1	6487	J	10.184	8.887	Butt	1	Pair of MultiGrips
			E	9.253	6.748	Cross	1	CT400
TG02	1	8308	J	4.751	4.248	Butt	1	JH 47x90
			G	5.281	3.495	Cross	1	CT400
			O	14.249	11.082	Cross	1	CT400
			N	1.820	2.045	Cross	1	Pair of Wire Dog Staples
T05A	1	3560	A	6.514	5.181	Cross	1	CT400
			E	4.241	2.213	Cross	1	Pair of Wire Dog Staples
T08	1	4270	H	14.319	10.054	Cross	1	CT400
			F	5.741	3.335	Cross	1	CT400
			L	2.788	2.046	Cross	1	Pair of Wire Dog Staples

Fixing List

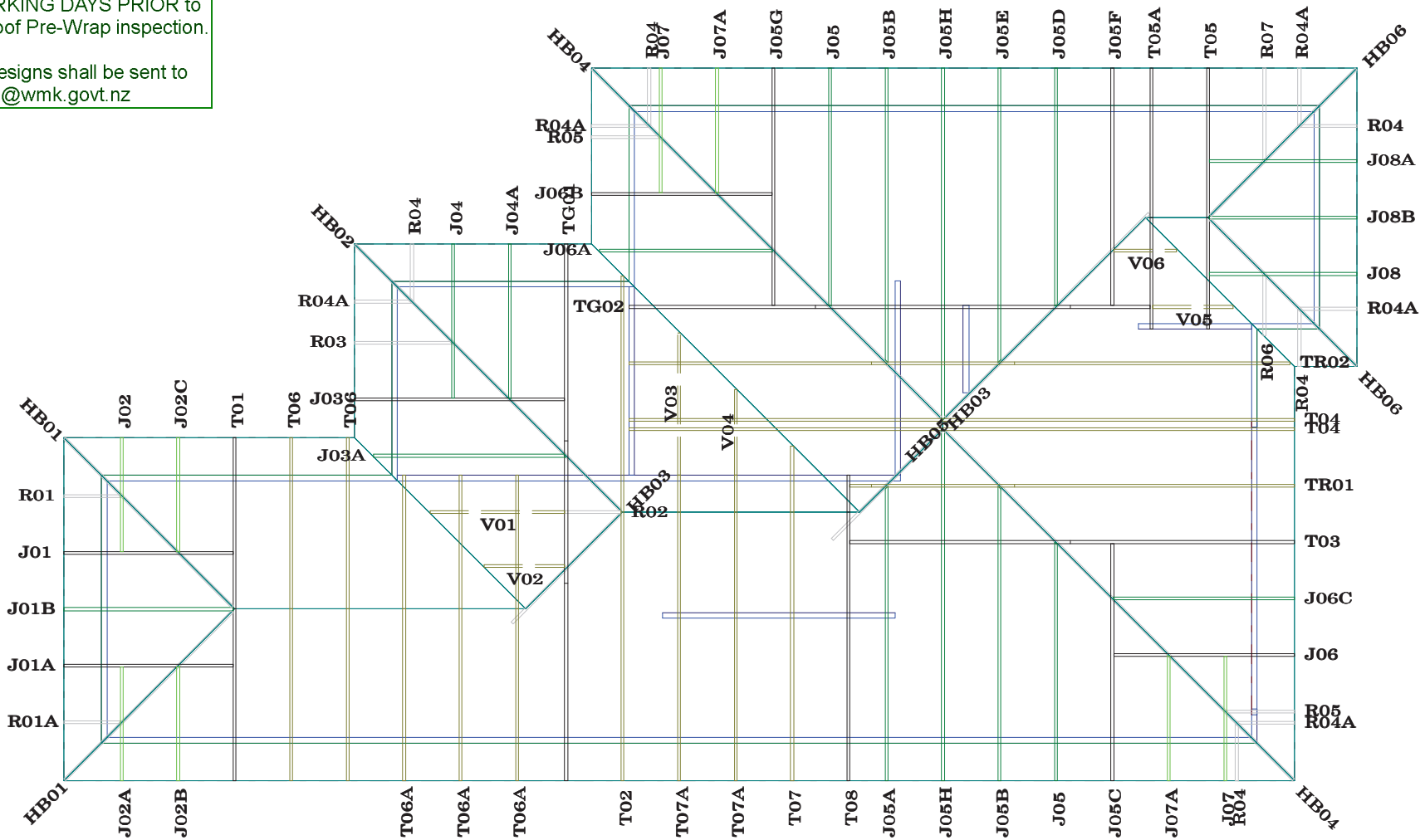
Qty	Selected Fixing
76	Pair of Wire Dog Staples
22	Pair of 3.15d Nails
25	JH 47x90
16	CT400
1	Pair of MultiGrips
6	No fixing selected

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

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-- 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



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Precut Construction

9 Empire Road
Belfast
Christchurch
New Zealand
Telephone:
Fax:

MT LYFORD INVESTMENT LTD
Lot 156, 33 Tara Crescent
Ravenswood

Job: PC20041
Building Consent No.:

Scale: 1 : 100 | Date: 13/02/2020 | Drawn By: Michelle Foor

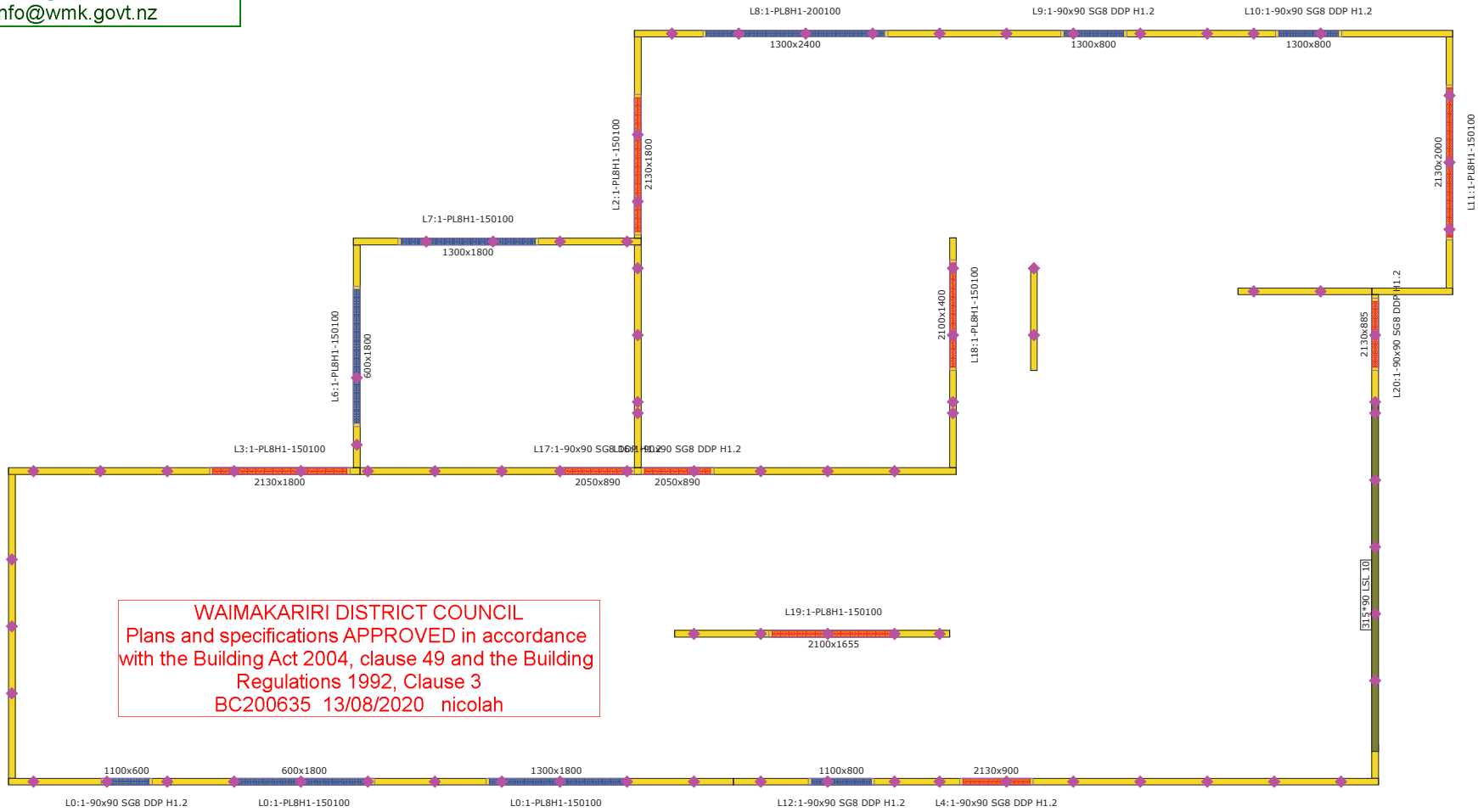
Job Details:

Snow Zone:	Christchurch (N4)	Snow Altitude:	100 m
Wind Area:	High	Design Wind Speed:	44.0 m/s
TC Restraints:	900 mm	BC Restraints:	600 mm
Roof Material:	Galv Iron 0.55mm	Ceiling Material:	Standard Plaster Board 10mm
Roof Live Load:	0.250 kPa	Snow Load:	0.441 kPa
Roof Pitch:	25.00 deg	Truss Centres:	900 mm

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-- AS BUILT TRUSS LAYOUT REQUIRED --
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Truss "As-Build" designs shall be sent to buildinginfo@wmk.govt.nz



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PRECUT CONSTRUCTION LTD
Framing & Trusses Specialists

9 Empire Road
Belfast
Christchurch
New Zealand

Phone: (03) 323 7687

Sheet Tittle: **Framing Layout for Building Consent**

OT No.: **PC20041-Q-01** Name:

Address: Lot 156-33 Tara Crescent , Christchurch

Wind Area: High Design Wind Speed: 44.0 m/s

MiTek SAPPHIRE™ Ver. 8.3.1
Better Technology. Better Building.

Building Consent No.:
Structure: PC20041-ST-01
Drawn By:
Date: 13/02/2020

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Building Consent BC200635
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Precut Construction

Client: Mt Lyford Investments
Phone:

Site:
Lot 156-33 Tara Crescent
Christchurch

MiTek SAPPHIRE™ 8.3.1.215.Update5

Printed: 14:36:02 13-02-2020

LINTEL SUMMARY

This Lintel Summary is issued by MiTek accredited fabricator Precut Construction 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 10mm	0.16 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
L0:1-PL8H1-150100	1890	1/PL8H1-150100	1300x1800	E12	Ground Floor	Designed
L0:1-PL8H1-150100	1890	1/PL8H1-150100	600x1800	E13	Ground Floor	Designed
L0:1-90x90 SG8 DDP H1.2	690	1/90x90 SG8 DDP H1.2	1100x600	E14	Ground Floor	Designed
L2:1-PL8H1-150100	1890	1/PL8H1-150100	2130x1800	E5	Ground Floor	Designed
L3:1-PL8H1-150100	1890	1/PL8H1-150100	2130x1800	E2	Ground Floor	Designed
L4:1-90x90 SG8 DDP H1.2	990	1/90x90 SG8 DDP H1.2	2130x900	E11	Ground Floor	Designed
L6:1-PL8H1-150100	1890	1/PL8H1-150100	600x1800	E3	Ground Floor	Designed
L7:1-PL8H1-150100	1890	1/PL8H1-150100	1300x1800	E4	Ground Floor	Designed
L8:1-PL8H1-200100	2490	1/PL8H1-200100	1300x2400	E6	Ground Floor	Designed
L9:1-90x90 SG8 DDP H1.2	890	1/90x90 SG8 DDP H1.2	1300x800	E6	Ground Floor	Designed
L10:1-90x90 SG8 DDP H1.2	890	1/90x90 SG8 DDP H1.2	1300x800	E6	Ground Floor	Designed
L11:1-PL8H1-150100	2090	1/PL8H1-150100	2130x2000	E7	Ground Floor	Designed
L12:1-90x90 SG8 DDP H1.2	890	1/90x90 SG8 DDP H1.2	1100x800	E11	Ground Floor	Designed
L16:1-90x90 SG8 DDP H1.2	980	1/90x90 SG8 DDP H1.2	2050x890	P18	Ground Floor	Designed
L17:1-90x90 SG8 DDP H1.2	980	1/90x90 SG8 DDP H1.2	2050x890	P18	Ground Floor	Designed
L18:1-PL8H1-150100	1490	1/PL8H1-150100	2100x1400	P22	Ground Floor	Designed
L19:1-PL8H1-150100	1745	1/PL8H1-150100	2100x1655	P23	Ground Floor	Designed
L20:1-90x90 SG8 DDP H1.2	975	1/90x90 SG8 DDP H1.2	2130x885	E9	Ground Floor	Designed

Total Quantity: 18

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The lintel design input has been carried out by:

Signed:

Date: Thursday, 13 February 2020

Name of Detailer: MIchelle Foong

On behalf of: Precut Construction

Date: 13/2/20 8:23 AM
Designed By: Precut Construction
Designer: Rebecca McKenzie
Email: sales@precut.co.nz
9 Empire Road
Kainga, Canterbury, 7644, New Zealand

Member: Garage Beam
Project: Mike Chernishoff
Project Number: PC20041
Project Address: Lot 1 Hickory Crescent, Ravenswood

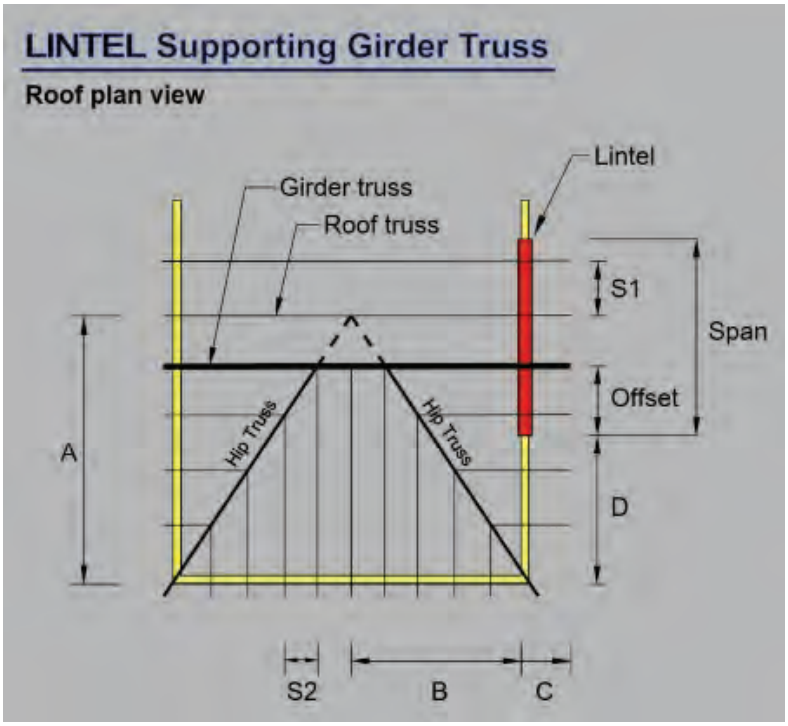
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SPANMAN DESIGN CERTIFICATE

LumberworX ENGINEERED WOOD PRODUCTS
SOFTWARE RELEASE 22.05.2017

9 Hickory Pl
Islington, Christchurch 8042
New Zealand
Certificate valid only if product sourced from Lumberworx

Single Span 315 deep x 90 wide Laminated Strand Lumber E10



This certificate may be submitted to a Building Consent Authority with an application for a Building Consent.Installation can only occur when a Building Consent has been issued by the relevant Building Consent Authority.
Country: New Zealand
Building type: House - domestic dwelling
Design working life: 50 years
Building Type Importance: 2 - Normal structures and structures not falling into other levels
Roof Use: Normal roof
Roof live load: 0.25 kPa, Roof live load: 1.1 kN

Wind region is High (44m/s ultimate)
V_{des}(serviceability) = 35 m/s
V_{des}(ultimate) = 44 m/s

Span = 4,500 mm
A = 5,027 mm
B = 3,266 mm
C = 600 mm
D = 540 mm
S1 = 900 mm
S2 = 900 mm
Offset = 2,687 mm
H1(wall height) = 0 mm
Roof truss chords no bigger than = 90x45 mm
Maximum truss chord density 800 kg/m^3

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Area supported by trusses
Girder truss = 7.2 m^2
Roof truss(887mm from end) = 0.957 m^2
Roof truss(1,787mm from end) = 1.22 m^2
Roof truss(3,587mm from end) = 3.479 m^2
Roof truss(4,487mm from end) = 3.479 m^2

Roof weight(0.50 mm steel sheet) = 5 kg/m^2
Roof ceiling(13 mm plaster, pink batt insulation, wiring + sisalation + fittings) = 18 kg/m^2
Truss weight = 13.68 kg/m^2
H1 weight(10 mm softwood T&G lining each side, pink batt insulation, wiring + sisalation + fittings) = 20 kg/m^2

Snow Load (AS/NZS 1170.3:2003)

Region: N4 (Sub-Alpine)
Importance level(House - domestic dwelling) = 2
Design working life = 50 years
h_0 = 100 m
C_e(4.2.2 - windswept roofs) = 0.6
Snow load(serviceability) = 0.4 kPa
Snow load(ultimate) = 0.285 kPa

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Design Criteria

- The Lintel is to be installed by a Licensed Building Practitioner (carpentry) or under supervision of an LBP
- The top of the Lintel is to be restrained by studs at 600 mm centres
- The ends of the Lintel are to be securely supported and prevented from rotation
- The Lintel is to be a single member that is 4,500mm long
- The Lintel is to have no notches throughout its length unless referenced in standards or manufacturers literature
- The Lintel is to have an end bearing length of 45mm or greater

Serviceability Criteria (+upward, -downward)

	Span Deflection	Allowable Span Deflection
Deflection Dead Load	5.933 mm	span/300 ± 0% and 12 mm ± 0%
Deflection Live Load	3.034 mm	span/250 ± 0% and 15 mm ± 0%
Deflection Wind Down	0 mm	span/200 ± 0%
Deflection Wind Up	6.472 mm	span/200 ± 0%

Reactions (+upward, -downward)

Maximum limit state downward reaction = 13.36 kN
Maximum limit state upward reaction (wind uplift) = -9.785 kN

SpanMan complies with the requirements of the following standards:

- AS/NZS 1170.0:2002 Structural design actions, Parts 0 and 1
- AS/NZS 1170.2:2011 Structural design actions, Part 2: Wind Actions
- AS/NZS 1170.3:2003 Structural design actions, Part 3: Snow and ice actions
- NZS 3603:1993 Timber Structures Standard
- NZS 3604:2011 Timber Framed Buildings Standard
- AS/NZS 4055 - 2006 Wind loads for housing
- AS/NZS 4600 - 2005 Cold-formed steel structures
- Nash Standard: Residential and Low-Rise Steel Framing Part 1: Design Criteria 2005
- AS1720.1 - 2010 Timber Structures, Part 1: Design methods

Sizes calculated by SpanMan assume that members are installed in a manner that suits their intended structural function for the life of the structure. Members should be maintained in accordance with Australian and New Zealand standards for the life of the structure.

SpanMan does not take into account member durability or required treatments for your application. These include, but are not limited to, materials subject to wetting and drying, in or below ground applications and corrosive environments. Contact product manufacturers or timber and steel institutes for advice.

All Lumberworx products are suited to the H1.2 hazard zone.

This design certificate is void where there has been a substitution of an alternative product/material not detailed, or if used for an alternative wind or snow loading other than stated.

Spanware Pty Ltd gives no warranties in relation to the use of the section design specified this certificate and neither Spanware Pty Ltd, or Lumberworx, will accept any liability for loss or damage, either direct or consequential arising from the use of the above nominated section in an application not consistent with the input data used to generate this report or that requires additional data beyond the scope of SpanMan software.

For further information or advice please contact SpanMan at http://spanman.net/about/contact

GIB EzyBrace® Bracing Software

Demand Calculation Sheet

Job Details

Name:	PROPOSED RESIDENTIAL DWELLING
Street and Number:	33 TARA CRESCENT RAVENSWOOD WOODEND
Lot and DP Number:	LOT 156 DP525252
City/Town/District:	WOODEND - WAIMAKARIRI DISTRICT
Designer:	LMA
Company:	LEIGH ADAMS ARCHITECTURE
Date:	Wednesday, June 24, 2020

Building Specification

Number of Storeys	1
Floor Loading	2 kPa
Foundation Type	Slab
	Single
Cladding Weight	Heavy
Roof Weight	Light
Room in Roof Space	No
Roof Pitch (degrees)	25
Roof Height above Eaves (m)	2.8
Building Height to Apex (m)	5.31
Ground to Lower Floor (m)	0.2
Average Stud Height (m)	2.42
Building Length (m)	19.67
Building Width (m)	10.4
Building Plan Area (m²)	160

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Building Location

Wind Zone = High		**Earthquake Zone 2**	
Wind Region	A	Soil Type	D & E (Deep to Very Soft)
Lee Zone	No	Annual Prob. of Exceedance:	1 in 500 (NZS3604:2011 Default)
Ground Roughness	Urban		
Site Exposure	Exposed		
Topography Class	T2		

Bracing Units required for Wind

	Along	Across
Single Level	**593**	**1195**

Bracing Units required for Earthquake

	Along & Across
Single Level	**992**

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Single Level Along Resistance Sheet

Job Name: PROPOSED RESIDENTIAL DWELLING

									Wind	EQ
									Demand	
									593	992
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1146 193%	1259 127%
A	1	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	2	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	3	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	External Length = 18.67								393 OK	446 OK
B	1	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	2	2.40		2.42	GS1-N	GIB®	164	143		
	External Length = 4.64								295 OK	292 OK
C	1	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	2	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	3	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	External Length = 4.78								262 OK	298 OK
D	1	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	2	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	External Length = 11.25								196 OK	223 OK

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Single Level Across Resistance Sheet

Job Name: PROPOSED RESIDENTIAL DWELLING

									Wind	EQ
									Demand	
									1195	992
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1197 100%	1193 120%
M	1	1.20		2.42	TP1	IPL TUFFPLY	131	149		
	External Length = 4.51								131 OK	149 OK
N	1	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	2	3.00		2.42	GS1-N	GIB®	205	179		
	3	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	External Length = 3.09								336 OK	327 OK
O	1	0.60		2.42	TP1	IPL TUFFPLY	65	74		
	2	3.00		2.42	GS1-N	GIB®	205	179		
	External Length = 2.8								271 OK	253 OK
P	1	2.40		2.42	GS1-N	GIB®	164	143		
	2	1.00		2.42	GS1-N	GIB®	64	59		
									229 OK	202 OK
Q	1	0.40		2.42	TP3	IPL TUFFPLY	39	44		
	2	0.40		2.42	TP3	IPL TUFFPLY	39	44		
	3	0.70		2.42	TP1	IPL TUFFPLY	76	87		
	4	0.70		2.42	TP1	IPL TUFFPLY	76	87		
	External Length = 10.4								230 OK	262 OK

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8.7.3.2

Joints in the *top plate* of a *wall* that does not contain any *wall bracing elements* (either in line or at *wall* intersections), shall be halved and nailed at the joints, see figure 8.14 (A), or be butted over *blocking* and nailed, see figure 8.14 (B), or be provided with an alternative fixing, having a *capacity* in tension or compression of 3 kN.

8.7.3.3

For single-*storey* buildings the connection in line of the *top plate* of a *wall* that contains one or more *wall bracing elements* shall be jointed according to the *bracing capacity* of the highest-rated individual *wall bracing elements* as follows:

(a) *Bracing capacity* not exceeding 100 *bracing units*: A 3 kN connection as shown in figure 8.15 or by an alternative fixing of 3 kN *capacity* tension and compression along the *plate*;

(b) *Bracing capacity* exceeding 100 *bracing units*: A 6 kN connection as shown in figure 8.15 or by an alternative fixing of 6 kN *capacity* tension and compression along the *plate*.

(c) *Wall top plates* to which ceiling *diaphragms* are attached: A 6 kN connection as shown in figure 8.15 or by an alternative fixing of 6 kN *capacity* in tension and compression along the *plate*.

8.7.3.4

Each *wall* that contains one or more *wall bracing elements* shall be connected at the *top plate* level, either directly, or through a *framing* member in the line of the *wall*, to *external walls* at right angles to it. *Top plate* fixing(s) of the *capacity* in tension or compression along the line of the *wall bracing element* are given as follows:

(a) For each *wall* containing *wall bracing elements* with a total *bracing capacity* of not more than 125 *bracing units*: to at least one such *external wall* by a fixing as shown in figure 8.16 of 6 kN *capacity*;

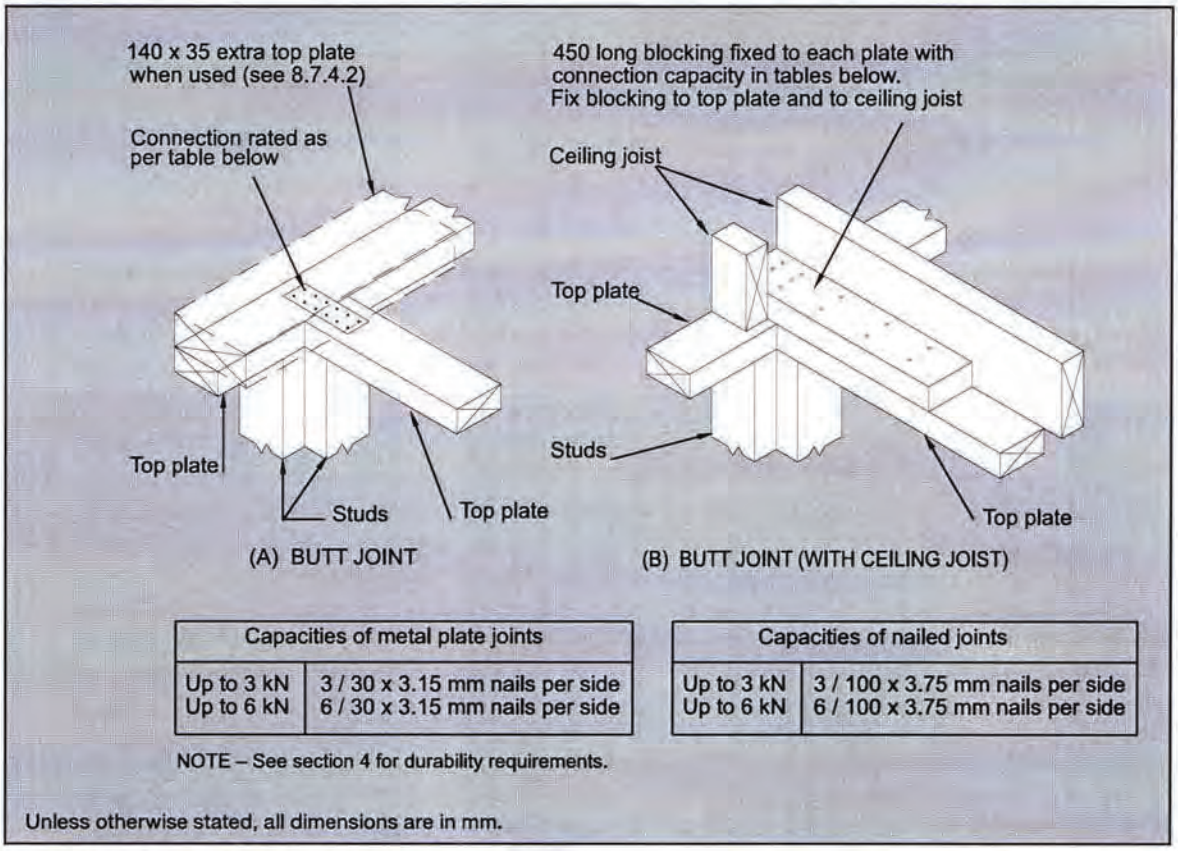
(b) For each *wall* containing *wall bracing elements* with a total *bracing capacity* of not more than 250 *bracing units*: to at least 2 *external walls* by fixings as shown in figure 8.16 each of 6 kN *capacity*;

(c) For each *wall* containing *wall bracing elements* with a total *bracing capacity* of more than 250 *bracing units*: to at least 2 *external walls* by fixings as shown in figure 8.16 each having a rating of not less than 2.4 kN per 100 *bracing units*.

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Capacities of metal plate joints	
Up to 3 kN	3 / 30 x 3.15 mm nails per side
Up to 6 kN	6 / 30 x 3.15 mm nails per side

Capacities of nailed joints	
Up to 3 kN	3 / 100 x 3.75 mm nails per side
Up to 6 kN	6 / 100 x 3.75 mm nails per side

NOTE – See section 4 for durability requirements.

Unless otherwise stated, all dimensions are in mm.

Figure 8.16 – Connecting top plates to external walls at right angles – Walls containing bracing (see 8.7.3.4)

8.7.4 Lateral support of top plates

8.7.4.1

Top plates shall be laterally supported by:

(a) A ceiling with a sheet *lining* material having a density no less than 600 kg/m³; or

(b) Intersecting *top plates*, *joists*, *rafters*, trusses or *purlins*; or

(c) *Framing* members *spaced* at not greater than 2.5 m; or

(d) 70 x 45 mm connecting members between the *top plate* and a parallel floor or *roof framing member* as shown in figure 8.17.

8.7.4.2

When the *top plate* is on the boundary of a ceiling *lining*, having a density less than 600 kg/m³, and the distance between *bracing lines* at right angles to the *plate* is between 5.0 m and 6.0 m, the 90 x 45 *top plate* shall be strengthened by the addition of a 140 x 35 *plate* of at least the same grade as the *top plate* (see figure 8.18).

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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
BC200635 13/08/2020 nicolah

CBI 5113
AUGUST 2016

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NATIONAL SUPPORT

VISIT: Winstone Wallboards Limited
37 Felix Street, Penrose,
Auckland 1061, New Zealand
POST: PO Box 12 256, Penrose 1642,
Auckland, New Zealand
PHONE: +64 9 633 0100
FAX: +64 9 633 0101
Free Fax: 0800 229 222
EMAIL: info@gib.co.nz
WEB: gib.co.nz

GIB® HELPLINE

0800 100 442

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BC200635

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

NEW GIB EZYBRACE® 2016 DESIGN SOFTWARE

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

NEW GIB® BRACING ELEMENT GS2-NOM

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

[1] Actual savings dependent on building and bracing design

UPDATE TO OPENINGS IN BRACING ELEMENTS AND CEILING DIAPHRAGMS

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

NEW — GIBFIX® FRAMING SYSTEM

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

BRANZ Appraised
Appraisal No.928 [2016]

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GIB EzyBrace® Systems — August 2016

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

USE ONLY THE CURRENT SPECIFICATION

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

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

PATENTS

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

Beware of substitution

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

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

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

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

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

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

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

Scope of use

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

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

Finish quality — framing and substrates

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

New GIBFix® Framing System

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

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

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

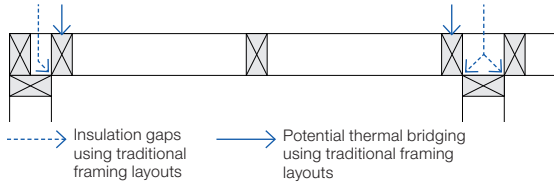
The GIBFix® Framing System offers better thermal efficiencies and minimises potential joint imperfections resulting from interior linings being fixed to multiple timber framing members.

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

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

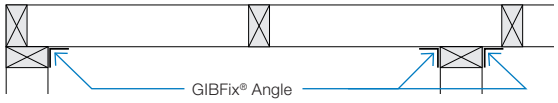
Bracing ratings apply whether fixing is directly into timber or into the metal components, provided correct construction details, fastener types and centres are applied.

FIGURE 1: TRADITIONAL WALL FRAMING LAYOUT



GFS004

FIGURE 2: GIBFIX® FRAMING SYSTEM (ALTERNATIVE LAYOUT)



GFS005

NEW GS2-NOM Bracing Element

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

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

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

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

1. Actual savings dependent on building and bracing design.

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Compliance with the NZ Building Code

NZBC CLAUSE B1 — STRUCTURE

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

NZBC CLAUSE B2 — DURABILITY

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

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

NZBC CLAUSE F2 — HAZARDOUS BUILDING MATERIALS

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

NZBC CLAUSE H1 — ENERGY EFFICIENCY

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

CAD design details

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

Appraisal

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

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

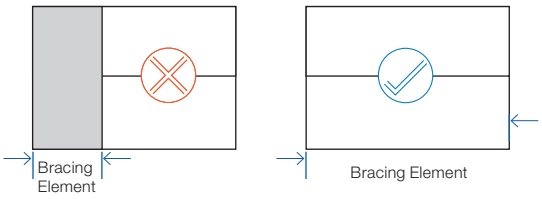
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Bracing resistance

WALL BRACING LAYOUT

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

FIGURE 3: WALL BRACING LAYOUT



BRACING DISTRIBUTION

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

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

Space bracing lines no more than:

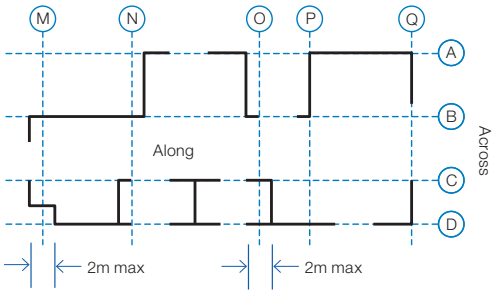
- 6 metres for standard construction with any GIB® plasterboard ceiling, or
- 7.5 metres where dragon ties in accordance with NZS3604:2011 have been installed, or
- 12 metres with a GIB® plasterboard ceiling diaphragm.

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

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

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

FIGURE 4: BRACING GRID LAYOUT



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

GIB EZYBRACE® SYSTEMS

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

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

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

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

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

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

Specifying GIB EzyBrace® elements (minimum wall length 400mm)	
Inside lining external walls.	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required. If the other side of the frame is lined with plywood consider GSP-H or BLP-H elements or use alternative proprietary bracing systems.
Internal walls (only one side available for bracing).	Nominate available lengths of wall as GS1-N elements. Use BL1-H if higher ratings are required.
Internal walls (both sides available for bracing).	Nominate available length of wall as GS2-NOM elements. Change to GS1-N if higher ratings are required. Change to GS2-N if higher ratings are required. Change to BLG-H for even higher ratings. Consider GSP-H or BLP-H if the opposite side is lined with plywood.

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.

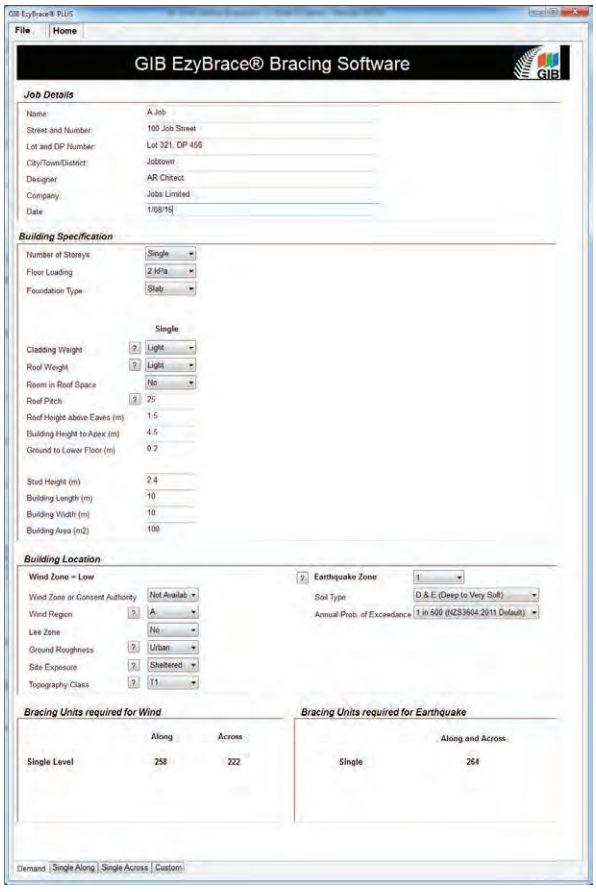
Bracing resistance sheets ('tabs') are added depending on the building specification entered. For example, subfloor bracing resistance tabs only show when a 'subfloor' foundation type has been selected.

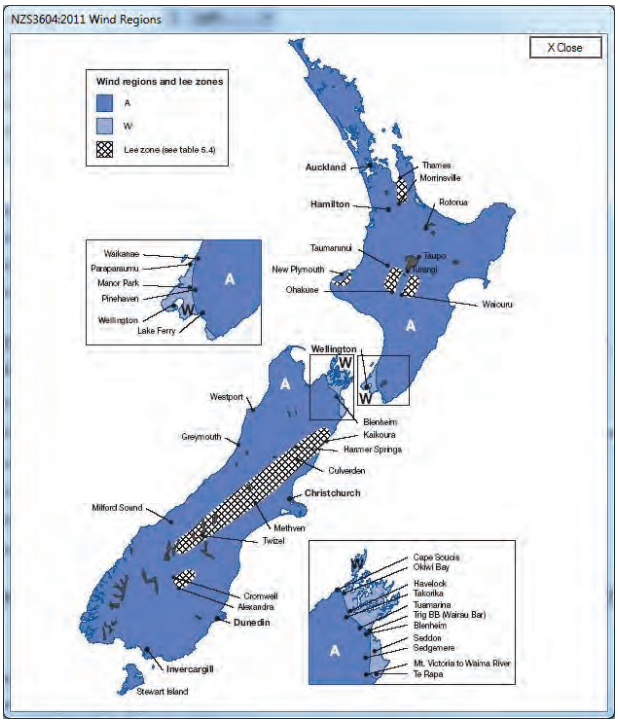
The Demand sheet gives the designer the option to select a longer earthquake return period which represents a higher earthquake design force. The default for buildings constructed in accordance with NZS3604:2011 is an earthquake that has a 10% chance of being exceeded within the assumed 50 year 'design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

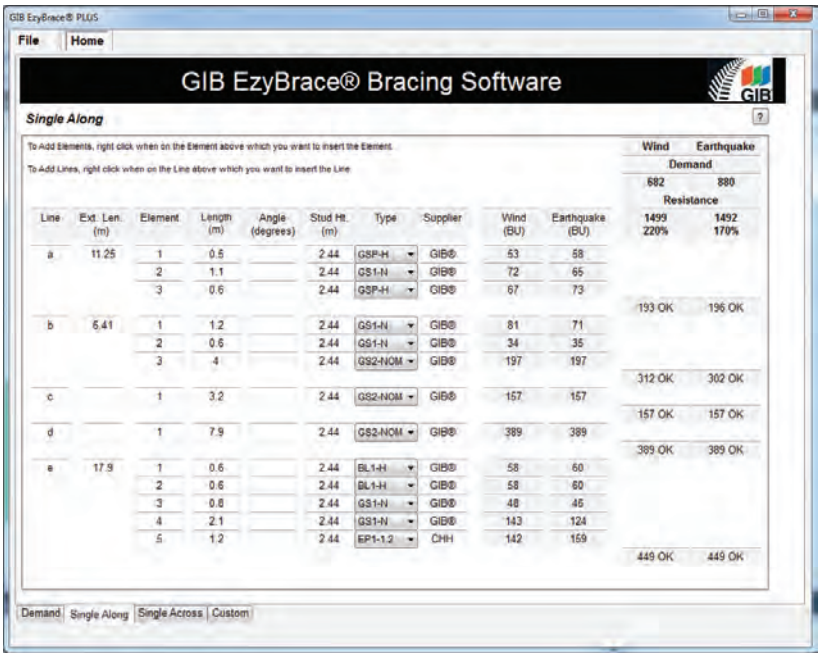
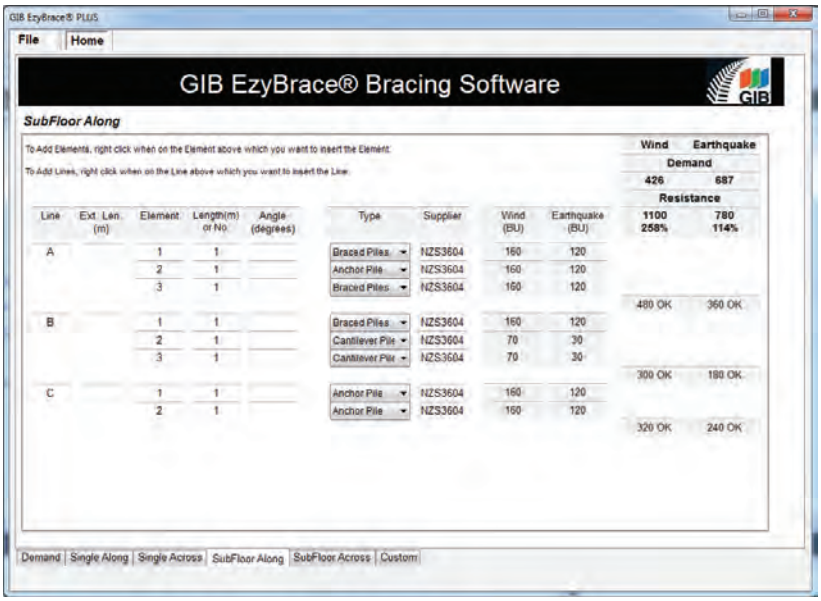


FIGURE 7: GIB EZYBRACE® 2016 — SUBFLOOR BRACING RESISTANCE CALCULATION SHEET

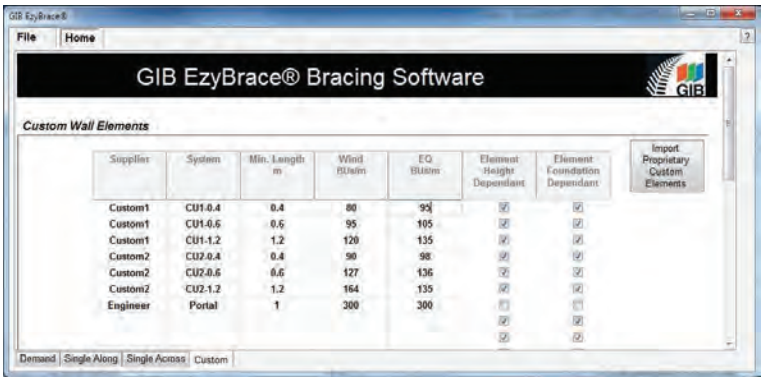


Download GIB EzyBrace® 2016 design software from gib.co.nz/ezybrace

Software functionality

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

FIGURE 8: GIB EZYBRACE® 2016 — CUSTOM ELEMENTS SHEET



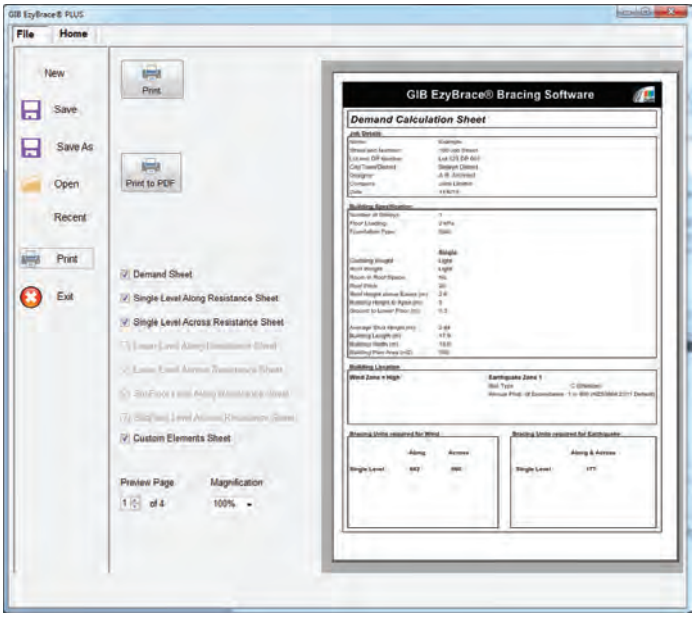
Note: Values and systems shown in Custom Elements Sheets are for illustrative purposes only.

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

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

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

FIGURE 9: GIB EZYBRACE® 2016 — PRINT SCREEN VIEW



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

GIB® plasterboard linings

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

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

LIMITATIONS

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

GIB EzyBrace® Systems in water-splash areas

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

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

Renovation

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

Openings in bracing elements

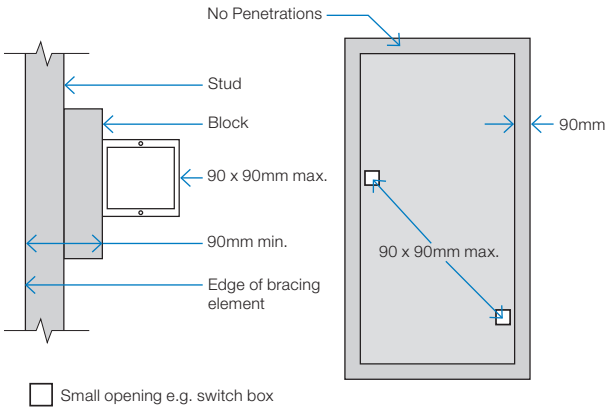
SMALL OPENINGS

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

LARGE OPENINGS

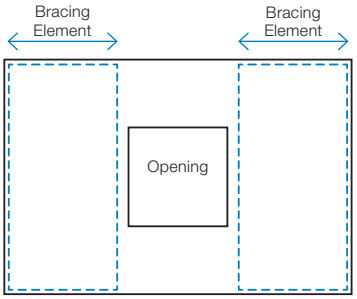
Openings above 90 x 90mm such as switch boards, recessed cabinets and TV's etc. should be placed outside of the bracing element or locate bracing on the other side of the wall framing.

FIGURE 10: SMALL OPENINGS IN BRACING ELEMENTS



GEB001

FIGURE 11: LARGE OPENINGS AND BRACING ELEMENTS



Timber framing

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

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

GIBFix® Framing System (alternative layout)

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

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

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

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

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

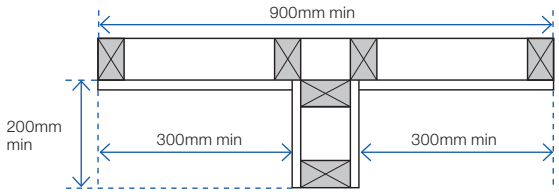
Guidelines for intersection walls

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

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

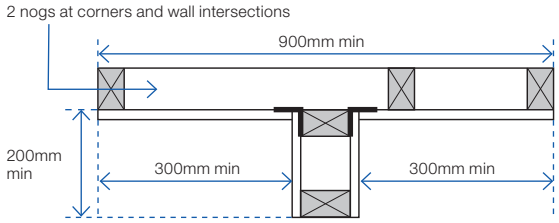
When fixing part sheets of GIB® plasterboard to the side of a T-junction, a minimum width of 300mm applies for bracing elements. See figures 12 and 13.

FIGURE 12: WALL INTERSECTION (TRADITIONAL WALL FRAMING)



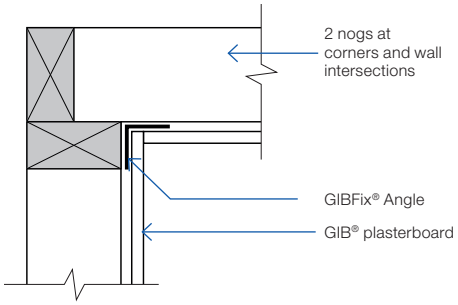
GEB002

FIGURE 13: WALL INTERSECTION (GIBFIX® FRAMING SYSTEM)



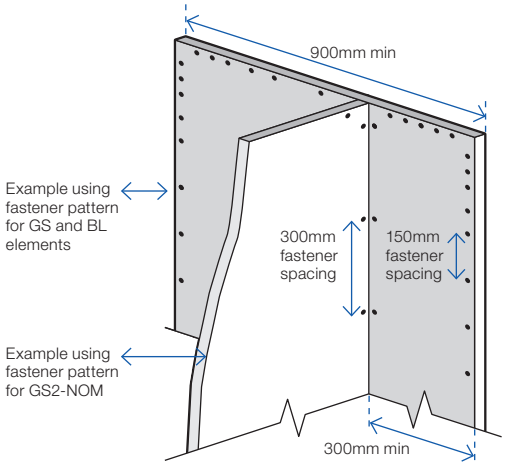
GEB003

FIGURE 14: CORNER INTERSECTION (GIBFIX® FRAMING SYSTEM)



GFS001

FIGURE 15: WALL INTERSECTION FASTENER PLACEMENT



Junction

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

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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

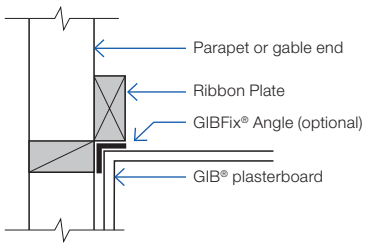
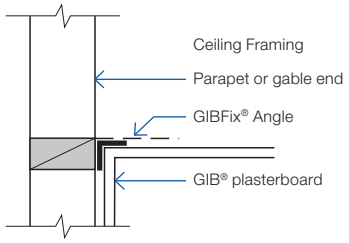


FIGURE 17: PARAPETS AND GABLE ENDS WITH GIBFIX® ANGLE



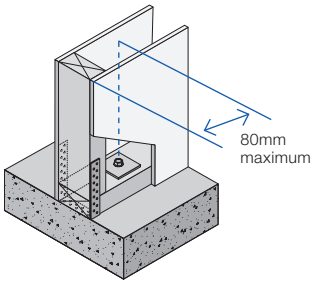
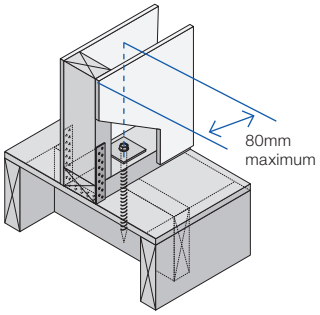
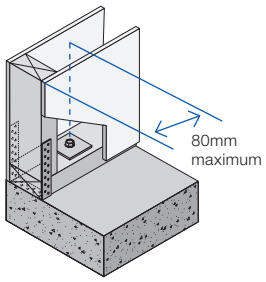
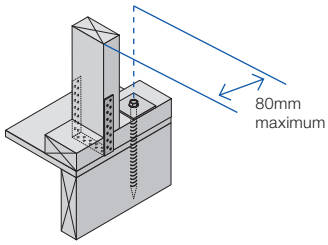
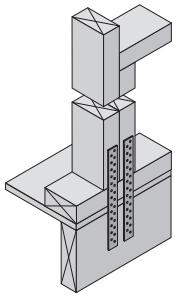
GFS003

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.	

Bracing strap installation

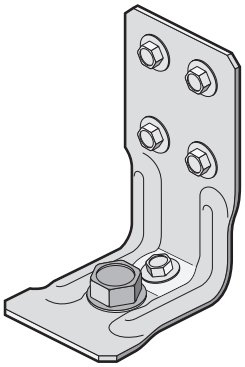
Care needs to be taken with the installation of the bracing strap. It should be checked in to be flush with the face of the stud providing a flat substrate for the plasterboard and positioned in such a way that the corner fastenings of the bracing element are not affected by it. Keeping the strap to 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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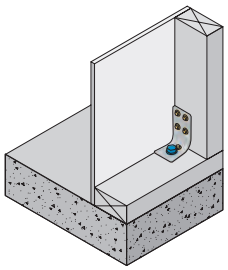
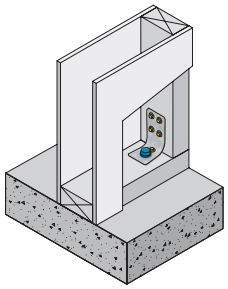
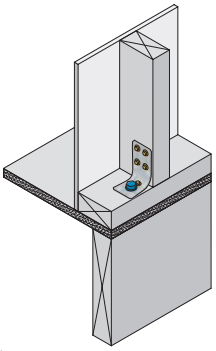
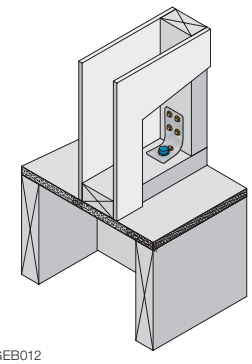
GIB HandiBrac® installation



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.	

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

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

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

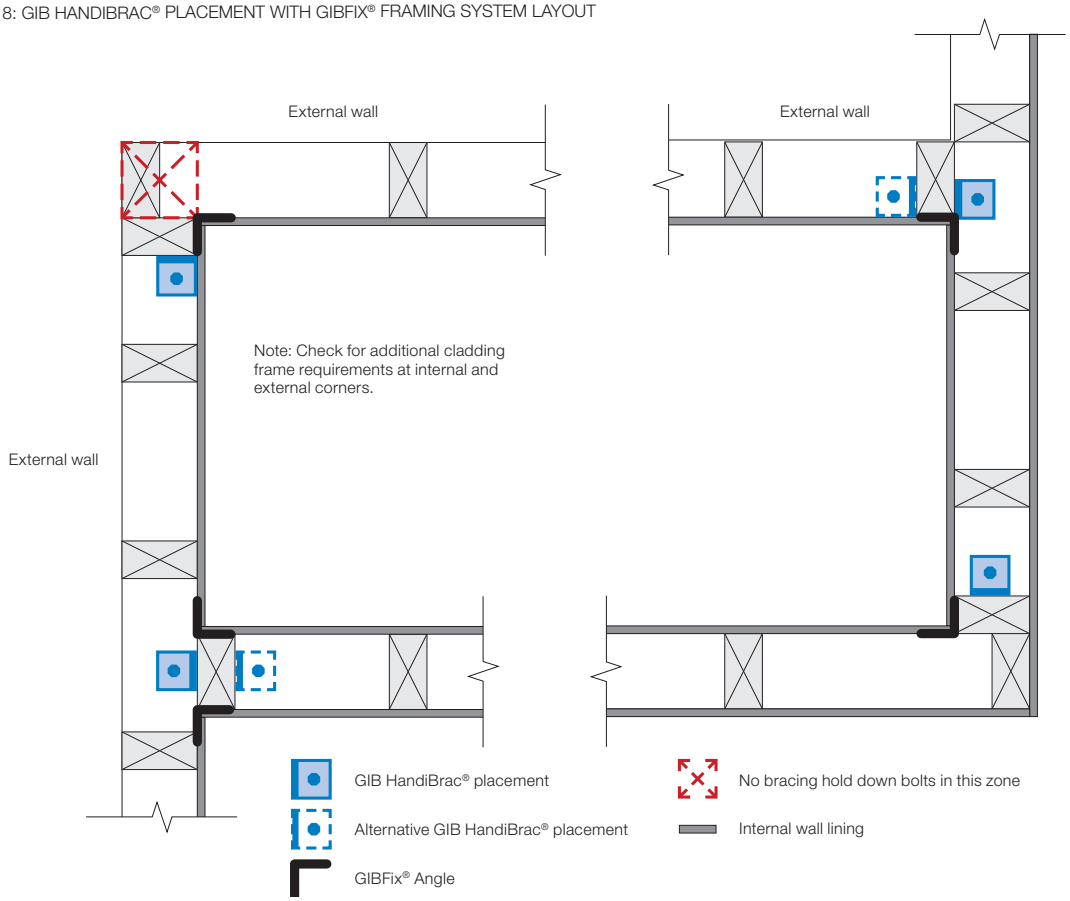
The GIB HandiBrac® is fixed to the stud which has the GIBFix® Angle.

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

TIMBER FLOORS

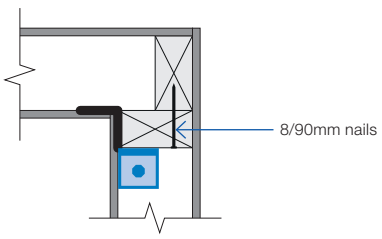
For timber floors bolt fixing in to solid joist or block is required, as shown on p 15.

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



GEB013

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



GEB014

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Ceiling diaphragms

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

Limitations for GIB® plasterboard ceiling diaphragms

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

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

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

Diaphragms outside these parameters must be specifically designed.

General fixing requirements for GIB® Ceiling Diaphragms:

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

FIGURE 20: PROTRUSIONS AND CUTOUTS

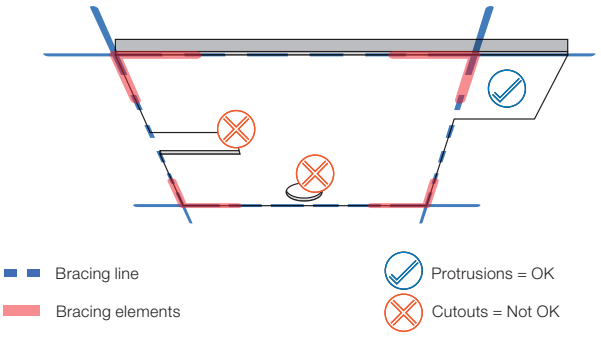


FIGURE 21: DIAPHRAGM BRACING LINING SPACINGS

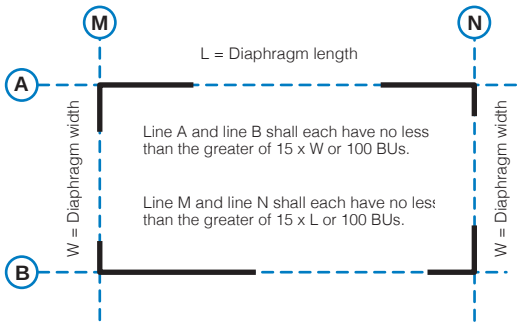
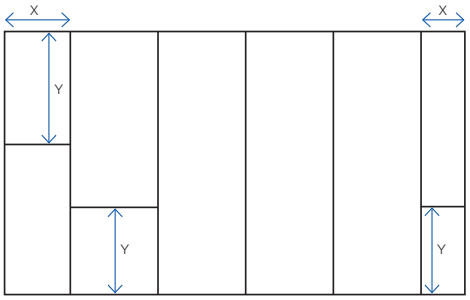


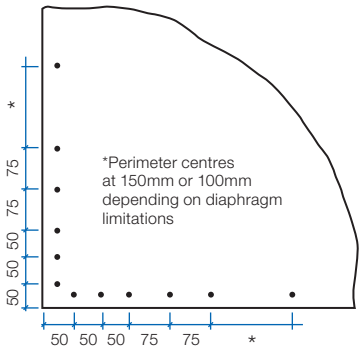
FIGURE 22: GIB® CEILING DIAPHRAGM SHEET WIDTHS AND LENGTHS



X = 900mm min or 600–900mm min provided all adjacent joints are back-blocked.

Y = 1800mm min sheet lengths at ends of ceiling diaphragms.

FIGURE 23: GIB EZYBRACE® FASTENER PATTERN



Unless stated all fastener spacings are maximums.

GEB015

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Ceiling battens in ceiling diaphragms

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

Battens shall be spaced at a maximum of:
- 500mm for 10mm GIB® plasterboard.
- 600mm for 13mm GIB® plasterboard.

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

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

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

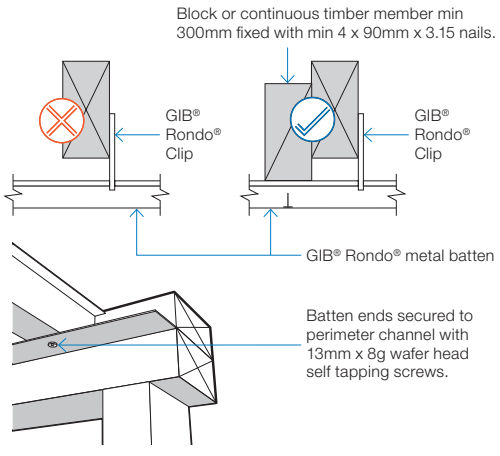
GIB® Rondo® metal battens must be fixed directly to the roof framing. If a clip system has been used, a timber block (min 300mm) or a continuous timber member can be fixed alongside the bottom chord to permit a direct connection to the batten, see figure 26.

For GIB® Rondo® metal battens, a GIB® Rondo® metal channel or metal angle is required at the perimeter of the diaphragm. The perimeter channel shall be fastened to the top plate with 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm x 7g GIB® Grabber® Dual Thread screw at 300mm centres maximum.

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

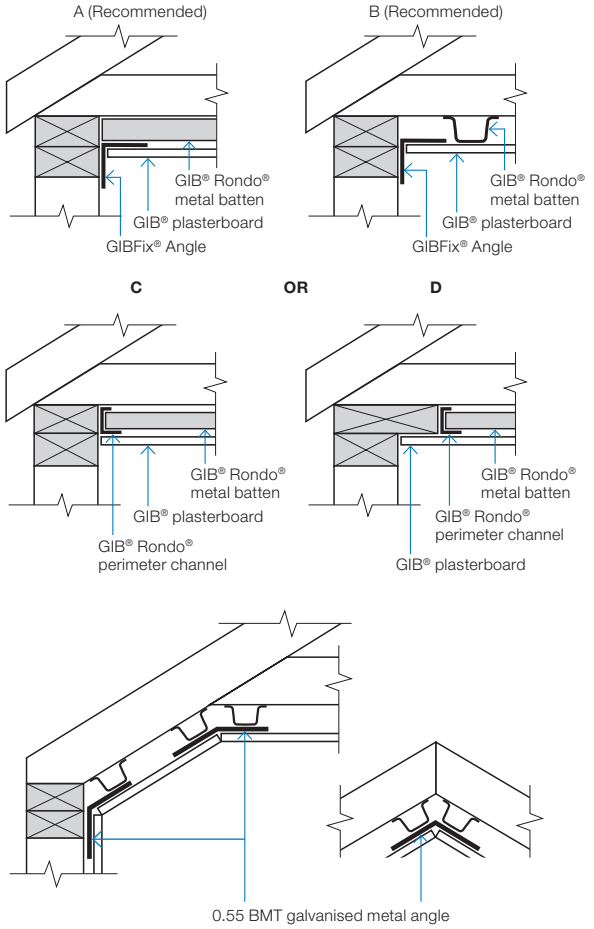
Coved ceiling diaphragms can be achieved by using nominally 32 x 32 x 0.55mm proprietary galvanised metal angles ("back-flashing") at the changes in direction. These angles shall be:
- Fastened at 300mm on each edge to metal battens using 32mm x 8g GIB® Grabber® Wafer Head Self Tapping screws or 32mm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

FIGURE 26: GIB® RONDO® METAL CEILING BATTEN INSTALLATION



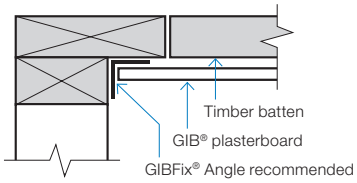
GEB016

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



GEB017

FIGURE 28: TIMBER CEILING BATTENS*



GEB018

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Openings in ceiling diaphragms

SMALL OPENINGS

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

LARGE OPENINGS

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

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

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

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

FIGURE 24: LARGE OPENINGS IN CEILING DIAPHRAGMS

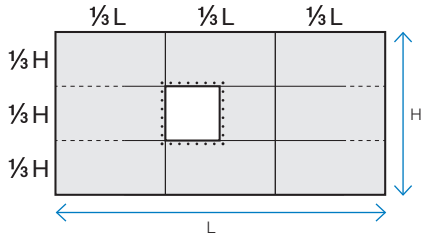
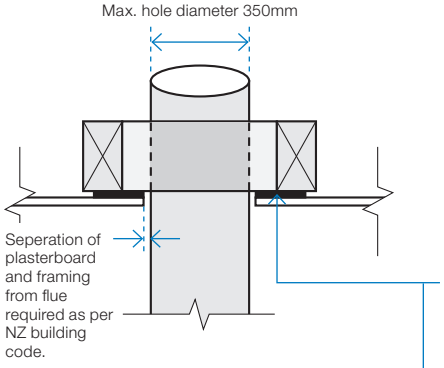
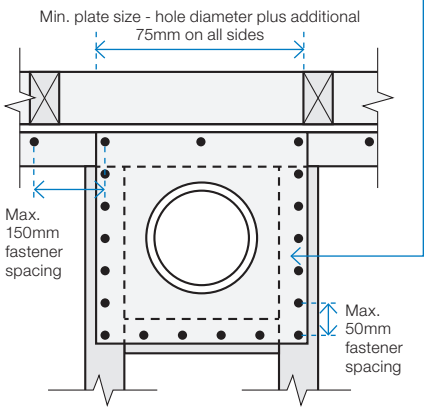


FIGURE 25: FIREPLACE FLUES AND RANGE HOOD OPENINGS

Section view



Plan view



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

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

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

Plasterboard ceiling not shown in plan view

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

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

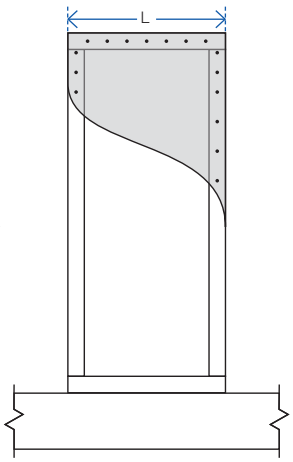
'N' type GIB EzyBrace® elements are identified by GIB® specification numbers GS1-N, GS2-N and GS2-NOM

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

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

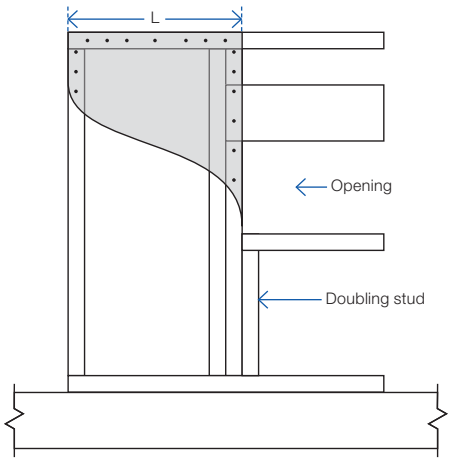
Fastener spacings and diagram scales shown in Figures 29–32 are indicative only. Refer to p.23–30 for construction details.

