



WAIMAKARIRI
DISTRICT COUNCIL

Consent Issued BC170237

BC No: 170237

SITE DETAILS:

42 WATKINS DRIVE

RANGIORA

LEGAL:

LOT 77 DP 497145

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

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

APPROVED BUILDING CONSENT DOCUMENTS AND PLANS
(FULL SET 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:

03 311 8906

or

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

- Please refer to your inspection schedule for details of inspections to be carried out.
- 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

Dial Before You Dig

Safety near underground cables and services

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

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

Working near electricity cables

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

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

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

Steps to ensure safe digging

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

Underground electricity cables

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

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

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

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

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

Underground council services

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

Contact MainPower

To report a fault:
0508 60 70 80

For electricity emergencies:
0508 60 70 80

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



mainpower

Dial before you dig.

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

03 311 8300

Think for Safety's Sake

www.mainpower.co.nz

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**

**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 may be sent to
Buildinginfo@wmk.govt.nz

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

Mike Greer Homes North Canterbury Limited, PO Box 421 Rangiora 7440	No.	BC170237
	Issue date	04 April 2017
	Overseer	Lachlan Thompson

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	Housing Residential
Estimated Value	\$300000.00
Location	42 Watkins Drive RANGIORA
Legal Description	LOT 77 DP 497145 0.075500 Ha
Valuation No.	2165015136

This inspection list and all the approved plans relating to this building consent are to be kept on site and available to the building and/or plumbing and drainage inspector, or approved building certifier, on request.

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.

Please note! The approved plans and this inspection sheet are to be available on site, on request, at all times.

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.

BC170237 *Main BC* Building Name: Location within Site: Level/Unit Number:
Compacted Hardfill - pre DPM - Engineer to leave site notes for WDC Inspectors after the engineers inspection
Foundation / Floor Slab - Engineer to leave site notes for WDC Inspectors after the engineers inspection
Structure Pre Roof Pre Wrap -
Building Wrap & Sill Tape -
Cavity Battens & Flashings -
Mid Height Veneer (Brick) -
Drains -
Preline Plumbing & Drainage -
Prestopping -
Wet Area Tanking -
Final -

Form 5

Building consent BC170237

Section 51, Building Act 2004

The building

Street address of building: 42 Watkins Drive RANGIORA

Legal description of land where building is located: LOT 77 DP 497145 0.075500 Ha

Valuation number: 2165015136

Building name:

Location of building within site/block number:

Level/unit number:

The owner

Name of owner: Mike Greer Homes North Canterbury Limited

Contact person: Sonya Ann Dacombe

Mailing address: PO Box 421 Rangiora 7440

Street address/registered office:

Phone number: Landline: 039755674

Mobile: 021758767

Daytime: 033130319

After hours: 039755674

Facsimile number: 033130321

Email address: nc.compliance@mikegreerhomes.co.nz

Website:

First point of contact for communications with the council/building consent authority:
Mike Greer Homes North Canterbury Limited

Building work

The following building work is authorised by this building consent:

DWELLING WITH ATTACHED GARAGE 42 WATKINS DRIVE RANGIORA LOT 77 DP 497145

New (& prebuilt) House, Unit, Bach, Crib, Town Houses

Housing - Detached dwellings

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:

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.

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

Comply with the endorsements on the plan.

The electrical certificate shall be provided to the building consent authority prior to issue of Code Compliance Certificate

Licensed 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.

Please note the consent has been granted prior to confirmation of who the Licensed Building Practitioners are for the job. The Building Consent Authority will not book nor carry out an inspection until the names and licence number(s) of the Licensed Building Practitioner(s) have been provided in writing.

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

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

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

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

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

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

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

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

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

A handwritten signature in blue ink, appearing to read 'Shirley Cresswell', with a long horizontal stroke extending to the right.

Shirley Cresswell
Building Unit Administrator

On behalf of: Waimakariri District Council
Date: 04 April 2017

Form 6

Application for code compliance certificate

Section 92, Building Act 2004

The building consent

Building consent number: BC170237

Issued by: Waimakariri District Council

Valuation number: 2165015136

*The owner

Name of owner: Mike Greer Homes North Canterbury Limited

†Contact person: Sonya Ann Dacombe

Mailing address: PO Box 421 Rangiora 7440

Street address/registered office:

Phone number: Landline: 039755674

Mobile: 021758767

Daytime: 033130319

After hours: 039755674

Facsimile number: 033130321

Email address: nc.compliance@mikegreerhomes.co.nz

Website:

The following evidence of ownership is attached to this application: RCNotReq

Application

All building work to be carried out under the above building consent was completed on:

The personnel who carried out the building work are as follows:

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:

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: PO Box 421 Rangiora 7440

Signature of the owner

Name of person signing

Date:

Attachments

The following documents are attached to this application:

[¶]Certificates from the personnel who carried out the work

[¶]Certificates that relate to the energy work

[¶]Evidence that specified systems are capable of performing to the performance standards set out in the building consent

*Delete this section if details have not changed from the building consent.

[†]Delete if owner is an individual.

^{||}Contact details must be in New Zealand.

[¶]Delete items not applicable.



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

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:

Registration Number:

Company Name:

Date:



THE BUILDING

1. Site address: 42 Watkins Drive, Rangiora
(Street / Road / Township)
2. Legal description of the land where the building is located:
Lot: 77 DP: 497145 Valuation Number: 2165015136
3. Building Name (if applicable):
4. Location of building within site:
(Only applicable to multi-development sites)
5. Number of levels: 1 6. Unit/Level No.: 1
7. Floor area m² - Existing: 0 New: 205.51 Total: 205.51
8. Current lawfully established use:
(i.e. use on any previous consent for the existing building)
9. Year building first constructed:
(Only applicable to existing buildings, approximate date is acceptable, eg 1920's)

THE OWNER

10. Owner's name: Mike Greer Homes North Canterbury Limited
(Company or organisation name if applicable)
11. Contact person: Sonya Dacombe
12. Mailing address: PO BOX 421, Rangiora
13. Street address / Registered office: Shop 1, 29 Huntingdon Drive
14. Mobile: 021 662 517 Landline: 03 313 0319 Email: nc.compliance@mikegreerhomes.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 \$10.20)
(Current within 1 month)
☒ 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:
(Company or Organisation name if applicable)
17. Contact person:
18. Mailing address:
19. Street address / Registered office:
20. Mobile: Landline: Email:

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: <input type="text"/> |
| ☒ Building Consent with PIM | ☐ Building Consent without PIM (Planning Check applies) |
| ☐ Exemption from the need for B/C
(Refer Schedule 1, Part 1, Section 2, BAA13) | ☐ Amendment to Building Consent |

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

PLEASE NOTE - If CD 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 ⁽¹⁾
- ☐ CD: ☐ (post) OR ☐ (pick-up) OR ☐ (courier)
- ☐ Hard copy: ☐ (post) OR ☐ (pick-up) OR ☐ (courier)

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.

24. Please also provide:

- ☐ Additional On-site copy
- ☐ Weather tight storage box⁽²⁾

(1) You must be set up and registered for this option.

(2) The council can supply a weather tight storage box for a cost (must be picked up from the Council).

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

If the applicant chooses to print their own "On-site" copy of documents it must be a full set, to scale and legible.

If there are non-consented documents on-site this will result in a failed inspection.

PROJECT

Consent Issued BC170237

BC170237

25. Description of work (e.g. dwelling, alteration/addition)

New 4 bedroom dwelling with attached garage.

26. Specify the intended use of the building (e.g. residential) Residential

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):

(i.e. is this project being constructed in stages? Is this consent for a relocated or transportable building?)

32. Estimated value (incl GST) \$ 300,000

(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:

NOTES

Consent Issued BC170237

BC170237

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

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	AS1, VM1	
☒ B2 Durability	AS1	
☒ C1 - C6 Protection from fire	AS1	
☒ D1 Access routes	AS1	
☐ D2 Mechanical installations for access		
☒ E1 Surface water	AS1	
☒ E2 External moisture	AS1	
☒ E3 Internal moisture	AS1	
☒ F1 Hazardous agents on site	AS1	
☒ F2 Hazardous building materials	AS1	
☐ F3 Hazardous substances and processes		
☒ F4 Safety from falling	AS1	
☒ F5 Construction and demolition hazards	AS1	
☐ F6 Visibility in escape routes		
☒ F7 Warning systems	AS1	
☐ F8 Signs		
☒ G1 Personal hygiene	AS1	
☒ G2 Laundering	AS1	
☒ G3 Food preparation and prevention of contamination	AS1	
☒ G4 Ventilation	AS1	
☒ G5 Interior environment	AS1	
☒ G6 Airborne and impact sound	AS1	
☒ G7 Natural light	AS1	
☒ G8 Artificial light	AS1	
☒ G9 Electricity	AS1	
☐ G10 Piped services		
☐ G11 Gas as an energy source		
☒ G12 Water supplies	AS1	
☒ G13 Foul water	AS1, AS2	
☐ G14 Industrial liquid waste		
☐ G15 Solid waste		
☒ H1 Energy efficiency	AS1	

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	To Be Advised.	
CARPENTRY	To Be Advised.	
EXTERIOR PLASTERER	Not Applicable.	
BRICKLAYER	To Be Advised.	
BLOCKLAYER	Not Applicable.	
ROOFER	To Be Advised.	

KEY PERSONNEL**BUILDER**

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

DESIGNER(S)

Name:	Glen (Bud) Caldwell - Watkins Group	Reg. No.:	115719
Address:	Unit 16\17 Level 1 Silverstream Village		
Phone No.:	03 310 0272	Fax No.:	
Email:	bud@watkinsgroup.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:		Reg. No.:	
Address:			
Phone No.:		Fax No.:	
Email:			

OWNER / AGENT AUTHORISATION

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

Name: Sonya Dacombe

Date: 1st March 2017

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 [redacted] 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 [redacted] to act as Agent on my behalf for the application for Code Compliance Certificate under Section 92 of the Building Act 2004.

Name (Owner): [redacted]

Date: [redacted]

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 (issued 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 (issued 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 4 for a schedule confirming the building work will comply with the Building Code

APPLICATION FORM (One copy)**Consent Issued BC170237**

BC170237

**OFFICE
USE ONLY**These have
been provided:

- ☒ Fully complete all sections
- ☒ Means of Compliance with NZBC - designer to complete
- ☒ Provide the correct legal description (Council can help with this)
- ☒ Provide one copy of the current Certificate 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)
- ☒ Sign and date the form
- ☐ Agent Authorisation (section completed where applicable)
- ☒ Certificate/s of design work (LBP)

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 | 0.9KPa |
| ☒ Corrosion zone (if applicable) | C |
| ☐ Building is specifically engineer-designed | |
| ☐ Complies with NZS 3604:2011 | |
| ☐ Both specific design and NZS 3604:2011 | |

DESIGN DOCUMENTS (One copy)

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

SITE PLAN (One copy)

- ☒ Overview of site showing legal boundaries as per current 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

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

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

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

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

**OFFICE
USE ONLY**These have
been provided:**FLOOR PLANS** (One copy to scale usually 1:100 or 1:50)

- ☒ 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)

- ☒ 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)

- ☒ Roof lines, overhangs, floor levels, ground levels
- ☒ Major vertical dimensions
- ☒ Foundation, wall and roof structure materials
- ☐ Upper level decks or balconies over lower level room must be fully detailed including the stormwater disposal and overflow precautions
- ☐ Stairs, handrails and balustrade showing pitch and head clearances
- ☒ Structural connections, posts to footings, beams to posts, trusses or beams to walls
- ☒ Component fixing information is to be provided for all structural and framing components
- ☒ Foundation and footing details and reinforcing. Show height from finished floor to ground level
- ☐ Pile details for timber floors
- ☒ Floor bracing details
- ☒ Timber grade and treatment
- ☒ Damp proof membranes, building papers and insulation systems/materials
- ☒ Flashing details and documents
- ☒ Roof penetrations
- ☒ Shower floor details and wall to shower base junction detail
- ☒ Sealing to wet area fixtures
- ☒ Water splash prevention
- ☒ All other building components that are not otherwise detailed or are unusual in any way

☐**SPECIFICATION** (One copy)

The specification must be for the project. We will not accept standard specifications unless they relate directly to the building and they cover the project accurately and fully. Multichoice 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 relevant)

- ☐ 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

**OFFICE
USE ONLY**
These have
been provided:

☐**GEOTECHNICAL REPORT**

- ☐ Unique report reference number provided, if applicable

☐**OFFICE USE ONLY**

Further information required? ☐ Yes ☒ No

Back Dated to the 2nd March, notification from Sharefile didnt arrive. GOT CT

Date of acceptance: 09/03/2017

Officer: EMMA BOOTH

OFFICE USE ONLY

Fee paid on application: \$ ON ACCOUNT

Date:

Officer:

Date payment processed:

Receipt

Officer:

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) Planning Check:
Where a PIM is not sought, a Planning 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

Council are required to collect levies for the MBIE and BRANZ. No levy shall be payable if the value of that work is less than \$20,000. If your project is valued at \$20,000 or more, the fixed fee will increase by the value of the MBIE and BRANZ levies.

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.

Failed inspections will incur a re-inspection charge.

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 03 311 8900 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 7. All amendments require new authorisation.

**COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952****Search Copy**

Identifier 733652
Land Registration District Canterbury
Date Issued 13 July 2016

Prior References

705045

Estate Fee Simple
Area 755 square metres more or less
Legal Description Lot 77 Deposited Plan 497145

Proprietors

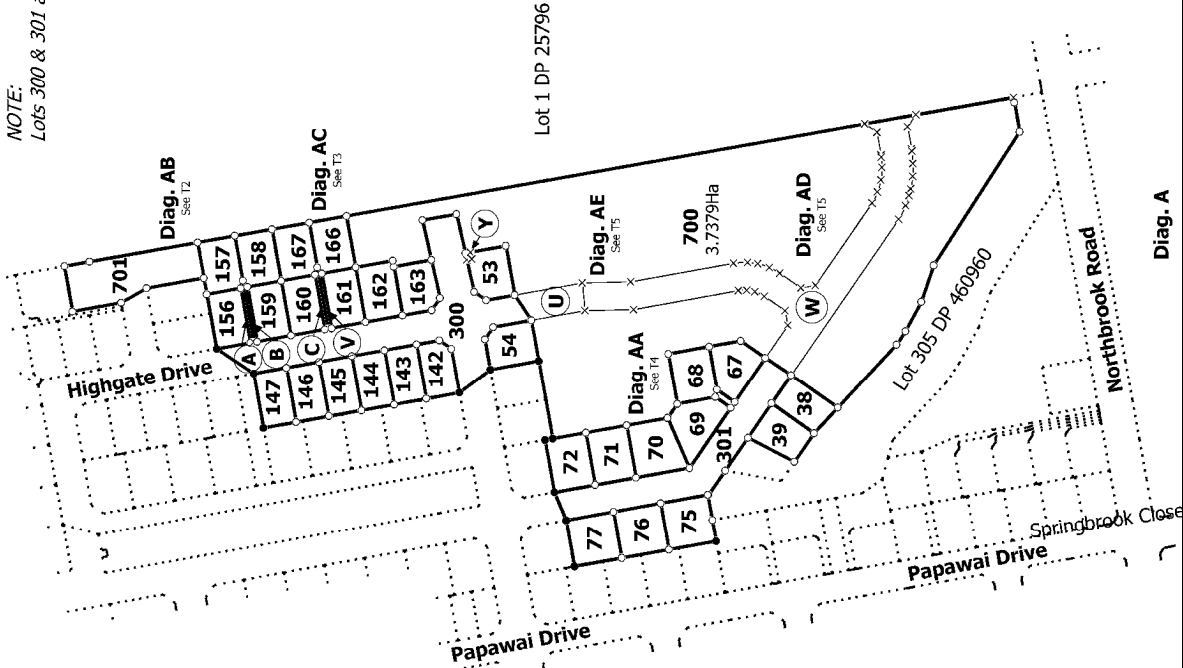
Mike Greer Homes North Canterbury Limited

Interests

10499187.4 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 13.7.2016 at 1:15 pm
Land Covenant in Easement Instrument 10499187.9 - 13.7.2016 at 1:15 pm (Limited as to Duration)



NOTE:
Lots 300 & 301 are to vest as Road in the Waimakariri District Council.



T 1/5

Ref 223094

Title Plan
LT 497145
Approved on: 16/07/2016

Surveyor: James Dougherty Lynch
Firm: Aurecon (Christchurch)

Lots 38, 39, 53, 54, 67 - 72, 75 - 77, 142 - 147, 156 - 163, 166, 167, 300, 301, 700
& 701 being Subdivision of Lot 700 DP 489128

Land District: Canterbury

Digitally Generated Plan
Generated on: 16/07/2016 16:32:34 Page 4 of 8

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: 7 July 2016

VENDOR: VB Properties (2008) Limited

PURCHASER: Mike Greer Homes North Canterbury 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 77, Highgate 42 Watkins Drive, Rongia

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

Legal Description:

Area (more or less): 0.755 ha Lot/Flat/Unit: 77 DP: 497145 Unique Identifier or CT: 733652

Being a new title to
issue from CT 705045**PAYMENT OF PURCHASE PRICE**

Purchase price: \$160,000.00

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 13.0):

Deposit (refer clause 2.0): \$10,000

Payable in accordance with the further terms of sale.

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

(1) By payment in cleared funds on the settlement date which is Six months from the date of this agreement
OR upon issue of title for the lot whichever is the latter
(2) In the manner described in the Further Terms of Sale.
Interest rate for late settlement: 15 % p.a.**CONDITIONS (refer clause 9.0)**

Finance condition

Lender:

Amount required:

Finance date:

LIM required: (refer clause 9.2)

Yes/No

Building report required: (refer clause 9.3)

Yes/No

OIA Consent required: (refer clause 9.4)

Yes/No

Land Act/OIA date:

TENANCIES (if any)

Name of tenant:

Bond:

Rent:

Term:

Right of renewal:

SALE BY: Private Treaty

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.

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 incomes 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) "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 9.2(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.
- (31) 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 20(1) of the Electronic Transactions Act 2002, 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 5.0 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 5.2(3)(c) or avoided pursuant to subclause 9.8(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:
 - (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 8.2(3),
- 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.

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 ^{fifth} ~~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 ^{fifth} ~~tenth~~ working day following the later of the date on which:
- the vendor has given the purchaser notice that a search copy is obtainable; or
 - ~~the requisition procedure under clause 5.0 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 Risk and insurance

- 4.1 The property and chattels shall remain at the risk of the vendor until possession is given and taken.
- 4.2 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:
- if the destruction or damage has been sufficient to render the property untenable and it is untenable on the settlement date, the purchaser may:
 - 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
 - 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;
 - if the property is not untenable 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;
 - 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 untenable where the diminution in value exceeds an amount equal to 20% of the purchase price; and
 - if the amount of the diminution in value is disputed, the parties shall follow the same procedure as that set out in subclause 7.4 for when an amount of compensation is disputed.
- 4.3 The purchaser shall not be required to take over any insurance policies held by the vendor.

5.0 Title, boundaries and requisitions

- 5.1 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.
- ~~5.2 (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 5.2(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 expenses of investigating the title or to any compensation whatsoever.~~
- 5.3 (1) If the title to the property being sold is a cross lease title or a unit title and there are:
- in the case of a cross lease title:
 - alterations to the external dimensions of any leased structure; or
 - 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;
 - 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 5.2 requiring the vendor:
- 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
 - 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.
- 5.4 Except as provided by section 7 of the Contractual Remedies Act 1979, 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 7.1 but not otherwise, shall be made or given as the case may require.
- 5.5 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.

6.0 Vendor's warranties and undertakings

- 6.1 The vendor warrants and undertakes that at the date of this agreement the vendor has not:
- received any notice or demand and has no knowledge of any requisition or outstanding requirement:
 - from any local or government authority or other statutory body; or
 - under the Resource Management Act 1991; or
 - from any Tenant of the property; or
 - from any other party; or
 - given any consent or waiver, which directly or indirectly affects the property and which has not been disclosed in writing to the purchaser.
- 6.2 The vendor warrants and undertakes that at settlement:
- 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.
 - All electrical and other installations on the property are free of any charge whatsoever.
 - There are no arrears of rates, water rates or charges outstanding on the property.
 - 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.
 - Where the vendor has done or caused or permitted to be done on the property any works:
 - any permit, resource consent, or building consent required by law was obtained; and
 - to the vendor's knowledge, the works were completed in compliance with those permits or consents; and
 - 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:
- 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;
 - the building has a current building warrant of fitness; and
 - 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:
- from any local or government authority or other statutory body; or
 - under the Resource Management Act 1991; or
 - from any tenant of the property; or
 - 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.
- 6.3 If the property is or includes part only of a building, the warranty and undertaking in subclause 6.2(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:
- 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;
 - the building has a current building warrant of fitness; and
 - 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.
- 6.4 The vendor warrants and undertakes that on or immediately after settlement:
- 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.
 - 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.
 - 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.
 - 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.
- 6.5 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 5.4 and any right of equitable set-off.

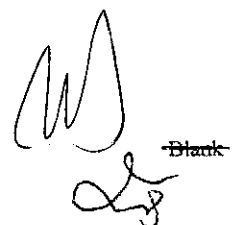
7.0 Claims for compensation

- 7.1 If the purchaser claims a right to compensation either under subclause 5.4 or for an equitable set-off:
- the purchaser must serve notice of the claim on the vendor on or before the last working day prior to settlement; and
 - the notice must:
 - in the case of a claim for compensation under subclause 5.4, state the particular error, omission, or misdescription of the property or title in respect of which compensation is claimed;
 - in the case of a claim to an equitable set-off, state the particular matters in respect of which compensation is claimed;
 - comprise a genuine pre-estimate of the loss suffered by the purchaser; and
 - be particularised and quantified to the extent reasonably possible as at the date of the notice.
- 7.2 For the purposes of subclause 7.1(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 10.1.
- 7.3 If the amount of compensation is agreed, it shall be deducted on settlement.
- 7.4 If the amount of compensation is disputed:
- an interim amount shall be deducted on settlement and paid by the purchaser to a stakeholder until the amount of the compensation is determined;
 - the interim amount must be a reasonable sum having regard to all of the circumstances;
 - 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;
 - 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;
 - 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;
 - the amount of compensation determined to be payable shall not be limited by the interim amount; and
 - 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.
- 7.5 The procedures prescribed in subclauses 7.1 to 7.4 shall not prevent either party taking proceedings for the specific performance of the contract.

8.0 Unit title and cross lease provisions

Unit Titles

- 8.1 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.
- 8.2 If the property is a unit title, the vendor warrants and undertakes as follows:
- The information in the pre-contract disclosure statement provided to the purchaser was complete and correct.
 - 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.
 - Not less than five working days before the settlement date, the vendor will provide:
 - a certificate of insurance for all insurances effected by the body corporate under the provisions of section 135 of the Act; and
 - 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.
 - There are no other amounts owing by the owner under any provision of the Act or the Unit Titles Act 1972.
 - There are no unsatisfied judgments against the body corporate and no proceedings have been instituted against or by the body corporate.
 - 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.
 - The vendor has no knowledge or notice of any fact which might give rise to or indicate the possibility of:
 - the owner or the purchaser incurring any other liability under any provision of the Act or the Unit Titles Act 1972; or
 - any proceedings being instituted by or against the body corporate; or
 - 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.
 - 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.
 - 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.
 - No resolution has been passed and no application has been made and the vendor has no knowledge of any proposal for:
 - the transfer of the whole or any part of the common property;
 - the addition of any land to the common property;
 - the cancellation of the unit plan; or
 - 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.
 - As at settlement, all contributions and other moneys payable by the vendor to the body corporate have been paid in full.



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- 8.3 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 8.2(2), 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.
- 8.4 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.
- 8.5 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

- 8.6 (1) Where structures (not stated in clause 5.0 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 5.2(3) and 5.2(4) shall apply with the purchaser's demand under subclause 8.6(1) being deemed to be an objection and requisition.

9.0 Conditions and mortgage terms

Particular Conditions

- 9.1 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.
- 9.2 (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 ~~fifth~~ ^{tenth} 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 ~~fifth~~ ^{tenth} 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 9.8(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 9.8(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.
- 9.3 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 9.8(5), the purchaser must provide the vendor immediately upon request with a copy of the building inspector's report.
- 9.4 (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.
- 9.5 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.
- 9.6 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.
- 9.7 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.

Operation of Conditions

- 9.8 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

- 9.9 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.
- 9.10 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.

10.0 Notice to complete and remedies on default

- 10.1 (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; but
- (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.
- 10.2 Subject to subclause 10.1(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.

- 10.3 (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 10.1.
- (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.
- 10.4 If the purchaser does not comply with the terms of the settlement notice served by the vendor then, subject to subclause 10.1(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 10.4(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.
- 10.5 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.
- 10.6 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.
- 10.7 Nothing in this clause shall preclude a party from suing for specific performance without giving a settlement notice.
- 10.8 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.

11.0 Non-merger

- 11.1 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.

12.0 Agent

- 12.1 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.
- 12.2 The agent may provide statistical data relating to the sale to the Real Estate Institute of New Zealand Incorporated.

13.0 Goods and Services Tax

- 13.1 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).
- 13.2 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.
- 13.3 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(1b) of the GST Act applies.
- 13.4 (1) Without prejudice to the vendor's rights and remedies under subclause 13.1, 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 10.1.
- (3) The vendor may give a settlement notice under subclause 10.1 with a notice under this subclause.

14.0 Zero-rating

- 14.1 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.
- 14.2 The purchaser warrants that any particulars stated by the purchaser in Schedule 2 are correct at the date of this agreement.
- 14.3 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.
- 14.4 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.
- 14.5 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.
- 14.6 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.

14.7 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 14.3 and 14.4 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.

15.0 Supply of a Going Concern

- 15.1 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%.
- 15.2 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 13.0 of this agreement shall apply.

16.0 Limitation of Liability

- 16.1 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.

17.0 Counterparts

- 17.1 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.



FURTHER TERMS OF SALE - Attached Clauses 18 - 36 *JS*
* Land Conventions *W*

SCHEDULE 1

List all chattels included in the sale
(strike out or add as applicable)

~~Stove~~

~~Fixed floor coverings~~

~~Blinds~~

~~Curtains~~

~~Light fittings~~

Bare Land

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.

1.	The vendor's registration number (if already registered):	98 497 706
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

5.	The purchaser's details are as follows:	
(a)	Full name: Mike Greer Homes North Canterbury Ltd	
(b)	Address: PO Box 421, Rangiora 7440	
(c)	Registration number (if already registered): 96-280-424	
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).	Yes/No
	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.	Yes/No
	That part is: (e.g. "the main farmhouse" or "the apartment above the shop")	
7.	The purchaser intends to direct the vendor to transfer title to the property to another party ("nominee").	Yes/No

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

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

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.

.....

VB Properties (2008) km

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 6.0 and 8.0:
 - 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: 7 July 2016

VENDOR:

VB Properties (2008) Limited

Contact Details:

Sales@highgaterangiora.co.nz
Ph 027466026

VENDOR'S LAWYERS:

Firm: Cavell Leitch

Individual Acting: Emily Quested

Contact Details: PO Box 799

Christchurch 8140

Ph: (03) 379 9940

emily.quested@cavell.co.nz

PURCHASER:

Mike Greer Homes North Canterbury LTD

Contact Details:

PO Box 421
Rangiora 7440
03 313 0819

PURCHASER'S LAWYERS:

Firm: Meg Gregson Saunders & Co

Individual Acting:

Contact Details:

131 Victoria Street
PO Box 18
Christchurch 8140
Ph 03 963 1458

meg.gregson@saunders.co.nz

LICENSED REAL ESTATE AGENT:

Agent's Name:

Manager:

Salesperson:

Contact Details:

Private Treaty

FURTHER TERMS OF SALE**18. DEPOSIT**

18.1 A deposit of ten thousand dollars (\$10,000) is to be paid to the vendor's solicitor's trust account upon confirmation of Clause 36 in the Further Terms of Sale. The deposit shall be paid to the vendor's solicitor to be held in the vendor solicitors trust account as stakeholder on interest bearing deposit until the 5th day after title has been issued. In the event that this contract is terminated for any reason other than by default of Purchaser the deposit together with all interest (less Resident Withholding Tax (RWT) and commission) shall be retained by the Vendor.

18.2 The Purchaser and Vendor acknowledge that the deposit is to be regarded as part of the purchase price.

19. The Purchaser acknowledges that the Purchaser has inspected the property and that the Purchaser purchases it solely in reliance on the Purchaser's own judgement and not on any representation or warranty made by the Vendor or any agent of the vendor.

20. VENDOR SUBDIVISION

20.1 The Vendor has received a satisfactory Resource Consent from the Waimakariri District Council and the Vendor will at the Vendor's cost:-

20.1.1. Implement the Resource Consents by carrying out all requirements and complying with all conditions imposed by the Resource Consents.

20.1.2. Prepare a survey plan in accordance with the Resource Consents;

20.1.3. Obtain approval of the survey plan by the Territorial Authority and the Department of Survey and Land Information;

20.1.4. Lodge the approved survey plan in the Land Titles Office; and

20.1.5. Deposit the approved survey plan in the Land Titles Office and cause the land to be amalgamated.

20.2 The Vendor undertakes to complete the subdivision without delay.

20.3 The Purchaser acknowledges that the Purchaser has inspected the property and that the Purchaser purchases it solely in reliance on the purchaser's own judgment and not on any representation or warranty made by the Vendor or any agent of the vendor.

20.4 The property is sold subject to all existing fencing covenants, drainage or water rights, building line restrictions and other easements, reservations and exceptions of any kind shown on the present title(s) and to any easements, rights, restrictions or other encumbrances which may be required by the Waimakariri District Council or any other body having authority. The Vendor reserves the right to impose, grant or create any consent notices, fencing covenants, other covenants, easements, rights of way, building line restrictions or other encumbrances which may be required by the Waimakariri District Council, LINZ or any other authority having jurisdiction or which the Vendor considers necessary for the subdivision. The Purchaser shall take title subject to all such consent notices, fencing covenants, easements, rights of way, building line restrictions or other encumbrances

notwithstanding any other provision of this Agreement to the contrary. The Purchaser shall execute all documents (with the inclusion of all terms considered reasonably desirable by the solicitors for the vendor) and do such acts and things as may be required to obtain the deposit of the Land Transfer Plan and the implementation of any such easements, building line restrictions, encumbrances or other rights or obligations. The Purchaser shall be entitled to cancel this contract if the Purchaser gives notice in writing within ten (10) working days of being advised of any easement having a substantial detrimental effect on the Purchaser's ability to construct a dwelling on the property.

- 20.5 The Purchaser will not be entitled to claim any compensation, damages, right of set off or to make any objection or requisition based upon any amendment, alteration or variation made by the Vendor pursuant to clauses 20.2 to 20.4 (inclusive). The provisions of clause 5.2 of the general terms of sale are hereby expressly negated. The Purchaser is deemed to have accepted the vendor's title.

21. LAND COVENANTS

- 21.1 The Purchaser acknowledges that the subject land is part of a subdivisional development and that it is desirable that restrictions be imposed for the protection and in the interests of all purchasers, including the Purchaser herein.
- 21.2 The purchaser, and the successors, assigns and transferees of the purchaser, agree with the Vendor to observe and comply with the covenants set out in the Schedule to this Agreement ("the covenants"), although the Vendor may, in the sole and unfettered discretion of the vendor, waive, amend or delete any or all of those covenants. The provisions of the covenants shall form part of the purchaser's obligations in terms of this Agreement and in the event of any default by the Purchaser or its successors assigns and transferees in complying with those obligations the Vendor may at the expense in all things of the Purchaser without notice to the Purchaser take such action as the Vendor shall consider necessary to rectify such default.
- 21.3 Nothing in this Agreement will make it obligatory for the Vendor to enforce any of the covenants contained in the Schedule against any other owner of land in the subdivision of which the land forms part, for itself, or on behalf of any other owner or owners.
- 21.4 The covenants (subject to any reasonable changes made to the covenants by the Vendor) shall be registered prior to the Purchaser taking title or be included in the transfer of the property from the Vendor to the Purchaser and shall run with the property. The Purchaser shall as a requirement of settlement, sign such documents as may be necessary to give effect to this clause.

22. FENCING COVENANT

- 22.1 The Purchaser shall incorporate a fencing covenant in its transfer to comply with the requirements of clause 5.5 of the general terms of sale. In the event that either the Registered Proprietor of a lot adjoining the property or the Vendor, has erected fencing on the boundary between the property and any adjoining property, then the Purchaser shall be liable to contribute to the cost of such fencing notwithstanding that the fencing may have been erected prior to the Purchaser becoming the Registered Proprietor of the property. The amount payable by the Purchaser in relation to such fencing shall be the lesser of one half of the actual cost of the fencing or \$35.00 per lineal metre inclusive of GST. It is recorded that this clause is intended to provide benefit to the vendor or owner of such adjoining property.

23. VENDORS RIGHTS ON PROPERTY SUBDIVISION

23.1 The Vendor retains the following rights in respect of the land on the subdivisional plan up until the possession date:

23.1.1 To store soil in the course of development works.

23.1.2 To cut away and remove the soil and sub-strata of the land, to kerb and fill adjacent to roads, access ways and right of ways.

23.1.3 To excavate, lower, contour, fill, landscape and plant any part of the land.

23.1.4 To enter upon any Lot itself or by its servants, agents or workmen and do such work as shall in the opinion of the Vendor be necessary or desirable for the formation, construction or laying of any road, footpath, drain, pipe, cable, line and other connection and any transformer or supply box or as may otherwise be in the opinion of the Vendor necessary or desirable to complete the subdivision of all or any part of the land.

AND

23.2 No such matter shall entitle the Purchaser to compensation or damages nor shall it annul the sale or entitle the Purchaser to make objection or requisition pursuant to clause 5 of the general terms hereof.

24 COMPLETION OF FURTHER SUBDIVISION OF THE LAND

24.1 The Purchaser acknowledges that the Vendor will have the right after settlement date to complete the subdivision development including further stages of the development and the Purchaser agrees to not make any objections to any further stages of the development and to sign all necessary documents that may be required by the Vendor to complete the overall subdivision development.

25 MAINTENANCE OF SECTION

25.1 In the event the possession is given to the Purchaser prior to payment to the Vendor of all moneys payable hereunder the Purchaser will keep the property in a neat and tidy condition and in particular will prevent long grass and weeds from growing thereon.

25.2 The Purchaser will not erect any buildings, sheds or other structures on the property unless the same has been approved in writing by the Vendor. In the event the Purchaser shall fail to comply with the provisions of this clause the Vendor or their agent may at the option of the Vendor enter the property for the purpose of remedying such breach and all costs of so doing shall be recoverable from the Purchaser.



26 BUILDING AND FENCING WITHOUT CONSENT

- 26.1 That notwithstanding that the Purchaser may have possession of the land, the Purchaser shall not, prior to settlement, build, erect or place on the land any buildings or fence without the prior consent of the vendor. When the Vendor exercises discretion it may also take into account its own assessment of the effects of any land, building land, building and visual concept or integrated appearance of all or any lots in the subdivision. Without limiting its discretion the Vendor may refuse to approve some landscape designs, fencing and plants of which in its sole opinion have a shade or other detrimental negative effect on other lots in the subdivision now or at a later date.
- 26.2 The Purchaser shall not commence any works on the land until the Purchaser has obtained all relevant building and planning permits, approvals and consents (including but not limited to consents from Waimakariri District Council and Environment Canterbury).
- 26.3 All approvals or consents required from the Vendor shall be:
- 26.3.1 Sought by the Purchaser from the Vendor (or its appointed agent) prior to any work being carried out on the land; and
- 26.3.2 Given or refused in the sole absolute and unfettered discretion of the vendor;
- 26.4 The Vendor may withhold its right to approve requests for one party without creating any form of precedent to another party. Further the Vendor may refuse an identical request from another party without having to give reasons.

27 EXPECTED DATE FOR ISSUE OF TITLE

- 27.1 The expected date of Title is 31 July 2016, however, the Vendor gives no warranty in this respect and the date shall not be an express obligation on the part of the Vendor herein and the Vendor shall not be liable for any damages or any other claims to the Purchaser or any other person arising from the Title issuing at a later date. The Vendor and/or the Purchaser shall be entitled to cancel this agreement if the Title has not issued on or before 31 December 2016 and the Vendor shall refund the Purchaser all money paid by way of deposit and neither party shall have any claim against the other arising from cancellation pursuant to this clause.

28 ON SALE

- 28.1 If the Purchaser re-sells or agrees to re-sell or assign or otherwise dispose of the Purchaser's interest in the property or this Agreement, then the Purchaser will obtain from that sub-Purchaser or assignee a Deed of Covenant to be prepared by the Vendor's Solicitor at the cost of the Purchaser pursuant to which the sub-Purchaser or assignee shall covenant to observe perform and fulfil all obligations and restrictions contained in this Agreement including this covenant to obtain a Deed of Covenant from any subsequent sub-Purchaser or assignee.

29 NO CAVEAT AND PROHIBITION ON DEALING

The Purchaser will not lodge a caveat against the vendor's title to the land.



30 GENERAL

- 30.1 The Purchaser hereby indemnifies the Vendor against any damage caused by the Purchaser or any builder, or contractor of the purchaser's or supplier of goods to the Purchaser to any road, footpath, kerb, berm, grass, tree, shrub, access way or other work or improvement or to any other land forming part of the vendor's subdivision and will upon demand pay the Vendor the cost of making good any damage caused as aforesaid.

31 INVOICE

- 31.1 The parties agree that the Vendor will not be required to supply a tax invoice to the Purchaser until on or after the settlement day at the request of the purchaser.

32 PURCHASE BY A REGISTERED COMPANY

- 32.1 Where the purchaser of any Lot 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 jointly and severally guarantees to the Vendor the performance of all the Purchaser's obligations under this Agreement, and has separately executed this Agreement in that capacity in recognition of this obligation

33 LOWEST PRICE CLAUSE

- 33.1 The parties hereby agree that where in relation to this Agreement it is necessary to determine "the acquisition price" for the purposes of the Income Tax Act 1994, the purchase price payable hereunder is the lowest price the parties will have agreed upon for the property that is the subject of the Agreement for Sale and Purchase of Property at the time at which this Agreement for the Sale and Purchase of Property was entered into on the basis of payment in full at the time at which the first right in the property is to be transferred.

34 RATES

- 34.1 From the possession date the Purchaser shall be responsible for payment of rates in respect of the property. The Purchaser will if required by the Vendor upon demand reimburse the Vendor for any rates paid in advance by the Vendor.

35 BUILDERS TERMS

- 35.1 The parties agree the Purchaser is entitled to immediate possession from the date that Title is issued for the section.
- 35.2 The Vendor agrees that the Purchaser together with any required contractors are allowed to commence the building of a dwelling on the section notwithstanding settlement of the property is to be completed six months from the date of this agreement or upon issue of Title for the lot whichever is the latter.

The Vendor agrees the ownership of all material and works remains with the Purchaser and the Purchaser reserves the right to dismantle and remove all improvements made by them notwithstanding that they may be fixtures of the land provided that if the Purchaser does not settle in full on the settlement date then the ownership of all materials and works and buildings may, at the Vendor's election, pass to the Vendor or the Vendor may, in a proper and workmanlike manner, remove the same from the property and forward to a refuse collection centre and the cost of making good resulting damage and the cost of removal may be recoverable from the Purchaser and the Vendor shall not be liable to pay any compensation nor be liable for any loss suffered by the Purchaser.

36 DUE DILIGENCE BY PURCHASER

- 36.1 This Agreement is conditional upon the purchaser being satisfied that the property is suitable for the Purchaser's intended use following the Purchasers undertaking an investigation of the property.
- 36.2 The parties acknowledge that the condition in clause 36.1 is inserted for the sole benefit of the Purchaser and may at any time prior to this Agreement being cancelled be waived by the Purchaser giving written notice of the waiver to the Vendors or its solicitor.
- 36.3 The date of satisfaction of the condition under clause 36.1 shall be ten (10) working days from the date this agreement is signed by both parties.

The above conditions will be considered approved if the vendor's solicitor has not received any notice to the contrary by 4pm on the tenth working day following acceptance.

SCHEDULE

LAND COVENANT - Attached



JUN 16 HIGHGATE



ANNEXURE SCHEDULE 2

The Grantee covenants with the Grantor, the said V B Properties 2008 Limited, as set out in Schedule B herein and the covenants form part of this Instrument and the Grantee and the Grantor hereby request that such covenants be noted against Certificates of Titles 733644 to 733669 inclusive, and 740379 (Canterbury Registry).

It is the Grantor's intention to create for the benefit of the registered proprietors of the dominant tenements in Schedule A the land covenants set out in Schedule B hereof **TO THE INTENT** that the land in Schedule A shall be bound by the stipulations and restrictions set out in Schedule B hereof.

The covenants in Schedule B shall be restrictive covenants running with each of the lots in Schedule A being stipulations and restrictions on the lots shown as servient tenements in Schedule A and being for the benefit of the lots shown as the dominant tenements in Schedule A.

SCHEDULE B

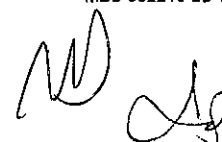
It is acknowledged that the land being developed is intended to be a modern, high quality and well designed subdivision to ensure a quality development that is in harmony with the unique surrounding environment. It is therefore desirable that supervision and control be exercised for the protection and in the interest of all registered proprietors of the land in relation to any development of the land. In recognition of these objects, at all times from the date of this Land Covenant the Registered Proprietor for the time being of any part of the land described in Schedule A hereto ("the Registered Proprietor") shall:-

1. Not erect or carry out any building, fencing (including live hedging) landscaping or any other structure on the land (this includes but is not limited to exterior finishes and excavation of foundations) unless the Grantor or its nominee has approved all plans and specifications including the site plan of the dwelling, fencing, external colour scheme, landscaping or any other structure prior to building commencing.
2. Not further subdivide the lot without the prior written approval of the Grantor or its nominee. The decision of the Grantor or its nominee shall be final and binding.
3. Not grant or allow to be granted any further easements to be registered on any lot, including any right of way easement, without the prior written approval of the Grantor or its nominee. The decision of the Grantor or its nominee shall be final and binding
4. Submit two sets of all design plans for any dwelling or accessory building, or any other structure, letterbox, fences fronting the road or reserves or waterways. The dwelling plans required are the elevations, floor plan and site plan and must detail exterior cladding and show lot and D.P. number and include the name of the proposed builder. All design plans must be approved by the Grantor in writing prior to construction. The Design for any dwelling or accessory building or other structure shall be submitted to the Grantor or its nominee at sketch plan stage so that approval for the design can be given prior to the commencement of working drawings. In exercising its discretion the Grantor or its nominee shall take into account the following matters:

- 4.1. The height and positioning of any dwelling, detached building or structure within the individual lot.
- 4.2. The external appearance of any built structure including any dwelling, detached building, structure or landscaping.
- 4.3. The impact of any proposal on adjacent properties and to the subdivision as a whole with particular reference to daylight, views and privacy.
- 4.4. All plans and elevations submitted are to comply with the Transitional and Proposed Waimakariri District Council Plan and with the terms of the agreement for sale and purchase signed by the Purchaser.
5. Not erect any house or building of any kind utilising fibro-cement panels and/or second hand materials (apart from good quality used brick and slate, which shall be allowed). No relocatable or kitset dwelling or structures to be erected without specific written permission from the Grantor.
6. Not erect any dwelling or garage which has a roof pitch of less than 26 degrees. Flat and partial flat roof areas may be allowed at the discretion of the Grantor. Roof lines should not have one long continuous line. Preference will be for gables and architectural roof lines in lieu of multiple hip roofing.
7. Not erect any structure other than one new dwelling house with a minimum floor area, including garaging, of not less than:

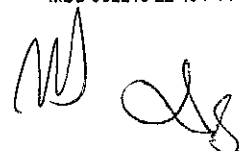
180m² for sections 650m² and over or

165m² for sections under 650m²
8. Not erect any separate garage, i.e., a garage not attached to the house;
9. Ensure in the overall design approach that the dwelling plans have street appeal. Plans shall have on the exterior street front elevations, several or some architectural features such as a large window, feature chimney, boxed windows, or brick or plastered columns. Fencing between dwelling and side boundaries to be of same or similar materials to dwelling not palings. The Grantor reserves the right to approve such plans that do not comply with the above if in the grantor's sole discretion such departure will not adversely effect on the subdivision or the environment.
10. Not construct, place or permit any caravan, hut, garage or shed or transportable home or other similar structure on the lot for any kind of permanent or temporary residential use. Additionally, no boat, plant, caravan or vehicle of any unsightly nature is to be allowed or suffered to be brought onto or remain on the lot and no boat building or other similar activity is to take place on the lot unless such boat, caravan, vehicle or activity is adequately garaged or screened to prevent viewing from the street frontage or from adjoining lots and nor shall any such item be located on the road adjacent to the property. Not use any part of the lot as a junkyard, metal or scrap metal yard.
11. Not permit any rubbish, noxious substances, noxious livestock and/or birds or animals likely to cause nuisance or annoyance to the neighbouring occupiers to accumulate and/or be placed on the lot, or permit grass and/or weeds to grow to a height exceeding 150mm. All household rubbish bins to be screened from the road frontage. Appropriate rubbish skips shall be maintained within the site for all site rubbish and shall be cleared

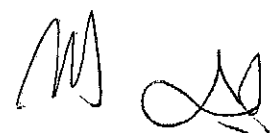


at regular intervals. At no time shall rubbish be permitted to blow outside of the building site or be permitted to cause an unsightly mess. All rubbish skips must be covered each night to ensure that rubbish is not blown out by high winds.

12. Maintain the lot to a high standard and regularly mow both the grass on the lot and on any road berm fronting the lot and trim any boundary weeds or long grass including maintenance of any gardens that maybe planted fronting the lot.
13. Not permit a dwelling to be occupied until a Code of Compliance Certificate has been issued by the Waimakariri District Council and all driveways, pathways, letterbox and fences to the lot boundaries are completed. All unpaved areas are to be properly grassed or landscaped within three (3) months of the date of occupation of the dwelling.
14. Not leave the outside of any dwelling house unfinished or any exterior walls or doors unpainted or unstained except where cedar cladding or decorative brick/stone are used.
15. Ensure that any buildings being built on the lot have been fully completed within 18 months of the date that construction of the building commenced and no building under construction shall be left without substantial work being carried out for a period exceeding three months.
16. Not register any caveat against any of the Certificates of Titles owned by the Grantor which are included in whole or part of the lot being subdivided.
17. Not permit the erection of any sign on the lot or adjacent road reserve other than a professionally written and installed sign marketing the dwelling for sale. Signs marketing the section only are not permitted. The erection of signage indicating a business will only be permitted by the Grantor if such signage is acceptable in the sole discretion of the Grantor and prior written consent is obtained. The Grantor shall have the right to remove any sign, which in its sole discretion is unacceptable, without prior warning. The within clause shall not be applicable to any lot the Grantor owns in the subdivision.
18. Accept the decision of the Grantor or its nominee in any situation where the Grantor's approval or consent is required and acknowledge that the Grantor may grant or decline such approval or consent at the sole discretion of the Grantor or may grant approval or consent on such terms and conditions as the Grantor requires.
19. Accept that the Grantor reserves the right to reasonably alter or amend the land covenants prior to registration.
20. Not breach any of the terms of the Waimakariri District Council or Environment Canterbury subdivision consent for the land.
21. Not make any submission or objection to the Waimakariri District Council or any other relevant authority against any application made by the Grantor in respect of resource consent applications of whatever nature whatsoever for further subdivision or redevelopment of the balance property currently known as Lot 700 on Deposited Plan 489128 and comprised and described in certificate of title 705045
22. Not allow contractors and subcontractors to commence work on the lot without first informing them of the restrictions created by these covenants and ensuring their compliance therewith and in particular before commencing any work on the lot the builder shall.

Two handwritten signatures in black ink, one appearing to be 'M' and the other 'S', located at the bottom right of the page.

- 22.1. Construct all boundary fences and create a temporary footpath and berm crossing by cutting out kerb and crossing area and providing hard base material compacted in a manner that shall ensure a tidy crossing during construction. This access point referred to herein as the "designated access" is the only permitted access to the lot.
- 22.2. Ensure that if a kerb and crossing have already been installed it shall be the designated access and must be protected by laying down a protective layer of sand followed by a layer of base course material to a thickness that will ensure no damage occurs to the under laying crossing and footpath. In the event of any damage occurring, full replacement and reinstatement will be required.
- 22.3. At the completion of the building and during the landscaping and laying of paths the builder shall reinstate the new footpath and berm crossing.
- 22.4. Ensure all builders' site sheds shall be placed within the building lot. No unloading of materials is permitted onto the footpath or berm areas or neighbouring lots, walkways, road or reserve. If any such damage to such adjoining lot, road, curbing footpath or berms or landscaped or planted areas or enhancement or architectural feature the registered proprietor will, without demand, immediately (time being strictly of the essence) at the cost of the registered proprietor, repair and reinstate.
- 22.5. Not, prior to settlement, build, erect or place on the lot any buildings or fence without the prior consent of the Grantor. When the Grantor exercises discretion it may also take into account its own assessment of the effects of any lot, buildings and visual concept or integrated appearance of all or any lots in the subdivision. Without limiting its discretion the Grantor may refuse to approve some landscape designs, fencing and plants of which in its sole opinion have a shade or other detrimental negative effect on other lots in the subdivision now or at a later date.
23. Not remove any fencing, and/or landscaping provided by the Grantor and shall maintain such fencing and/or landscaping as is contained either within or immediately adjacent to the lot.
24. Not alter the fencing where such fencing has been approved.
25. Be bound by a Fencing Covenant within the meaning of Section 2 of the Fencing Act 1978.
26. Not call upon the Grantor to pay for or contribute towards the expense of construction or maintenance of any fence between the Lot and any contiguous land of the Grantor PROVIDED HOWEVER that this covenant shall not enure the benefit of any subsequent owner of the contiguous lot.
27. Not erect or permit to be erected on the lot any fence or boundary wall:
- 27.1. Within 2.0 metres of the legal road boundary except on lots which have frontage to two Public Roads where fencing on the secondary road frontage may be permitted on the boundary shall be exempt from this 2.0 metre legal road boundary rule. All Street front fencing shall be of similar materials to the dwelling and may include 'piers' with infill timber panels. All road frontages, right of way frontage, fences fronting a public reserve or waterway, fence

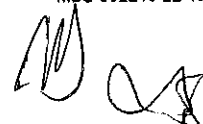


design shall be consistent with the design and exterior materials of the dwelling and any timbers must be painted or stained. Approval of fence design may be declined at the Grantor's sole discretion if the planned fencing is seen to potentially cause detriment to the subdivision. On boundaries fronting a public reserve or waterway preference shall be given to some open style fencing on the reserve boundary.

- 27.2. On the internal boundaries (being boundaries not fronting a road or right of way) of a height greater than 2m above the finished ground level or of materials other than new timber. All internal boundary fences shall be constructed in the form of a paling fence and timber capping. Colour steel fencing may be approved at the sole discretion of the Grantor.
- 27.3. The Reserve boundary fences on the north western boundary of lot 39 and the southern boundary of lot 75 shall not be altered without the approval of the grantor.
- 27.4. The planted hedging along the south western Reserve fronting boundary of lots 38 & 39 shall not be removed. Notwithstanding this a width of hedging not to exceed 1.1 metres may be removed for the purpose of allowing pedestrian access.

Any fencing along this boundary is to be set back a minimum of 0.5 metres from the hedge.

28. Not plant or permit to grow any live hedge greater than 1.8 metres in height or plant pinus radiata or cedrus macrocarpa trees.
29. Acknowledge that all approvals and/or consents required from the Grantor shall be given or refused in the sole absolute and unfettered discretion of the Grantor subject to the Grantor reserving its right to approve requests for one party without creating any form of precedent to another party. Further the Grantor may refuse an identical request from another party without having to give reasons.
30. Not allow or cause any breach or non-observance of any of the foregoing covenants (and without prejudice to any other remedies available at law to the Grantor or to any other liability which the Registered Proprietor may have to any person having the benefit of this covenant) and the Registered Proprietor will on written demand being made by the Grantor or any of the Registered Proprietors of the lots described in Schedule A herein:-
- 30.1. Pay to the person making such demand the sum of \$100.00 per day in total (as liquidated damages) for every day that such breach or non-observance continues after the date on which written demand has been made; and
- 30.2. Remove or cause to be removed from the lot any improvements on the lot which have been erected or placed on the lot in breach or non-observance of any of the foregoing covenants.

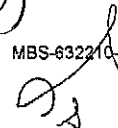


FURTHER TERMS

- A. The Grantor shall not be liable for any breaches of the covenants herein contained in respect to any lot after it has sold and transferred title to such lot.
- B. If any dispute shall arise in relation to the provisions of the covenants such dispute shall be referred to arbitration in accordance with the Arbitration Act 1996 or its amendments or any Act in substitution thereof.
- C. The abovementioned restrictions shall apply for the benefit of lots 38-39, 53-54, 67-72, 75-77, 142-147, 156-163 and lots 166-167 of Stages 5 and 6 of the subdivision. Any person having the benefit of these covenants shall be entitled in the event of any default, breach or non-observance of any one or more of them at the cost of the party committing the breach in all things and without having to establish that any loss has been or will be suffered to either an immediate injunction prohibiting such use or an order that such breach be remedied forthwith notwithstanding that such an order may necessitate the demolition either in whole or in part or removal of any structure/building or the closure of any business. Notwithstanding this provision V B Properties 2008 Limited shall not be liable hereunder.
- D. VB Properties 2008 Limited shall not be required or obliged to enforce all or any of the covenants, stipulations and restrictions contained in this instrument nor be liable to the Registered Proprietor for any breach thereof by any of the Registered Proprietors from time to time of the other lots that comprise the subdivision.
- E. The Registered Proprietor covenants that the Registered Proprietor will at all times save harmless and keep indemnified VB Properties 2008 Limited from all proceedings, costs, claims and demands in respect of breaches by the Registered Proprietor of any of the stipulations, restrictions and covenants contained in the preceding clauses.
- F. If the Registered Proprietor breaches any of these covenants causing damage the Restricted Proprietor will without demand, immediately (time being strictly of the essence) at the cost of the Registered Proprietor, repair and reinstate any such damage and if the Registered Proprietor fails to rectify any such damage to the satisfaction of the Grantor or acting reasonably then the Grantor or its nominee may carry out such rectification works at the cost of the Registered Proprietor. Any money so expended by the Grantor which is not paid by the Registered Proprietor to the Grantor within five working days of written demand by the Grantor to the Registered Proprietor will incur interest at the rate of 12% per annum (calculated on a daily basis) until paid in full.
- G. The foregoing covenants shall cease to have any force and effect on 31 December 2026. Such cessation shall be without prejudice to any rights accruing for any antecedent breach of the covenants.



MBS-632210-22-104-V1



Memorandum from licensed building practitioner: Certificate of design work
Section 45 and Section 30C, Building Act 2004
THE BUILDING

Street address:	42 Watkins Drive		
Suburb:	Hiighgate Estate		
Town/City	Rangiora	Postcode:	7400

THE OWNER

Name(s):	Mike Greer Homes North Canterbury		
Mailing address:			
Suburb:	PO Box/Private Bag: PO Box 421		
Town/City:	Rangiora	Postcode:	7440
Phone number:	03 975 5675	Email address:	nc.compliance@mikegreerhomes.co.nz

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

I, Bud Caldwell supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
<i>Tick(√)if included Cross (X) if excluded</i>	<i>[If appropriate, provide details of the restricted building work]</i>	<i>[Specify whether you carried out this design work or supervised someone else carrying out this design work]</i>	<i>[If appropriate, specify references]</i>
All RBW Design work relating to B1 (√)		(x) Carried out (√) Supervised	
Foundations (x)	<i>S.E.D as per Geotech report</i>	(x) Carried out (x) Supervised	Foundation plan & details - Refer to engineers documentation
Walls (√)	<i>Timber framing</i>	(x) Carried out (√) Supervised	Floor plan, cross section, construction details
Roof (√)	<i>Roof structure to NZS3604 apart from trusses</i>	(x) Carried out (√) Supervised	Roof plan & Truss Manufacturers Docs
Columns and beams (x)		(x) Carried out (x) Supervised	
Bracing (√)	<i>Sheet Bracing</i>	(x) Carried out (√) Supervised	Bracing plan & calculations
Other (x)		(x) Carried out (x) Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(√)		(x) Carried out (√) Supervised	
Damp proofing	(√)	<i>DPM underside of slab, DPC under bottom plate</i>	(x) Carried out (√) Supervised	Cross Section, construction details
Roof cladding or roof cladding system	(√)	<i>Longrun coloursteel to manufacturers specifications</i>	(x) Carried out (√) Supervised	Roof Plan
Ventilation system <i>eg: subfloor or cavity</i>	(√)	<i>Cavity to brick to NZS3604 Cavity to Linea cladding system as per appraisal</i>	(x) Carried out (√) Supervised	Floor Plan
Wall cladding or wall cladding system	(√)	<i>Brick on cavity as per E2/AS1 Linea on cavity as per appraisal – AS1</i>	(x) Carried out (√) Supervised	Elevations Construction details
Waterproofing	(x)		(x) Carried out (x) Supervised	Detail
Other	(x)		(x) Carried out (x) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other	(x)	Commercial or apartments only	(x) Carried out (x) Supervised	Floor Plan
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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 (x) Yes (√) No

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

Clause	Waiver/modification required
<i>[List relevant clause numbers of building code]</i>	<i>[Specify nature of waiver or modification of building code]</i>

ISSUED BY

Name: Glen Caldwell	LBP or Registration number: BP115719
The practitioner is a: ☒ Design LBP ☐ Registered architect ☐ Chartered professional engineer	
Design Entity or Company (optional):	DesignNZ (<i>Watkins Group</i>)
Mailing address (if different from below):	
Street address / Registered office:	Level 2, Units 16/17, 42 Silverstream Blvd
Suburb: Kaiapoi	Town/City: Christchurch
PO Box/Private Bag: P O Box 23. Woodend	Postcode: 7641
Phone number: 03 310 0272	Mobile:
After Hours:	Fax:
Email address: bud@designNZ.co.nz	Website:

DECLARATION

I Glen Caldwell, LBP,

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

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

Signature:



Date: 02/03/2017

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

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

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

THE BUILDING

Street address: Lot 77, 42 Watkins Drive

Suburb: Highgate

Town/City: Rangiora

Postcode:

THE OWNER

Name(s): C/o Mike Greer Homes North Canterbury

Mailing address:

Suburb:

PO Box/Private Bag:

Town/City:

Postcode:

Phone number:

Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

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

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

I Cory Bedford carried out / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Primary structure			
All RBW Design work relating to B1 (X)		() Carried out () Supervised	
Foundations and subfloor framing (✓)	reinforced concrete waffle foundation slab and entry post footings	() Carried out (✓) Supervised	Refer to Constructure drawings #7833
Walls (X)		() Carried out () Supervised	
Roof (X)		() Carried out () Supervised	
Columns and beams (X)		() Carried out () Supervised	
Bracing (X)		() Carried out () Supervised	
Other (X)		() Carried out () Supervised	

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

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required () Yes (✓) No

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

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

Note: continue on another page if necessary.

ISSUED BY

Name: Cory Bedford	LBP or Registration number: 238134
The practitioner is a: () Design LBP () Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): Constructure Ltd	
Mailing address (if different from below):	
Street address / Registered office: Unit 6, 75 Peterborough Street	
Suburb:	Town/City: Christchurch
PO Box/Private Bag: PO Box 21381	Postcode: 8143
Phone number: 03 365 3243	Mobile:
After Hours:	Fax:
Email address: cory@constructure.co.nz	Website:

DECLARATION

I Cory Bedford [name of practitioner], LBP,

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

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

Signature:



Date: 02/12/2016

22 March 2017

Our Reference: BC170237.01

Mike Greer Homes North Canterbury Limited
PO Box 421
Rangiora 7440

Dear Sir/Madam

PROJECT INFORMATION MEMORANDUM

Please find enclosed your Project Information Memorandum in respect of the proposed work at 42 Watkins Drive RANGIORA.

Prior to **commencing building work**, the applicant must ensure that a Building Consent has been applied for and issued and that any "authorisations" have been obtained and any conditions of the PIM have been verified.
These include:

Consent Notices – RC125211

The applicant is advised that the following conditions, as they apply to Lot 77 shall be subject to a Consent Notice pursuant to section 221 of the Resource Management Act 1991, to be registered on the certificates of title:

As required by NZS 3604:2011 Timber framed buildings, Lot 77 shall have a site specific geotechnical assessment carried out by a suitably qualified Chartered Professional Engineer with experience in residential development. This requirement shall be undertaken prior to building consent being applied for. This site specific geotechnical assessment shall be used to inform the foundation design for any building to be constructed on the allotments.

Vehicle Crossing – Urban

This property has been identified as requiring a new vehicle crossing. **A formal Vehicle Crossing application will need to be submitted (along with a \$61.30 processing fee) for approval and established prior to the erection of a dwelling or other significant building.** (Rule 3.2, Waimakariri District Council Vehicle Crossing Bylaw 2007). Note that a legal and compliant vehicle crossing will need to be established (in accordance with WDC Engineering Code of Practice **DWG 600-211** (Urban). Resource Consent approval will need to be sought if the location of the proposed vehicle crossing cannot be **located within 1m or greater than 7m** to the adjacent vehicle crossing (Waimakariri District Plan Rule 30.6.1.13). **Any person who begins work on a vehicle crossing without first receiving a vehicle crossing permit from the Council commits an offence against this bylaw.** (Rule 4.4 Waimakariri District Council Vehicle Crossing Bylaw 2007)

Environment Canterbury (Canterbury Regional Council) Liquefaction hazard study

The applicant is made aware that the proposed project falls within an area of shading on the ECAN liquefaction study map, and the following will apply.

The shading on the ECAN map identifies areas where liquefaction assessment is needed and where a site specific geotechnical investigation and report is required as part of a Building Consent application.

A Geotechnical Investigation has been carried out on this site by Lewis & Barrow Ltd and supplied with the application – This will be reviewed as part of the building consent process.

The approval plan along with any Development Contribution notification or Resource Consent Certificate (where applicable) attached to this Project Information Memorandum must be included with the Building Consent for the project (when issued). Any significant departure from the original plans may require that a new Project Information Memorandum be issued.