FIGURE 29: GS BRACING ELEMENTS (OPTION A)



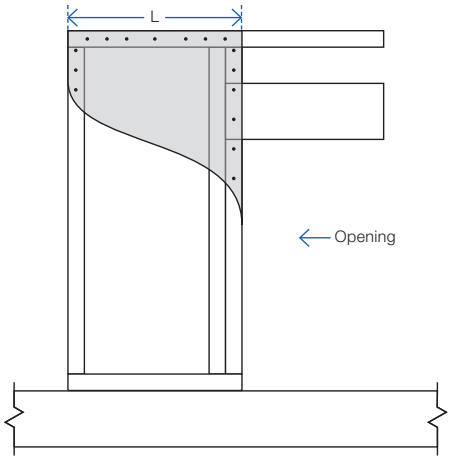
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 30: GS BRACING ELEMENTS (OPTION B)



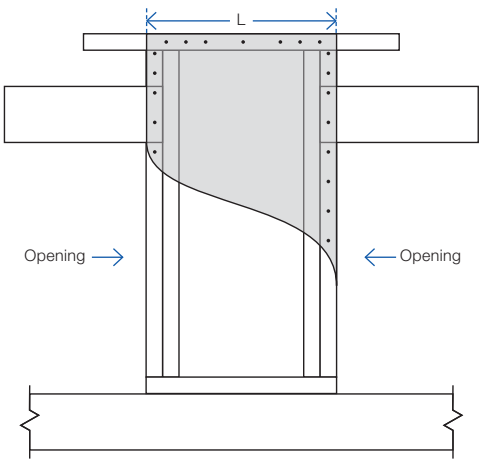
GS1-N, GS2-N elements
'L' indicates the length of the bracing element

FIGURE 31: GS BRACING ELEMENTS (OPTION C)



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

FIGURE 32: GS BRACING ELEMENTS (OPTION D)



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

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

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

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

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

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

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

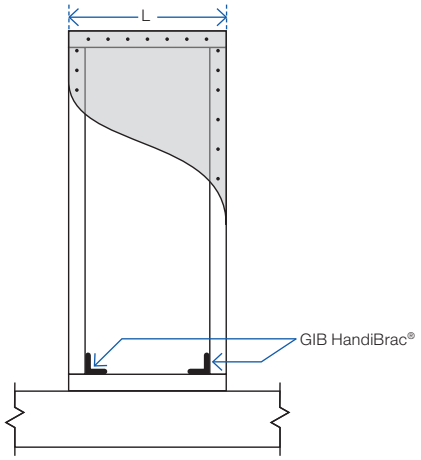
Spike doubling stud to trimming stud using a minimum of 2/90mm gun nails at 600mm centres. Lintel straps (where required for wind uplift) should be checked in and be located away from the bracing element fasteners.

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

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

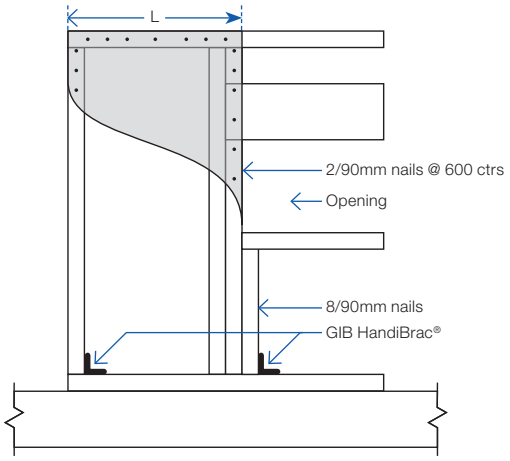
Fastener spacings and diagram scales shown in figures 33–36 are indicative only. Refer to p.23–30 for construction details.

FIGURE 33: BL BRACING ELEMENTS (OPTION A)



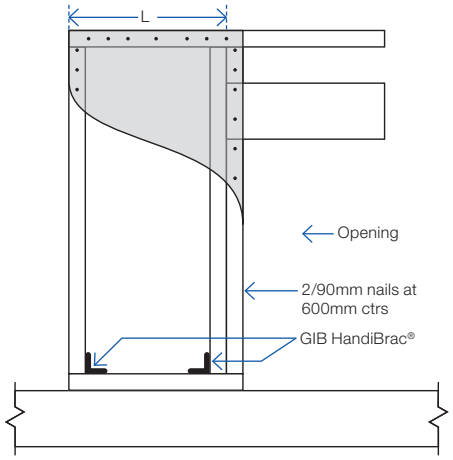
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 34: BL BRACING ELEMENTS (OPTION B)



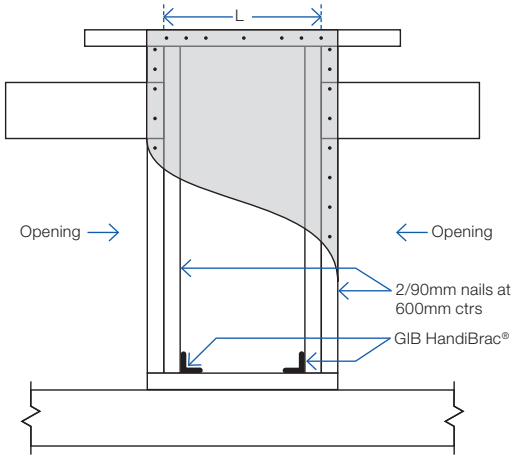
'H' type elements with specific hold downs
'L' indicates the length of the bracing element

FIGURE 35: BL BRACING ELEMENTS (OPTION C)



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

FIGURE 36: BL BRACING ELEMENTS (OPTION D)



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

GIB EzyBrace® Systems specification GS1-N

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

WALL FRAMING

Wall framing to comply with;

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

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

BOTTOM PLATE FIXING

Timber floor

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

Concrete floor

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

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

WALL LINING

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

PERMITTED ALTERNATIVES

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

FASTENING THE LINING

Fasteners

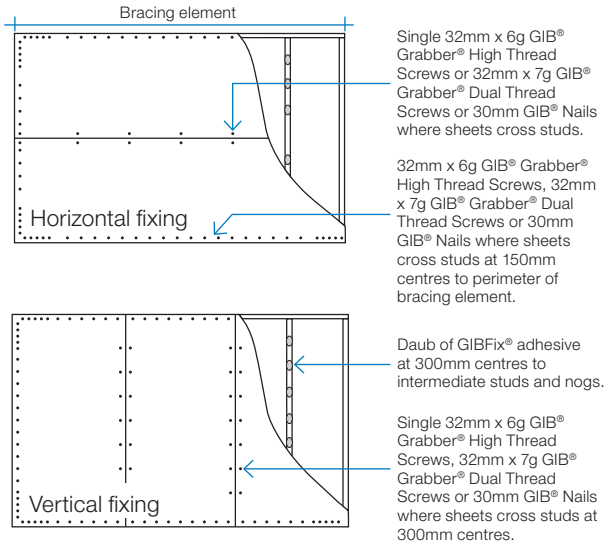
32mm x 6g GIB® Grabber® High Thread Screws, 32mm x 7g GIB® Grabber® Dual Thread Screws or 30mm GIB® Nails. If using the GIBFix® Angle use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

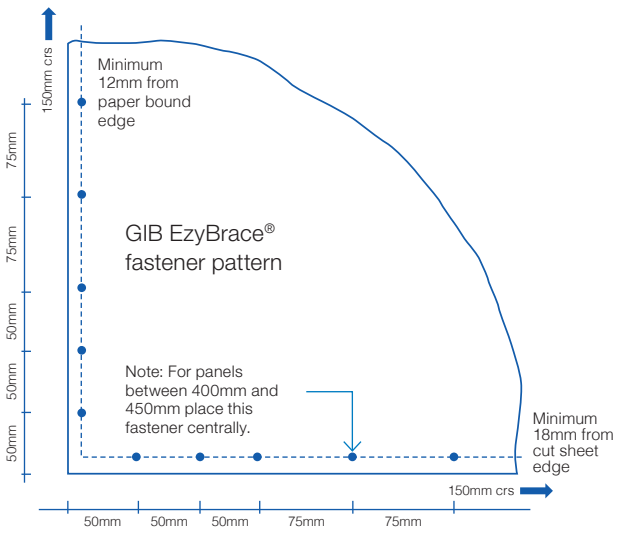
Fastener centres

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

JOINTING

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





Unless stated all fastener spacings are maximums.

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

GIB EzyBrace® Systems specification 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

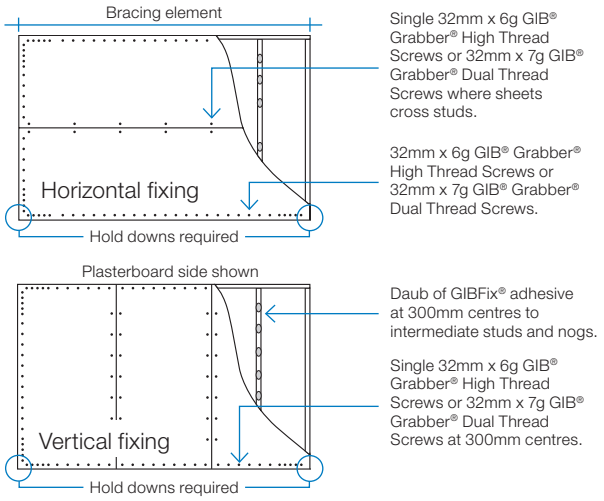
32mm x 6g GIB® Grabber® High Thread Screws or 32mm x 7g GIB® Grabber® Dual Thread Screws. If using the GIBFix® Framing System or if fastening through GIBFix® Angles use only 32mm x 7g GIB® Grabber® Dual Thread Screws.

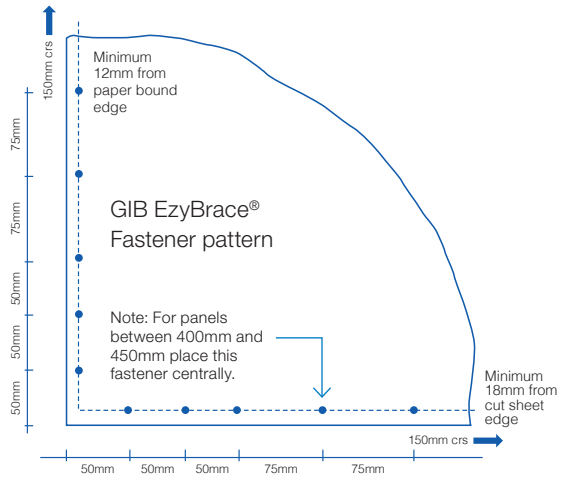
Fastener centres

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

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

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

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

GLOBAL GREENTAG^{CERTTM}

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

GIB® plasterboard has a Level B green rating.

DECLARE CERTIFICATION

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

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

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

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

TRADEMARKS

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

PATENTS

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

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FOR MORE INFORMATION VISIT

gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

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Tuffply Bracing



Plywood Bracing

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IPL Tuffply Bracing

IPL Tuffply Bracing is manufactured on the West Coast of New Zealand's South Island.

IPL plywood offers unsurpassed quality backed by a third party audited quality assurance programme.

Benefits of IPL Tuffply Bracing

- ☐ Proven performance and strength
- ☐ Guaranteed quality via EWPAA product Certification Scheme
- ☐ Site damage resistance (cross laminated construction)
- ☐ Bonded with durable 'marine' A bond
- ☐ Easy and light to handle
- ☐ Simple installation (gun nail to within 7mm of edges)
- ☐ High strength and stiffness in relatively short panels
- ☐ Braces building frame during construction period
- ☐ Economical and eco friendly
- ☐ Super EO - less than 0.3mg/l AS/NZ Standard formaldehyde emissions
- ☐ Use in conjunction with GIB board

Environmentally Sustainable

All veneer used in IPL Tuffply Bracing is from renewable, plantation-grown Pinus Radiata New Zealand plantations and is available FSC (Forestry Stewardship Council) certified on request.

PRODUCT CERTIFIED tested STRUCTURAL paa PLYWOOD JAS-ANZ

There are many sound reasons to choose IPL Tuffply Bracing

Building frames require bracing structually able to resist imposed horizontal forces (racking forces) resulting from earthquakes or high winds during the building life. Nailed IPL Tuffply Bracing is a safe and reliable means of providing bracing for light timber framed buildings.

Nail fixed Tuffply structural plywood panels have tested stiffness, plus energy absorption to meet the earthquake and wind loads required by the Standards.

IPL Tuffply Bracing is 7mm thick 3 ply structural plywood made up of three layers of Pinus Radiata veneer permanently bonded together making it suitable for use on timber framed buildings designed and constructed in accordance with NZS 3604:2011.



IPL Tuffply Bracing

Design Information

Structure

Framing that complies with NZS 3604:2011 will meet the requirements of the Building Code. Studs are at a maximum of 600mm centre - dwangs are not necessary for effective bracing but may be used.

As 7mm IPL Tuffply Bracing is structural plywood manufactured to AS/NZ 2269:2012, it is suitable for design of earthquake and wind bracing for timber framed buildings in accordance with design codes NZS 3603 and AS/NZ 1170. This has been confirmed by EWPAA sponsored testing.

Durability

As IPL Tuffply Bracing is an integral part of the building structure it must be durable in each application i.e. have at least 50 years durability rating. In interior dry applications (i.e. 18% moisture content or less) untreated IPL Tuffply Bracing is acceptable for use.

However, in applications where IPL Tuffply Bracing may be subject to wetting, dampness or condensation (basically where the moisture content may exceed 18% for prolonged periods) IPL Tuffply Bracing must be preservative treated to at least H3.2 hazard rating and fixed with non-corrosive fasteners (i.e. stainless steel or silicone bronze).

Exposure during construction

IPL Tuffply Bracing will withstand rain exposure for at least 3 months. The possible wetting may cause slight buckling of panels but generally, after drying, there is close to full recovery.

Installation, Sheet Fasteners and Connections

IPL Tuffply Bracing is to be installed and fixed as per the building design. As plywood dimensions can vary with changes in ambient humidity and wetting during construction it is recommended to allow expansion gaps between adjacent panel edges of at least 2mm.

The minimum fastener requirement in New Zealand is 50mm x 2.8mm dia hot dip galvanised structural clouts.

Treated IPL Tuffply Bracing must be fixed with non corrosive fasteners - a minimum of 50mm x 2.8mm dia stainless steel annular grooved flat head nails or hot dipped galvanised.

Refer to GIB HandiBrac® installation instructions for correct installation of galvanised steel angle brackets and bolt types to be used for concrete and timber floors.

Please note that IPL Tuffply Bracing is not to be installed in contact with the ground.

Compliance with Standards

IPL Tuffply Bracing is manufactured in accordance with AS/NZ 2269. The panels are to be installed in accordance with the building design code.

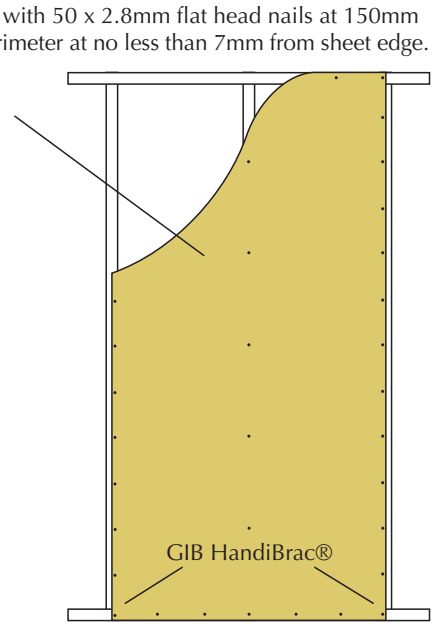
The Engineered Wood Products Association of Australasia (EWPAA or PAA) audits our production processes to ensure we meet the requirements of the product Standard. This third party audited, process based, quality assurance scheme meets the requirements of an ISO Type 5 system for production certificate. The EWPAA is an accredited body to JAS - ANZ under registration No. Z1460695AB.

Elements using BRANZ P21 test as per NZ23604:2011.
The below values can be used with any IPL plywood stamped with AD, SD, CD, DD grade that are a minimum of 7mm thickness.

Bracing Ratings for IPL Plywood Bracing

Type	Lining	Min Length (mm)	Wind (BUs/m)	Earthquake (BUs/m)
TP1	7mm Tuffply one side	600	110	125
TP2	7mm Tuffply two sides	600	140	155
TP3	7mm Tuffply one side 10mm GIB® Standard Plasterboard other	400	98	112
TP4	7mm Tuffply one side 10mm GIB® Standard Plasterboard other	1200	169	156

BRANZ P21 test carried out in Winstone Wallboard Laboratory Auckland.



IPL Tuffply Bracing

CCA wood preservative

Recently certain New Zealand media has questioned the health and safety aspects of using CCA as a wood treatment. CCA (Chromated Copper Arsenate) preservative has been used in New Zealand for over 50 years and has proved to be the most reliable and cost effective form of timber preservation.

The New Zealand Environmental Risk Management Authority (ERMA) reviewed CCA and the risk of health-related issues in 2003, commissioning Dr Deborah Read, a public health physician, to prepare a report, which was subsequently peer-reviewed by a number of health professionals (Read 2003). In the report, Dr Read stated:

"There are no epidemiological studies or human case reports involving disease related to direct contact with CCA-treated wood, and the low level exposures that most of the general population will experience from contact with CCA-treated wood are extremely unlikely to result in acute health effects. CCA-treated wood has also been in use for many years without discernible adverse health effects suggesting that if there is a true risk it is very small."

A second review was done by Dr. Bruce Graham (2009) continuing to support the stance by ERMA, NZ in response to the Read report.

"Background exposures to arsenic from food and water sources are significantly higher than from estimated exposure to CCA timber. The combined intake of arsenic from all these sources falls well below the World Health Authority tolerable daily intake for arsenic."

Temple and Di Marco (2003)

IPL offers ACQ preservative as an alternative to CCA

ACQ (Alkaline Copper Quaternary) is a water-based preservative system developed in the USA.
The formulation contains copper oxide which is the primary fungicide and insecticide and a quaternary ammonium compound which provides additional fungicide and insect resistance properties.

For further information and pricing contact IPL.

Product Details

Thickness and Tolerance

IPL Tuffply Bracing is 7mm in thickness +/- 7%.

Sheet Size

2400mm x 1200mm. The dimension tolerance for untreated plywood is +/- 1.5mm.

There may be some variation from these parameters on CCA treated plywood because during the treatment process the sheet expands and contracts during drying.

Stress Grading

IPL Tuffply Bracing plywood is rated at F8.

Bonding

All IPL construction plywood is bonded with phenol formaldehyde resin (dark red in colour). This results in a permanent bond which after manufacture will not part. This is the same bonding material used in Marine type plywood.

Formaldehyde emissions in IPL plywood are very low and rated as Super EO - less than 0.3mg/l AS/NZ Standard 2098:11.

Branding

Back of all sheets marked:

DD	The back of all sheets marked with sheet face and grade
IPL	Company name
A bond	Bond type
F8	Stress grade
AS/NZ 2269	Structural Plywood Standard
914	Engineered Wood Products Association mill number
7-24-3	Construction code

INTERNATIONAL PANEL & LUMBER (WEST COAST) LTD
3 Trickies Road, Greymouth, New Zealand, PO Box 179
Telephone 03-762 6759, Facsimile 03-762 6789,
Freephone 0800 650 801, Freefax 0800 650 802, Email tuffply@xtra.co.nz

MS 20565/NOVEMBER 2013

SECTION 4

H1 Calculations

Risk Matrix

Sheet 6 Plans

BC200635

JOB TITLE

NAME:	PROPOSED RESIDENCE
DATE:	24TH JUNE 2020
STREET AND NUMBER:	33 TARA CRESCENT RAVENSWOOD
LOT AND DP NUMBER:	LOT 156 DP525252
CITY/TOWN/DISTRICT:	WOODEND TOWNSHIP - WAIMAKARIRI DISTRICT
DESIGNER:	LMA
COMPANY NAME:	LEIGH ADAMS ARCHITECTURE

BUILDING DESCRIPTION

NORTH ELEVATION			
WALL AREA:	47.6	M²	
GLAZED AREA:	11.37	M²	
% OF GLAZED AREA:	23.886555	%	
EAST ELEVATION			
WALL AREA:	11.37	M²	
GLAZED AREA:	6.18	M²	
SOUTH ELEVATION			
WALL AREA:	33.78	M²	
GLAZED AREA:	4.96	M²	
WEST ELEVATION			
WALL AREA:	25.17	M²	
GLAZED AREA:	4.91	M²	
TOTAL EAST SOUTH AND WEST			
WALL AREA:	70.32	M²	
GLAZED AREA:	16.05	M²	
% OF GLAZED AREA:	22.824232	%	TO BE BELOW 30% FOR SCHEDULE METHOD
OVERALL			
TOTAL WALL AREA:	117.92	M²	
VERTICAL GLAZED AREA:	27.42	M²	
SKYLIGHT AREA:	0	M²	
TOTAL GLAZED AREA:	27.42	M²	
TOTAL % OF GLAZING:	23.253053	%	TO BE BELOW 30% FOR SCHEDULE METHOD

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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 "iso-thermal planes" method, the same method as used in NZS4214:2006.

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

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

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

- Floors ○
- Walls ◉
- Roofs ○

Element Name (optional) — 2.23 m²K/W

Type: Wall: Timber frame with vented cavity

timber frame with vented cavity

external surface 0.03

Cladding : 70mm brick
R-value: 0.06

Air Barrier : Building paper
R-value: 0.01

Timber Frame & Cavity : 90mm, studs @ 600mm, dwangs @ 800mm

Wall Frame Area: 14.4%	*Cavity Area: 85.6%*
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08	15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Framing : *R-value: 0.75*	Insulation : 2.6
	still Airgap: none *R-value: 0.00*

Wall Lining : Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

Print Page

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

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

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3
Wall	R-2.9	R-3.8

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Construction R-value Calculator

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

- Floors
- Walls
- Roofs

Element Name (optional) — 3.37 m²K/W

Type: Roof: Timber framed roof, direct fixed or battened flat ceiling

Pitched timber framed roof, flat ceiling

external surface 0.03

Roofing : 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 : Gypsum plasterboard 13mm
R-value: 0.06

internal surface 0.09

Recessed downlights
Ceiling Area [m²]: Number of downlights: Clearance from lamp holder side [m]:

Print Page

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

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

Australian Building Code Targets:

	All Zones except NSW	NSW
Roof	R-4.1	R-6.3

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SECTION 5

Specifications

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PROPOSED RESIDENTIAL DEVELOPMENT

SPECIFICATIONS

At 33 Tara Crescent
Ravenswood Woodend
Waimakariri District Council

WAIMAKARIRI DISTRICT COUNCIL
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THE PROPOSED RESIDENCE AT 33 TARA CRESCENT RAVENSWOOD WOODEND WAIMAKARIRI DISTRICT

SITE SCRAPE PAGE 1

THE AREA OF THE SITE TO BE COVERED BY THE BUILDING SHALL BE STRIPPED OF ALL TOP GROWTH AND VEGETABLE MATTER. SHOULD SOFT CLAY, PEAT OR FILLED GROUND BE ENCOUNTERED ON THE SITE, AN ENGINEER SHALL BE CONSULTED FOR ADDITIONAL FOUNDATION DETAILS.

CONCRETE FOUNDATION & FLOOR

CONCRETE SHALL BE 20 MPA AT 28 DAYS AND COMPLY WITH NZS 3109. CONCRETE FLOORS TO BE POURED OVER POLYTHENE VAPOUR BARRIER LAPPED 150MM MINIMUM. ALL LAPS TO BE SEALED WITH TAPE. LEAVE OPENINGS FOR WASTE ETC AS REQUIRED. POLYTHENE TO BE LAID ON 150MM MINIMUM HARDFILL. THE SLAB SHALL BE FINISHED WHILE STILL GREEN. A HIGH STANDARD OF FINISH IS EXPECTED. CONSULT WITH OWNERS. FLOOR SLAB TO GARAGE TO HAVE REBATE TO SUIT SELECTED GARAGE DOOR AND JAMBS. TROWELLED FINISH TO REBATED EDGE. ALL EXPANSION CUTS TO BE CONCEALED UNDER WALLS. REFER TO DRAWINGS FOR FURTHER SPECIFICATIONS.

WALL FRAMING

ALL WORK IS TO COMPLY TO NZS 3604 FRAMING GENERALLY TO BE H1.2 TREATED SG8 KILN DRIED 90 x 45 STUDS AT 600 CRS WITH 2 ROWS OF DWANGS. BRACING TO BE AS PER SCHEDULE. USE MALTHOID DPC BETWEEN CONCRETE AND TIMBER. LINTELS – SIZE FROM NZS 3604, USE THE TABLES IN SECTION 15. FURTHER SIZES AND TREATED TIMBER SPECIFIED IN DRAWINGS. ALL TIMBER TREATMENT TO BE IN ACCORDANCE WITH NZS 3602:2003.

ROOF FRAMING

ENGINEER CERTIFIED PRE NAILED TRUSSES AT 900 CRS TYPICAL DESIGNED AND MANUFACTURED BY A LICENSED MANUFACTURER. FOR LONG RUN COLOUR STEEL TYPE ROOFS, PURLINS TO BE 70 x 45 AT 900 CRS. CEILING BATTENS TO BE 70 x 35 AT 600 CRS.

ROOFING (SPECIFIED ON WORKING DRAWINGS – SEE SECTIONS AND DETAILS).

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THE PROPOSED RESIDENCE AT 33 TARA CRESCENT
RAVENSWOOD WOODEND WAIMAKARIRI DISTRICT

FASCIA & GUTTER

METAL EXTERNAL FASCIA AND GUTTER SYSTEM FIXED TO TRUSS ENDS. FIX FASCIA GUTTER SYSTEM TO MANUFACTURERS' SPECIFICATIONS. ALL DOWNPIPES TO MATCH EITHER HOUSE COLOUR OR FASCIA & GUTTER COLOUR. CONFIRM WITH OWNER.

BRICK VENEER

CONSTRUCT 70 SERIES BRICK VENEER WITH APPROVED FACE FIXED TIES AT CORRECT SPACING IN ACCORDANCE WITH SECTION 9.2.7. OF NZBC E2 AS1 AND MATERIALS AND WORKMANSHIP TO NZS 4210. CONFIRM COLOUR AND TOOLING OF MORTAR ON SITE WITH OWNERS OR DESIGNER. RUN BREATHER TYPE BUILDING PAPER TO NZS 2295 HORIZONTALLY AND SECURE WELL TO OUTSIDE FACE OF FRAMING. REPAIR TEARS AND HOLES BEFORE CONSTRUCTING VENEER.

PLUMBING & DRAINAGE

ALL PLUMBING IS TO BE CARRIED OUT IN A TRADESMAN-LIKE MANNER. HOT AND COLD WATER TO BE PIPED IN SECURA PIPEWORK IN ACCORDANCE WITH NZBC ACCEPTABLE SOLUTIONS AND MANUFACTURERS DETAILS.
ALL DRAINAGE IS TO BE CARRIED OUT IN A TRADESMAN-LIKE MANNER IN ACCORDANCE WITH FOUL WATER AND DRAINAGE ACCEPTABLE SOLUTIONS G13/AS2 FOR FOUL WATER, E1 FOR SURFACE WATER. ALL WORK SHALL COMPLY WITH NZBC G13 ACCEPTABLE SOLUTIONS.

LININGS

WALL LININGS TO BE 10MM GIBRALTAR BOARD, CEILING LININGS TO BE 13MM GIBRALTAR BOARD SCREW FIXED TO MANUFACTURERS' SPECIFICATIONS AND FINISHED AS REQUIRED BY THE OWNER. THE SURFACE TO WHICH THE GIBRALTAR BOARD IS FIXED MUST BE CLEAN, STRAIGHT AND DRIED TO THE REQUIRED MOISTURE CONTENT. GIB AQUALINE WALL AND CEILING LININGS TO ALL BATHROOMS AND WET AREAS. STANDARD 13MM GIBRALTOR BOARD TO GARAGE CEILING.

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THE PROPOSED RESIDENCE AT 33 TARA CRESCENT RAVENSWOOD WOODEND WAIMAKARIRI DISTRICT

ELECTRICAL WORK PAGE 3

ALL ELECTRICAL WORK IS TO BE CARRIED OUT IN A TRADESMAN-LIKE MANNER AND IS TO COMPLY WITH THE RELEVANT CODES OF PRACTICE AND LOCAL BODY BYLAWS. TESTS ARE TO BE CARRIED OUT AT COMPLETION OF VARIOUS SECTIONS OF THE CONTRACT AS REQUIRED UNDER ELECTRICAL WIRING REGULATIONS 1993. THE LAYOUT PLAN OF POWER POINTS AND LIGHT SWITCHES IS TO BE DETERMINED ON SITE BY THE ELECTRICIAN AND OWNER. ANY EXTRAS OVER AND ABOVE THE NZECP54 SPECIFIED AMOUNT ARE TO BE DETERMINED BY THE ELECTRICIAN. THE OWNER IS THEN TO BE NOTIFIED OF THIS AMOUNT AND IS TO AGREE TO THE NEW SCHEDULE PRIOR TO WORK COMMENCING. THE ELECTRICAL CONTRACTOR IS TO OBTAIN RELEVANT PERMITS, TO PAY FEES AND TO ARRANGE THE NECESSARY INSPECTIONS IN CONNECTION WITH THE ELECTRICAL WORK.

INSULATION

ALL CEILINGS TO BE INSULATED WITH R 3.6 FIBREGLASS BATTS. ALL EXTERNAL WALLS OF BUILDING TO BE INSULATED WITH R 2.6 FIBREGLASS BATTS. REFER TO THE NOTES IN THE WORKING DRAWINGS.

PAINTING & WALLPAPERING

ALL PAINTING WORK IS TO BE CARRIED OUT IN A TRADESMAN-LIKE MANNER. INTERNAL SURFACES SHALL HAVE 3 COATS OF ACRYLIC PAINT AND/OR POLYURETHANE (OWNER'S CHOICE). EACH COAT SHALL BE ALLOWED TO DRY THOROUGHLY FOR 24 HOURS BEFORE SUBSEQUENT COATS ARE APPLIED. EACH COAT SHALL BE FINISHED OVER ALL SURFACES BEFORE A FURTHER COAT IS APPLIED. BLEMISHES SHALL BE SANDED OUT BETWEEN EACH COAT. TO ALL WET AREA WALLS AND CEILINGS, SURFACES MUST BE PROTECTED BY 1 COAT OF SEALER/UNDERCOAT AND 2 COATS OF SEMI GLOSS ENAMEL PAINT IN ACCORDANCE WITH NZBC E3 AS1.

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EXTERNAL JOINERY

ALUMINIUM WINDOWS WITH STAINED OR PAINTED TIMBER REVEALS GLAZED WITH FLOAT GLASS, THICKNESS AS REQUIRED. ALUMINIUM AND GLASS CONSTRUCTION TO COMPLY WITH NZS4211 AND NZS 4223, PART 3, 2016. RECOMMENDED APL ALUMINIUM WINDOW PROFILE. FOAM INSULATION AND WINDOW BANDAGES AS PER LOCAL TERRITORIAL AUTHORITY REGULATIONS AND NZBC E2 AS1.

SECTION 6

Technical Information

(Manufacturer's Information)

- ~~Septic Tank & Effluent Design incl. fencing~~
- ~~ECan Approval Documents~~
- ~~Gas Fire~~
- ~~Heating Unit~~
- ~~Solar Panels~~
- ~~Central Heating Systems~~
- A4 Details/Acceptable Solution Extract
- ~~Well/Water Test~~

PROPOSED RESIDENCE

SUPPORTING DOCUMENTS

At 33 Tara Crescent
Ravenswood Woodend
Waimakariri District Council

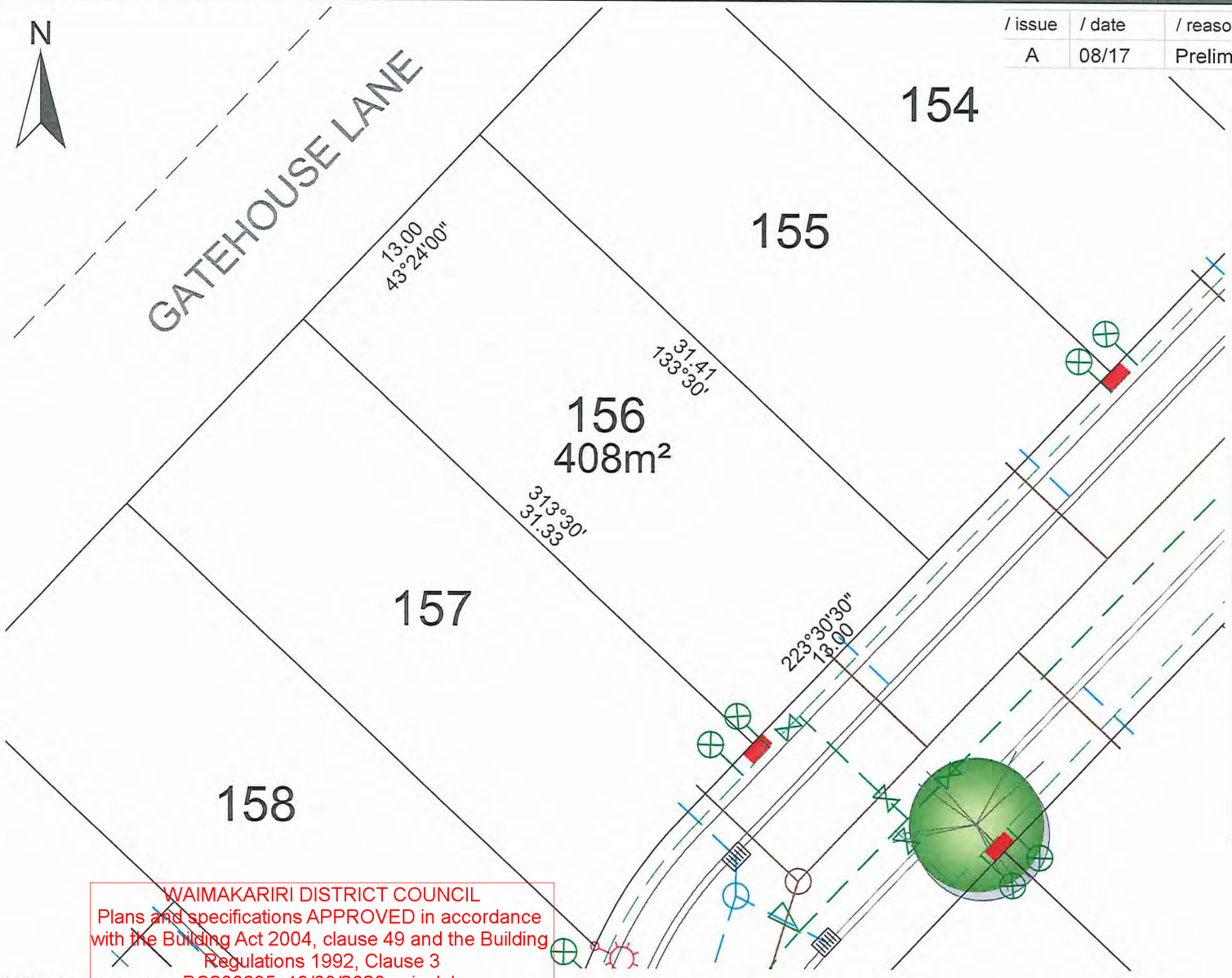
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contractor to locate all existing services & verify all dimensions before commencing work

/ issue	/ date	/ reason	/ approved
A	08/17	Preliminary Site plan	RB



Areas and dimensions are subject to final survey and approval by LINZ.

These are preliminary plans only.
It is the responsibility of the lot owner to verify the position of services on the ground before excavation.

These plans are compiled from design information and may be changed without notification. All information is to be verified prior to building design.

KEY:

- Water
- Sewer
- Stormwater
- Water toby
- Fire hydrant
- Sewer manhole
- Street lamp
- Power box / fibre
- Proposed Tree
- Existing Tree
- Proposed Easement Area

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CAD ref: 36821.scheme.stage one.site plans.dwg

DAVIS OGILVIE
ENGINEERS / SURVEYORS / PLANNERS
Davis Ogilvie & Partners Ltd - Ph. 0800 999 333

Lot 156 - Stage 1
Ravenswood

RAVENSWOOD
NORTH CANTERBURY

/ design	/ drawn	/ QA check	/ dwg
MM	RG	MM	L156
/ scale @ A4	/ date	/ file	/ issue
1:300	08/17	36821	A

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9.2 Masonry Veneer

9.2.1 Limitations

This Acceptable Solution is limited to *masonry veneer cladding* attached to timber *wall framing* outlined in NZS 3604. *Masonry veneer* is either:

a) Clay brick, or

b) Concrete brick or block.

COMMENT:

Natural stone bricks or blocks may be suitable. However, they are not part of this Acceptable Solution. Refer to the manufacturer's recommendations for *specific design* information.

Refer to Paragraph 1.5 for qualification of installers.

9.2.2 General

1) The materials and workmanship of *masonry veneer* shall be in accordance with SNZ HB 4236 and have a maximum mass of veneer of 220 kg/m^2 and minimum veneer thickness of 70 mm

2) Masonry units shall be laid-up in running bond

3) Mortar, materials (cement, sand and admixtures) shall comply with NZS 4210

(4) Mortar joints less than 24 hours old shall not be subject to vibration, such as would result from the nailing of interior *linings*

Errata 2 Dec 2011

9.2.3 Installation

Masonry veneer construction shall be as shown in Figure 73B, and have:

a) A maximum height of veneer above adjacent *finished ground level* of 7 m.

b) A maximum height of veneer of 4.0 m, measured from the top of the concrete masonry *wall*, foundation *wall* or slab edge foundation. In the case of a veneer faced concrete block *wall* or foundation *wall* height is measured from the top of that *wall*.

c) A maximum height of veneer of 5.5 m on a gable end *wall*.

d) A minimum *wall* or panel width of 230 mm.

Amend 5 Aug 2011

Note: The bracing demand for framing supporting *masonry veneer* is determined from values listed in NZS 3604.

Errata 2 Dec 2011

COMMENT:

Refer to Paragraph 1.5 for qualification of installers

9.2.4 Flashings

1) Sill and head *flashings* shall be as described in Paragraph 4.3 and be either:

   a) 1.5 mm butyl rubber– refer to Paragraph 4.3.9

   b) 2 ply asphaltic pliable *waterproofing membrane* – refer to Paragraph 4.3.10

   c) Pliable polyethylene minimum 0.5 mm thick complying with DPC/DPM Table 23.

2) Jamb *flashings* shall be:

   d) 2 ply asphaltic pliable *waterproofing membrane* complying with AS/NZS 2904

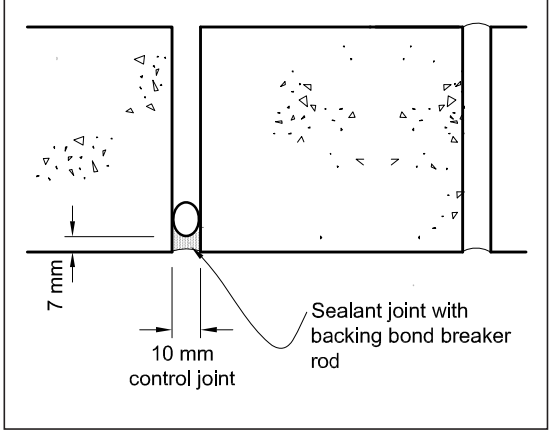
   e) Pliable polyethylene minimum 0.5 mm thick complying with DPC/DPM Table 23.

COMMENT:

For further information refer to ASTM C1330 for backing rod material performance.

Amend 5 Aug 2011

Figure 73A: Vertical control joint
Paragraph 9.2.8

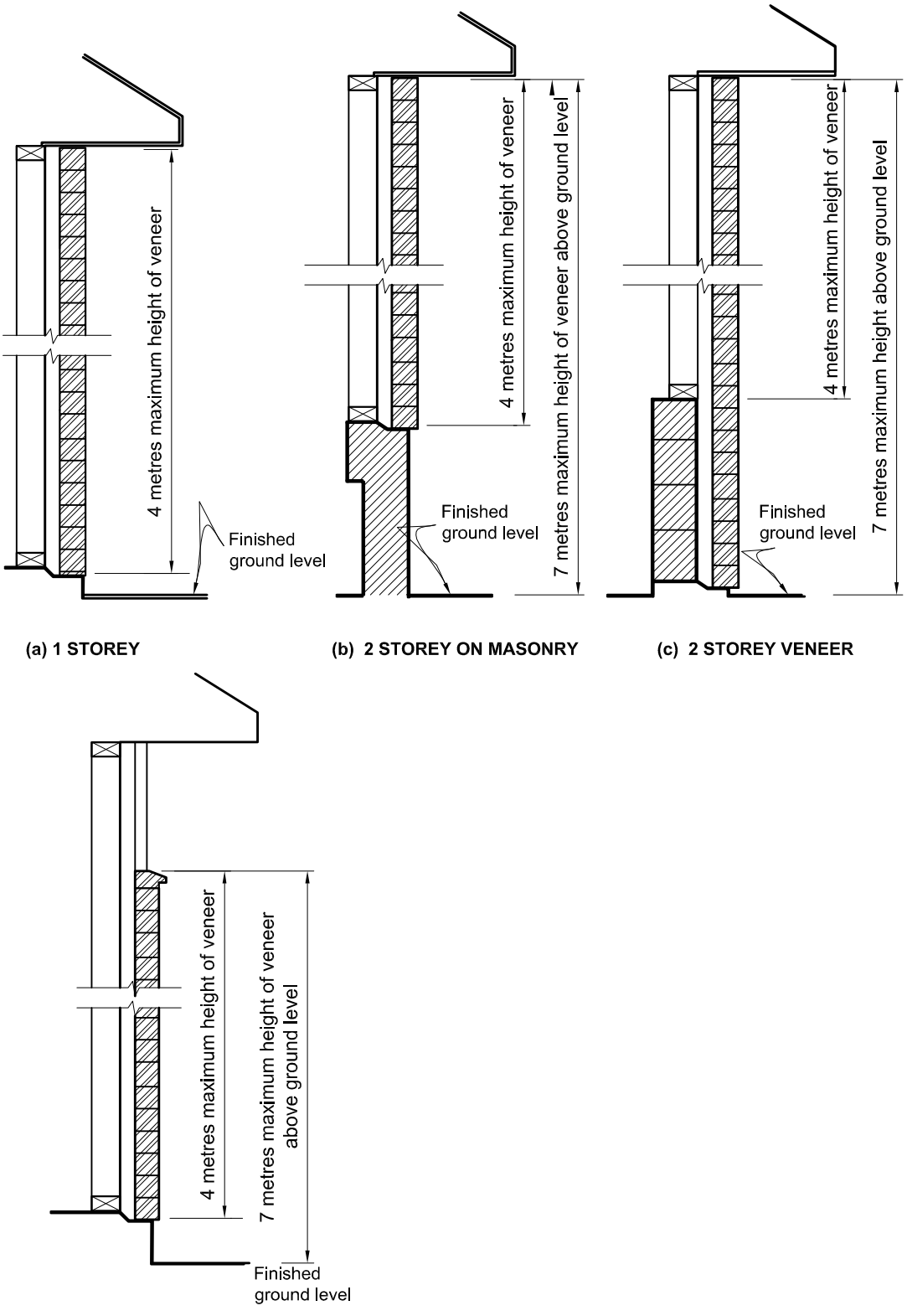


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Figure 73B: Masonry veneer height limitations
Paragraph 9.2.3

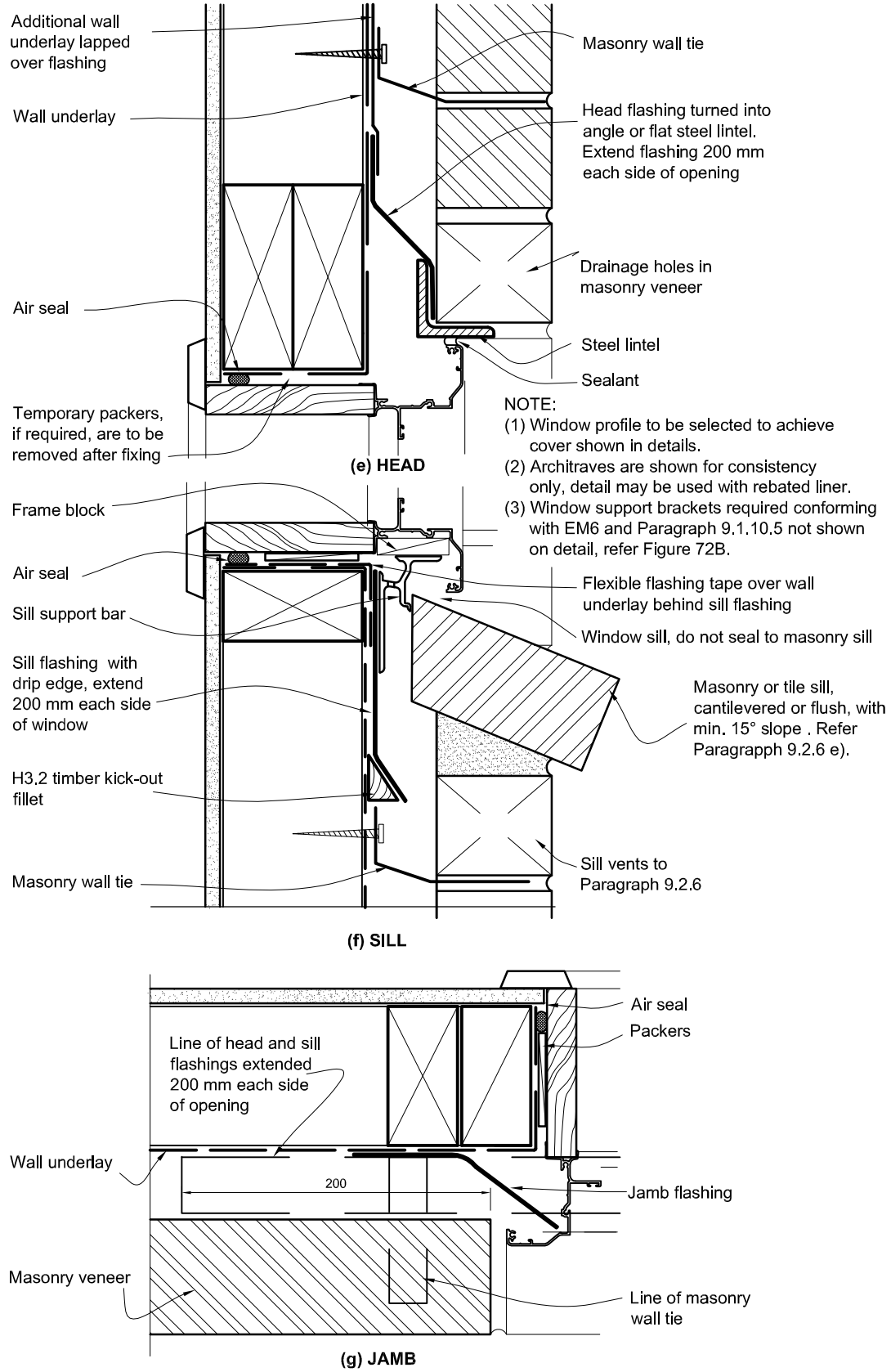


Amend 5
Aug 2011

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Figure 73C: Masonry veneer window and door installation
Paragraphs 9.2.4, 9.2.6 and 9.2.9



Errata 2 Dec 2011

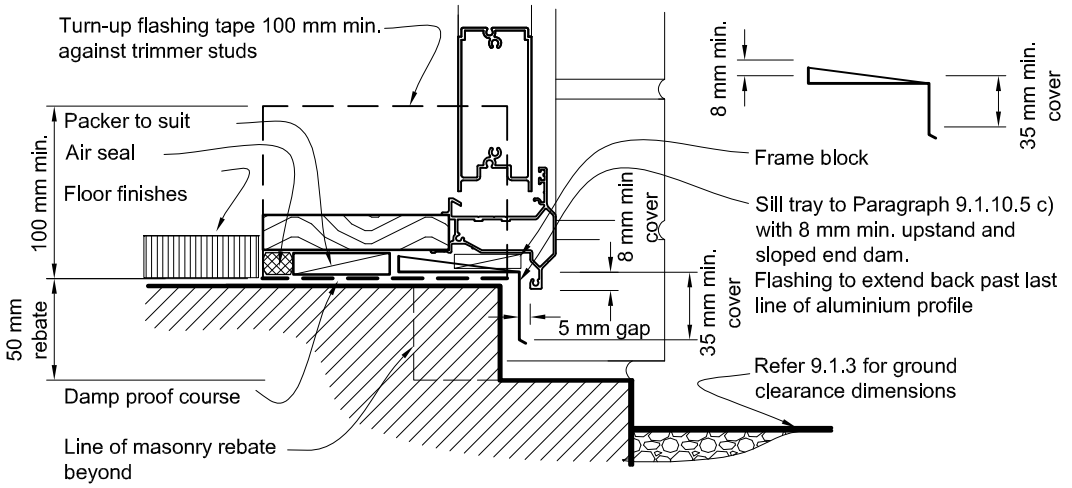
Errata 2 Dec 2011

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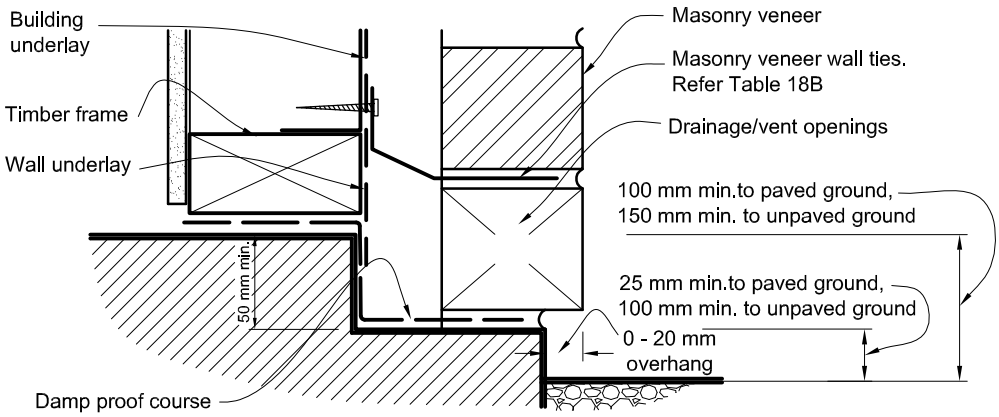
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Figure 73D: Masonry veneer details
Paragraph 9.2.5



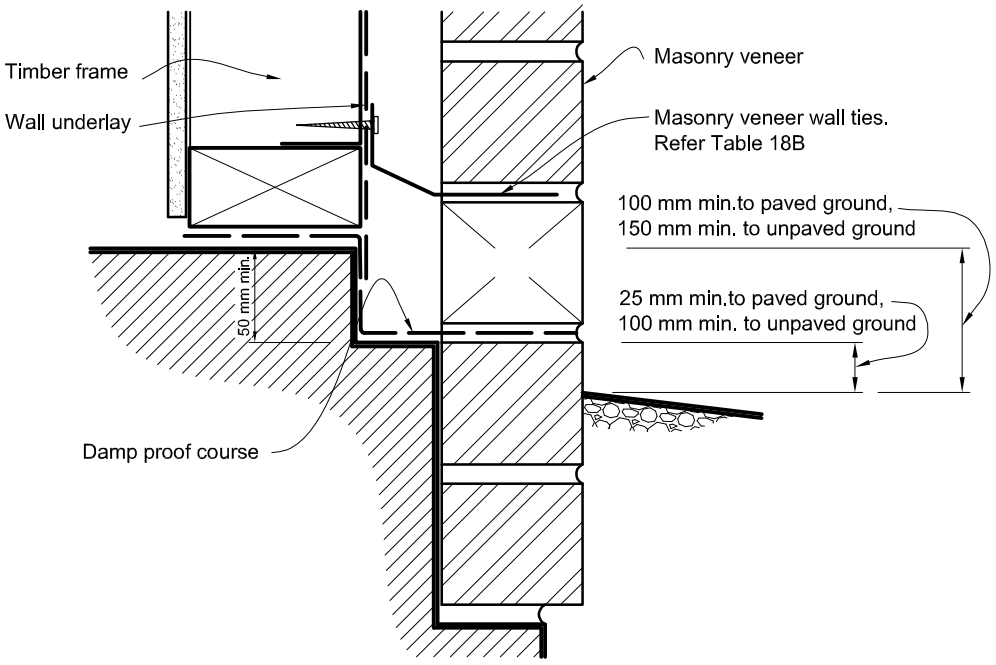
(h) MASONRY VENEER - DOOR SILL

Errata 2 Dec 2011



(i) MASONRY VENEER - FLOOR REBATE DETAIL

Errata 2 Dec 2011



(j) MASONRY VENEER - MASONRY BELOW GROUND

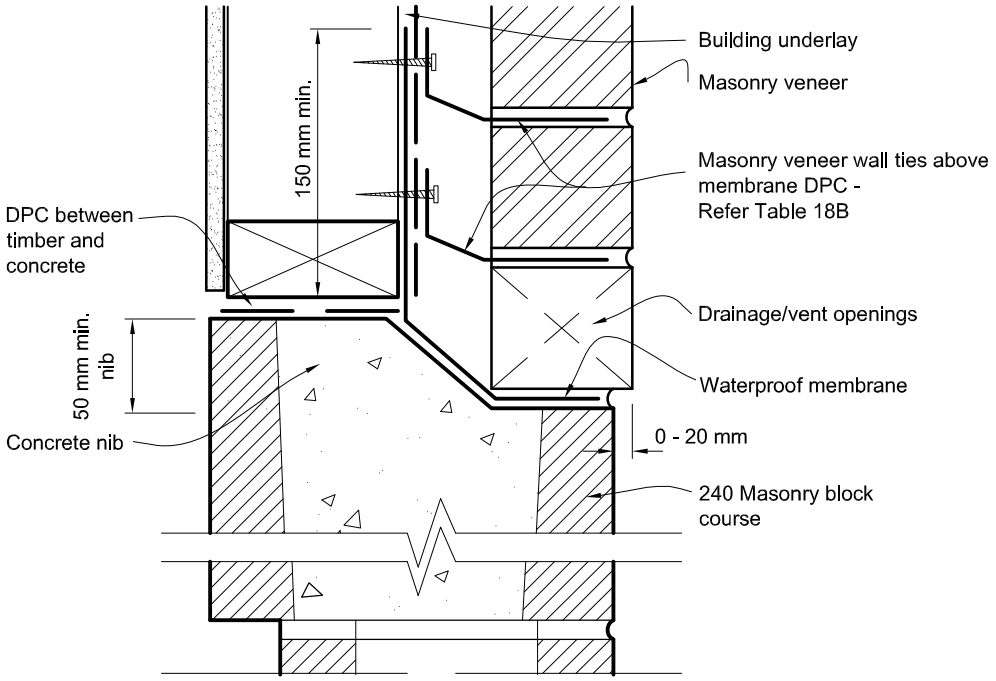
Errata 2 Dec 2011

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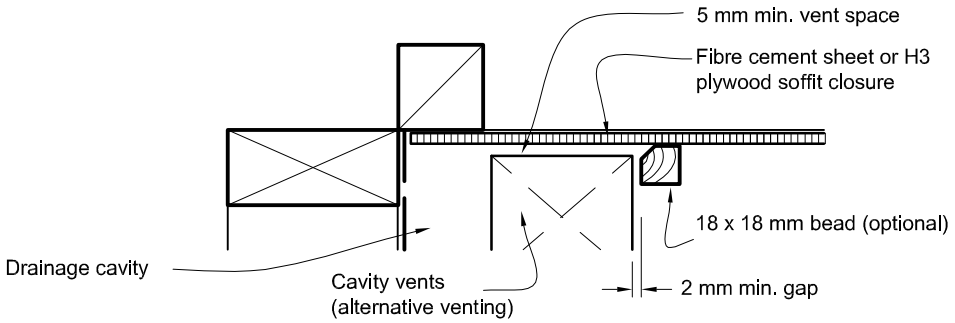
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Figure 73E: Masonry veneer details
Paragraphs 9.2.5 and 9.2.6



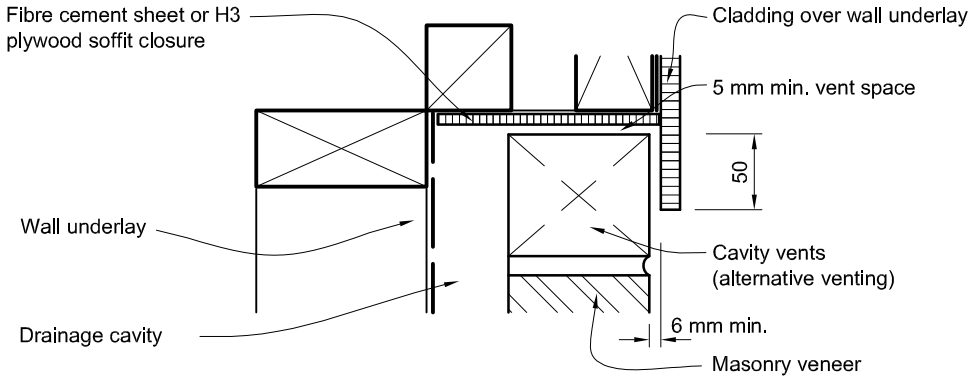
(k) MASONRY VENEER - ABOVE GROUND SUPPORT

Errata 2 Dec 2011



(l) MASONRY VENEER - SOFFIT DETAIL

Errata 2 Dec 2011



(m) MASONRY VENEER - CANTILEVER UPPER FLOOR

Errata 2 Dec 2011

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9.2.5 Foundation support and damp proofing

1) *Masonry veneer* shall be supported by one, or a combination of the following:

   a) Concrete of masonry foundation *wall*
   b) Thickened slab edge footing
   c) Concrete or masonry lower storey *wall*.

2) The level of the concrete slab above ground shall comply with Figure 65.

3) The top of a foundation wall or concrete slab shall be stepped down, so that the surface supporting the veneer is 50 mm or more below the surface supporting the timber *framing*.

4) Provide a *damp-proof course* to the stepped rebates supporting *masonry veneer* adjacent to all habitable spaces and garages attached to habitable spaces. This includes stepped rebates in foundations, or on top of concrete or concrete masonry *walls* supporting veneers. Damp-proofing material shall be as outlined in Table 23 and be either:

   a) For rebates lower than ground floor level:
      i) two coats of bituminous liquid, or
      ii) 1.0 mm butyl rubber or bituminous sheet, or
      iii) 0.25 mm polythene or polyethylene *damp-proof membrane*.

   b) For rebates above ground floor level:
      i) 1.0 mm butyl rubber or bituminous sheet, or
      ii) 0.25 mm polythene or polyethylene *damp-proof membrane.*

5) Lap joints in *flashings* minimum of 150 mm.

6) Dimension rebates to accommodate the required cavity width in Paragraph 9.2.6 and the thickness of the veneer so that the veneer is supported within the tolerances outlined in Figures 73D and E.

Amend 5 Aug 2011

9.2.6 Cavities

Paragraphs 9.1.8.2(a), 9.1.8.5, and 9.1.9.3 shall apply to *masonry veneer* cavities.

a) The clear width of cavity between the *masonry veneer* and the exterior face of the *wall underlay* or bracing attaching to timber *framing* shall not be less than 40 mm or more than 75 mm wide measured at any part of the cavity.

COMMENT:
It is important to maintain the minimum cavity width of 40 mm after allowing for construction tolerances and thicknesses of *wall underlays* and sheet bracing.

b) Pipes and services shall not be placed in the cavity other than passing directly through the cavity to the exterior.

c) The cavity shall be drained and vented to outside at the bottom of wall panels, and above openings by open perpends that:

   i) are a minimum of 75 mm in height, by the width of the vertical mortar joint
   ii) at centres not exceeding 800 mm (where drainage/weep holes are less than 75 mm high, decrease spacing to give a ventilation area of 1000 mm^2/m wall length)
   iii) are fitted with vermin proofing where gaps greater than 13 mm exist.

d) The cavity shall be ventilated to the outside at the top of *walls* by either similar vents as at the bottom, or a continuous 5 mm minimum gap between the top course and soffit board, with a cover bead to outside that maintains a minimum 2 mm gap to masonry – refer to Figure 73E(I).

Errata 2 Dec 2011

Errata 2 Dec 2011

e) The cavity shall be vented under openings exceeding 2.4 metres wide through gaps in perpends positioned at 1/3 points along the opening except at opening ends. Where these vent openings are used, protect from water entry using cantilevered sill bricks, as shown in Figure 73C (f).

f) The cavity shall be sealed off from the floor and *roof* space.

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

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

NOTES

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

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

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

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

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

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

COMMENT:
Variations in cavity width will require compensating adjustments to the length of masonry tie used.

9.2.7 Wall ties

Masonry veneer shall be attached to *wall framing* by *wall* ties. *Wall* ties and their spacings and embedment shall be in accordance with the requirements of NZS 4210 and Tables 18A, 18B and 18C. Screw fixings shall be minimum 12 gauge, 35 mm long hex washer face, galvanised or stainless steel to suit the ties required under Table 18C.

Amend 5 Aug 2011

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

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

NOTES:

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

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9.2.7.1 Wall ties and screws shall be determined by the *durability* zone outlined in NZS 3604 and as outlined in Table 18C.

Table 18C: Corrosion protection to masonry wall ties
Paragraph 9.2.7

	316, 316L, or 304 stainless steel	470 g/m^2 galvanising on mild steel
Zone B	Yes	Yes
Zone C	Yes	Yes
Zones D and E	Yes	-

Errata 2 Dec 2011

9.2.8 Control joints

9.2.8.1 Clay bricks

Control joints in clay brick *masonry veneer* are not required, unless specified by the brick manufacturer.

9.2.8.2 Concrete bricks

Longitudinal shrinkage stresses in concrete *masonry veneer* shall be controlled by providing vertical *control joints* at not more than 6 m centres.

Vertical control joints shall be located:

(a) Within 600 mm of T joints

(b) Within 600 mm of L shaped corners or by restricting the spacing to the next *control joint* to 3.2 m maximum

(c) At changes in *wall* height, exceeding 600 mm

Amend 5 Aug 2011

(d) At changes in *wall* thickness.

Control joints shall be formed as shown in Figure 73A and comprise:

a) A backer rod of compressible foam, and

b) Sealant in compliance with:

i) Type F, Class 20LM or 25LM of ISO 11600, or

ii) low modulus Type II Class A of Federal Specification TT-S-00230C.

9.2.9 Openings in masonry veneer

Openings with *masonry veneer* above shall be spanned by steel angle lintels.

Openings in *masonry veneer* for meter boxes less than 500 mm wide may be installed without lintel bars or head *flashings* provided the meter box is sealed to *wall underlay* with flashing tape to Paragraph 4.3.11.

Separate steel meter boxes from direct contact with *masonry veneer* or mortar with flashing tape to Paragraph 4.3.11.

Lintels shall:

a) Be protected against corrosion as in Table 18D and to exposure zones outlined in NZS 3604.

b) Have a minimum seating into adjacent veneer of:

i) 100 mm for spans up to, and including 2 m,

ii) 200 mm for spans over 2 m.

c) Be sized in accordance with Table 18E.

Table 18D: Corrosion protection to lintels
Paragraph 9.2.9, Table 18E

	316 or 316L or 304(2) stainless steel or **600 g/m^2 galvanising on mild steel plus duplex coating(1)**	**600 g/m^2 galvanising on mild steel(1)** or **300 g/m^2 galvanising on mild steel plus Duplex coating(1)**
Zone B	Yes	Yes
Zone C	Yes	Yes
Zone D	Yes	

1) To AS/NZS 2699.3

2) 304 stainless steel will exhibit greater levels of surface rusting than 316 stainless steel, especially where not exposed to rain washing.

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Table 18E: Masonry veneer lintel sizes (minimum)
Paragraph 9.2.9

Span of lintel (m) up to:	Maximum thickness of masonry veneer (mm)					
	70			90		
	Maximum height of veneer supported (mm)					
	350	700	2000	350	700	2000
0.800	60 x 60 x 6 L	60 x 60 x 6 L	60 x 60 x 6 L	60 x 80 x 6 L	60 x 80 x 6 L	80 x 80 x 6 L
2.000	60 x 60 x 6 L	60 x 60 x 6 L	60 x 60 x 6 L	60 x 80 x 6 L	60 x 80 x 6 L	80 x 80 x 6 L
2.500	60 x 60 x 6 L	80 x 80 x 6 L	80 x 80 x 6 L	80 x 80 x 6 L	80 x 80 x 6 L	80 x 80 x 6 L
3.000	80 x 80 x 6 L	80 x 80 x 6 L	125 x 75 x 6 L	80 x 80 x 6 L	80 x 80 x 8 L	90 x 90 x 10 L
3.500	80 x 80 x 6 L	80 x 80 x 6 L	125 x 75 x 6 L	80 x 80 x 8 L	90 x 90 x 10 L	125 x 75 x 10 L
4.000	80 x 80 x 8 L	125 x 75 x 6 L	125 x 75 x 10 L	80 x 80 x 10 L	125 x 75 x 6 L	150 x 90 x 10 L
4.500	125 x 75 x 6 L	125 x 75 x 10 L	_	125 x 75 x 6 L	125 x 75 x 10 L	_
4.800	125 x 75 x 6 L	125 x 75 x 10 L	_	125 x 75 x 6 L	125 x 75 x 10 L	_

Amend 5 Aug 2011

9.2.10 Windows and doors

Amend 5 Aug 2011

The openings in *wall framing* for windows and doors shall have *flexible flashing tape* applied, in accordance with Paragraph 9.1.5.

Air seals shall be provided in accordance with Paragraph 9.1.6.

Window *flashings* shall be installed in accordance with Paragraph 9.2.4 and Figures 73C and 73D(h).

Amend 5 Aug 2011

9.2.11 Secondary cladding

Where a secondary *cladding* is used with the *masonry veneer*, and is *direct fixed* to *framing* above windows or at gable ends, this shall be fully sealed on:

a) The face of the *cladding*,

b) All edges of the *cladding*, and

c) A 75 mm minimum perimeter strip on the rear of the *cladding*.

Amend 5 Aug 2011

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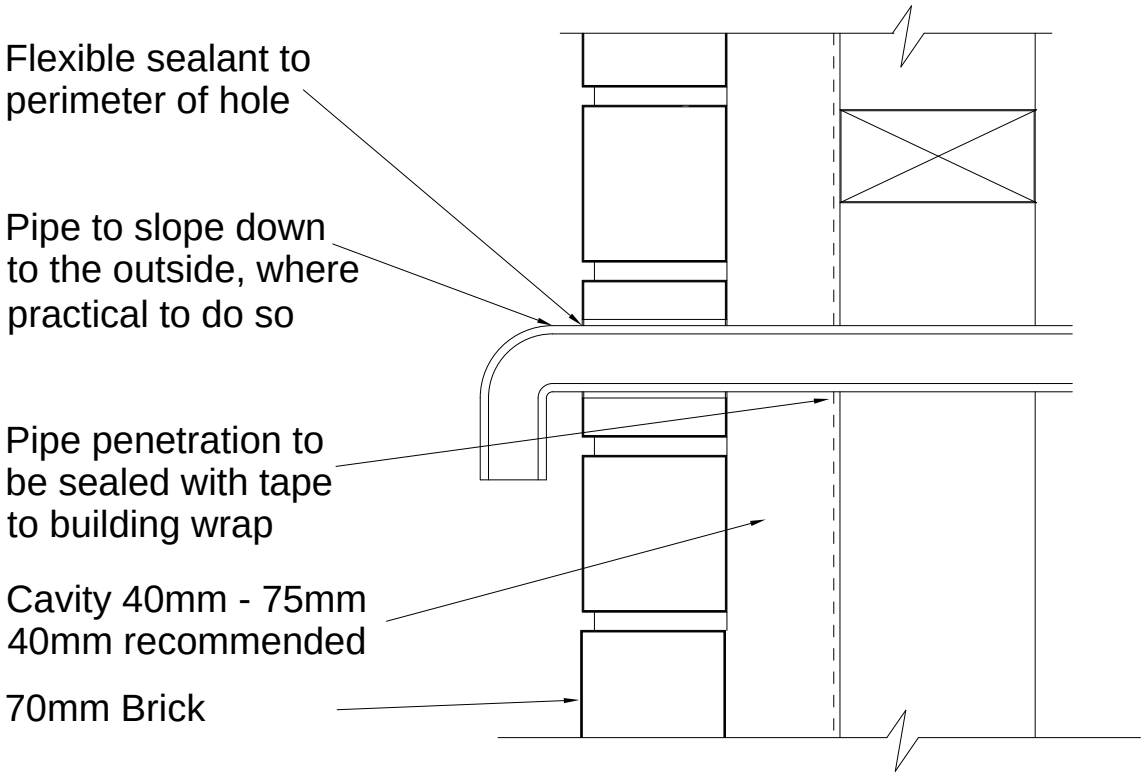
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Construction Detail: OP01

July 2014

Openings: Penetrations

Pipe Penetration



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CAD Detail: op01-pipe penetration

Scale 1: 5

Disclaimer: This information is intended solely as a guide for use of Monier and Austral Bricks products. Before using these products you should ensure that the product is suitable for use in the specific application. Nothing in this information constitutes a statement of fitness for particular purpose - appropriate expert advice should always be obtained. NZ Brick Distributors makes no warranty regarding the use of this information with non-Monier or Austral Bricks product.

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Thermakraft™



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

Product Data Sheet

THERMAKRAFT 215

Self-supporting bituminous wall and roof underlay

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

Thermakraft 215 comes in two roll sizes:

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

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

Smarter products. Better buildings.
thermakraft.co.nz

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Scope of Use (Roof Application)

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

Scope of Use (Wall Application)

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

General

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

Limitations

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

Compliance

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

Durability

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

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

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

Property Performance

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

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

Thermakraft 215

Self-supporting bituminous wall and roof underlay

Control of Condensation

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

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

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

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

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

Product Warranty

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

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

Issue 6, November 2019

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BRANZ Appraised

Appraisal No. 548 [2019]

TEKTON® BUILDING WRAP



Appraisal No. 548 (2019)

This Appraisal replaces BRANZ Appraisal No. 548 (2013)

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

1.1 Tekton® Building Wrap is a synthetic breather-type flexible wall underlay and air barrier for use under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured of a coated spun-bonded polypropylene.

Scope

2.1 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on timber framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent wall claddings directly fixed to framing; 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; and,
- situated in NZS 3604 Wind Zones up to, and including Very High.

2.2 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
- with masonry veneer subject to specific design; and,
- situated in NZS 3604 Wind Zones up to, and including Very High.

2.3 Tekton® Building Wrap has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; 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 specific design for steel framed buildings; and,
- situated in NZS 3604 Wind Zones up to and including Extra High.

2.4 Tekton® Building Wrap 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 Tekton® Building Wrap into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.

Marshall Innovations Limited
PO Box 9411
Greerton
Tauranga
Tel: 07 543 0948
Fax: 07 541 1029
Web: www.mwnz.com

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Readers are advised to check the validity of this Appraisal by

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Tekton® Building Wrap, 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. Tekton® Building Wrap meets these requirements. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, Tekton® Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 – 12.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Tekton® Building Wrap meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Tekton® Building Wrap is a 100 g/m^2 light grey sheet polypropylene membrane material approximately 0.6 mm thick.

4.2 The product is supplied in rolls 1.370 m x 37 m and 2.743 m x 37 m. The product is printed with the Tekton® logo repeated along the length of the roll. The rolls are wrapped with an instruction sticker.

Accessories

4.3 Accessories used with Tekton® Building Wrap which are supplied by the installer are:

- Fixings – staples, clouts, screws or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
- Wall underlay support – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Handling and Storage

5.1 Handling and storage of the product, whether on 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.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Tekton® Building Wrap. 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

Timber and Steel Framing

7.1 Studs must be provided at maximum 600 mm centres. Dwangs must be fitted flush between the studs at maximum 1200 mm centres.

General

7.2 Tekton® Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber and 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.

7.3 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.

7.4 Tekton® Building Wrap must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.

7.5 Tekton® Building Wrap is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Tekton® is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.

7.6 Tekton® Building Wrap is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c). Refer to Table 1.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Wall Wrap Properties	**Property Performance Requirement**	**Actual Property Performance**
Absorbency	≥ 100 g/m^2	Classified as non-absorbent (see paragraph 7.5)
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 5.5 and ≤ 8	9.78 *(Note 1)*
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	**Edge tear:** Machine direction = 228 N Cross direction = 186 N **Tensile strength:** Machine direction = 4.4 kN/m Cross direction = 3.9 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m^3	Pass

Note 1: Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlay performance, or the performance of other materials.

7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Stucco Plaster

7.8 Tekton® Building Wrap 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. The wall 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.

7.9 Tekton® Building Wrap 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).

Structure

8.1 Tekton® Building Wrap is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

Durability

9.1 Tekton® Building Wrap meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building wraps used where the cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Tekton® Building Wrap is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

10.1 Tekton® Building Wrap has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, 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. It may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Tekton® Building Wrap from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

12.1 Tekton® Building Wrap must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.

12.2 Tekton® Building Wrap, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.

12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.

Installation Information

Installation Skill Level Requirements

13.1 Installation must always be carried out in accordance with the Tekton® Building Wrap Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.

Wrap Installation

14.1 Tekton® Building Wrap must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.

14.2 Tekton® Building Wrap must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.

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 membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.

14.4 Tekton® Building Wrap can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.

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 Tekton® Building Wrap, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

14.7 The Technical Literature must be referred to during the inspection of Tekton® Building Wrap 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 Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.

15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421. A range of these tests were completed before and after Tekton® Building Wrap was exposed to ultra-violet light.

15.3 The Flammability Index of Tekton® Building Wrap has been evaluated in accordance with AS 1530.2.

Other Investigations

16.1 A durability opinion was given by BRANZ technical experts.

16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Tekton® Building Wrap, and to examine completed installations.

16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.

Readers are advised to check the validity of this Appraisal by

Quality

17.1 The manufacture of Tekton® Building Wrap has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certification by ICC-ES and CCMC covering quality aspects associated with the product.

17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.

17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall wrap into their design in accordance with the instructions of Marshall Innovations Limited.

17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations 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.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 8, 30 November 2018).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, Tekton® Building Wrap 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 Marshall Innovations 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. Marshall Innovations 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 Marshall Innovations 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 Marshall Innovations Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
14 June 2019

Readers are advised to check the validity of this Appraisal by

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Marshall Innovations Construction Solutions

TEKTON SPECIFICATION

PRODUCT DESCRIPTION

Tekton Wall Underlay is a synthetic breather-type Wall Underlay for use as a wall underlay and air barrier under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is a coated spun-bonded polypropylene, and is approximately 0.6mm thick. Tekton Wall Underlay is supplied in rolls 2740mm x 37m and 1370mm x 37m.

FEATURES /BENEFITS

- Tekton Wall Underlay can be used in all wind zones up to and including very high and extra high with RAB Systems.
- Tekton Wall Underlay is fire retardant with a zero flammability index and can be used without restriction on all buildings, however must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the NZ Building Code.
- Tekton Wall Underlay can be installed as an air barrier to walls that are not lined, such as gable ends.
- Tekton Wall Underlay has superior water hold out - keeping framing drier while permanent cladding is installed.
- Tekton Wall Underlay has 50 year durability.
- Tekton Wall Underlay can be left exposed for up 60 days.
- Tekton Wall Underlay has optimal surfactant resistance (will not lose integrity if exposed to most soaps, detergents and cleaning chemicals).
- Tekton Wall Underlay is Branz appraised # 548 (2013)
- Tekton Wall Underlay can be used as a non-rigid backing material for stucco plaster and as a slip layer over rigid backing for stucco plaster.
- Tekton Wall Underlay is compatible with metal cavity battens.

APPLICATION RANGE

TIMBER FRAMED BUILDINGS

- With absorbent wall claddings directly fixed to the framing.
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

STEEL FRAMED BUILDINGS

- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity.
- With masonry veneer.
- In building wind zones up to and including very high.

Tekton Wall Underlay can also be used on buildings subject to specific weathertightness design.

STORAGE

Tekton Wall Underlay must be stored on its end in a clean and dry environment. It is the responsibility of the installer to protect the roll from damage and weather.

SURFACE PREPARATION

Studs must be provided at a maximum of 600mm centres. Nogs must be fitted flush between the studs at a maximum of 1200mm centres. The framing must be free from any sharp protrusions that may damage the wall underlay.

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BC200635 13/08/2020 nicolah

TEKTON Specification

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BC200635

INSTALLATION

PLACEMENT

- The branded side of the wall underlay must face away from the framing.
- The wall underlay must run horizontally.
- The wall underlay must extend from the upper side of the top plate to the underside of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs.
- Horizontal laps must be no less than 75mm with the direction of the lap ensuring that water is shed to the outside.
- End laps must be made over framing and be no less than 150mm wide.

It is preferable to tape all joins.

APPLICATION

- Position the roll of Tekton Wall Underlay against the framing with a short length of wall underlay free of the roll.
- Align the guide marks printed on the Tekton Wall Underlay with visible studs and nail /staple to the framing

Fix the wall underlay into place using 6-8mm zinc/ stainless plated staples, hot dip galvanised large head clouts or proprietary wall underlay fixings.

- Unroll the wall underlay across the framing and fix to all framing members at a maximum of 300mm centres.
- Keep the wall underlay straight and taut over the framing.
- The wall underlay should be run over any openings and these should be left covered until the windows and doors are ready to be installed. To form the openings cut the wall underlay at a 45 degree diagonal in from each corner. Fold and staple the wall underlay to the inside of the framed opening. Excess wall underlay can be trimmed.
- All openings must be detailed using a Branz appraised flexible flashing system like Super-Stick, Protecto One Piece Sill Tape or the Protecto Sill System.
- Where cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when insulation is installed.
- Tekton Wall Underlay can be added as a second layer over head flashings as per E2/AS1 or the headflashing can be sealed to the wall underlay using Protecto Head Flashing Tape.
- Any damaged areas of the wall underlay must be repaired by overlapping with new material and taping, or by taping small tears .

When fixing wall underlay in windy conditions, care must be taken due to the large sail area created by the roll widths.

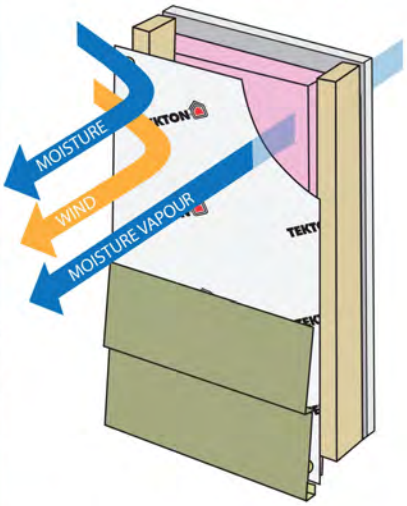
WARRANTY

Tekton Wall Underlay meets the durability requirements of NZBC B2.3.1(a), 50 years and B2.3.1(b), 15 years. Tekton Wall Underlay is warranted to be free of defect in manufacture. This warranty is limited to replacement of the Tekton Wall Underlay material. Marshall Innovations NZ/AUS Ltd (the distributor) is not liable for incorrect installation or any accidental or wilful damage to the product.

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TEKTON HouseWrap



BRANZ Appraised
Appraisal No.548 [2013]

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Benefits of Tekton Wall Underlay

- BRANZ Appraised #548 (2013).
- Is breather type coated, spun-bonded polypropylene.
- Can be left exposed for 60 days.
- Superior water holdout. Taking the industry to a new level for water resistance.
- Optimal surfactant resistance. Wash your building with confidence.
- Fire retardant with the Highest Fire rating of all papers in NZ. It has a 0 rating on the Flammability Index.
- A leader in tear strength.
- Suitable for all wind zones including extra high when used with RAB Systems.
- Can be used with no internal wall linings, ie: gable ends.
- Increases your building's energy efficiency.
- 50 year durability warranty.
- Used for residential and commercial applications.
- Will not support the growth of mould.
- Contains more than 23% recycled content

CONSENT ISSUED BC200635 - Page 177 of 355

USER MANUAL

INSTALLATION INSTRUCTIONS

WARRANTY REGISTER

GREENGLO MAINS PRESSURE INTEGRATED WATER HEATER
SINGLE COIL SERIES & DOUBLE COIL SERIES
GREENGLO MAX

Customer
Congratulations for choosing a GreenGlo integrated water heater
We recommend you read page 1 to 5 of this manual.
It may save you time and trouble later.
Please register the product warranty as per page 20 of this manual

The other pages of the manual are intended for the installer.

For a further assistance or information contact our service desk
☎ 0800 447 336 info@greenglo.co.nz

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IMPORTANT INFORMATION

GreenGlo are purposely-built heavy duty mains pressure cylinders. Installation of GreenGlo could be different than other tanks.

GreenGlo water heaters must be installed by a registered plumber and in accordance with these installation instructions, NZ.3500.4 National plumbing regulations; municipal building codes other relevant statutory regulations.

Observation of these instructions and the associated component instructions is most important and failure to do so could void the benefits of warranty.

The information contained in this manual, and all other information or advice provided by GreenGlo Limited in connection with the purchase, installation use and service of GreenGlo water heater is given in good faith. GreenGlo Limited will not be liable for any person for any inaccuracy or omission in the information arising through the fault of GreenGlo Limited directly or indirectly.

A pressure-limiting valve of 500kPa max rating must be fitted. Failure to install a pressure limiting valve where required will void the warranty.

SAFETY

Scalding occurs at 50^0C. This appliance is capable of providing hot water above this temperature. All installers must advise customers of the potential hazard of scalding in accordance with the relevant National standards including NZS3500.4.

Young children should not play with the appliance.

A combination Temperature Pressure Relief valve with a maximum rating of 850kPa must be fitted.
Water may drip from the discharge pipe of this valve.
This pipe must be left open to the atmosphere.
For more information, please refer to the Regular Care section on page 5 of this manual.

Also fitted to the water heater is a special auto reset thermostat.

These safety devices must not be tempered with or removed from the appliance under any circumstances.

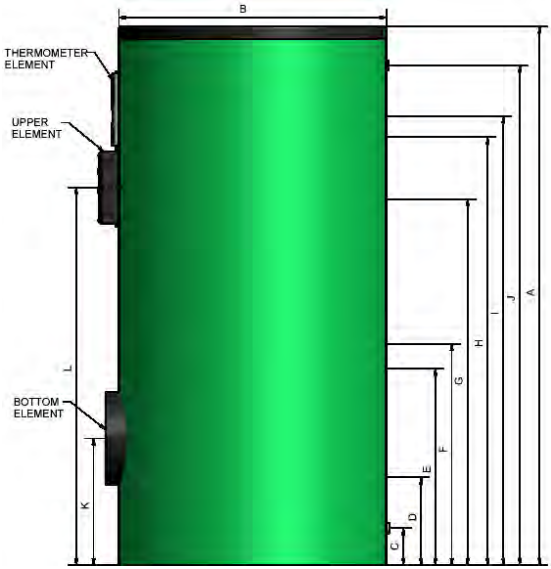
Use a separate circuit breaker for each of the electrical heating elements

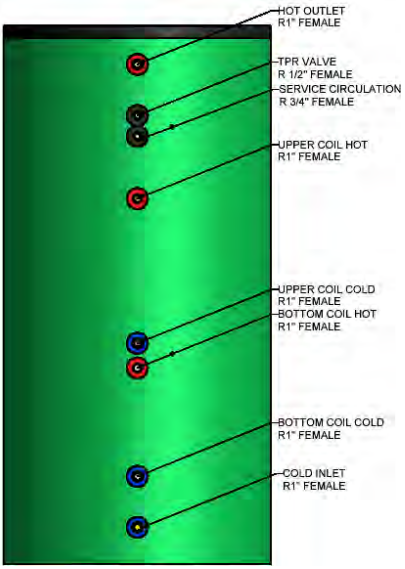
ABOUT YOUR WATER HEATER

1. GreenGlo & GreenGlo Max is a high technology storage tank, backed up by new manufacturing methods offering quality of goods to consumers.
2. The main goal of producing GreenGlo water heaters is heating and storing potable hot water in a main pressure storage tank using electricity. GreenGlo also offers optional heating equipment such as solar, gas and wetback. Potable hot water is stored in the main water storage tank separately from the heating fluids in the coils.
3. The heating fluid, which is heated in the heat source, is circulated between the heat source and cylinder's coil. The warmed fluid takes its heat from the heat source and transmits to the water heater.
4. GreenGlo cylinders inner surface is enamelled. The process used is a double enamelling process that coats the inside surface of the cylinder.
5. GreenGlo cylinders are protected by a magnesium anode rod in order to prevent cathode corrosion. The magnesium anode rod ought to be checked and replaced if required, every 36 months by a certified plumber, and can be done by following this manual page 16.
6. GreenGlo exterior surface is covered by 40 kg/m³ and 50 mm polyurethane insulation (except 800D and 1000D) in order to diminish the loss of the heat. The GreenGlo 800D and 1000D insulation is removable. This convenience allows easy delivery and access through narrow doorways. **Do not remove covers** unless essential and only after receiving specific instructions from GreenGlo service desk
7. GreenGlo is an indoor tank and shall be install in a well vented space to prevent condensation
8. There is a choice of double or single or double coil GreenGlo depending on the application needed. I.E. if the cylinder will be heated with a wetback or a solar system, GreenGlo single coil water heater would be appropriate. On the other hand, if the cylinder will be heated with both wetback and a solar system, GreenGlo double coil would be appropriate.
9. GreenGlo water heaters have been produced to suit a wide range of applications and installations and are complying with NZS4606
   In this manual we present the most common applications, however if you require advice on any other application, please contact our service desk on 0800 447 336 or info@greenglo.co.nz

© GreenGlo Limited

PRODUCT INFORMATION





Note: 800D & 1000D foam insulation is removable
Do not remove cover unless essential
Contact GreenGlo service desk before removal of cover
GreenGlo models have a soft blanket cover for extra insulation



GreenGlo Max

Dimensions may change without notice	180S	300S	180D	300D	400D
	Single Coil **S Series**		Double Coil **D Series**		
Volume *(litres)*	180	300	180	300	400
A – Height *(mm)*	1100	1800	1100	1800	1850
B – Diameter *(mm)*	575	575	575	575	630

Outdoor models are available

PRODUCT INFORMATION

General product information

Maximum working pressure	800kPa
Maximum water temperature	90°C
Maximum coils working pressure	800kPa
Maximum heat exchange temperature	95°C

Enamelled steel automatically welded
50 mm polyurethane in accordance to NZS4692.1 and NZS4692.2
Indoor use only
Note : The product must not be exposed direct sunlight, rain, etc. Uninsulated pipework exposed to outdoor decrease heater performance & may increased energy consumption.

Specific product information

Dimensions may change without notice	180S	300S	180D	300D	300DS	400D	500D	800D	1000D
	Single Coil **S Series**		Double Coil **D Series**						
Volume *(litres)*	180	300	180	300	300	400	500	800	1,000
A – Height *(mm)*	1650	1780	1650	1780	1240	1580	1860	1750	2090
B – Diameter *(mm)*	520	615	520	615	755	755	755	1060	1060
C - Cold Inlet	180	80	180	80	95	75	60	395	395
D - Bottom Coil Cold	280	350	280	350	355	385	235	495	495
E - Bottom Coil Hot	500	655	500	655	565	595	690	870	920
F - Upper Coil Cold	N/A	N/A	570	755	655	690	780	965	1020
G - Upper Coil Hot	N/A	N/A	855	1210	865	1040	1320	1190	1510
H -Service Circulation	740	920	740	920	730	790	1010	710	760
I - TPR Valve	1430	1570	1430	1570	940	1300	1580	1270	1610
J - Hot Outlet	1585	1720	1585	1720	1100	1490	1765	1365	1715
K - Bottom Element	240	290	240	290	300	335	315	385	385
L - Upper Element	N/A	N/A	935	1285	N/A	1060	1395	1260	1580
Element Rating *(kW)*	3.0	3.0	2 x 2.0	2 x 2.0	3.0	2 x 2.0	2 x 3.0	2 x 4.8	2 x 4.8
O - Ports Thread	1" F	1" F	1" F	1" F	1" F	1" F	1" F	2" F	2" F
Tank Thickness *(mm)*	3	3	3	3	3	3	3	4	4
Angle of ports	45°R	45°R	45°R	45°R	45°R	45°R	45°R	90°R	90°R
Max energy Bottom coil *(kW)*	9.0	17.5	9.0	17.5	20.0	24.6	39.3	35.0	37.2
Max energy upper coil *(kW)*	N/A	N/A	13.6	26.2	30.0	39.3	54.0	70.0	89.3
Weight *(kG)*	90	112	103	127	128	198	229	293	326

WATER QUALITY

GreenGlo water heaters have been manufactured to deal with most local body water supplies. Desired water quality levels:

pH Level	between 6.5 and 8.5
Chlorides:	up to 200 ppm
Total Dissolved Solids (TDS)	up to 1000 mg/L
Saturation Index	between -0.8 and +0.8

If your water quality or the heating liquids are outside the above range, you should fit appropriate water filtration.

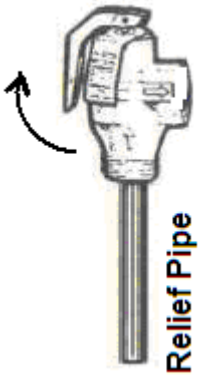
Caution:
If water TDS is above 600 mg/L, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.
If the water heater has not been used for more than 2 weeks:

- Open the hot water tap and let water flow for 1 minute.
- Hydrogen gas is flammable; therefore make sure that there is no smoking, sparks or naked flames near the tap.
- Do not operate any hot water appliance such as a washing machine or a dishwasher prior to the above procedure.

REGULAR CARE

Six Monthly:
Near the top of the water heater you will find the TPR Valve (Temperature Pressure Relief Valve). Raise the lower lever and gently release some water into the relief pipe.
Note:

- If water does not flow down the relief pipe, or if water does not stop flowing once you released the lever, contact your plumber
- It is normal for the valve to release small amount of water during heating cycles
- Never block the relief drain pipe



Five yearly maintenance:
A qualified plumber should check and if needed replace the sacrificial anode in the water heater as per pages 16 & 17
Consider also replacement of the TPR valve, and clean coils of the cylinder via the clearing door if needed

PLUMBING CONNECTION

Delivering and mounting the GreenGlo cylinder

- The product should be kept away from sharp tools during loading or delivering and ports should be protected.
- The product should not be left or placed where it's exposed directly to weather such as direct sunlight, rain snow etc.
- Chose a dry and well vented space. Access moisture may cause tank condensation and may void the warranty.
- Mount the bottom of the tank clear of the floor. Usage of a drain tray is highly recommended
- If the product is installed on the floor, the floor must be dry and moisture-proof. Consider a drainage tray when required.
- If possible leave headroom of half water heater length so the anode can be inspected or replaced. Remember you may have to remove the entire water heater later for servicing as per pages 16 & 17.
- Cylinder must be strapped and mounted in accordance to NZS3500.4
- GreenGlo Limited does not accept any responsibility, if the product is physically damaged or operates inefficiently due to wrong handling
- The product must be carried vertically – if in doubt, **fasten** the bolts of the upper and lower dome prior to installation

Basic Plumbing connection of the Water heater

- The size of the GreenGlo tank needs to be chosen carefully in order to maintain the hot water supply demand.
- Start with the Basic Diagram of page 7 before conducting any specific application connection
- Fit the cold inlet valves prior to commissioning the cylinder
- Ensure that the TPR Valve is fitted and that the service circulation is **plugged off** or connected prior to filling up the cylinder with water
- Lag all hot water pipes coming out of the water heater

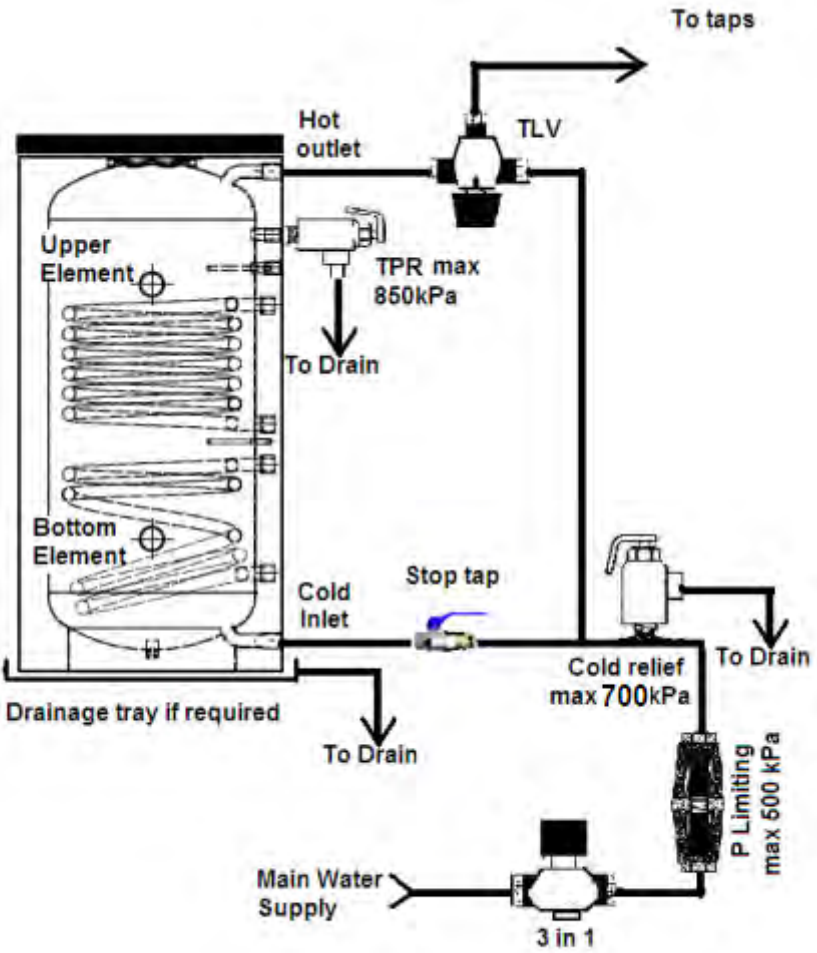
Plumbing Connection of additional applications

- Simply follow the diagrams and the notes of page 8 to 12
- If you are in doubt or attempting to install an application outside the below diagrams, please contact GreenGlo service desk for advice.

IMPORTANT NOTE:

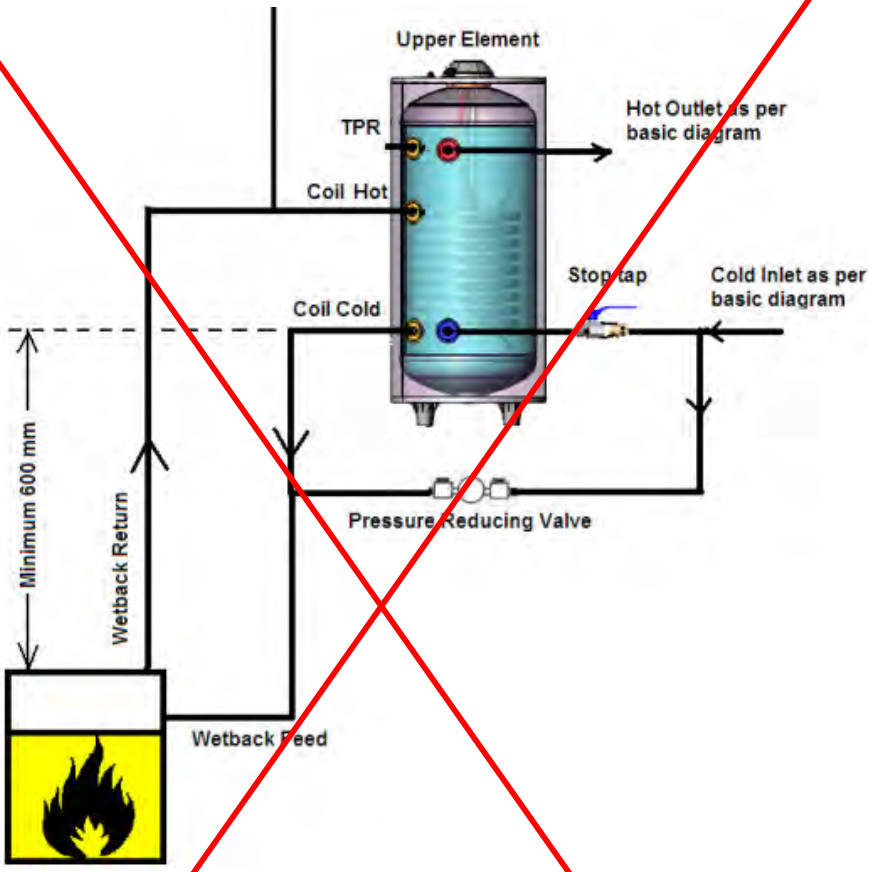
When using brass fitting, use **PTFE** tape or a **dialectic connector** between the brass fitting and the port thread to prevent electrolysis.
Hemp is only allowed if Heldite is used

GreenGlo basic plumbing connection diagram



Important Notes:
Valves are not supplied with the water heater
The above diagram describes valves for a mains pressure arrangement; however the cylinder could also be fitted to a low pressure system.
GreenGlo tanks are equipped with a service circulation port.
Use this port for **ring main** or other external applications.

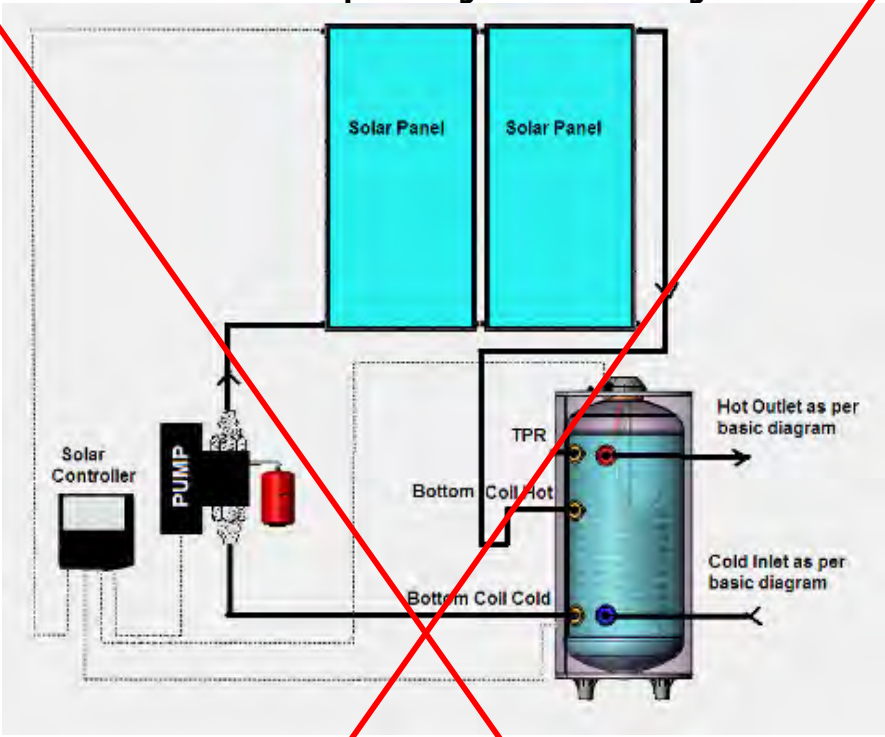
GreenGlo wetback plumbing connection diagram



Important Notes:

1. No valves or restrictions are allowed on the wetback loop
2. When installing Wetback and Solar using GreenGlo D Series, connect wetback to upper coil and solar to bottom coil. Wetback should be installed to the bottom coil with all other multiple connections
3. Wetback output **shall not** be greater than 1kW per 100 litres storage.
4. **Add 100ml** of Fernox F1 or similar to the static water in the coil

GreenGlo Solar plumbing connection diagram

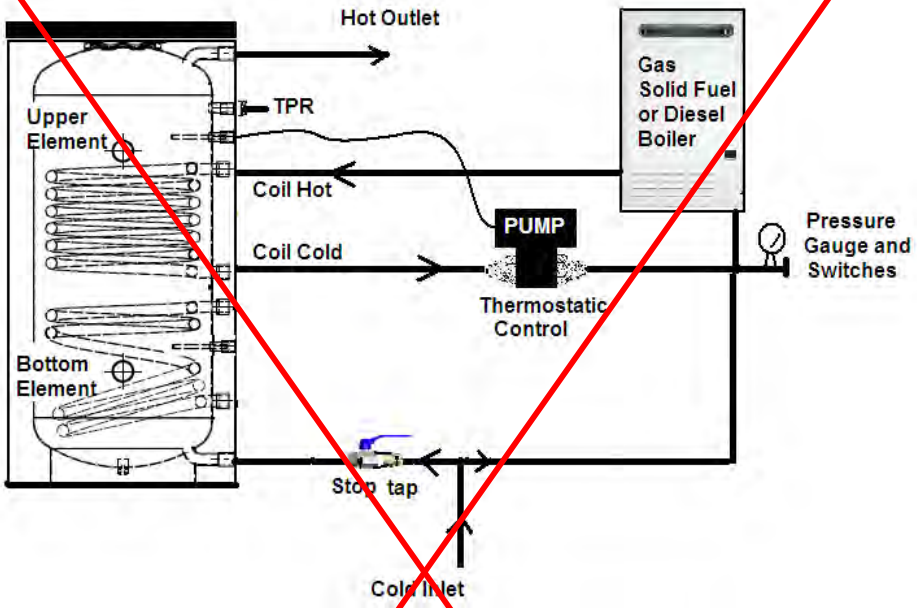


Important Notes:

1. The diagram shows generic drawings of connections to and from GreenGlo cylinder. Follow the specific instructions of the solar panel supplier for the actual detailed arrangement, components and valves.
2. When using GreenGlo D series, solar collectors should be installed to the bottom coil - boiler, wetback or heaters should be installed to upper coil.
3. It is highly recommended running the solar system via the GreenGlo coil on a close loop arrangement. Open loop solar is also possible using the Service Circulation port for the solar return instead of the Coil Hot port, and branching off the Cold Inlet instead of using the Coil Cold port.
4. When connecting commercial solar systems, ensure that the energy going through the solar coil is lower than the max kW rating of the coil as per page 4. Excess energy above the coils rating will void the warranty.

Warning: Open loop solar carries frost risks to the panels if antifreeze is not used

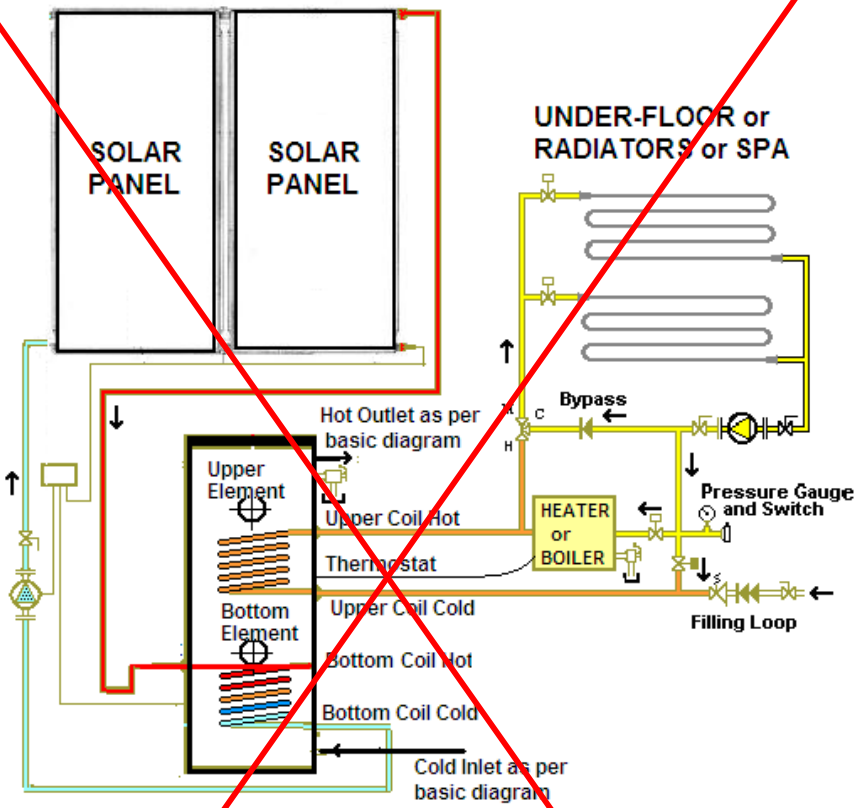
GreenGlo Gas/Solid Fuel/Diesel plumbing connection diagram



Important Notes:

1. The diagram shows generic drawings of connections to and from GreenGlo cylinder. Follow the specific instructions of the heater / boiler supplier for the actual detailed arrangement, components and valves.
2. The heater / boiler must have an integrated relief valve
3. The energy input of the boiler must be smaller than the max kW rating of the coil.
4. Excess energy above the coils rating will void the warranty.
5. The above diagram will maximize hot water flow rate of water.
6. Instantaneous water heaters should be installed after hot water outlet for temperature top up, in cases where high water flow is not required.
7. **Add 100ml** of Fernox F1 or similar to the static water in the coil

GreenGlo Solar *plus* Heater/Boiler *plus* Underfloor Heating / Radiator / SPA - plumbing connection diagram

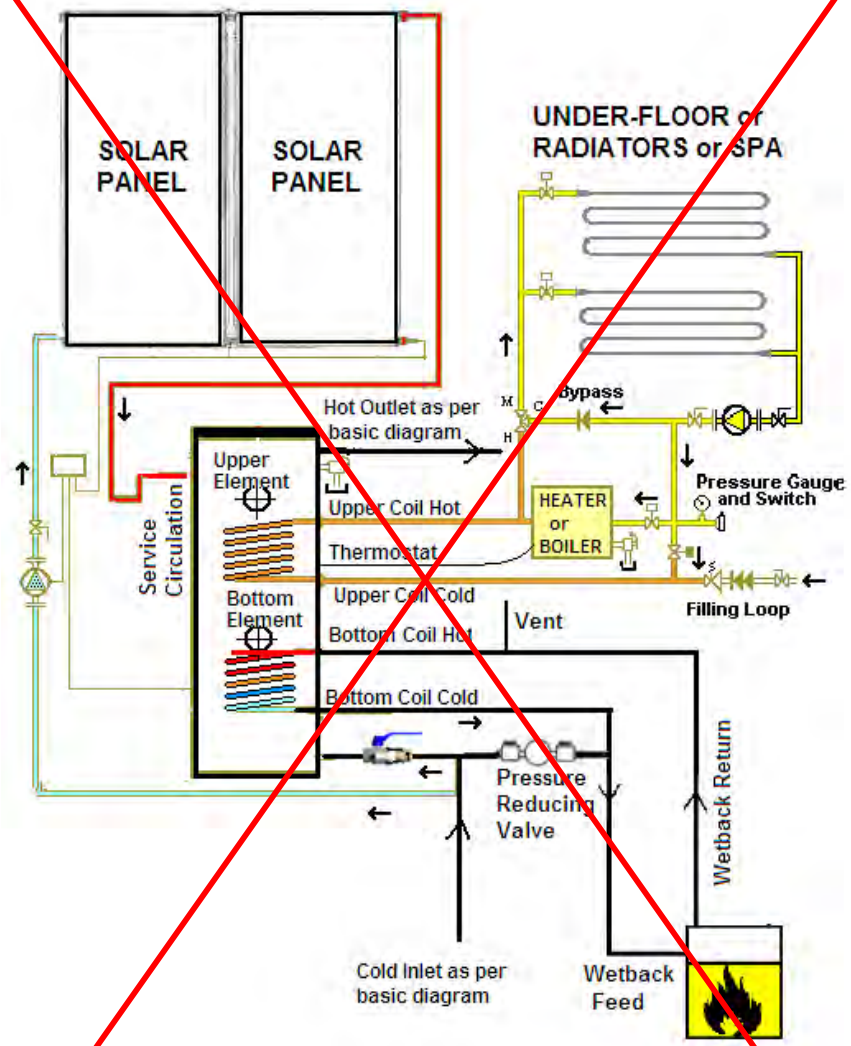


Important Notes:

1. Applicable for GreenGlo D series only
2. The diagram shows generic drawings of connections to and from GreenGlo cylinder. Follow the specific instructions fof the heater / boiler supplier, the Solar Panels supplier and the Underfloor / Radiators or SPA supplier for the actual detailed arrangement, components and valves.
3. The heater / boiler must have an integrated relief valve
4. **Add 100ml** of Fernox F1 or similar to the static water in the boiler coil
5. The energy input of the boiler must be smaller than the max kW rating of the coil. Excess energy above the coils rating will void the warranty

More options are available

GreenGlo Solar *plus* Wetback *plus* Heater/Boiler *plus* Underfloor Heating / Radiator / SPA - plumbing diagram



Refer to the notes of page 11

COMMISSIONING

VERY IMPORTANT:
Prior to turning on the power supply and prior to turning on any heating application such as solar, wetback or a heater, the cylinder MUST BE FILLED UP WITH WATER

- Open a hot water tap, making sure that all other hot water taps are shut down
- Open the inlet tap fully to fill up cylinder
- Open each hot water tap till water flows freely
- Check all pipes for leaks
- Switch on the elements and set the timer/controller (if one is installed)
- Attend to any other external heating applications

DRAINING THE WATER HEATER

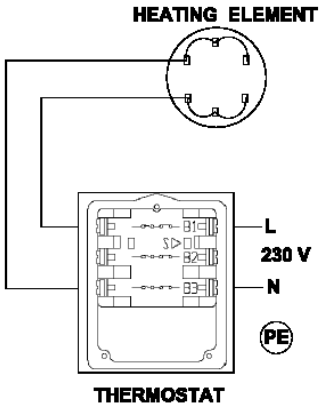
- Turn off the power supply to the elements
- Turn off all external heating applications
- Turn off cold inlet supply at the 3 in 1 valve or at the meter
- Open a hot water tap to drain the pipework
- Disconnect the hot water outlet union
- Open to atmosphere Cold Water Expansion Valve to let water flow via the drain pipe

ELECTRICAL CONNECTION

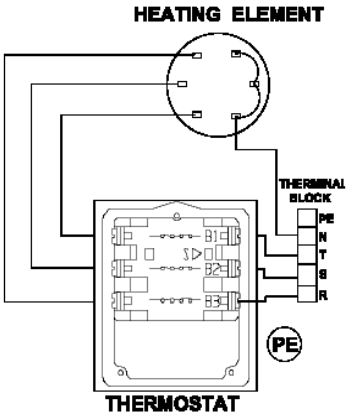
NOTE: Power supply must be OFF until water heater filled with water
All electrical work must be carried out by a qualified person (per AS/NZS3000).
All water heaters are manufactured for 230VAC, 50HZ single phase.
GreenGlo 800D 1000D elements also capable to operate on a 3-phase 400VAC
A flexible 20mm conduit is required for the electrical cable to the water heater

Booster Elements and Thermostats setting:
Adjust the thermostat temperature to the customer requirements.
The booster elements and the thermostats are single phase factory pre-wired.

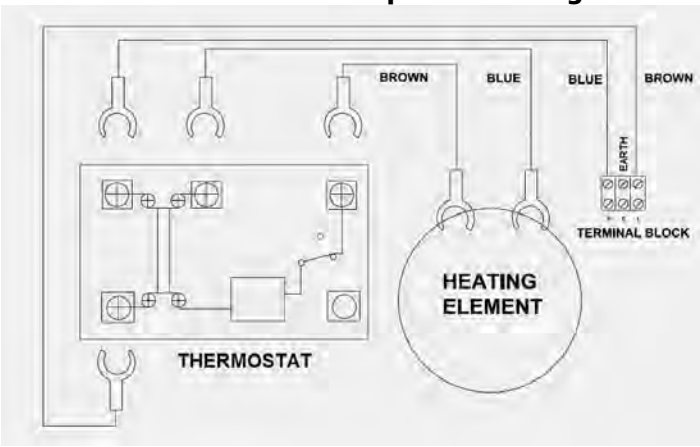
800D & 1000D on Single phase



800D & 1000D on Three phase

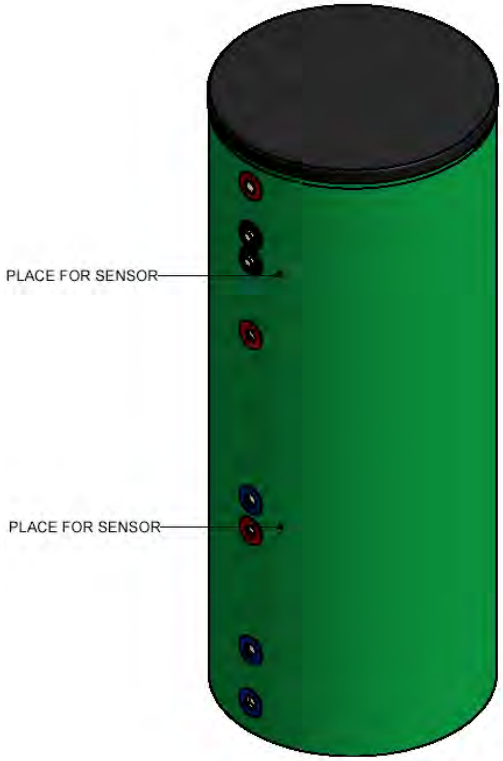


GreenGlo 180S to 500D pre-wired diagram



The lower element can be connected to the **Off Peak electricity supply**.

SENSORS CONNECTION

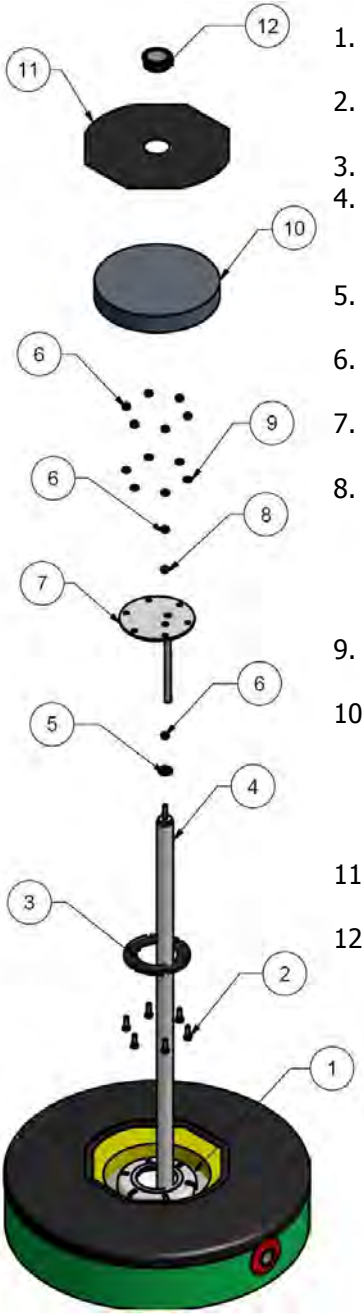


Sensors sense the temperatures when the cylinder is connected to heating applications, and transfer the reading to the controllers, such as 3 way valve, pumps and other electronic controllers.

Sensor pockets are located in the most appropriate level for heat distribution in the cylinder. Sensor holders must be used and supplied by the electronic control unit supplier. The holders attach the sensor to the surface which prevents the sensors from falling down from the pocket.
Make sure that probes are pushed all the way into the sensor tubes.
Use a thermal paste.
Secure the probe cable
Locate sensors above the electrical elements when required

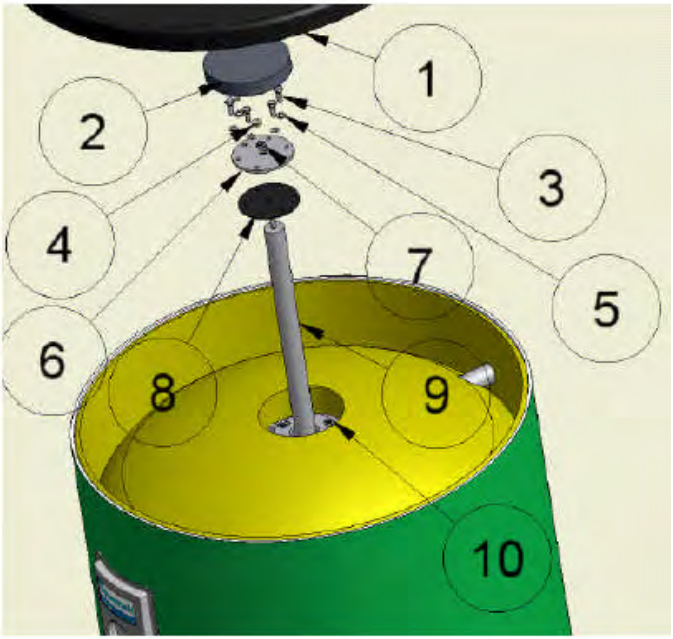
REGULAR CARE – SERVICE PERSON

Anode Replacement GreenGlo 180S, 180D, 300S, 300D



1. Disconnect the power supply to the water heater
2. Drain approximately 5 to 10 lt. from cylinder as per page 13 instructions.
3. Unscrew service cap (11) gently
4. Take out the soft foam insulation (10) and disassemble anode ground cable from flanges cap (7).
5. Disassemble the flanges (7) and then remove the flanges gasket (3).
6. Open the nut that is on the flanges (6) and attach it to the anode rod.
7. Remove old anode rod (4) over flanges and insulation gasket (5) and the washer (8).
8. Assemble new anode rod from the side of enamelled flanges (7); with a new insulation gasket (5) with a new washer (8) on the other side, and fasten the anode nut (6) over anode rod.
9. Return flange gasket (3) to position. Replace gasket if needed
10. Locate flange exactly central side of the cylinder flange. Fasten nuts in a cross tightening order as per page 18. Don't leave out nut flakes (6) – it needs to be directly opposite flange slots (1) as shown.
11. Conduct a pressure test and check for any leaks or sweat
12. Assemble insulation; place the tail of thermometer couple in the pocket, which is on the flange. Locate the service cap on the bush of top cap.

Anode Replacement GreenGlo 300DS to 1000D



6. Disconnect the power supply to the water heater.
7. Drain approximately 5 to 10 lt. from cylinder as per page 13 instructions.
8. 800D & 1000D: Drain entire water from cylinder as per page 13.
9. Remove cylinder top cap (1)
10. Take out insulation carefully and disassemble anode ground cable from flanges cap (6) then from flanges (10).
11. Disassemble the flanges (6) and (3) by removing the nuts.
12. Remove the flanges gasket (8).
13. Disassemble the flanges nut (4) and attached the anode rod (9).
14. Remove old anode rod (9) over flanges and keep the anode isolation bush and anode gasket (8).
15. Assemble new anode rod from the side of enamelled flanges (7) and leave isolated bush (5) on the other side, and install nut over anode behind the beam gear side.
16. Locate flange gasket through inlet of the cylinder. Replace gasket if needed
17. Locate flange exactly central side of the cylinder flange. Fasten nuts in a cross tightening order per page 18. Don't leave out nut flakes (5) – it needs to be opposite flange number (1) as shown.
18. Close the service cap on the bush of top cap.

Cylinder Coils Cleaning via Clearing Door

Access door is located on the cylinder top for GreenGlo 180S to 300D models. Access door is located on the cylinder side for GreenGlo 300DS to 1000D. GreenGlo access door dimensions are designed to the European standards.

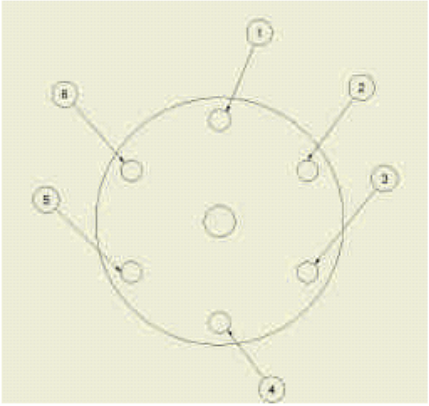
Over the years, cylinder coils become covered with lime and other mineral deposit depending upon water quality. After a while, heat transfer will become difficult and the cylinder's efficiency reduces due to the deposits. Therefore, clearing the coils should be periodically done thru the access door.

1. Disconnect the power supply to the water heater
2. Drain entire water from cylinder as per page 13 instructions.
3. Remove nuts of access door and remove service door
4. Gently water blast coils removing the mineral deposits
5. Return access door ensuring that gasket is in place. Replace gasket if required
6. It is **essential** to tighten up access door nuts in the order shown below:

GreenGlo S Series, 180D, 300D
Order: 1-5, 3-7, 2-6 torque: 17Nm



GreenGlo 300DS to 1000D
Order: 1-4, 6-3, 2-5 torque: 8Nm



7. Fill up and pressurise water heater and check for leaks
8. Place a maintenance sticker on the water heater

WARRANTY

GreenGlo Limited will repair or if necessary replace a defective water heater or parts failure due to faulty manufacturing as per the following schedule:

Component	Installation	Warranty period	Coverage
All	All types of standard installations	First 12 months	Repair or replace 100% water heater and components free including labour at GreenGlo discretion
Internal heat exchanger	Domestic standard installations	Year 2 to 7	Repair or replace 100% water heater free. Owner responsible for installation and labour costs **SUBJECT TO 5 YEARS SERVICE**
Internal heat exchanger	Commercial and other standard installations	Year 2 & 3	Repair or replace 100% water heater free. Owner responsible for installation and labour costs
		Year 4 & 5	Repair or replace 50% of water heater value. Owner responsible for installation and labour costs

Durability

GreenGlo water heaters meet the requirements of NZS4606 given that:

1. Installed and maintained by a qualified person and according to the building code and this manual
2. Not damaged in any way
3. Water quality according to page 5 of this manual
4. Max kW Rating of all heater connections as per page 4 of this manual

Change of Ownership

This warranty extends beyond the original purchaser of the water heater.

Standard Installation

Standard installation includes all connections as per this manual and any other connections that may be approved by GreenGlo service desk.
The tank shall be accessible and easy to remove

WARRANTY REGISTRATION

Warranty registration is highly important, as it confirms installation date and the type of installation to ensure that you enjoy the full benefits of the product warranty.

Registration **Option 1**: go to www.greenglo.co.nz under warranty register

Registration **Option 2**: Call our service desk on 0800 447 336

Registration **Option 3**: Fax the below form to 09 353 1445

Registration **Option 4**: Send the below form to

Solar Group Limited
PO Box 35588
Browns Bay, Auckland

Name: _____

Address: _____

Phone: _____ _____

email: _____

Name of Installer: _____

Main Application: _____
e.g..Wetback, Solar, Gas, etc

Domestic usage? Yes / No – if no specify: _____

GreenGlo Water Heater Model: _____

Product Serial Number: _____

Notes: _____

_____

© GreenGlo Limited

REGULAR CARE LOGON

Installation Date: ____/____/____

6 months: TPR Valve check date: ____/____/____

12 months TPR Valve check date: ____/____/____

18 months TPR Valve check date: ____/____/____

2 years TPR Valve check date: ____/____/____

30 months TPR Valve check: ____/____/____

3 years service by: _____ date: ____/____/____

42 months TPR Valve check date: ____/____/____

4 years TPR Valve check date: ____/____/____

54 months TPR Valve check: ____/____/____

5 years service by: _____ date: ____/____/____

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19. **Warranty Exclusions:**

GreenGlo warranty will not cover the following situations:

1. Failure because of misuse, damage or neglect
2. Product is not installed or serviced in accordance with this manual or the NZ building code
3. Damage caused by an act of God
4. Water quality outside the range of page 5 of this manual
5. Connection of any associated heater with a max kW Rating higher than the coil capacity as per page 4 of this manual
6. Installation of tanks in moisture environment
7. Use of water temperature or pressure, or coil temperature or pressure, outside the restrictions of page 4 of this manual
8. Water hammer or negative pressure occurring in water pipework
9. Neglect to protect the coils with anti corrosive

Note:

- GreenGlo Limited is not liable for any sequential damages such as walls, carpets, furniture etc.
- Replacement parts provided under this warranty does not carry a new warranty. The unexpired warranty remains effective.
- GreenGlo Limited is only liable for the water heater and will not assume directly or indirectly any other obligations in connection with the product
- GreenGlo Limited does not cover access labour replacement costs of GreenGlo tanks installed: 30KM outside main centre, weekend charges, labour due to difficult access to tank
- You may have other rights in addition to this warranty under the Consumer Guarantee Act

Installer / Service Provider details





greenglo.co.nz

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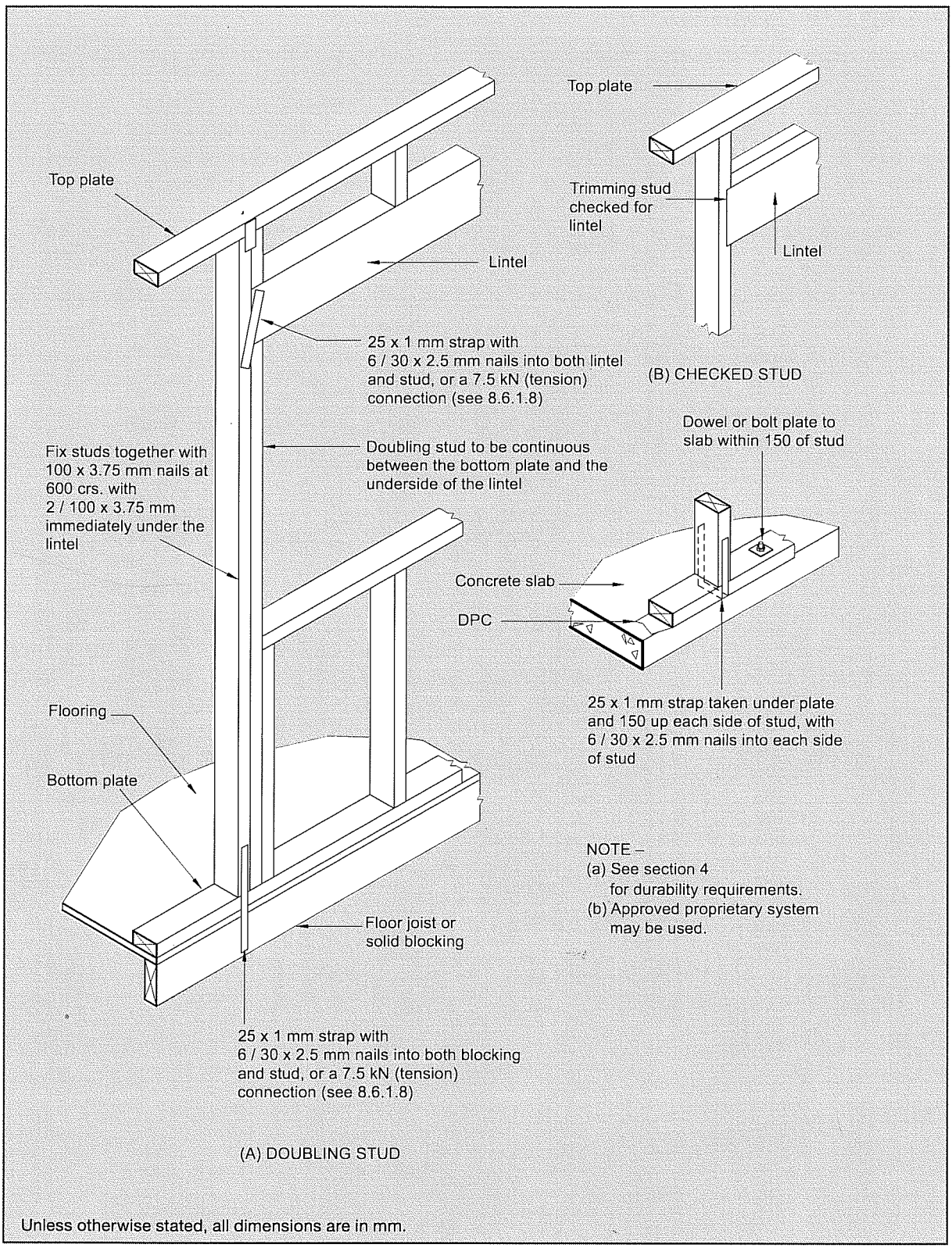
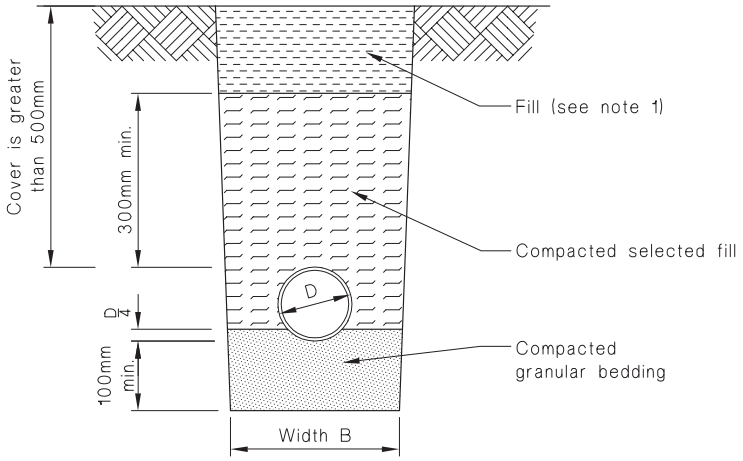


Figure 8.12 – Lintel fixing to prevent uplift (see 8.6.1.8 and table 8.14 (a) and (b))

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with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

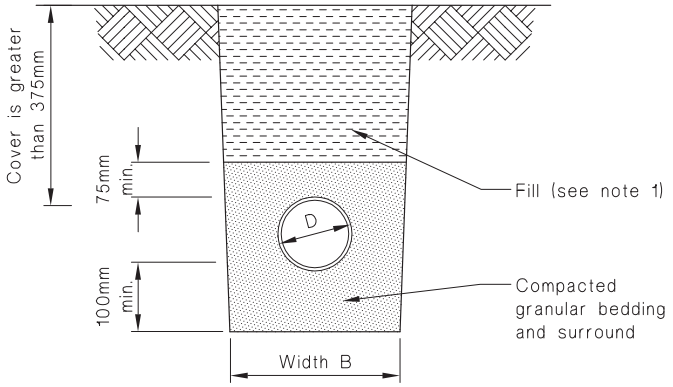
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Figure 13: Bedding and Backfilling
Paragraphs 3.9.2, 3.9.4 and 3.9.5



(a) Cover greater than 500 mm
Bedding type 'B' of NZS 4452

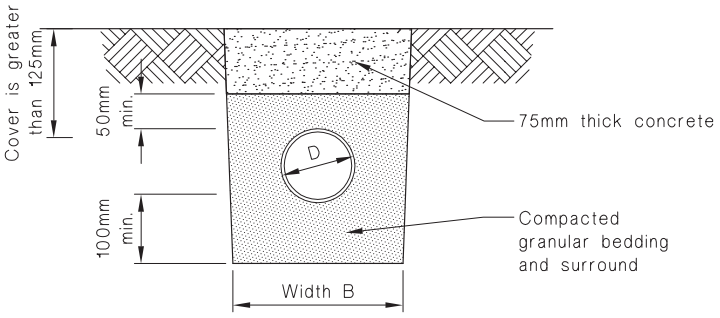
Amend 1 Sep 1993



(b) Cover greater than 375 mm
Bedding type 'D' of NZS 4452

Amend 1 Sep 1993

Amend 1 Sep 1993



(c) Cover greater than 125 mm

Amend 1 Sep 1993

Amend 1 Sep 1993

NOTE:
1. Fill shall be:
-Ordinary fill where drains are located below gardens and open country.
-Compacted selected fill where the drains are located below residential driveways and similar areas subjected to light traffic.