Yours faithfully



Debbie Wilson
PIMs Officer

Project Information Memorandum

Sections 31-38, Building Act 2004

Application

Mike Greer Homes North Canterbury Limited PO Box 421 Rangiora 7440	No. Issue date Received date Responsible Officer	BC170237.01 22 March 2017 2 March 2017 Debbie Wilson
--	---	---

Project

Description	DWELLING WITH ATTACHED GARAGE 42 WATKINS DRIVE RANGIORA LOT 77 DP 497145
Intended Life	Indefinite (50+)
Intended Use	Housing Residential
Estimated Value	\$300,000.00
Location	42 Watkins Drive RANGIORA
Legal Description	LOT 77 DP 497145 0.075500 Ha
Valuation No.	2165015136

This project information memorandum is confirmation that the proposed building work may be undertaken, subject to the provisions of the Building Act 2004, and any requirements of the building consent.

This project information memorandum includes:

- ___ Information identifying special features of the land concerned
- ___ Information about the land or building concerned notified to the Council by any statutory organisation having the power to classify land or buildings
- ___ Details of relevant utility systems
- ___ Details of authorisations which have been granted
- ___ Notification of any other authorisations which must be obtained before the proposed building work may be undertaken
- ___ Important information

All boundary survey pegs are to be located by discovery or redefinition and flagged before work is commenced.

A current copy of the certificate of title is to be submitted with the building consent application.

The certificate of title may make reference to land covenants - a copy of which should be submitted with the Building Consent application.

No part of the structure is to exceed the Councils recession plane.



This project Information Memorandum does not purport to be a full report on every aspect of the property which is likely to be relevant to the building works proposed. It is information that is known to the Council at the date of the issue of this memorandum. It is issued pursuant to Sections 30-39 of the Building Act 2004.

INFORMATION IDENTIFYING RELEVANT SPECIAL FEATURES OF THE LAND

Wind Zone High

This building project is located approximately 22.5m above mean sea level. This AMSL is for snow loading purposes only, and not to be used as a datum for minimum floor levels or other design purposes.

Canterbury Snow Zone 4

Earthquake Zone 2

Comments:

Attachments:

Nil

INFORMATION ABOUT THE LAND OR BUILDINGS NOTIFIED TO THE COUNCIL BY ANY STATUTORY ORGANISATION HAVING THE POWER TO CLASSIFY LAND OR BUILDINGS

Environment Canterbury (Canterbury Regional Council)

Comments:

Environment Canterbury (Canterbury Regional Council) Liquefaction hazard study

The applicant is made aware that the proposed project falls within an area of shading on the ECAN liquefaction study map, and the following will apply.

The shading on the ECAN map identifies areas where liquefaction assessment is needed and where a site specific geotechnical investigation and report is required as part of a Building Consent application.

A Geotechnical Investigation has been carried out on this site by Lewis & Barrow Ltd and supplied with the application – This will be reviewed as part of the building consent process.

Attachments:

Nil

DETAILS OF RELEVANT UTILITY SYSTEMS (administered by the Waimakariri District Council)

Sewer

Is a connection to a public sewer scheme available?

Yes

If yes, which public sewer scheme?

Eastern District

Is the property already connected?

No

Comments:

Connect to the service lateral provided in compliance with conditions of the Resource Consent for this development.

The reticulation shall gravitate to the existing main located in Watkins Drive. The reticulation design shall incorporate the following minimum requirements:

- The shared lateral between the road boundary and the sewer main (into which the shared lateral discharges) shall be verified for grade related capacity and condition.
- If lateral grade related capacity in (a) above is not satisfactory, then the sub divider shall install a new lateral within the road reserve to connect to the public main.
- The minimum grade for this shared lateral within the road reserve shall be a minimum of 1 in 80.



Notes:

Sewer connections must be installed by registered drainlayers. It is the property owner's responsibility to arrange connections. New connections to sewer mains must be inspected and approved by the Council prior to backfilling.

A trench opening permit is required to open a footpath or street.

A Capital charge is payable where the property has not previously paid sewer rates.

Water

Is a connection to a public water supply available?

Yes

If yes, which public water supply?

Rangiora

Is the property already connected?

No

Comments:

Connect to the service lateral provided in compliance with conditions of the Resource Consent for this development.

Notes:

Water connections to property boundaries are installed by the Council after the receipt of charges payable.

A capital charge is payable where the property has not previously paid water rates.

Stormwater

Is a connection to a public drainage system available?

Yes

Is the property already connected?

No

Discharge point: Kerb and Channel

Comments:

Connect to the service lateral provided in compliance with conditions of the Resource Consent for this development.

Notes:

Stormwater connections must be installed by registered drainlayers. It is the property owner's responsibility to arrange connection. New connections to drainage systems must be inspected and approved by the Council prior to backfilling.

A trench opening permit is required if crossing a footpath.

A Capital charge is payable where the property has not previously paid urban drainage rates.

Attachments

As built service plans

DETAILS OF AUTHORISATIONS THAT HAVE BEEN GRANTED

Resource Consent

Comments:

Resource Consent 125211 – Stage 5 of 154 lot residential 2 subdivision. Decision issued 23.05.13, 224c issued 30.06.16

Attachments:

Resource Consent 125211 224c and consent notice

A copy of the above noted resource consent can be viewed at or emailed from Waimakariri District Council if required.

DETAILS OF AUTHORISATIONS THAT MUST BE OBTAINED BEFORE BUILDING CAN COMMENCE:

Consent Notices

Vehicle Crossing

Comments:

Consent Notices – RC125211

The applicant is advised that the following conditions, as they apply to Lot 77 shall be subject to a Consent Notice pursuant to section 221 of the Resource Management Act 1991, to be registered on the certificates of title:



As required by NZS 3604:2011 Timber framed buildings, Lot 77 shall have a site specific geotechnical assessment carried out by a suitably qualified Chartered Professional Engineer with experience in residential development. This requirement shall be undertaken prior to building consent being applied for. This site specific geotechnical assessment shall be used to inform the foundation design for any building to be constructed on the allotments.

Vehicle Crossing – Urban

This property has been identified as requiring a new vehicle crossing. A formal Vehicle Crossing application will need to be submitted (along with a \$61.30 processing fee) for approval and established prior to the erection of a dwelling or other significant building. (Rule 3.2, Waimakariri District Council Vehicle Crossing Bylaw 2007). Note that a legal and compliant vehicle crossing will need to be established (in accordance with WDC Engineering Code of Practice DWG 600-211 (Urban)). Resource Consent approval will need to be sought if the location of the proposed vehicle crossing cannot be located within 1m or greater than 7m to the adjacent vehicle crossing (Waimakariri District Plan Rule 30.6.1.13). Any person who begins work on a vehicle crossing without first receiving a vehicle crossing permit from the Council commits an offence against this bylaw. (Rule 4.4 Waimakariri District Council Vehicle Crossing Bylaw 2007)

Attachments:

Vehicle crossing application form

DETAILS OF VEHICLE CROSSING (ENTRANCEWAY), TYPE OF FRONTAGE AND TRENCH OPENING PERMIT

Vehicle Crossing (Entranceway)

Is formation of a vehicle crossing from road edge to property boundary required? Yes
Type of access required: DWG 600-211 (Urban).

Advice Notes

None applicable

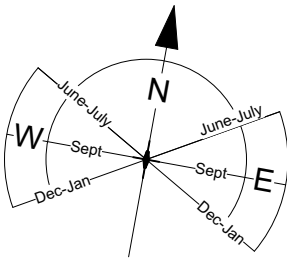
This project information memorandum is confirmation that the proposed building work may be undertaken subject to the provisions of the Building Act 2004 and any requirements of the building consent **Not yet Approved**.

Signed for and on behalf of the Council:



Name:

Date: 22/03/2017



SITE NOTES

Site Area: 755m²
Floor Area: 215.71m² (Over Foundation)
205.51m² (Over Frame)
Site Coverage: 28.57% (38% allowable)

Territorial Authority: Waimakariri District Council
Planning Zone: Residential 2
Site Coverage permitted: 38
Maximum Building Height: 8m

Wind Zone: High
Earthquake Zone: 2
Snow zone: 0.9kPa
Corrosion Zone: C

Set backs required:

- street: 2m
- internal boundaries: Recession planes

dp = Indicates 75x50mm colorsteel downpipes (55m² per dp)

ht + Indicates hose tap location (confirm with client)

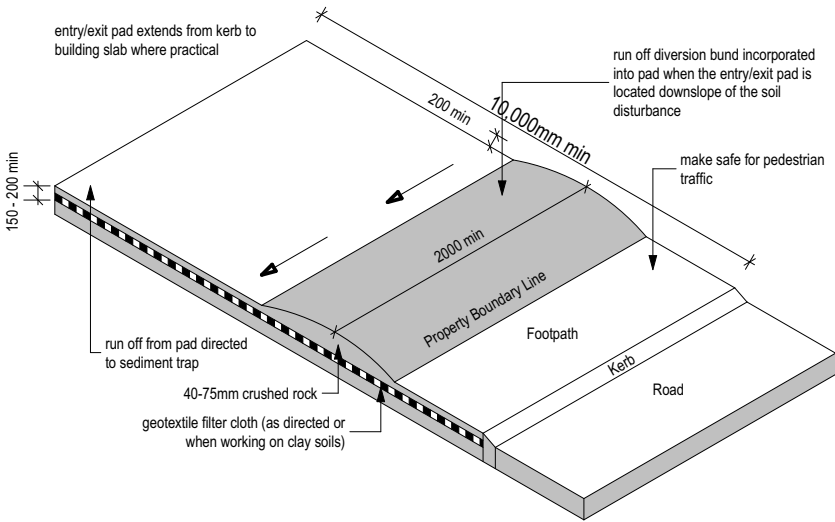
gt Indicates gully trap location

Landscaping: This is indicative only purely for presentation purposes.
Landscaping to be confirmed by the client.
All Fencing to comply with the relevant Covenants.

General: Concept subject to TA rules and regulations.
Concept may be subject to subdivision developer's approval.
All dimensions to be confirmed on site.
Boundary Dimensions and bearings subject to confirmation
Site Levels subject to confirmation

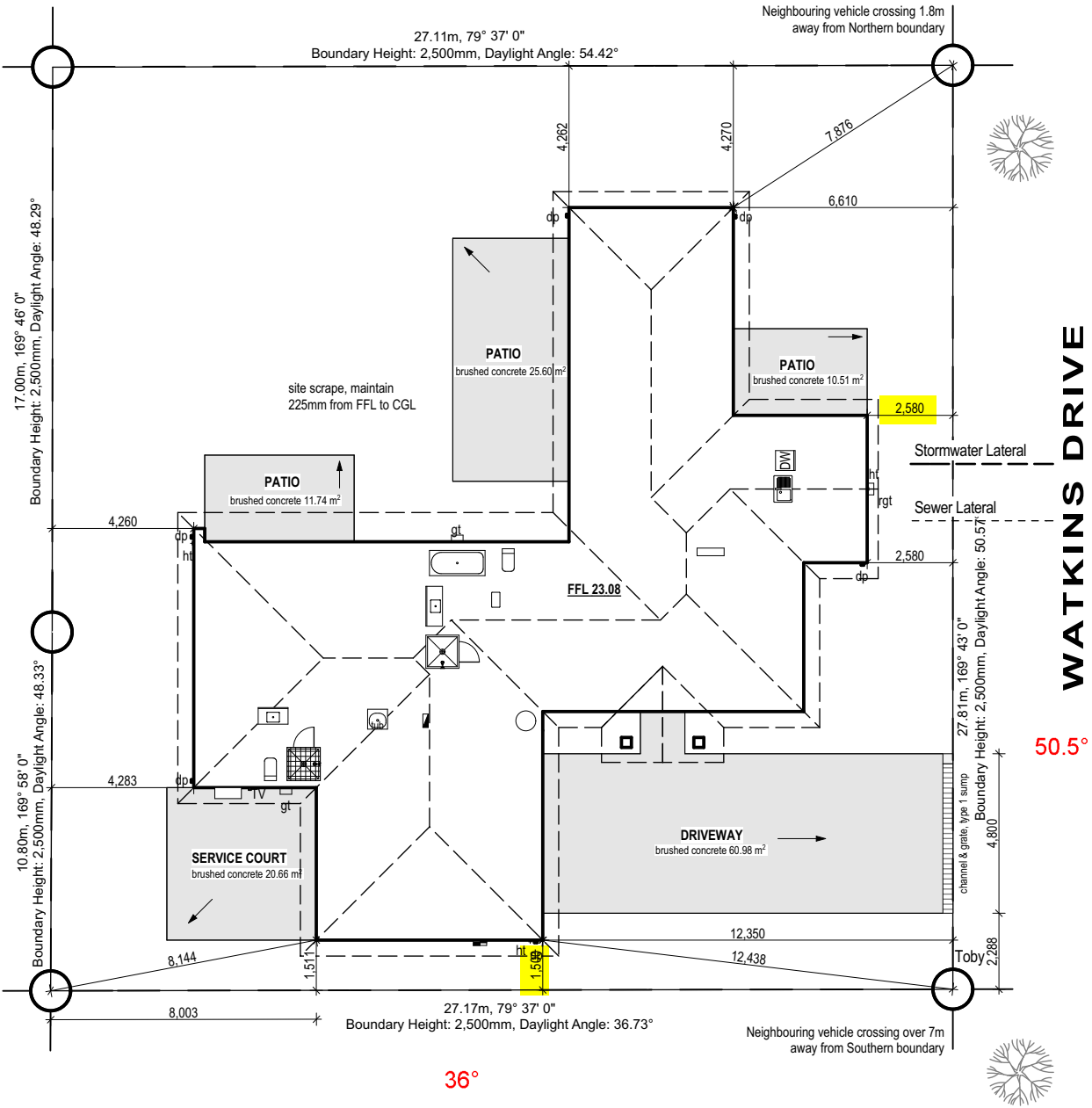
FOUNDATION TYPE: Equivalent to TC1

Specific engineered design - Waffle slab, as per Geotechnical Investigation by Lewis & Barrow Ltd, File #20398 dated 7 May 2015. Foundations to 400mm BGL minimum.



D-01 Stabalised entry pad Detail 1:10

APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
BC170237
22/03/2017
debbiew



Z:\A projects\16184D - N2113 Lot 77 Highgate Estate3 - Working drawings\16184D Lot 77 Highgate -WD pin 2/03/2017 Lana

 mikegreerhomes LTD © Mike Greer Homes North Canterbury Ltd PHONE: (03) 313 0319 FAX: (03) 313 0321 ADDRESS: Shop 1, 29 Huntingdon Drive, Rangiora 7440 WEB: www.mikegreerhomes.co.nz	JOB TITLE: Mike Greer Homes North Canterbury	DRAWING TITLE: SITE PLAN	LEGAL DESCRIPTION: Lot 77, DP 497145, 42 Watkins Drive, Highgate Estate, Rangiora	NOTES: - Subject to council approval - All measurements to be confirmed on site by the contractor prior to the commencement of work © 2010 Mike Greer Homes Limited. All rights reserved. No part of this work covered by copyright may be reproduced or copied in any form or by any means without the written permission of Mike Greer Homes Limited	DATE OF ISSUE: 17/11/2016	DESIGNER: JM	SCALE: 1:200, 1:10	A03
				AMENDMENT DATE: 2/03/2017	VERSION: V1	JOB # 16184D, N2113		
						OF: 35		

Consent Issued BC170237

FLOOR NOTES

Floor Area: 215.71m² (Over Foundation)
205.51m² (Over Frame)
Maximum Building Height: 8m

dp Indicates 75x50mm colorsteel downpipes (55m² per dp)
ht+ Indicates hose tap location (confirm with client)
gt Indicates gully trap location

Cladding Materials: 70 Series Brick over 50mm cavity
Linea Weatherboard over 20mm cavity

Roof Cladding: Colorsteel Longrun Corrugate
Roof Pitch: 28°
Height to underside of truss: 2455mm
Lintel Height: 2105mm

Note: in High Wind Zone: 2.455mm stud height: studs @ 600mm centres

Internal Door Leaf Height: Standard
Internal Door Leaf Width: Typically 810mm
Typically 710mm (wet areas)

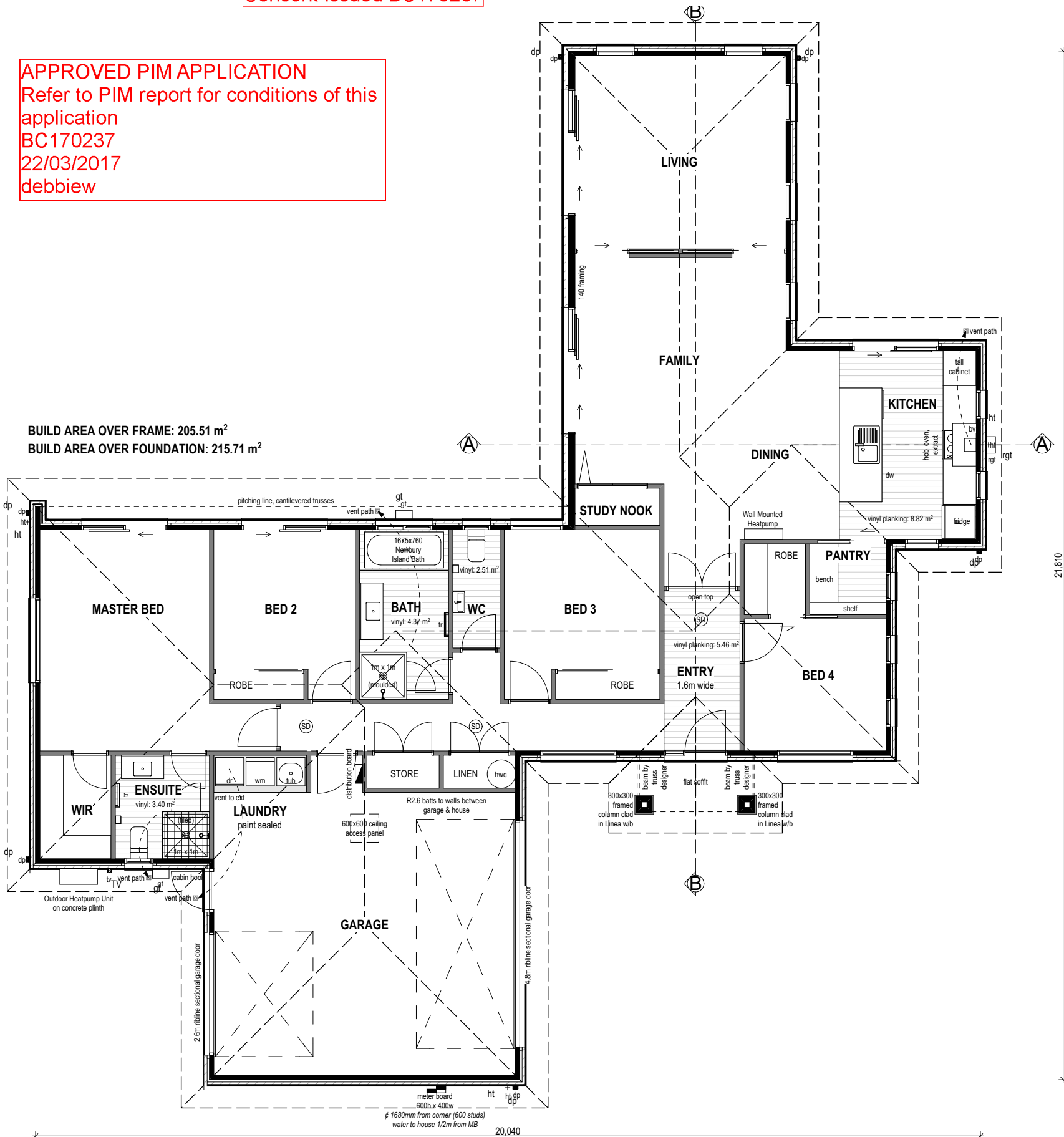
Hot Water System type and capacity:
Electric HWC

General: All dimensions to be confirmed on site
Concept may be subject to subdivision developer's approval

Mechanical extraction required to terminate to external air space through soffit.

Wet Areas
Lining to wall and ceiling to be 10mm USG Boral minimum, with 9mm Villaboard Lining behind tiled showers.

APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
BC170237
22/03/2017
debbiew



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					AMENDMENT DATE: 2/03/2017	VERSION: V1	JOB # 16184D, N2113	

APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
Consent issued BC170237
BC170237
22/03/2017
debbiew

BC170237

ELEVATION NOTES

Ground level subject to confirmation

Cladding Materials: 70 Series Brick over 50mm cavity
Linea Weatherboard over 20mm cavity

Roof Cladding: Colorsteel Longrun Corrugate

Roof Pitch: 28°

Maximum Building Height: 8m

Set backs required:
- street: 2m

EAST ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high - Risk Factor = 1

Number of Storeys: low - Risk Factor = 0

Roof / Wall Intersection Design: low - Risk Factor = 0

Eaves Width: medium - Risk Factor = 1

Envelope Complexity: medium - Risk Factor = 1

Deck Design: low - Risk Factor = 0

Total Risk Score: - Risk Severity = 3

SOUTH ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high - Risk Factor = 1

Number of Storeys: low - Risk Factor = 0

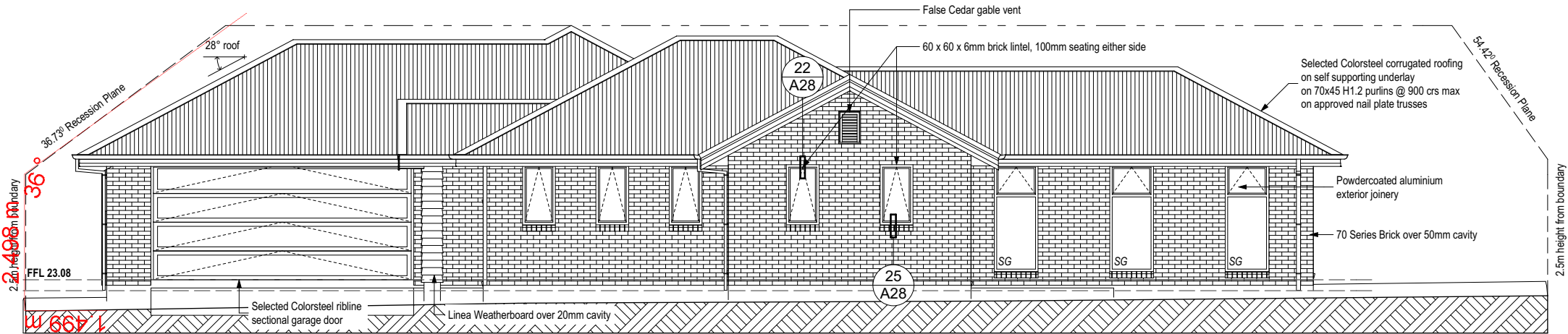
Roof / Wall Intersection Design: low - Risk Factor = 0

Eaves Width: medium - Risk Factor = 1

Envelope Complexity: medium - Risk Factor = 1

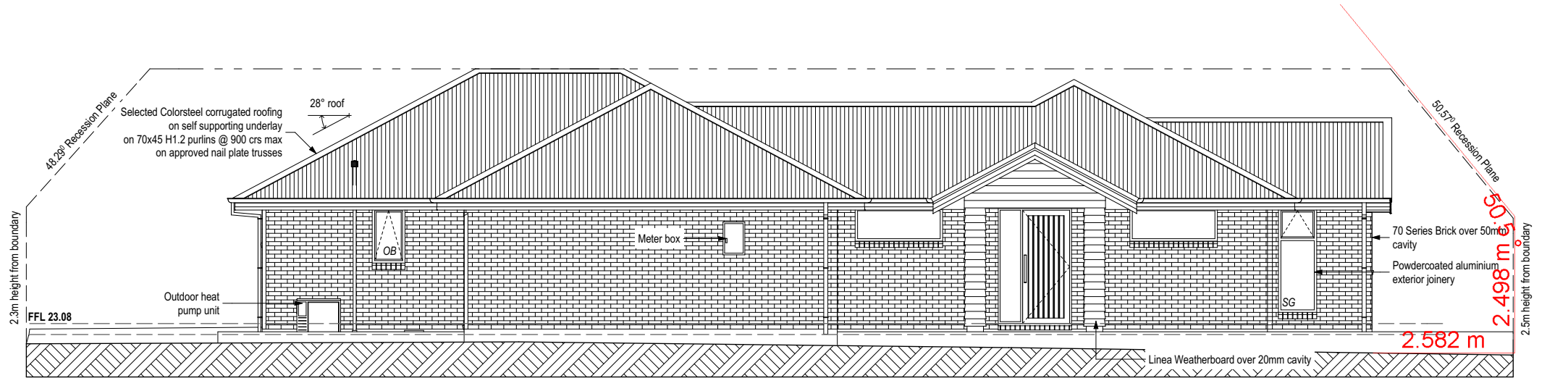
Deck Design: low - Risk Factor = 0

Total Risk Score: - Risk Severity = 3



EAST ELEVATION

1:100



SOUTH ELEVATION

1:100

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APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
Consent Issued BC170237
BC170237
22/03/2017
debbiew

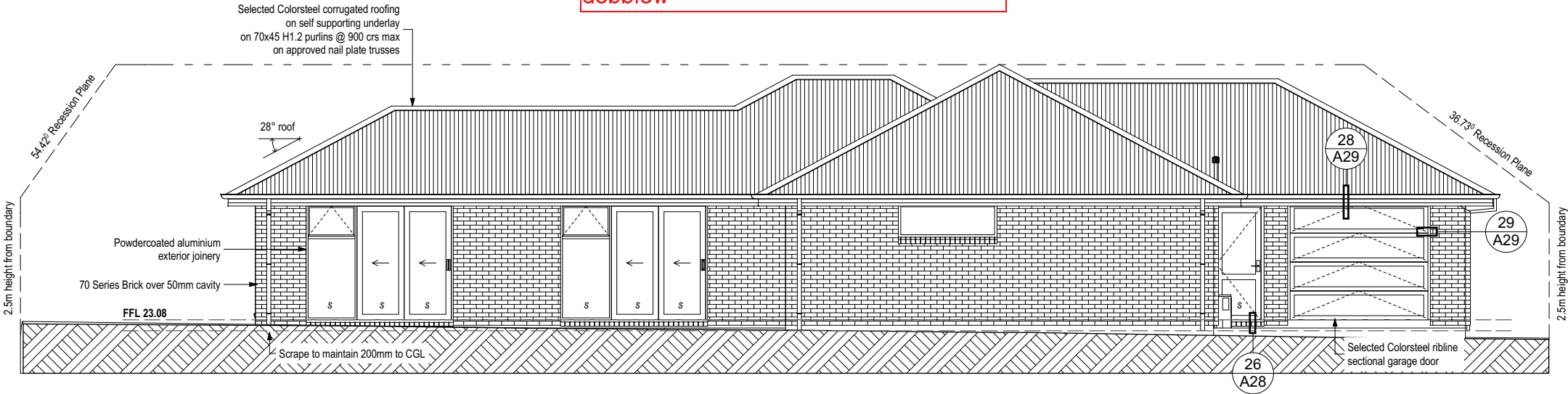
BC170237

WEST ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix
Wind Zone (per NZS 3604):
high - Risk Factor = 1
Number of Storeys:
low - Risk Factor = 0
Roof / Wall Intersection Design:
low - Risk Factor = 0
Eaves Width:
low - Risk Factor = 0
Envelope Complexity:
low - Risk Factor = 0
Deck Design:
low - Risk Factor = 0
Total Risk Score: - Risk Severity = 1

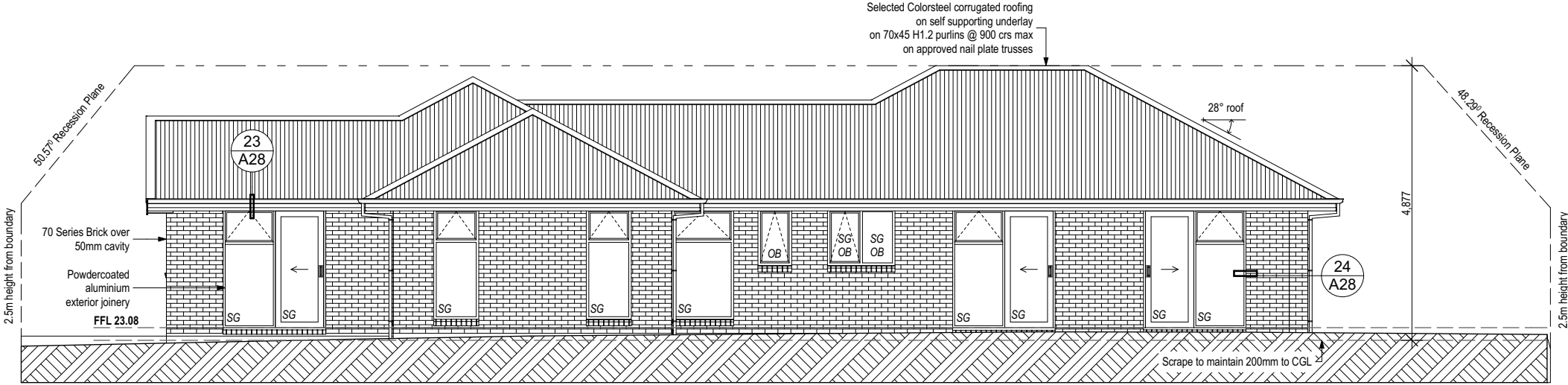
NORTH ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix
Wind Zone (per NZS 3604):
high - Risk Factor = 1
Number of Storeys:
low - Risk Factor = 0
Roof / Wall Intersection Design:
low - Risk Factor = 0
Eaves Width:
low - Risk Factor = 0
Envelope Complexity:
low - Risk Factor = 0
Deck Design:
low - Risk Factor = 0
Total Risk Score: - Risk Severity = 1



WEST ELEVATION

1:100

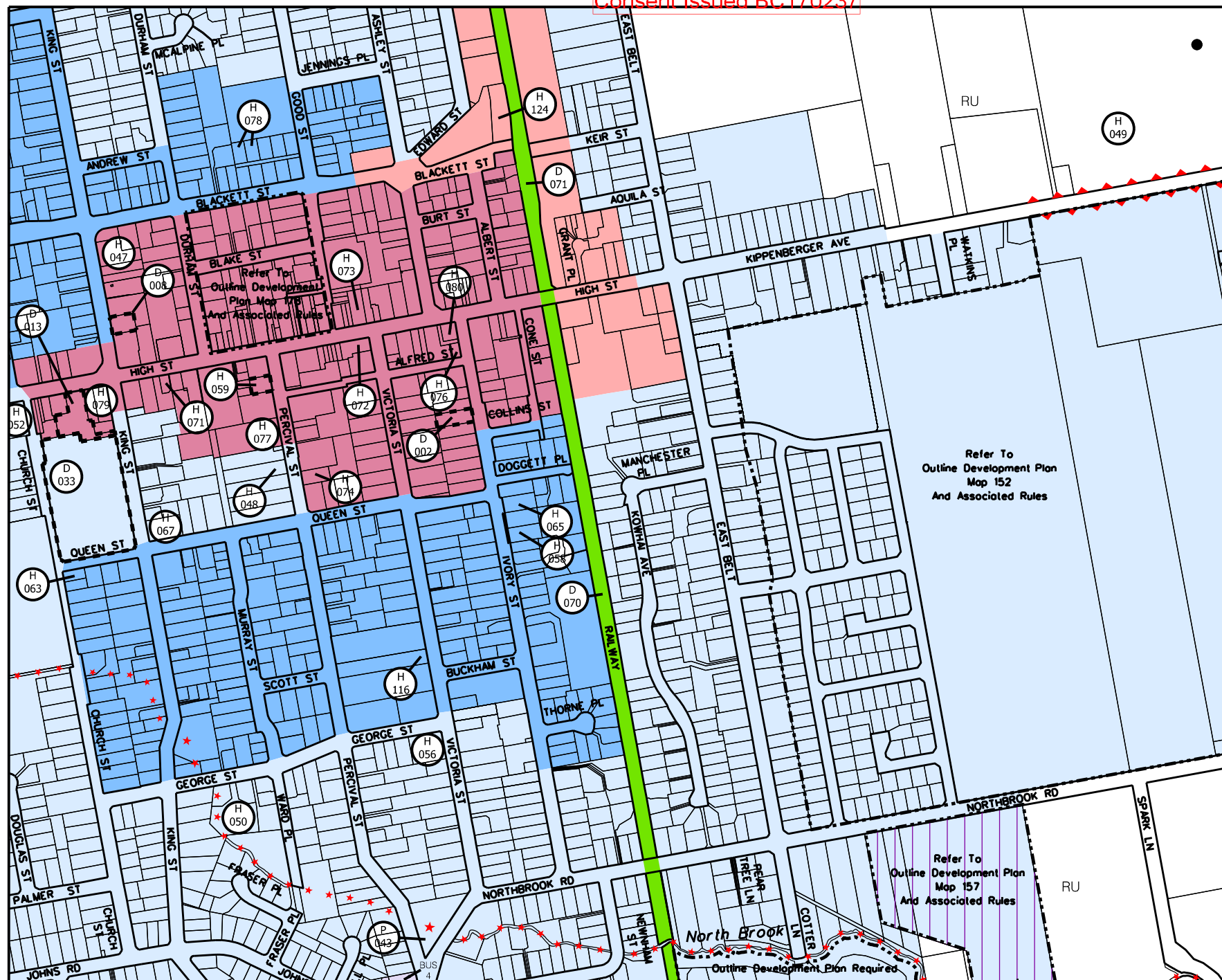


NORTH ELEVATION

1:100

Z:\A projects\16184D - NZ113 Lot 77 Highgate Estate\3 - Working drawings\16184D Lot 77 Highgate -WD pin 2/03/2017 Lana