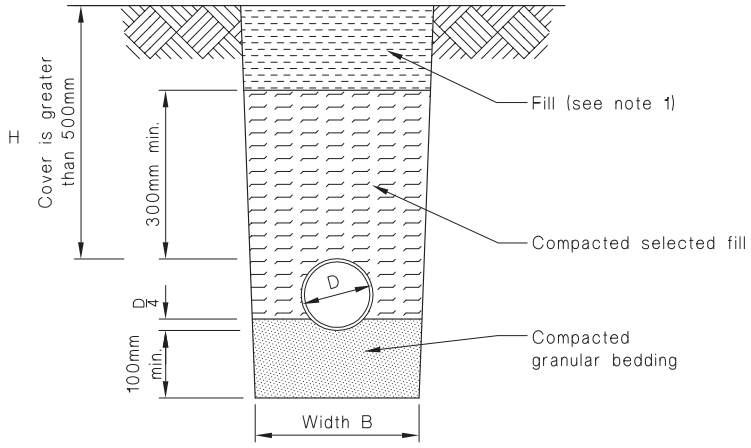
Amend 1 Sep 1993

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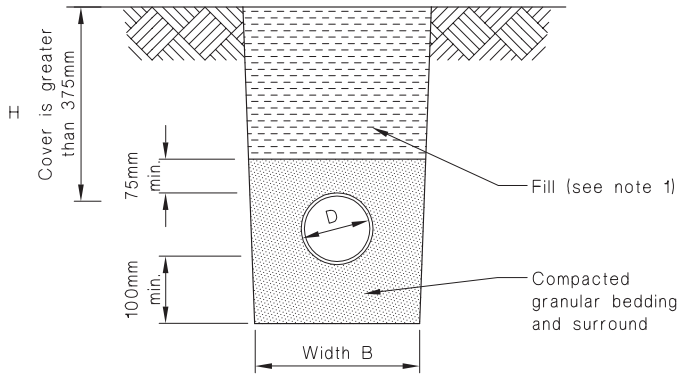
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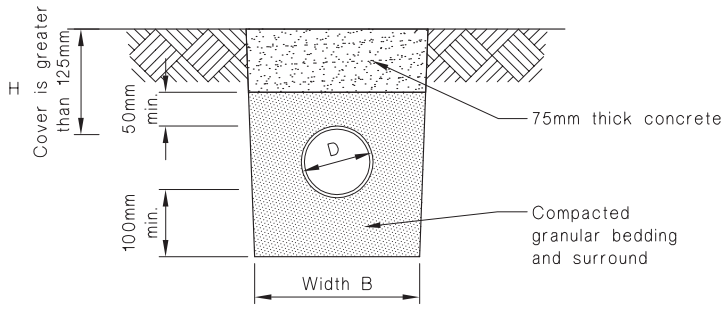
Figure 7: **Bedding and backfilling**
Paragraphs 5.2.1, 5.3.1 and 5.4.1



(a) Bedding type 'B' of NZS 7643
Cover greater than 500mm



(b) Bedding type 'D' of NZS 7643
Cover greater than 375mm



(c) Cover between 125mm and 375mm

NOTE:
1. Fill shall be:
-Ordinary fill where drains are located below gardens and open country.
-Compacted selected fill where the drains are located below residential driveways and similar areas subject to light traffic.

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STEEL & TUBE

ROOFING PRODUCTS

Spouting & Fascia Systems



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APRIL 2004

SPOUTING & FASCIA SYSTEMS

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SPOUTING & FASCIA SYSTEMS

The Natural Choice for Style and Strength in Rainwater Systems

As a long-time innovator in rainwater systems, Steel & Tube Roofing Products has a range of products to enhance any building. For any style of home, rural and industrial building, there are proven systems that are strong, practical, affordable and very attractive.

Features

Style at home

With a range of spouting profiles to complement conventional and contemporary styled homes, or the option of a concealed fascia gutter system, you are certain to find a look you'll love. Our range of residential spoutings are suited to any roof type or pitch, and can be attached to the Multiline External metal fascia system using our patented bracket system. Alternatively, they can be fastened directly to a timber fascia using concealed brackets. Make your choice from a wide range of modern and traditional colours, or unpainted Zincalume™ for economy and the latest style statements. Selected products are also available in copper for a timeless alternative.



Ready for the big jobs

With a range of standard industrial spoutings, or custom design and manufacture for larger projects, designers have peace of mind when selecting products for commercial and industrial applications.

It's easy to look good

To make it easy to get a great looking finish, selected products feature accessories such as ready-made stop-ends and corners, and optional Flush-Fit end laps.

Durability

Products selected and maintained in accordance with Steel & Tube Roofing Products' recommendations on environmental categories, will meet the performance expectations in regard to durability as expressed in the New Zealand Building Code.

Drinking Water

All pre-painted and metallic coated products supplied by Steel & Tube Roofing Products are guaranteed as being suitable for the collection of drinking water.

Quality

Steel & Tube Roofing Products' operations are all certified to a minimum standard of ISO 9002 for the manufacturing, marketing and delivery of metal roofing and rainwater products.



Materials

New Zealand is exposed to a wide range of environmental conditions, from harsh West Coast beaches through moderate inland locations to industrial and geothermal sites. All rainwater systems are available in a range of finishes to suit any environment. Prior to selecting a product from this guide discuss the particular site conditions with your preferred supplier to ensure the profile and finish will perform to your expectations.

Protective Film

To ensure the surface is not damaged during transport and handling, prepainted materials have a protective strippable film. This should be removed during installation, and before prolonged exposure to sunlight.

Compatibility

Contact with or water run off from dissimilar metals such as lead, copper or stainless steel should be avoided with any Colorsteel® or Zincalume™ product. In particular avoid discharging copper spouting or downpipes from upper storeys onto lower roof sections. Monel rivets should not be used.

Colour Matched Paint

The use of colour matched paint for the touching up of scratches is not recommended, as the paint has different weathering characteristics to pre-painted materials. Accessories should be colour matched before installation.

Maintenance and Warranties

Maintenance

Few products are absolutely maintenance-free and all are subject to the cumulative effects of weather, dust, salt and other airborne deposits — some of which are extremely aggressive. In order to ensure the maximum service life from the chosen coating system, the property owner should note:

Normal rainwashing will remove some atmospheric debris, but manual washing is required for areas that do not receive adequate rainwashing, specifically the underside of spouting, and the fascia surface, which is sheltered by the spouting attached to it.

As high-risk areas, these require regular manual washing as a condition of the warranty:

Environment	Very Severe	Severe	Moderate
Washing Required	Monthly	Every three months	Every six months

Surfaces may be washed with water and a soft bristled brush. For hard to access areas, waterblasting at pressures up to 2OmPa may be more appropriate. In all cases spouting should be cleaned out at least every six months; more frequently in marine areas or where fallout from leaves etc, is severe. Refer to New Zealand Steel's Specifiers & Builders Guide for more information.

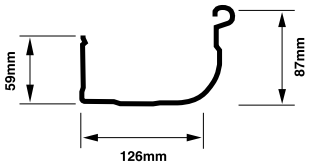
Warranties

Depending on material and environment, products may be eligible for a **Warranty *Plus*** of up to 10 years covering paint surfaces, up to 10 years against perforation of spouting as a result of corrosion, and up to 15 years against perforation of fascia as a result of corrosion. Note that selecting a suitably durable material is important – refer to your preferred supplier, Steel & Tube Roofing Products, or New Zealand Steel's Specifiers & Builders Guide for further information.

Traditional Styles



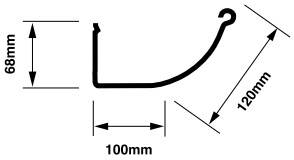
Multiline Quad



Cross Sectional Area
6850mm²

- Multiline Quad captures the colonial look with it's gentle radiused front and strong swaging, blending traditional design with the styles of today.
- Multiline Quad has an optional slotted overflow system.
- Multiline Quad is fitted using fully concealed brackets.

Customline



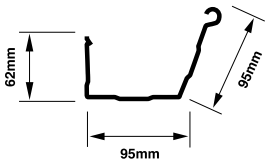
Cross Sectional Area
7500mm²

- Customline is a larger, longrun version of the classic quarter round, and is deeper than other designs, for greater water carrying capacity and enhanced aesthetic appeal.
- Customline can be fitted with fully concealed brackets to enhance the clean smooth lines or with external brackets, for a timeless classic look.

Contemporary Styles



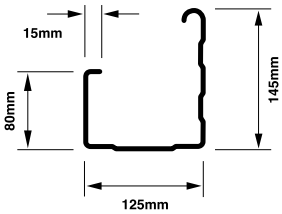
Highline



Cross Sectional Area
6600mm²

- Highline is one of the most attractive domestic spoutings available, and has a high, sloping face to better cover the end view of domestic roofing systems.
- Highline has an optional slotted overflow system.
- Highline is fixed using fully concealed brackets to maintain its clean line.

Plumbline



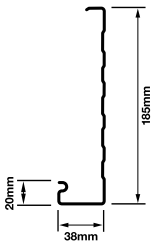
Cross Sectional Area
10000mm²

- Plumbline provides a large capacity domestic spouting which is also at home on smaller commercial work.
- Plumbline has a strong profile with a double swaged face and swaged base.
- Plumbline is fixed using concealed clips for emphasis of its bold lines.

Fascia Systems

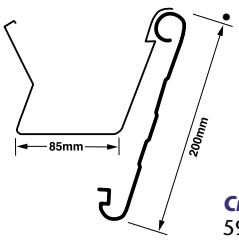


Multiline Fascia - External



- An attractive and economical advance over timber fascias, Multiline Fascia can be fitted with a range of spoutings for contemporary or traditional appearances.
- Multiline Fascia uses a uniquely designed rafter bracket to prevent denting and damage in metal fascias due to differential movement of trusses and rafters.

Taylor Fascia - Internal



- Taylor Fascia is a concealed gutter system, with built-in overflow protection and decades of proven performance in New Zealand conditions.

Cross Sectional Area
5900mm²

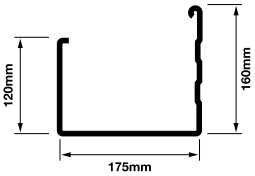
- Taylor Fascia's unique bracket design enables installers to provide fall for the gutter internally, while maintaining level for the Fascia itself.
- Taylor Fascia's classic, rounded lines make it a suitable partner for any roofing product.

Steel & Tube Roofing Products fascia systems are available exclusively through Approved Installers.

Commercial Gutters

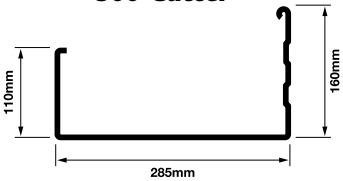


175 Gutter



Cross Sectional Area
21000mm²

300 Gutter



Cross Sectional Area
31350mm²

- The most commonly specified commercial gutters are 175mm and 300mm however as each are specifically folded the dimensions can be varied greatly to suit any application provided appropriate fixing brackets are sourced.
- Standard pressed internal brackets are available for the 175 gutter, however for extra strength specially fabricated steel external brackets are recommended (colour matched if required).
- Steel & Tube Roofing Products provide details regarding industrial gutter bracket design & placement, as part of the Steel & Tube Roofing & Cladding Solutions CD-ROM, available from your local branch.

Note that all profile dimensions are nominal

Design

Drainage Requirements

As the primary function of a spouting or guttering system is the dispersal of rainfall from a roof area into a stormwater drain, it is important to have adequate sizing and placement of downpipes. The drainage requirements are influenced by a wide range of factors, including regional rainfall intensity and roof pitch. Note that while most urban areas in New Zealand are subject to 100mm/hr rainfall intensity, some are not –your Territorial Authority can confirm. Designers should refer to Acceptable Solution E1/AS1 of the New Zealand Building Code for further information.

Typical maximum areas for residential spoutings and popular downpipe sizes are summarized in the table below. For example:

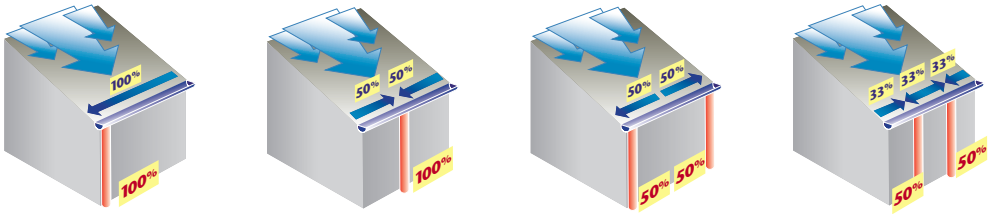
- **Select spouting = Customline**
- **Select rainfall = 100mm/hr**
- **Select roof pitch = 30°**

Therefore, outlets should take a maximum of 54m² of roof area each.

Roof Pitch	Typical Maximum Roof Area (m²) per outlet										
	Spouting						Downpipes				
	Multiline Quad, Customline, Highline			Plumbline			Round (mmØ)			Rectangular (mmxmm)	
	Regional Rainfall Intensity mm/hr			Regional Rainfall Intensity mm/hr							
	100	150	200	100	150	200	65	75	100	100 x 50	75 x 50
<10°	65	43	33	100	67	50	60	85	155	100	73
10-24°	59	39	30	91	61	45	60	85	155	100	73
25-34°	54	36	27	83	56	42	50	70	130	80	61
35-44°	50	33	25	77	51	38	40	60	10	70	50
45-55°	46	31	23	71	48	36	35	50	90	60	43

Downpipe Placement

Downpipe placement can have a substantial impact on the effective roof area being served by a downpipe or section of spouting.



Proportion of roof area drained by:	A: One Downpipe at end of run	B: One Downpipe at centre of run	C: Two Downpipes at ends of run	D: Two Downpipes at third points
Each spouting section drains:	100%	50%	50%	33%
Each downpipe drains:	100%	100%	50%	50%

Fall

To perform satisfactorily spoutings should have a consistent fall towards the nearest outlet to promote drainage and avoid ponding. The recommended minimum fall for external spoutings is 1:500, or 2mm fall for every metre of run.

Handling, Storage and Installation

Handling and Storage

Care must be taken to avoid damage by handling and storage. The product should be handled with care to preserve the quality of the finish and stored clear of the ground on site. Do not drag any other building materials or roof sheeting over the fascia or spouting. Due care must be taken when lifting long lengths.

Installation

- Cutting must be done by shear using tin snips, or by hacksaw
- Fasteners must be compatible with the materials used
- The use of abrasive disc cutters or grinders above or adjacent to the products by roofers or other trades, is against trade practice and must be avoided, otherwise swarf staining will result
- Do not use black lead pencils for marking products
- During fixing, the spouting must be cleaned of all loose debris
- At all times, contact with wet concrete, lime, mortar acids and treated timber must be avoided
- On completion, the whole area can be cleaned by hosing and soft brushing
- Residential spoutings should have brackets spaced at a maximum of 900mm under normal conditions.

Preferred Supplier

Technical Helpline: 0800 333 247
Website: www.stroofing.co.nz
Email: info@stroofing.co.nz

WHANGAREI
9 Southend Ave
Otaika
PO Box 1869
Ph: 09 438 4600
Fax: 09 438 0342

AUCKLAND
14 Kerwyn Ave
East Tamaki
PO Box 58-216
Ph: 09 274 4056
Fax: 09 274 8972

HAMILTON
32 Kaimiro St
Pukete Ind Estate
PO 10 458
Ph: 07 850 9200
Fax: 07 850 9330

TAURANGA
67 Koromiko St
Judea
PO Box 2001
Ph: 07 578 1089
Fax: 07 577 0186

WELLINGTON
201 Gracefield Rd
Lower Hutt
PO Box 36 082
Ph: 04 568 4359
Fax: 04 568 6770

CHRISTCHURCH
106 Antigua St
Sydenham
PO Box 7306
Ph: 03 377 0994
Fax: 03 377 2680

STEEL & TUBE ROOFING PRODUCTS

TESTED & APPROVED

Used by Registered Master Builders

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Table 1: **Lighting in Common Spaces Wattage Requirement (W/m^2)**
Paragraph 1.0.1

Luminaire type	Space category		
	Corridors (note 3)	**Stair and lift lobbies** (note 4)	**Places of assembly** (note 5)
Incandescent (plastic shade)	12	10	6
Incandescent (general diffusing enclosure)	15	12	8
Fluorescent 36 W cool white (enclosed diffusing fitting)	7	4	2
Fluorescent compact single-ended 11-16 W (enclosed diffusing fitting)	8	5	–
Discharge 50 W high pressure sodium (enclosed diffusing fitting)	5	5	–
Incandescent reflector type downlights (120 W PAR 38 flood)	–	–	6
Mercury vapour downlight (80 W coated lamp)	–	–	2

Note:

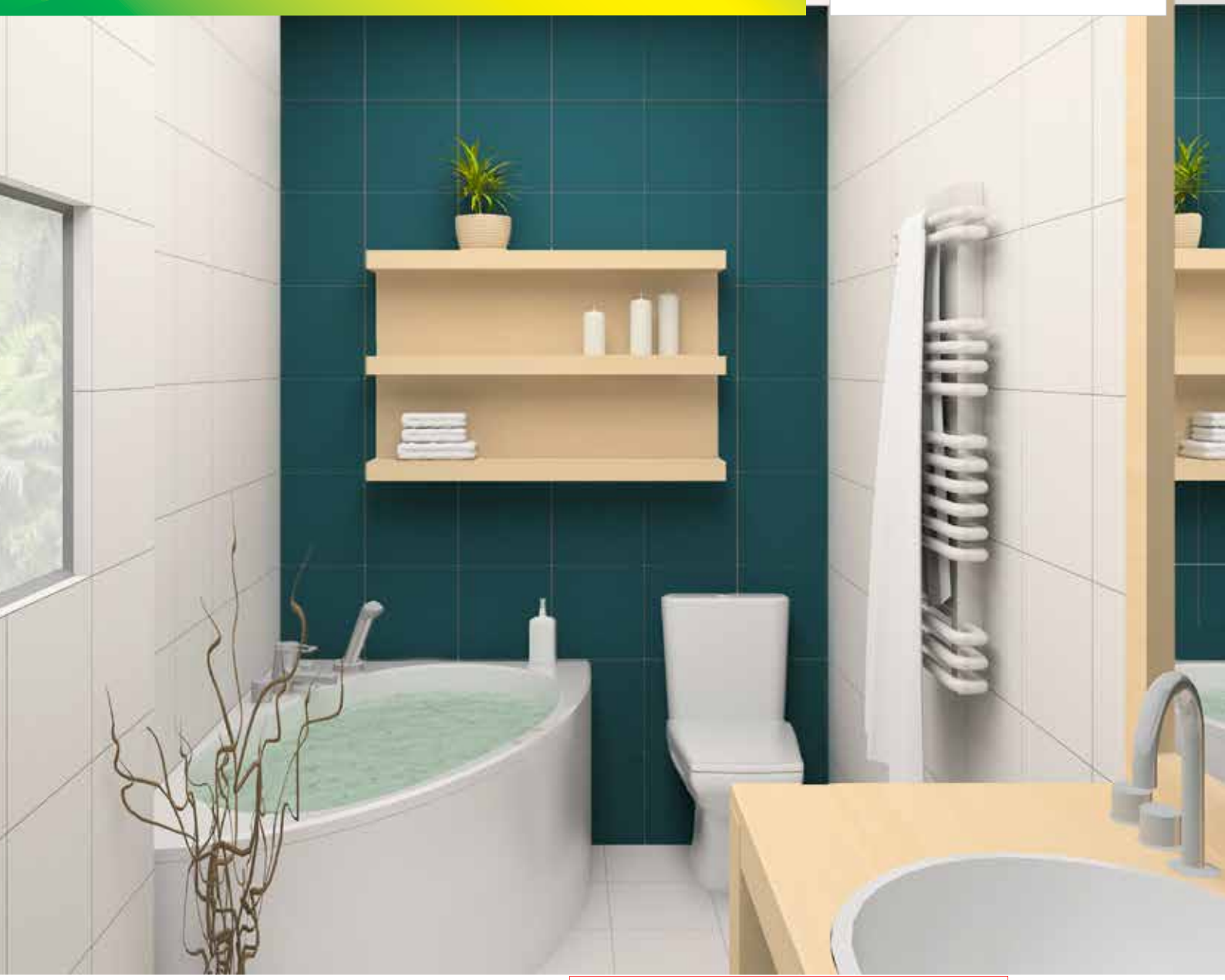
1. The figures given are measurements from site tests and the wattages include the power required for control gear where it is part of the installation. Gaps in the table indicate the unavailability of a specific installation for testing.
2. The figures (W/m^2) are not suitable for situations where narrow beam downlights, or small numbers of high power luminaires are used.
3. Data is based on a corridor 3.0 m wide and longer than 15 m, with ceiling mounted luminaires 3.0 m above floor level.
   Reflectances:
   - Ceiling 0.7
   - Walls 0.5
   - Floors 0.1
4. Data is based on a lobby area 7.0 m by 4.0 m with ceiling mounted luminaires 3.0 m above floor level.
   Reflectances:
   - Ceilings 0.7
   - Walls 0.5
   - Floors 0.2
5. Data is based on an auditorium 16 m by 21 m with a ceiling height on 5.0 m.
   Reflectances:
   - Ceiling 0.7
   - Walls 0.5
   - Floor 0.2

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bathroom heat fan light units

MANROSE



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BC200635 13/08/2020 nicolah

HEAT FAN LIGHT UNITS

www.simx.co.nz | www.manrose.com.au

"proven reliable bathroom solutions"

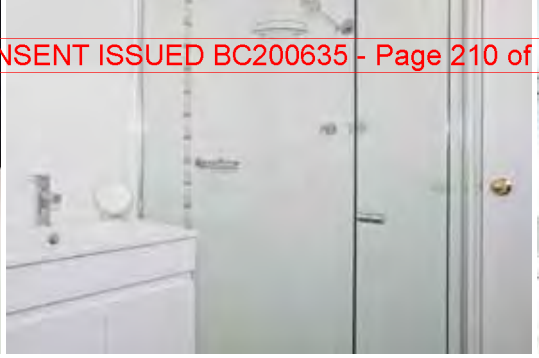
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BC200635



5 YEAR WARRANTY

All Manrose fans are proudly supported by a manufacturers five year warranty





MANROSE DESIGNER SERIES — Manrose Designer LED HFL

CA 135°C ABUTTED ONLY



LED HFL Designer styling, incorporated with long life LED centre lights, for energy efficiency. Enhanced with higher extraction than similar combination units, the Manrose Designer LED HFL is the high quality option for bathrooms & ensuites.

- High levels of extraction 86l/s.
- Longer lasting, energy efficient centre LEDs.
- Stylish low profile design.
- Temperature interlocked safety feature.
- Complete system with duct, grille and wall switch included.
- Fully complies to AS/NZS Standards.



SPECIFICATIONS

Model	Size	Cut Out Size	LED	Free Air Performance	Duct	Order Code
LED HFL4 White	150mm	435mm x 275mm	4 x 4.5W	86l/s, 310m³/hr	3m	FAN4465
LED HFL4 Silver	150mm	435mm x 275mm	4 x 4.5W	86l/s, 310m³/hr	3m	FAN4466
LED HFL2 White	150mm	435mm x 255mm	3 x 4.5W	86l/s, 310m³/hr	3m	FAN4463
LED HFL2 Silver	150mm	435mm x 255mm	3 x 4.5W	86l/s, 310m³/hr	3m	FAN4464

MANROSE PRO-SERIES — Manrose Pro Series Heat 'n Vent

CA 135°C ABUTTED ONLY



Heat 'n Vent Pro-Series units have been designed to compliment your bathroom decor. With high performance and integral temperature interlock, Manrose Heat 'n Vent continues to lead the market in quality heat/fan/light bathroom solutions.

- High efficiency centrifugal fan with unique anti-condensate design feature.
- Tiltable halogen downlight, direct light where it's needed.
- Complete system with duct, grille and wall switch included.
- Easily installed in confined spaces.
- Fully complies to AS/NZS Standards.



SPECIFICATIONS

Model	Size	Cut Out Size	Free Air Performance	Colour	Duct	Order Code
Heat n Vent 4	125mm	300mm x 300mm	67l/s, 240m³/hr	White	3m	FAN0995
Heat n Vent 2	125mm	383mm x 214mm	63l/s, 226m³/hr	White	3m	FAN0940

MANROSE CLASSIC SERIES — Manrose Classic Heat 'n Vent

CA 135°C ABUTTED ONLY



Heat 'n Vent is suitable for smaller bathrooms and ensuites. With stylish looks in classic white, it is an all round heat/fan/light combination.

- Easily installed in confined spaces -195mm height to fit between floors.
- Complete system with duct, grille and wall switch included.
- Fully complies to AS/NZS Standards.

SPECIFICATIONS

Model	Size	Cut Out Size	Free Air Performance	Colour	Duct	Order Code
Heat 'n Vent 2	100mm	390mm x 220mm	35l/s, 126m³/hr	White	3m	FAN2162

CA 135°C ABUTTED ONLY

Manrose Heat Fan Light units have been tested to the Downlight standard AS/NZS60598.2.2 Amendment A and they are all classified as CA135.

MANROSE
PRO-SERIES

Combine high efficient ventilation with a quality halogen or energy efficient LED light fitting in a low profile diffuser that will appeal to the discerning homeowner.

This system can be positioned above your shower or bath to effectively draw steam directly from source.

- Designed for bathrooms where extra lighting is required.
- Steam is extracted directly from its source.
- High efficiency in-line fan.
- Easily installed in confined spaces.
- SELV transformer or LED driver included.
- Fully complies to AS/NZS Standards.
- Includes weatherproof cowl & fixed louvre grille.



Extract-a-Lite

SPECIFICATIONS

Halogen Model	Size	Performance	Colour	Duct	Order Code
ELLP150WS	150mm	94l/s, 340m3/hr	White	6m	FAN2033
ELLP150SS	150mm	94l/s, 340m3/h	Silver	6m	FAN2034
ELLP125WS	125mm	39l/s, 140m3/hr	White	6m	FAN2029
ELLP125SS	125mm	39l/s, 140m3/hr	Silver	6m	FAN2030

Cut out diameter: ELLP150 - 148mm ELLP125 -118

PRO-SERIES DIFFUSERS

Fits Model	Diffuser	Colour	Order Code
ELLP150	Incl Halogen	White	DCT1521
ELLP150	Incl Halogen	Silver	DCT1522
ELLP125	Incl Halogen	White	DCT1519
ELLP125	Incl Halogen	Silver	DCT1520

Cut out diameter: ELLP150 - 148mm ELLP125 -118



Extract-a-LED

SPECIFICATIONS

LED Model	Size	Performance	Colour	Duct	Order Code
LED-ELLP150WS	150mm	94l/s, 340m³/hr	White	6m	FAN5375
LED-ELLP150SS	150mm	94l/s, 340m³/h	Silver	6m	FAN5376
LED-ELLP125WS	125mm	39l/s, 140m³/hr	White	6m	FAN5379
LED-ELLP125SS	125mm	39l/s, 140m³/hr	Silver	6m	FAN5380

Cut out diameter: LED ELLP150 - 148mm LED ELLP125 -118

PRO-SERIES LED DIFFUSERS

Fits Model	Diffuser	Colour	Order Code
LED-ELLP150	Incl LED & Driver	White	DCT3211
LED-ELLP150	Incl LED & Driver	Silver	DCT3212
LED-ELLP125	Incl LED & Driver	White	DCT3213
LED-ELLP125	Incl LED & Driver	Silver	DCT3214

Cut out diameter: LED ELLP150 - 148mm LED ELLP125 -118



MANROSE
CLASSIC SERIES

Incorporates a quality light fitting with a high performing fan. This system can be positioned directly above your shower or bath to effectively draw steam from source with halogen or LED centre lamp.

- Designed for bathrooms where extra lighting is required.
- Choose either an energy efficient LED or halogen lamp.
- Steam is extracted directly from its source.
- SELV transformer or LED driver included.
- Fully complies to AS/NZS Standards.



Extract-a-Lite

SPECIFICATIONS

Halogen Model	Size	Performance	Colour	Duct	Order Code
EL150S	150mm	89l/s, 320m³/hr	White	5m	FAN0803
EL125S	125mm	36l/s, 130m³/hr	White	4m	FAN2037
EL100S	100mm	31l/s, 110m³/hr	White	3m	FAN0420

Cut out diameter: EL150 - 148mm EL125 -118 EL100 - 98mm

CLASSIC DIFFUSERS

Fits Model	Diffuser	Colour	Order Code
EL150	Incl Halogen	White	DCT1169
EL150	Incl Halogen	Chrome	DCT1171
EL125	Incl Halogen	White	DCT2121
EL125	Incl Halogen	Chrome	DCT2120
EL100	Incl Halogen	White	DCT0360
EL100	Incl Halogen	Chrome	DCT0362

Cut out diameter: EL150 - 148mm EL125 -118 EL100 - 98mm



Extract-a-LED

SPECIFICATIONS

LED Model	Size	Performance	Colour	Duct	Order Code
LED-EL150S	150mm	89l/s, 320m3/hr	White	5m	FAN5369
LED-EL125S	125mm	36l/s, 130m3/hr	White	4m	FAN5371
LED-EL100S	100mm	31l/s, 110m3/hr	White	3m	FAN5373

Cut out diameter: LED-EL150 - 148mm LED-EL125 -118 LED-EL100 - 98mm

CLASSIC LED DIFFUSERS

Fits Model	Diffuser	Colour	Order Code
LED-EL150	Incl LED & Driver	White	DCT3209
LED-EL150	Incl LED & Driver	Chrome	DCT3208
LED-EL125	Incl LED & Driver	White	DCT3207
LED-EL125	Incl LED & Driver	Chrome	DCT3206
LED-EL100	Incl LED & Driver	White	DCT3205
LED-EL100	Incl LED & Driver	Chrome	DCT3204

Cut out diameter: LED-EL150 - 148mm LED-EL125 -118 LED-EL100 - 98mm



Fan Selection Guide

Use the chart below to work out the best option for your home.

		Heat/Fan/Light Units		Extract-A-Lite Kits	
		DESIGNER	PRO SERIES	PRO SERIES	CLASSIC
Room Type	**Room Size (m^3)**				
• Bathrooms • Showers • Ensuites These rooms require between 11 and 15 ACH (Air changes per hour)	1 - 10m^3	LED HFL 2	Heat 'n Vent 2	ELLP125	EL150
	11 - 15m^3	LED HFL 2	Heat 'n Vent 4	ELLP150	EL150
	16 - 20m^3	LED HFL 2		ELLP150	EL150
	21 - 30m^3	LED HFL 4			

MANROSE CLASSIC SERIES

Manrose Classic Heat 'n Light

CA 135°C ABUTTED ONLY

2 Heat 'n Light If you require additional lighting then the Manrose 2 Heat 'n Light offers the comfort of two heat lamps plus a centre light. Use on it's own or add a Manrose extraction fan for a complete heat/light and ventilation solution. 100mm - 150mm duct outlet included.



- Attractive low profile finish.
- Easily installed in confined spaces, even between floors.
- Heat lamps individually ice/water splash tested.
- Thermal safety cut-off to prevent overheating.
- Wall switch provided.
- Fully complies to AS/NZS Standards.

Model	Description	Colour	Order Code
Heat 'n Light 2	2 Heat lamps & centre light - no fan	White	FAN2200

Cut out size: 390mm x 220mm

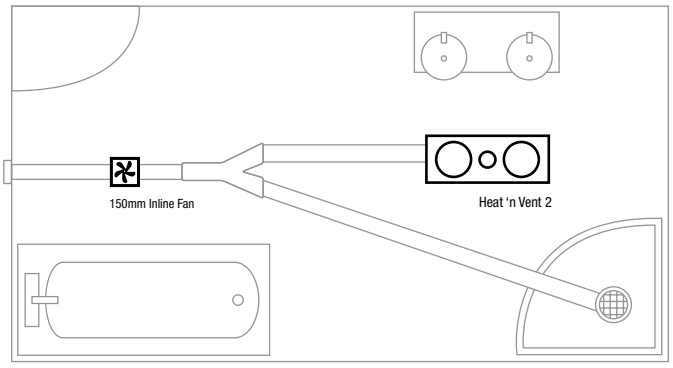
'NO FAN' Model add to a new or existing fan

Fan Placement Guide

Add a Manrose 150mm In-line fan kit and Y-Branch for a complete bathroom heat/light and ventilation solution.

- Manrose Pro-Series Shower Fan Kit SFLP150.
- Manrose Classic Shower Fan Kit SF150.

For a customed designed solution Manrose have all the components required, from in-line fans to ducting, Y-branches and grilles. Technical drawing (on right) represents a typical layout using additional components to connect this system to a new or existing extraction fan.



5 YEAR WARRANTY

All Manrose fans are proudly supported by a manufacturers five year warranty (excludes lamps).

For the full range of MANROSE Fans, Hand Dryers, Ducting, Grilles and Accessories visit our websites:
www.simx.co.nz | www.manrose.com.au

Simx

Manrose is proudly distributed by Simx Limited
PO Box 14347, Panmure, Auckland 1741, New Zealand
Technical Support (09) 259 1662

Dealer details:

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rangehood & dryer ducting

MANROSE®



KITCHEN & LAUNDRY EXTRACTION

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for the Kitchen

BC200635

MANROSE CLASSIC

Extraction of cooking fumes at their source is essential for moisture and odour reduction in the home. To help achieve this all kitchen rangehoods should be ducted outside.

Manrose Kitchen Rangehood Ducting Kits are designed to extract fumes efficiently and will fit most rangehoods. They can be easily installed by the home handyman or a qualified tradesperson.

RANGEHOOD DUCTING KITS

There are three ducting options available for the kitchen rangehood, through an adjacent wall, through the soffit (under the eave) or up through the roof. Designed with rangehood noise reduction in mind, Manrose Rangehood Ducting Kits are also fully compliant to AS/NZS 60335.2.80.

THRU WALL

Duct Size	Description	Order Code
125mm	Rear Vent Gravity Grille	DCT1162
150mm	Top & Rear Vent Weatherproof Cowl	DCT2592

For added weather protection use the weatherproof cowl as included in DCT2592

SOFFIT

Duct Size	Description	Order Code
150mm	Thru Soffit	DCT1161
150mm	Thru Soffit - Galv Tube	DCT1259◆
150mm	Thru Soffit - Semi Rgid	DCT2323◆

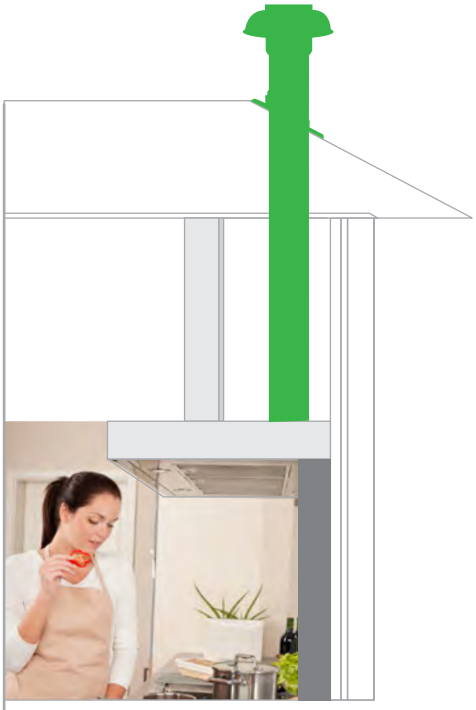
All systems include 3 metres of Aluminium Duct
◆ Also includes 900mm of Solid Tube
◆ Also includes 3 metres of Semi-Rigid Duct

THRU ROOF

Duct Size	Description	Order Code
150mm	Thru Roof - Iron	DCT2324
150mm	Thru Roof - Tiled	DCT2325

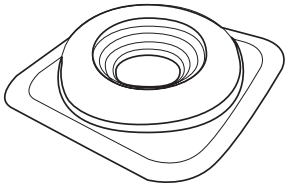




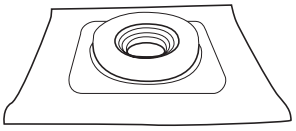




THRU- ROOF Flashing Options



For Iron Roof



Tiled Roof

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for the Laundry

MANROSE CLASSIC

Dryer Ducting Kits effectively remove the moist warm air generated from clothes dryers and expel it directly outside. This process eliminates the build up of dampness, helping to keep your home dry and free from condensation.

- Designed for today's modern & classic dryers.
- Ducting Kit suits dryers with a 100mm outlet.
- The square to round elbow will fit snugly onto most 100mm dryer outlets.
- Easily installed in confined spaces.
- Fully complies to AS/NZS 60335.2.80.
- 2 Year Warranty.

INVERTED & WALL MOUNTED DRYER DUCTING KIT

Duct Size	Model No.	Description	Order Code
100mm	DKSD100	Soffit Ducted	DCT1263

CLASSIC THRU WALL FAN KIT

Duct Size	Model No.	Performance	Order Code
100mm	XP100S	23l/s, 85m^3/hr	FAN0053
125mm	XP125S	36l/s, 130m^3/hr	FAN0080
150mm	XP150S	87l/s, 313m^3/hr	FAN0135

PRO SERIES THRU WALL FAN KIT

Duct Size	Model No.	Performance	Order Code
125mm	XPLP125SS	36l/s, 130m^3/hr	FAN0614
150mm	XPLP150SS	87l/s, 313m^3/hr	FAN0621

DRYER DUCTING KIT SOFFIT DUCTED

For soffit ducted free standing dryers extra rectangular ducting and a connector will be required Order Codes: DCT0013 & DCT0014).



MANROSE THRU WALL FAN KITS

- Thru wall ventilation kits are ideally suited to ventilate laundry areas where utilities are adjacent to exterior walls.
- Thru wall kit includes fan, ducting and grille.
- Fully Building Code compliant
- 5 Year Warranty



MANROSE CLASSIC



MANROSE PRO-SERIES



NZS 4303:1990
The New Zealand Building Code regulations require that any fan installed in a bathroom, toilet, laundry or kitchen must have the exhaust air ducted to the outside of the home. This eliminates the build up of an unhealthy concentration of moisture in roof cavities.

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DUCTING KIT CONTENT

BC200635

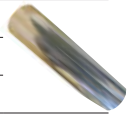
	Thru Wall Rear Vent	Thru Wall Rear/Top	Soffit Kit	Soffit Kit Galv Tube	Soffit Kit Semi-Rigid	Thru Roof 125 Iron	Thru Roof 150 Iron	Thru Roof Tiled	Dryer Soffit Kit
Semi Rigid Duct - 400mm length	✓								
Semi Rigid Duct - 1.5m length		✓							
Semi Rigid Duct - 3m length					✓		✓	✓	
Solid Tube - Galvanised 900m length				✓			✓	✓	
Flexible Aluminium - 3m length		✓	✓	✓	✓	✓			✓
Flat Channel Ducting - 0.75m length									✓
White Eggcrate Grille					✓				✓
White Gravity Grille	✓	✓							
White Fixed Louvre Grille			✓	✓					
White Weatherproof Cowl		✓							
2 x Rec to Round 90 Elbows									✓
150:125 Reducer		✓			✓	✓	✓	✓	
150mm Connector		✓			✓		✓	✓	
Thru Roof Cowl						✓	✓	✓	
Flashing - Dektite						✓	✓		
Flashing - Lead								✓	
Duct Tape	✓	✓	✓	✓	✓	✓	✓	✓	✓

COMPONENTS LIST

MANROSE DUCTING

Type	Diameter (mm)	Length (m)	Order Code
Aluduct Aluminium Flexible	100	1	DCT0357
Aluduct Aluminium Flexible	125	1	DCT0358
Aluduct Aluminium Flexible	150	1	DCT0359
Semi Rigid	100	1.5	DCT0333
Semi Rigid	125	1.5	DCT0334
Semi Rigid	150	1.5	DCT0335
Low Profile Flat Channel	110 x 54	1.5	DCT0013
Low Profile Flat Channel	204 x 60	1.5	DCT0519
Low Profile Flat Channel	220 x 90	1.5	DCT1443
Low Profile Flat Channel	300 x 25	1.5	DCT1460
Galvanised Solid Tube	100	0.9	DCT0151
Galvanised Solid Tube	125	0.9	DCT0152
Galvanised Solid Tube	150	0.9	DCT0153
White Finish PVC Tube	100	0.9	DCT1424
White Finish PVC Tube	125	0.9	DCT1425
White Finish PVC Tube	150	0.9	DCT1426



All ducting complies with NZ Building Code fire rating requirements.


Round adaptor


Round connector


Round to rectangular connector


Round reducer


Rectangular connector


Rectangular to round elbow connector


Fixed louvre grille


Gravity shutter grille


Weatherproof cowl

MANROSE CONNECTORS & ADAPTORS

Type	Size (mm)	Order Code
Round Adaptor	125	DCT0448
Rect : Round Adaptor	335 x 155 : 125	DCT1360
Round Connector	100	DCT0159
Round Connector	125	DCT0037
Round Connector	150	DCT0059
Round Reducer	150 : 125	DCT2066
Round Reducer	150 : 100	DCT2122
Rectangular Connector	110 x 54	DCT0014
Rect : Round Elbow Connector	110 x 54 : 100	DCT0124

MANROSE WALL/CEILING GRILLES

Type	Size (mm)	Order Code
White Fixed Louvre	100	DCT0025
White Fixed Louvre	125	DCT0041
White Fixed Louvre	150	DCT0063
White Gravity Shutter	100	DCT0029
White Gravity Shutter	125	DCT0044
White Gravity Shutter	150	DCT0066
White Weatherproof Cowl	100	DCT0018
White Weatherproof Cowl	125	DCT1030
White Weatherproof Cowl	150	DCT1031

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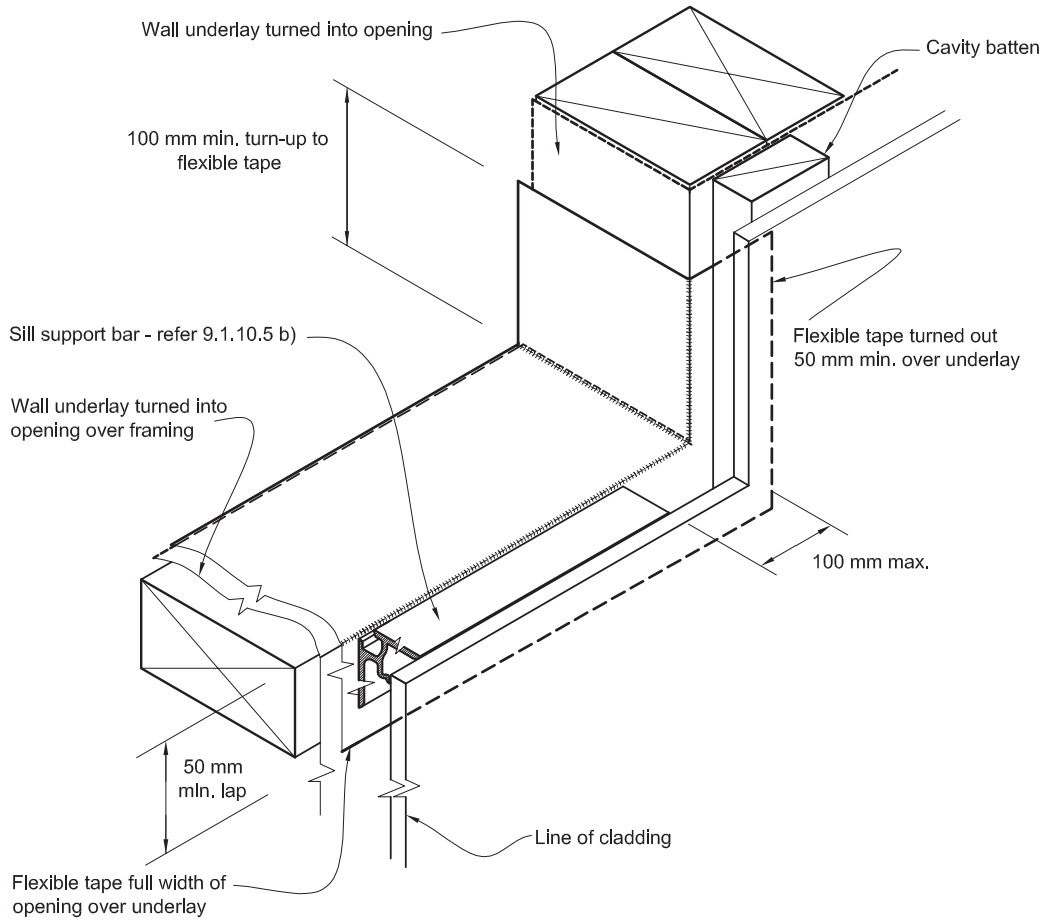
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Dealers Stamp:

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

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



Errata 2 Dec 2011

Amend 5 Aug 2011

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SecuraGold™

WATER TIGHT PLUMBING SYSTEMS

Technical Manual

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC200635 13/08/2020 nicolah

Version 1

STANDARDS COMPLIANCE

All materials and components used in the SecuraGold™ range are sourced and produced in ISO 9000 accredited facilities and hold the **Australian Watermark** registration number **WMK 1289 from SAI Global** as well as the prestigious **Germanischer Lloyd Society** for marine applications on certificate no. **13 659 – 98 HH**.

The SecuraGold™ piping system complies with all relevant requirements of the following standards:

- AS/NZS3500 Parts 1, 4 & 5
- AS/NZS2642 Parts 1, 2 & 3
- C35200
- AS/NZS 1567
- AS/NZS 1568
- AS 2345

Durability

Installed correctly SecuraGold™ can be expected to meet the requirements of both the Australian and New Zealand Building Codes.



CERTIFICATE OF CONFORMITY

SAI Global hereby grants:

Dux Industries Limited

ABN 17879759

32 Mahia Road,, MANUREWA AUCKLAND, New Zealand

WaterMark Certificate of Conformity – Level 1

Evaluated to:

AS/NZS 2642.3:2008 - Polybutylene (PB) plumbing pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications

"the WaterMark Licensee" the right to use or arrange the use of the WATERMARK as shown below only in respect of the goods described and detailed on the product schedule identified on www.saiglobal.com which are produced by the WaterMark Licensee or on behalf of the WaterMark Licensee" and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the WATERMARK and the Terms and Conditions for certification. The WaterMark Licensee covenants to comply with all the Rules and Terms and Conditions

Certificate No: WMKA1289-1

Issued : 1 April 2011
Expires : 31 March 2016

Originally Certified : 1 April 2011
Current Certification : 1 April 2011

Duncan Lilley
Global Head – Assurance Services

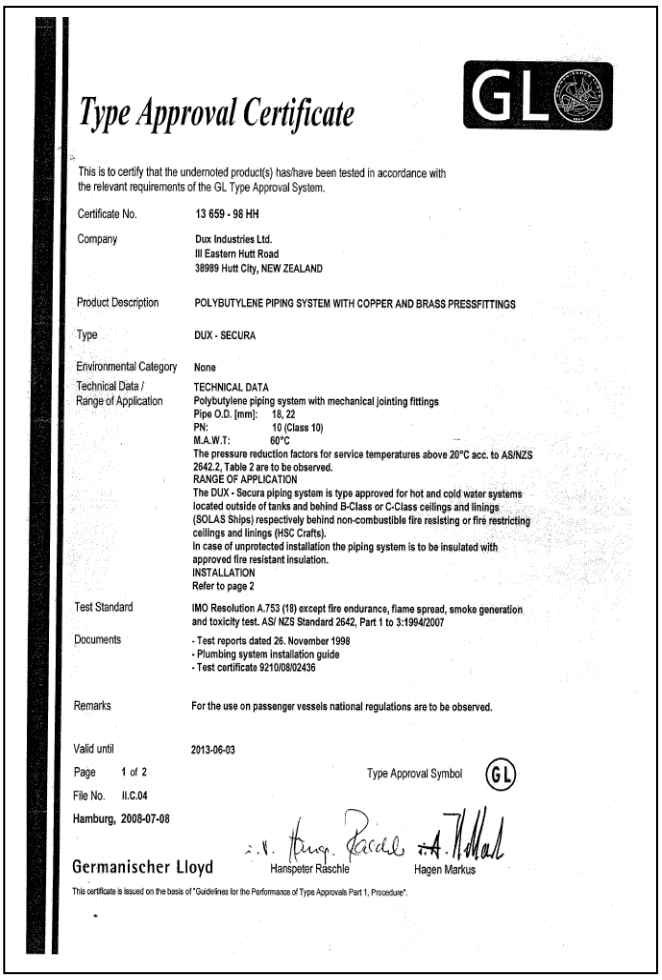
Alex Ezhekhovich
General Manager – Certification Services

WaterMark

JAS-ANZ

SAI GLOBAL

AI Global Certificate



Type Approval Certificate

GL

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No.	13 659 - 98 HH
Company	Dux Industries Ltd. III Eastern Hutt Road 38989 Hutt City, NEW ZEALAND
Product Description	POLYBUTYLENE PIPING SYSTEM WITH COPPER AND BRASS PRESSFITTINGS
Type	DUX - SECURA
Environmental Category	None
Technical Data / Range of Application	TECHNICAL DATA Polybutylene piping system with mechanical jointing fittings Pipe O.D. [mm]: 18, 22 PN: 10 (Class 10) M.A.W.T: 60°C The pressure reduction factors for service temperatures above 20°C acc. to AS/NZS 2642.2, Table 2 are to be observed. RANGE OF APPLICATION The DUX - Secura piping system is type approved for hot and cold water systems located outside of tanks and behind B-Class or C-Class ceilings and linings (SOLAS Ships) respectively behind non-combustible fire resisting or fire restricting ceilings and linings (HSC Crafts). In case of unprotected installation the piping system is to be insulated with approved fire resistant insulation. INSTALLATION Refer to page 2
Test Standard	IMO Resolution A.753 (18) except fire endurance, flame spread, smoke generation and toxicity test. AS/ NZS Standard 2642, Part 1 to 3:1994/2007
Documents	- Test reports dated 26. November 1998 - Plumbing system installation guide - Test certificate 9210/08/02436
Remarks	For the use on passenger vessels national regulations are to be observed.
Valid until	2013-06-03

Page 1 of 2

Type Approval Symbol GL

File No. II.C.04

Hamburg, 2008-07-08

Germanischer Lloyd

Hanspeter Raschle

Hagen Markus

This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1, Procedure".

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INTRODUCTION

Dux Industries Limited has been and remains synonymous with plumbing in New Zealand. Starting from humble beginnings as a small engineering firm based out of Wellington in 1936 it has grown into a competitive force able to offer the plumbing industry of New Zealand a large selection of plumbing solutions. Dux Industries Limited moved to the forefront of the plumbing industry in New Zealand by pioneering the use of plastics in the plumbing industry and has become known for innovative design solutions to the problems faced by professional plumbers today.

Dux revolutionised the plumbing market in the 1990's introducing the Secura Polybutene -1 Plumbing System for Hot and Cold Potable Water reticulation. These early encapsulated copper fittings combined with PB-1, a highly flexible, lightweight but tough pipe, proved to be very popular with plumbers due to their ease of installation.

From this early start SecuraGold™ has evolved into the premium product available today. Manufactured from high grade Dezincification Resistant (DR) brass combined with Polybutene-1 pipe and available in four sizes ranges with over 90 fittings to choose from, SecuraGold™ is the most complete hot and cold water reticulation system available in New Zealand.

The SecuraGold™ range of products are the market leaders and continues to be the first choice for professional plumbers and designers in New Zealand.



SECTION 1 – Polybutene-1 The Secura Pipe

POLYBUTENE-1 PIPE PROPERTIES

Polybutene – 1 (PB-1) resins are high molecular weight isotactic, semi-crystalline thermoplastic polyolefin's produced through the polymerisation of Butene-1 and Ethylene, and/or Propylene co monomers.

PB-1 combines the typical characteristics of Polyolefin's with a unique property mix of high flexibility and outstanding creep resistance over a wide temperature range. Due to a similar molecular structure, PB-1 is very compatible with PP and Propylene based thermoplastic elastomers. It is easily dispersible in PE notwithstanding its limited molecular compatibility. Secura PB-1 is extruded from grade 4267 PB-1 resin manufactured by Lyondell Basell.

Temperature	Polybutene -1 will withstand all temperatures found in a normal hot and cold water reticulation system. It is capable of handling temperature variations from -50°C up to 99°C.
Mechanical	Polybutene-1 is a strong, robust material. Its strength is not significantly affected by temperatures and pressures normally encountered in hot and cold water reticulation systems. It exhibits the highest creep resistance of any of the polyolefin's and as a result retains its strength even under long term stress. It also has an exceptional resistance to stress cracking.
Bending and Flexing	Polybutene-1 can be repeatedly flexed without harm. The recommended minimum bending radius is eight times the pipe outside diameter. At this diameter it is recommended to use either a Dux Centipede or ensure that the pipe is well supported with pipe clips to prevent undue stress. This reduces the requirement for elbows, thereby minimising frictional loss. Where tighter bends are required elbows are necessary.
Chemical Resistance	Polybutene-1 is resistant to soaps, detergents, most acids and alkalis below 96°C and many solvents at room temperatures. Because it is so inert, it is immune to attack from most common chemicals. For a list of chemical resistances please refer to the Chemical Resistance Charts on the Dux website. Do not allow Polybutene-1 to come into contact with building product adhesives, sealers, solvent cements, lubricants or any oxidising agent such as household bleach.
Pressure	Polybutene-1 has the highest pressure rating of any flexible thermoplastic. It is capable of withstanding pressures up to 6.90Mpa.
Thermal	As Polybutene-1 has a high thermal insulation value water will not cool as quickly when laying in the pipe resulting in hot water being delivered more quickly. Also the expansion rate is unusual for a plastic as it is only 1.3 x 10^4 m/m/°C. The thermal conductivity being 0.22 W/(m.k).
VOC Rating	Polybutene-1 has been tested for the release of VOC's (Volatile Organic Compounds) in compliance with the test specifications of EN852-1, ISO 4120 and ISO 5495. Polybutene-1 has a VOC rating <0.02 mg C/l and <0.02 mg C/m² /day.
Electrical	Polybutene-1 has good di-electric properties over a wide range of ambient conditions. **WARNING** – because of its good insulation qualities Polybutene-1 cannot be used for electrical earthing. Where it forms a break between existing metal pipe that is being used for earthing or bonding, then a bonding lead should be connected to both ends of the existing metal pipe work.
Anti-Fouling	Because of its relatively high thermal insulation value, exceptionally smooth bore and high abrasion resistance, build ups of pipe scale or mineral deposits do not occur.
Compatibility	Polybutene-1 is chemically inert so it can be connected safely to any other type of pipe system without danger of corrosive action.
Water Hammer and Surge	Polybutene-1 can easily withstand the effects of water hammer because of its high elastic modulus. It dampens rather than propagates pressure waves and the associated pipe noise. Under extreme conditions of service water hammer arrestors may be advisable provided the installation has been

	completed correctly.
Freezing	Ice formation causes no damage as the pipe's flexibility accommodates expansion. The pipe will return to its original state upon thawing. It must be pointed out however that a small section of Polybutene-1 in an otherwise rigid system cannot protect the pipe system from the effects of freezing. Only where a significant proportion of Polybutene-1 is used will the effects of freezing be minimised. ***Always check with your local council for any specific requirements for lagging in freezing conditions.***
Fire Resistance	Polybutene-1 is not highly flammable but it will burn. By-products of combustion are not toxic or harmful should they be inhaled.

PERFORMANCE CHARACTERISTICS

Polybutene-1 exhibits a unique morphology and crystallisation behaviour which, combined with careful control of molecular parameters, gives Polybutene-1 a profile of properties unrivalled in piping systems manufacture.

Table A – Performance Characteristics of PB-1, PEX & PP

	PB-1	PEX	PP	VALUES		PB-1	PEX	PP-R
Density	0.93	0.94	0.90	g/cm³	**Impact Toughness**	Good	Good	Average
Melt Range	122	130		°C	**Chemical Resistance**	Good	Good	Good
Thermal Conductivity @20°C	0.22	0.41	0.24	W/Mk	**Flexibility**	Excellent	Good	Average
Internal Surface Resistance	0.007			W	**Creep Resistance**	Excellent	Good	Good
Linear Expansion Rate	0.13	0.20	0.18	mm/M/°C	**Thermal Pressure Resistance**	Excellent	Good	Average
Impact Value @ 0°C	4.7		3.7	kJ/mm²	**CLTE Induced Stress**	Excellent	Good	Average
Elastic Modulus	350	600	800	Mpa (N/mm²)	**Pipe Weight**	Excellent	Good	Poor
Expansion Contraction	0.13	0.2	0.18	mm/M/°C				
Yield Stress @ 23°C	28		25	N/mm²				

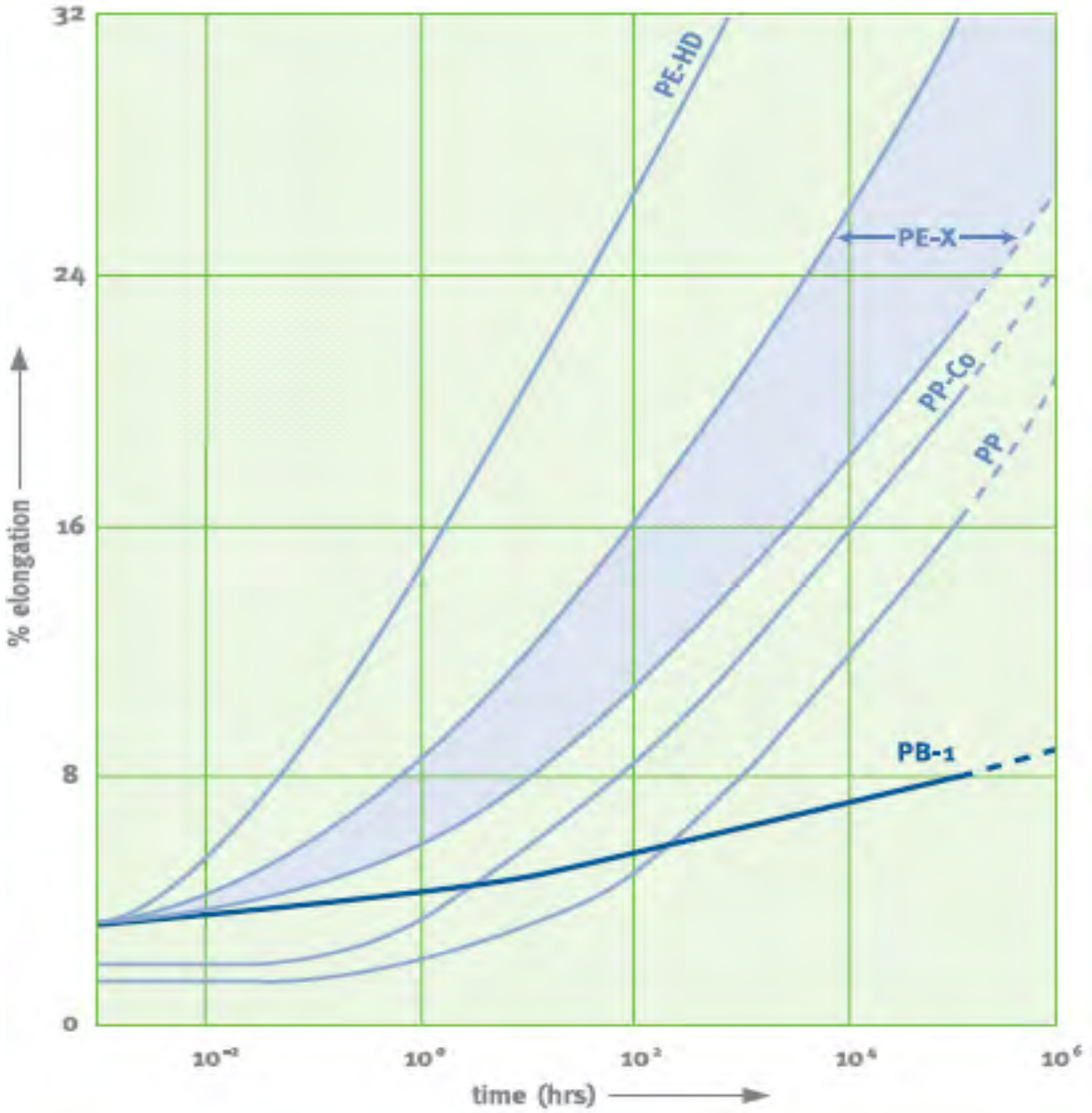
COMPARISON OF CREEP RESISTANCE

Creep is the amount of stretch or give in a material under a given load over a set period of time. In pipe systems internal and external pressure works to stretch, expand, pull and push material away from the point load of a joint or seal.

The most important property or characteristic which sets PB-1 apart from competitive products is the combination of high flexibility and outstanding resistance to internal pressure creep over a wide range of hot and cold temperatures.

All Polyolefinic materials tend to creep when exposed to continually applied stresses over a long period of time. This cold flow behaviour can be suppressed by creating a three dimensional network in the polymer structure by either physical or chemical cross linking as is the case in the manufacture of cross linked Polyethylene (PEX). PB-1 pipe displays superior inherent creep resistance without the application of any cross linking, co-polymerisation or compounding modification as illustrated by Figure 1. In its simplest homopolymer form, its property profiles are ideal for satisfying the demands of pressure piping applications.

Figure 1 – Creep behaviour of Polyolefin's at room temperature (8 Mpa)



ACOUSTIC CHARACTERISTICS

Due to the flexibility of PB-1 and its low density and low thermal expansion, PB-1 pipes have superior acoustic behaviour. Water hammer or hydraulic noise is absorbed with no damage to the pipe.

Table B – Acoustic Properties of Various Pipe Materials

	Density (g/cm^3)	Elastic Modulus (Mpa)	Sound Velocity (m/s)
Copper	7.2	110,000	3.900
PB-1	0.94	450	620
CPVC	1.56	3,500	2,350
PEX	0.95	600	800
Soft Rubber	0.90	90	320

BENDING AND FLEXING POLYBUTENE-1

Secura PB-1 is extremely flexible and can be repeatedly flexed without harm however minimum radii bends should be adhered to in order to avoid kinking of the pipe. This radius is measured by multiplying the outside diameter of the pipe by a factor of eight. Maintaining this dimension as your minimum radius will prevent the possibility of damage to the pipe during installation. At this radius it is recommended that the pipe is well supported through the use of either pipe clips or a Dux Centipede to prevent undue stress on the pipe or fittings.

Table C – Bending Radii for Various Pipe Diameters (PB-1)

Pipe Designation	Mean O.D. of Pipe	Minimum Radii
12mm	12.93mm	103.44mm
15mm	16.31mm	130.48mm
20mm	22.84mm	182.72mm
28mm	25.50mm	204.00mm

Figure 2 – Pipe Failure due to Kinking

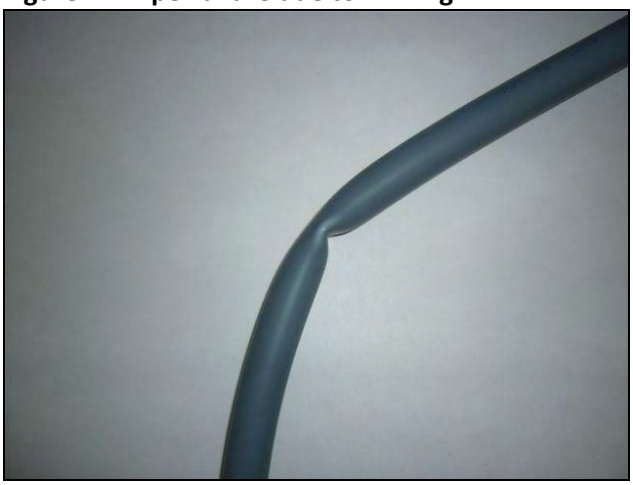


Figure 3 – Small radius bend using Dux Centipede



Where tighter bends are required the pipe must be supported by a bend support such as the **Dux Centipede (Dux Code: DCS751501)** At this point in time only the 15mm Centipede support is available. For other sizes of pipe it is recommended that pipe clips be used to support the pipe and prevent stress being placed on nearby fittings.

Alternatively within the SecuraGold™ range there are 45° and 90° Elbows available as well as a multitude of further fittings that will be able to accommodate and overcome any problem installation facing a professional plumber.

NOTE: If a pipe is kinked during installation that portion of the pipe must be cut out and replaced. If the damaged section of pipe is not removed a pipe failure will occur.

CHANGES OF DIRECTION

It is important to install pipes and fittings with as little stress as possible on the joints particularly at changes of direction.

When a pipe is being bent after a fitting it must be supported sufficiently to reduce stress. This is carried out by fitting Dux pipe clips to support and stabilize the fitting. When installing through framing this problem is less obvious but care should still be taken to reduce the stress on fittings.

'STRAIGHT' COILS'

A feature offered by Dux Industries Limited within our pipe range is the 25m 'Straight' Coils. These coils are processed with a reduced memory so that when they are used the pipe behaves more like a straight length. The coil is wrapped in an outer dispenser wrap that is left in place while the pipe is drawn from the centre.



Figure 4 – 25m Lay Straight Coil



Figure 5 – 25m Lay Straight coil laid out

Benefits of the straight coils are:

- Easier to Handle
- Easier to store and transport
- Fewer joints
- No 'Bird Nesting'
- Reduces wastage

SecuraGold™ Lay Straight Coils effectively give a plumber the advantage of a 25m straight length with little or no curve and no bird nesting. These straight coils are currently available in three sizes: 15mm, 20mm and 28mm each with a standard length of 25m.

CHEMICAL AND CORROSION RESISTANCE

The SecuraGold™ system is designed specifically for potable hot and cold water reticulation systems with PB-1 and DR Brass fittings being perfectly matched for this purpose.
The system is unaffected by the chemicals, compounds and minerals normally found in potable water supplies and a wide range of ground conditions. SecuraGold™ will not pit, rot, rust or corrode and the exceptionally smooth bore of the PB-1 pipe will not allow internal mineral build up, maintaining a consistent flow throughout its life.

PRESSURE VS TEMPERATURE

The temperature of the liquid passing through the pipe affects the ability of PB-1 to withstand pressure. As the temperature rises the supplied pressure must reduce. Temperature and pressure are relative. AS/NZS 2642.2 sets out the parameters as follows:

Table D: Continuous Working Pressure

Working Temperature	20°C	40°C	60°C	70°C	80°C
Max. Working Pressure kPa	1600	1370	1050	880	740

Max. Working Pressure PSI	230	200	160	130	110

NOTE: The above temperature pressure combinations are maxima and should under no circumstances be exceeded.

SECURAGOLD™ the 'Green' Solution

Polybutene-1 is a single process material that is pure, inert and food safe. It is also the most environmentally friendly plastic available, using far fewer resources and less energy to produce than other plastic materials used in hot and cold water reticulation.

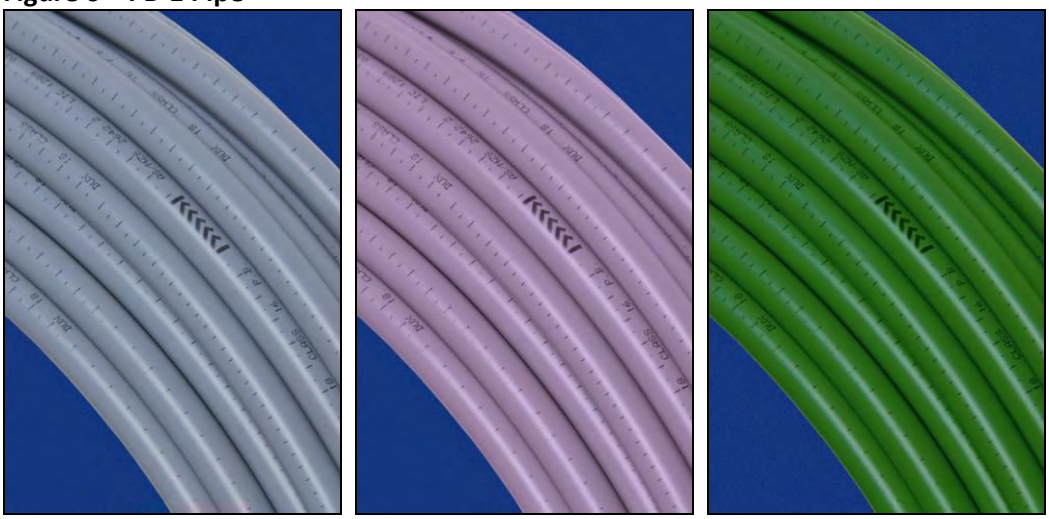
Each part of the SecuraGold™ range, from the individual fitting components to the lengths of pipe are 100% recyclable. The SecuraGold™ system is truly a **'Green'** Product.

STORAGE & HANDLING

Although PB-1 is a very tough and rugged pipe there are a number of factors that should be taken into account when storing and handling the pipe.

- PB-1 is not resistant to Ultra Violet light and should be kept away from sunlight as much as possible. The UV rays will degrade and limit the life of PB-1.
- Avoid placing heavy loads or sharp objects on top of the pipe.
- Do not drag or roll coils across the ground or rough surfaces such as tarmac or concrete, this will scratch or cut the material and could cause leaks.
- Avoid applying direct heat or naked flame to the pipe.
- Coils can be stacked up to a maximum of 10 coils high
- When storing 5m straights for any length of time, lay them flat. No heavy objects should be placed on top of the lengths.
-

Figure 6 – PB-1 Pipe



POTABLE WATER RECYCLED WATER RAINWATER

SECTION 2 – SecuraGold™ Water Tight Plumbing System

The SecuraGold™ system is available in four sizes: 12mm, 15mm, 20mm and 28mm. The standard **Grey** - Potable Hot and Cold plumbing pipe is the flagship of the range. The pipe is also available in **Lilac** - Recycled or Reclaimed Non-Potable Water and **Green** - Rainwater.
With over ninety fittings, six crimping tools, two pipe cutters, four pipe clips and other accessories available to choose from, the SecuraGold™ range is the most comprehensive Hot & Cold domestic/light commercial plumbing system in New Zealand today.

All SecuraGold™ fittings are engineered and manufactured to exacting standards with all fittings except for the Brazing Tails comprising of four basic components:

1) Dezincification resistant (DR) brass body
2) Copper crimp ring
3) EVA retaining ring (Not required with Brazing Tails)
4) LDPE protective cap

Dezincification Resistant (DR) Brass

Every SecuraGold™ fitting is manufactured using DR Brass. Dux Industries Limited selected this material based on its historical performance in the water industry and because its physical performance is completely compatible with PB-1 pipe.

Material: Dezincification resistant brass is principally a mixture of copper, lead and zinc. The exact proportions of each component are detailed in AS/NZS 1567 and AS 2345 DR brass is recognised and adopted worldwide as a premium alloy suitable for water fittings.

Mechanical: DR Brass is a strong, durable material that has excellent forging and machining properties and gives exceptional resistance to temperature, pressure and impact damage across a wide range.

Durability: DR Brass is a strong durable material able to withstand the rigors of installation and deliver years of uninterrupted service under a variety of installation and operating conditions.

Corrosion: DR Brass is perfectly suited to potable water usage. Its resistance to a wide range of varying water and ground conditions also makes it suitable for other applications such as heating and compressed air.

Temperature / Pressure: DR Brass gives exceptional resistance to varying operating temperatures and pressures and will exceed the temperature and pressures required of PB-1 pipe.

Electrical: DR Brass will conduct electrical energy, however as the fittings are installed as part of a non conductive plastic piping system SecuraGold fittings must never be used for earthing purposes.

Environmental: DR Brass is 100% recyclable.

SecuraGold™ fittings are extensively tested ensuring the highest quality of fitting is made available to the professional plumber.

The Tools

Dux Industries Limited currently offers 2 types of crimping tools for use with the SecuraGold™ system. These are the **Magnum** Compact tool and the **Alba** Tool. The **Pipe Cutter SGPC0V2** is able to cut 12mm – 28mm comfortably.

The Magnum

The Magnum compact tool has been developed by Dux Industries Limited after requests for a crimping tool that is easy to use and is particularly suited for the confined spaces found in modern houses. It has been precision engineered from stainless steel to resist corrosion and withstand the rigours of everyday use.
Unlike 'bolt action' crimp tools the handles of the Magnum do not open wide allowing it to be used in very confined spaces.
The Magnum tool operates with a pull back action to open the jaws that are held open by one hand.
The jaws are then positioned on the crimp ring and when the grip on the handles is relaxed the spring loaded jaws close around the crimp ring and the handles are compressed fully to complete the joint.

Figure 7 – The Magnum is available in three sizes:



CCT2 – 12mm (Green Handle)

CCT3 – 15mm (Blue Handle)

CCT4 – 20mm (Red Handle)

The Alba

The Alba crimp tool is light weight, robust and durable with an easy adjustment mode and requires little maintenance. The jaws are high grade cast tempered steel fitted with tubular handles and comfortable grips. The tool uses a patented offset roller cam combined with a broken arm lever action that gives an easy action and reduces operational force, giving reasonable access to confined spaces.

The Alba is available in three sizes:



SCT3 – 15mm

SCT4 – 20mm

SCT5 – 28mm

Figure 8 – The Alba Tool

The Pipe Cutters



Figure 9 – SGPC026 Pipe Cutter



Figure 10 – SGPC0V2 Pipe Cutter

Successfully cutting a section of pipe using the SGPC026 pipe cutter is best achieved by applying pressure then giving a quarter turn until the blade cuts through the first wall of the pipe.
The SGPC0V2 EX-TEC pipe cutter does not require this action and will cut through PB-1 smoothly. As with any blade consistent use will dull the edge and it will require sharpening from time to time.
These cutters are designed to be used only with PB-1.

Making a SecuraGold™ Crimp Joint

There are four easy steps required to successfully crimp a SecuraGold™ Joint.

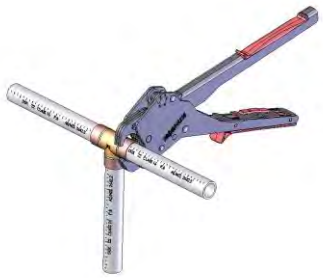
Step One:
Cut the pipe making sure the end is square and free from dirt or burrs. Check the pipe has no scores or kinks. (Cut out and replace if necessary).



Step Two:
Select the required fitting, remove the protective cap/s from the joint end and insert the pipe fully into the fitting up to the shoulder so pipe is clearly visible through the inspection holes.



Step Three:
Position the crimp tool jaws centrally over the crimp ring at 90° to the pipe. Check the pipe and fitting are aligned correctly then close the handles of the tool to the stop point.



Step Four:
Check the completed crimp joint with the crimp gauge, the gauge must fit over the crimped area of the ring without using **any** force.



If the joint does not pass this test

1. Check the joint has been crimped
2. Remove fitting and replace
3. Adjust the crimping tool until the joints gauge correctly

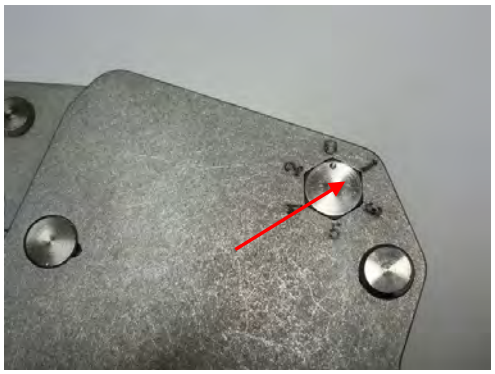
Note: Under-crimped joints must be replaced as joints should not be double crimped. Double crimping can lead to work hardening of the copper crimp ring and may cause future stress failures.

Tool Maintenance

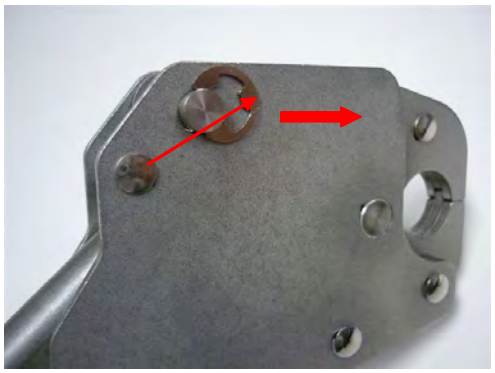
It is important to maintain and check your tool regularly as all mechanical devices wear with use. Unless it is adjusted to compensate the tool will not perform correctly which could lead to crimp failures.

Adjusting the Magnum Tool

1. Note the position of the dot on the hex adjustment bolt head in relation to the increments on the tool body.



2. Remove the circlip that holds the adjusting nut in place. (take care not to lose the clip)



3. Gently tap the adjusting bolt enough to clear the hex head from the body. (Take care not to push the bolt completely out). Turn the adjustment bolt to the next sequential number and push the bolt back into position in the tool body. (Do not turn more than one increment at a time).
   Note: The positions of the numbers.



4. Refit the circlip.



5. Check the tool is now correctly adjusted by crimping and gauging a joint. The gauge must pass freely over the crimp ring where it has been crimped. If this does not occur repeat the above steps or contact your local Dux representative.



Adjusting the Alba Tool

1. Close the handles fully.



2. Note the position of the alignment mark on the hex bolt head marked ‘ALBA’ in relation to the increment marks on the tool.



3. Loosen the Nylock nut.



4. Turn the hex adjusting bolt head one increment towards the + mark. (Clockwise to tighten, anti-clockwise - to loosen).



5. Hold the adjustment bolt head at its new position and re-tighten the Nylock nut.



6. Make a crimp joint and check that the joint gauge passes freely over the crimped area of the crimp ring. If the gauge does not fit repeat the above steps.

SECTION 3 - Installing SecuraGold™

The SecuraGold™ piping system is ideally suited to New Zealand building systems. Its flexibility enables long lengths to be quickly and easily manipulated through framing systems, under floors and in ceiling spaces with minimal joints.

Installation Guide

Site Preparation

a) Pre-plan the route you will take when laying the PB-1 pipe, a well set out installation will reduce wastage and time.
b) If possible mark and pre-drill holes in timber
c) Ensure you have the tools and product you will require during the installation, Cutters, crimping tool, gauge tool, pipe, fittings and pipe clips etc if required pipe bend assistors such as the Dux Centipede should be at hand.

Pipe Preparation

a) Only use an approved pipe cutter to cut PB-1, using other utensils can result in poor and erratic cuts.
b) Do not pull pipe tight during the installation, it is good practice to allow enough for expansion and contraction and generally 10mm per metre length would be adequate.
c) Check the condition of the pipe prior to installation, any cuts or damage to a pipe may result in premature pipe failure.

Installation

a) PB-1 pipe should not be kinked or buckled during installation; if this occurs the section affected should be cut out and removed.
b) When inserting pipe into a fitting push in fully and check that pipe can be seen in the two spy holes of the crimp ring.
c) Once crimped check the gauge of the crimp with the supplied gauge tool if it is correct carry on with the installation otherwise replace the fitting and re-calibrate your tool before any further fittings are crimped.
d) Fit pipe clips to support the PB-1 pipe at the recommended intervals.
e) At the end of the installation pressure test the installation as per AS/NZS 3500 standard.

Code of Practice and Local Authority Approvals

Dux SecuraGold™ has the Australian Standards Water Mark and complies with all necessary standards and therefore is approved by local authorities. However, special conditions may apply to some areas. Always check with your local authority before installation.

System Identification

All pipes and fittings are identified with the Dux name. Ensure that only pipe and fittings marked in this way are used to guarantee satisfactory performance and a long working life.

Electrical Earthing

Polybutene -1 is an insulator and must NOT be used for the earthing of electrical equipment.

Storage and Handling

Polybutene -1 is not UV resistant and should be stored under cover. In installations exposed to direct sunlight pipe work must be covered with a protective sleeve or painted to avoid exposure. Its flexibility permits considerable freedom of handling, but care should be taken not to cut abrade or crush the pipe. All fittings should be treated in a similar manner.

Cutting

It is important to ensure cut ends are square and clean. Rotate the pipe cutter while cutting pipe to avoid distortion. Remove any burrs.

Do not use a hacksaw to cut the pipe.

Bending

Polybutene -1 pipe can be repeatedly flexed without harm. The recommended minimum bending radius is eight times the diameter of the pipe. Where tighter bends are required, elbows or pipe supports must be used. Care should be taken to avoid over bending and buckling the pipe. If the pipe is accidentally 'Kinked' the damaged section must be replaced.

Timber Framework

Polybutene -1 may be installed in the traditional manner by running notches or chases, or by surface mounting. However the preferred method is to run the pipe through holes drilled through the neutral axis (centre) of studs, dwangs (noggings) or joists. The holes must be a minimum of 3mm larger than the pipes outside diameter as per the following table. To prevent rubbing or chafing of the pipe, neutral cure silicon can be used to fill the hole.

Table E: Recommended Hole Sizes PB-1 Pipe

Pipe Designation	Mean OD	Recommended Minimum Hole Size
12mm	12.93mm	16.00mm
15mm	16.31mm	19.50mm
20mm	22.84mm	26.00mm
28mm	28.50mm	31.50mm

Metal Framework

Polybutene -1 can be installed in metal framework but protection must be provided where the pipe passes through holes in the frame using a suitable sleeve or grommet to prevent any chafing or rubbing against the metal edges.

Under Concrete

Polybutene -1 can be installed under concrete in accordance with AS 3500 or to local authority requirements. Where pipe work enters or leaves a concrete slab it must be sleeved or passed through ducting to permit free movement for expansion and contraction to the full depth of the slab penetration.

Joints under Concrete: are not recommended and should be avoided where possible. However where joints are unavoidable they should be kept to a minimum and pressure tested before backfilling, all joints should be wrapped in an impermeable flexible material for protection and their positions noted accurately on 'As Built' drawings.

Concrete Walls: Polybutene -1 should be placed in a formed chase and wrapped with an impermeable flexible material. Joints should be avoided where possible.

Supports (Pipe Clips)

Where not fully supported Secura PB -1 piping needs to be clipped to avoid stress damage and for aesthetic reasons Dux Industries Limited recommend proprietary plastic clips that permit free thermal movement. The use of metal pipe clips is not recommended.

Support spacing must meet the requirements of AS/NZS 3500.



Figure11 – Dux Pipe Clips

Table F: Pipe Clip Spacing

Pipe Size	Horizontal Clip Distance		Vertical Clip Distance
	Hot	Cold	
12mm (Type 15)	500mm	600mm	1200mm
15mm (Type 18)	500mm	600mm	1200mm
20mm (Type 22)	600mm	700mm	1400mm
28mm	600mm	750mm	1500mm
Continuous Support Tray	2.5m		

Tension

Do not pull the pipe tight during installation as this will restrict pipe movement during expansion and contraction.

Expansion

The linear expansion rate for polybutene -1 is approximately 13mm per 10°C temperature change for every 10m of pipe. Make allowance for expansion based on this value. For most installations this low expansion rate combined with the pipe's inherent flexibility eliminates the need to allow for expansion so long as the pipes are not anchored rigidly or pulled tight between fixed points.

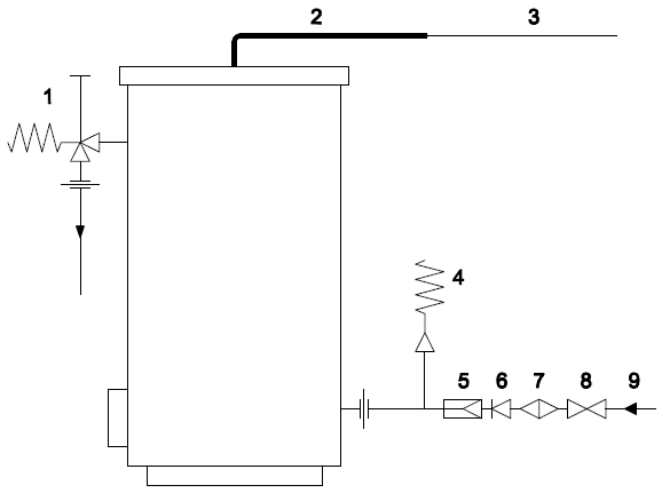
Testing

In accordance with AS/NZS 3500.1.2, the installation must be pressure tested after installation to a hydrostatic pressure of 1500 kPa for a period of not less than 30 minutes using cold water only.

Pressure testing before wall lining is good trade practice and is strongly recommended.

Note: When pressure testing additions to an existing installation it is advisable to cap the addition and test independently as the existing pipe work and fixtures may be damaged by the high test pressure.

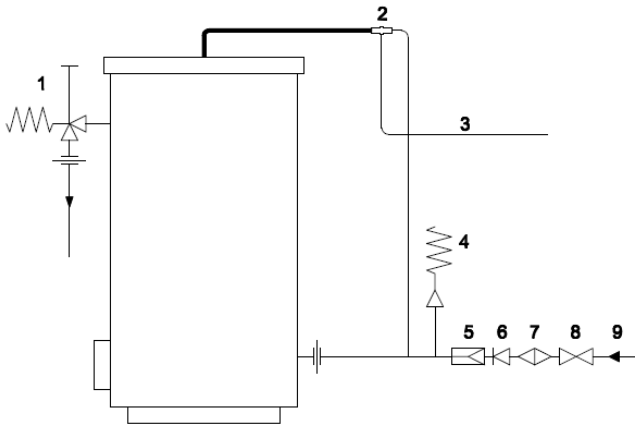
Hot Water Cylinders Typical Installations



Typical Industrial High Pressure System
Potable Water – Not Personal Hygiene

1. Temperature Pressure Relief Valve
2. One Metre Copper Pipe
3. Hot Water Supply PB-1 Pipe
4. Pressure Limiting Valve 350kPa
5. Expansion Control Valve 550kPa
6. Non Return Valve
7. Line Strainer (Where required)
8. Isolating Valve
9. Mains Water Supply PB-1 Pipe

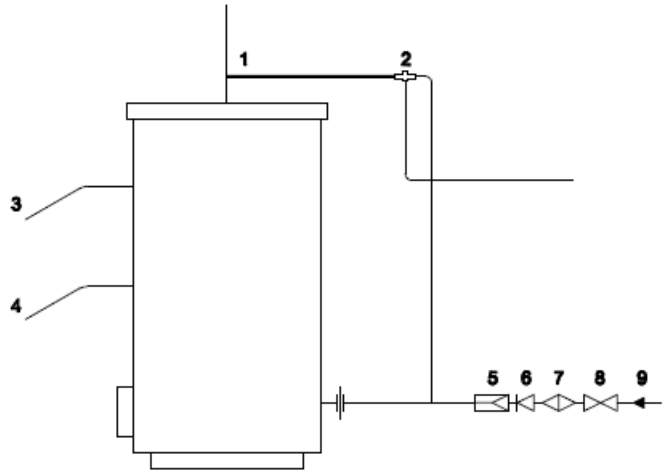
Figure 12



High Pressure Valve Sequence Potable Hot Water – For Personal Hygiene

1. Temperature Pressure Relief Valve 700kPa
2. Tempering Valve
3. Hot Water Supply PB-1 Pipe
4. Expansion Valve
5. Limiting Valve
6. Non Return Valve
7. Line Strainer (Where Required)
8. Isolating Valve
9. Mains Water Supply Pb-1 Pipe

Figure 13



Low Pressure Valve Sequence Potable Hot Water – For Personal Hygiene

1. Header Pipe and Vent
2. Tempering Valve
3. Return From “Wetback” (Back Boiler) If Required
4. To “Wetback” If Required
5. Pressure Reducing Valve
6. Non Return Valve
7. Line Strainer (Where Required)
8. Isolating Valve
9. Mains Water Supply PB-1 Pipe

Figure 14

Section 4 SecuraGold™ – The Range

Dux Industries Limited supplies the largest range of Polybutene -1 pipe coupled with the largest range of fittings available in New Zealand.



The newest addition to the SecuraGold™ range maximises water saving while delivering excellent flow rates.



The industry standard giving high volume supply in a flexible easy to handle size

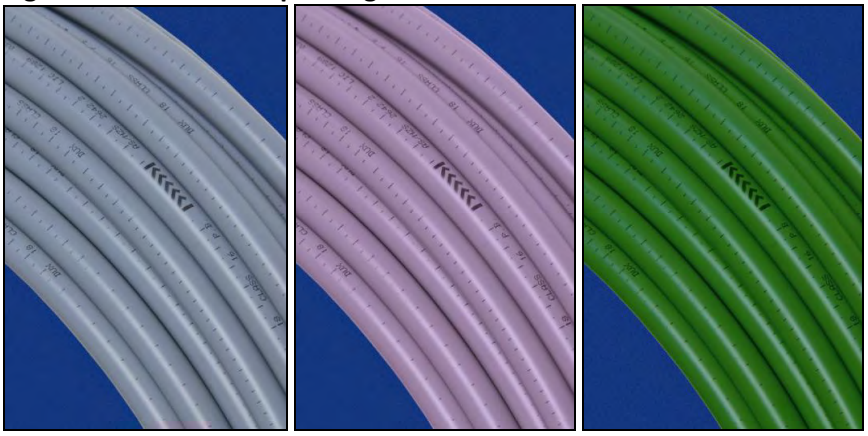


High volume supply this pipe will give you the volume you require but also gives you flexibility during installation



Maximum supply with minimum pressure drop, when you need volume this large bore pipe will deliver, ideal for a ring main situation

Figure 15 – The PB-1 Pipe Range



POTABLE WATER **RECYCLED WATER** **NON-POTABLE RAINWATER**

PIPE CODES

PIPE	GREY (Potable Water)	LILAC (Recycled Water)	GREEN (Rainwater)
12mm x 5m	N2PS5		
12mm x 100m	N2PC100		
12mm x 50m	N2PC50		
15mm x 5m	N3PS5	N3PS5L	N3PS5G
15mm x 25m*	N3PC25	N3PC25L	N3PC25G
15mm x 50m	N3PC50	N3PC50L	
15mm x 100m	N3PC100		
20mm x 5m	N4PS5	N4PS5L	N4PS5G
20mm x 25m*	N4PC25	N4PC25L	N4PC25G
20mm x 50m	N4PC50	N4PC50L	
28mm x 5m	N5PC5		
28mm x 25m*	N5PC25		

*Lay Straight Coil

THE SECURAGOLD™ FITTINGS

	**COUPLINGS**
SC2 – 12mm	**SC24 – 20mm x 12mm (Reducing)**
SC3 – 15mm	**SC32 – 15mm x 12mm (Reducing)**
SC4 – 20mm	**SC43 – 20mm x 15mm (Reducing)**
SC5 – 28mm	**SC54 – 28mm x 20mm (Reducing)**

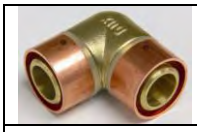
	**BRASS MALE ADAPTORS**
SAM3 – 15mm x ½" BSP	**SAM23 – 12mm x ½" BSP**
SAM4 – 20mm x ¾" BSP	**SAM43 – 15mm x ¾" BSP**
SAM5 – 28mm x 1" BSP	

	**REDUCING TEES**
ST223 – 12mm x 12mm x 15mm	**ST434 – 20mm x 15mm x 20mm**
ST224 – 12mm x 12mm x 20mm	**ST442 – 20mm x 20mm x 12mm**
ST332 – 15mm x 15mm x 12mm	**ST443 – 20mm x 20mm x 15mm**
ST334 – 15mm x 15mm x 20mm	**ST553 – 28mm x 28mm x 15mm**
ST433 – 20mm x 15mm x 15mm	**ST554 – 28mm x 28mm x 20mm**

	**TEES**
ST2 – 12mm	**ST4 – 20mm**
ST3 – 15mm	**ST5 – 28mm**

	**FEMALE LUGGED TEES**
SWT3 – 15mm x ½" BSP	

	**CROX TEE ADAPTORS**
SXT3 – 15mm x ½" BSP	

	**ELBOWS 90°**
SE2 – 12mm	**SE5 – 28mm**
SE3 – 15mm	**SE43 – 20mm x 15mm (Reducing)**
SE4 – 20mm	**SE54 – 28mm x 20mm (Reducing)**

	**ELBOWS 45°**
SE3045 – 15mm	**SE5045 – 28mm**
SE4045 – 20mm	

	**WINGBACK ELBOW MALE**
SWM3 – 15mm x ½" BSP (65mm L)	**SWM3100 – 15mm x ½" BSP (100mm L)**
SWM4 – 20mm x ¾" BSP (75mm L)	**SWM4100 – 20mm x ¾" BSP (100mm L)**

	**WINGBACK ELBOW FEMALE**
SW3 – 15mm x ½" BSP	**SW34 – 15mm x ¾" BSP**
SW4 – 20mm x ¾" BSP	**SW43 – 20mm x ½" BSP**
SW23 – 12mm x ½" BSP	

	**DOUBLE FIX WINGBACK MALE**
SDWM3100 – 15mm x 100mm x ½" BSP	**SDWM4100 – 15mm x 100mm x ¾" BSP**

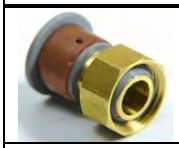
	**DOUBLE FIX WINGBACK FEMALE**
SDW3 – 15mm x ½" BSP	**SDW34 – 15mm x ¾" BSP**

SDW4 – 20mm x ¾" BSP	**SDW43 – 20mm x ½" BSP**
SDW5 – 28mm x 1" BSP	**SDW53 – 28mm x ½" BSP**

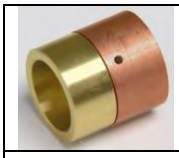
	**MANIFOLD**
SMF4203 – 20mm x 3 – 12mm Outlet	**SMF4303 – 20mm x 3 – 15mm Outlet**
SMF4204 – 20mm x 4 – 12mm Outlet	**SMF4304 – 20mm x 4 – 15mm Outlet**

	**THREADED ELBOWS MALE**
SEM3 – 15mm x ½" BSP	**SEM5 – 28mm x 1" BSP**
SEM4 – 20mm x ¾" BSP	

	**HOSEPLATE FEMALE**
SH3 – 15mm x ½" BSP	**SH53 – 28mm x ½" BSP**
SH4 – 20mm x ¾" BSP	

	**BSP SWIVEL ELBOW**
SXE23 – 12mm x ½" BSP	**SXE43 – 20mm x ½" BSP**
SXE24 – 12mm x ¾" BSP	**SXE4 – 20mm x ¾" BSP**
SXE3 – 15mm x ½" BSP	**SXE5 – 28mm x 1" BSP**
SXE34 – 15mm x ¾" BSP	
	**BSP SWIVEL CONNECTORS**
SXC23 – 12mm x ½" BSP	**SXC43 – 20mm x ½" BSP (Reducing)**
SXC3 – 15mm x ½" BSP	**SXC5 – 28mm x 1" BSP**
SXC4 – 20mm x ¾" BSP	**SXC54 – 28mm x ¾" BSP (Reducing)**

	**BLANK PLUGS**
SBP2 – 12mm	**SBP4 – 20mm**
SBP3 – 15mm	**SBP5 – 28mm**

	**BRAZING TAIL**
SBT3 – 15mm	**SBT4 – 20mm**

	**PLUGGED NIPPLE**
NPN3 – 15mm	**NPN4 – 20mm**

	**CRIMP RINGS (COPPER)**
SR2 – 12mm	**SR4 – 20mm**
SR3 – 15mm	**SR5 – 28mm**

	**PIPE CLIPS (SINGLE NAIL)**
PS2 – 12mm (Grey)	**PS4 – 20mm (Grey)**
PS3 – 15mm (Grey)	**PS5 – 28mm (Grey)**

Chemical Resistance of Polybutene -1 *KEY: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Acetaldehyde	L	U	Ammonium Metaphosphate	E	E
Acetate Solvents - Crude	E	L	Ammonium Nitrate	E	E
Acetate Solvents - Pure	E	L	Ammonium Persulphate	E	E
Acetic Acid 0 – 10%	E	E	Ammonium Phosphate (Ammoniacal)	E	E
Acetic Acid 10 – 20%	E	E	Ammonium Phosphate (Neutral)	E	E
Acetic Acid 20 – 30%	E	G	Ammonium Sulphate	E	E
Acetic Acid 30 – 60%	E	L	Ammonium Sulphide	E	E
Acetic Acid 80%	E	E	Ammonium Thiocyanate	E	E
Acetic Acid - Glacial	U	U	Amyl Alcohol	E	E
Acetic Acid Vapours	E	L	Aniline	L	L
Acetic Anhydride	U	U	Aniline Chlorohydrate	U	U
Acetone	E	G	Aniline Hydrochloride	U	U
Acetylene	L	U	Anthraquinone	L	U
Adipic Acid	E	L	Anthraquinone Sulphonic Acid	L	U
Allyl Alcohol 96%	E	G	Antimony Trichloride	E	E
Allyl Chloride	E	G	Aqua Regia	U	U
Alum	L	U	Arsenic Acid 60%	E	E
Aluminium Chloride	E	E	Asphalt	E	G
Aluminium Fluoride	E	E	Barium Carbonate	E	E
Aluminium Hydroxide	E	E	Barium Chloride	E	E
Aluminium Oxychloride	E	E	Barium Hydroxide	E	E
Aluminium Nitrate	E	E	Barium Sulphate	E	E
Aluminium Sulphate	L	U	Barium Sulphide	E	E
Ammonia – Dry Gas	E	E	Beer	E	E
Ammonia - Liquid	G	L	Beet – Sugar Liquor	E	E
Ammonium Biflouride	E	E	Benzaldehyde	L	U
Ammonium Carbonate	E	E	Benzene	U	U
Ammonium Chloride	E	E	Benzoic Acid	E	E
Ammonium Fluoride 25%	E	L	Benzol	U	U
Ammonium Hydroxide 28%	E	E	Bismouth Carbonate	E	E

Chemical Resistance of Polybutene-1 *Key: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Black Liquor (Paper Industry)	E	E	Castor Oil	E	E
Bleach – 12.5% Active CL	G	G	Caustic Potash	G	L
Borax	E	E	Caustic Soda	G	L
Boric Acid	E	E	Cellosolve	E	G
Boron Trifluoride	E	E	Chloracetic Acid	U	U
Breeder Pellets – Deriv. Fish	E	E	Chloral Hydrate	U	U
Brine	E	E	Chlorine Gas (Dry)	U	U
Bromic Acid	E	E	Chlorine Gas (Moist)	U	U
Bromine - Liquid	U	U	Chlorine Water	E	G
Bromine - Water	L	U	Chlorobenzene	U	U
Butane	U	U	Chloroform	L	U
Butanol - Primary	E	-	Chlorosulphonic Acid	-	U
Butanol - Secondary	E	-	Chrome Alum	E	E
Butyl Acetate	L	U	Chromic Acid 10%	E	E
Butyl Alcohol	E	E	Chromic Acid 25%	E	E
Butyric Acid 20%	E	L	Chromic Acid 30%	E	E
Calcium Bisulphite	E	E	Chromic Acid 40%	E	-
Calcium Carbonate	E	E	Chromic Acid 50%	G	-
Calcium Chlorate	E	E	Citric Acid	E	E
Calcium Chloride	E	E	Coconut Oil	G	G
Calcium Hydroxide	E	E	Copper Chloride	E	E
Calcium Hypochlorite	E	E	Copper Cyanide	E	E
Calcium Nitrate	E	E	Copper Fluoride 2%	E	E
Calcium Sulphate	E	E	Copper Nitrate	E	E
Cane Sugar Liquors	E	E	Copper Sulphate	E	E
Carbon Bisulphide	U	U	Core Oils	E	E
Carbon Dioxide (Aqueous Solution)	E	E	Cottonseed Oil	E	E
Carbon Dioxide Gas (Wet)	E	E	Cresol	U	U
Carbon Monoxide	E	E	Cresylic Acid 50%	U	U
Carbon Tetrachloride	U	U	Crude Oil - Sour	L	U
Carbonic Acid	E	E	Crude Oil - Sweet	L	U
Casein	E	E	Cyclohexanol	G	L

Chemical Resistance of Polybutene-1 *Key: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Cyclohexanon	U	U	Formaldehyde	E	E
Demineralised Water	E	E	Formic Acid	E	E
Dextrin	E	E	Freon - 12	E	G
Dextrose	E	E	Fructose	E	E
Diazo Salts	E	E	Fruit Pulps and Juices	E	E
Diglycolic Acid	E	E	Fuel Oil (Containing H2S04)	U	U
Dimethylamine	U	U	Gallic Acid	E	E
Dioctylpthalate	L	U	Gas – Coke Oven	E	L
Disodium Phosphate	E	E	Gas - Manufactured	E	L
Distilled Water	E	E	Gas – Natural (Dry)	E	L
Ethers	U	U	Gas – Natural (Wet)	E	L
Ethyl Acetate	L	U	Gasoline - Refined	U	U
Ethyl Alcohol 0- 50%	E	E	Gasoline - Sour	U	U
Ethyl Alcohol 50 – 98%	E	E	Gelatine	E	E
Ethyl Ether	L	U	Glucose	E	E
Ethylene Bromide	U	U	Glycerine (Glycerol)	E	E
Ethylene Chlorohydrin	U	U	Glycol	E	E
Ethylene Dichloride	G	G	Glycolic Acid 30%	E	E
Ethylene Glycol	E	E	Green Liquor (Paper Industry)	U	U
Fatty Acids	E	G	Heptane	U	U
Ferric Chloride	E	E	Hexme	E	G
Ferric Nitrate	E	E	Hexanol, Tertiary	E	E
Ferric Sulphate	E	E	Hydrobromic Acid 20%	E	E
Ferrous Chloride	E	E	Hydrochloric Acid 0 – 25%	E	E
Ferrous Sulphate	E	E	Hydrochloric Acid 25 – 40%	E	E
Fish Solubles	E	E	Hydrocyanic Acid or Hydrogeo Cyanide	E	E
Fluorine Gas - Dry	L	U	Hydrofluoric Acid 10%	E	E
Fluorine Gas - Wet	L	U	Hydrofluoric Acid 48%	E	E
Fluoroboric Acid	E	E	Hydrofluoric Acid 60%	E	E
Fluorosilicic Acid	E	E	Hydrogen	E	E
Food Products such as Milk, Buttermilk, Molasses, Salad Oils, Fruit	E	E	Hydrogen Peroxide 30%	E	G

Chemical Resistance of Polybutene-1 *Key: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Hydrogen Peroxide 50%	U	U	Methyl Chloride	U	U
Hydrogen Peroxide 90%	U	U	Methyl Ethyl Ketone	E	L
Hydrogen Phosphide	E	E	Methyl Sulphuric Acid	E	E
Hydrogen Sulphide Aqueous Solution	E	E	Methylene Chloride	G	L
Hydrogen Sulphide - Dry	E	E	Milk	E	E
Hydroquinone	E	E	Mineral Oils	L	U
Hypochlorous Acid	E	E	Molasses	E	E
Iodine (In Alcohol)	U	U	Naphthalene	G	U
Isopropylalcohol	E	E	Nickel Acetate	E	E
Kerosene	L	U	Nickel Chloride	E	E
Kraft Liquor (Paper Industry)	E	E	Nickel Nitrate	E	E
Lactic Acid 28%	E	E	Nickel Sulphate	E	E
Lard Oil	G	L	Nicotine	E	E
Lauryl Chloride	G	L	Nicotine Acid	E	E
Lead Acetate	E	E	Nitric Acid 10%	L	U
Lime Sulphur	E	E	Nitric Acid 20%	U	U
Linoleic Acid	E	E	Nitric Acid 35%	U	U
Linseed Oil	E	E	Nitric Acid 40%	U	U
Liquors	E	E	Nitric Acid 60%	U	U
Lubricating Oils	E	E	Nitric Acid 68%	U	U
Magnesium Carbonate	E	E	Oils and Fats	E	E
Magnesium Chloride	E	E	Oleum	U	U
Magnesium Hydroxide	E	E	Oxalic Acid	E	G
Magnesium Nitrate	E	E	Perchloric Acid 10%	L	U
Magnesium Sulphate	E	E	Perchloric Acid 70%	U	U
Maleic Acid	E	E	Phenol	E	L
Malic Acid	E	E	Phosphoric Acid 0 – 25%	E	E
Mercuric Chloride	E	E	Phosphoric Acid 25 – 50%	E	G
Mercuric Cyanide	E	E	Phosphoric Acid 50 – 75%	G	L
Mercurous Nitrate	E	E	Photographic Chemicals	E	E
Mercury	E	E	Picric Acid	E	E
Methyl Alcohol	E	E	Potassium Acid Sulphate	E	E

Chemical Resistance of Polybutene-1 *Key: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Potassium Bicarbonate	E	E	Silver Plating Solutions	E	G
Potassium Bichromate	L	U	Soaps	E	E
Potassium Borate 1%	E	E	Sodium Acetate	E	E
Potassium Borate 10%	E	E	Sodium Acid Sulphate	E	E
Potassium Bromide	E	E	Sodium Antimonate	E	E
Potassium Carbonate	E	E	Sodium Arsenite	E	E
Potassium Chlorate	E	E	Sodium Benzoate	E	E
Potassium Chloride	E	E	Sodium Bicarbonate	E	E
Potassium Chromate 40%	E	E	Sodium Bisulphate	E	E
Potassium Cuprocyanide	E	E	Sodium Bisulphite	E	E
Potassium Cyanide	E	E	Sodium Bromide	E	E
Potassium Dichromate 40%	E	E	Sodium Carbonate (Soda Ash)	E	E
Potassium Ferricyanide	E	E	Sodium Chlorate	E	E
Potassium Fluoride	E	E	Sodium Chloride	E	E
Potassium Hydroxide 10%	E	E	Sodium Cyanide	E	E
Potassium Hydroxide 20%	E	E	Sodium Dichromate	E	E
Potassium Nitrate	E	E	Sodium Ferricyanide	E	E
Potassium Perborate	E	E	Sodium Ferrocyanide	E	E
Potassium Perchlorate	E	E	Sodium Fluoride	E	E
Potassium Permanganate 10%	E	E	Sodium Hydroxide 10%	E	E
Potassium Persulphate	E	E	Sodium Hydroxide 35%	E	E
Potassium Sulphate	E	E	Sodium Hydroxide Saturated	E	E
Potassium Sulphide	E	E	Sodium Hypochlorite	E	E
Potassium Thiosulphate	E	E	Sodium Nitrate	E	E
Propane	E	-	Sodium Nitrite	E	E
Propyl Alcohol	E	E	Sodium Phosphate - Acid	E	E
Rayon Coagulating Bath	E	E	Sodium Silicate	E	E
Salt Water	E	E	Sodium Sulphate	E	E
Selenic Acid	E	G	Sodium Sulphide	E	E
Silicic Acid	E	G	Sodium Sulphate	E	E
Silver Cyanide	E	E	Sodium Thiosulphate (Hypo)	E	E
Silver Nitrate	L	U	Stannic Chloride	E	E

Chemical Resistance of Polybutene-1 *Key: E = Excellent, G = Good, L = Limited, U = Unsuitable*

	Temperature			Temperature	
	22°C	66°C		22°C	66°C
Stannous Chloride	E	E	Trichloroethylene	U	U
Stoddards Solvent	E	E	Triethanolamine	E	L
Stearic Acid	E	E	Trisodium Phosphate	E	E
Sulphur	E	E	Turpentine	U	U
Sulphur Dioxide Gas - Wet	E	L	Urea	E	E
Sulphuric Acid 0 – 1%	E	E	Urine	E	E
Sulphuric Acid 10 – 30%	E	E	Vinegar	E	E
Sulphuric Acid 30 – 50%	E	E	Water – Acid Mine Water	E	E
Sulphuric Acid 50 – 75%	L	U	Water - Distilled	E	E
Sulphuric Acid 75 – 90%	L	U	Water - Fresh	E	E
Sulphuric Acid 95%	U	U	Water - Salt	E	E
Sulphurous Acid	E	E	Whiskey	E	E
Sulphur Trioxide	L	U	White Gasoline	U	U
Tannic Acid	E	E	Wines (Still)	E	E
Tanning Liquors	E	G	Xylene or Xylol	U	U
Tattaric Acid	E	E	Zinc Chromate	E	E
Tetrahydrofurane	L	U	Zinc Cyanide	E	E
Thionyl Chloride	E	E	Zinc Nitrate	E	E
Toluol or Toluene	U	U	Zinc Sulphate	E	E

DISCLAIMER: All information supplied is considered accurate but is furnished upon the express condition that the person receiving it shall make his own tests to determine its suitability for his particular purpose. No warranty is expressed or implied regarding such information, the data upon which same is based, or the results to be obtained from the use thereof and any product shall be merchantable and fit for any particular purpose; or that the use of such other information or product will not infringe any patent.

FLOW RATE CALCULATIONS

There are a number of factors involved with the calculation of friction loss through pipes and fittings that need to be taken into account, these being Velocity, Reynolds number (roughness of the pipe bore), Temperature and Density of the water, the length of pipe and finally the Head Pressure. Below is an example of the calculations required to determine the pressure drop in a 15mm PB-1 pipe.

To calculate the velocity of water through a 15mm pipe: **$v = Q \times 21.22/D^2$**

Pipe Ø	Flow Rate l/min (Q)	Constant	D^2	m/second
15mm	12	21.22	169.2601	1.50

At a flow rate of 12 litres per minute the velocity of water through the pipe would be 1.5 m/sec

To calculate the Reynolds number (Re): **Re=1000 x v x D/kv**

Pipe Ø	Constant	Velocity (m/sec)	Diameter of Bore in mm	Kinematic Velocity (kv)	Reynolds number (Re)
15mm	1000	V = 1.50	D = 13.01	Kv = 1.004	Re = 19494.66

The Reynolds number is 19494.66, this number determines the type of flow characteristic passing through the pipe. Flow can be either Laminar or Turbulent when passing through a pipe and this during the calculations can be determined if the Reynolds number is less or greater than 2300. A number <2300 is Laminar while >2300 the flow is deemed to be Turbulent. Flows through average household plumbing systems would be deemed Turbulent.

Turbulent flow **$f=0.3164 \times Re^{-0.25}$**

0.3164	Constant number
0.084629368	$0.3164 \times 19494.66^{-0.25}$
0.026776732	**Total Friction Factor**

This number is the friction factor in relation to the flow, the Reynolds number and the Kinematic Velocity @ 20°C

The final calculation for the expected pressure drop is: **$\Delta p = v^2 \times f \times L \times p/2D$**

Velocity $(v)^2$	Friction Factor (f)	(L) Length of Pipe (m)	(p) Density kg/m^3	2 x Diameter in Meters	Δp (Pascal)	kPa
2.2633	0.026776732	10	998.21	0.02602	23249.64	23.250

The expected pressure drop for a 10m length of 15mm PB-1 pipe at a flow rate of 12 l/min would be 23.250 kPa or 3.372 PSI

The two factors that have not as yet been explained are Kinematic velocity and density. The following tables show their relationship to water temperature.

Kinematic velocity relates to the movement or flow of water through a pipe and the interaction of the water with the wall of the pipe. This acts very much in the favour of PB-1 pipe as the wall surface is very smooth in comparison to steel. Velocity is affected by changes in temperature as shown in Table G.

Density is also affected by temperature and will change as the temperature increases or decreases as is shown in Table H.

Temperature – Kinematic Velocity @ °C			
°C	Centistokes (cSt)	°C	Centistokes (cSt)
20	1.004	70	0.413
30	0.801	80	0.365
40	0.658	90	0.326
50	0.553	100	0.294
60	0.475		

Table G

Viscosity – Density of Water @°C			
°C	Kg/m^3	°C	Kg/m^3
20	998.21	70	977.77
30	995.65	80	971.80
40	992.22	90	965.32
50	988.04	100	958.37
60	983.20		

Table H

A further factor to take into account is head pressure when lifting pipes up into an attic space or second storey. Each metre rise is equivalent to approximately 10 kPa lost pressure so this should be factored into the final calculation.

Fittings affect pressure loss and can either be calculated to each fitting configuration or allocated an equivalent pipe length in metres.

The equivalent pipe lengths in Table I are an estimate and slight variations would be seen with differing flow rates and temperatures but have been designed to accommodate these changes as far as possible.

Fitting Description	Code	Line Flow (m)	Branch Flow (m)		Fitting Description	Code	Line Flow (m)	Branch Flow (m)
Coupling	SC2	0.4			BSP Swivel Elbow	SXE23	0.9	
Coupling	SC3	0.5			BSP Swivel Elbow	SXE24	0.9	
Coupling	SC4	0.7			BSP Swivel Elbow	SXE34	1.1	
Coupling	SC5	1			BSP Swivel Elbow	SXE43	1.6	
Coupling	SC24	0.8						
Coupling	SC32	0.7			Elbow 90°	SE4	1.3	
Coupling	SC43	1			Elbow 90°	SE5	1.6	
Coupling	SC54	1.3			Elbow 90°	SE43	1.5	
					Elbow 90°	SE54	1.8	
Male Adaptor	SAM3	0.5						
Male Adaptor	SAM4	0.7			Elbow 45°	SE3045	0.2	
Male Adaptor	SAM5	1			Elbow 45°	SE4045	0.3	
Male Adaptor	SAM23	0.4			Elbow 45°	SE5045	0.4	
Male Adaptor	SAM43	0.5						
					Wingback Elbow (M)	SWM3	1.3	
Reducing Tee	ST223	0.4	1.1		Wingback Elbow (M)	SWM4	1.5	
Reducing Tee	ST224	0.4	1.1		Wingback Elbow (M)	SWM3100	1.5	
Reducing Tee	ST332	0.5	1.3		Wingback Elbow (M)	SWM4100	1.7	
Reducing Tee	ST334	0.5	1.3					
Reducing Tee	ST433	0.6	1.3		Wingback Elbow (F)	SW3	1.1	
Reducing Tee	ST434	0.8	1.6		Wingback Elbow (F)	SW4	1.3	
Reducing Tee	ST442	0.7	1.6		Wingback Elbow (F)	SW23	0.9	
Reducing Tee	ST443	0.7	1.6		Wingback Elbow (F)	SW34	1.1	
Reducing Tee	ST553	1	2		Wingback Elbow (F)	SW43	1.5	
Reducing Tee	ST554	1	2					
					Double Fix Wingback (M)	SDWM3100	1.5	
Equal Tee	ST2	0.4	1.1		Double Fix Wingback (M)	SDWM4100	1.7	
Equal Tee	ST3	0.5	1.3					
Equal Tee	ST4	0.7	1.6		Double Fix Wingback (F)	SDW3	1.1	
Equal Tee	ST5	1	2		Double Fix Wingback (F)	SDW4	1.3	
					Double Fix Wingback (F)	SDW5	1.6	
Female Lugged Tee	SWT3	0.5	1.3		Double Fix Wingback (F)	SDW34	1.1	
					Double Fix Wingback (F)	SDW43	1.5	
Crox Tee Adaptor	SXT3	0.5	1.3		Double Fix Wingback (F)	SDW53	1.8	
Elbow 90°	SE2	0.9			Manifold	SMF4203		1.3
Elbow 90°	SE3	1.1			Manifold	SMF4204		1.6
					Manifold	SMF4303		1.3
Threaded Elbow (M)	SEM3	1.1			Manifold	SMF4304		1.6
Threaded Elbow (M)	SEM4	1.3						
Threaded Elbow (M)	SEM5	1.6			BSP Swivel Connector	SXC3	0.5	
					BSP Swivel Connector	SXC4	0.7	
Hose Plate (F)	SH3	0.5			BSP Swivel Connector	SXC5	1	
Hose Plate (F)	SH4	0.7			BSP Swivel Connector	SXC23	0.5	
Hose Plate (F)	SH53	1			BSP Swivel Connector	SXC43	0.5	
					BSP Swivel Connector	SXC54	1.3	
BSP Swivel Elbow	SXE3	1.1						
BSP Swivel Elbow	SXE4	1.3						
BSP Swivel Elbow	SXE5	1.6						

Table I

Once the fittings have been added together this metre length can then be added to the total overall length to complete the calculation.

Table J - Acceptable flow rates to sanitary fixtures in NZBC G12/AS1

Appliance	Flow Litre/Sec	Flow Litre/Min	Requirement
Bath	0.3l/s at 45°C	18 l/min	Mix hot and cold water to achieve 45°C
Sink	0.2 l/s at 60°C	12 l/min	Flow rates required at both hot and cold taps but not simultaneously
Laundry Tub	0.2 l/s at 60°C	12 l/min	Flow rates required at both hot and cold taps but not simultaneously
Basin	01 l/s at 45°C	6 l/min	Mix hot and cold water to achieve 45°C
Shower	01 l/s at 45°C	6 l/min	Mix hot and cold water to achieve 42°C

The tables below show examples of pipe length calculations at varying flow rates, length and temperatures.

Table k – 12mm PB-1 Pipe

12mm PB-1 kPa Pressure Drop at 6 l/min				12mm PB-1 kPa Pressure Drop at 12 l/min			12mm PB-1 kPa Pressure Drop at 18 l/min		
Length (m)	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**
1	2.9	2.3	2.2	9.7	8.0	7.4	19.7	16.1	14.9
5	14.4	11.7	10.9	48.7	39.8	36.8	98.7	80.6	74.6
10	28.7	23.5	21.7	97.3	79.5	73.6	197.4	161.3	149.3
20	57.5	46.9	43.4	194.7	159.0	147.2	394.9	322.6	298.5
25	71.8	58.7	54.3	243.4	198.8	184.0	493.6	403.2	373.1

Table L – 15mm PB-1 Pipe

15mm PB-1 kPa Pressure Drop at 6 l/min				15mm PB-1 kPa Pressure Drop at 12 l/min			15mm PB-1 kPa Pressure Drop at 18 l/min		
Length (m)	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**
1	0.7	0.6	0.5	2.3	1.9	1.7	4.7	3.9	3.6
5	3.4	2.8	2.6	11.6	9.4	8.7	23.7	19.4	17.9
10	6.9	5.6	5.2	23.1	18.9	17.5	47.4	38.7	35.8
20	13.7	11.2	10.4	46.2	37.8	34.9	94.8	77.5	71.7
25	17.2	14.0	13.0	57.8	47.2	43.7	118.5	96.8	89.6

Table M – 20mm PB-1 Pipe

20mm PB-1 kPa Pressure Drop at 6 l/min				20mm PB-1 kPa Pressure Drop at 12 l/min			20mm PB-1 kPa Pressure Drop at 18 l/min		
Length (m)	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**
1	0.1	0.1	0.1	0.4	0.4	0.3	0.9	0.7	0.7
5	0.6	0.5	0.5	2.2	1.8	1.7	4.5	3.7	3.4
10	1.3	1.1	1.0	4.4	3.6	3.4	9.0	7.3	6.8
20	2.6	2.1	1.9	8.9	7.3	6.7	17.9	14.6	13.5
25	3.2	2.6	2.4	11.1	9.1	8.4	22.4	18.3	16.9

Table N – 28mm PB-1 Pipe

28mm PB-1 kPa Pressure Drop at 6 l/min				28mm PB-1 kPa Pressure Drop at 12 l/min			28mm PB-1 kPa Pressure Drop at 18 l/min		
Length (m)	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**	**20°C**	**60°C**	**80°C**
1	0.1	0.0	0.0	0.2	0.1	0.1	0.3	0.3	0.3
5	0.3	0.2	0.2	0.8	0.7	0.6	1.7	1.4	1.3
10	0.5	0.4	0.4	1.6	1.3	1.2	3.3	2.7	2.5
20	1.0	0.8	0.8	3.2	2.7	2.5	6.7	5.5	5.1
25	1.3	1.0	0.9	4.1	3.3	3.1	8.4	6.8	6.3

The above calculations have been independently verified by:
Professor Bruce Melville, FRSNZ, FIPENZ
Professor and Head of Department
Department of Civil and Environmental Engineering
The University of Auckland

Please refer to the New Dux website: www.dux.co.nz for an easy to use Flow Rate Calculator.

Water and Energy Conservation

Energy and Water efficiency concerns determine a set volume of hot water to be held in a pipe length feeding from a hot water heater to a fixture such as a kitchen tap.
Table O calculates the volume held by PB-1 pipe at varying lengths in all of the pipe diameters available in the SecuraGold™ range. 12mm PB-1 pipe is eminently suited to carrying hot water to a fixture and at 25 metres it will hold 1.825 litres of water ensuring a fast and efficient supply of hot water when required.

Table O – Pipe Volumes

PB-1 Pipe Volume in Litres				
Length (m)	**12mm**	**15mm**	**20mm**	**28mm**
1	0.073	0.133	0.269	0.408
5	0.365	0.665	1.345	2.04
10	0.73	1.33	2.69	4.08
15	1.095	1.995	4.035	6.12
20	1.46	2.66	5.38	8.16
25	1.825	3.325	6.725	10.2

Table O outlines the volume of water held in a PB-1 pipe per meter length, for further sizing multiply the length of the pipe run by the one metre volume.

Table P – Pressure Conversion

kPa	Bar	P.S.I.	Mpa	Metre Head
5	0.05	0.72	0.005	0.5
10	0.1	1.45	0.01	1
20	0.2	2.90	0.02	2
30	0.3	4.35	0.03	3
40	0.4	5.80	0.04	4
50	0.5	7.25	0.05	5
60	0.6	8.70	0.06	6
70	0.7	10.15	0.07	7
80	0.8	11.60	0.08	8
90	0.9	13.05	0.09	9
100	1.0	14.50	0.10	10
150	1.5	21.76	0.15	15
200	2.0	29.00	0.20	20
250	2.5	36.26	0.25	25
300	3.0	43.50	0.30	30
350	3.5	50.76	0.35	35
400	4.0	58.00	0.40	40
450	4.5	65.27	0.45	45
500	5.0	72.50	0.50	50
1000	10.0	145.00	1.00	100

Definition of Terms

Dezincification	Dezincification of brass is a form of selective corrosion that happens when Zinc is leached out of the alloy leaving a porous copper fitting.
Dezincification Resistant (DZR/DR)	Dezincification Resistant brass is a specifically modified brass alloy purposefully made to be suitable for potable water reticulation.
Elastic Modulus	Elastic Modulus or Modulus of Elasticity is the mathematical description of an object or substance's tendency to be deformed elastically (i.e. non-permanently) when a force is applied to it.
EVA	Ethylene Vinyl Acetate is the co polymer of Ethylene and Vinyl Acetate. It is a polymer that approaches elastomeric materials in softness and flexibility but can be processed like other thermoplastics.
Hydrostatic Pressure	The pressure exerted by a fluid at equilibrium at a given point within the fluid, due to the force of gravity. Hydrostatic pressure increases in proportion to depth measured from the surface because of the increasing weight of fluid exerting downward force from above.
Isotactic	A type of polymeric molecular structure containing a sequence of regularly spaced, asymmetric atoms arranged in like configuration in a polymer chain.
Kinematic Velocity	A measure of the resistance to flow of a fluid, equal to its absolute viscosity divided by its density, usually measured in stokes.
Laminar Flow	Sometimes known as streamline flow, occurs when a fluid flows in parallel layers, with no disruption between the layers. At low velocities the fluid tends to flow without lateral mixing and adjacent layers slide past one another like playing cards.
LDPE	Low Density Polyethylene is a thermoplastic made from petroleum and has the distinction of being the first grade of polyethylene produced in 1933.
Potable	Drinking water or potable water is water pure enough to be consumed or used with low risk of immediate or long term harm.
Thermal Conductivity	The property of a material to conduct heat, materials with a high level of thermal conductivity allows heat to transfer at a faster rate than those with a low thermal conductivity.
Thermoplastic	Also known as thermosoftening plastic is a polymer that turns to a liquid when heated and freezes to a very glassy state when cooled sufficiently. Most thermoplastics are high molecular weight polymers.
Turbulent Flow	Movement of a fluid in which subcurrents in the fluid display turbulence, moving in irregular patterns, while the overall flow is in one direction. Turbulent flow is common in non-viscous fluids moving at high velocities.
Viscosity	Viscosity is a measure of the resistance of a fluid which is being deformed by either shear stress or tensile stress.
Volatile Organic Compounds (VOC)	Volatile Organic Compounds are emitted as gases from certain solids or liquids. VOC's include a variety of chemicals, some of which may have short or long term adverse health risks.

Compatibility of PB-1 Systems

Dux SecuraGold™ fittings and pipe are manufactured to the AS/NZS 2642.1, 2 and 3 standards and as such any compatible competitor's pipe made to the same standard would be suitable for use with SecuraGold™ fittings. If the pipe specifications are correct to the AS/NZS 2642.2 standard and the crimped fitting gauges appropriately Dux will guarantee the connection.

The SecuraGold™ Guarantee



SecuraGold Hot and cold water piping system

Dux Industries Ltd 25 year performance warrantee (limited)

Dux Industries is committed to providing quality products to customers that meet or exceed the requirements of relevant current AS/NZ standards and the New Zealand Building Code. This warrantee covers the Dux SecuraGold fittings and Secura PB-1 pipe only, against material or manufacturing defects during normal operation from the date of manufacture for a period of 25 years.

(This warrantee does not apply to the tools used to install the SecuraGold system)

All products are to have been stored, handled and installed in strict accordance with the manufacturer's installation manuals and instruction leaflets.

Disclaimer Statement

All information contained within this technical Manual is supplied in good faith and whilst all reasonable care has been taken to ensure the accuracy of the information this manual should not be used as the sole source of information by the reader/user. Reference material such as standards are 'live' documents and are amended at times and may change aspects or specifications for installations contained within this manual. In case of uncertainty, the reader/user should contact Dux Industries Ltd or the local government body for clarification.
Dux Industries Ltd has a policy of continual research and development and reserves the right to amend without notice the specification and design of all products illustrated in this technical manual.
No responsibility can be accepted by Dux Industries Ltd for any error, omissions or incorrect assumptions.

Dux Industries Limited

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ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part

2 Part Undertile Waterproofing Membrane

BRANZ Appraised

Rapid Drying Time

Two Component Undertile Waterproofing Membrane

Advanced acrylic – will not re-emulsify

Liquid reinforced – eliminates the need for reinforcing mat

Water based – safe to use, low odour and easy cleaning

Meets class III category for AS/NZ 4858 Wet Area Membranes

Low VOC content – meets Green Building Council of Australia Green Star IEQ-13 requirements

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

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ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part
2 Part Undertile Waterproofing Membrane

BRANZ Appraised
Appraisal No.472 [2005]

BRANZ Appraised
Appraisal No.473 [2005]

Copies available on request.

PRODUCT DESCRIPTION

Ardex WPM 002 (Superflex Bathroom & Balcony 2 Part) is a tough, fast drying two component waterproofing membrane specifically designed for use under tiles. The product has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. Ardex WPM 002 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification.

Ardex WPM 002 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. Ardex WPM 002 is one of the fastest drying acrylic membranes on the market – normally ready to tile in 16-24 hours @ 23°C.

WPM 002 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 002 can be tiled over in 16-24 hours, or 4 hours @ 23°C/50% RH in non critical areas*.

Features benefits

- Liquid reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement.
- Advanced acrylic: Will not re-emulsify.
- Designed for tiling: Fully compatible with ABA/Ardex tile systems adhesives.
- Water based, safe to use, low odour and easy cleaning for undertile waterproofing in shower recesses by independent testing authority.
- Excellent exterior.
- Conforms to the requirements of AS/NZ 4858: 2004 Wet Area Membranes (Ref: CSIRO Report 3879)

*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 and external 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 Ardex WPM 300 (HydrEpoxy 300) at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet concrete should be allowed to dry thoroughly or sealed with one coat of Ardex WPM 300 as above.
Renders and screeds	Cured for min. 7 days or sealed when set with one coat Ardex 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 WPM 300 as above.
Fibre cement	Wet area grade only.
Plasterboard	Wet area grade only.
Plywood	Structural plywood (PAA branded) or marine grade or other wet area grade only. 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 WPM 002 must be covered with tiles for full immersion applications.

Contact Ardex for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

Ardex WPM 002 (Superflex Two Part)
The waterproofing membrane shall be Ardex WPM 002, a two component cementitious acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Two component: 20kg (approx 20 litres) liquid pail/ 2 x 10kg bags powder.

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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	0.6mm	0.9mm	1.2mm	32m²	16m²	40kg kit
WALLS	0.4mm	0.6mm	0.8mm	48m²	24m²	40kg kit

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.

COVERAGE

Two coats are recommended for an effective waterproof membrane. Coverage will vary depending on the porosity of the surface.

One 40kg kit will cover approximately 16-24m (based on two coats) depending on area requirements between wall and floor surfaces to be treated.

DRYING TIMES

Curing time will vary depending on temperature and humidity.

Recoat time

1-2 hours (23°C/50% RH) between first and second coats. Alternatively, if a polyester 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 002 membrane is totally dry in 16 hours at 23°C/50% RH but can take up to 24 hours at 10°C / 50% RH in corners or for thick films.

In areas where bond breakers or additional reinforcement are not used, Ardex WPM 002 can be tiled over after 4 hours at 23°C / 50% RH.

Fully cured

The shower should not be used until the membrane has reached its full strength. Normally Ardex WPM 002 membranes are 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 WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of Ardex 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 002.

For substrates or situations other than those listed contact Ardex.

SAFETY DATA

Ardex WPM 002 Part A is non-hazardous. It may produce discomfort of the eyes, respiratory tract and skin. It should not be swallowed or inhaled. Avoid contact with skin and wear eye/face protection. In case of contact with eyes, rinse with plenty of water and contact a doctor or Poisons Information Centre.

Ardex WPM 002 Part B contains cement and is therefore hazardous. It may cause burns and serious damage to eyes. Do not breathe dust and avoid contact with eyes. Wear dust masks, goggles and gloves when handling. Keep container locked up and in a well ventilated place.

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

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ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part
2 Part Undertile Waterproofing Membrane

APPLICATION

Apply Ardex WPM 002 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 light 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 002 needs to be applied at between 0.6 and 0.9 mm per coat depending on product and application (Refer Table 1).

Critical areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian 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 2m) 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 cured 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, and spread to 6mm on either side of joint.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls, and spread to 6mm on either side of joint.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS3740 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 150mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Apply the membrane 1800mm up the walls or to the height of the shower rose within the shower recess.
14. Install the shower screen to inside edge of the hob.

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 a min set down (step down) of 50mm to the finished floor level (ie. top of tiles).
3. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
4. Treat any sheet joints with a neutral cure silicone

Fig.1 – Shower recess – critical areas

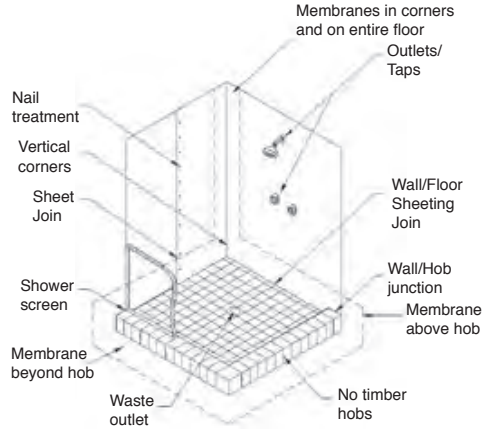
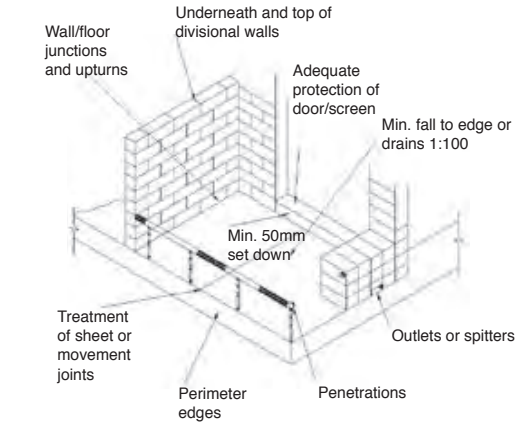


Fig.2 – Balcony – critical areas



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prior to waterproofing.

5. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
6. Apply the membrane up the step down and as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
7. Where possible, apply the membrane prior to building divisional walls.
8. Apply the membrane to the entire balcony floor and at least 50mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
9. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
10. Apply the membrane down over the front edge of the balcony onto the drip rail.
11. Carefully seal any gaps around balcony penetrations prior to applying the membrane.
12. Apply the membrane down into outlets and drains, ensuring excess material is removed.
13. 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 2m (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 (Sheltercoat/Superflex Water Based Primer) by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to be completely dry prior to the application of the Ardex WPM 002 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 and allow to dry before applying two coats of Ardex WPM 002 membrane, in a band at least 200mm wide equidistantly across the crack, along the length of the crack.

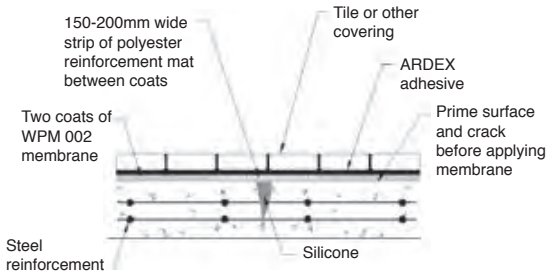
Cracks 2-6mm:

(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 002 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex “Deckweb” polyester woven cloth 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.

Cracks >6mm:

Contact your local Ardex representative.