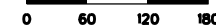
 © Mike Greer Homes North Canterbury Ltd PHONE: (03) 313 0319 FAX: (03) 313 0321 ADDRESS: Shop 1, 29 Huntingdon Drive, Rangiora 7440 WEB: www.mikegreerhomes.co.nz	JOB TITLE: Mike Greer Homes North Canterbury	DRAWING TITLE: ELEVATIONS	LEGAL DESCRIPTION: Lot 77, DP 497145, 42 Watkins Drive, Highgate Estate, Rangiora	NOTES: - Subject to council approval - All measurements to be confirmed on site by the contractor prior to the commencement of work © 2010 Mike Greer Homes Limited. All rights reserved. No part of this work covered by copyright may be reproduced or copied in any form or by any means without the written permission of Mike Greer Homes Limited	DATE OF ISSUE:	DESIGNER:	SCALE:	A14 OF: 35
					17/11/2016	JM	1:100	
					AMENDMENT DATE:	VERSION:	JOB #	
					2/03/2017	V1	16184D, N2113	



NOTE:
Disclaimer - refer to map legend sheet



Metre



Scale 1:7,500 (A4)

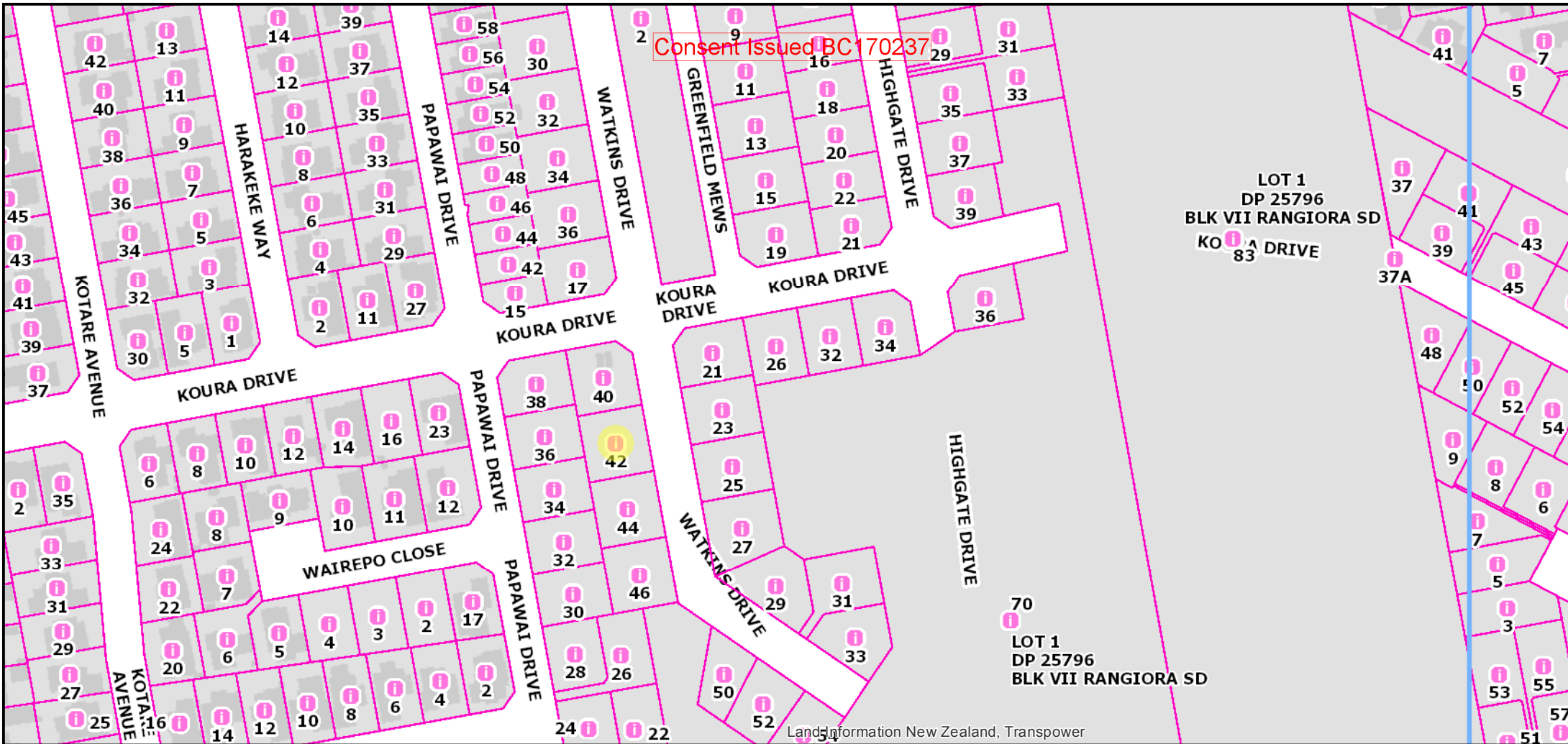
110	111	35
112	113	114
116	117	47

Rangiora

113

URBAN LEGEND (Sheets 77 to 133)

	Zone Business 1		Zone Rural		Designations		River Reaches subject to esplanade provisions
	Zone Business 2		Zone Mapleham Rural 4B		Heritage Sites		Limited Access Road
	Zone Business 3		Subdivision Constraint Rural		Vegetation and Habitat Sites		Road to be Closed
	Zone Business 4		Subdivision Constraint Area (Policy 18.1.1.8)		Notable Plant Sites		Outline Development Plan Required Boundary
	Zone Business 5		Pegasus Rural Zone See Map 142		Archaeological Sites		Coastal Marine Area boundary
	Zone Business 6		Localised Flooding Area		Waahi Tapu / Waahi Taonga		Average Noise Exposure Contours; Christchurch International Airport
	Zone Residential 1		Goat control area	NOTE:	These notations do not necessarily indicate the precise position of the Site, nor relate to the size of any Site.		Noise Level in dBA Ldn
	Zone Residential 2			NOTE:	See Rule 23.1.1.17 for goat control (includes Outstanding Landscape areas)		Transit New Zealand Designation
	Zone Residential 3		LURP (Land Use Recovery Plan)				Tranz Rail Designation
	Zone Residential 4A		LURP Priority Areas - Business				Transpower High Voltage Lines
	Zone Residential 4B		Zoned				Waimakariri District boundary
	Zone Residential 5		Not Yet Zoned				Projected Infrastructure Boundary
	Zone Residential 5		LURP Priority Areas - Residential			NOTE: The planning maps are produced in colour and are intended to provide accurate and adequate information as at the date of publication and at the scale at which they are published. The Waimakariri District Council will not accept liability to any person or entity arising out of any reliance in part or full, by such person or entity upon any of the contents of the planning maps for any purpose in circumstances where they are reproduced in a way that alters the scale, and / or colour or any other detail of the maps, and the information contained therein.	
	Zone Residential 6		Zoned				
	Zone Residential 6A		Not Yet Zoned				
	Zone Residential 7						



Legend

Transmission Lines

Properties < 1 ha

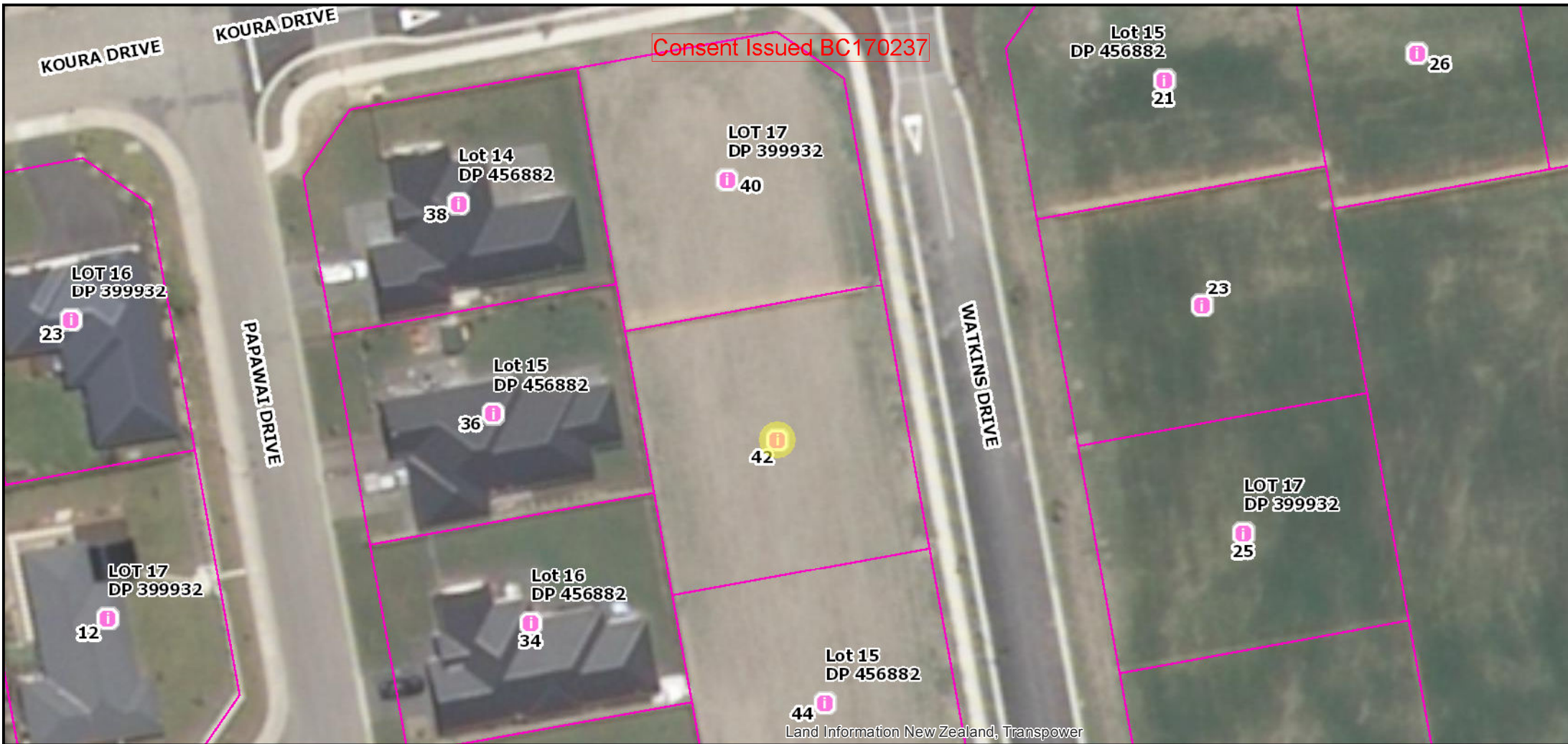
Properties > 1 ha

Legal Description Rural

Approved to Survey Land Parcels

Property Boundaries

Deposited Land Parcels



Legend

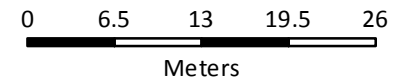
- | | | |
|---|---|--|
|  Transmission Lines |  Legal Description Urban |  Deposited Land Parcels |
|  Properties < 1 ha |  Approved to Survey Land Parcels | |
|  Properties > 1 ha |  Property Boundaries | |



42 Watkins Drive, Rangiora

Date: 22/03/2017

Author: WAIMAP



Scale @ A4 - 1:564



DISCLAIMER:

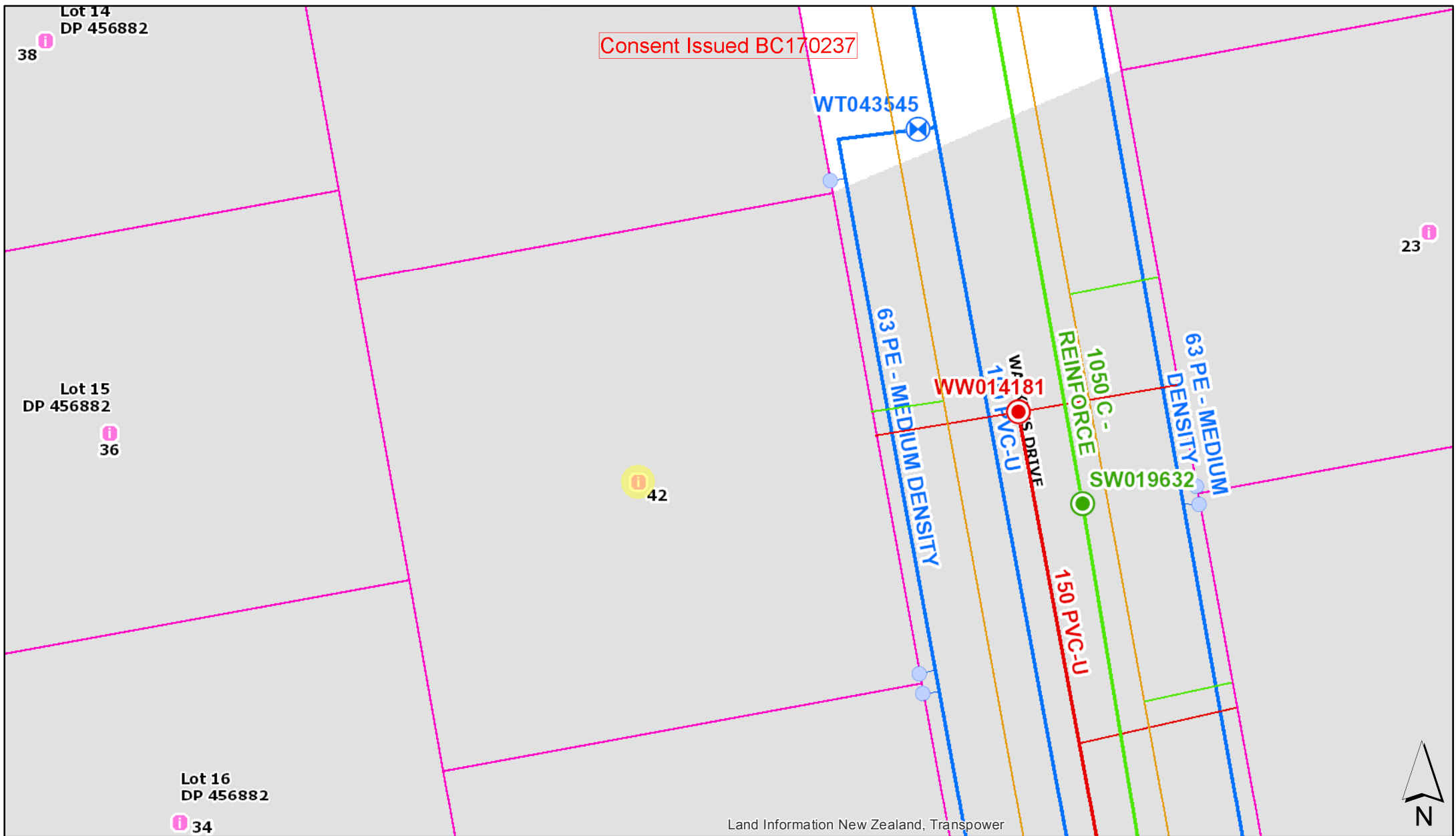
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The location of Council services are shown indicatively only and no guarantee is given as to the accuracy of the information. The user of the information has the responsibility to confirm the exact location of the service prior to commencing any construction including potholing and protecting existing services. Contractors will be held responsible for all damage to Council property. The Council does not guarantee the existence of service laterals to vacant lots, regardless of whether a lateral is shown or not. The Waimakariri District Council does not give and expressly disclaims any warranty as to the accuracy or completeness of the information or its fitness for any purpose.

Flood information on this map is based on modelling outputs and the accuracy of this data is limited by the assumptions used in the model. The Council reserves the right to update this information and cannot guarantee that the information is accurate and up to date at all times. An experienced practitioner should be consulted if this information is to be used for Building or Development purposes. Please refer to the District Plan and the Council's Planning Unit if you wish to use this information for planning purposes. Anyone who acts on any of this information does so at their own risk.

Map Created by WAIMAP Utilities at 12:53:27 p.m.



42 Watkins Drive, Rangiora

Date: 22/03/2017

Author: WAIMAP

0 3 6 9 12

Meters

Scale @ A4 - 1:282

DISCLAIMER:

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Map Created by WAIMAP Utilities at 12:58:50 p.m.

Legend

Consent Issued BC170237

	Transmission Lines		WW Vented GPS Manhole		Water AGS
	Stormwater Facility Site		WW Flushtank Manhole		Water Well
	Stormwater Manhole		WW Flushtank GPS Manhole		Water Pump
	Stormwater Sump		WW Lamphole Manhole		Water Tank
	Stormwater Valve		WW Lamphole GPS Manhole		Water Toby
	Stormwater End		Unknown WW Manhole		Water Lateral
	Stormwater Node		Unknown GPS WW Manhole		Water Main
	Stormwater Inspection Chamber		Wastewater Valve		Hurunui Water
	Stormwater Inspection		Wastewater Node		Properties < 1 ha
	Stormwater Pump		Wastewater Pump		Properties > 1 ha
	Stormwater Lateral		Wastewater Inspection		Legal Description Urban
	Stormwater Kerb		Wastewater Inspection Chamber		Approved to Survey Land Parcels
	Stormwater Main - In Service		Wastewater Lateral		Property Boundaries
	Stormwater Swale		Wastewater Main		Deposited Land Parcels
	Stormwater Channel WDC		Water Facility Site		
	Stormwater Channel Other		Water Endcap		
	Wastewater Facility Site		Water Hydrant		
	WW Standard GPS Manhole		Water Node		
	WW Vented Manhole		Water Valve		

Our Reference: RC125211/160630062638
Valuation Reference: 2165015000

30 June 2016

V B Properties (2008) Limited
C/- Aurecon NZ Limited
PO Box 1061
CHRISTCHURCH 8140

Dear Sir/Madam

**V B PROPERTIES (2008) LIMITED – NORTHBROOK RAD, RANGIORA – STAGES 5 & 6
SECTION 224(C) CERTIFICATE OF COMPLIANCE AND CONSENT NOTICES (2)**

Thank you for your letter dated 18th May requesting the 224c Certificate and the email from Judy van Beek dated 27th June 2016, along with the payment of the development contributions.

Please find enclosed a copy of the Certificate of Compliance for Stages 5 & 6 of the above mentioned subdivision, signed electronically on LandonLine, pursuant to Section 224(c) of the Resource Management Act 1991.

Also enclosed are two (2) consent notices, signed pursuant to section 221 of the Resource Management Act 1991, in respect to conditions imposed on Rc125211.

If you have any queries regarding the above, or if I can be any further assistance, please do not hesitate to contact me on (03) 311-8900 ext 8885.

Yours faithfully



Sally Fear
PLANNING SECRETARY/ASSISTANT

Encl

CC: P & J van Beek - peteandjudevb@xtra.co.nz
Emily Quested - Emily.Quested@cavell.co.nz



TA Approvals

Territorial Authority	Waimakariri District Council TA Certification Division	TA Reference	RC125211
Survey Number	LT 497145	Survey Purpose	LT Subdivision
Surveyor Reference	223094 Highgate Stage 5	Land District	Canterbury
Surveyor	James Dougherty Lynch		
Surveyor Firm	Aurecon (Christchurch)		
Dataset Description	Lots 38, 39, 53, 54, 67 - 72, 75 - 77, 142 - 147, 156 - 163, 166, 167, 300 , 301, 700 & 701 being Subdivision of Lot 700 DP 489128		

TA Certificates

Pursuant to Section 224(c) Resource Management Act 1991 I hereby certify that some of the conditions of the subdivision consent have been complied with to the satisfaction of the Waimakariri District Council and that two (2) consent notice has been issued in respect of those conditions that have not been complied with. Dated this 30th day of June 2016.



Signature

Signed by Yvonne Sally Fear, Authorised Officer, on 30/06/2016 01:49 PM

Receipt Information

Transaction Receipt Number	9953192
Signing Certificate (Distinguished Name)	Fear, Yvonne Sally
Signing Certificate (Serial Number)	1292528606
Signature Date	30/06/2016

*** End of Report ***



TA Approvals

Territorial Authority	Waimakariri District Council TA Certification Division	TA Reference	RC125211
Survey Number	LT 497145	Survey Purpose	LT Subdivision
Surveyor Reference	223094 Highgate Stage 5	Land District	Canterbury
Surveyor	James Dougherty Lynch		
Surveyor Firm	Aurecon (Christchurch)		
Dataset Description	Lots 38, 39, 53, 54, 67 - 72, 75 - 77, 142 - 147, 156 - 163, 166, 167, 300 , 301, 700 & 701 being Subdivision of Lot 700 DP 489128		

TA Certificates

Pursuant to section 243(e) of the Resource Management Act 1991, I hereby certify that the Waimakariri District has revoked the conditions as to the creation of the Right to Convey Power in Gross marked U & Z on Plan DP 489128 over Lot 700 Plan 489128 (CFR 705045) appurtenant to MainPower New Zealand Limited



Pursuant to section 243(e) of the Resource Management Act 1991, I hereby certify that the Waimakariri District has revoked the conditions as to the creation of the Right to Convey Water, and Drain Water and Sewage marked U & Z on Plan DP489128 over Lot 700 Plan DP 489128 (CFR 705045) appurtenant to Waimakariri District Council



Signature

Signed by Yvonne Sally Fear, Authorised Officer, on 30/06/2016 01:50 PM

Receipt Information

Transaction Receipt Number	9953206
Signing Certificate (Distinguished Name)	Fear, Yvonne Sally
Signing Certificate (Serial Number)	1292528606
Signature Date	30/06/2016

*** End of Report ***

IN THE MATTER of the Resource
Management Act 1991

AND

IN THE MATTER of an application by
VB Properties to subdivide land into 29
lots (stage 5 & 6)

**CONSENT NOTICE PURSUANT TO SECTION 221 OF THE
RESOURCE MANAGEMENT ACT 1991**

TO: The District Land Registrar
Canterbury Land Registry

TAKE NOTICE that the land described in the Schedule below is subject to a condition in relation to a subdivision consent as follows:

1. As required -by NZS 3604:2011 *Timber-framed buildings*, Lots 38, 39, 53, 54, 67 – 72, 75 – 77, 142 – 147, 156 – 163, 166 & 167 shall have a site specific geotechnical assessment carried out by a suitably qualified Chartered Professional Engineer with experience in residential development. This requirement shall be undertaken prior to building consent being applied for. This site specific geotechnical assessment shall be used to inform the foundation design for any building to be constructed on the allotments.

The above condition, as it relates to Lots 38, 39, 53, 54, 67 – 72, 75 – 77, 142 – 147, 156 – 163, 166 & 167 shall be subject to a consent notice pursuant to Section 221 of the Resource Management Act 1991 to be registered on the Certificates of Title to issue for Lots 38, 39, 53, 54, 67 – 72, 75 – 77, 142 – 147, 156 – 163, 166 & 167

AND YOU are requested to register this Consent Notice as prescribed by Section 221 of the Resource Management Act 1991.

SCHEDULE

Estate in fee simple and being Lots 38, 39, 53, 54, 67 – 72, 75 – 77, 142 – 147, 156 – 163, 166 & 167 Deposit Plan 497145 and being a subdivision of Lot 700 DP 489128, Certificate of Title 705045.

Dated this 30th day of June 2016

SIGNED for and on behalf of
the **WAIMAKARIRI DISTRICT COUNCIL**
pursuant to Section 252 of the
Local Government Act 1974



AUTHORISED OFFICER

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by **VB Properties** to subdivide land into 29 lots (stage 5 & 6)

**CONSENT NOTICE PURSUANT TO SECTION 221 OF THE
RESOURCE MANAGEMENT ACT 1991**

TO: The District Land Registrar
Canterbury Land Registry

TAKE NOTICE that the land described in the Schedule below is subject to a condition in relation to a subdivision consent as follows:

1. The consent holder of Lots 147 shall pay the full costs of fencing the common boundary with the adjoining Council Reserve.

The above condition, as it relates to Lot 147 shall be subject to a consent notice pursuant to Section 221 of the Resource Management Act 1991 to be registered on the Certificates of Title to issue for Lot 147.

AND YOU are requested to register this Consent Notice as prescribed by Section 221 of the Resource Management Act 1991.

SCHEDULE

Estate in fee simple and being Lot 147 Deposit Plan 497145 and being a subdivision of Lot 700 DP 489128, Certificate of Title 705045.

Dated this 30th day of June 2016

SIGNED for and on behalf of
the **WAIMAKARIRI DISTRICT COUNCIL**
pursuant to Section 252 of the
Local Government Act 1974



AUTHORISED OFFICER

SECTION 2

Geotech, Engineer Reports & Conditions PS1 & 2

- Calculations**
- A4 Details**

Warren R. Lewis BE (Hons) MIPENZ CPEng IntPE(NZ) ANZIM
Stephen W. Barrow BE (Hons) MIPENZ CPEng IntPE(NZ)



LEWIS & BARROW LTD
Consulting Civil and Structural Engineers

Unit 8, 357 Madras Street
Christchurch, New Zealand
P.O. Box 13-282
Armagh, Christchurch 8141
Telephone (03) 366-4320
Fax (03) 365-7069
Email eng@lewisandbarrow.co.nz
www.lewisandbarrow.co.nz

7 May 2015

File: 20398

VB Properties 2008 Ltd
123 Gardiners Road
Harewood
Christchurch 8051

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Attention: Peter van Beek

Dear Sir,

Re: Geotechnical Investigation – Lot 77 Watkins Drive, Highgate Subdivision, Rangiora

Aurecon has undertaken testing of the overall Highgate Subdivision to determine the suitability of the land for development including determining the potential for liquefaction. Their report dated 20 December 2011 concludes that the potential for liquefaction is low, the potential for lateral spreading is very low, and the land is equivalent to a "Technical Category 1" classification.

Site specific investigations were carried out by Lewis & Barrow Ltd. on the above site on the 5th May 2015 to determine the site soil bearing capacity and likely foundation type. Four penetrometer tests were undertaken to a maximum depth of 1.64m. These were followed by two bore holes with a hand auger down to a maximum depth of 4.3m. The type of soil was determined at each depth by visual and contact identification.

The soil on this site consists of 0.4m of topsoil over silts with some peat content from 1.9m. Gravel is expected below the depth of testing which the subdivision geotechnical report by Aurecon shows extends for some depth. Peat is an organic material which can compress over time due to the weight imposed on it such as a dwelling structure leading to foundation settlement. The amount of settlement expected will depend on the weight of the proposed dwelling and will need to be calculated by specific engineering design. It is likely that a raft type foundation such as Firth "TC1 RibRaft" will be suitable for single storey timber framed dwellings.

Enclosed is a site plan and separate sheets for each penetrometer test/auger hole. The penetrometer tests have been graphed to show the ultimate bearing strength at each depth alongside the different soil types.

The ground on this site has an ultimate bearing capacity of 200kPa at a depth of 400mm. The minimum depth of any foundation shall be 400mm.

In conclusion, this site does not comply with the N.Z.S.3604:2011 definition of good ground due to the presence of peat and the ultimate bearing capacity being less than 300kPa, therefore the foundations will require specific engineering design for an ultimate bearing capacity of 200kPa at 400mm below ground level. As the peat is located more than 1.9m below ground level a stiffened raft foundation such as Firth "TC1 RibRaft" is likely to be suitable for a single storey timber framed dwelling.

A site subsoil classification of D in accordance with AS/NZS 1170.5:2002 is appropriate for seismic design for this site.



Shallow Geotechnical Investigation
Lot 77 Watkins Drive, Highgate Subdivision, Rangiora

Yours faithfully



Nigel Hogg

Engineer

Encl. Plots of soil profiles, penetrometer tests and site plan.

This report has been prepared solely for the benefit of our Client with respect to the brief.
The reliance by other parties on the information or opinions contained in this report, shall
without our prior review and agreement in writing, be at such other parties sole risk.