Fig.3 Crack Treatments



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ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part
2 Part Undertile Waterproofing Membrane

Movement/construction joints

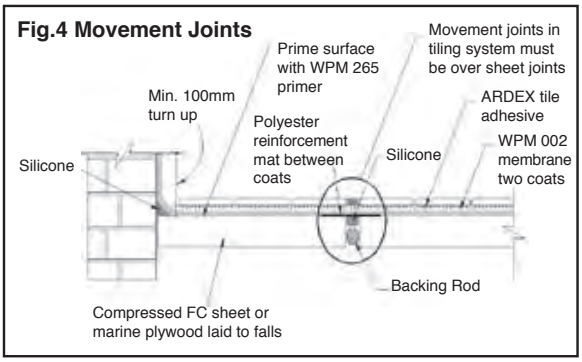
Movement joints (<6mm)

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 002 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth 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.

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 and allowing to dry, apply a generous bead (16mm) of neutral cure silicone sealant in coving areas and corners. (Refer Fig.5) Smooth over the silicone so that it extends 8mm up the wall and 8mm over the floor and allow to touch dry.

Apply a first coat of Ardex WPM 002 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 around 1.2mm) Alternatively, if a polyester 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 Superflex WPM 265 and allowing to dry, apply a generous bead (16mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 8mm up the wall and 8mm over the floor and allow to touch dry. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth 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 002 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of Ardex WPM 002 to floors.

Walls

Two coats of Ardex WPM 002 are required to achieve a minimum total dry film thickness of 0.8mm.

After priming with Ardex Superflex WPM 265 and allowing to dry, apply two coats of Ardex WPM 002 (to achieve a minimum dry film thickness of 0.8mm) in two opposite directions. Wall sheets 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 002 are required to achieve a minimum total dry film thickness of 1.2mm. The flooring recommendations should be extended at least 150mm 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 treatment. 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

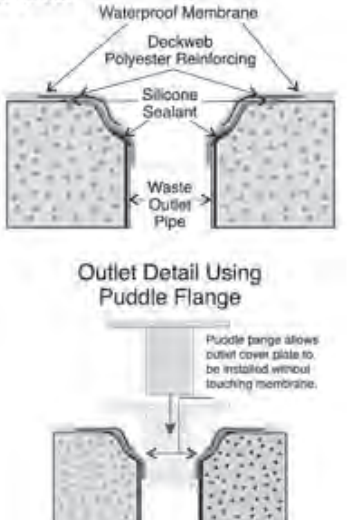
Prime the surface with Ardex WPM 265 and allow to dry. Surfaces of outlet flange must be primed with an appropriate primer.

Apply Ardex WPM 002 over the adjacent floor surface extending down into the waste outlet pipe overlapping the pipe surfaces by at least 30mm. Place Ardex "Deckweb" polyester woven cloth 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).

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Fig.5 – Waste outlet



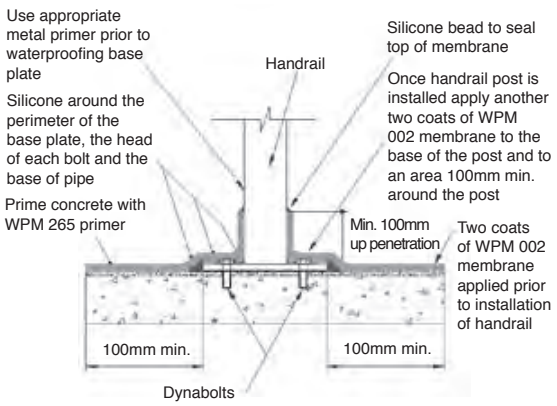
Balcony penetrations (Refer Fig.6)

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 10mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of Ardex WPM 002 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 1.2mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Fig.6 – Balcony penetration



Tiling systems

It is advisable to conduct a flood test of the shower once the membrane has cured (normally after 48 hours), and before the tiling commences. A broad range of Ardex tile adhesives can be used over Ardex Superflex membranes. Contact Ardex or your nearest Ardex stockist for advice on the most suitable system.

QUALITY PRODUCT

Ardex WPM 002 is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001.

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.

TECHNICAL DATA

Ardex WPM 002
Characteristics of components

Form & Colour	Liquid: white, medium viscosity Powder: off white
Characteristics of mixed product	
Mixing Ratio	1:1 by weight
SG of mixed product	1.44kg/litre
Non Volatile Matter	77±1%
Colour	light grey/green
Characteristics of cured membrane	
Shore A hardness ASTM D2240	
– dry film	85 – 90
– wet film	75 – 80
Tensile Strength	
7 days dry AS1145	1.7 MPa
Full Cure 28 days:	2.9 MPa
Elongation at Break	
7 days dry AS1145	332%

NOTE: Most of the tests have been carried out in the Ardex laboratory under standard conditions (23±2°C, 50±5% RH)

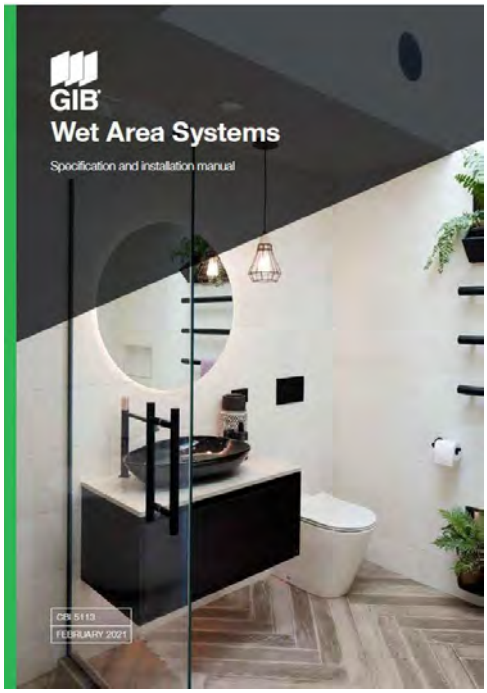
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BRANZ Appraised

Appraisal No. 427 [2021]

GIB® WET AREA SYSTEMS



Appraisal No. 427 (2021)

This Appraisal replaces BRANZ Appraisal No. 427 (2007)

BRANZ Appraisals

Technical Assessments of products for building and construction.

Winstone Wallboards Ltd
PO Box 12 256
Penrose
Auckland 1642
Tel: 09 633 0100
Email: info@gib.co.nz
Web: www.gib.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 GIB® Wet Area Systems are for the interior lining of timber and steel-framed walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water-resistant lining material is desirable.

Scope

2.1 GIB® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:

- on timber-framed walls and ceilings within the scope limitations on NZS 3604; or,
- on steel-framed walls and ceilings within the scope limitations of NASH Standard Part 2, or,
- on timber and light gauge steel-framed walls and ceilings subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, GIB® Wet Area Systems, 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB® Wet Area Systems meet the requirements for loads arising from self-weight and impact [i.e. B1.3.3 (a) and (j)]. See Paragraphs 8.1-8.3.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB® Wet Area Systems meet these requirements. See Paragraphs 9.1-9.5.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4 and E3.3.5. GIB® Wet Area Systems meet these requirements. See Paragraphs 12.1-12.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB® Wet Area Systems meet this requirement.

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
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

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Technical Specification

4.1 The GIB® plasterboards and accessories used in GIB® Wet Area Systems, and supplied by Winstone Wallboards Ltd are as follows:

GIB® Plasterboards

- **GIB Aqualine®** is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. It is available in 10 and 13 mm sheet thicknesses. Sheets are available in various edge profiles and lengths from 2,400 mm to 4,800 mm. Refer to Table 1. The nominal sheet weights are 8 kg/m² and 11 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.
- **GIB Toughline® Aqua** is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. It is available in a sheet thickness of 13 mm. Sheets are available in various edge profiles and lengths from 2,400 mm to 3,000 mm. Refer to Table 1. The nominal sheet weight is 11.4 kg/m². GIB Toughline® Aqua face paper is mauve in colour.
- **GIB Weatherline®** is an exterior-grade, glass-fibre fleece-wrapped modified-gypsum core sheet material. The product is available in 10 mm and 13 mm thicknesses and a board width of 1,200 mm. Standard sheet lengths are 2,450, 2,700 and 3,000 mm. Custom sheet lengths are also available. The nominal sheet weights are 9 kg/m² and 11.5 kg/m² for 10 mm and 13 mm thick sheets respectively.

Table 1: GIB® Wet Area Plasterboard Available Sheet Sizes

Plasterboard Type	Sheet Thickness (mm)	Sheet Edge Profile	Sheet Width (mm)	Sheet Length (mm)					
				2,400	2,450	2,700	3,000	3,600	4,800
GIB Aqualine®	10	TE/TE	1,200	✓		✓	✓	✓	
		TE/SE	1,200	✓					✓
		TE/SE	1,350	✓				✓	
	13	TE/TE	1,200	✓		✓	✓	✓	
GIB Toughline® Aqua	13	TE/TE	1,200	✓		✓	✓		
GIB Weatherline®	10	SE/SE	1,200		✓	✓	✓		
	13	SE/SE	1,200			✓	✓		

TE = Tapered Edge SE = Square Edge

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber: 6 g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel: 6 g x 25 mm and 32 mm.

Adhesive and Sealants

- GIBFix® One (Acrylic).
- GIBFix® All-Bond (Solvent).

GIB® Accessories

- Corner Support Angle - GIBFix® Angle or GIB® Rondo® NZ18. Minimum 32 x 32 x 0.55 mm galvanised metal angle.

GIB® Jointing Compounds

- As specified in the GIB® Wet Area Systems and GIB® Site Guide Technical Literature.

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4.2 System components and accessories for the GIB® Wet Area Systems, which are supplied by the building contractor are:

Waterproofing

- A waterproofing system complying with AS/NZS 4858.

Finishes

- Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

5.1 The best results are achieved when GIB® plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GIB® Wet Area Systems. 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 GIB® Wet Area Systems provide a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls, and paint and wallpaper to walls and ceilings. [*Note: GIB Weatherline® is a suitable substrate for ceramic tiles and sheet vinyl. For paint or wallpaper finishes use GIB Aqualine® or GIB Toughline® Aqua.]*

7.2 GIB® Wet Area Systems must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths [See Paragraphs 7.4 and 8.2].
- In areas of high humidity [above 90% RH] or continually wet areas such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. [Refer to appliance and fitting manufacturers for installation details.]

7.3 GIB Aqualine® may be substituted for some other GIB® plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems and GIB® Noise Control Systems. Refer to the relevant systems technical literature for details.

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Wet Areas

7.4 Wet areas are spaces where sanitary fixtures and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

- Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
- Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. In addition, shower areas must be waterproofed. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finishes, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertenancy Walls – Wet Areas

7.6 Intertenancy construction that incorporates fire resistance and noise control must be protected from water splash. In shower areas, GIB® Wet Area plasterboards must not be substituted for other GIB® plasterboards but must be an extra lining layer. Refer to the Technical Literature.

Tiling

7.7 GIB® Wet Area Systems are suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® and GIB Weatherline® - up to 26 kg/m^2.
- 13 mm GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline® - up to 40 kg/m^2.

[Note: Most ceramic and porcelain wall tiles weigh less than 20 kg/m^2. For further information on tiling consult the BRANZ Good Practice Guide – Tiling.]

Framing

7.8 Supporting framing must comprise one of the following, subject to the minimum sizes, dwang centres and all other frame requirements of GIB® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170. Refer to Paragraph 15.2 regarding recommended moisture content of timber framing.
- Steel framing must be designed and constructed in accordance with NASH Standard Part 2, or to a specific design in accordance with AS/NZS 1170.

Structure

Bracing

8.1 GIB Aqualine®, GIB Toughline® Aqua and GIB Weatherline®can be used in GIB EzyBrace® Systems. Refer to BRANZ Appraisals Nos. 928 (2016) and 1048 (2019).

8.2 GIB Wet Area Systems must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications. GIB Toughline® Aqua is recommended by Winstone Wallboards Ltd where higher impact resistance is desired.

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.

Durability

Serviceable Life

9.1 GIB® Wet Area Systems have a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining, GIB® Wet Area Systems will have a serviceable life in excess of 50 years. The ability of GIB® plasterboards to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB® plasterboard substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints, especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to the GIB® Wet Area Systems from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire and Smoke Spread

11.1 The gypsum plasterboard used in GIB® Wet Area Systems without an applied paint or wallpaper finish has been tested in accordance with ISO 5660 and achieved a Material Group Number of 1-S.

11.2 The gypsum plasterboard used in GIB® Wet Area Systems with an untested applied finish of a waterborne or solvent borne paint coating ≤ 0.4mm thick achieves a Material Group Number of G2-S in accordance with Table A1 of NZBC Verification Method C/VM2.

11.3 A lower Material Group Number may be achieved when used with a tested finishing system. The Material Group Number for the complete lining system must be obtained from the supplier of the finish product or system.

Fire Resistance Ratings (FRRs)

11.4 GIB® Wet Area plasterboards, when used as part of GIB® Fire Rated Systems, can be used to provide FRRs as determined by NZBC Acceptable Solutions C/AS1 and C/AS2 and NZBC Verification Method C/VM2. Refer to BRANZ Appraisal No. 289 (2018) and relevant technical literature.

Internal Moisture

12.1 When installed in accordance with this Appraisal, GIB® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

12.2 The construction methods in the Technical Literature meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

12.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

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Airborne and Impact Sound

13.1 GIB® Wet Area plasterboards, when used as part of GIB® Noise Control systems, can be used to provide acoustic ratings as required by NZBC Acceptable Solution G6/AS1. Refer to BRANZ Appraisal No. 394 [2017] and relevant technical literature.

Installation Information

Installation Skill Level Requirement

14.1 Installation of GIB® Wet Area Systems must be completed by, or under the supervision of, a Licensed Building Practitioner with the relevant Licence Class, in accordance with the Technical Literature and this Appraisal.

General

15.1 GIB® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Framing

15.2 To achieve an acceptable decorative finish, the walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Ltd recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Cutting

15.3 GIB® Wet Area plasterboards are easily cut by scoring the face paper with a sharp short-bladed trimming knife, and then snapping the plasterboard away from the cut face and cutting the back paper or by sawing. Use of a metal straightedge facilitates clean straight cuts. Cut edges can be tidied up by using a knife. Paper dags should be removed.

Fixing Sheets

Non-Tiled Areas

16.1 GIB® Wet Area plasterboards may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

16.2 Control joints must be provided at maximum 4 m centres.

16.3 Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle (i.e. GIBFix® Angle or GIB® Rondo® NZ18) prior to lining the walls.

16.4 GIB® Wet Area plasterboards may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 150 mm centres to the perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

16.5 Supports of timber or steel battens or ceiling joists must be 450 mm centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine® or GIB Toughline® Aqua.

16.6 GIB Aqualine® and GIB Toughline® Aqua sheets must be fixed with GIB® Grabber® screws at 600 mm centres around the perimeter of the ceiling and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive placed at 200 mm centres between the screws.

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Penetrations and Sealants

17.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.

17.2 A bead of sealant must be placed to the full thickness of the plasterboard sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.

17.3 In tiled areas, a bead of sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

18.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.

18.2 Tiled shower areas must incorporate a waterproofing membrane over GIB® Wet Area Systems. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Health and Safety

19.1 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Basis of Appraisal

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

Tests

20.1 Winstone Wallboards Ltd GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, edge hardness, water resistance, hard and soft body impact tests and humidified deflection.

20.2 Cone calorimeter tests to ISO 5660 have been carried out by BRANZ.

Other Investigations

21.1 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

21.2 Site inspections were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

21.3 The GIB® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

Quality

22.1 Winstone Wallboards Ltd's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.

22.2 The quality management systems of Winstone Wallboards Ltd have been assessed and registered by TELARC as meeting the requirements of ISO 9001: 2015, Registration No. 581.

22.3 Winstone Wallboards Ltd is responsible for the quality of the product supplied.

22.4 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.

22.5 Designers are responsible for the design of buildings.

22.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Ltd.

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

Sources of Information

- AS/NZS 1170: 2002 Structural design actions - General principles.
- AS/NZS 2588: 2018 Gypsum plasterboard.
- BRANZ Good Practice Guide: Tiling (3rd edition), April 2015.
- ISO 5660-1:2002 Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method).
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

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BRANZ

In the opinion of BRANZ, GIB® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Winstone Wallboards 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. Winstone Wallboards 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 Winstone Wallboards 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 Winstone Wallboards Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
15 February 2021

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GIB®

Wet Area Systems

Specification and installation manual

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

CBI 5113

FEBRUARY 2021

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NATIONAL SUPPORT

VISIT: Winstone Wallboards Limited
37 Felix Street, Penrose,
Auckland 1061, New Zealand
POST: PO Box 12 256, Penrose,
Auckland 1642, New Zealand
PHONE: +64 9 633 0100
EMAIL: info@gib.co.nz
WEB: gib.co.nz

GIB® HELPLINE

0800 100 442

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

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

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

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

USE ONLY THE CURRENT SPECIFICATION

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

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

BEWARE OF SUBSTITUTION

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

BRANZ Appraised
Appraisal No.427 [2021]

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This publication

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

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

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

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

WET AREAS

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

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

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

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

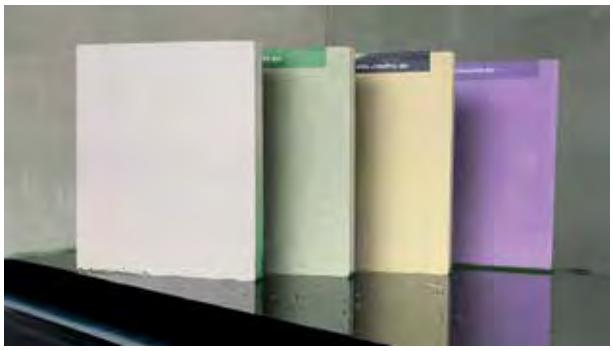
Although able to cope with infrequent short-term exposure, standard gypsum plasterboard will have a shortened life expectancy when frequently exposed to water or a high moisture environment.

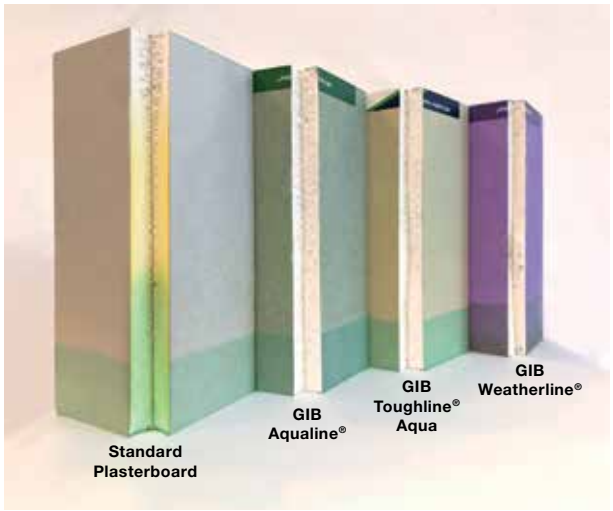
The NZ Building Code does not call for water resistant linings in wet areas but it is desirable to specify lining materials which will maintain their integrity longer when exposed more frequently to moisture, and to one-off events such as leaks or flooding.

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

WATER ABSORPTION TEST

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





WHERE TO USE GIB® WET AREA LININGS

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

BENEFITS

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

HANDLING AND STORAGE

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

LIMITATIONS

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

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

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

BOARD SUBSTITUTION OPTIONS

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

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

FLEXIBLE SHEET VINYL – SHOWERS AND OTHER WET AREAS

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

RIGID SHEET SHOWER LININGS

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

WATERPROOF MEMBRANE SYSTEMS AND TILING

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

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

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PENETRATIONS AND SEALANTS

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

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

RENOVATIONS

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

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

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

MAINTENANCE

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

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

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

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Compliance with the NZ Building Code

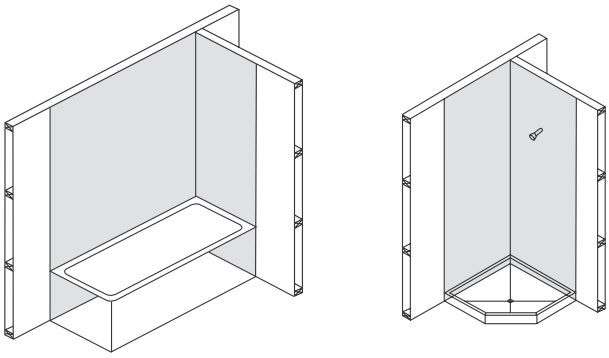
STRUCTURE – CLAUSE B1

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

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

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

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



No bracing in the shaded areas.

DURABILITY – CLAUSE B2

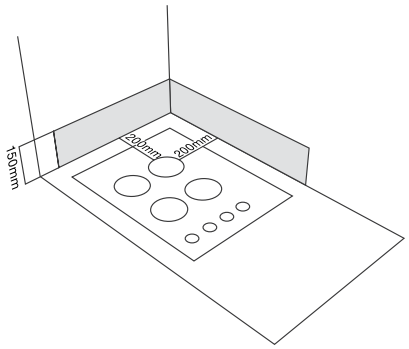
When installed and maintained in accordance with this literature, GIB® Wet Area systems tiled or vinyl covered have a serviceable life of at least 15 years. They comply with the requirements of NZ Building Code Clause B2 (Durability) for use in wet areas directly exposed to liquid water, e.g. showers,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

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

FIRE AFFECTING AREAS BEYOND THE SOURCE – CLAUSE C3

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

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



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

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

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

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.

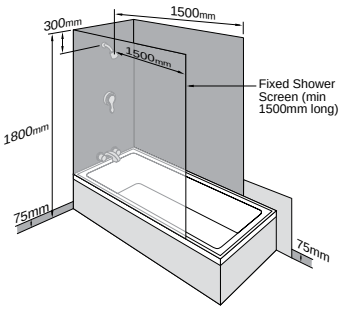
E3.3.6 - Surfaces of building elements likely to be splashed must be constructed in a way that prevents water splash from penetrating behind linings or into concealed spaces.

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.

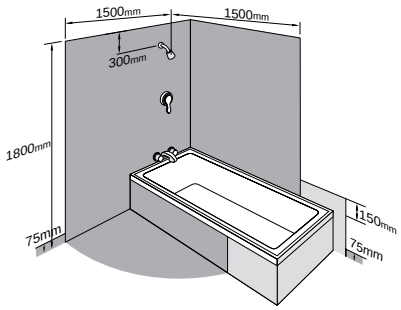
The IWAM Code of Practice refers to wet area membranes and over-surfaces that are easy to clean and suggests an extent as outlined below for a typical bathroom application. For further details refer to the IWAM Code of Practice which also lists suitable rigid sheet materials and tiling membranes.

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

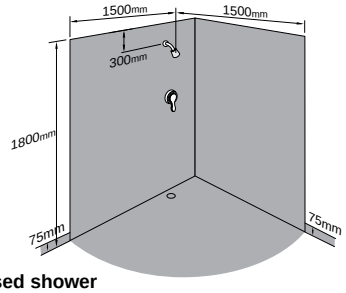
Enclosed shower over bath



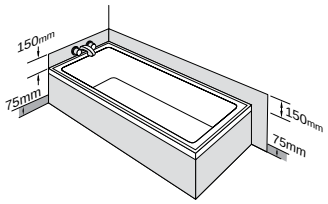
Unenclosed shower over bath



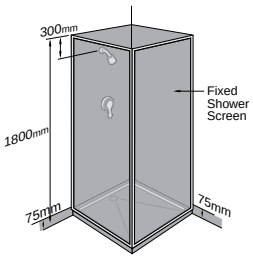
Unenclosed shower



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.

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TIMBER WALL FRAMING

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

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

FASTENERS

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

FASTENER CENTRES

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

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

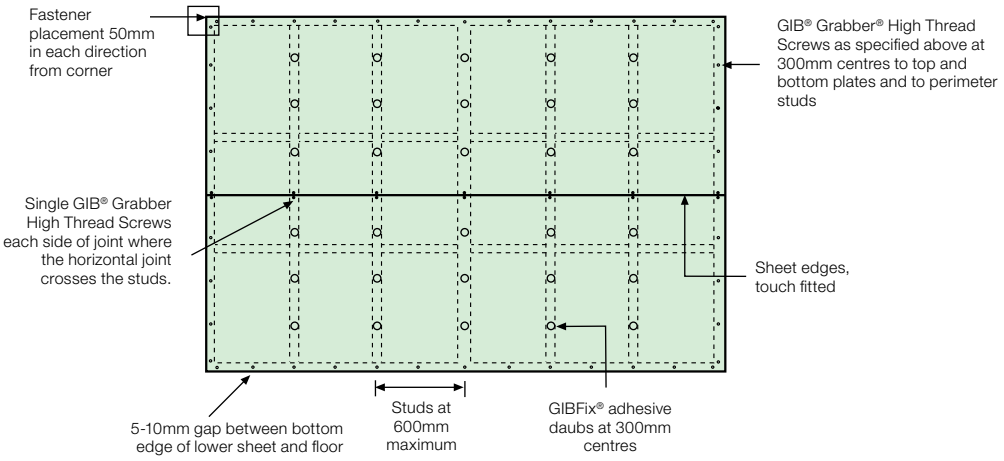
LINING

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

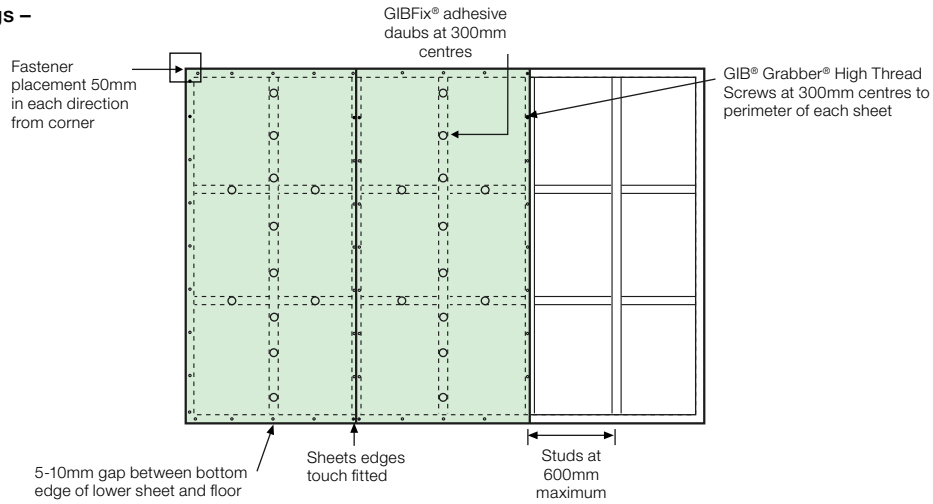
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



STEEL WALL FRAMING

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

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

FASTENERS

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

FASTENER CENTRES

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

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

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

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

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

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

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

LINING

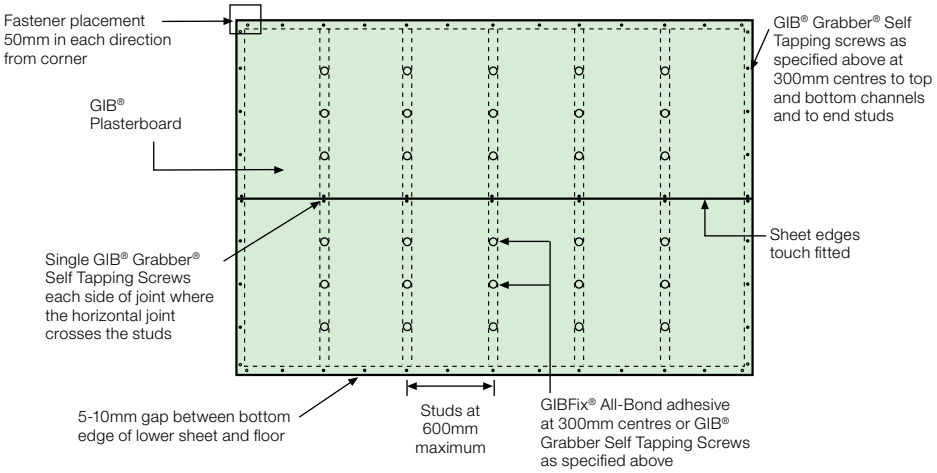
— Lay the sheets, leaving a 5-10mm gap at the floor line. Note: If friction fitted steel studs have been used, sheets must be fitted hard to the floor. Ensure floor is cured and dry

— Sheets to be touch fitted.

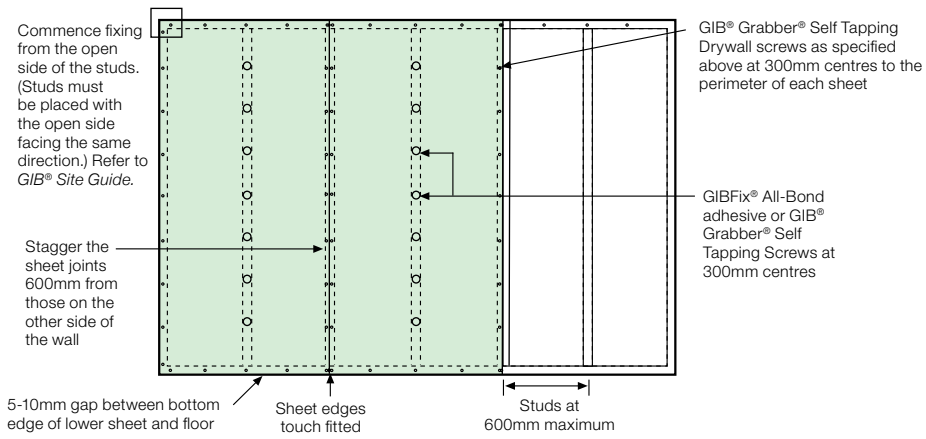
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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TIMBER WALL FRAMING

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

NOGS

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

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

CORNER REINFORCING

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

FASTENERS

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

FASTENER CENTRES

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

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

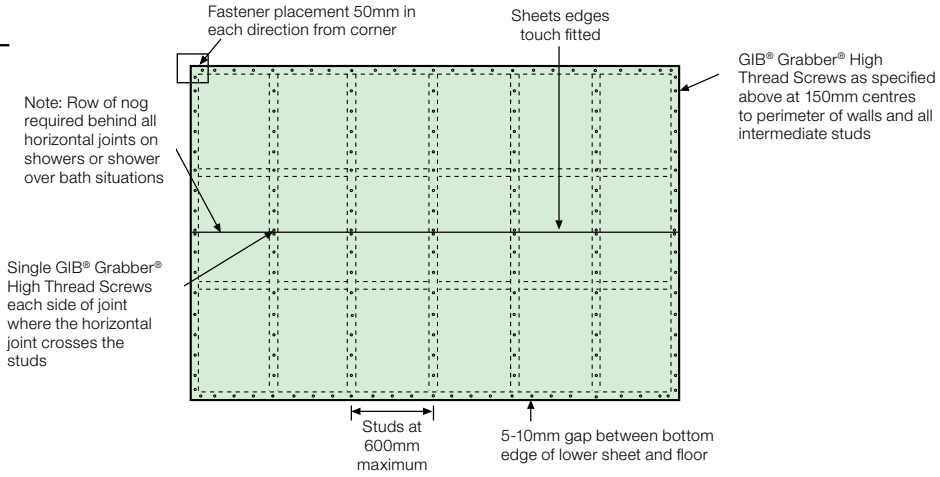
LINING AND TILE WEIGHTS

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

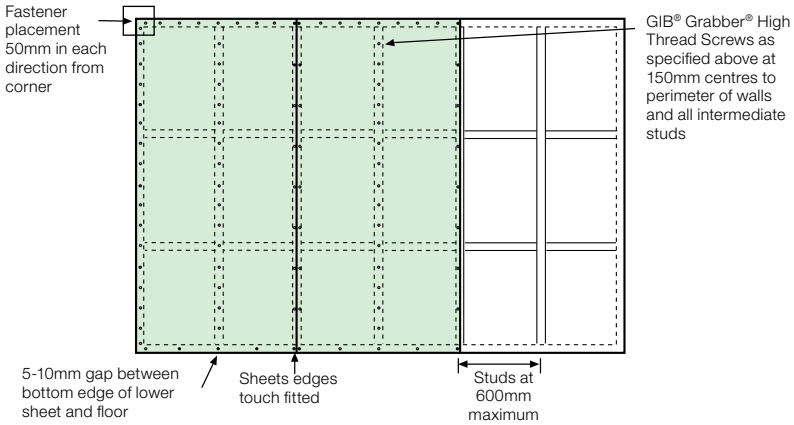
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



Fastening the Linings – Vertical Fixing Only



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STEEL WALL FRAMING

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

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

NOGS

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

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

CORNER REINFORCING

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

FASTENERS

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

FASTENER CENTRES

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

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

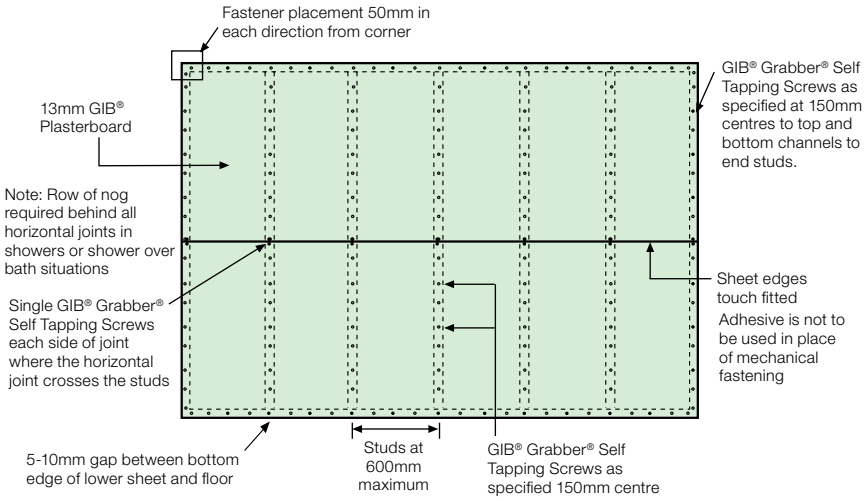
LINING AND TILE WEIGHTS

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

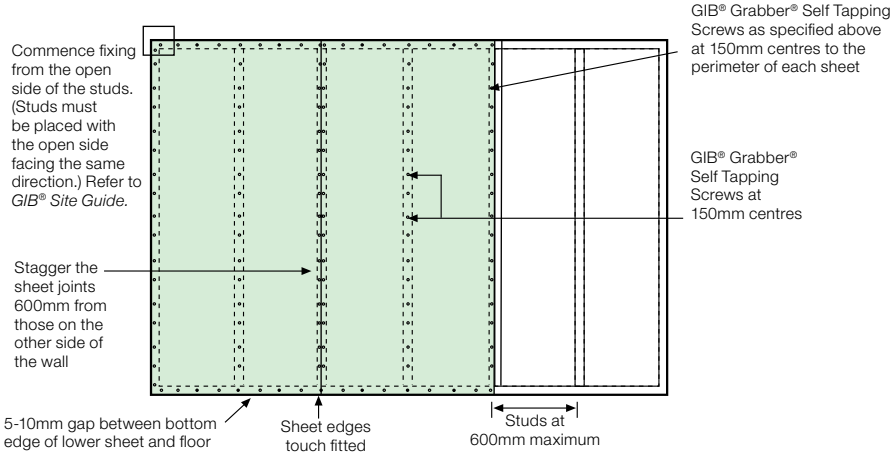
JOINTING

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

Fastening the Linings – Horizontal Fixing Only



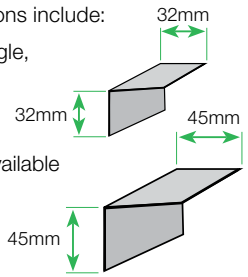
Fastening the Linings – Vertical Fixing Only



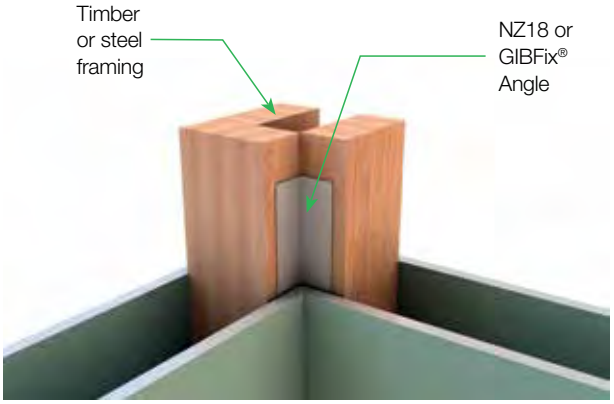
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METAL ANGLES FOR TILED INTERNAL CORNERS

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



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



WATERPROOF MEMBRANE SYSTEMS

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

For further information see p10.

TILES AND TILE WEIGHTS

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

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

Table 2: Recommended maximum tile weights

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

ADHESIVE AND GROUT WEIGHTS

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

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CEILING FRAMING

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

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

FASTENERS

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

ADHESIVES

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

FASTENERS CENTRES

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

LINING

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

BATTEN SPACINGS

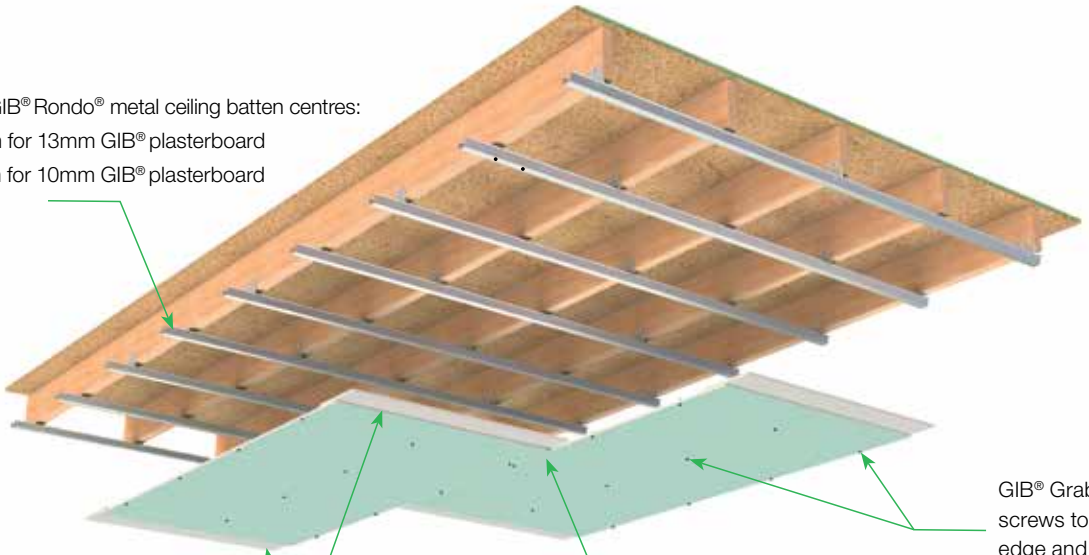
- 13mm GIB® plasterboard – 600mm centres maximum
- 10mm GIB® plasterboard – 450mm centres maximum

JOINTING

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

Maximum GIB® Rondo® metal ceiling batten centres:

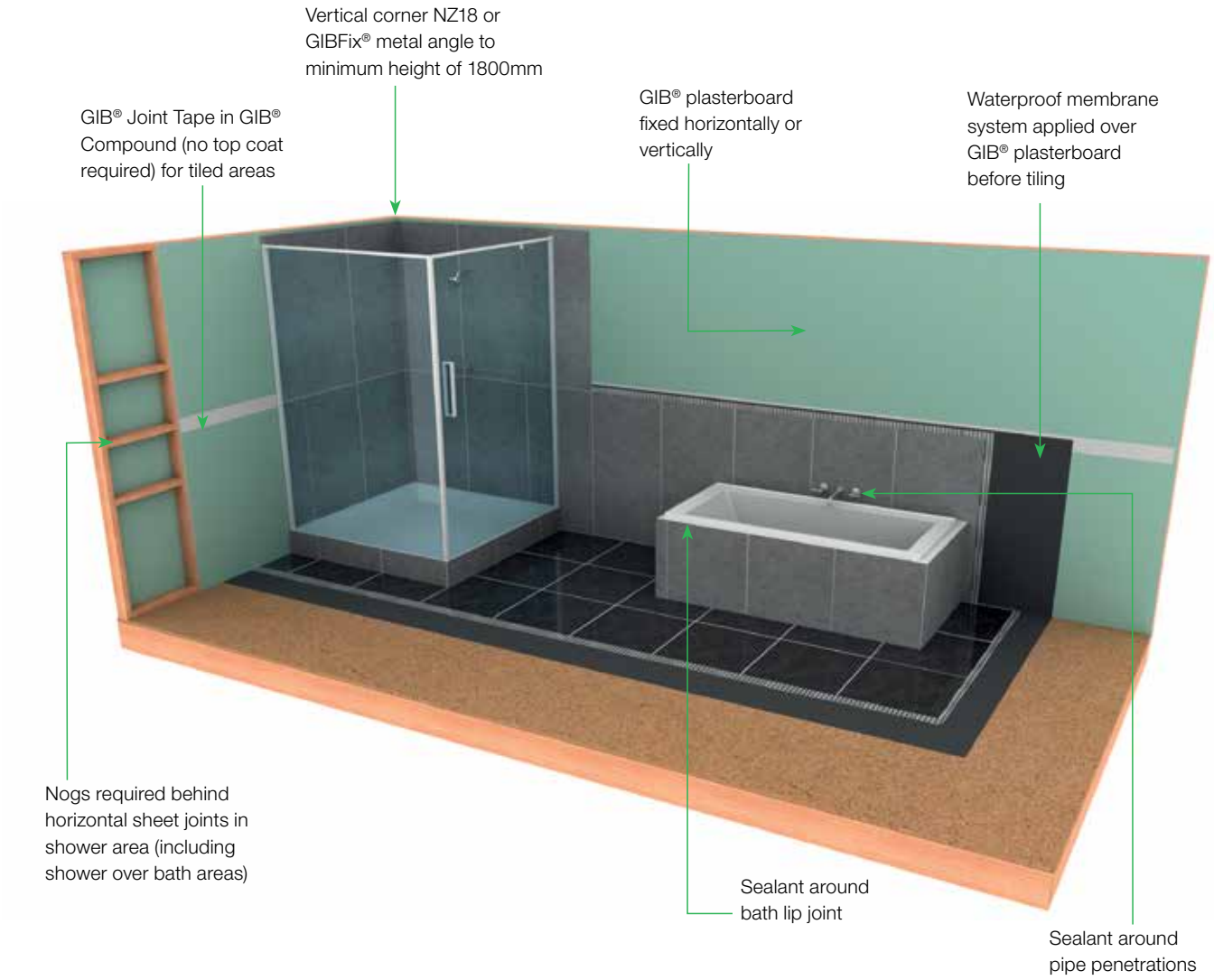
- 600mm for 13mm GIB® plasterboard
- 450mm for 10mm GIB® plasterboard



GIB® Grabber® screws to sheet edge and sheet centre at each batten intersection

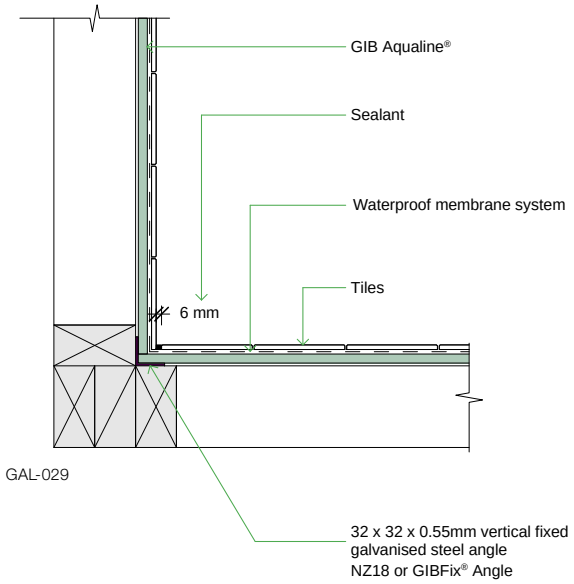
Back-block sheet end joints (see GIB® Site Guide)

Stagger sheet end joints by 600mm or nearest batten


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

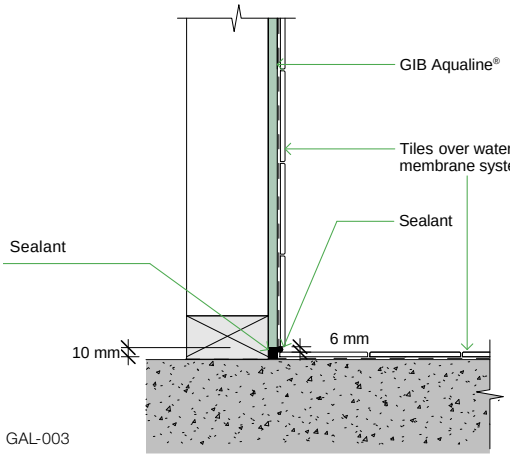
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A: TILED INTERNAL CORNER



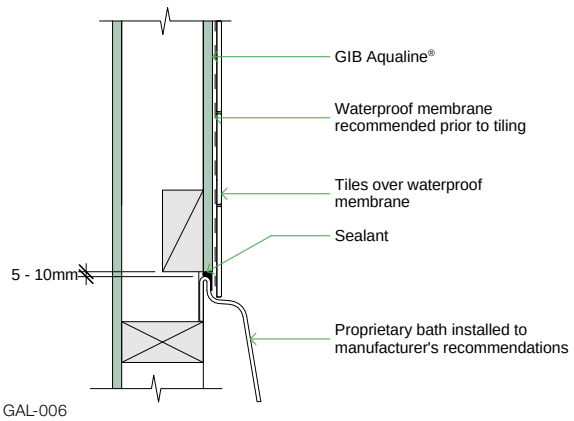
GAL-029

B: CERAMIC FLOOR LINING JUNCTION



GAL-003

C: BATH LINING JUNCTION

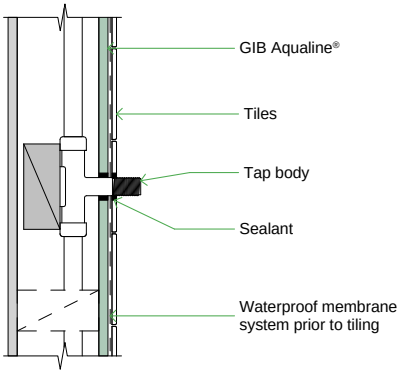


GAL-006

G: SHOWER MIXER PENETRATION IN WET WALL LININGS

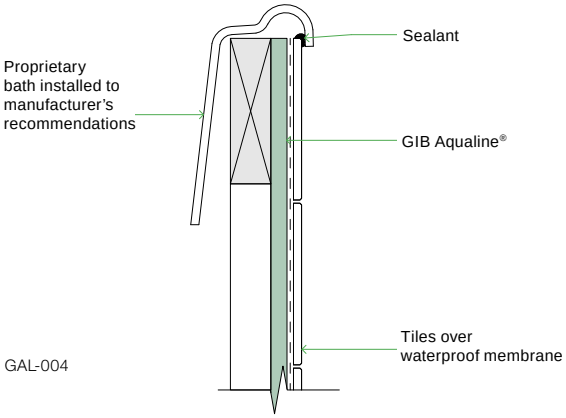
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.

D: SEALING WET AREA PENETRATION



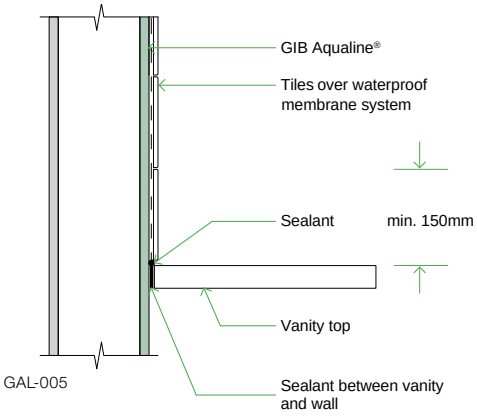
GAL-002

E: BATH CRADLE LINING DETAIL



GAL-004

F: VANITY TOP LINING JUNCTION

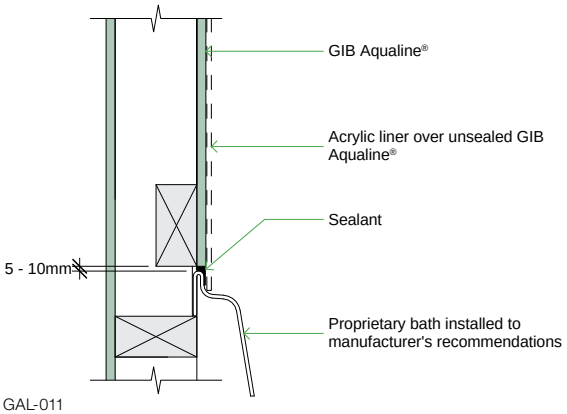


GAL-005



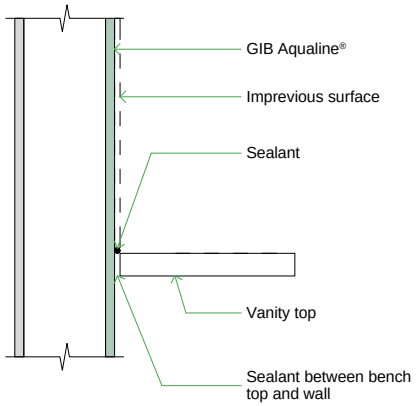
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A: BATH LINING JUNCTION



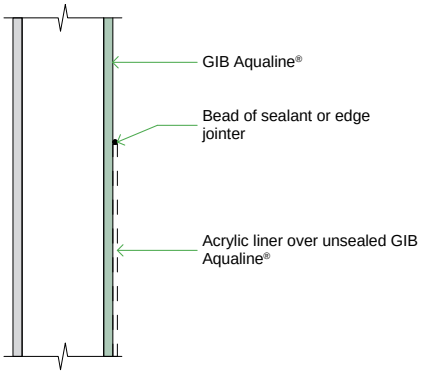
GAL-011

B: VANITY TOP LINING JUNCTION



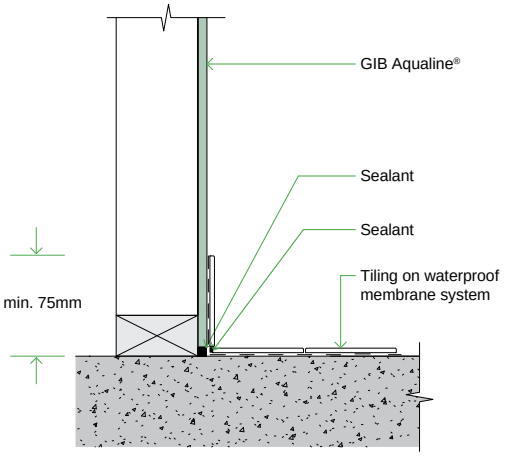
GAL-023A

C: UNSEALED PLASTERBOARD LINING



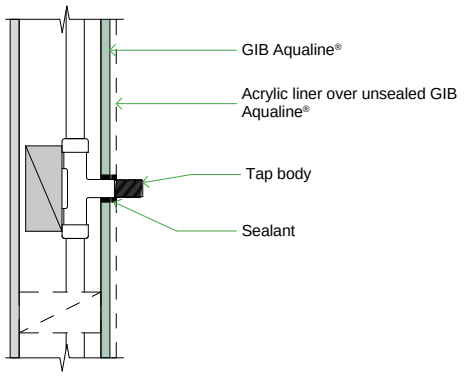
GAL-028

D: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

E: SEALING SEMI WET AREA PENETRATION



GAL-019

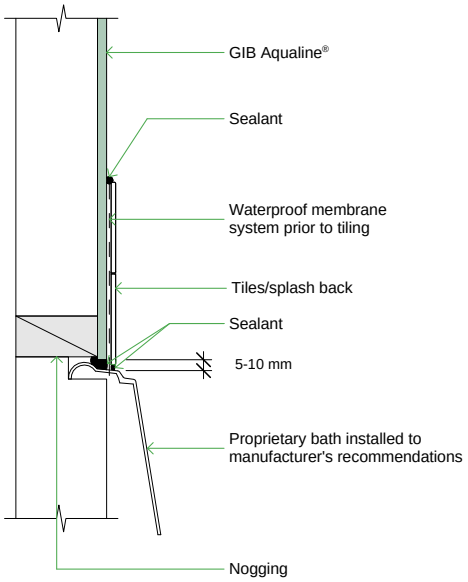
F: SHOWER MIXER PENETRATION IN WET WALL LININGS

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



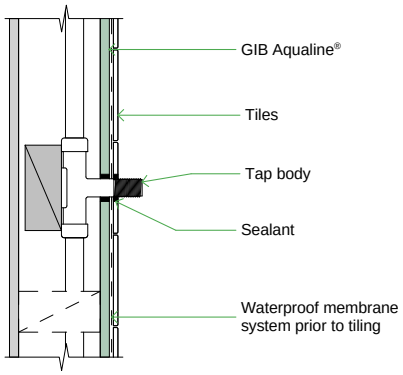
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A: BATH LINING JUNCTION



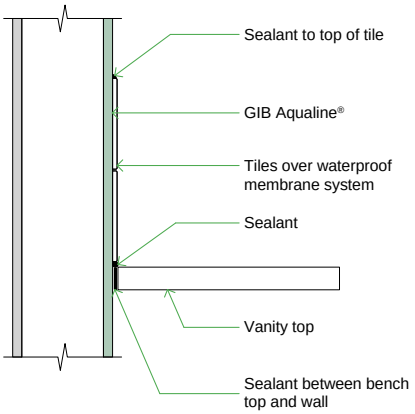
GAL-009

B: SEALING SEMI WET AREA PENETRATION



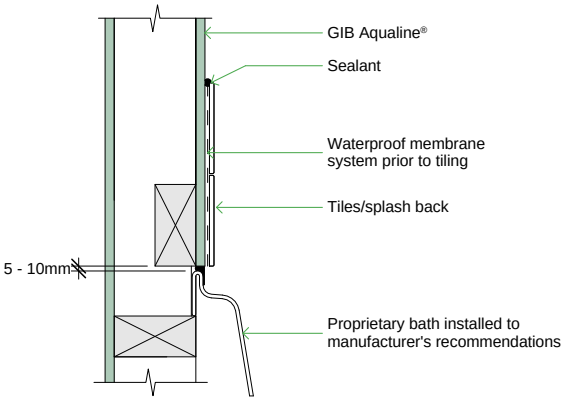
GAL-020

C: VANITY TOP LINING JUNCTION



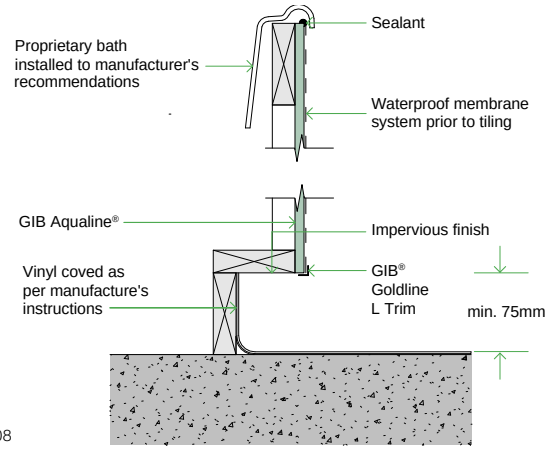
GAL-024

D: BATH LINING JUNCTION

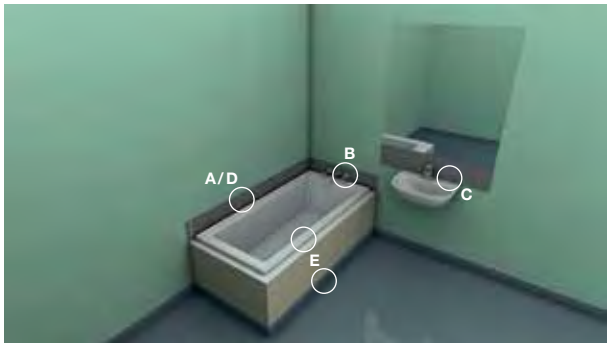


GAL-010

E: CRADLE VINYL LINING JUNCTION

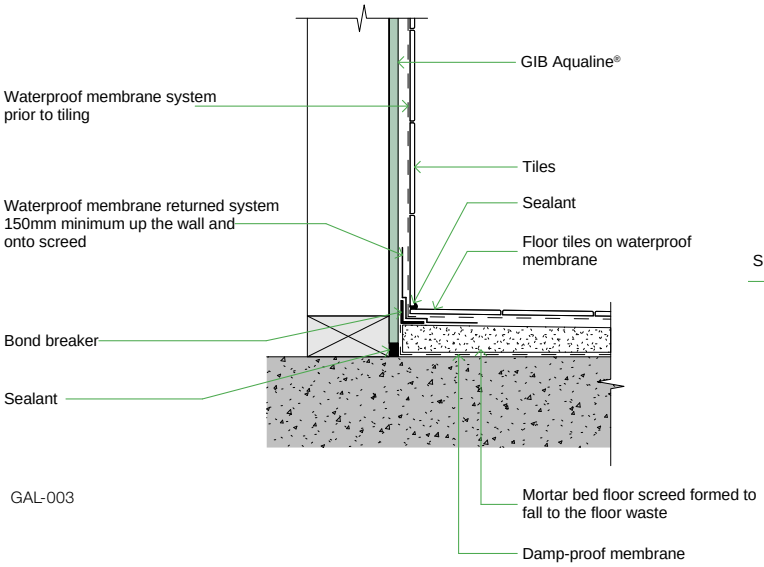


GAL-008



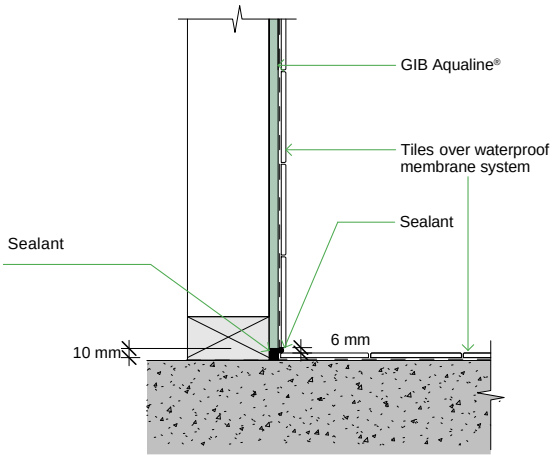
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A: MORTAR UNDER CERAMIC FLOOR LINING JUNCTION



GAL-003

C: CERAMIC FLOOR LINING JUNCTION

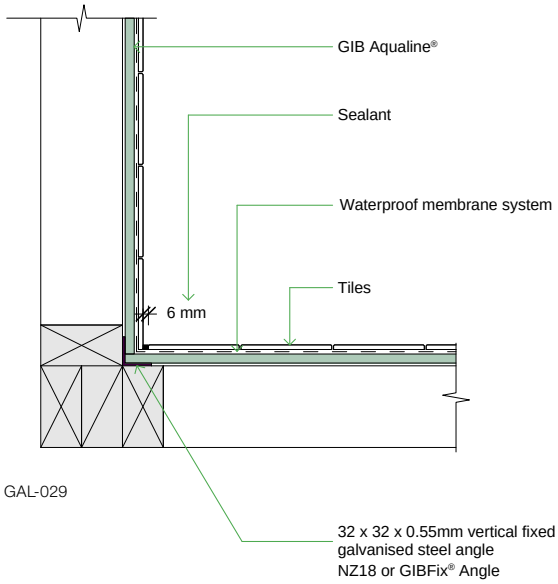


GAL-002A

PREFORMED SHOWER BASE JUNCTIONS

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

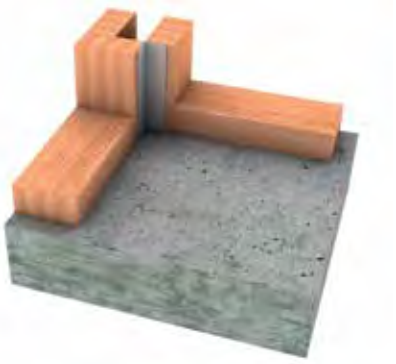
B: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

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

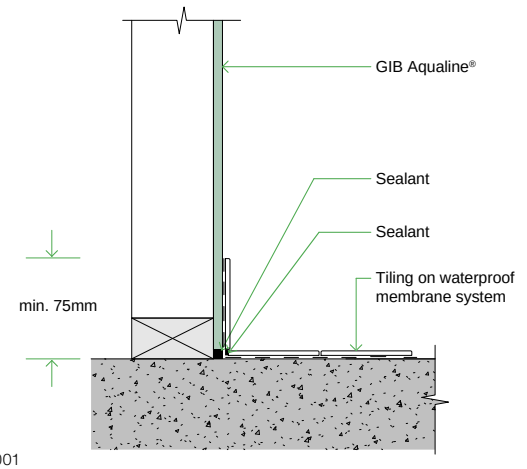


E: SHOWER MIXER PENETRATION IN WET WALL LININGS

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

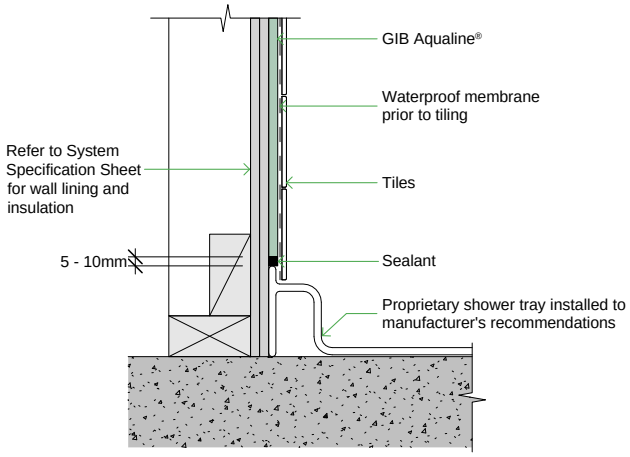


A: CERAMIC FLOOR SKIRTING LINING JUNCTION



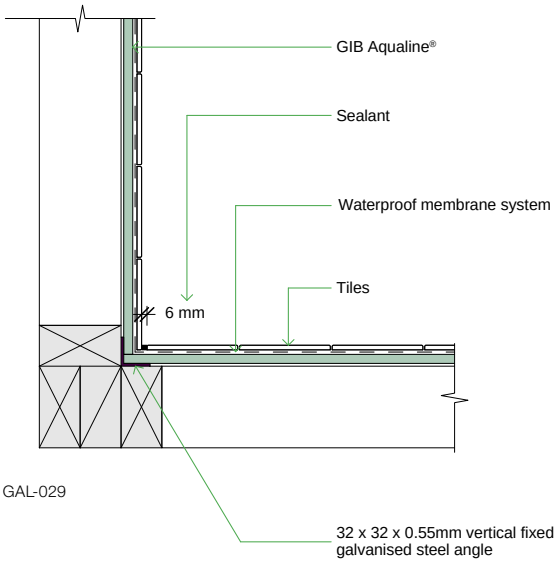
GAL-001

B: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



GAL-016

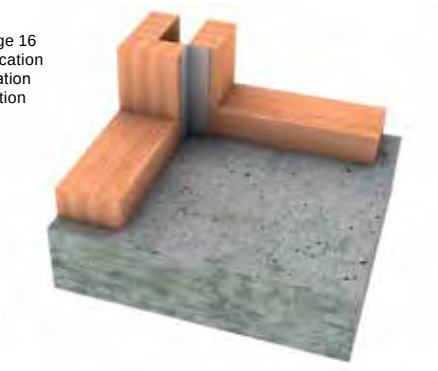
C: TILED INTERNAL CORNER



GAL-029

D: TILED INTERNAL CORNER METAL ANGLE POSITION

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



E: SHOWER MIXER PENETRATION IN WET WALL LININGS

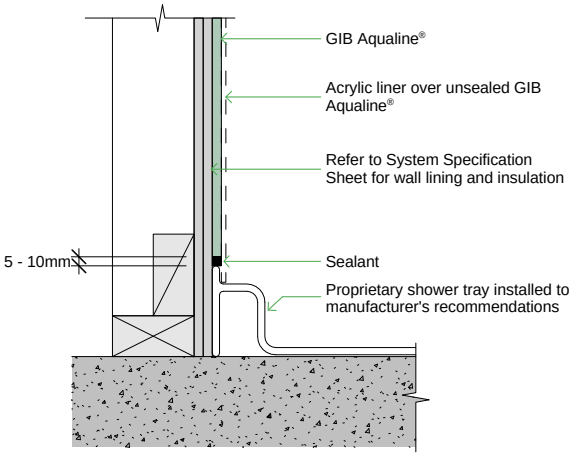
Refer to the shower mixer manufacturer for shower mixer installation detailing including the use of proprietary products to prevent water or moisture ingress behind the wet wall lining.



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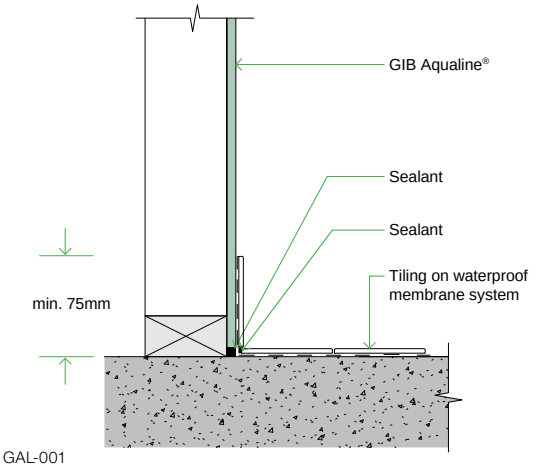
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A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



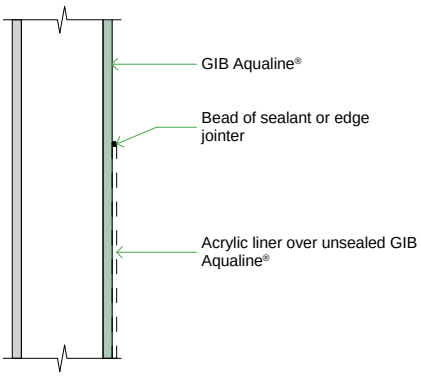
GAL-015

B: CERAMIC FLOOR SKIRTING LINING JUNCTION



GAL-001

C: UNSEALED PLASTERBOARD LINING



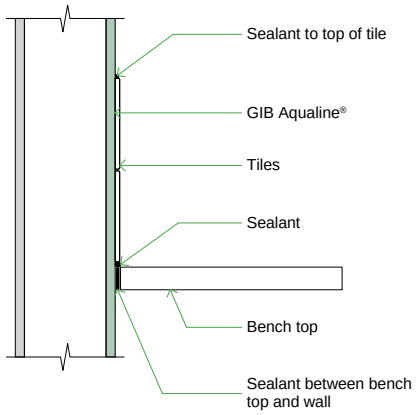
GAL-028

D: SHOWER MIXER PENETRATION IN WET WALL LININGS

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

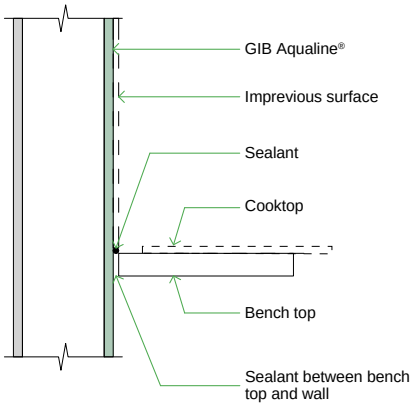


A: BENCH TOP LINING JUNCTION



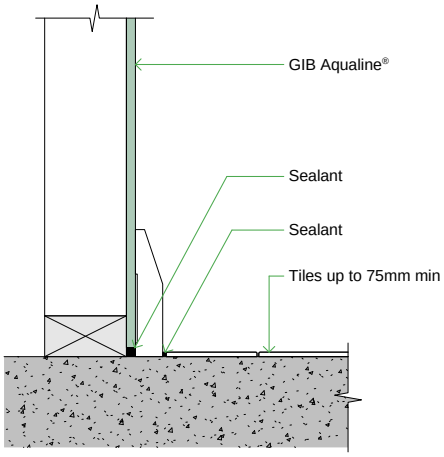
GAL-024

B: COOKTOP LINING JUNCTION



GAL-023B

CERAMIC FLOOR SKIRTING LINING JUNCTION

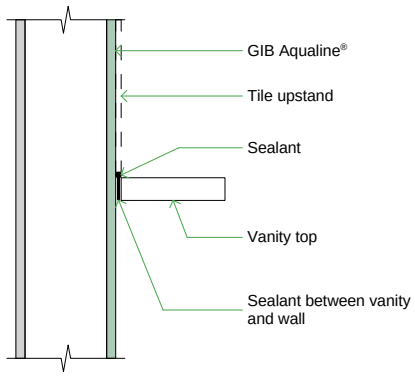


GAL-001A



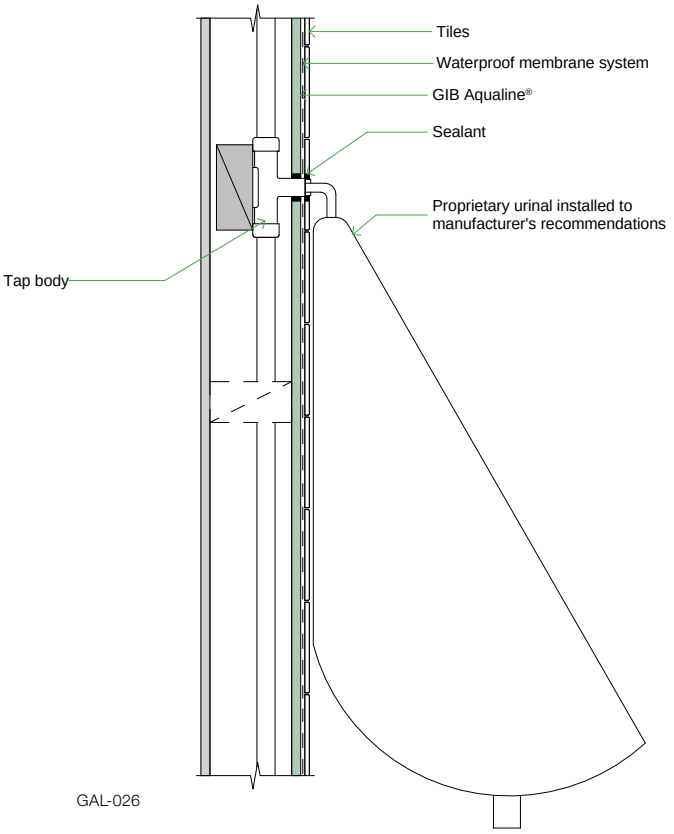
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A: VANITY TOP LINING JUNCTION



GAL-022

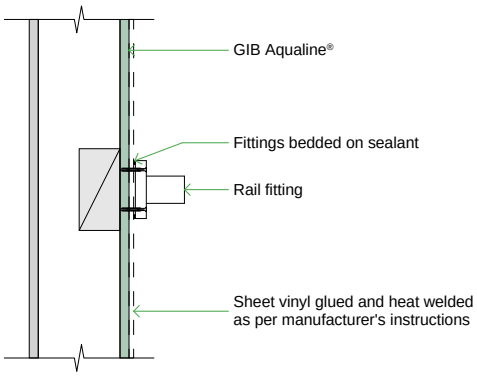
B: SEALING WET AREA PENETRATION LINING JUNCTION



GAL-026

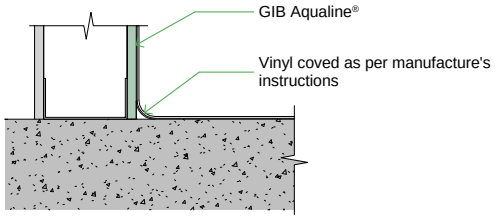


A: SURFACE MOUNTED WITH NOG



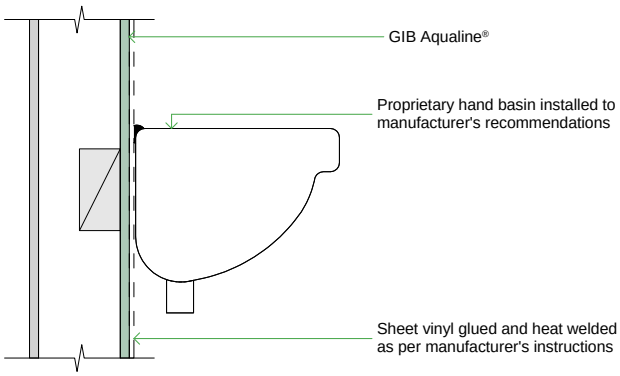
GAL-027

B: VINYL FLOOR LINING JUNCTION



GAL-006A

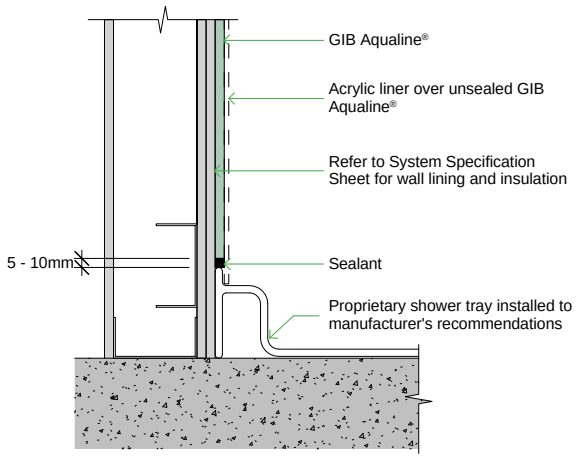
C: BASIN LINING JUNCTION



GAL-025

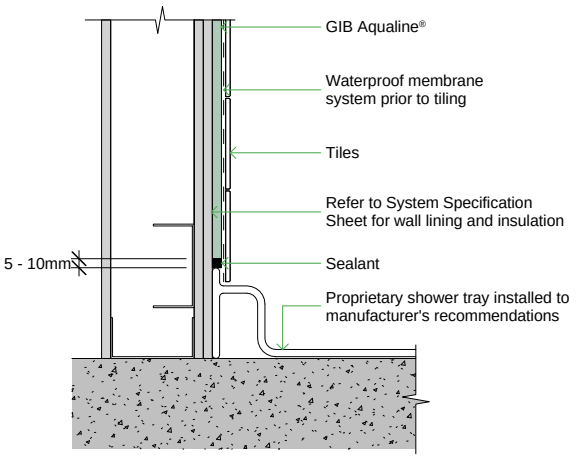


A: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



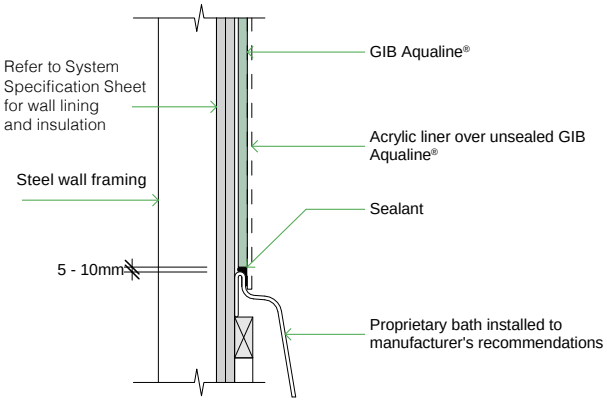
GAL-017

C: MOULDED SHOWER TRAY DOUBLE LINING JUNCTION



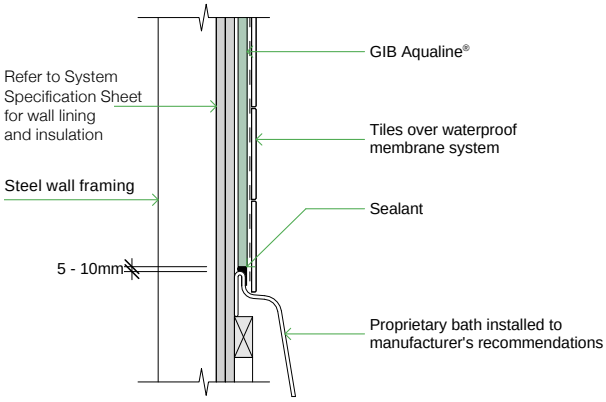
GAL-018

B: BATH DOUBLE LINING JUNCTION



GAL-013

D: BATH DOUBLE LINING JUNCTION



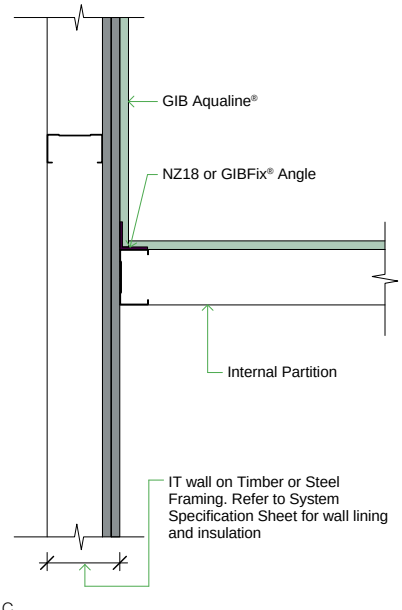
GAL-014

GIB® WET AREA SYSTEMS FIRE RESISTANCE AND NOISE CONTROL PERFORMANCE

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

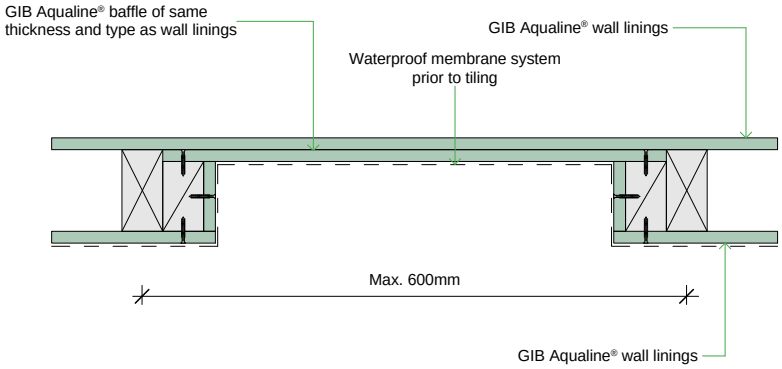
Do not tile on the resilient side of a GIB Rail® or Acoustic Resilient Mount (ST-001) and channel noise control system.

E: INTERTENANCY WALL AND WET AREA WALL JUNCTION

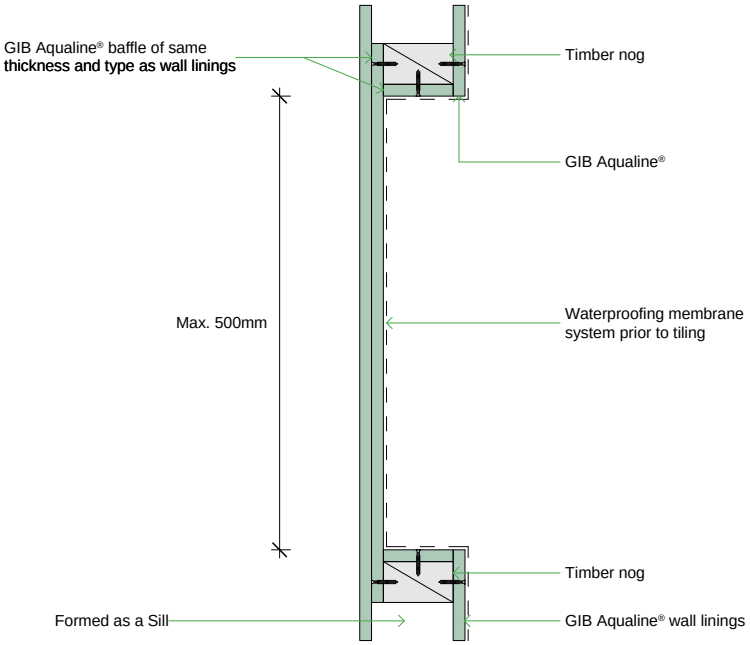


GAL-031C

TIMBER FRAME TILE RECESS

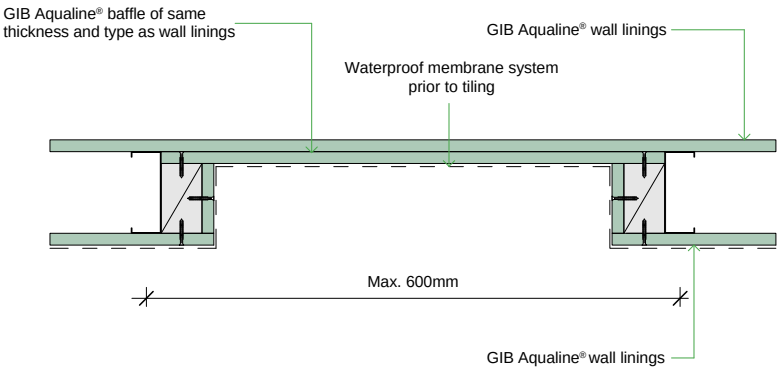


Larger recesses can be accommodated depending on specific framing layout provided 500mm is not exceeded in at least one direction.

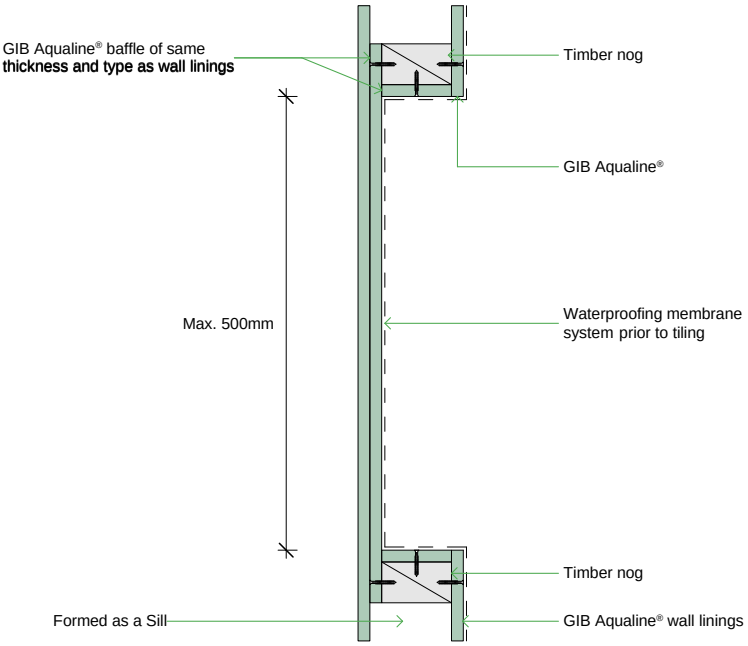


GAL-029B

STEEL FRAME TILE RECESS



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



GAL-030

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GIB® Wet Area Systems, February 2021

LIMITATIONS

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

USE ONLY THE CURRENT SPECIFICATION

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

SUBSTITUTION

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

TRADEMARKS

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

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GIB®

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gib.co.nz

OR CALL THE GIB® HELPLINE

0800 100 442

February 2021

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MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Acceptable Solutions and Verification Methods

For New Zealand Building Code Clause
E3 Internal Moisture

WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

E3 BUILDING CODE

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Status of Verification Methods and Acceptable Solutions

Verification Methods and Acceptable Solutions are prepared by the Ministry of Business, Innovation and Employment in accordance with section 22 of the Building Act 2004. Verification Methods and Acceptable Solutions are for use in establishing compliance with the New Zealand Building Code.

A person who complies with a Verification Method or Acceptable Solution will be treated as having complied with the provisions of the Building Code to which the Verification Method or Acceptable Solution relates. However, using a Verification Method or Acceptable Solution is only one method of complying with the Building Code. There may be alternative ways to comply.

Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Verification Methods and Acceptable Solutions and explains alternative methods of achieving compliance.

Defined words (italicised in the text) and classified uses are explained in Clauses A1 and A2 of the Building Code and in the Definitions at the start of this document.

Enquiries about the content of this document should be directed to:

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Ministry of Business, Innovation and Employment
PO Box 1473, Wellington 6140
Telephone 0800 242 243
Email: info@building.govt.nz

Verification Methods and Acceptable Solutions are available from www.building.govt.nz

New Zealand Government

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Document Status

The most recent version of this document (Amendment 7), as detailed in the Document History, is approved by the Chief Executive of the Ministry of Business, Innovation and Employment. It is effective from 5 November 2020 and supersedes all previous versions of this document.

The previous version of this document (Amendment 6) will cease to have effect on 3 November 2021.

People using this document should check for amendments on a regular basis. The Ministry of Business, Innovation and Employment may amend any part of any Verification Method or Acceptable Solution at any time. Up-to-date versions of Verification Methods and Acceptable Solutions are available from www.building.govt.nz

E3: Document History			
	Date	**Alterations**	
First published	July 1992		
Amendment 1	September 1993	p. 7, 3.1.2	
Second edition	28 February 1998	Document revised – second edition issued	
Amendment 2	1 July 2001	p. 2, Document History, Status p. 9, Definitions	p. 14, 2.2.1
Amendment 3	14 October 2004	pp. 3 and 4 Code Clause	
Amendment 4	Effective from 10 October 2011 until 14 August 2014	p. 2, Document History, Status p. 7, References	p. 9, Definitions p. 13, E3/AS1 1.1.2
Amendment 5	14 February 2014 until 30 May 2017	p. 2A, Document History, Status p. 7, References	p. 9, Definitions p. 13, E3/AS1 1.1.4
Amendment 6	Effective from 1 January 2017 until 3 November 2021	p. 13 1.1.4	
Amendment 7	Effective from 5 November 2020	p. 5 Contents p. 7 References p. 10 Definitions	pp. 14–21 E3/AS12.0, 3.0, Figure 6 p. 22 Index
Note: Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.			

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2B

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New Zealand Building Code Clause E3 Internal Moisture

This Clause is extracted from the New Zealand Building Code contained in the First Schedule of the Building Regulations 1992.

FIRST SCHEDULE–*continued*

Clause E3–INTERNAL MOISTURE

Provisions	Limits on application
OBJECTIVE	
E3.1 The objective of this provision is to–	
(a) Safeguard people against illness, injury, or loss of *amenity* that could result from the accumulation of internal moisture; and	
(b) Protect household units and other property from damage caused by free water from another household unit in the same building.	
FUNCTIONAL REQUIREMENT	
E3.2 *Buildings* must be constructed to avoid the likelihood of–	
(a) Fungal growth or the accumulation of *contaminants* on linings and other *building elements*; and	
(b) Free water overflow penetrating to an adjoining *household unit*; and	
(c) Damage to *building elements* being caused by the presence of moisture.	
PERFORMANCE	
E3.3.1 An *adequate* combination of *thermal resistance*, ventilation, and space temperature must be provided to all *habitable spaces*, bathrooms, laundries, and other spaces where moisture may be generated or may accumulate.	Performance E3.3.1 does not apply to *Communal Non-residential, Commercial, Industrial, Outbuildings* or *Ancillary buildings.*
E3.3.2 Freewater from accidental overflow from *sanitary fixtures* or *sanitary appliances* must be disposed of in a way that avoids loss of *amenity* or damage to *household units* or *other property*.	
E3.3.3 Floor surfaces of any space containing *sanitary fixtures* or *sanitary appliances* must be *impervious* and easily cleaned.	

Amend 3 Oct 2004

Amend 3 Oct 2004

Amend 3 Oct 2004

Amend 3 Oct 2004

Amend 3 Oct 2004

Amend 3 Oct 2004

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FIRST SCHEDULE–*continued*

Provisions	Limits on application
E3.3.4 Wall surfaces adjacent to *sanitary fixtures* or *sanitary appliances* must be *impervious* and easily cleaned.	
E3.3.5 Surfaces of *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*.	

Amend 3
Oct 2004

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Amend 7
Nov 2020

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References

For the purposes of New Zealand Building Code (NZBC) compliance, the Standards and documents referenced in this Verification Method and Acceptable Solution (primary reference documents) must be the editions, along with their specific amendments, listed below. Where these primary reference documents refer to other Standards or documents (secondary reference documents), which in turn may also refer to other Standards or documents, and so on (lower-order reference documents), then the version in effect at the date of publication of this Verification Method and Acceptable Solution must be used.

Amend 5 Feb 2014

Amend 4 Oct 2011

Amend 5 Feb 2014

		Where quoted
Standards New Zealand		
NZS 4214: 2006	Methods of determining the total thermal resistance of parts of buildings	AS1 Definitions, 1.1.2
British Standards Institution		
BS EN 274:- Part 2: 2002	Waste fittings for sanitary appliances Test methods	AS1 2.0.2
Building Research Association of New Zealand		
BRANZ House Insulation Guide: 1995		AS1 1.1.3

Amend 4 Oct 2011

Amend 7 Nov 2020

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Definitions

Amend 4 Oct 2011

This is an abbreviated list of definitions for words or terms particularly relevant to this Verification Method and Acceptable Solution. The definitions for any other italicised words may be found in the New Zealand Building Code Handbook.

Amend 5 Feb 2014

Adequate *Adequate* to achieve the objectives of the *building code*.

Amend 4 Oct 2011

Building has the meaning given to it by sections 8 and 9 of the *Building Act 2004*.

Building element Any structural and non-structural component or assembly incorporated into or associated with a *building*. Included are *fixtures*, services, *drains*, permanent mechanical installations for access, glazing, partitions, ceilings and temporary supports.

Concealed space Any part of the space within a *building* that cannot be seen from an *occupied space*.

COMMENT:
This term includes any ceiling space, roof space, space under a raised floor (such as computer rooms, floors, or stages), plenums, spaces under a tiered floor, "left-over spaces" created when some structural element or the like has been covered in; small service or duct spaces within the volume of a *firecell* and the like, but not a protected shaft.

Construct in relation to a *building*, includes to build, erect, prefabricate, and relocate; and *construction* has a corresponding meaning.

Fixture An article intended to remain permanently attached to and form part of a *building*.

Amend 2 July 2001

Floor waste An outlet located at the low point of a graded floor or in a level floor designed to receive accidental or intentional discharges.

Habitable space A space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water-closet, pantry, walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods.

Household unit

a) means any *building* or group of *buildings*, or part of a *building* or group of *buildings*, that is:

   i) used, or intended to be used, only or mainly for residential purposes; and

   ii) occupied, or intended to be occupied, exclusively as the home or residence of not more than one household; but

b) does not include a hostel, boarding house or other specialised accommodation.

Amend 4 Oct 2011

Impervious That which does not allow the passage of moisture.

Insulating material A material that has a thermal conductivity of less than 0.07 W/mK.

Intended use in relation to a *building*,—

(a) includes any or all of the following:

   (i) any reasonably foreseeable occasional use that is not incompatible with the *intended use*:

   (ii) normal maintenance:

   (iii) activities undertaken in response to *fire* or any other reasonably foreseeable emergency; but

(b) does not include any other maintenance and repairs or rebuilding.

Person with a disability means a *person* who has an impairment or a combination of impairments that limits the extent to which the *person* can engage in the activities, pursuits, and processes of everyday life, including, without limitation, any of the following:

Amend 2 Jul 2001

(a) a physical, sensory, neurological, or intellectual impairment:

(b) a mental illness.

Amend 4 Oct 2011

Plumbing system Pipes, joints and fittings laid above ground and used for the conveyance of *foul water* to the *foul water* drain, and includes vent pipes.

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R-value The common abbreviation for describing the values of both *thermal resistance* and *total thermal resistance*.

Amend 7 Nov 2020

Sanitary appliance An appliance which is intended to be used for *sanitation*, but which is not a *sanitary fixture*. Included are machines for washing dishes and clothes

Sanitary fixture Any *fixture* which is intended to be used for *sanitation*.

Amend 7 Nov 2020

COMMENT:

Toilets, urinals, bidets, baths, showers, basins, sinks and tubs are examples of common *sanitary fixtures*.

Sanitation The term used to describe the activities of washing and/or excretion carried out in a manner or condition such that the effect on health is minimised, with regard to dirt and infection.

Thermal resistance The resistance to heat flow of a given component of a *building element*. It is equal to the temperature difference (°C) needed to produce unit heat flux (W/m^2) through unit area (m^2) under steady conditions. The units are °Cm^2/W.

Total thermal resistance The overall air-to-air *thermal resistance* across all components of a *building element* such as a wall, roof or floor. (This includes the surface resistances which may vary with environmental changes, e.g. temperature and humidity, but for most purposes can be regarded as having standard values as given in NZS 4214.)

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Verification Method E3/VM1

No specific methods have been adopted for verifying compliance with the Performance of NZBC E3.

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Acceptable Solution E3/AS1

1.0 Prevention of Fungal Growth

1.0.1 Fungal growth (mildew) is avoided by minimising internal condensation. Condensation is avoided or reduced by maintaining the correct balance between interior temperature and ventilation. Insulation assists in maintaining interior temperatures at a suitable level.

1.0.2 The New Zealand Building Code does not specify minimum heating requirements except for old people's homes and early childhood centres. Occupants will determine their own methods and levels of heating. Typically it is necessary and sufficient, for condensation control in winter, to keep interior temperatures 5°C to 7°C above exterior temperatures in a ventilated space.

1.1 Thermal resistance

1.1.1 *R-values* for walls, roofs and ceilings shall be no less than:

a) For light timber frame wall or other framed wall *constructions* with cavities, 1.5.

b) For single skin normal weight masonry based wall *construction* without a cavity, 0.6.

c) For solid timber wall systems no less than 60 mm thick, 0.6.

d) For roof or ceilings of any *construction*, 1.5.

Amend 4 Oct 2011

1.1.2 *R-values* shall be determined using the methods in NZS 4214. Laboratory test samples shall be truly representative of the wall, roof or ceiling system, including any provision for reducing thermal bridging.

1.1.3 Materials and installation

The BRANZ House Insulation Guide provides examples of acceptable wall, roof and ceiling *constructions* to satisfy the requirements of Paragraph 1.1.1.

COMMENT:

The BRANZ House Insulation Guide gives *constructions* for a range of *R-values*. It is essential to choose the correct *R-values* from these shown in the tables in order to comply with this Acceptable Solution.

1.1.4 For the *construction* to be acceptable:

a) Building paper shall extend from the upper side of the top plate to the underside of the bearers or wall plates supporting the ground floor joists.

b) Deleted

Amend 5 Feb 2014

c) There shall be no perimeter gaps between the *insulating material* and the framing members.

d) Where steel framing is used in Housing and Communical Residential building uses a thermal break with a minimum *R-value* of 0.25 m^2°C/W shall be provided at the outside face of each steel framing member. Expanded polystyrene (EPS) strips, 10 mm thick provide an *R-value* of 0.25 m^2°C/W. Other materials or methods may be used to provide the minimum *R-value* of 0.25 m^2°C/W.

Amend 5 Feb 2014

e) If foil insulation is used it must be placed on the lining side of studs, not the cladding side.

COMMENT:

Amend 5 Feb 2014

1. Frame *construction* with 10 mm plaster board linings and a single layer of foil has an *R-value* of approximately 0.9 and does not satisfy Paragraph 1.1.1.
2. Surface condensation can be a problem where vapour barriers are needed for *buildings* enclosing very warm or wet areas such as spa pools, saunas and swimming pools, or *buildings* in a very cold environment such as ski lodges and mountain huts. These situations are not covered by this Acceptable Solution and require specific design.
3. Thermal breaks should be specifically designed for steel framed *buildings* that are not covered by Building Code Clause E3 Internal Moisture. That is where:
   i) the *building* use is not *Housing* or *Communal Residential*, and
   ii) the moisture load is greater than in Housing, and the building use has high occupant moisture load (eg, schools), and
   iii) there is a temperature differential from inside to outside that is sufficient to cause condensation on steel framing members.

Amend 6 Jan 2017

Amend 5 Feb 2014

1.1.5 Insulation for energy efficiency

Insulation satisfying the energy efficiency requirements of NZBC H1 cannot automatically be assumed to meet the *R-values* for internal moisture requirements of Paragraph 1.1.1.

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COMMENT:

Insulation to prevent condensation relates to *thermal resistance* of the *building element* in question (e.g. wall or roof). Insulation for energy efficiency relates to the *building* as a whole, and the requirement can be met in different ways. It is possible, for example, to obtain sufficient energy efficiency in a *building* by heavily insulating the floor and ceiling with no insulation in the walls. This would not satisfy the requirement for this acceptable solution because there would not be sufficient insulation in the walls to minimise condensation.

1.2 Ventilation

1.2.1 Ventilation shall be provided naturally or mechanically to comply with G4/AS1.

1.3 Condensation control

1.3.1 In *buildings* classified as *Housing or Communal residential* which are not air conditioned, metal-framed windows with single glazing shall be *constructed* with a means of condensation disposal. An acceptable method is the provision of a condensation collection channel which, either discharges the water to the outside or is of sufficient capacity to hold the water, without overflowing, until it evaporates.

1.3.2 Condensation channels shall have closed ends and no openings which permit ponded water to contact *building elements* susceptible to moisture. Where provision is made for drainage to the outside, drainage outlets shall have the capacity to expel all condensed water and shall have means of preventing condensed water from being blown back by wind pressure.

1.3.3 Condensation channels and drainage outlets shall be able to be cleaned. The minimum clear dimensions of collection channels shall be 10 mm wide by 5 mm deep.

COMMENT:

1. Condensation can be reduced by good ventilation. Windows incorporating passive ventilators, particularly those with full perimeter ventilation, are effective in reducing condensation.
2. While a 10 mm condensation channel width is normally adequate to prevent overflowing, it is awkward to clean adequately. A more practical width is 20 mm.

2.0 Overflow

2.0.1 If a *sanitary fixture* is located where accidental overflow could damage an adjoining *household unit* or *other property*, then either:

a) Containment and *floor wastes* that meet the requirements of Paragraphs 2.1.1 and 2.2.1 shall be provided, or

b) The exemption for household kitchen sinks and laundry tubs with integrated overflows that meet Paragraph 2.0.2 shall apply.

2.0.2 Household kitchen sinks and laundry tubs that have an integrated overflow with a minimum flow rate of 0.25 l/s do not require additional overflow provision such as containment and a *floor waste* where:

a) The maximum flow rate from the inlet tap(s) is less than the flow rate of the integrated overflow for that sink or tub, or

b) The water supplies to the inlet tap(s) for that sink or tub are fitted with proprietary flow restrictors (such as cartridges) to limit the tap flow rate to less than the flow rate of the integrated overflow for the sink or tub.

Integrated overflows shall be tested and verified in accordance with BS EN 274 to determine their minimum flow rates.

COMMENT

Specifiers applying for building consents will need to demonstrate that integrated overflows have been tested and verified as meeting the minimum flow rate in accordance with BS EN 274. Manufacturers may be able to supply this information.

2.0.2.1 For multiple tubs or sinks installed in a kitchen or laundry and served by a single tap, either:

a) Each individual tub and sink shall have its own integrated overflow complying with Paragraph 2.0.2, or

b) A secondary tub or sink shall have a controlled overflow path into a main tub or sink which has an integrated overflow complying with Paragraph 2.0.2.

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2.0.3 Containment and *floor wastes* are not required solely to account for the failure of a *sanitary appliance* component or hose, where the flexible discharge hose from the *sanitary appliance* can be directly connected into the *plumbing system* either by mechanical fastening to a fixture trap spigot, or by direct insertion into an open standpipe or a laundry tub waste hose connection port.

COMMENT:

This Acceptable Solution does not regard the failure of a component (e.g. a washer) or hose (e.g. burst hose) of a *sanitary appliance* as an accidental overflow.

Compliance of the spigot, open standpipe, or laundry tub waste hose connection port with NZBC Clause G13 Foul water is outside the scope of this Acceptable Solution.

Amend 7 Nov 2020

2.1 Containment

2.1.1 Containment provided to satisfy Paragraph 2.0.1 a) may be achieved by using *impervious* floor coverings which:

a) Are continuous and coved or joints sealed where they meet the wall (See Figure 1), and

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b) Extend to the doorway and all walls of the room, or to at least 1.5 m from all *sanitary fixtures* and *sanitary appliances* in open-plan rooms.

COMMENT

Additional protection to adjoining *household units* and *other property* may be provided by the use of construction details that provide more complete prevention of the passage of overflow water at doorways and open plan areas. However, doing so will exceed the requirements of this Acceptable Solution.

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2.2 Floor wastes

2.2.1 *Floor wastes* provided to satisfy Paragraph 2.0.1 b) shall comply with NZBC Clause G13. A graded floor is not essential in this situation.

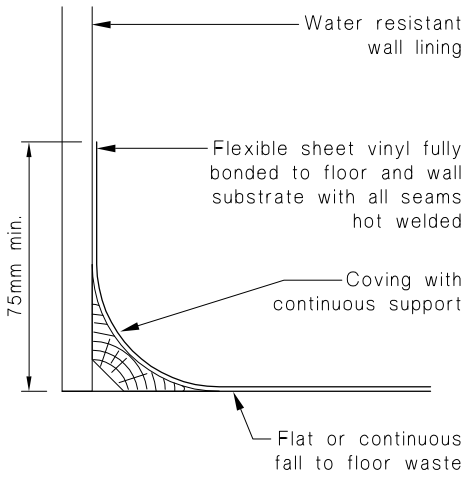
Amend 2 Jul 2001

COMMENT

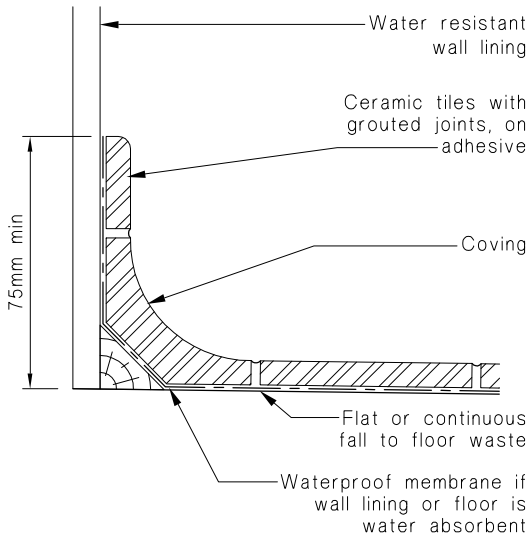
Acceptable Solutions G13/AS1 and G13/AS3 contain provisions for *floor wastes* that comply with NZBC Clause G13 Foul water.

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Figure 1: Floor Coverings at Wall Junctions
Paragraph 2.1.1



(a) Vinyl floor covering



(b) Ceramic tile covering

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3.0 Watersplash

3.1 Lining materials

3.1.1 Floors

The following finishes to floors satisfy the performance for *impervious* and easily cleaned surfaces in spaces containing *sanitary fixtures* or *sanitary appliances*. In open plan spaces this surface shall extend at least 1.5 m from all *sanitary fixtures* and *sanitary appliances*:

COMMENT
The requirement for *impervious* and easily cleaned floor surfaces applies to spaces such as kitchens, bathrooms, laundries and toilet facilities. This requirement applies regardless of whether containment is required by Paragraph 2.0.

Amend 7 Nov 2020

a) Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints and sealed or coved at edges where watersplash may occur.

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b) Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use. Edges of the tiled area where watersplash may occur must be sealed or coved, and tiles must be laid on a continuous impervious substrate or a membrane specified by the manufacturer as being suitable for the tiles, substrate material and the environment of use.

c) A slab-on-grade concrete floor having a steel trowel or polished finish, sealed at edges where watersplash may occur, when used in a domestic laundry within a garage, or in a *building* that contains only sanitary facilities.

COMMENT:
Other floor finishes may also be capable of satisfying the performance for *impervious* and easily cleaned, if installed in a manner that prevents gaps or cracks within the finish and at any parts of its perimeter that are exposed to watersplash, and/or if the surface is sealed with a suitable durable coating. However such other finishes are outside the scope of this Acceptable Solution.

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Water can penetrate behind or under floor finishes in situations where watersplash occurs regularly (such as around shower enclosures or the fronts of built-in baths), unless these edges are sealed or coved.

Domestic laundries in garages, and *buildings* containing only sanitary facilities, are spaces where the consequences of any small imperfections (such as microcracking) in the imperviousness of a concrete floor are minimal and compliance with NZBC Clause E3 Internal moisture can still be demonstrated.

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3.1.2 Walls

The following linings and finishes to walls satisfy the performance for *impervious* and easily cleaned surfaces in areas adjacent to *sanitary fixtures* or *sanitary appliances*, or otherwise likely to be splashed in the course of the *intended use* of the *building*:

Amend 7 Nov 2020

a) Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints.

b) Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use.

c) Sheet linings finished with a semi-gloss or gloss coating or a hard-wearing low-sheen latex paint containing mould inhibitors.

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d) Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin, and installed with *impervious* joints (see Figure 2).

COMMENT:
Other wall linings and finishes may also be capable of satisfying the performance for *impervious* and easily cleaned, if installed in a manner that prevents gaps or cracks within the finish and at any parts of its perimeter that are exposed to water splash, and/or if the surface is sealed with a suitable durable coating. However such other finishes are outside the scope of this Acceptable Solution.

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3.2 Joints

3.2.1 Joints between sanitary fixtures and impervious floor finishes

Where *sanitary fixtures* abut *impervious* floor finishes, the base of the fixture must be sealed to the *impervious* floor finish.

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3.2.2 Joints between fixtures and wall linings

Where baths, basins, tubs or sinks abut *impervious* linings, the joint between *fixture* and lining shall be sealed to prevent water penetration to *concealed spaces* or behind linings. (See Figures 3 (a) and (b).)

3.3 Showers and urinals

3.3.1 Showers

All shower spaces shall have *impervious* floors or floor finishes and *impervious* wall linings or wall finishes.

The *impervious* shower wall linings or wall finishes shall extend up the wall to the higher of 1800 mm above the shower floor, or 50 mm above the shower rose.

The top edge of *impervious* shower wall linings or wall finishes shall be sealed to the wall behind (or to the ceiling if full height) to prevent condensation penetrating behind the shower wall linings or wall finishes.

Penetrations in the shower wall for tapware, mixers, roses etc. shall be waterproofed with a proprietary flange system or with sealant (refer Figure 6), installed in a way that allows easy access when replacing washers, ceramic discs and o-rings.

COMMENT

Some tapware manufacturers have specific product installation requirements that are additional to the use of sealant around the tapware penetration.

3.3.1.1 Shower floor materials

Within shower enclosures, or within a 1500 mm horizontal radius from the shower rose where there is no shower enclosure such as a wall, screen, door or curtain (see Figure 5), one of the following materials or finishes to floors shall be used:

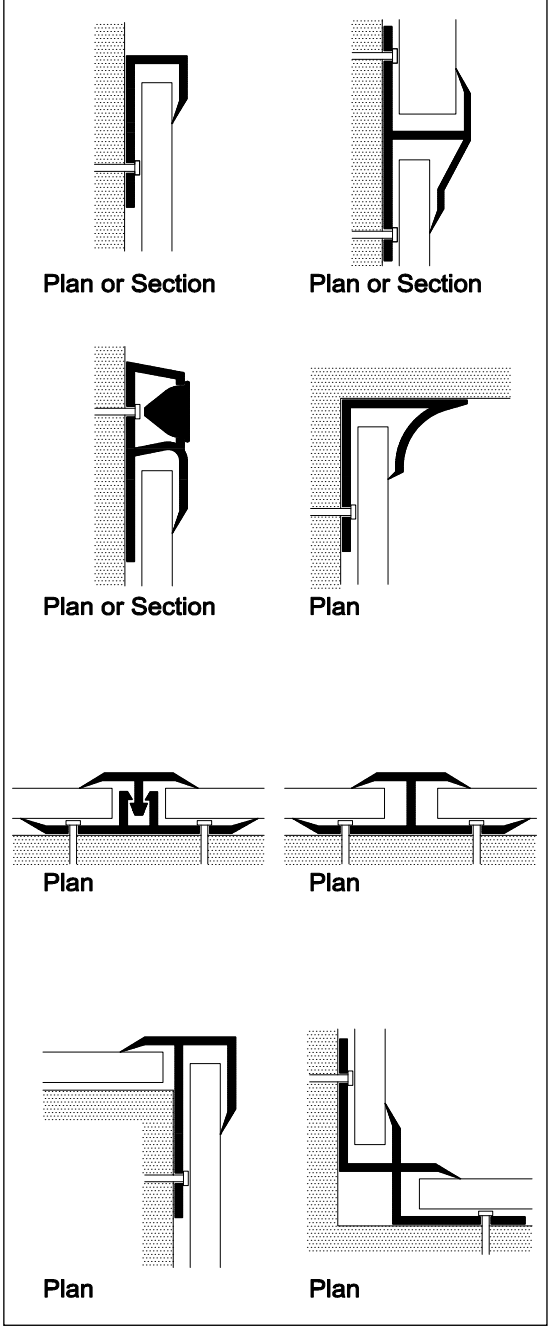
a) Plastic or stainless steel shower trays

b) Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints, and coved at edges

c) Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use. The shower must also have tiled walls (see Paragraph 3.3.1.2 c)), and tiles must be laid either:

i) Within a shower tray specified by the manufacturer as being suitable for the tiles; or

Figure 2: Wall Lining Joints
Paragraph 3.2.1

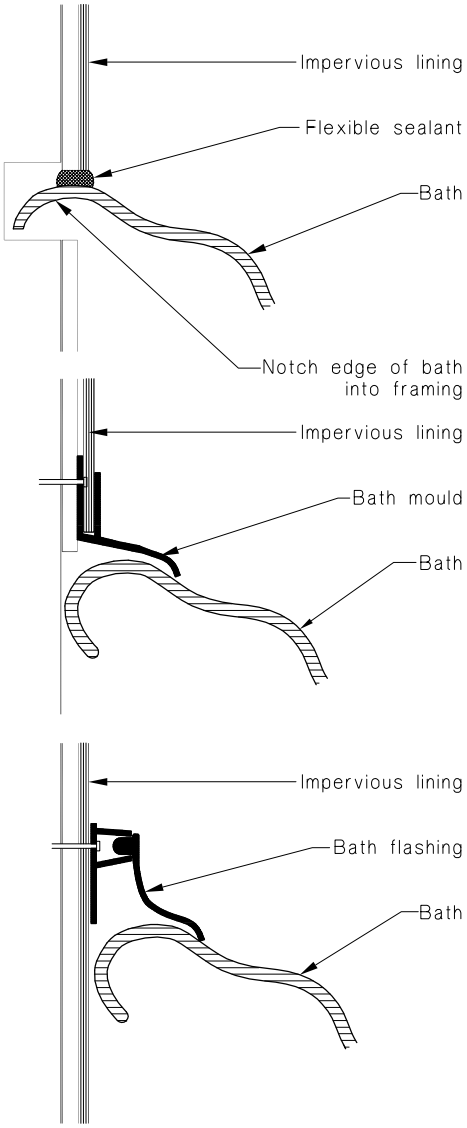


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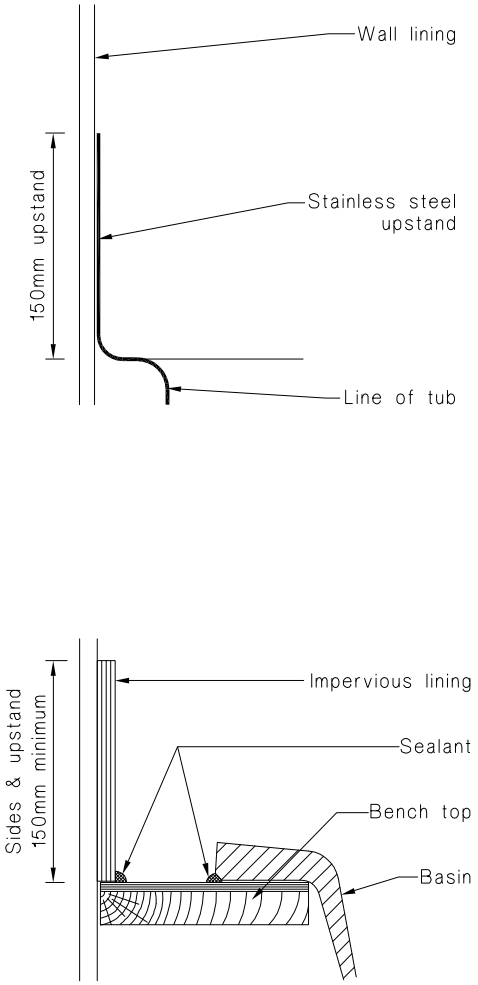
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Figure 3: **Baths, Basins, Tubs and Sinks, Joints against Wall Linings**
Paragraph 3.2.2



(a) Junctions of bath and wall



(b) Tub, sink and basin

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ii) On a membrane specified by the manufacturer as being suitable for the tiles, substrate material and the environment of use.

3.3.1.2 Shower wall lining and finish materials

Within shower enclosures or within a 1500 mm horizontal radius from the shower rose where there is no shower enclosure such as a wall, screen, door or curtain (see Figure 5), one of the following linings and finishes to walls shall be used:

a) Plastic shower wall liners, either as a single component without joints, or installed with waterproof joints

b) Integrally waterproof sheet material (e.g. polyvinylchloride) with sealed joints.

c) Ceramic or stone tiles having 6% maximum water absorption, waterproof grouted joints, and bedded with an adhesive specified by the tile manufacturer as being suitable for the tiles, substrate material and the environment of use. Tiles must be laid on a membrane specified by the manufacturer as being suitable for the tiles, substrate material and the environment of use.

d) Water resistant sheet linings finished with decorative high pressure laminate or factory applied polyurethane or resin, and installed with impervious joints (see Figure 2).

3.3.1.3 Showers over baths

For showers over baths, the bath rim must have a minimum height of 15 mm, and the shower wall lining shall lap over and be sealed to the rim of the bath. Either the bath rim must be recessed into the wall framing, or the shower lining must be packed out to suit the rim. A bath mould or flashing shall not be used for showers over baths.

COMMENT

Notches to recess the rim of a bath into the wall framing may require the use of over-sized framing members to ensure that the notches do not detrimentally affect structural performance of the wall.

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3.3.2 Shower enclosures

Shower floors and bases may be constructed with or without upstands, and where installed for use by *people with disabilities* shall have level thresholds.

3.3.2.1 When enclosures, such as walls, screens, doors or curtains are used they shall be continuous from floor level or top of upstand to 1800 mm minimum above floor level and not less than 50 mm above the shower rose.

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3.3.2.2 Where shower trays are used, the junction between tray and wall linings shall be constructed in accordance with Figure 4 (a) or (b).

Amend 7 Nov 2020

3.3.2.3 Where the shower floor has no upstand or where a wall, screen, door or curtain is omitted, the floor shall have a fall of no less than 1:50 towards the *floor waste*. The fall shall apply to the floor area within a radius of 1500 mm taken from a point vertically below the shower rose, or from any wall within that radius. (See Figure 5.)

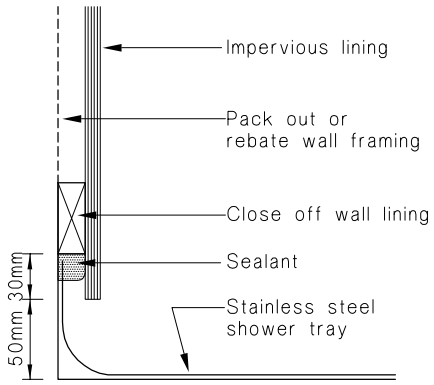
Amend 7 Nov 2020

3.3.3 Urinals

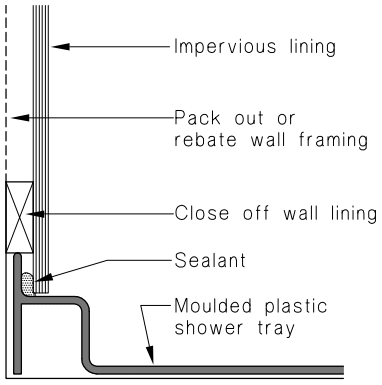
Impervious wall shall extend horizontally at least 300 mm beyond each side of the urinal and vertically from floor level to a height of 1500 mm.

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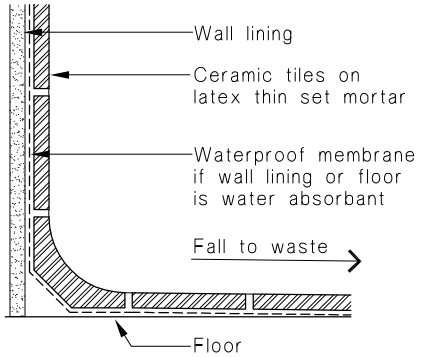
Figure 4: **Shower Trays**
Paragraphs 3.3.1 and 3.3.3



(a) Stainless steel shower tray

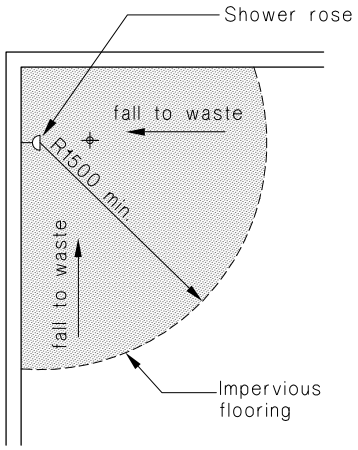


(b) Moulded plastic shower tray

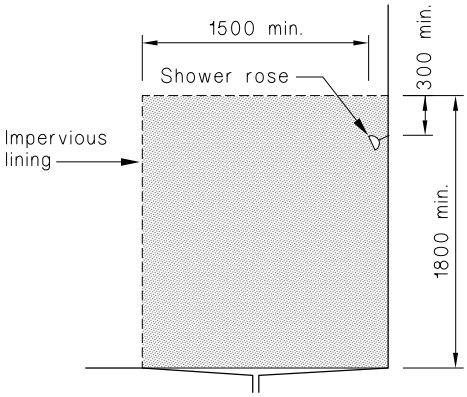


(c) Tiled shower tray

Figure 5: **Wall and Floor Coverings to Unenclosed Showers**
Paragraphs 3.3.1 and 3.3.5



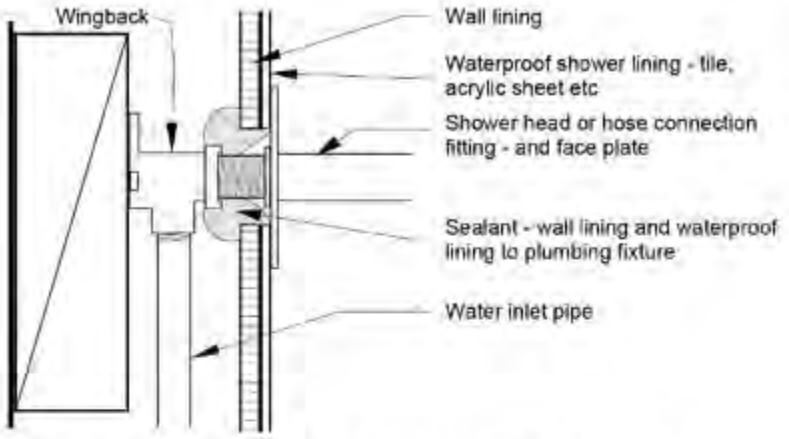
(a) Plan



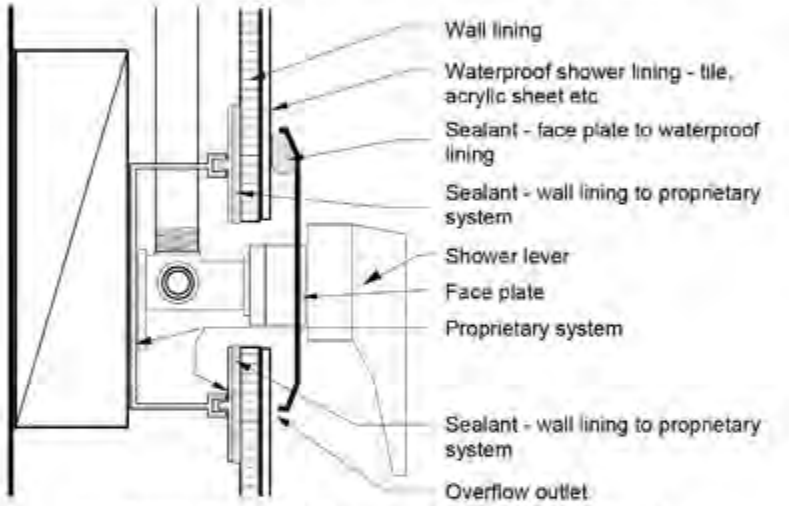
(b) Section

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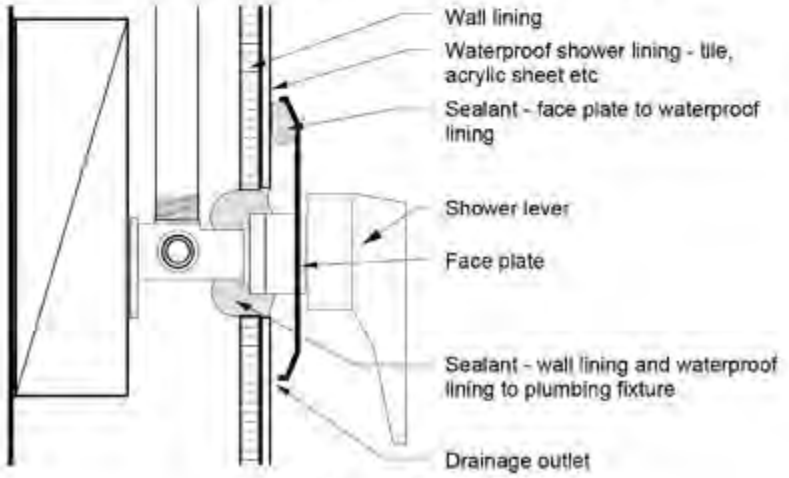
Figure 6: **Examples for waterproofing through shower walls**
Paragraph 3.3.1



(a) Shower head or flexible hose connection using sealant



(b) Shower mixer using proprietary system (example only)



(c) Shower mixer using sealant

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Overflow **AS1** 2.0
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METRO
Frameless Glass Systems

5 Lady Fisher Place,
Highbrook, Auckland
PO Box 58 144 Botany Auckland 2163

P 09 927 3000
F 09 274 1100
W www.metroglass.co.nz

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WAIMAKARIRI DISTRICT COUNCIL
AMENDED Plan and/or Specifications APPROVED
BC200635.02 23/12/2021 brendam
Change acrylic showers to tiled showers to both

Ex Auckland Store. All prices exclude G.S.T.

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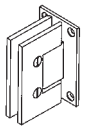
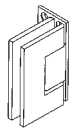
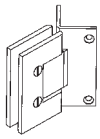
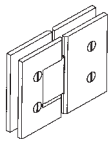
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Merchant Price List

SHOWER COMPONENTS

Elite Hinges

Specify 8mm or 10mm glass thickness

Product	Code	Description	Polished Chrome	Satin Chrome
	MF1	Wall Fix Hinge Standard mounting plate		
	MF1-L	Wall Fix Hinge Single sided mounting plate 37mm wide back plate 4 screw wall fixing		
	MF1-L3	Wall Fix Hinge Single sided mounting plate 50mm wide back plate 3 screw wall fixing		
	MF1-XL	Wall Fix Hinge Single sided mounting plate 62mm wide back plate 4 screw wall fixing		
	MF1-90	Wall Fix Hinge 90° mounting plate		
	MF2	Glass to Glass Fix Hinge		

For Glass Cutout and Hinge Details refer page 1.14 to 1.15
For Typical Shower Setout Details refer pages 1.17 to 1.23

Ex Auckland Store. All prices exclude G.S.T.

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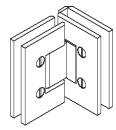
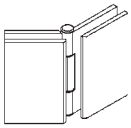
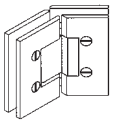
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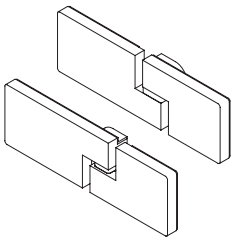
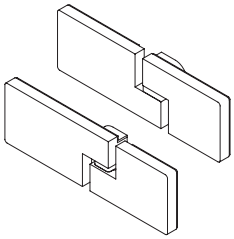
Merchant Price List

SHOWER COMPONENTS

Elite Hinges

Product	Code	Description	Polished Chrome	Satin Chrome
	MF2-90	Glass to Glass Fix Hinge 90° Angle		
	MF2-BF	Glass to Glass Bifold Hinge 180° Angle		
	MF2-135	Glass to Glass Fix Hinge 135° angle		
	MF2-SP	Glass to Glass Fix Hinge Custom angles from 125° to 180°		

Designer Hinges

Product	Code	Description	Polished Chrome
	MF2DL	Glass to Glass Fix Hinge for left hung doors. Suitable for 8mm glass only. Max door weight 40kg.	
	MF2DR	Glass to Glass Fix Hinge for right hung doors. Suitable for 8mm glass only. Max door weight 40kg.	

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SHOWER COMPONENTS

Ozone Sliding Shower Doorkit

Suits 8mm or 10mm glass thickness.

For doors up to 45kg in weight.

Each set contains: Track, Track fixing bracket, Hangers, Anti jump buttons, Side Panel fixing brackets, wheels, Stops & Guide.

Finish Bright Polished Stainless Steel.

Product	Code	Description	Price
	OTR-2000	Glass to Wall Fixing Set For showers up to 2000mm OA Width See page 1.25 for Typical Setout Detail	
	OTR-2000	Wall to Wall Fixing Set For showers up to 2000mm OA Width See page 1.27 for Typical Setout Detail	
	OTR-2000	Glass to Glass Fixing Set For showers up to 2000mm OA Width See page 1.29 for Typical Setout Detail	
	OTR-2000B	Additional button supports for OTR-2000 Shower	

Kits are sent out with all components to make any configuration above. Excluding channel and handle.
For Typical Shower Setout Details refer pages 1.24 to 1.29

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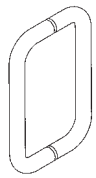
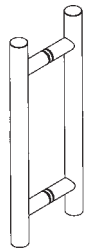
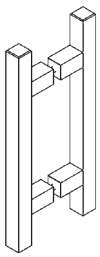
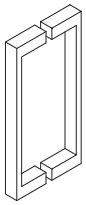
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SHOWER COMPONENTS

Glasstech Stainless Steel Handles

Product	Code	Description	PSS	SSS
	G.T-250	D Pull Handle 25mm diameter Stainless Steel 250mm hole centres 12mm hole diameter		
	G.T-FR150	Fineline Round Pull Handle 19mm diameter Stainless Steel 250mm long x 150mm hole centres 10mm hole diameter		
	G.T-FR250	Fineline Round Pull Handle 25mm diameter Stainless Steel 350mm long x 250mm hole centres 10mm hole diameter		
	G.T-FS150	Fineline Square Pull Handle 19mm x 19mm Square Section Stainless Steel 250mm long x 150mm hole centres 10mm hole diameter		
	G.T-FS250	Fineline Square Pull Handle 19mm x 19mm Square Section Stainless Steel 350mm long x 250mm hole centres 10mm hole diameter		
	G.T-RA250	Rectangular Pull Handle 20mm x 40mm Rectangle Section Stainless Steel 270mm long x 250mm hole centres 10mm hole diameter		
	G.T-Q 250	Rectangular Pull Handle 10mm x 20mm Rectangle Section Stainless Steel 270mm long x 250mm hole centres 10mm hole diameter		

For Typical Setout Details refer pages 1.16

PSS - Polished Stainless Steel
SSS - Satin Stainless Steel

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SHOWER COMPONENTS

Handles

Product	Code	Description	PSS	SSS
	MD250	Delta Double Pull Handle Set 250mm hole centres 12mm diameter holes		

For Typical Setout Details refer pages 1.16

Forged Stainless Steel Handles

Product	Code	Description	PSS	SSS
	CURVE 210	Curve Handle 235mm long. 210mm hole centres 12mm diameter holes		
	WAVE 210	Wave Handle 235mm long. 210mm hole centres 12mm diameter holes		

PSS - Polished Stainless Steel
SSS - Satin Stainless Steel

*Powder coat colour as per standard range as stated on page 1.8 of this price list.

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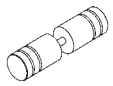
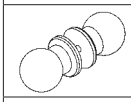
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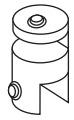
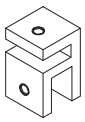
SHOWER COMPONENTS

Plated Brass Knobs & Components

Product	Code	Description	Polished Chrome	Satin Chrome	PSS	SSS
	MK25	Pull Knob Set 25mm diameter Use MW 30 washer for chrome/gold				
	MK38	Pull Knob Set 38mm diameter Use MW 43 washer for chrome/gold				
	MK60	Pull Knob Set 38mm diameter Use MW 30 washer for chrome/gold				
	MKS25	Pull Knob Set Square 25x25mm Square				
	MW 30	Highlight Washer 30mm/37mm/43mm diameter				
	MW 37					
	MW 43					

PSS - Polished Stainless Steel
SSS - Satin Stainless Steel

Over Panel Clamp

Product	Code	Description	Polished Chrome
	H05598	Shower Overpanel Clamp - Round To suit 10mm shower to 6mm overpanel Chrome plate. 20mm diameter round profile.	
	H05598S	Shower Overpanel Clamp - Square To suit 10mm shower to 6mm overpanel Chrome plate. 20mm x 20mm square profile.	

*Powder coat colour as per standard range as stated on page 1.8 of this price list.

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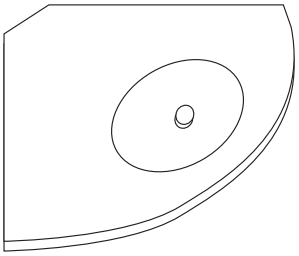
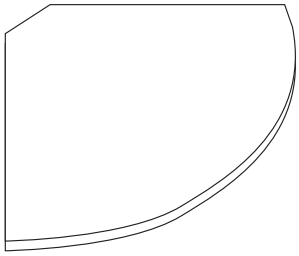
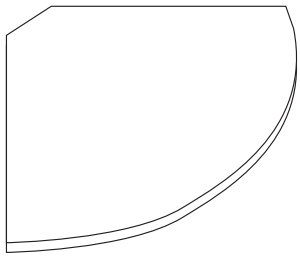
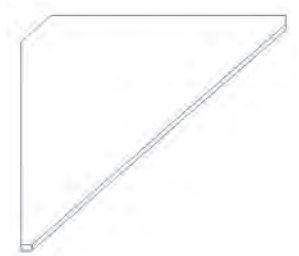
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SHOWER COMPONENTS

Glass Shelves

Product	Code	Description	Price
	GS200SD	Corner Shelf with Soap Dish 200 x 200 x 10mm Low Iron Toughened Glass	
	GS250SD	Corner Shelf with Soap Dish 250 x 250 x 10mm Low Iron Toughened Glass	
	GS200	Corner Shelf 200 x 200 x 10mm Clear Toughened Glass	
	GS200/S	Corner Shelf 200 x 200 x 10mm Low Iron Toughened Glass	
	GS250	Corner Shelf 250 x 250 x 10mm Clear Toughened Glass	
	GS250/S	Corner Shelf 250 x 250 x 10mm Low Iron Toughened Glass	
	GSA200	Angled Corner Shelf 200 x 200 x 10mm Clear Toughened Glass	
	GSA250	Angled Corner Shelf 250 x 250 x 10mm Clear Toughened Glass	

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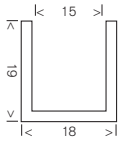
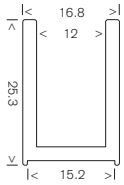
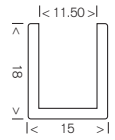
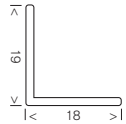
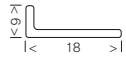
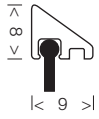
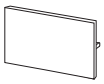
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SHOWER COMPONENTS

Channels and End Caps

All prices per metre

Product	Code	Description	Bright Silver Anodised	Natural Silver Anodised	Powder Coat*
	CS18	Channel Section 19 x 18 Stock lengths 2100mm and 3000mm Cut lengths			
	CS17	Channel Section 25 x 17 2.4mm wall thickness for increased strength and reduced bowing. Raised lip hides tape/silicone and prevents silicone leakage. Stock length 2500mm.			
	CS15	Channel Section 18 x 15 Stock length 3000mm Cut lengths			
	AS18	Angle Section 19 x 15 Stock length 2500mm Cut lengths			
	AS6	Angle Section 6 x 18 Water Bar Stock length 1400mm Cut lengths			
	HR1	Half Round Water Bar Stock length 1400mm Cut lengths			
	WD1	Water Deflector Complete with felt Stock length 1400mm Cut lengths			
	CC18	Channel End Cap To suit CS18 channel			
	CC45	Channel End Cap To suit 45° mitre CS18 channel			
	CC17	Channel End Cap To suit CS17 channel			
	CC15	Channel End Cap To suit CS15 channel			

***Note:** The powder coat price list is based on the following standard colours – **Gloss White, Gloss Black & Matt Black.**Special colours outside this range are subject to a powder coaters surcharge. Allow seven day lead time for all powder coat colours.