Reviewed/Checked By:

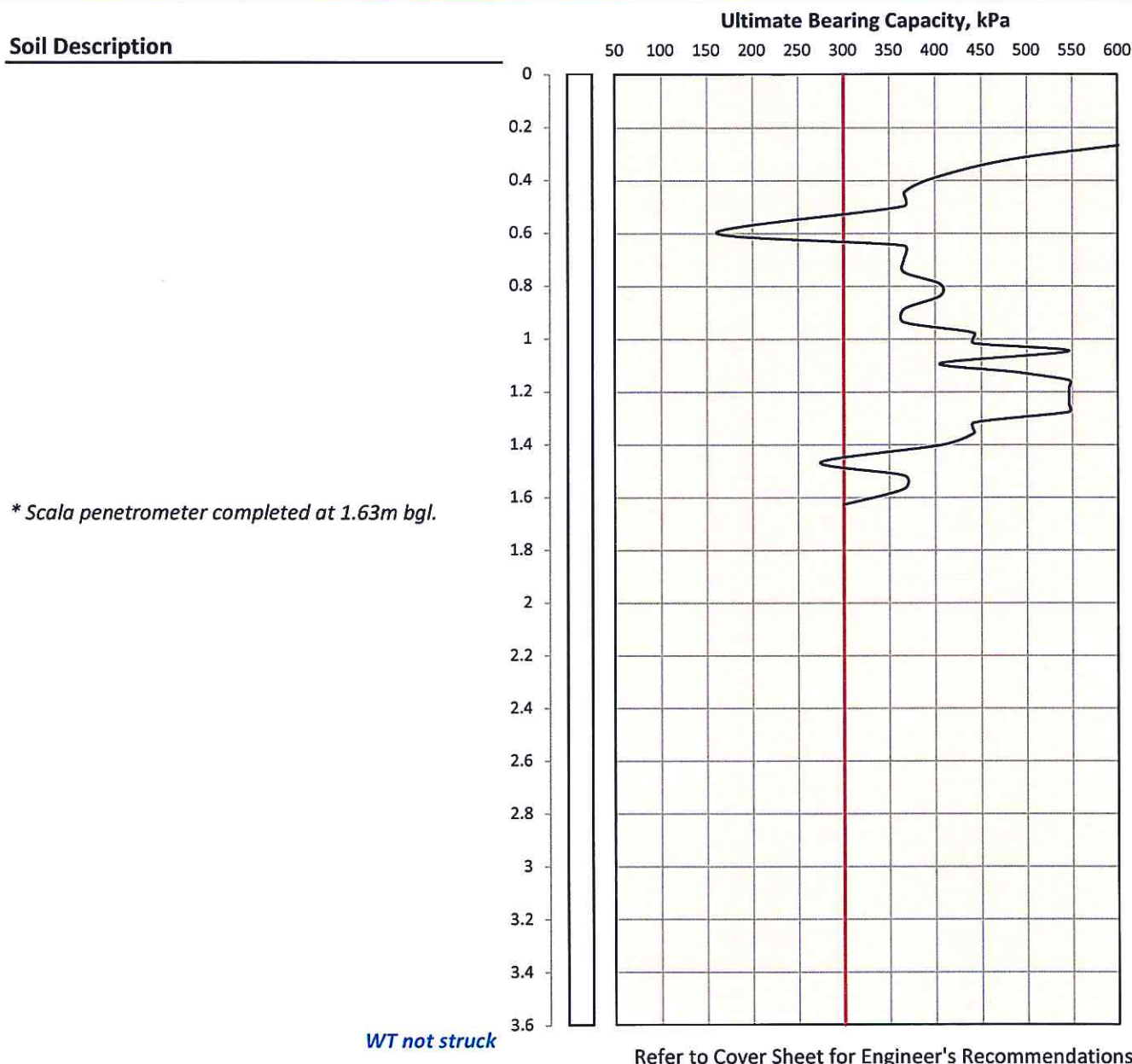




SOIL PROFILE AND SCALA PENETROMETER RESULTS

Bore Hole No. 1

Sheet 1 of 5



Site Address: **Lot 77, Watkins Drive, Highgate Subdivision (Stage 3), Rangiora**

Client: **VB Properties Ltd**

Technical Category: **NA**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **RL**

This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. 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, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law



Bore Hole No. 2

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 2 of 5

Soil Description

TOPSOIL with some silt.

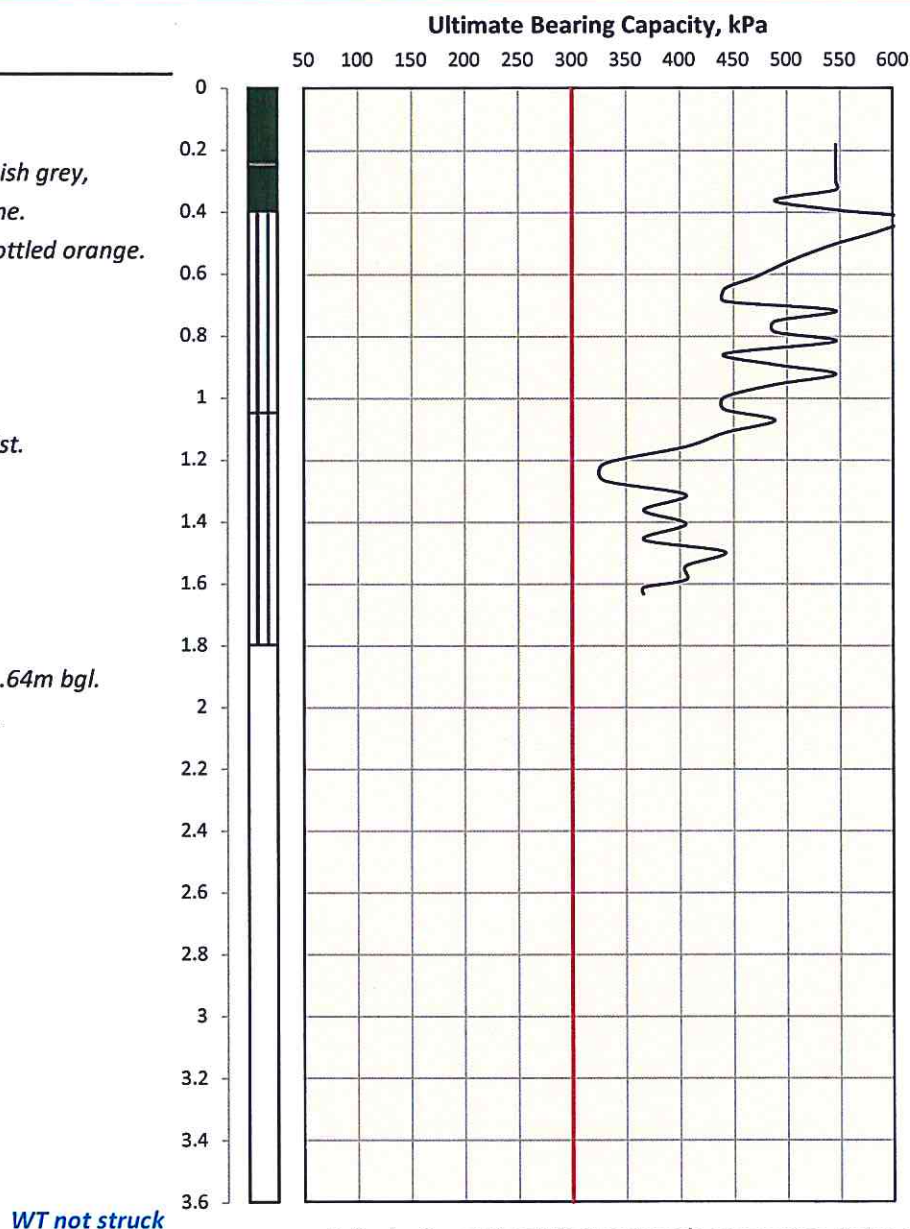
Topsoily SILT with minor sand; brownish grey, mottled orange. Firm; moist; sand, fine.

SILT with minor sand; brown grey, mottled orange. Firm; moist; sand, fine.

SILT; grey, mottled orange. Firm; moist.

* Scala penetrometer completed at 1.64m bgl.

* Hand auger completed at 1.8m bgl.



Refer to Cover Sheet for Engineer's Recommendations

Site Address: **Lot 77, Watkins Drive, Highgate Subdivision (Stage 3), Rangiora**

Client: **VB Properties Ltd**

Technical Category: **NA**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **RL**

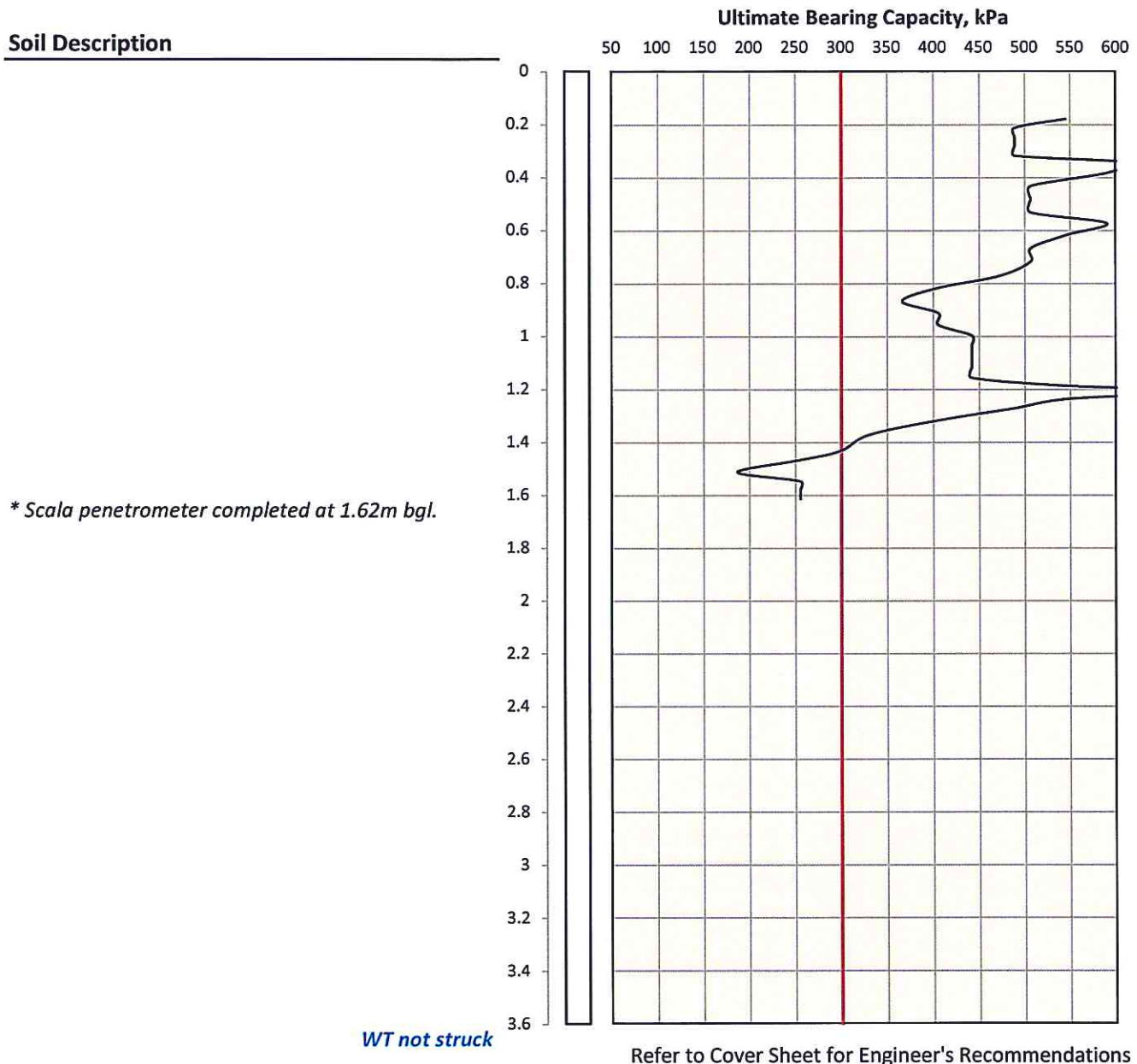
This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. 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, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law



Bore Hole No. 3

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 3 of 5



Site Address: **Lot 77, Watkins Drive, Highgate Subdivision (Stage 3), Rangiora**

Client: **VB Properties Ltd**

Technical Category: **NA**

Plotted by: **NL**

Reason for Test: **Council Requirement**

Field Worker: **RL**

This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found at the bottom of the excavations, the Engineer shall be notified to inspect and issue further details. 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, and any other person who relies upon any matter contained in this report does so entirely at their own risk. This disclaimer shall apply notwithstanding that the report may be made available to any person in connection with any application for permission or approval, or pursuant to any requirement of law



Bore Hole No. 4

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 4 of 5

Soil Description

TOPSOIL with some silt.

Topsoily SILT with minor sand; brownish grey, mottled orange. Firm; moist; sand, fine.

SILT with minor sand; brown grey, mottled orange. Firm; moist; sand, fine.

SILT; grey, mottled orange. Firm; moist.

SILT with trace peat; brown grey, mottled orange. Soft; saturated. (0-5% Peat)

Silty PEAT; dark brown grey, mottled brown. Soft; saturated. (60-70% Peat)

SILT with minor peat; brownish grey. Firm; saturated. (5-12% Peat)

Peaty SILT; brown grey. Soft, saturated. (30-40% Peat)

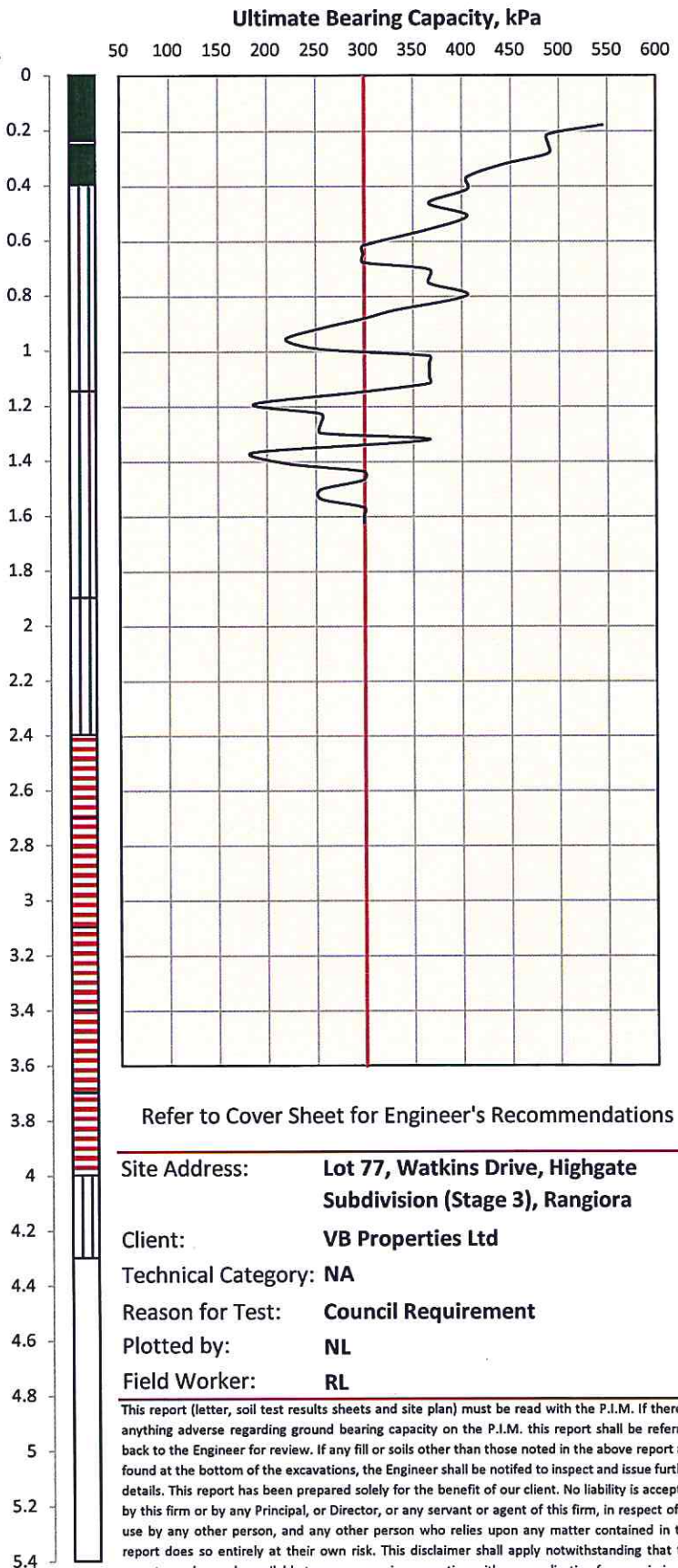
SILT with some peat; brownish bluish grey. Soft; saturated. (12-20% Peat)

PEAT with trace silt; greyish dark brown. Soft; saturated. (95-100% Peat)

SILT with minor sand and trace peat; bluish grey. Soft; saturated; sand, medium. (0-5% Peat)

** Scala penetrometer completed at 1.63m bgl.*

** Hand auger completed at 4.3m bgl.*

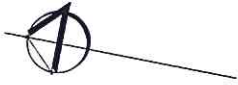


WT depth approx. 1.70m bgl

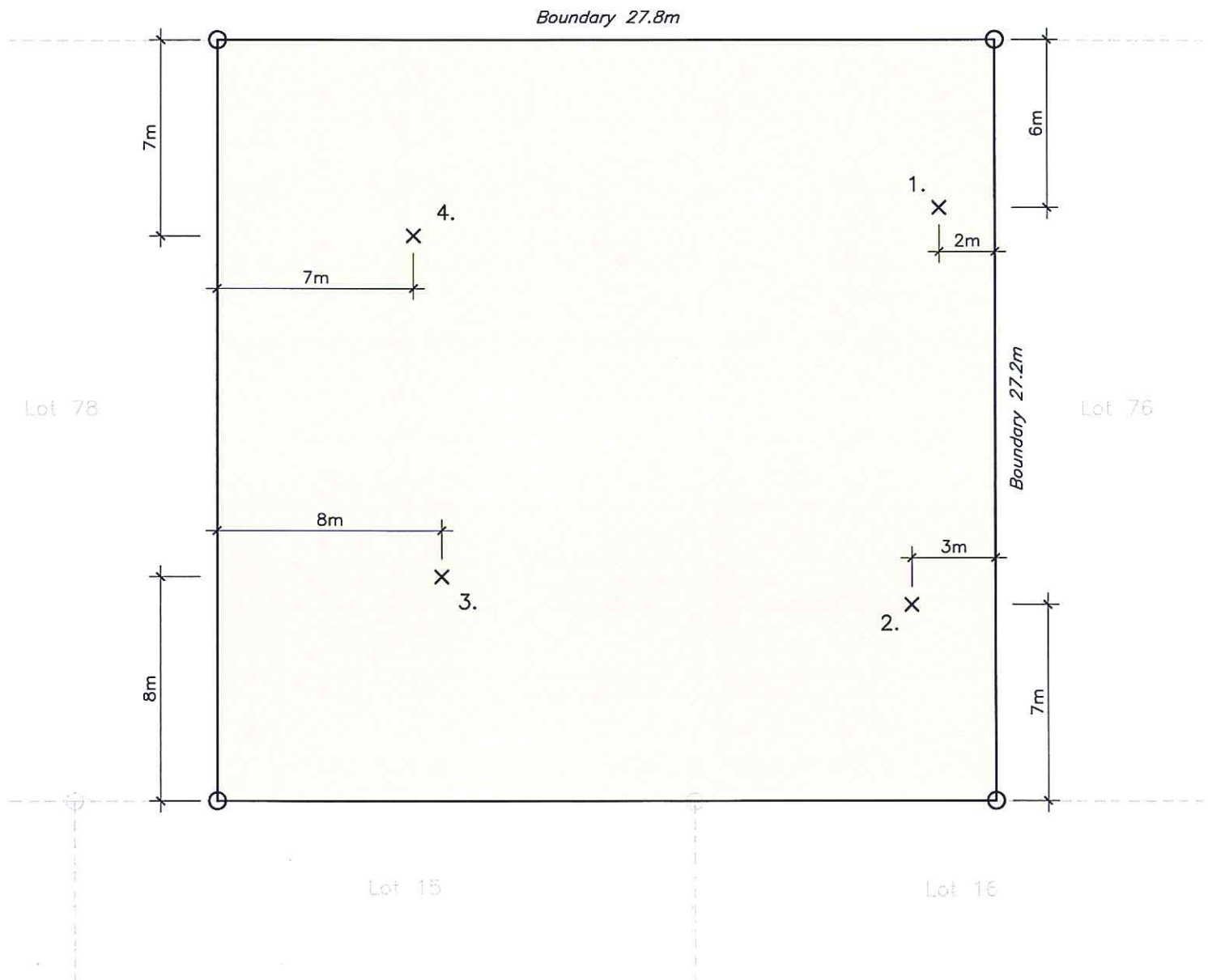


SITE PLAN

SHEET **5** OF 5



WATKINS DRIVE



1. X

Approximate Position of Penetrometer Test and Auger Hole.

ADDRESS: WATKINS DRIVE, HIGHGATE SUBDIVISION (STAGE 3), RANGIORA
LOT: 77



Building Code Clause(s)B1.....

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

ISSUED BY: CONSTRUCTURE LIMITED

(Design Firm)

TO: C/O MIKE GREER HOMES NORTH CANTERBURY

(Owner/Developer)

TO BE SUPPLIED TO: WAIMAKARIRI DISTRICT COUNCIL

(Building Consent Authority)

IN RESPECT OF: NEW DWELLING

(Description of Building Work)

AT: LOT 77, 42 WATKINS DRIVE, HIGHGATE, RANGIORA

(Address)

LOT 77 DP SO

We have been engaged by the owner/developer referred to above to provide **Structural Engineering Design and Construction Monitoring of reinforced concrete waffle foundation slab and entry post footings only** services in respect of the requirements of

(Extent of Engagement)

Clause(s) **B1 (STRUCTURE)** of the Building Code forAll ☐ or Part only ☒ (as specified in the attachment to this statement), of the proposed building work.

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

☒ Compliance Documents issued by the Ministry of Business, Innovation & Employment **B1/VM1; B1/VM4; B1/AS1**;or
(verification method / acceptable solution)

☒ Alternative solution as per the attached schedule... **Repairing & rebuilding houses affected by the Canterbury earthquake December 2012**

The proposed building work covered by this producer statement is described on the **Constructure Limited** drawings titled **Lot 77, 42 Watkins Drive, Highgate, Rangiora** and numbered **as per title sheet 7833 dated 30 November 2016**

together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

(i) Site verification of the following design assumptions **Ground conditions as per Lewis and Barrow geotechnical report dated 7 May 2015**

(ii) All proprietary products meeting their performance specification requirements;

I **believe on reasonable grounds** that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐ CM1 ☐ CM2 ☒ CM3 ☐ CM4 ☐ CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, **CORY JOHN BEDFORD**
(Name of Design Professional)

am:

☒ CPEng **238134** #☐ Reg Arch #

I am a Member of : ☒ IPENZ ☐ NZIA and hold the following qualifications: **BEng (HONS) MIPENZ CPEng IntPE (NZ)**

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than \$200,000*.

The Design Firm is a member of ACENZ: ☒

SIGNED BY **CJ BEDFORD** ON BEHALF OF **CONSTRUCTURE LIMITED**

(Design Firm)

Date: **02/12/2016**

(signature)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of \$200,000*.

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

GUIDANCE ON USE OF PRODUCER STATEMENTS

Producer statements were first introduced with the Building Act 1991. The producer statements were developed by a combined task committee consisting of members of the New Zealand Institute of Architects, Institution of Professional Engineers New Zealand, Association of Consulting Engineers New Zealand in consultation with the Building Officials Institute of New Zealand. The original suit of producer statements has been revised at the date of this form as a result of enactment of the Building Act (2004) by these organisations to ensure standard use within the industry.

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

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

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

PS3 Construction Forms commonly used as a certificate of completion of building work are Schedule 6 of NZS 3910:2013 or Schedules E1/E2 of NZIA's SCC 2011²

PS4 Construction Review Intended for use by a suitably qualified independent design professional who undertakes construction monitoring of the building works where the BCA requests a producer statement prior to issuing a Code Compliance Certificate.

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

The following guidelines are provided by ACENZ, IPENZ and NZIA to interpret the Producer Statement.

Competence of Design Professional

This statement is made by a Design Firm that has undertaken a contract of services for the services named, and is signed by a person authorised by that firm to verify the processes within the firm and competence of its designers.

A competent design professional will have a professional qualification and proven current competence through registration on a national competence based register, either as a Chartered Professional Engineer (CPEng) or a Registered Architect.

Membership of a professional body, such as the Institution of Professional Engineers New Zealand (IPENZ) or the New Zealand Institute of Architects (NZIA), provides additional assurance of the designer's standing within the profession. If the design firm is a member of the Association of Consulting Engineers New Zealand (ACENZ), this provides additional assurance about the standing of the firm.

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

*Professional Indemnity Insurance

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

The PI Insurance minimum stated on the front of this form reflects standard, small projects. If the parties deem this inappropriate for large projects the minimum may be up to \$500,000.

Professional Services during Construction Phase

There are several levels of service which a Design Firm may provide during the construction phase of a project (CM1-CM5 for Engineers³). The Building Consent Authority is encouraged to require that the service to be provided by the Design Firm is appropriate for the project concerned.

Requirement to provide Producer Statement PS4

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

Attached Particulars

Attached particulars referred to in this producer statement refer to supplementary information appended to the producer statement.

Refer Also:

- ¹ Conditions of Contract for Building & Civil Engineering Construction NZS 3910: 2013
- ² NZIA Standard Conditions of Contract SCC 2011
- ³ Guideline on the Briefing & Engagement for Consulting Engineering Services (ACENZ/IPENZ 2004)
- ⁴ PN Guidelines on Producer Statements

www.acenz.org.nz
www.ipenz.org.nz
www.nzia.co.nz





02 December 2016

7833

C/o Mike Greer Homes North Canterbury

Dear Sirs,

**APPLICATION FOR BUILDING CONSENT
LOT 77, 42 WATKINS DRIVE, HIGHGATE, RANGIORA
STRUCTURAL ENGINEERING INSPECTIONS**

We have been engaged to monitor the construction and wish to confirm the extent of our monitoring.

We will monitor the construction of the building structure. This will be an audit of a sample of work, rather than a detailed inspection of every component in accordance with IPENZ Construction Monitoring Services level CM3. We ask that the builder notify us at least 48 hours in advance of all major items of work before they are concealed. On this project, that would include:

- Foundation bearing at excavation.
- Waffle Foundation slab and entry post footings before casting.

The number of inspections for each item above will depend on the builders method of construction, concrete pour sequencing and such like and shall be agreed with the builder as the works progress.

For any construction queries or inspection notifications, please contact our office.

A Producer Statement – PS4 – Construction Review could be issued once the above inspections have been completed.

Please forward this to the Local Authority as part of the Building Consent documentation.

Yours faithfully

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Cory Bedford
BEng (HONS) MIPENZ CPEng IntPE(NZ)



constructure
structural engineering

OUTLINE STRUCTURAL SPECIFICATION

for

C/O MIKE GREER HOMES NORTH CANTERBURY

**LOT 77, 42 WATKINS DRIVE
HIGHGATE, RANGIORA**

by

CONSTRUCTURE LIMITED

DECEMBER 2016

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Project: 7833

1. GENERAL

Refer to the Preliminary and General Clauses of the Specification and to the General Conditions of Contract, which are equally binding on all Trades. This specification shall be read in conjunction with all other sections of the project specification.

No change or variation is permitted unless the Engineer provides appropriate written instructions.

Dimensions and details shall be read in conjunction with the Architect's drawings. The contractor shall check all dimensions before construction commences.

The contractor shall fully comply with all the provisions of the New Zealand Building Code, including all requirements for site and worker safety.

2. EXCAVATION AND HARDFILLING

Excavate the soils sufficient for the construction of the works, and to solid bearing. An ultimate bearing pressure of 200kPa has been assumed for the design. This assumption is to be verified at the time of excavation by the Engineer via site inspection and bearing check.

Provide at least 24 hours notice to the Engineer to allow the sub grade to be inspected before placement of hard fill, formwork, DPM or reinforcing.

Foundations shall not be cast until approval from the Engineer has been obtained.

Excavate all topsoil/organic matter from the building footprint and areas to be hard filled or to receive concrete foundations. Thoroughly compact all sub grade surfaces prior to backfilling with hard fill.

If excavation to a greater depth than that detailed is necessary, the contractor shall obtain the written approval of the Engineer before over-excavating. Over-excavation shall be back-filled in accordance with the instructions of the Engineer.

Supply, lay and compact hard fill under floor slabs and foundations where detailed. Hard fill material shall be well graded AP40, compacted to a minimum average density of 2150 kg/m³, with 95% exceeding 2100 kg/m³. The minimum depth shall be 150mm.

The contractor shall provide evidence of adequate compaction (by nuclear density gauge or alternative as approved by the Engineer) to hard fill greater than 600mm overall depth or as required.

Existing hard fill may be re-used, subject to compliance with this Specification.

3. CONCRETE CONSTRUCTION

All concrete work shall comply with the requirements of NZS 3109.

All reinforcing materials shall comply with the requirements of NZS3402 and AS/NZS 4671. All reinforcing shall be manufactured by the micro-alloy process.

On the drawings:

'D' indicates deformed grade 300E reinforcing to AS/NZS 4671:2001

'HD' indicates deformed grade 500E reinforcing to AS/NZS 4671:2001

'R' indicates round grade 300E reinforcing to AS/NZS 4671:2001

'HR' indicates round grade 500E reinforcing to AS/NZS 4671:2001

Mesh reinforcement in floor slabs shall be ductile mesh and comply with NZS3422.

All products shall be supplied and installed in accordance with the manufacturer's written recommendations.

Except where specified otherwise, finishes shall be as specified below and shall be in accordance with NZS 3114:

all concrete which is visible externally or internally in the completed building:	F5 finish
concrete concealed in the completed building:	F3 finish
concrete below ground	F1 finish
all floor slabs and toppings	U3 finish

Form all chases, rebates, etc as detailed.

Reinforcement shall be cut, bent, and fixed in accordance with NZS 3109, and as shown on the drawings. All reinforcement shall fully lap at all splices, corners of foundation beams, beams, blockwalls etc. Laps for reinforcement shall be in accordance with the schedule below, unless detailed otherwise on the drawings.

Bar	Lap length for concrete	Lap Length for blockwork
HD10	600mm	700mm
HD12	700mm	850mm
HD16	900mm	1150mm
HD20	1050mm	1400mm

All foundation reinforcement must lap in accordance with the above and as shown on the drawings.

Cast in all fixings, bolts, and other items detailed or required for the completion of the works. Fix securely in place before casting concrete, and check their positions immediately after casting.

Place concrete in accordance with NZS 3109.

Take care to protect and cure all concrete adequately, and in accordance with NZS 3109.

After casting floor slabs, supply and apply an anti-evaporation film such as FBS ER 921 or similar.

Apply a curing compound to all concrete floor slabs immediately on completion of the surface finishing, or alternatively, cure by ponding.

The following concrete shall be used:

Element	Concrete type	28 day strength	Slump	Max aggregate size
Waffle Foundation slab	Normal	20 MPa	100mm	19mm

It is the contractor's responsibility to prepare any additional shop drawings of the works or elements if required.

Supply and lay DPM beneath all ground slabs in accordance with the manufacturer's written recommendations and the Architectural Specification. The DPM shall be 0.25mm polythene or equivalent.

Polystyrene for waffle slabs shall be supplied as detailed on the drawings.

Reinforcement shall not be bent on site except in accordance with this specification. Bending shall be in accordance with the requirements of NZS3109 and the manufacturer's written recommendations.



02 December 2016

7833

C/o Mike Greer Homes North Canterbury

Dear Sirs,

**APPLICATION FOR BUILDING CONSENT
LOT 77, 42 WATKINS DRIVE, HIGHGATE, RANGIORA
STRUCTURAL ENGINEERING CALCULATIONS**

The design and calculation process for Constructure Limited projects includes a wide range of activities and documentation including:

- Project team meetings and discussion
- Design based on experience
- Engineering judgement
- Reference to Standards, codes and guidelines
- Drawings and Specification review and mark-up
- Electronic calculations, spreadsheets, etc.
- Written calculations

The attached calculations have been requested by the building consent authority for their review as part of the building consent process. They are provided on the basis that they are accompanying information to assist in the building consent authorities understanding of the design. However, it is the plans and specifications that wholly represent the design.

Please forward this to the Local Authority as part of the Building Consent documentation.

Yours faithfully

Cory Bedford
BEng (HONS) MIPENZ CPEng IntPE(NZ)

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Constructure Limited

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Email: cory@constructure.co.nz

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DESIGN SUMMARY.

SINGLE STOREY DWELLING BRICK VENEER CLADDING.

CONCRETE f_{cu} 25MPa WITH STEEL FIBRE REINFORCING
SPECIAL MIX 252 CONSF SUPPLIED BY ALLIED CONCRETE LTD

SLAB - 85mm THICK CENTRALLY REINFORCED WITH:

SE62 MESH IN DOMESTIC AREAS

SE72 MESH IN GARAGE AREA

MESH TO EXTEND TO WITHIN 50mm OF SLAB EDGE.
WITH D10 / HD12 STARTER L-BARS INTO PERIMETER BEAM

(FOR HYDRONIC HEATED FLOOR SYSTEMS INCREASE SLAB THICKNESS
TO 110mm AND LAY APEWORK ON MESH.)