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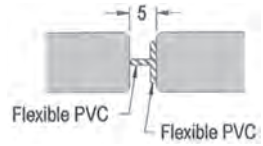
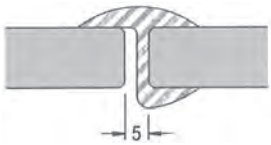
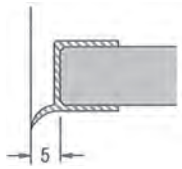
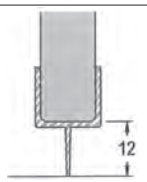
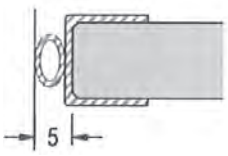
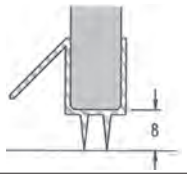
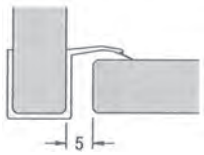
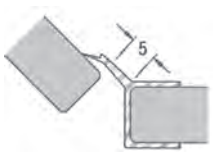
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SHOWER COMPONENTS

PVC Shower Seals

Product	Code	Description	All Prices Per Metre
	MT 1	Clear Water Seal PVC rigid back and flexible seal to suit 10mm glass Stock length 2000mm	
	MWS 10-1	Clear Water Seal PVC rigid stop to suit 10mm glass Stock length 2200mm Cut lengths	
	MWS 10-5	Clear Water Seal PVC rigid channel and flexible fin to suit 10mm glass Stock length 2200mm Cut lengths	
	MWS 10-6	Clear Water Seal PVC rigid channel and flexible seal to suit 10mm glass Stock length 2200mm Cut lengths	
	MWS 10-7	Clear Water Seal PVC rigid channel and flexible tube seal to suit 10mm glass Stock length 2200mm Cut lengths	
	MWS 10-10	Clear Water Seal PVC rigid channel / water deflector and dual flexible seals to suit 10mm glass. Stock length 2200mm Cut lengths	
	MWS 10-8	Clear Water Seal PVC rigid channel with flexible seal at 90º to suit 10mm glass. Stock length 2200mm Cut lengths	
	MWS 10-9	Clear Water Seal PVC rigid channel with flexible seal at 135º to suit 10mm glass. Stock length 2200mm Cut lengths	

NOTE: Clearances shown for water seals are only a guide

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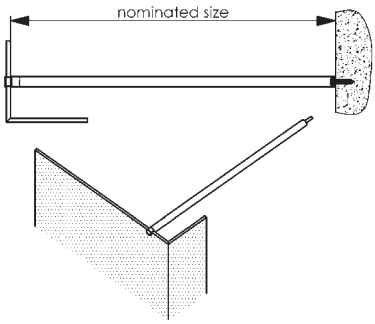
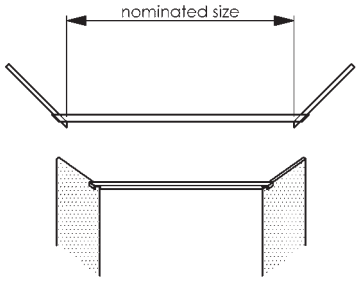
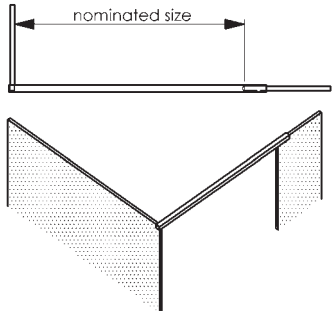
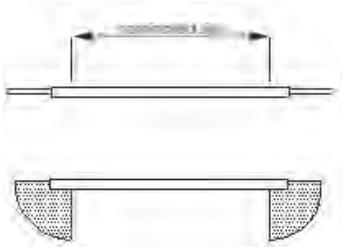
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SHOWER COMPONENTS

Frameless Shower Support Headers

Product	Code / Description	Polished Chrome	Satin Chrome
Type 6 	SH-T6 Wall to side panel support header. Sits over glass 25mm diameter rod. Specify length and glass thickness. Manufactured to custom sizes up to 1200mm long.		
Type 3 	SH-T3 Quadrant support header sits over glass. 16 x 16 square section. Specify opening and glass thickness. Manufactured to custom sizes up to 1200mm long.		
Type 1 	SH-T1 Side panel to return support header. Sits over glass 16 x 16 square section. Specify opening size and glass thickness. Manufactured to custom sizes up to 1200mm long.		
Type 4 	SH-T4 Inline side panel to side panel header. Sits over glass 16 x 16 square section. Specify opening size and glass thickness. Manufactured to custom sizes up to 1200mm long.		

Adjustable Support Headers also available – please enquire

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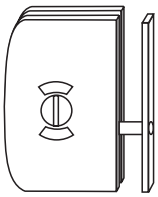
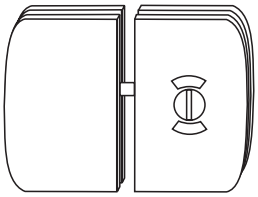
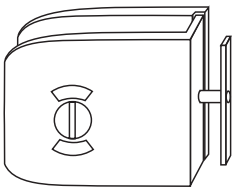
P 09 927 3000
F 09 274 1100
W www.metroglass.co.nz

Merchant Price List

FRAMELESS GLASS SHOWER COMPONENTS

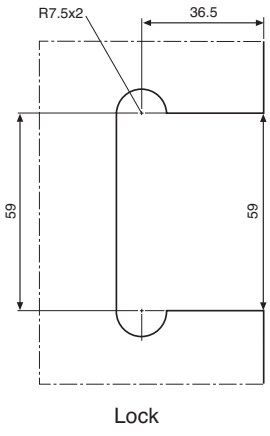
Glass Door Indicator Locks for Swing Doors

For Toilet and Bathroom Doors. To suit 8mm and 10mm glass.

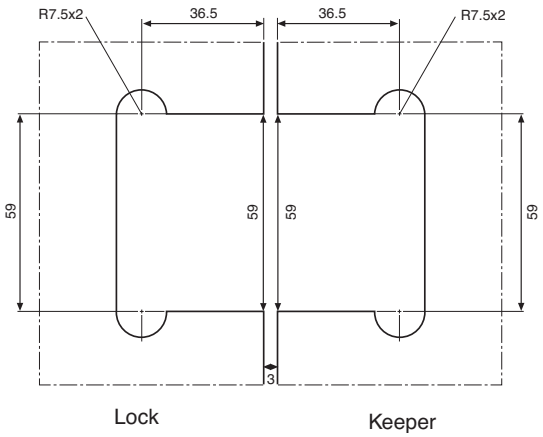
Product	Code	Description	Polished Chrome	Satin Chrome
	IL700C	Indicator Lock Door to Wall (Glass Cut Out Required)		
	IL701C	Indicator Lock Door to Sidepanel (Glass Cut Outs Required)		
	IL600C	Indicator Lock Door to Wall (No Glass Cut Out Required)		

GLASS PREPARATION

IL-700C



IL-701C



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METRO
Frameless Glass Systems

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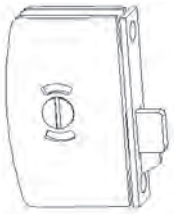
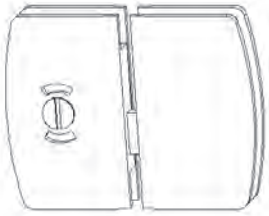
P 09 927 3000
F 09 274 1100
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Merchant Price List

FRAMELESS GLASS SHOWER COMPONENTS

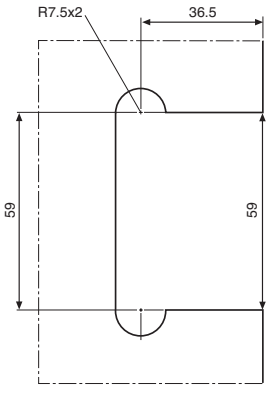
Glass Door Indicator Locks for Sliding Doors

For Toilet and Bathroom Doors. To suit 8mm and 10mm glass.

Product	Code	Description	Polished Chrome	Satin Chrome
	IL700C-H	Indicator Lock Door to Wall (Glass Cut Out Required)		
	IL701C-H	Indicator Lock Door to Sidepanel (Glass Cut Outs Required)		

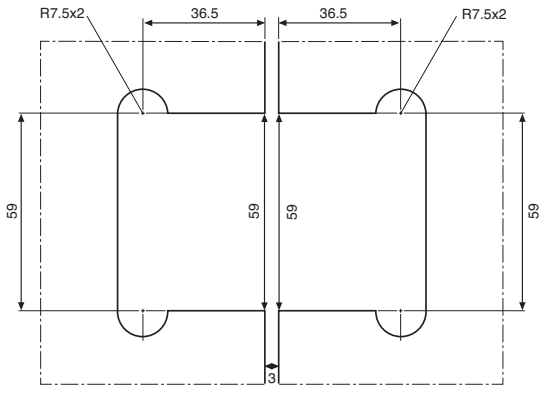
GLASS PREPARATION

IL-700C-H



Lock

IL-701C-H



Lock Keeper

Ex Auckland Store. All prices exclude G.S.T.

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Frameless Glass Systems

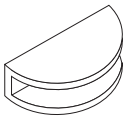
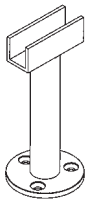
5 Lady Fisher Place,
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Merchant Price List

SHOWER COMPONENTS

Glass Clamps

Product	Code	Description	Polished Chrome	Satin Chrome
	MB6	Shelf Bracket for 6mm shelf		
	MB8	Shelf Bracket for 8mm shelf		
	MB10	Shelf Bracket for 10mm shelf		
	MB12	Shelf Bracket for 12mm shelf		
	MV50 MV100	Upstand Support Bracket 50mm high 100mm high Special sizes P.O.A		

*Powder coat colour as per standard range as stated on page 1.8 of this pricelist.

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METRO
Frameless Glass Systems

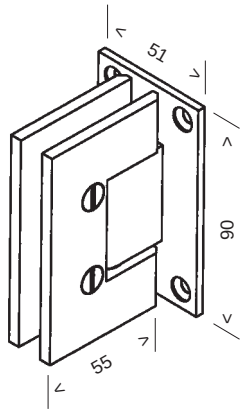
5 Lady Fisher Place,
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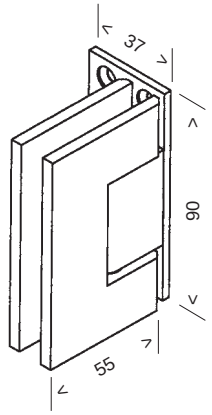
Set Out Details

ELITE SHOWER HINGES

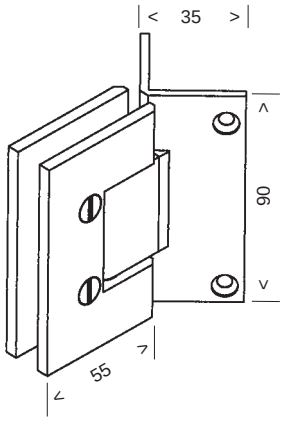
MF1
Wall Mount Hinge

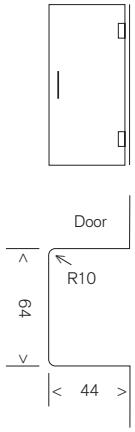


MF1-L
Single Side Wall Mount Hinge

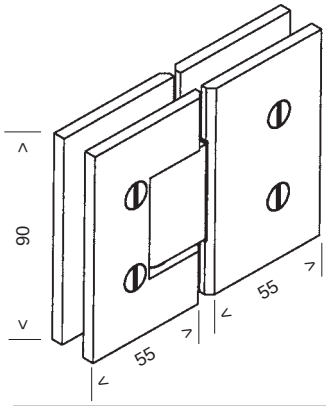


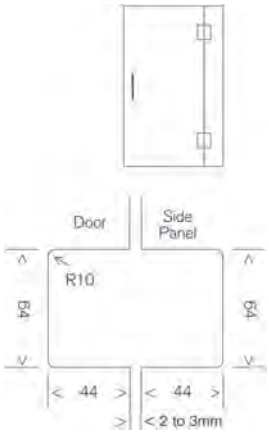
MF1-90
Wall Mount Hinge 90° Fixing



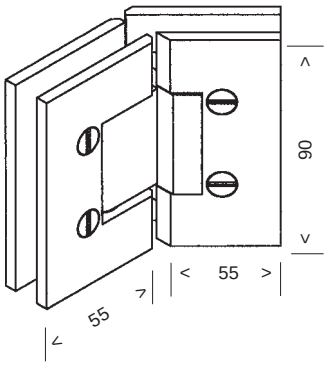


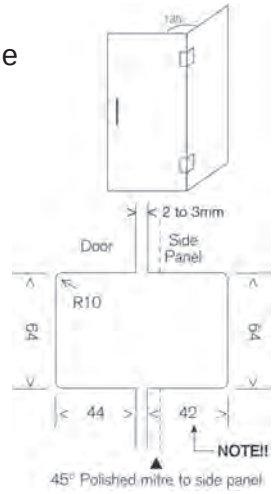
MF2
Glass to Glass Hinge



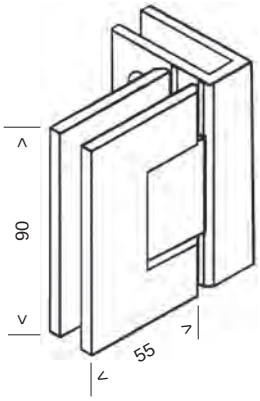


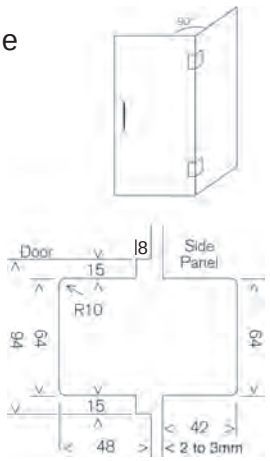
MF2-135
Glass to Glass 135° Hinge



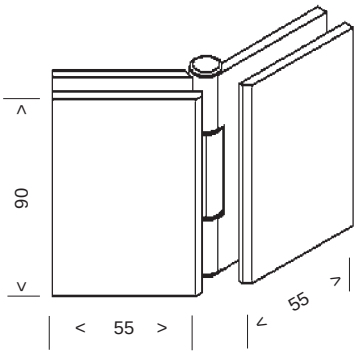


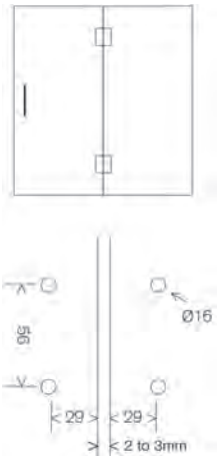
MF2-90
Glass to Glass 90° Hinge





MF2-BF
Glass to Glass BiFold Hinge





Maximum door weight is 35kg and maximum door width is 800mm for above hinges.

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METRO
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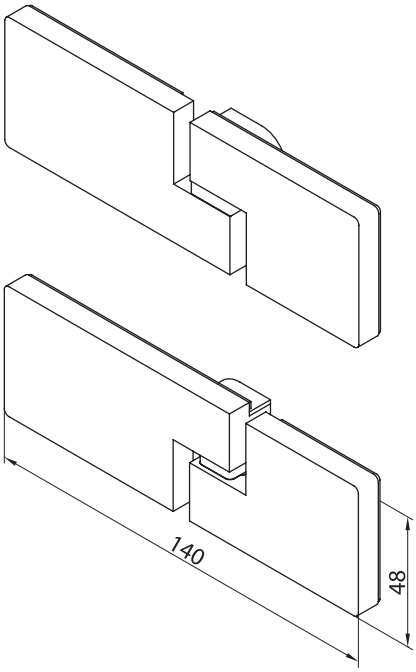
5 Lady Fisher Place,
Highbrook, Auckland
PO Box 58 144 Botany Auckland 2163

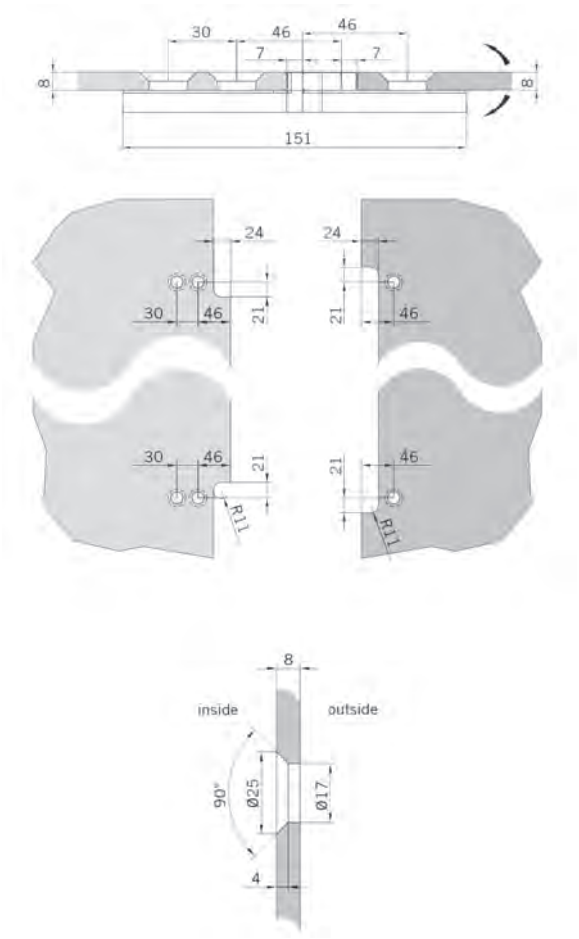
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Set Out Details

DESIGNER SHOWER HINGES

MF2DL/R
Glass to Glass Fix Hinge





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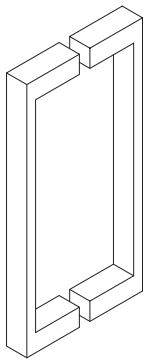
5 Lady Fisher Place,
Highbrook, Auckland
PO Box 58 144 Botany Auckland 2163

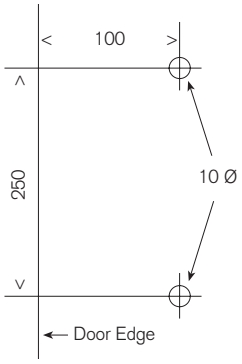
P 09 927 3000
F 09 274 1100
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Set Out Details

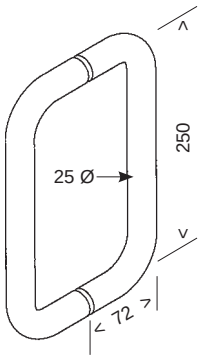
SHOWER HANDLES AND KNOBS

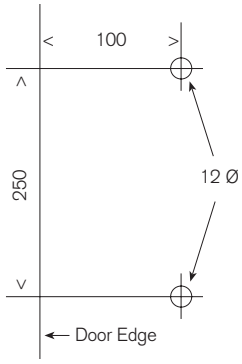
GT-Q250
Rectangular Pull Handle



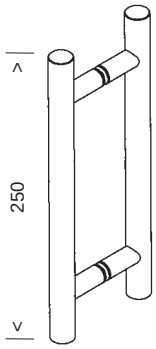


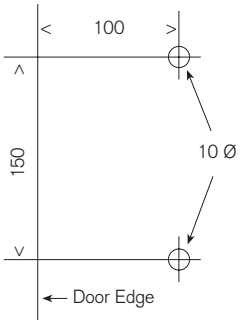
GT-250
Double D Handle



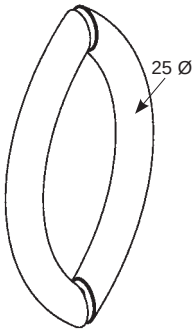


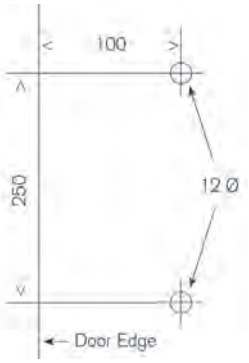
GTFR150 and GTFS150
Fineline Handle





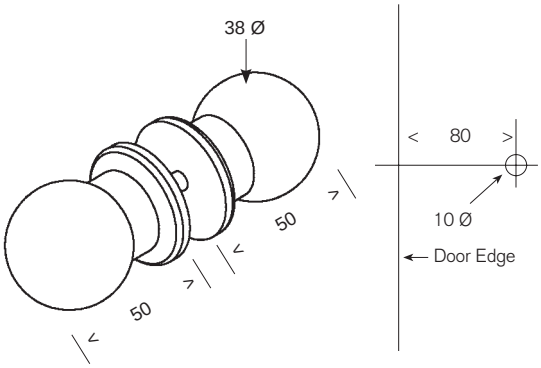
MD250
Delta Handle



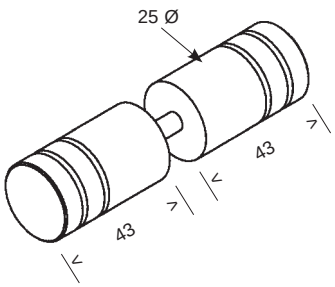


Knobs

MK38
Pull Knob Set

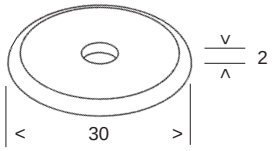


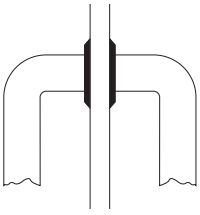
MK25
Pull Knob Set



MW30
Highlight Washer

To suit MK25 Knob Set
and GT and M250 Handles





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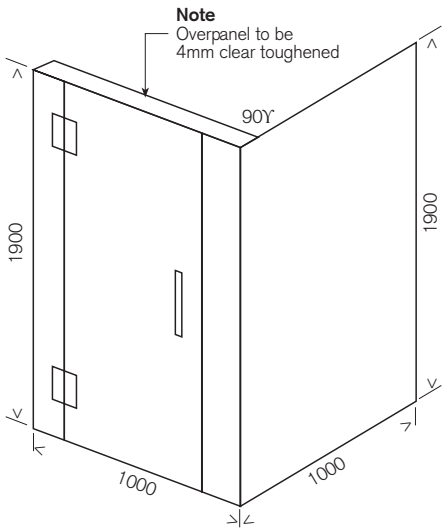
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Set Out Details

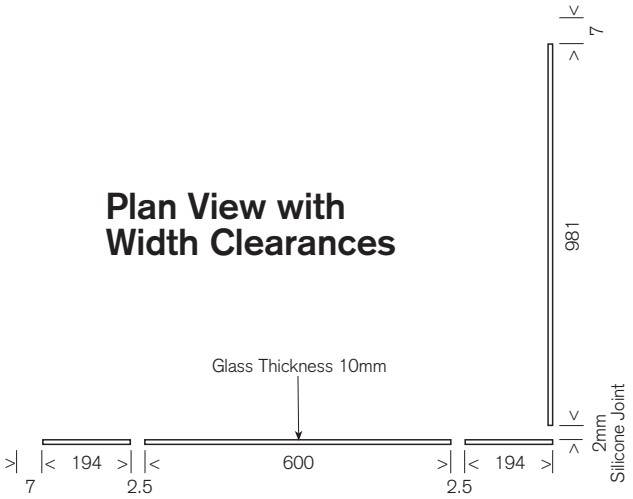
SHOWER SETOUT EXAMPLES

Shower Type: Glass to Glass Square

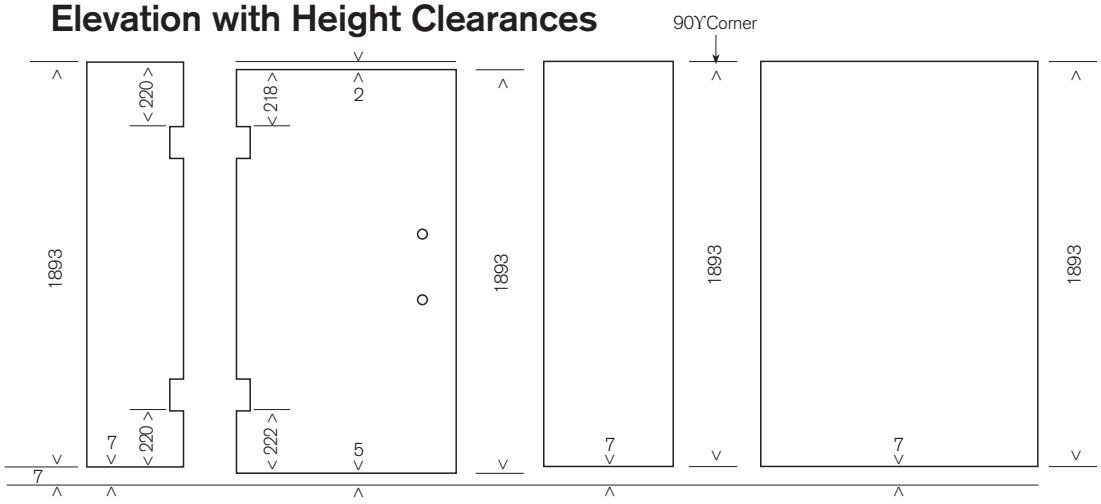
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF2 Hinges
- 5.5m x CS18 Channel
- 1 x 600mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 2 x CC Channel End Caps

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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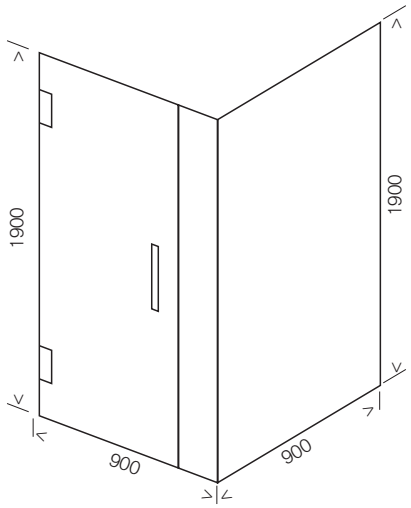
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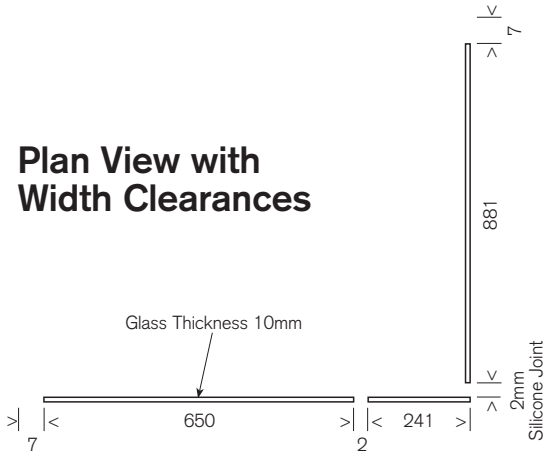
SHOWER SETOUT EXAMPLES

Shower Type: Wall Hung Square

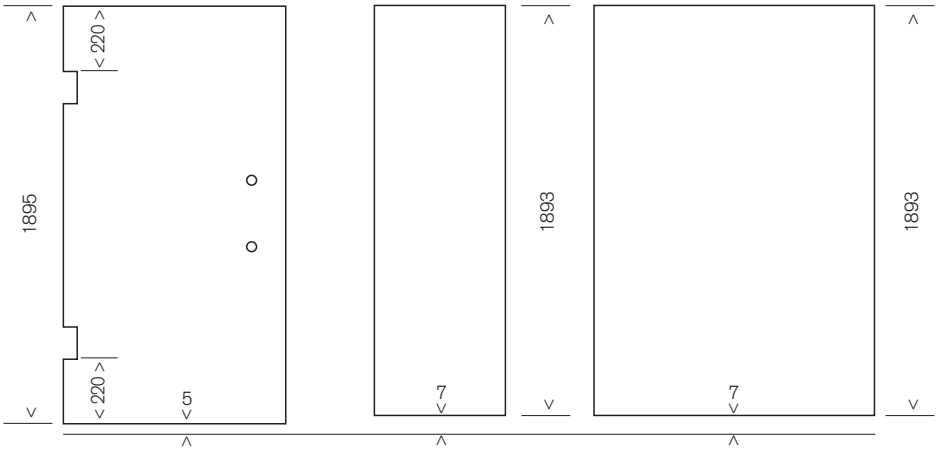
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF1 Hinges
- 3m x CS18 Channel
- 1 x 650mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 1 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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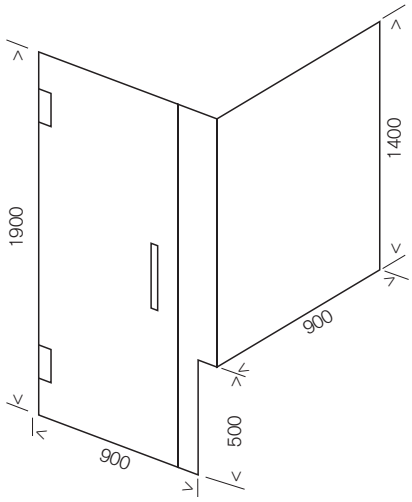
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F 09 274 1100
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Set Out Details

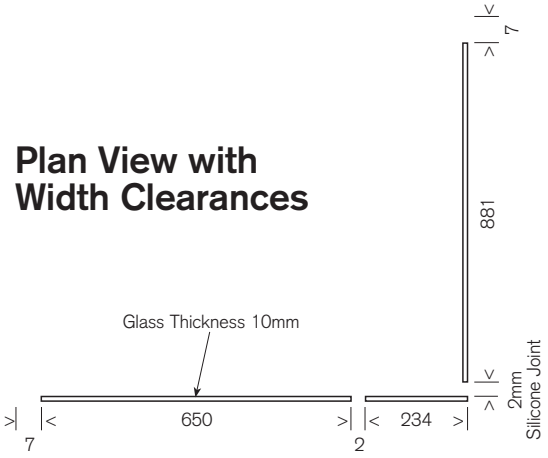
SHOWER SETOUT EXAMPLES

Shower Type: Wall Hung Square Stepped for Bath

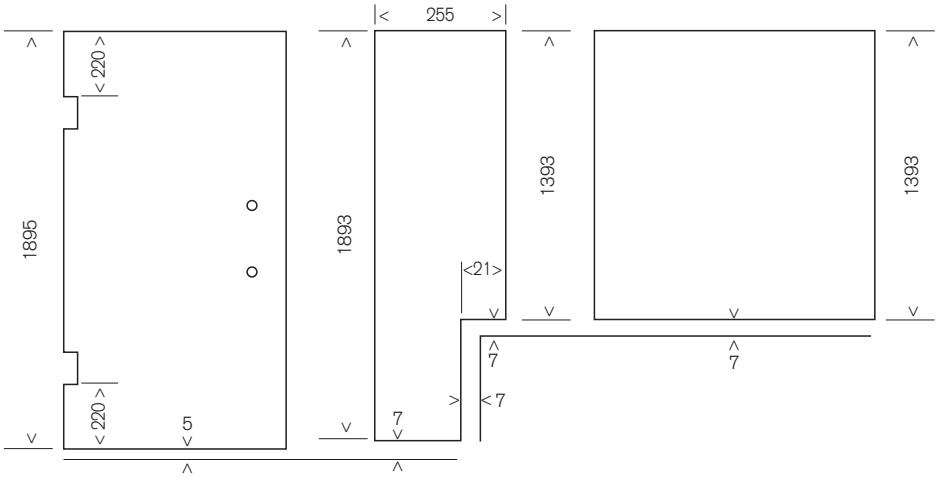
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF1 Hinges
- 3.5m x CS18 Channel
- 1 x 650mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 1 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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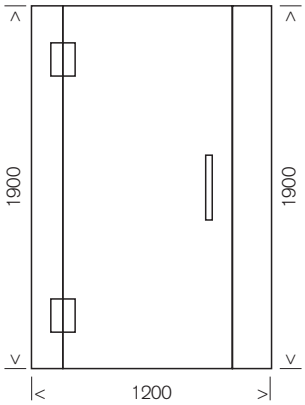
5 Lady Fisher Place,
Highbrook, Auckland
PO Box 58 144 Botany Auckland 2163

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SHOWER SETOUT EXAMPLES

Shower Type: Glass to Glass Inline

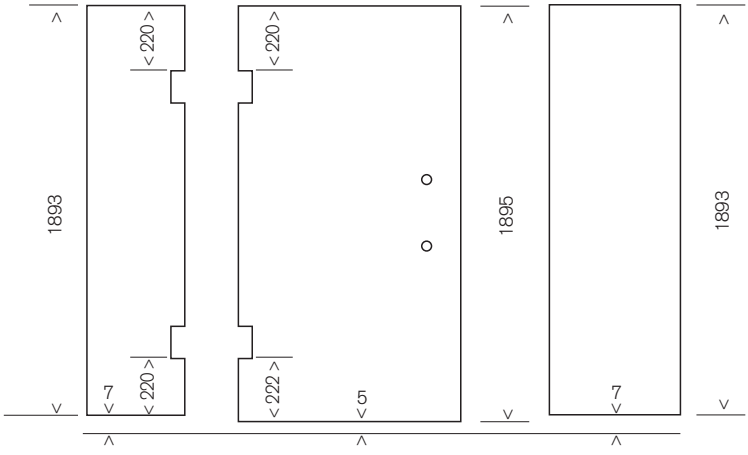
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF2 Hinges
- 4.5m x CS18 Channel
- 1 x 650mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 2 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

Ex Auckland Store. All prices exclude G.S.T.

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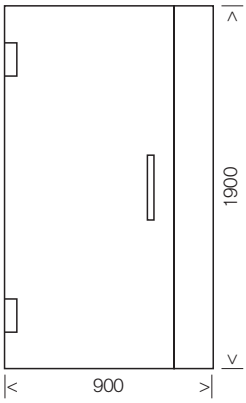
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Set Out Details

SHOWER SETOUT EXAMPLES

Shower Type: Wall Hung Inline

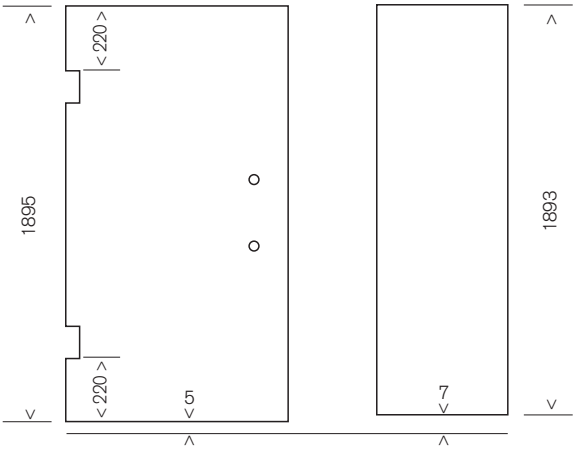
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF1 Hinges
- 2.5m x CS18 Channel
- 1 x 650mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 1 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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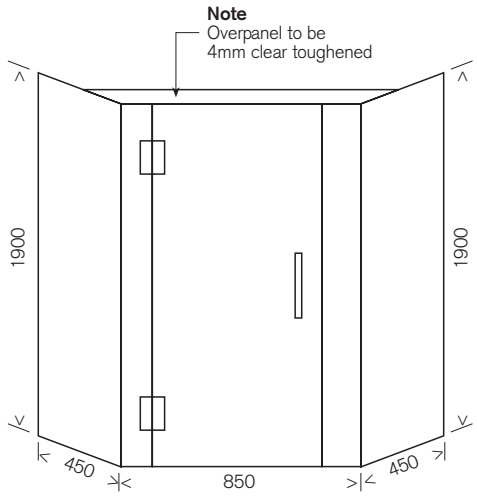
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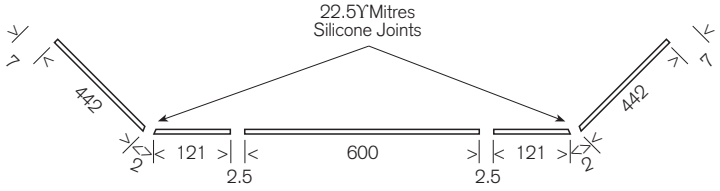
SHOWER SETOUT EXAMPLES

Shower Type: Glass to Glass Quadrant

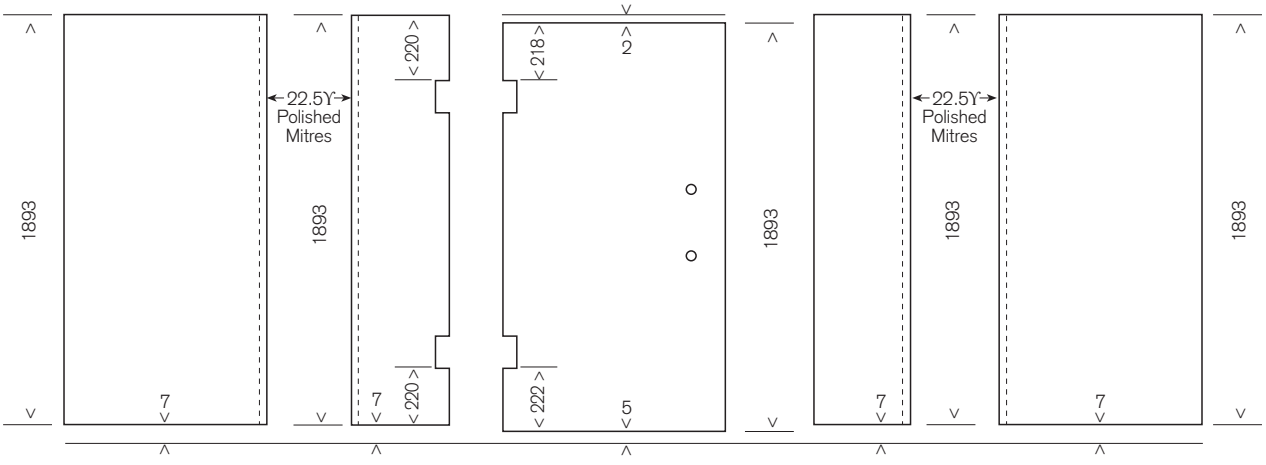
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF2 Hinges
- 5m x CS18 Channel
- 1 x 600mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 2 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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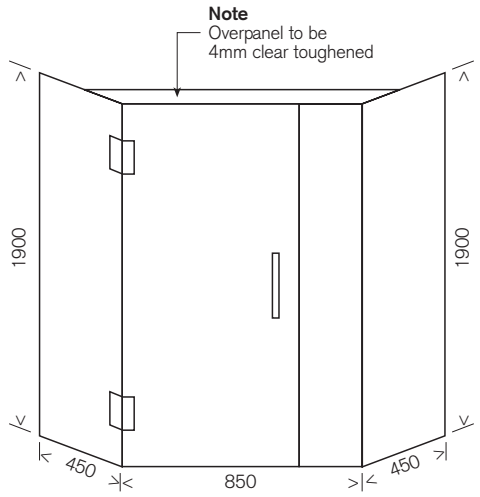
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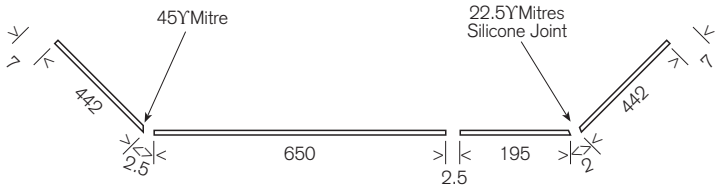
SHOWER SETOUT EXAMPLES

Shower Type: 135° Glass to Glass Quadrant

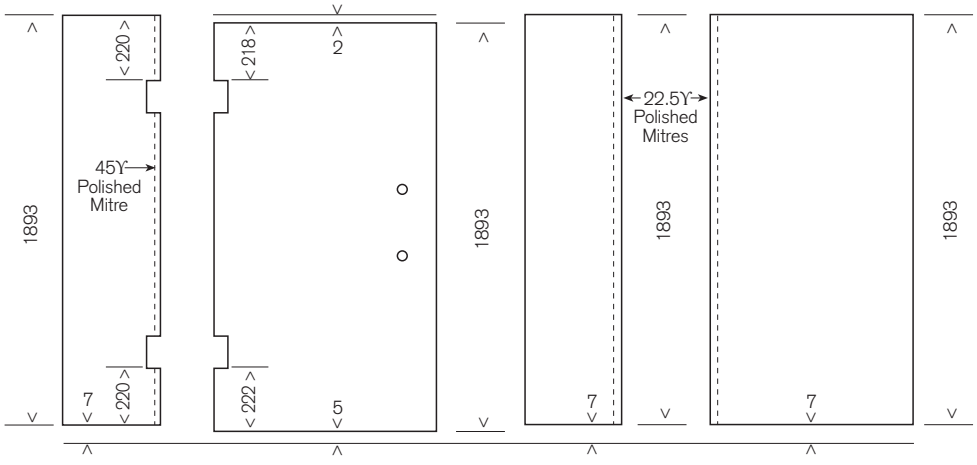
Overall Shower Sizes



Plan View with Width Clearances



Elevation with Height Clearances



Hardware List

- 2 x MF2-135 Hinges
- 5m x CS18 Channel
- 1 x 600mm WD1 Water Deflector
- 1 x Pair Handles (customer's selection)
- 1 x CC Channel End Cap

If a water bar is to be used under the door, allow an additional 5mm clearance under door.

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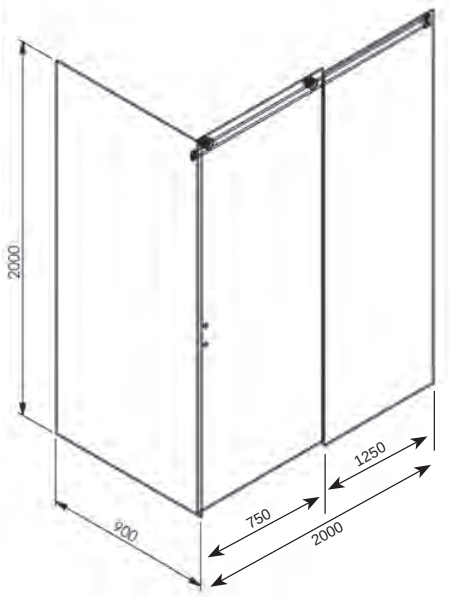
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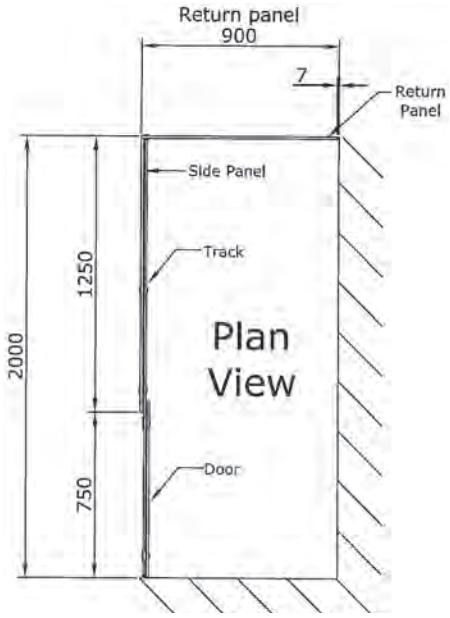
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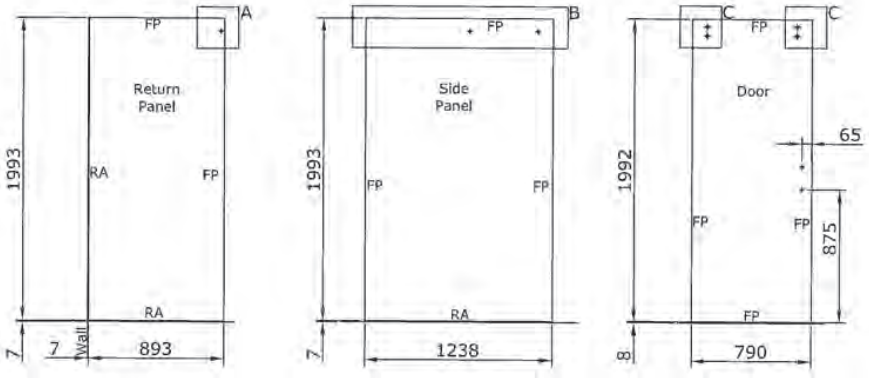
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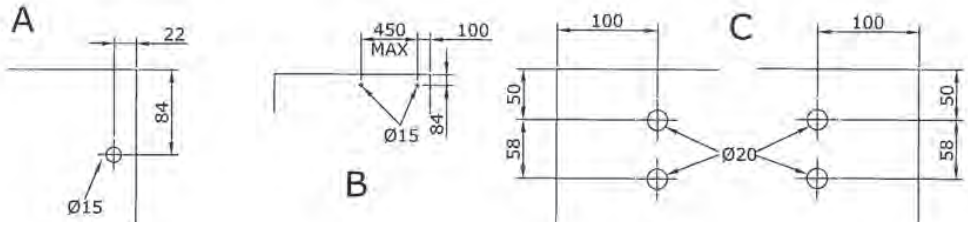
SHOWER SETOUT EXAMPLES

Sliding Shower OTR–2000 Glass To Wall – 1 Side Panel









Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 655mm - subject to handle type.

Max door weight 45kgs.

Isometric shows a left hand door plan and glass drawings are for right hand door.

Ex Auckland Store. All prices exclude G.S.T.

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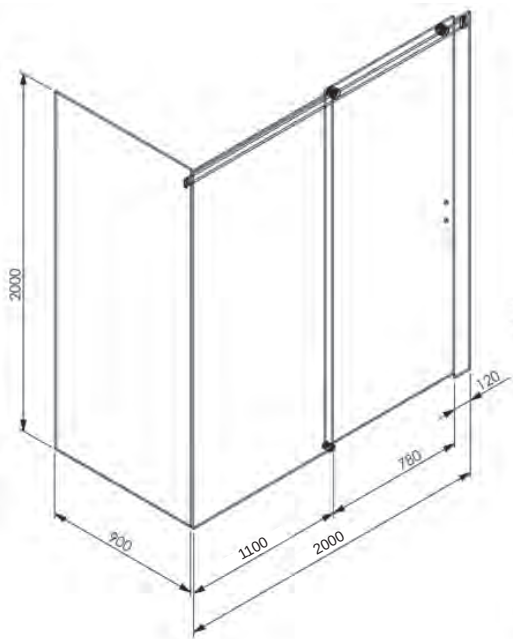
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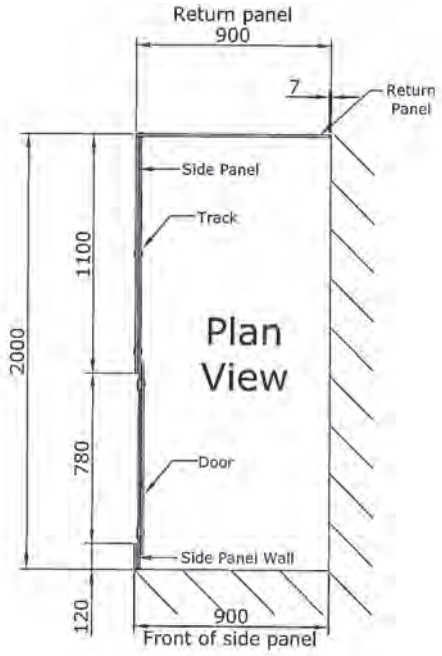
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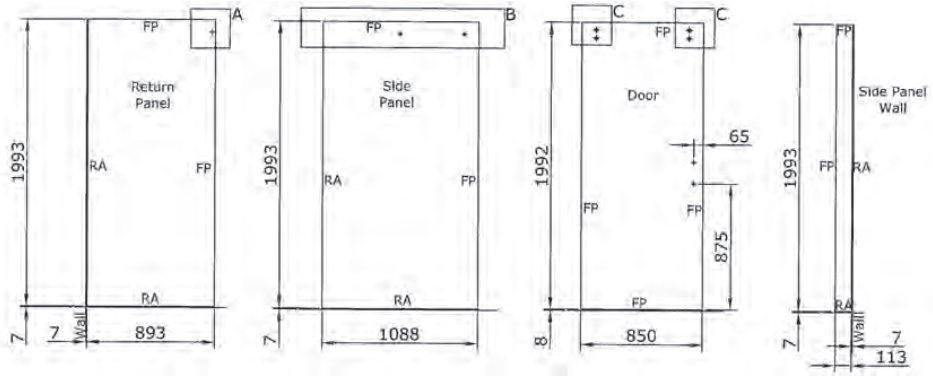
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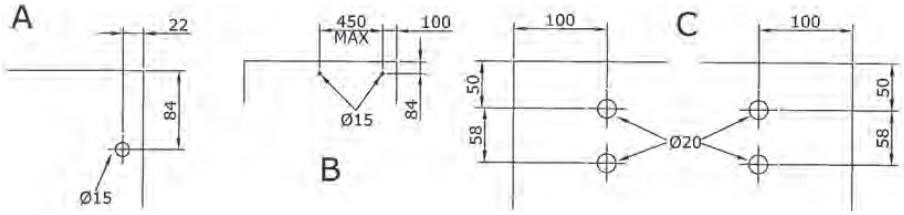
SHOWER SETOUT EXAMPLES

Sliding Shower OTR–2000 Glass To Wall – 2 Side Panel









Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 695mm - subject to handle type.

Max door weight 45kgs.

Ex Auckland Store. All prices exclude G.S.T.

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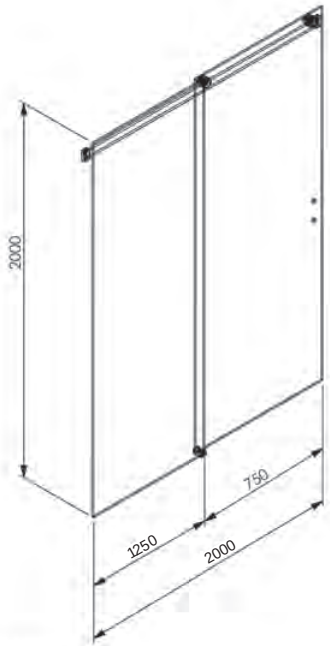
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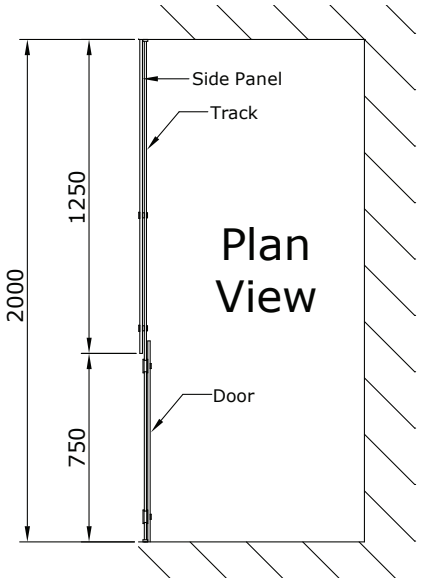
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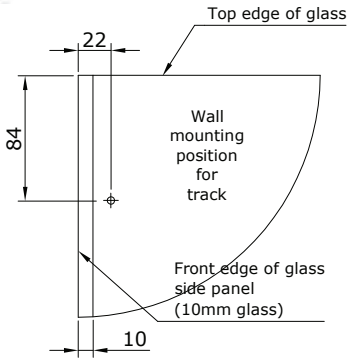
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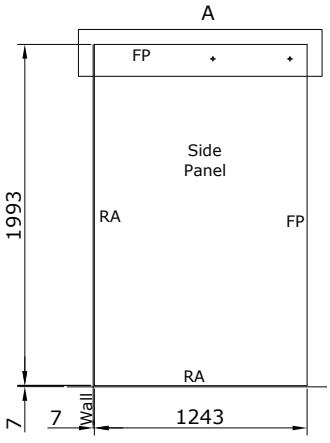
SHOWER SETOUT EXAMPLES

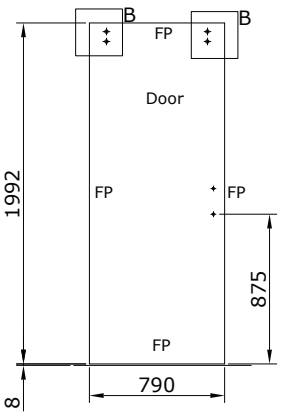
Sliding Shower OTR-2000 Wall To Wall – 1 Side Panel

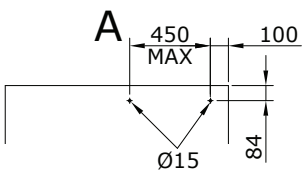


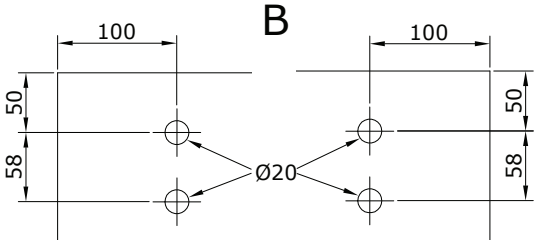












Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 665mm - subject to handle type.

Max door weight 45kgs.

Ex Auckland Store. All prices exclude G.S.T.

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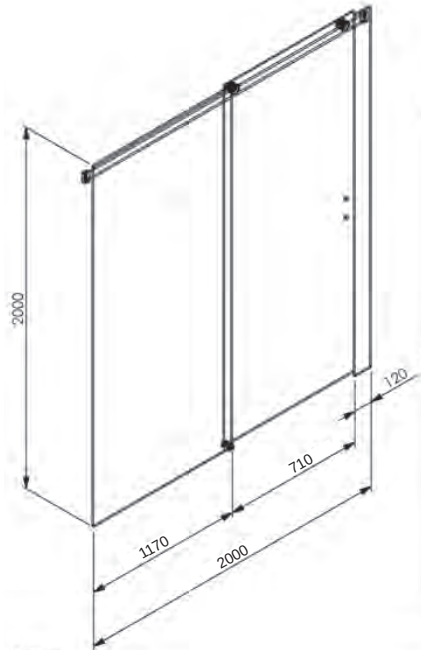
5 Lady Fisher Place,
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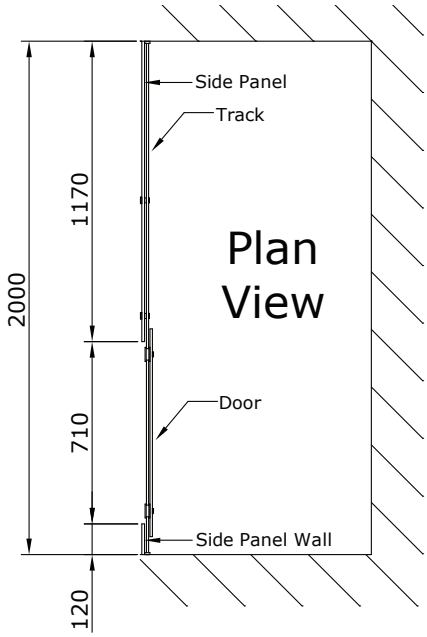
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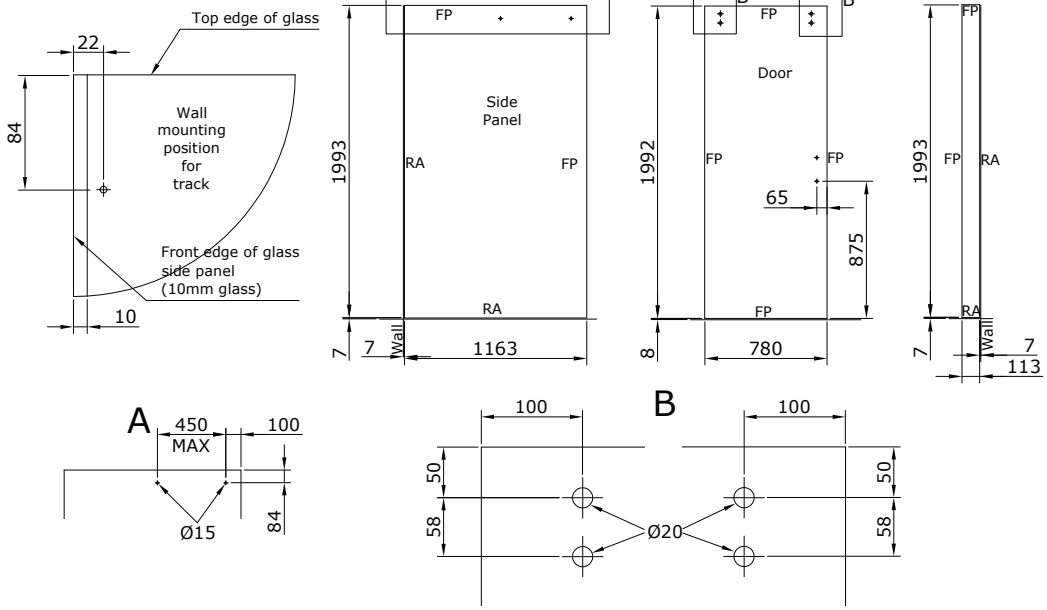
Set Out Details

SHOWER SETOUT EXAMPLES

Sliding Shower OTR–2000 Wall To Wall – 2 Side Panel







Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 625mm - subject to handle type.

Max door weight 45kgs.

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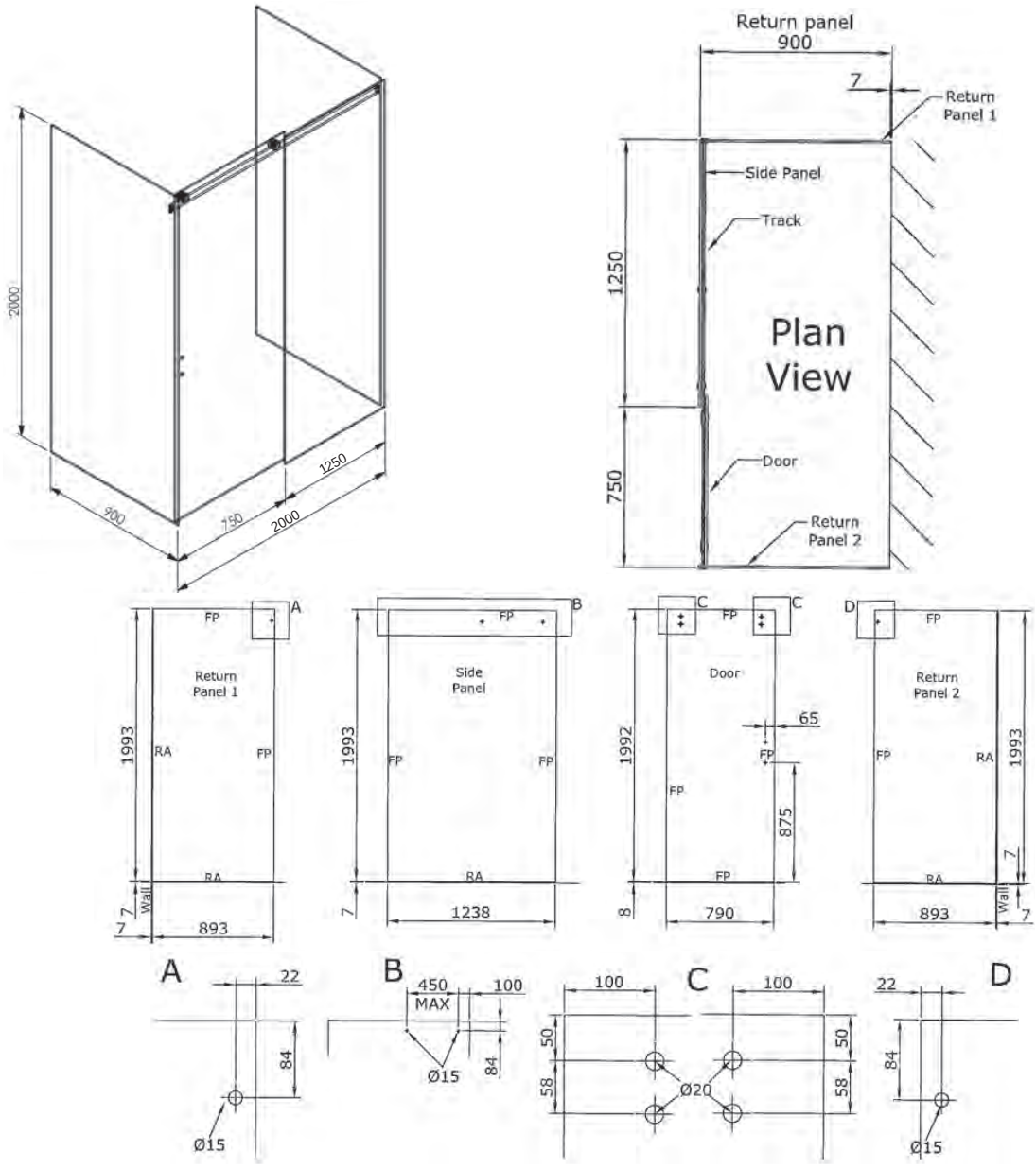
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Set Out Details

SHOWER SETOUT EXAMPLES

Sliding Shower OTR–2000 Glass To Glass – 1 Side Panel



Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 665mm - subject to handle type.

Max door weight 45kgs.

Isometric shows a left hand door plan and glass drawings are for right hand door.

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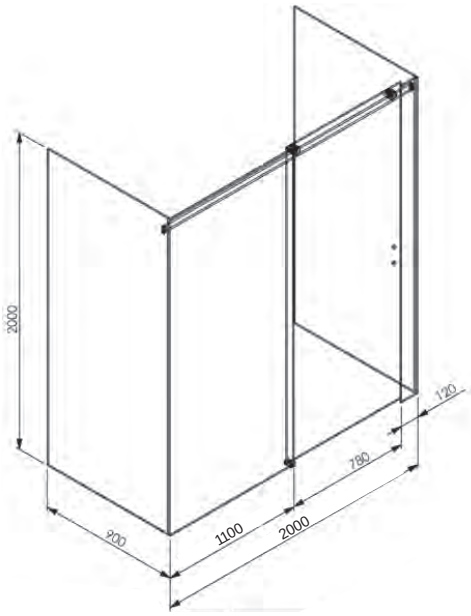
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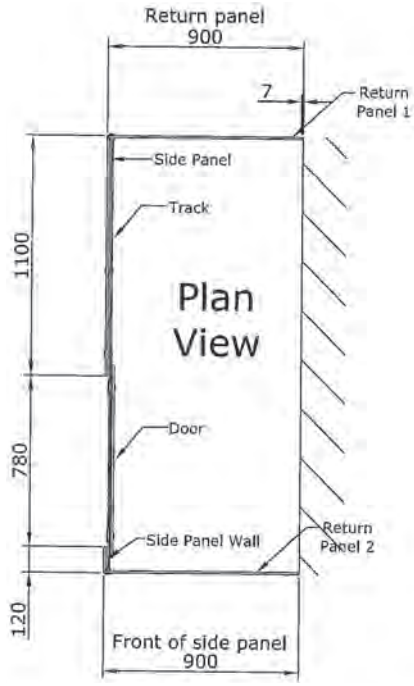
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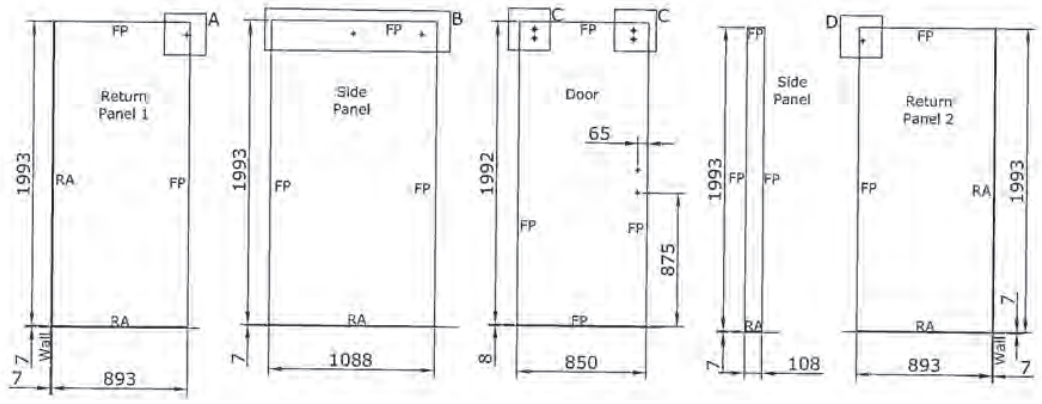
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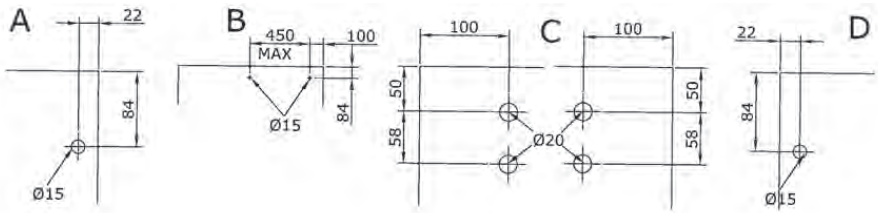
SHOWER SETOUT EXAMPLES

Sliding Shower OTR–2000 Glass To Glass









Hardware List

- 1 x OTR2000 Sliding Door Kit
- CS18 Channel - sold separately
- AS6 Water Bar - sold separately
- CS18 End Cap - sold separately
- 1 x Handle or Knob, Customers Selection

Allow holes for handle or knob - sold separately

Note

Cut channel on side panel, less 20mm to allow door guide to clamp to glass at bottom of side panel.

Clear opening 695mm - subject to handle type.

Ex Auckland Store. All prices exclude G.S.T.