PERIMETER FOUNDATION:

300 WIDE 275 DEEP

2HD16 TOP

NO ADDITIONAL SHEAR LINKS

INTERNAL FOUNDATION:

AS PERIMETER

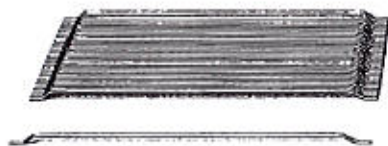
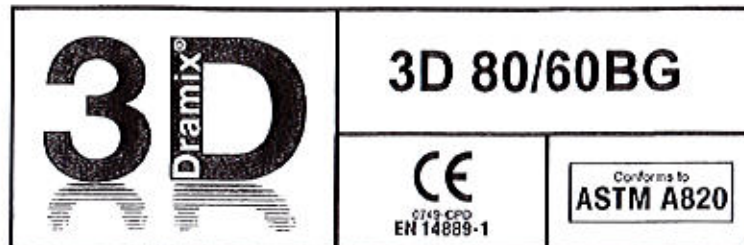
INTERNAL RIBS: 100 WIDE.
385 DEPTH.

1 HD12 BOTTOM BAR - TOP MESH ONLY
NO ADDITIONAL SHEAR LINKS

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Dramix®**BEKAERT**

better together

Technical Data Sheet

Dramix® 3D 80/60BG is a cold drawn, bright steel fibre with hooked ends for optimum and cost efficient reinforcement of concrete, mortar or grout. It is glued to bundles for easy dosing.

Geometry

fibre length l	60 mm
fibre diameter d	0.75 mm
aspect ratio l/d	80

Fibre Network

number of fibres per kg	4,584
CE-minimum dosage	10 kg/m³
wire length for 10 kg/m³	2.9 km

Material Properties

tensile strength $R_{m,cm}$	1,225 N/mm²
Young's modulus	210,000 N/mm²

Quality Standards

EN 14889-1, system '1', structural use
ISO 9001, ISO 14001



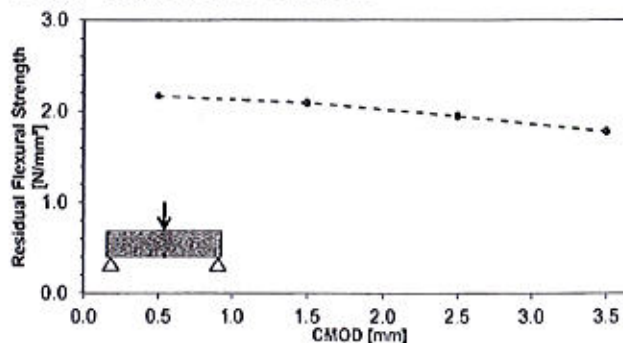
Provided to you by Alan Ross - BOSFA.

Customer
location
Project
location
remark
Date

Allied Concrete
country wide
SuperSlab
country wide
in accordance with NZS3101:2006
3/12/2014

Residual Flexural Strength*

15 kg/m³ Dramix 3D 80/60BG in C25/30



Average residual flexural strength $f_{R,m}$ according to EN 14651.*

Only valid for the mentioned combination of fibre type, dosage and concrete compressive strength.

fibre type	Dramix®	3D 80/60BG
dosage	15 kg/m³	
concrete	C25/30	
CMOD 0.5mm	$f_{R1,m}$	2.2 N/mm²
CMOD 1.5mm	$f_{R2,m}$	2.1 N/mm²
CMOD 2.5mm	$f_{R3,m}$	1.9 N/mm²
CMOD 3.5mm	$f_{R4,m}$	1.8 N/mm²

* Indicative material properties according to EN 14651 for the selected concrete, fibre type and dosage. Only valid for Dramix® steel fibres and only valid for the combination of concrete, fibre type and dosage as stated above. All values are based on the Bekaert database and do not release from testing the required material properties for a specific project. The user is responsible for putting this data into practice. For suitable applications, correct design and proper use of the material, please consult our technical experts, our "Recommendations for Handling, Dosing and Mixing" and our online library "Dramix® Club". Bekaert will be glad to advise on the most suitable fibre for your application. Modifications reserved. All details describe our products in general form only. For detailed information, product specifications available on request.

<http://dramix.bekaert.com>
<http://dramixclub.bekaert.com>
www.bekaert.com/dosingdramix

Dramix® Product Pages
Dramix® Club
Mixing, Dosing and Handling

info@building@bekaert.com
slr@posts.com

your general contact address
your personal contact address
3D Data Sheet - 1.0

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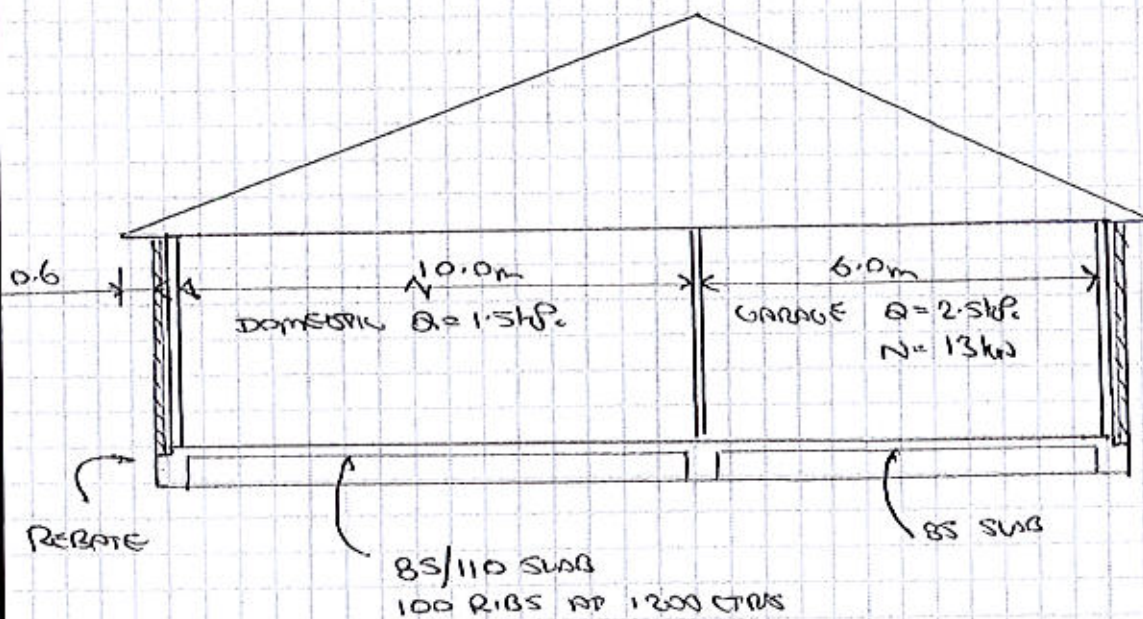
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SINGLE STOREY WAFFLE SLAB FOR BRICKWORK EXTERIOR CLADDING

DESIGN ASSUMPTIONS

- LIGHTWEIGHT ROOF WITH TIMBER TRUSSES
- MAXIMUM SPAN OF ROOF $\leq 10.0m$ WITH $0.6m$ OVERHANG
- ROOF IN EXCESS OF $10.0m$ TO HAVE INTERNAL LOADBEARING WALL
- MAXIMUM CEILING HEIGHT $2.7m$
- TIMBER FRAMED WALLS WITH 90 SERIES BRICK VENEER
- MINIMUM ULTIMATE GROUND BEARING CAPACITY $> 200kPa$.
- $S_u = 0.63kPa$.



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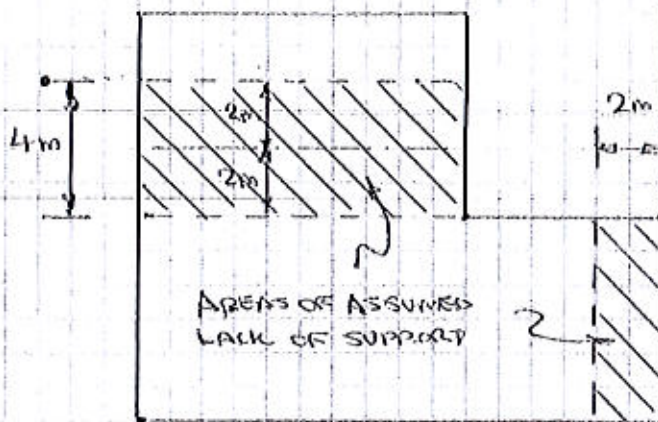
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DESIGN CRITERIA IS ACCORDANCE WITH MBIE GUIDANCE
EXOMENT DECEMBER 2012 SECTION 3.4
'REPAIRING AND REBUILDING HOUSES AFFECTED BY
THE CANTERBURY EARTHQUAKES'

LOSS OF SUPPORT DUE TO DIFFERENTIAL SETTLEMENT OF
THE SURROUNDING GROUND

TARGET GROUND CONDITIONS

SITE SOIL BEARING INVESTIGATION TO CONFIRM
GEOTECHNICAL ULTIMATE BEARING CAPACITY $\geq 200 \text{ kPa}$

SUB-BASE HARDFILL 20mm SAND BUILDING ON
COMPACTED AP40 HARDFILL AS NECESSARY

LOAD COMBINATIONS

'Normal' conditions ULS $\text{LOADING} = 1.2G + 1.5Q$

'Loss of support' conditions ULS $\text{LOADING} = 1.0G + 0.3Q$

Constructure Limited 229 Lichfield Street PO Box 21381, Christchurch 8143 Ph: 03 365 3243 Email: cory@constructure.co.nz	JOB NAME: WAFFLE SLAB IN TEL		PAGE No. 1.1
	SECTION: SINGLE STOREY BRICK		
	JOB No.	DESIGNED:	
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LOADING - SINGLE STOREY DWELLING BRICK VENEER

REFER TO ATTACHED SPREADSHEETS FOR LOADING.

ROOF - LIGHTWEIGHT CLADDING ON TRUSSES
 MAXIMUM SPAN 10.0m TO EXTERIOR WALLS.

- INTERNAL WALL - IF LONGSPAN TO HAVE
 MAXIMUM 8.0m SUPPORTING ROOF LOAD.

WALLS INTERNAL: 90x45 FRAMING, 13mm GIB 2 SIDES

WALLS EXTERNAL: - ALL WALLS ASSUMED TO BE 27m

i) WENTHERBOARD OR SIMILAR, TIMBER FRAMING + GIB	LIGHTWEIGHT
ii) 50mm ROCKWOOL OR SIMILAR TIMBER FRAMING + GIB	MEDIUM WEIGHT
iii) 90x45 BRICK VENEER TIMBER FRAMING + GIB	HEAVY WEIGHT

GROUND FLOOR SLAB:

85mm CONCRETE ON 300 DEEP POLYSTYRENE PODS, OVERALL DEPTH 385mm
 WITH REBATE FOR BRICKWORK TO PERIMETER

IMPOSED LOADS:

SNOW:	$S_g = 0.9 kPa$	$\mu = 0.7$	$S_u = 0.63 kPa$
FLOOR LIVE LOAD	$Q = 1.5 kPa$		
GARAGE FLOOR LOAD	$Q_g = 2.5 kPa$		
	PUNCHING SHEAR LOAD $P_c = 13 kN$		

DOMESTIC LOADINGS CALCULATOR

Use AS/NZS 1170

Importance level	2	Wind & EQ
Annual Probability of exceedance	1/500	Snow
	1/150	SLS1
	1/25	

Loads

G	roof	heavy domestic (conc tile, trusses, ceiling)	0.84	kPa
		light domestic (steel sheet, trusses, ceiling)	0.46	kPa
Floor		85mm concrete	2.05	kPa
		Average of 100mmx300mm deep ribs	1.15	kPa
			0	kPa
Walls		Partitions 9.5mm Gib, studs @ 600mm	0.25	kPa
		Weatherboard, timber framing, GIB	0.35	kPa
		Celcrete, timber framing, GIB	0.8	kPa
		Brick veneer, timber framing	2.17	kPa

Total G

Floor only	3.2	Roof only	0.46
------------	-----	-----------	------

Q	Floor	General areas	1.5	kPa	1.8 kN
		Balconies 1m above ground	2	kPa	
		Stairs and landings	2	kPa	2.7 kN
	Roof	Structural elements	0.25	kPa	1.4 kN
Su	Roof	kp	1.25	(Table 5.1 AS/NZS 1170.3:2003)	
		ho	10	m	
		Sg	0.50	if less than 0.75, Su = 0.4kPa	
			1.08	if less than 0.75, Su = 0.4kPa	
		Ce	1	sub-alpine regions	
		ui	0.7	see Sections 6/7, AS/NZS1170.3	
		Su = SgxCexui	0.63	kPa	take Sg as 0.9 as per DBH
Wu	from separate spreadsheet (Medium)	Wu up	-0.747		
		Wu down	0.266		
		Ws	0.219		

Combinations

		Floor		Roof	
ULS 1	1.35G	4.32	kPa	0.62	kPa
	1.2G + 1.5Q	6.09	kPa	0.93	kPa
	1.2 G + Su			1.18	kPa
	1.2 G + Wu			0.82	kPa
	0.9G + Wu			-0.33	kPa
ULS 2	G	3.20	kPa	0.46	kPa
	1.0G + 0.3Qs	3.65	kPa	0.64	kPa
	G + 0.3S			0.65	kPa
	G + Ws			0.68	kPa

SINGLE STOREY

typical external wall load - heavy

span		0	m	span/400	0.000
tributary width	floor	0	m		
	roof	5.6	m		
	wall above	2.7	m (height)		

ULS 1 load	floor	0.00	(assumes 1.2g+1.5q is max)
	roof	6.62	(assumes snow governs)
	wall above	7.03	(assumes 1.2g factor governs & that wall is fyreline above)

ULS TOTAL **13.65** kN/m

ULS 2 Load	floor	0.00	(assumes 1.2g+1.5q is max)
	roof	3.63	(assumes snow governs)
	wall above	5.86	(assumes 1.2g factor governs & that wall is fyreline above)

SLS TOTAL **9.49** kN/m

M*	wl2/8	0.00	kNm		
R*		0.00	kN	Rs	0.00 kN
deflection				I req'd	#DIV/0!
	steel	0.000	1/lxx	I req'd	#DIV/0! K2 =1.0 ?
	LVL 10.7	0.000	1/lxx	I req'd	#DIV/0! K2 =1.0?
	MSG8	0.000	1/lxx	I req'd	#DIV/0! K2 =1.0?
M*	wl2/12	0.00	kNm		
R*		0.00			
deflection		0.000	1/lxx	I req'd	#DIV/0!

SINGLE STOREY
typical internal LBW

span		0	m	span/400	0.000
tributary width	floor	0	m		
	roof	8	m		
	wall above	2.7	m (height)		

ULS 1 load	floor	0.00	(assumes 1.2g+1.5q is max)
	roof	9.46	(assumes snow governs)
	wall above	0.81	(assumes 1.2g factor governs & that wall is fyreline above)

ULS TOTAL **10.27** kN/m

ULS 2 Load	floor	0.00	(assumes 1.2g+1.5q is max)
	roof	5.19	(assumes snow governs)
	wall above	0.68	(assumes 1.2g factor governs & that wall is fyreline above)

SLS TOTAL **5.87** kN/m

M*	wl2/8	0.00	kNm		
R*		0.00	kN	Rs	0.00 kN
deflection				I req'd	#DIV/0!
	steel	0.000	1/1xx	I req'd	#DIV/0! K2 =1.0?
	LVL 10.7	0.000	1/1xx	I req'd	#DIV/0! K2 =1.0?
	MSG8	0.000	1/1xx	I req'd	#DIV/0! K2 =1.0?
M*	wl2/12	0.00	kNm		
R*		0.00			
deflection		0.000	1/1xx	I req'd	#DIV/0!

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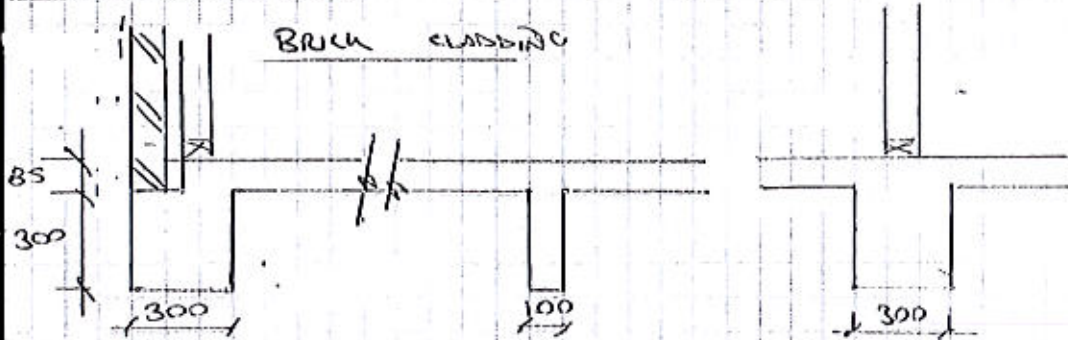
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GROUND BEARING- USING $1.2G + 1.5Q$ ULS LOADINGPERIMETER BEAM

UDL ULS = Wall Loads - SEE P. 13.65 kN/m

SUB DEAD LOADS BS SLAB $\times 1.0 \text{ m} \times 24 \text{ kN/m}^3 = 2.4 \text{ kN/m}$
G.B. $0.3 \times 0.3 \times 24 \text{ kN/m}^3 = 2.16 \text{ kN/m}$
LIVE LOAD $1.5 \text{ kPa} \times 0.6 = 0.9 \text{ kN/m}$
 $Q = 0.9 \text{ kN/m}$

ULS $= 1.2G + 1.5Q = 1.2 \times 4.3 + 1.5 \times 0.9 = 6.51 \text{ kN/m}$ UDL $= 13.65 + 6.51 = 20.16 \text{ kN/m}$

GBP $= \frac{20.16}{0.3} = 68 \text{ kPa} < 100 \text{ kPa}$ OKAY
(IF 110 SLAB ADD 2 kPa)

INTERNAL LOAD BEARING WALL

UDL = Wall Loads 10.27 kN/m
SLAB DL BS SLAB $\times 1.4 \text{ m} \times 24 = 2.86 \text{ kN/m}$
G.B. 2.16 kN/m
L.L. $1.5 \text{ kPa} \times 1.4 = 2.1 \text{ kN/m}$
 $Q = 2.1 \text{ kN/m}$

ULS $= 1.2G + 1.5Q = 9.17 \text{ kN/m}$ UDL $= 10.27 + 9.17 = 19.44 \text{ kN/m}$

GBP $= \frac{19.44}{0.3} = 64.8 \text{ kPa} < 100 \text{ kPa}$
(IF 110 SLAB ADD 3 kPa)

INTERNAL RIB

SLAB DL BS SLAB $\times 1.2 \text{ m} \times 24 = 2.45 \text{ kN/m}$
RIB $0.1 \times 0.3 \times 24 \text{ kN/m}^3 = 0.72 \text{ kN/m}$
L.L. $1.5 \text{ kPa} \times 1.2 = 1.8 \text{ kN/m}$
 $Q = 1.8 \text{ kN/m}$

ULS $= 1.2G + 1.5Q = 6.5 \text{ kN/m}$

GBP $= \frac{6.5}{0.1} = 65 \text{ kPa} < 100$

(IF 110 SLAB ADD 9 kPa)

ALL OKAY
FOR 200 kPa.

use of 42.5 ϕ min = 2.5 hours $> m$ $\therefore$ no window.

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GARAGE SLAB - 85mm Thic. SCL = Old

$$Q = 2.5 \text{ kPa} \quad N = 13 \text{ kN} \quad ULS = 6.2 \text{ kPa}$$

$$M_{ULS} = 6.2 \times 1.2^2 / 16 = 0.56 \text{ kNm} < \phi M_n = 2.54 \text{ kNm}$$

POSITIVE SHEAR

$$N = 13 \text{ kN}$$

$$M_{ULS} = 0.56 \text{ kNm} + 1.5 \times 13 \times 1.1 / 8 = 3.24 \text{ kNm}$$

TRM SE72 MESH $A_s = 192 \text{ mm}^2/\text{m}$

$$a = 4.5 \text{ mm} \quad \phi M_n = 3.28 \text{ kNm} > M_{ULS}$$

$$Q = 2.5 \text{ kPa}$$

$$N = 13 \text{ kN}$$

85mm SLAB
 SE72 MESH

$$f_{cu} = 25 \text{ MPa}$$

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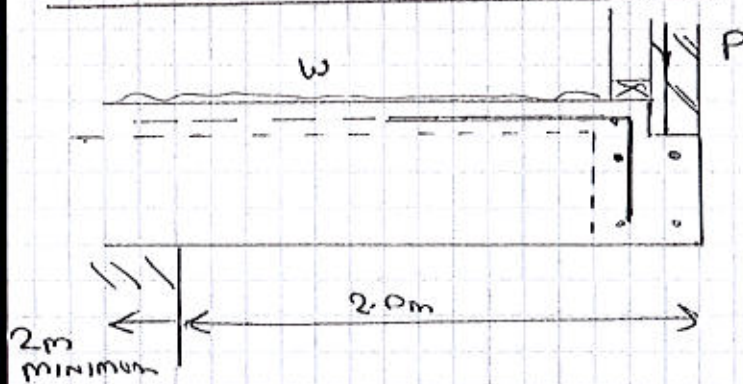
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SLAB CANTILEVER - BRICK VENEER

BRICK CADDIS (90 SERIES)

CONSIDER 2m CANTILEVER WITH ULS2 LOADING = $G + 0.3Q$

$$P = 9.49 \text{ kN/m}$$

1.2m LOAD/RIB

$$W = 3.64 \text{ kN/m}$$

$$M^* = \left(3.64 \times \frac{2^2}{2} + 9.49 \times 2 \right) \times 1.2 = 31.51 \text{ kNm (RIB)}$$

$$V^* = (3.64 \times 2 + 9.49) \times 1.2 = 20.15 \text{ kN}$$

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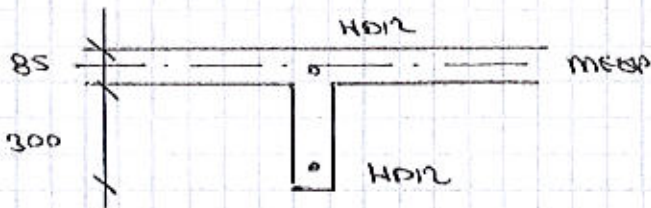
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SLAB ANTILEVER - BRICK VENEERSLAB SECTION

$$f_{cu} = 25 \text{ MPa} \quad (25 \text{ CONCRETE})$$

$$f_y = 500 \text{ MPa}$$

$$A_s = \text{MESH SE62} + \text{HD12}$$

$$= 147 + 113 = 260 \text{ mm}^2$$

$$d = 385 - \left(42.5 + 6 + \frac{12}{2}\right) = 330 \text{ mm}$$

CHECK ϕM_n

$$0.4 f_{cu} b x = A_s f_y \cdot 0.87$$

$$\therefore x = \frac{0.87 A_s f_y}{0.4 \cdot b \cdot f_{cu}} = \frac{0.87 \cdot 260 \cdot 500}{0.4 \cdot 100 \cdot 25} = 113 \text{ mm}$$

$$\phi M_n = 0.4 f_{cu} b x \left(d - \frac{x}{2}\right)$$

$$= 0.4 \cdot 25 \cdot 100 \cdot 113 \left(330 - \frac{113}{2}\right) = 30.9 \text{ kNm}$$

With A_s'

$$\phi M_n = 0.4 f_{cu} b x \left(d - \frac{x}{2}\right) + 0.72 f_y A_s' (d - d')$$

$$= 30.9 + 0.72 \cdot 500 \cdot 113 (330 - 56)$$

$$= 30.9 + 11.1 = 42 \text{ kNm} > m^* = 31.5 \text{ kNm}$$

 $\therefore$ SLAB OKAY WITHSE62 + HD12 TOP R.B.TOP HD12 TO EXTEND 3.0m

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CHECK SHEAR CAPACITY OF RIBS

- USING STEEL FIBRE REINFORCED CONCRETE SUPPLIED BY
ALLIED CONCRETE LTD
REF: 252 CONSF

REF NZS 3101, Pt 2: 2006 Cl. C5.

$$V_{rd,3} = V_b + V_{fd} + V_{wd} \quad (\text{cl C5, A4.2.1})$$

$$V_b = k_a k_d (0.07 + 10 \rho_w) \sqrt{f_c'} b_w d$$

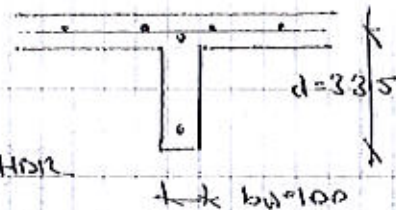
$$k_a = 1.0 \quad k_d = 1.0 \quad (9.3.9.3.4)$$

A_s (SE62 mesh) Allow for 3 strands + Horiz

$$A_s = \frac{3}{5} \times 147 \text{ mm}^2 = 88 \text{ mm}^2 + 113 = 201 \text{ mm}^2$$

$$\therefore \rho_w = \frac{A_s}{b_w d} = \frac{201}{100 \times 335} = 0.006$$

$$\therefore V_b = 0.13 \sqrt{f_c'} b_w d = 21.7 \text{ kN}$$



$$V_{fd} = 0.7 k_f k_i \tau_{fd} b_w d$$

$$k_f = 1.0$$

$$k_i = 1 + \sqrt{\frac{200}{d}} = 1.77$$

$$\tau_{fd} = 0.12 f_{R4,k} = (C25) f_{R4,k} = 1.8$$

$$f_{R4,k} = 0.7 \times 1.8 = 1.26$$

$$\tau_{fd} = 0.12 \times 1.26 = 0.151$$

$$\therefore V_{fd} = 0.7 \times 1.0 \times 1.77 \times 0.151 \times 100 \times 335 = 6.27 \text{ kN}$$

With No Shear Links $V_{rd,3} = 21.7 + 6.27 = 27.9 \text{ kN}$

$$V = V_{rd,3} = 27.9 \text{ kN} > V^* = 20.15 \text{ kN}$$

$\therefore$ No Shear Links Req'd
in Ribs.

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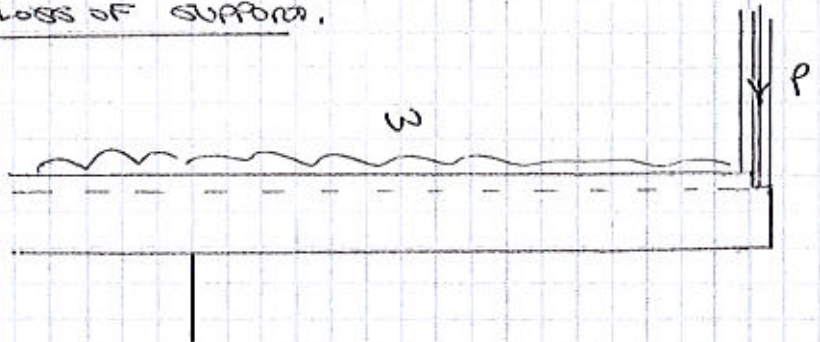
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EDGE BEAM Back Veneer.2m Loss of Support.

ULS2 Loading
= $G + 0.3Q$

$$P = (\text{WALL} + \text{ROOF}) \times 0.6 \text{ m } 9.49 \text{ kN/m} \times 0.6 = 5.7 \text{ kN/m}$$

W = $\left. \begin{array}{l} \text{ROOF} \\ \text{WALL} \\ \text{Floor} \end{array} \right\}$

Floor $0.6 \text{ m} \times 3.64$
EDGE BEAM $0.3 \text{ m} \times 0.3 \text{ m} \times 24 \text{ kN/m}^2$

9.49	
2.18	
2.16	$\cdot$
13.85	kN/m

EDGE BEAM

$$M^* = (13.85 \times 2^2 / 2 + 5.7 \times 2) = 39.1 \text{ kNm}$$

$$V^* = 13.85 \times 2 + 5.7 = 33.4 \text{ kN}$$

Constructure Limited

229 Lichfield Street
 PO Box 21381, Christchurch 8143
 Ph: 03 365 3243
 Email: cory@constructure.co.nz

JOB NAME:

PAGE No.

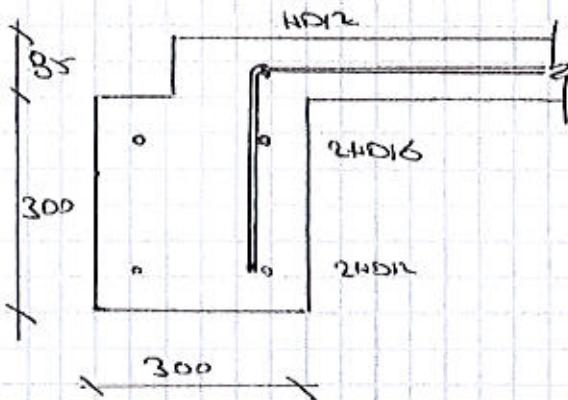
SECTION:

JOB No.

DESIGNED:

DATE:

CHECKED:

EDGE BEAM CANTILEVER

$$\begin{aligned} \text{COVER} &= 50 \text{ mm} \\ f_{cr} &= 25 \text{ MPa (25 CONSF)} \\ f_y &= 500 \text{ MPa} \end{aligned}$$

$$A_{smin} = \frac{\sqrt{f_c} \cdot b_w \cdot d}{4 f_y} \approx 180 \text{ mm}^2$$

$$d = 300 - (85 + 50 + 16/2) = 240 \text{ mm}$$

$$A_s = 2 \text{ HD16} = 402 \text{ mm}^2$$

CHECK ϕ_{Mn}

$$a = \frac{A_s f_y}{0.85 \cdot b \cdot f_{cr}} = \frac{402 \times 500}{0.85 \times 300 \times 25} \approx 31.5 \text{ mm}$$

$$\phi_{Mn} = 0.85 \times 500 \times 402 \left(\frac{240 - 31.5}{2} \right) \approx 38.3 \text{ kNm}$$

ALLOW FOR TOP HD12 ALSO

$$\phi_{Mn} = 38.3 + \sim 6 = 44 \text{ kNm} > M^d$$

$$\therefore \underline{2 \text{ HD16 TOP}} + \text{HD12 IN SPB}$$

OKAY.

Constructure Limited

229 Lichfield Street
PO Box 21381, Christchurch 8143
Ph: 03 365 3243
Email: cory@constructure.co.nz

JOB NAME:

PAGE No.

SECTION:

JOB No.

DESIGNED:

DATE:

CHECKED:

CHECK SHEAR CAPACITY OF EDGE BEAM

- USING STEEL FIBRE REINFORCED CONCRETE

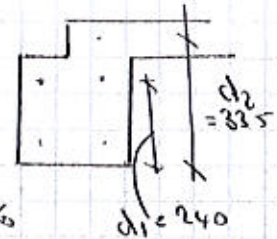
REF 252 WNSF

$$V_{rd3} = V_b + V_{fd} + V_{wd}$$

WHERE $V_b = k_c k_d (0.07 + 10 \rho_w) \sqrt{f_{cu}} b_w d$

$$A_{s1} = 2 \times 16 = 402 \text{ mm}^2 \quad k_c = 1 \quad k_d = 1$$

$$\rho_w = \frac{A_s}{b d} = \frac{402}{300 \times 240} = 0.0056 \quad (0.07 + 10 \rho_w) = 0.126$$



$$V_b = 0.126 \times \sqrt{25} \times 300 \times 240 = 45.3 \text{ kNm}$$

$$V_{fd} = 0.7 k_f k_s \tau_{fd} b_w d$$

$$k_f = 1.0$$

$$k_s = 1 + \frac{\sqrt{200}}{d} = 1.9$$

$$\tau_{fd} = 0.12 f_{Rk,4}$$

$$f_{Rk,4} = 1.8 (C25) \quad f_{Rk,4} = 0.7 \times 1.8 = 1.26$$

$$\tau_{fd} = 0.151$$

$$\therefore V_{fd} = 0.7 \times 1.0 \times 1.9 \times 0.151 \times 300 \times 240 = 14 \text{ kNm}$$

$$V_{wd} = 0$$

$$V_{rd3} = V_b + V_{fd} = 45.3 + 14 = 59.3 \text{ kN} > V_d$$

$\therefore$ No shear links req'd

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 may be sent to
Buildinginfo@wmk.govt.nz



Date: 24 November 2016

Fabricator: VIP Frames & Trusses

Job Name: Mike Greer Homes NC
New House
Lot 77 Highgate for truss

**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 may be sent to
Buildinginfo@wmk.govt.nz

Building Consent No: _____

(Provided by relevant Consenting Authority at time of Consent application)

Attn: City/District Council

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 170237 4/04/2017 lachlant

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

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

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

Wind Zone	<u>High</u>	Altitude	<u>100m</u>
		Snow (Open Ground Load)	<u>0.900 kPa</u>
Roof Material	<u>Longrun Iron</u>	Snow (Basic Roof Load)	<u>0.403kPa</u>

Treatment Definition:

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

Trusses - H1.2 Treated

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

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

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

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

Council Contacts:

Consents Officer: _____

Fax #: _____

Phone: _____

Please forward to:

Bruce Ramsay
Dyers Road ITM
Ph (03) 373 6049
Fax (03) 376 6049

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.mitek.nz.co.nz

Printed: 10:29:28 24 Nov 2016

MiTek 20/20 Engineering 4.6.6.246

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.6ISSUED BY: **MiTek New Zealand Limited**TO: **VIP Frames & Trusses**IN RESPECT OF: **MiTek® Truss Designs**

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **41419** 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

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, 24 November 2016

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

Job: 41419 Client: Mike Greer Homes NC Site: New House
 Description: Building Consent No.: Lot 77 Highgate for truss
 Mitek 20/20 Engineering 4.6.6.246 Mitek New Zealand Limited

Consent Issued BC170237

BC170237
 Phone:

Printed: 10/29/28 24 Nov 2016

MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details

Roof Truss

Timber Group: ~MSGx45 H1.2

Roof

Material: Galv Iron .5mm
 Dead Load: 0.210 kPa
 Restraints: 900 mm centres
 Live Load: Q_r = 0.250 kPa
 Q_c = 1.100 kN

Importance Level : 2

Pitch: 28.000 deg

Ceiling

Material: Gib Board 12mm
 Dead Load: 0.200 kPa
 Restraints: 600 mm centres
 Live Load: Q_c = 1.400 kN

Design Working Life : 50 years

Nominal Overhang: 600 mm

Wind

Area: High (44.0 m/s)
 Pressure Coeff: C_{pe} = varies; C_{pi} = -0.30, 0.20

Snow

Location: Christchurch (N4) at 100 m
 Open Ground Load: 0.900 kPa
 Basic Roof Load: 0.403 kPa

The timber for these MiTek® trusses shall be treated to the requirements of NZS 3602:2003 and shall be graded to the requirements of NZS 3603:1993. Unless otherwise noted, this design assumes that the steel fixings and timber connectors proposed are located in a **“closed environment”**, as defined by NZS3604:2011 Section 4.

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)
*H1	4	1251	20.605	900	J30	1	1467	28.000	900	S18	4	4710	28.000	796
*H2	1	5624	20.605	900	J32	1	1467	28.000	900	S19	1	2480	28.000	900
*H3	1	2524	20.605	900	J33	1	1467	28.000	900	S20	1	2480	28.000	900
*H4	2	4125	20.605	900	J35	1	2492	28.000	796	T3	1	4870	28.000	900
*H5	2	5857	20.605	900	*R1	1	1305	28.000	900	V1	1	2390	28.000	900
*H6	2	5447	20.605	900	*R2	7	913	28.000	900	V2	1	902	28.000	900
J1	1	2492	28.000	900	*R3	7	913	28.000	900	V3	1	1566	28.000	900
J2	1	2492	28.000	900	*R4	2	901	28.000	900	V4	1	800	28.000	900
J3	1	2492	28.000	900	*R5	1	1145	28.000	900	V5	1	1537	28.000	900
J4	1	2492	28.000	900	*R6	1	1145	28.000	900	V6	1	1220	28.000	900
J6	1	1592	28.000	900	*R7	1	1470	28.000	900	V7	1	2120	28.000	900
J7	1	1592	28.000	900	*R8	1	1470	28.000	900	V8	1	1190	28.000	900
J8	1	2492	28.000	900	*R9	1	1180	28.000	900	J5	1	2492	28.000	900
J9	1	2332	28.000	900	*R10	1	1180	28.000	900	J10	1	2332	28.000	900
J11	1	1432	28.000	900	S1	1	6830	28.000	900	J13	1	2332	28.000	900
J12	1	1432	28.000	900	S2	1	6830	28.000	900	J19	1	2657	28.000	900
J14	1	1432	28.000	900	S4	1	4870	28.000	900	J22	1	2657	28.000	900
J15	1	1432	28.000	900	S5	1	7160	28.000	900	J28	1	2367	28.000	900
J16	1	2657	28.000	900	S6	4	4870	28.000	746	J31	1	2367	28.000	900
J17	1	2657	28.000	900	S7	3	4870	28.000	766	J34	1	2492	28.000	900
J18	1	2657	28.000	900	S8	1	6580	28.000	900	S3	1	4710	28.000	900
J20	1	1757	28.000	900	S9	3	6580	28.000	900	T1	1	6830	28.000	900
J21	1	1757	28.000	900	S10	1	6580	28.000	900	T2	1	6830	28.000	900
J23	1	1757	28.000	900	S11	1	6830	28.000	615	T4	1	7160	28.000	900
J24	1	1757	28.000	900	S12	1	6830	28.000	615	T5	1	6580	28.000	900
J25	1	2367	28.000	900	S14	3	4195	28.000	637	S13	1	4195	28.000	900
J26	1	2367	28.000	900	S15	1	2492	28.000	900	S21	1	4870	28.000	746
J27	1	2367	28.000	900	S16	2	4710	28.000	796					
J29	1	1467	28.000	900	S17	1	4710	28.000	796					

Total quantity : 117

The computer design input has been carried out by:

Signed: 

Date: ...Thursday, 24 November 2016....

Name of Detailer: Chris Nottingham

Qualifications and Title: Detailer

On behalf of: VIP Frames & Trusses

Job: 41419 Client: Mike Greer Homes NC Site: New House
Description: Building Consent No.: Phone: Lot 77 Highgate for truss

Consent Issued BC170237

BC170237
Phone:

Printed: 10/29/33 24 Nov 2016

TRUSS FIXING SELECTION REPORT - Characteristic Loads

Fixings are selected from the LUMBERLOK Brochure 08/2014 (Timber Connectors Characteristic Loadings Data)

MiTek® Truss List

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

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing ----- Qty Selected	
*H1	4	1251						Refer NZS3604:2011 Tables 15.6
*H2	1	5624						Refer NZS3604:2011 Tables 15.6
*H3	1	2524						Refer NZS3604:2011 Tables 15.6
*H4	2	4125						Refer NZS3604:2011 Tables 15.6
*H5	2	5857						Refer NZS3604:2011 Tables 15.6
*H6	2	5447						Refer NZS3604:2011 Tables 15.6
J1	1	2492	A	2.505	0.475	Cross	1	Pair of Wire Dog Staples
			D	0.581	0.432	Butt	1	Pair of 3.15d Nails
			C	3.624	2.412	Cross	1	Pair of Wire Dog Staples
J2	1	2492	A	2.576	0.824	Cross	1	Pair of Wire Dog Staples
			E	1.847	1.122	Butt	1	JH 47x90
			C	0.730	0.531	Butt	1	Pair of 3.15d Nails
J3	1	2492	A	2.576	0.824	Cross	1	Pair of Wire Dog Staples
			E	1.847	1.122	Butt	1	JH 47x90
			C	0.730	0.531	Butt	1	Pair of 3.15d Nails
J4	1	2492	A	2.576	0.824	Cross	1	Pair of Wire Dog Staples
			E	2.576	1.653	Butt	1	JH 47x90
J6	1	1592	B	2.852	0.588	Cross	1	Pair of Wire Dog Staples
			D	0.466	0.046	Butt	1	Pair of 3.15d Nails
			C	1.150	0.968	Butt	1	Pair of 3.15d Nails
J7	1	1592	B	2.550	0.743	Cross	1	Pair of Wire Dog Staples
			E	0.785	0.470	Butt	1	Pair of 3.15d Nails
J8	1	2492	B	3.740	0.889	Cross	1	Pair of Wire Dog Staples
			F	2.451	1.640	Butt	1	JH 47x90
J9	1	2332	B	3.583	0.837	Cross	1	Pair of Wire Dog Staples
			F	1.615	1.064	Butt	1	JH 47x90
			D	0.714	0.470	Butt	1	Pair of 3.15d Nails
J11	1	1432	B	2.710	0.538	Cross	1	Pair of Wire Dog Staples
			D	0.419	0.041	Butt	1	Pair of 3.15d Nails
			C	0.989	0.865	Butt	1	Pair of 3.15d Nails
J12	1	1432	B	2.401	0.692	Cross	1	Pair of Wire Dog Staples
			E	0.692	0.362	Butt	1	Pair of 3.15d Nails
J14	1	1432	B	2.710	0.538	Cross	1	Pair of Wire Dog Staples
			D	0.419	0.041	Butt	1	Pair of 3.15d Nails
			C	0.989	0.865	Butt	1	Pair of 3.15d Nails
J15	1	1432	B	2.401	0.692	Cross	1	Pair of Wire Dog Staples
			E	0.692	0.362	Butt	1	Pair of 3.15d Nails
J16	1	2657	B	3.822	0.592	Cross	1	Pair of Wire Dog Staples
			E	0.542	0.420	Butt	1	Pair of 3.15d Nails
			D	3.727	2.524	Cross	1	Pair of Wire Dog Staples
J17	1	2657	B	3.902	0.943	Cross	1	Pair of Wire Dog Staples
			F	1.782	1.173	Butt	1	JH 47x90
			D	0.847	0.577	Butt	1	Pair of 3.15d Nails
J18	1	2657	B	3.902	0.943	Cross	1	Pair of Wire Dog Staples
			F	1.782	1.173	Butt	1	JH 47x90
			D	0.847	0.577	Butt	1	Pair of 3.15d Nails
J20	1	1757	B	3.017	0.651	Cross	1	Pair of Wire Dog Staples
			E	1.099	0.565	Butt	1	Pair of 3.15d Nails
			D	0.801	0.552	Butt	1	Pair of 3.15d Nails
J21	1	1757	B	2.733	0.796	Cross	1	Pair of Wire Dog Staples
			E	0.911	0.581	Butt	1	Pair of 3.15d Nails
J23	1	1757	B	3.017	0.651	Cross	1	Pair of Wire Dog Staples
			E	1.099	0.565	Butt	1	Pair of 3.15d Nails
			D	0.801	0.552	Butt	1	Pair of 3.15d Nails
J24	1	1757	B	2.733	0.796	Cross	1	Pair of Wire Dog Staples
			E	0.911	0.581	Butt	1	Pair of 3.15d Nails
J25	1	2367	B	3.559	0.513	Cross	1	Pair of Wire Dog Staples
			G	1.493	1.019	Butt	1	JH 47x90
			E	0.530	0.412	Butt	1	Pair of 3.15d Nails
			D	1.909	1.303	Cross	1	Pair of Wire Dog Staples
J26	1	2367	B	3.607	0.852	Cross	1	Pair of Wire Dog Staples
			F	1.621	1.067	Butt	1	JH 47x90
			D	0.697	0.456	Butt	1	Pair of 3.15d Nails
J27	1	2367	B	3.607	0.852	Cross	1	Pair of Wire Dog Staples
			F	1.621	1.067	Butt	1	JH 47x90
			D	0.697	0.456	Butt	1	Pair of 3.15d Nails
J29	1	1467	B	2.740	0.549	Cross	1	Pair of Wire Dog Staples
			D	0.429	0.042	Butt	1	Pair of 3.15d Nails
			C	1.025	0.887	Butt	1	Pair of 3.15d Nails
J30	1	1467	B	2.409	0.703	Cross	1	Pair of Wire Dog Staples
			E	0.712	0.386	Butt	1	Pair of 3.15d Nails
J32	1	1467	B	2.740	0.549	Cross	1	Pair of Wire Dog Staples
			D	0.429	0.042	Butt	1	Pair of 3.15d Nails
			C	1.025	0.887	Butt	1	Pair of 3.15d Nails
J33	1	1467	B	2.409	0.703	Cross	1	Pair of Wire Dog Staples
			E	0.712	0.386	Butt	1	Pair of 3.15d Nails
J35	1	2492	B	3.307	0.786	Cross	1	Pair of Wire Dog Staples
			F	2.168	1.451	Butt	1	JH 47x90

VIP Frames & Trusses

Job: 41419

Client: Mike Greer Homes NC

Site: New House

Phone:

Lot 77 Highgate for truss

Description:

Building Consent No.:

Mittek 20/20 Engineering 4.6.6.246

Consent Issued BC170237

Mittek New Zealand Limited

BC170237

Phone:

Printed: 10/29/33 24 Nov 2016

Truss	Qty	Span (mm)	Joint	Down (kN)	Uplift (kN)	Bearing	----- Fixing -----	
							Qty	Selected
*R1	1	1305						Refer NZS3604:2011 Tables 15.6
*R2	7	913						Refer NZS3604:2011 Tables 15.6
*R3	7	913						Refer NZS3604:2011 Tables 15.6
*R4	2	901						Refer NZS3604:2011 Tables 15.6
*R5	1	1145						Refer NZS3604:2011 Tables 15.6
*R6	1	1145						Refer NZS3604:2011 Tables 15.6
*R7	1	1470						Refer NZS3604:2011 Tables 15.6
*R8	1	1470						Refer NZS3604:2011 Tables 15.6
*R9	1	1180						Refer NZS3604:2011 Tables 15.6
*R10	1	1180						Refer NZS3604:2011 Tables 15.6
S1	1	6830	A	5.641	3.390	Butt	1	JH 47x90
			E	6.529	3.451	Cross	1	CT400
S2	1	6830	B	6.529	3.451	Cross	1	CT400
			F	5.641	3.390	Butt	1	JH 47x90
S4	1	4870	F	4.368	2.154	Cross	1	Pair of Wire Dog Staples
			D	5.041	2.479	Cross	1	Pair of Wire Dog Staples
S5	1	7160	B	6.769	3.611	Cross	1	CT400
			F	6.769	3.611	Cross	1	CT400
S6	4	4870	A	3.316	2.002	Cross	4	Pair of Wire Dog Staples
			E	4.077	2.056	Cross	4	Pair of Wire Dog Staples
S7	3	4870	F	3.719	1.834	Cross	3	Pair of Wire Dog Staples
			D	4.292	2.111	Cross	3	Pair of Wire Dog Staples
S8	1	6580	B	6.288	3.322	Cross	1	CT400
			F	6.288	3.322	Cross	1	CT400
S9	3	6580	A	5.432	3.266	Cross	3	CT400
			E	6.323	3.327	Cross	3	CT400
S10	1	6580	A	5.467	3.271	Cross	1	CT400
			E	5.467	3.271	Cross	1	CT400
S11	1	6830	A	3.878	2.320	Butt	1	JH 47x90
			E	3.878	2.320	Cross	1	Pair of Wire Dog Staples
S12	1	6830	A	3.878	2.320	Butt	1	JH 47x90
			E	3.878	2.320	Butt	1	JH 47x90
S14	3	4195	B	3.048	1.512	Cross	3	Pair of Wire Dog Staples
			D	3.048	1.512	Cross	3	Pair of Wire Dog Staples
S15	1	2492	E	1.936	1.422	Butt	1	JH 47x90
			C	3.105	1.107	Cross	1	Pair of Wire Dog Staples
S16	2	4710	B	4.234	2.123	Cross	2	Pair of Wire Dog Staples
			F	3.419	2.065	Butt	2	JH 47x90
S17	1	4710	B	4.234	2.123	Cross	1	Pair of Wire Dog Staples
			F	3.419	2.065	Cross	1	Pair of Wire Dog Staples
S18	4	4710	B	4.190	2.117	Cross	4	Pair of Wire Dog Staples
			F	4.190	2.117	Cross	4	Pair of Wire Dog Staples
S19	1	2480	B	2.888	1.284	Cross	1	Pair of Wire Dog Staples
			D	2.888	1.284	Cross	1	Pair of Wire Dog Staples
S20	1	2480	A	2.061	1.233	Cross	1	Pair of Wire Dog Staples
			C	2.061	1.233	Cross	1	Pair of Wire Dog Staples
T3	1	4870	H	4.447	2.087	Cross	1	Pair of Wire Dog Staples
			E	4.886	2.457	Cross	1	Pair of Wire Dog Staples
V1	1	2390	A			Wide		No fixing selected
V2	1	902	A			Wide		No fixing selected
V3	1	1566	A			Wide		No fixing selected
V4	1	800	A			Wide		No fixing selected
V5	1	1537	A			Wide		No fixing selected
V6	1	1220	A			Wide		No fixing selected
V7	1	2120	A			Wide		No fixing selected
V8	1	1190	A			Wide		No fixing selected
J5	1	2492	B	4.129	1.652	Cross	1	Pair of Wire Dog Staples
			F	2.090	1.480	Butt	1	JH 47x90
J10	1	2332	B	3.819	1.508	Cross	1	Pair of Wire Dog Staples
			F	1.739	1.248	Butt	1	JH 47x90
J13	1	2332	B	3.819	1.508	Cross	1	Pair of Wire Dog Staples
			F	1.739	1.248	Butt	1	JH 47x90
J19	1	2657	B	4.426	1.783	Cross	1	Pair of Wire Dog Staples
			F	2.466	1.726	Butt	1	JH 47x90
J22	1	2657	B	4.426	1.783	Cross	1	Pair of Wire Dog Staples
			F	2.466	1.726	Butt	1	JH 47x90
J28	1	2367	B	3.889	1.541	Cross	1	Pair of Wire Dog Staples
			F	1.814	1.297	Butt	1	JH 47x90
J31	1	2367	B	3.889	1.541	Cross	1	Pair of Wire Dog Staples
			F	1.814	1.297	Butt	1	JH 47x90
J34	1	2492	B	6.236	2.601	Cross	1	Pair of Wire Dog Staples
			F	4.504	2.867	Butt	1	JH 47x90
S3	1	4710	B	7.106	4.150	Cross	1	CT400
			F	7.106	4.150	Cross	1	CT400
T1	1	6830	A	11.890	7.555	Butt	1	Pair of MultiGrips
			F	11.631	6.959	Cross	1	CT400
T2	1	6830	B	8.323	4.703	Cross	1	CT400
			G	11.016	7.121	Butt	1	Pair of MultiGrips
T4	1	7160	B	12.178	7.450	Cross	1	CT400
			G	12.190	7.459	Cross	1	CT400
T5	1	6580	B	10.450	6.398	Cross	1	CT400
			G	10.454	6.401	Cross	1	CT400
S13	1	4195	A	16.881	10.382	Cross	1	CT200 pair
			E	9.543	5.437	Cross	1	CT400
S21	1	4870	B	11.813	6.874	Cross	1	CT400
			H	18.885	11.484	Cross	1	CT200 pair

VIP Frames & Trusses

Job:	41419	Client:	Mike Greer Homes NC	Site:	New House
		Phone:			Lot 77 Highgate for truss
Description:					
Building Consent No.:					
Mitek 20/20 Engineering 4.6.6.246					

Consent Issued BC170237

BC170237

Phone:

Printed: 10:29:33 24 Nov 2016

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.



PROLAM SUMMARY

Customer/Project: Mike Greer Homes NC
Physical Address: Lot 77 Highgate for truss
Designer: Chris Nottingham, Vip Frames and Trusses
200 Maces Road, Bromley, Christchurch 8062
E: chrisn@vft.co.nz P: 0800 7736245

Beam - F

Prolam Lintels Supporting Girder/Setback Trusses

Building Type	House	Roof Weight	Light with Ceiling
Timber	Pine, Machined	Roof Load	0.40 kPa
Treatment	H1.2	Live Load	0.25 kPa uniform
Visual	No		1.10 kN concentrated
Exposed	No	Wind Zone	High (44.0 m/s)
Roof Pitch	28 °	Snow Region	Region N4
Eaves	400 mm	Altitude	100 m
Position of Girder Truss on Lintel	2.42 m	Ground Snow Load	0.90 kPa
Setback	2.40 m	Roof Snow Load	0.63 kPa
Supported Truss Span	6.50 m		
Lintel Span	4.86 m		

Use Prolam PL12H1-350100 315 x 90mm PL12

Capacity Ratio	1.2
Long Term Deflection	4.3 mm
Max. Bearing Reaction	13.3 kN
Load Combination	1.2G + Su
Minimum Bearing Length	35 mm
Uplift Fixing Requirements	8.5 kN Characteristic Load

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PRODUCER STATEMENT



Tasman Consulting Engineers Limited has been engaged by Prowood to provide design services for the development of the Prolam Online calculator.

The design has been carried out using sound and widely accepted engineering principles to the requirements of AS/NZS1170:2002, NZS3603:1993 and NZS3604:2011 using the timber properties for GL8, GL12 and GL17 glulam and LVL15.

I believe on reasonable grounds that the above design will meet the requirements of clauses B1/VM1 of the Building Code Documents.

David King

David King

ME (civil, MIPENZ CPEng (no 145511) IntPE

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

24 November 2016

283 Waiwhero Rd P O Box 413 Motueka New Zealand Phone 03 526 7436 Fax 03 526 7437

Email: info@prowoodnz.com • www.prolamnz.com

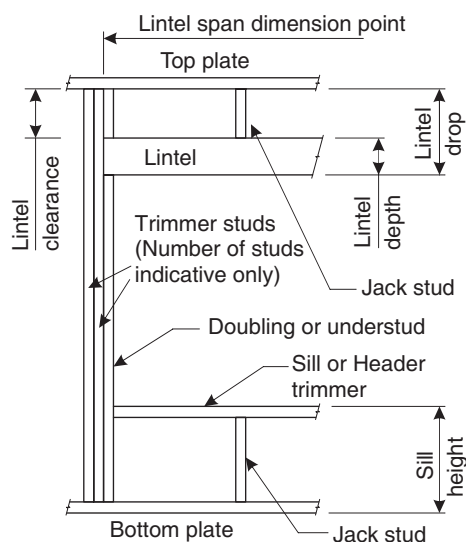


LINTEL FIXING SCHEDULE ALTERNATIVE TO TABLE 8.14 & FIGURE 8.12 NZS 3604:2011

NOTE:

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

DEFINITIONS



Lintel Supporting Girder Trusses:

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

Notes:

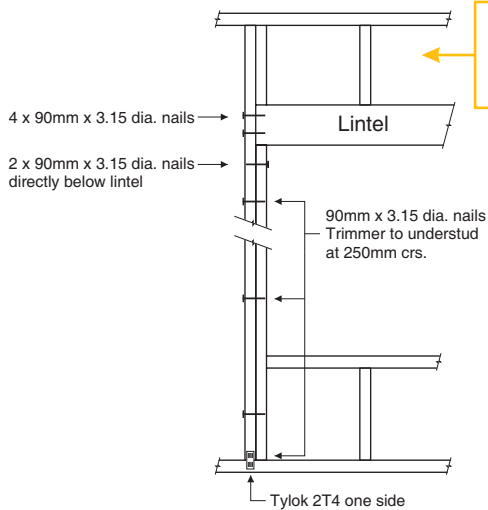
- 1) Roof Tributary Area = approx. 1/2 x (Total roof area on girder and rafter trusses supported by lintel)
- 2) Assumed girder truss is at mid-span or middle third span of lintel
- 3) Use similar fixings for both ends of lintel
- 4) All other cases require specific engineering design

SELECTION CHART FOR LINTEL FIXING

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

INTEL FIXING OPTIONS

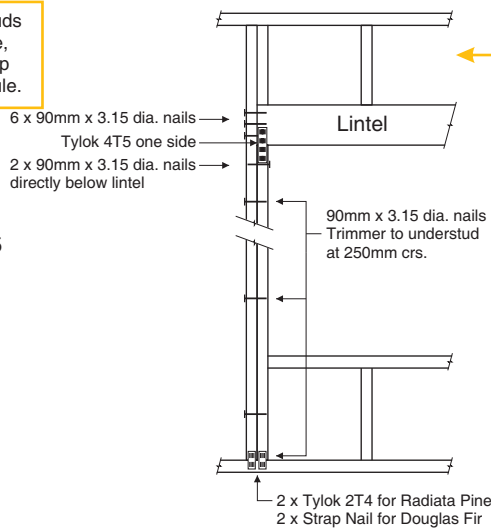
TYPE E 1.4 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only.
Refer Table 8.5
NZS 3604:2011

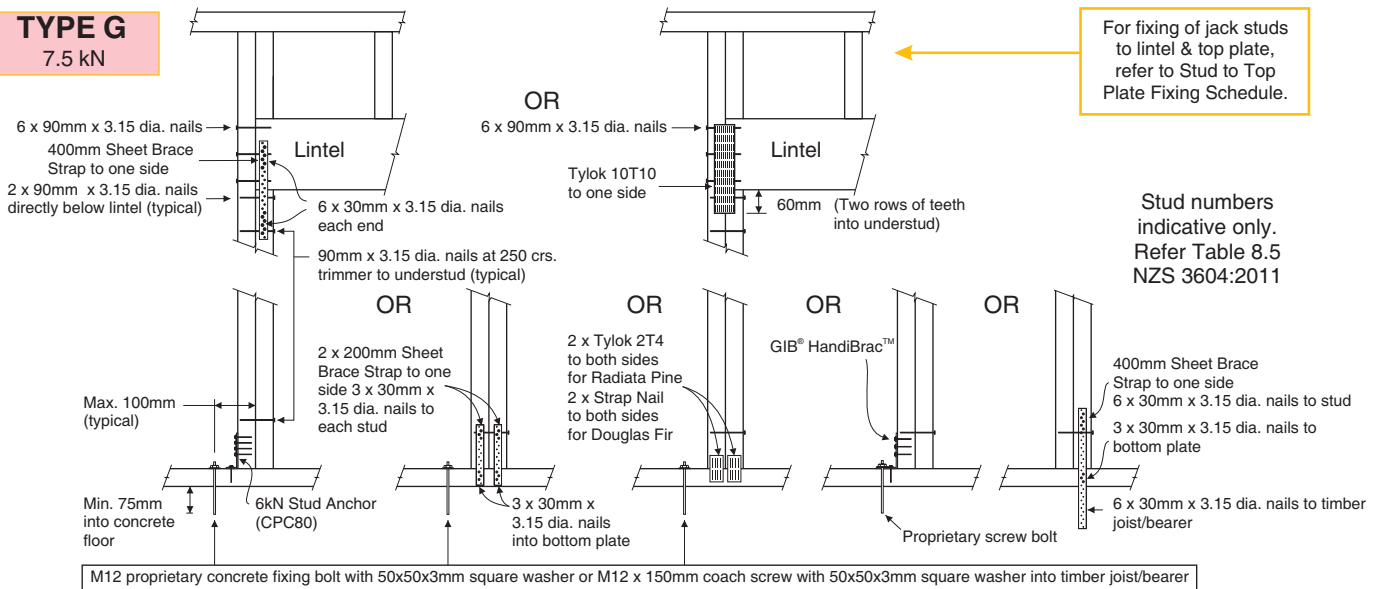
TYPE F 4.0 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only.
Refer Table 8.5
NZS 3604:2011

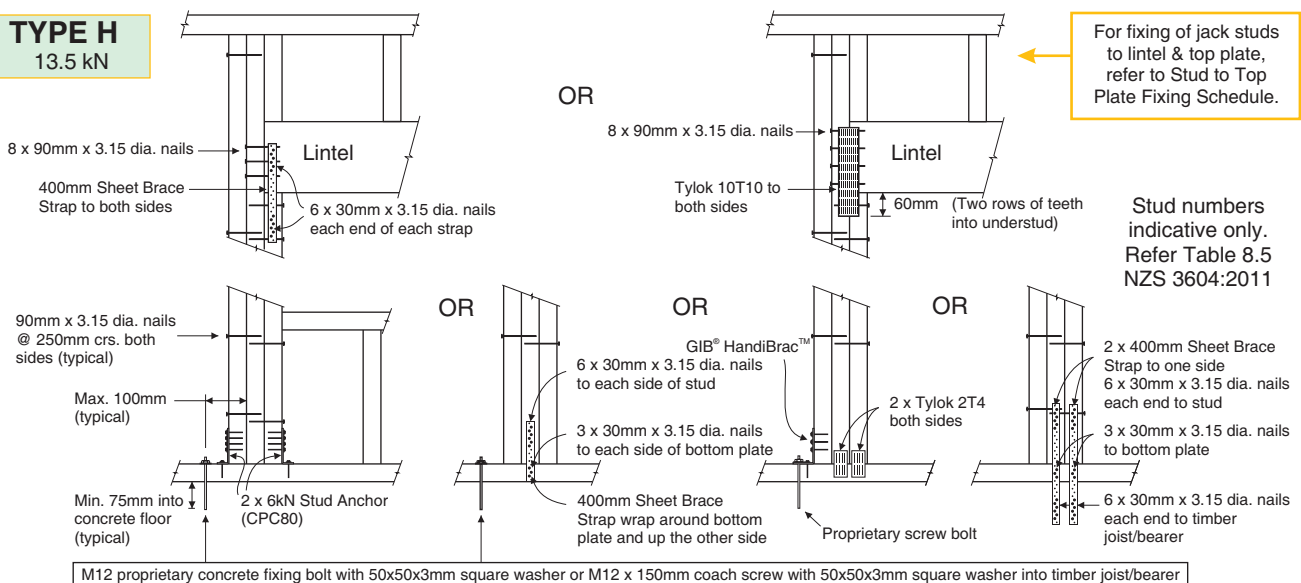
TYPE G 7.5 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only.
Refer Table 8.5
NZS 3604:2011

TYPE H 13.5 kN



For fixing of jack studs to lintel & top plate, refer to Stud to Top Plate Fixing Schedule.

Stud numbers indicative only.
Refer Table 8.5
NZS 3604:2011

PROLAM[®] products are manufactured to the requirements of AS/NZS 1328.1:1998 Glue Laminated Structural Timber, and AS/NZS 1491:1996 Finger Jointed Structural Timber under an approved quality system based on the ISO 9000 series of standards. As such if the product is used in accordance with **PROLAM**[®] product literature, it will meet the durability clauses of the New Zealand Building Code B2.

Subfloor Applications:

- ☒ **PROLAM**[®] may be used where approved practices for clearance and ventilation are used.

External Use:

- ☒ **PROLAM**[®] is recommended for weather exposed applications if sealed and maintained in accordance with **PROLAM**[®] literature.

Preservative Treatment:

- ☒ **PROLAM**[®] Beams are CCA H3.2 treated as defined by NZS 3640:2003, for weather exposed applications, such as verandah beams, deck bearers, and subfloor applications.
- ☒ **PROLAM**[®] Posts are CCA H5 treated as defined by NZS 3640:2003 for in-ground and weather exposed applications, such as deck piles, verandah posts and similar applications.

Storage of **PROLAM**[®]:

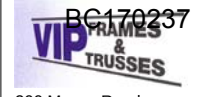
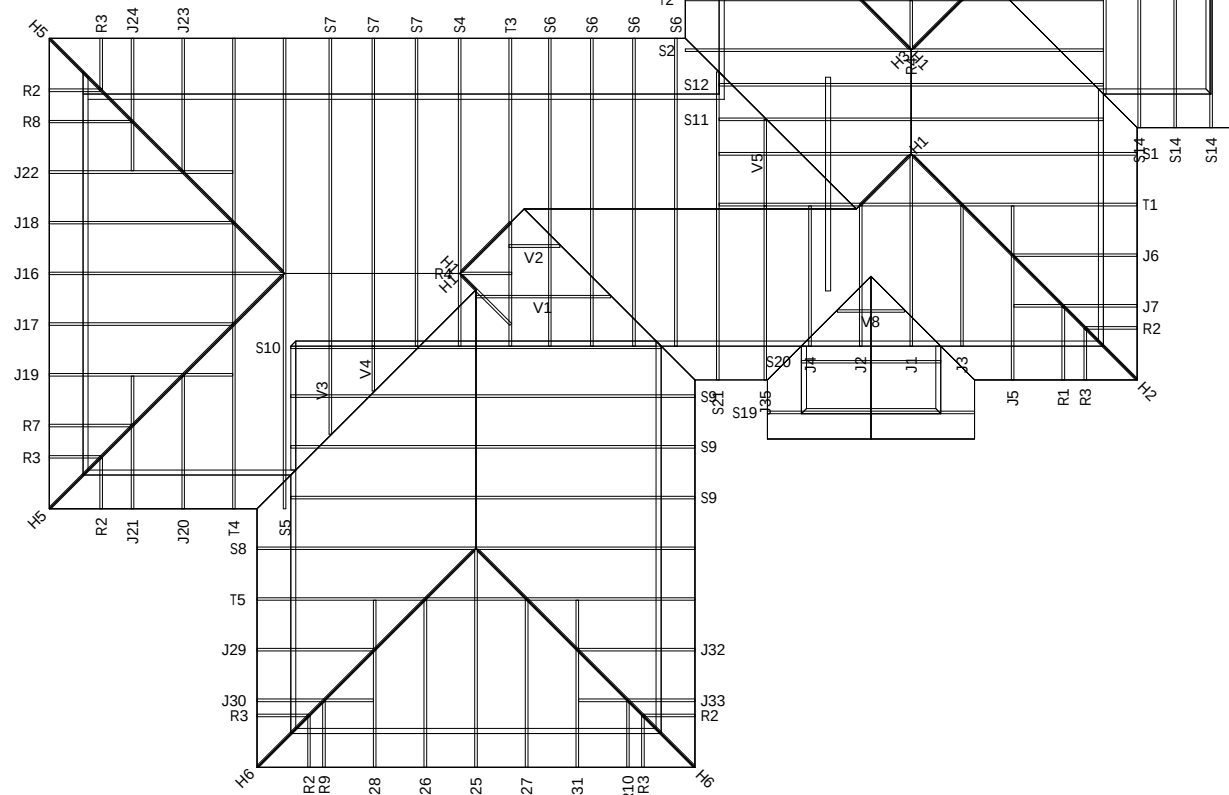
- ☒ To ensure **PROLAM**[®] remains straight and true at the time of installation, follow the below recommendations:
 1. Store under cover so that it remains dry until installation.
 2. Stack clear of the ground for good ventilation.
 3. Stack on bearers to keep flat and straight.

Branded **PROLAM**[®]:

- ☒ **PROLAM**[®] is branded for your protection. Look-alike materials may not perform to the standard of **PROLAM**[®]. For your protection do not accept unauthorized substitution

Consent Issued BC170237

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant



200 Maces Road
PO Box 35-193 Christchurch
Ph (03) 389 8200

JOB No 41419

Client: Mike Greer Homes NC
Job Name: New House
Address: Lot 77 Highgate for truss

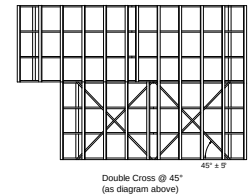
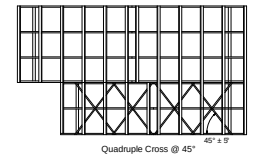
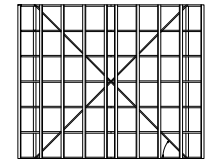
Pitch: 28.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.403

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Chris Nottingham

DATE 24 Nov,2016 PAGE 1 of

Roof Bracing Details

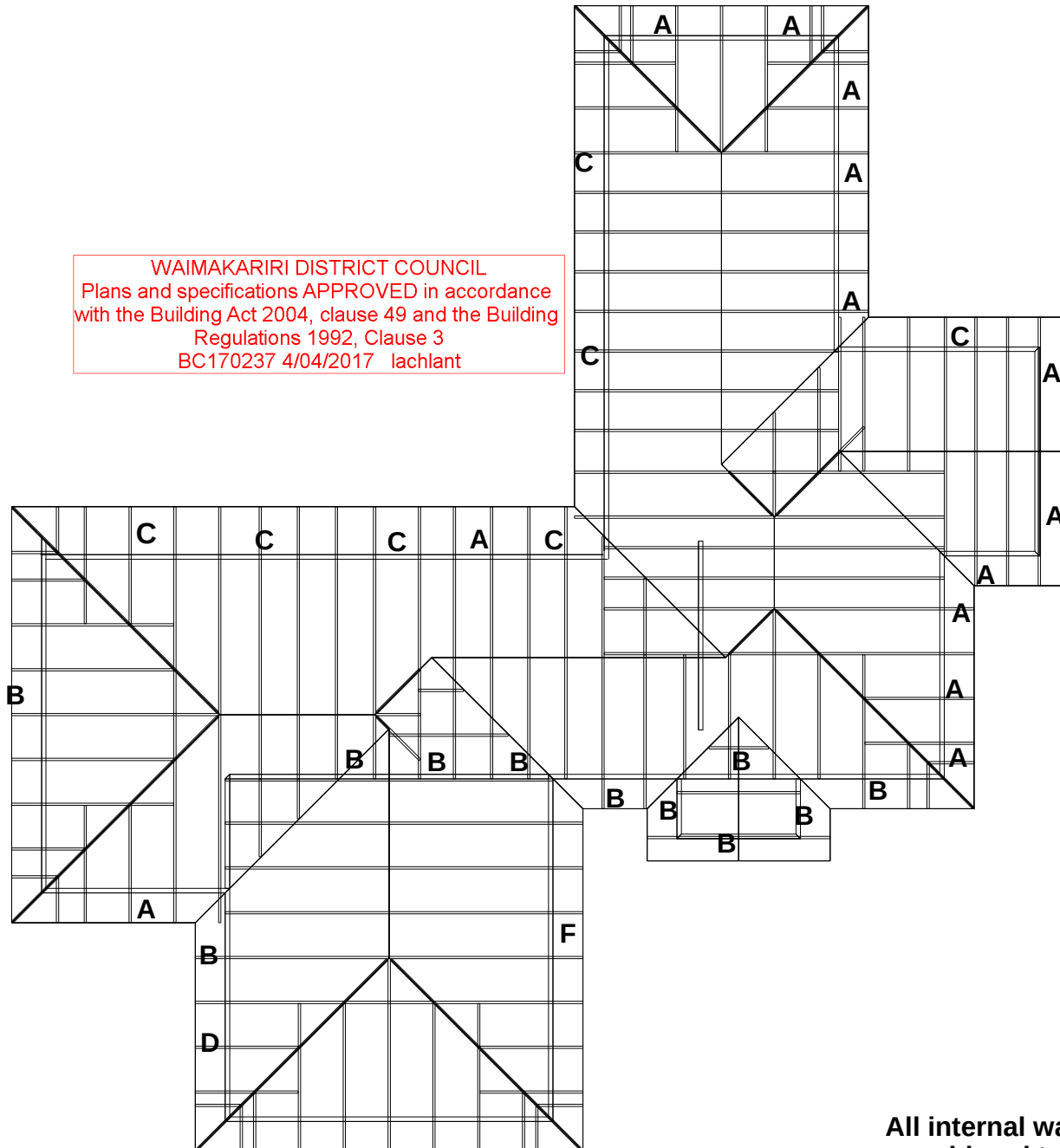


NOTES:

Refer to:
Lumberlok roof bracing brochure
07/2006

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

BC170237

VIP FRAMES & TRUSSES

200 Maces Road
PO Box 35-193 Christchurch
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JOB No 41419

Client: Mike Greer Homes NC
Job Name: New House
Address: Lot 77 Highgate for truss

Pitch: 28.000
Roof Material: Galv Iron .5mm
Soffit Overhang: 600
Wind Area: High
Snow Load: 0.403

Trusses And Rafters At 900 Centres
Unless Stated Otherwise

DRAWN BY Chris Nottingham

DATE 24 Nov,2016 PAGE 1 of

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

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

Unless otherwise stated all lintels are as per NZS3604 2011

LINTEL	SIZE	
A	2/90x45	PL8H1
B	2/140x45	PL8H1
C	2/190x45	PL8H1
D	2/240x45	PL8H1
E	2/290x45	PL8H1
F	PI 12 350 Prolam	

Slab Thickening Details

2 - D12 bars both ways

Loadbearing timber wall

75mm cover for steel

375

375x375 square concrete pad

100

200

TYPE FP1 - 375x375mm Pad

2 - D12 bars with R10 ties @ 600 crs

Loadbearing timber wall

75mm cover for steel

300

450

100

200

TYPE FS1 - 300mm Strip footing

3 - D12 bars both ways

Loadbearing timber wall

75mm cover for steel

450

450x450 square concrete pad

100

200

TYPE FP2 - 450x450mm Pad

3 - D12 bars with R10 ties @ 600 crs

Loadbearing timber wall

75mm cover for steel

450

450

100

200

TYPE FS2 - 450mm Strip footing

**USG Boral Bracing Calculator**
USG BORAL
 INNOVATION INSPIRED BY YOU.™
**Project description:**

Project Name	16184D MGHNC
Project Address	Lot 77 Highgate
	Rangiora
	New Zealand

Wind Zone:	High	Determined from information below
Region: A Not a Lee Zone	Roughness: Open	Exposure: Exposed Topography: T1

Earthquake Zone	2	Subsoil Classification	D
-----------------	---	------------------------	---

Summary of Bracing Demand and Resistance: Units BU's.

	Upper storey		Lower storey		Subfloor	
Wind	Demand	Provided	Demand	Provided	Demand	Provided
Along Direction	560	751	N/A	0	N/A	0
Across Direction	844	1023	N/A	0	N/A	0

Earthquake	Demand	Provided	Demand	Provided	Demand	Provided
Along Direction	622	805	N/A	0	N/A	0
Across Direction	622	1117	N/A	0	N/A	0

Bracing Check			
Wall Along Direction	OK	N/A	N/A
Wall Across Direction	OK	N/A	N/A

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**USG Boral Bracing Calculator**
USG BORAL
 INNOVATION INSPIRED BY YOU.™
**Building and Roof Description**

Number of storeys:	1	Building is founded on a slab (no subfloor)
RoofH = Roof height above eaves (m) =	2.5	
LR = Maximum roof length (m) =	13.35	
WR = Maximum roof width (m) =	11.468	
Roof slope (degrees) is in the range	25 to 45	
There is no room in the roof space		
Roof cladding weight =	Light	
Floor live load =	2 kPa	

Single Storey Details

Average exterior wall cladding weight =	Heavy	
LU = Building length (m) =	12.15	
WU = Building width (m) =	10.27	
AU = Gross building plan area (m ²) =	103.77	
HUI = Interior wall height (m) =	2.40	
HUE = Exterior wall height (m) =	2.10	

No Lower Storey

No Subfloor

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USG Boral Bracing Calculator

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(a) Resistance of Bracing Systems Used in the Single/Upper Floor in the Across Direction.

Line Name	Bracing Element Label	Bracing Wall Type	1 or Wall Length in Metres	Wall Height (metres)	Wall Angle in Degrees	Wind BU's	EQ BU's
M	M1	EPB1 0.6	0.9	2.4	0	85.5	94.5
	M2	EPB1 0.6	1	2.4	0	95	105
	M3	EPB1 0.6	0.6	2.4	0	57	63
	M4	None	1	2.4	0	0	0
	M5	None	1	2.4	0	0	0
	M6	None	1	2.4	0	0	0
N	N1	UB1S 0.4 - 6.0	0.6	2.4	0	33	30
	N2	UB1S 0.4 - 6.0	1.9	2.4	0	104.5	95
	N3	None	1	2.4	0	0	0
	N4	None	1	2.4	0	0	0
	N5	None	1	2.4	0	0	0
	N6	None	1	2.4	0	0	0
O	O1	EPB1 1.2	1.8	2.4	0	216	243
	O2	EPB1 1.2	1.2	2.4	0	144	162
	O3	None	1	2.4	0	0	0
	O4	None	1	2.4	0	0	0
	O5	None	1	2.4	0	0	0
	O6	None	1	2.4	0	0	0
P	P1	EPB1 1.2	1.2	2.4	0	144	162
	P2	EPB1 1.2	1.2	2.4	0	144	162
	P3	None	1	2.4	0	0	0
	P4	None	1	2.4	0	0	0
	P5	None	1	2.4	0	0	0
	P6	None	1	2.4	0	0	0
Q	Q1	None	1.8	2.4	0	0	0
	Q2	None	1.2	2.4	0	0	0
	Q3	None	1	2.4	0	0	0
	Q4	None	1	2.4	0	0	0
	Q5	None	1	2.4	0	0	0
	Q6	None	1	2.4	0	0	0
R	R1	None	1.8	2.4	0	0	0
	R2	None	1.2	2.4	0	0	0
	R3	None	1	2.4	0	0	0
	R4	None	1	2.4	0	0	0
	R5	None	1	2.4	0	0	0
	R6	None	1	2.4	0	0	0
S	M1	None	1	2.4	0	0	0
	M2	None	1	2.4	0	0	0
	M3	None	1	2.4	0	0	0
	M4	None	1	2.4	0	0	0
	M5	None	1	2.4	0	0	0

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Regulations 1992, Clause 3
BC170237 4/04/2017 - Iachant

Consent Issued BC170237

Building Consent BC170237
Received 3/4/2017

	M6	None	1	2.4	0	0	0
Total Bracing Achieved						1023	1116.5

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(b) Resistance of Bracing Systems Used in the Single/Upper Floor in the Along Direction.

Line Name	Bracing Element Label	Bracing Wall Type	1 or Wall Length in Metres	Wall Height (metres)	Wall Angle in Degrees	Wind BU's	EQ BU's
A	A1	EPB1 1.2	1.2	2.4	0	144	162
	A2	EPB1 1.2	1.2	2.4	0	144	162
	A3	None	1	2.4	0	0	0
	A4	None	1	2.4	0	0	0
	A5	None	1	2.4	0	0	0
	A6	None	1	2.4	0	0	0
B	B1	UB1S 0.4 - 6.0	2.9	2.4	0	159.5	145
	B2	EPB1 0.4	0.4	2.4	0	32	38
	B3	EPB1 0.4	0.4	2.4	0	32	38
	B4	None	1	2.4	0	0	0
	B5	None	1	2.4	0	0	0
	B6	None	1	2.4	0	0	0
C	C1	UB1S 0.4 - 6.0	0.7	2.4	0	38.5	35
	C2	EPB1 1.2	1.2	2.4	0	144	162
	C3	EPB1 0.6	0.6	2.4	0	57	63
	C4	None	1	2.4	0	0	0
	C5	None	1	2.4	0	0	0
	C6	None	1	2.4	0	0	0
D	D1	None	1	2.4	0	0	0
	D2	None	1	2.4	0	0	0
	D3	None	1	2.4	0	0	0
	D4	None	1	2.4	0	0	0
	D5	None	1	2.4	0	0	0
	D6	None	1	2.4	0	0	0
E	E1	None	1	2.4	0	0	0
	E2	None	1	2.4	0	0	0
	E3	None	1	2.4	0	0	0
	E4	None	1	2.4	0	0	0
	E5	None	1	2.4	0	0	0
	E6	None	1	2.4	0	0	0
F	F1	None	1	2.4	0	0	0
	F2	None	1	2.4	0	0	0
	F3	None	1	2.4	0	0	0
	F4	None	1	2.4	0	0	0
	F5	None	1	2.4	0	0	0
	F6	None	1	2.4	0	0	0
G	G1	None	1	2.4	0	0	0
	G2	None	1	2.4	0	0	0
	G3	None	1	2.4	0	0	0
	G4	None	1	2.4	0	0	0
	G5	None	1	2.4	0	0	0

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BC170237 4/04/2017 - Incompliant

Consent Issued BC170237

Building Consent BC170237
Received 3/4/2017

	G6	None	1	2.4	0	0	0
			Total Bracing Achieved			751	805

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BC170237 4/04/2017 lachlant

**USG Boral Bracing Calculator**
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**Project description:**

Project Name	16184D MGHNC
Project Address	Lot 77 Highgate
	Rangiora
	New Zealand

Wind Zone:	High	Determined from information below
Region: A Not a Lee Zone	Roughness: Open	Exposure: Exposed Topography: T1

Earthquake Zone	2	Subsoil Classification	D
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Summary of Bracing Demand and Resistance: Units BU's.

	Upper storey		Lower storey		Subfloor	
Wind	Demand	Provided	Demand	Provided	Demand	Provided
Along Direction	478	842	N/A	0	N/A	0
Across Direction	733	1090	N/A	0	N/A	0

Earthquake	Demand	Provided	Demand	Provided	Demand	Provided
Along Direction	565	921	N/A	0	N/A	0
Across Direction	565	1127	N/A	0	N/A	0

Bracing Check						
Wall Along Direction	OK		N/A		N/A	
Wall Across Direction	OK		N/A		N/A	

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**Building and Roof Description**

Number of storeys:	1	Building is founded on a slab (no subfloor)
RoofH = Roof height above eaves (m) =	2.5	
LR = Maximum roof length (m) =	11.65	
WR = Maximum roof width (m) =	9.79	
Roof slope (degrees) is in the range	25 to 45	
There is no room in the roof space		
Roof cladding weight =	Light	
Floor live load =	2 kPa	

Single Storey Details

Average exterior wall cladding weight =	Heavy	
LU = Building length (m) =	10.45	
WU = Building width (m) =	8.74	
AU = Gross building plan area (m ²) =	101.80	
HUI = Interior wall height (m) =	2.40	
HUE = Exterior wall height (m) =	2.10	

No Lower Storey

No Subfloor

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USG Boral Bracing Calculator

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(a) Resistance of Bracing Systems Used in the Single/Upper Floor in the Across Direction.

Line Name	Bracing Element Label	Bracing Wall Type	1 or Wall Length in Metres	Wall Height (metres)	Wall Angle in Degrees	Wind BU's	EQ BU's
M	M1	EPB1 0.6	0.6	2.4	0	57	63
	M2	EPB1 1.2	1.8	2.4	0	216	243
	M3	EPB1 0.6	0.6	2.4	0	57	63
	M4	None	1	2.4	0	0	0
	M5	None	1	2.4	0	0	0
	M6	None	1	2.4	0	0	0
N	N1	UB1S 0.4 - 6.0	2.1	2.4	0	115.5	105
	N2	EPB1 0.6	0.6	2.4	0	57	63
	N3	EPB1 0.6	0.6	2.4	0	57	63
	N4	None	1	2.4	0	0	0
	N5	None	1	2.4	0	0	0
	N6	None	1	2.4	0	0	0
O	O1	UB1S 0.4 - 6.0	1.8	2.4	0	99	90
	O2	UB1S 0.4 - 6.0	1.5	2.4	0	82.5	75
	O3	EPB1 0.6	0.8	2.4	0	76	84
	O4	None	1	2.4	0	0	0
	O5	None	1	2.4	0	0	0
	O6	None	1	2.4	0	0	0
P	P1	UB1S 0.4 - 6.0	2.2	2.4	0	121	110
	P2	EPB1 0.6	1	2.4	0	95	105
	P3	EPB1 0.6	0.6	2.4	0	57	63
	P4	None	1	2.4	0	0	0
	P5	None	1	2.4	0	0	0
	P6	None	1	2.4	0	0	0
Q	Q1	None	1	2.4	0	0	0
	Q2	None	1	2.4	0	0	0
	Q3	None	1	2.4	0	0	0
	Q4	None	1	2.4	0	0	0
	Q5	None	1	2.4	0	0	0
	Q6	None	1	2.4	0	0	0
R	R1	None	1	2.4	0	0	0
	R2	None	1	2.4	0	0	0
	R3	None	1	2.4	0	0	0
	R4	None	1	2.4	0	0	0
	R5	None	1	2.4	0	0	0
	R6	None	1	2.4	0	0	0
S	M1	None	1	2.4	0	0	0
	M2	None	1	2.4	0	0	0
	M3	None	1	2.4	0	0	0
	M4	None	1	2.4	0	0	0
	M5	None	1	2.4	0	0	0

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 BC170237 4/04/2017 lachlan

Consent Issued BC170237

Building Consent BC170237
Received 3/4/2017

	M6	None	1	2.4	0	0	0
Total Bracing Achieved						1090	1127

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(b) Resistance of Bracing Systems Used in the Single/Upper Floor in the Along Direction.

Line Name	Bracing Element Label	Bracing Wall Type	1 or Wall Length in Metres	Wall Height (metres)	Wall Angle in Degrees	Wind BU's	EQ BU's
A	A1	EPB1 0.6	0.6	2.4	0	57	63
	A2	EPB1 1.2	1.8	2.4	0	216	243
	A3	EPB1 0.6	0.6	2.4	0	57	63
	A4	None	1	2.4	0	0	0
	A5	None	1	2.4	0	0	0
	A6	None	1	2.4	0	0	0
B	B1	EPB1 0.6	0.6	2.4	0	57	63
	B2	EPB1 1.2	1.2	2.4	0	144	162
	B3	UB1S 0.4 - 6.0	1.5	2.4	0	82.5	75
	B4	None	1	2.4	0	0	0
	B5	None	1	2.4	0	0	0
	B6	None	1	2.4	0	0	0
C	C1	EPB1 0.6	0.6	2.4	0	57	63
	C2	EPB1 0.6	0.6	2.4	0	57	63
	C3	EPB1 0.6	0.6	2.4	0	57	63
	C4	EPB1 0.6	0.6	2.4	0	57	63
	C5	None	1	2.4	0	0	0
	C6	None	1	2.4	0	0	0
D	D1	None	1	2.4	0	0	0
	D2	None	1	2.4	0	0	0
	D3	None	1	2.4	0	0	0
	D4	None	1	2.4	0	0	0
	D5	None	1	2.4	0	0	0
	D6	None	1	2.4	0	0	0
E	E1	None	1	2.4	0	0	0
	E2	None	1	2.4	0	0	0
	E3	None	1	2.4	0	0	0
	E4	None	1	2.4	0	0	0
	E5	None	1	2.4	0	0	0
	E6	None	1	2.4	0	0	0
F	F1	None	1	2.4	0	0	0
	F2	None	1	2.4	0	0	0
	F3	None	1	2.4	0	0	0
	F4	None	1	2.4	0	0	0
	F5	None	1	2.4	0	0	0
	F6	None	1	2.4	0	0	0
G	G1	None	1	2.4	0	0	0
	G2	None	1	2.4	0	0	0
	G3	None	1	2.4	0	0	0
	G4	None	1	2.4	0	0	0
	G5	None	1	2.4	0	0	0

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None and specifications APPROVED in accordance
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BC170237 4/04/2017 lachlan

Consent Issued BC170237

Building Consent BC170237
Received 3/4/2017

	G6	None	1	2.4	0	0	0
			Total Bracing Achieved			841.5	921

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SECTION 4

H1 Calculations

Risk Matrix

42 Watkins Drive, Highgate Estate

Risk matrix

EAST ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high – Risk Factor = 1

Number of Storeys:

low – Risk Factor = 0

Roof / Wall Intersection Design:

low – Risk Factor = 0

Eaves Width:

medium – Risk Factor = 1

Envelope Complexity:

medium – Risk Factor = 1

Deck Design:

low – Risk Factor = 0

Total Risk Score: – Risk Severity = 3

SOUTH ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high – Risk Factor = 1

Number of Storeys:

low – Risk Factor = 0

Roof / Wall Intersection Design:

low – Risk Factor = 0

Eaves Width:

medium – Risk Factor = 1

Envelope Complexity:

medium – Risk Factor = 1

Deck Design:

low – Risk Factor = 0

Total Risk Score: – Risk Severity = 3

WEST ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high – Risk Factor = 1

Number of Storeys:

low – Risk Factor = 0

Roof / Wall Intersection Design:

low – Risk Factor = 0

Eaves Width:

low – Risk Factor = 0

Envelope Complexity:

low – Risk Factor = 0

Deck Design:

low – Risk Factor = 0

Total Risk Score: – Risk Severity = 1

NORTH ELEVATION

NZBC E2 / AS1 External Moisture Risk Matrix

Wind Zone (per NZS 3604):

high – Risk Factor = 1

Number of Storeys:

low – Risk Factor = 0

Roof / Wall Intersection Design:

low – Risk Factor = 0

Eaves Width:

low – Risk Factor = 0

Envelope Complexity:

low – Risk Factor = 0

Deck Design:

low – Risk Factor = 0

Total Risk Score: – Risk Severity = 1

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42 Watkins Drive, Highgate Estate

H1 calculations

Insulated Floor Plan Area: 160.41m² over frame (including interior wall of garage)

Insulated Wall Area (wall length x stud height 2455mm):

North: 49.2m²

East: 42.28m²

South: 49.2m²

West: 42.28m²

E/S/W: 133.76m²

Total Wall opening Area:

North: 18.63m² or 37.87% of wall area

East: 7.56m² or 17.88% of wall area

South: 8.35m² or 16.97% of wall area

West: 13.08m² or 32.1% of wall area

E/S/W: 28.99m² or 21.67% of wall area

N/E/S/W: 47.62m² or 26.03% of wall area

North equals 50% or less for wall opening area. East, South and West equal 30% or less for total wall opening area. North, East, South and West equal 30% or less for total overall wall opening area.

Therefore, this building does comply with NZBC H1 to use the Schedule method.

NZBC H1 Schedule Method

Reference Building: R Value

Roof 3.3

Wall 2.0

Floor 1.3

Glazing (<30%) 0.26

Glazing (>30%) 0.34

Proposed Building:

Roof Type (Longrun Coloursteel on Trusses R3.6 Batts) 3.4

Wall Type 1 (Brick, 90x45 framing R2.6 Batts) 2.2

Wall Type 2 (Internal lining, 90x45 framing R 2.6 Batts) 2.1

Wall Type 3 (Brick, 140x45 framing, R2.6 Batts) 2.4

Floor (concrete slab) 1.3

Total Glazing (<30%) (Double Glazing) 0.26

(Total construction R-value from BRANZ Home Insulation Guide 5th ed.)

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SECTION 5

Specifications



SPECIFICATION OF MATERIALS TO BE SUPPLIED AND WORK TO BE DONE FOR NEW DWELLING

AT:

**LOT 77 DP 497145,
42 WATKINS DRIVE,
HIGHGATE ESTATE,
RANGIORA.**

DesignNZ
Division of DSC Group Ltd
P.O. Box 23,
Woodend 7641
P 03 310 0272
E admin@designnz.co.nz
W www.dscgroup.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
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PRELIMINARY & GENERAL

Owner: MGH North Canterbury
Address: 42 Watkins Drive
Local Authority: Waimakariri District Council
Site Description: Lot 77, DP 497145

Scope:

The erection and completion in the most workmanlike manner all the works described herein and as shown on the drawings.

Documentation: Drawings
Specification
Bracing Calculations
Truss Design Certificate
Risk Matrix Worksheet
Energy Efficiency Worksheet
Ground Conditions Report
Certificate of Title

Conditions of Contract:

The whole of the work shall be carried out in accordance with this specification, the accompanying drawings and the New Zealand Standards Specification. Conditions of Contract for Building and Civil Engineering Construction NZS 3910 and the New Zealand Building Code 2004 & its Amendments.

Standards:

All work shall be carried out in accordance with the New Zealand Building Act 2004 and amendments. Acceptable solutions and verification methods as defined in the Code Handbook and approved documents and relevant NZS shall form part of this specification, along with Local Body Regulations and requirements

Dimensions: Figured dimensions are to be used in preference to scaled. If any discrepancies in the plans and specification are found by the Contractor, the Designer or Owner shall be notified before the work is commenced.

Consents & Fees:

The Building Consent and associated fees shall be paid for by the Builder. The Main Contractors shall ensure that all necessary Consents and/or approvals have been applied for and uplifted before commencing work. The Contractor shall keep on site the approved Consent documents and shall bring to the Designer's and/or Owner's notification, any amendments endorsed on the plans and/or specification.

Insurance:

The Main Contractor shall insure the works in an approved Fire Office and such insurance shall cover the full value of the premises when completed. The Contractor shall be held responsible for any damage or loss by fire to the works and such things as are covered by the 'Policy', until the completion of the contract. Receipts for such policies shall be lodged with the Owner before the first progress payment is made.

Sub-contractors:

Sub-contractors will be responsible to the Main Contractor for the carrying out of their respective work to a satisfactory standard and any work not accepted will be replaced at the Sub-contractor's expense.

Materials:

Materials shall be the best of their respective kinds as specified. All materials for which there is a New Zealand and/or Australian Standard Specification shall conform hereto. All workmanship shall be consistent with good trade practice.

Alternatives:

Alternatives to Trade Lines/items as specified throughout this Specification shall be allowed where technical information and performance shows that the same requirements for that product are met.

Attendance upon all trades:

The Sub-contractor concerned shall inspect all preparatory work against which his work is to be placed and report immediately to the Main Contractor, any defects which would affect the satisfactory execution or permanence of his work and shall not proceed until such preparatory work is satisfactory. The Main Contractor shall co-operate with, attend upon, and provide all reasonable assistance for all other Sub-contractors.

Plant & temporary works:

Each Sub-contractor shall allow to provide all necessary plant and temporary work, including temporary framing, fabrication and setting out equipment, together with all labour and tools, implements, ladders and everything necessary for the due performance of the works. He will be entirely responsible for the safety and performance and efficiency of all methods used in the carrying out of his section of the contract. The Main Contractor shall provide scaffolding during the course of the contract.

Existing Services:

The Contractor shall locate all underground services affected by the excavation work. Any details that are provided to the Contractor of existing private underground services are done so in good faith. The contractor is responsible for location all existing underground services before working in any area. The Contractor is required to carry out a detection survey of the site to ensure there are no buried operative electric cables.

Give all required notices to the Water, Sewage, Gas & Electricity Authorities or Companies, the territorial Authority and Telecom and other telecommunications companies and pay all relevant fees and charges.

Protect existing services, rectify any damage or interference to them and provide temporary services whilst repairs are being carried out.

Protection of Property:

The Contractor shall protect the Owners', Council and adjoining properties and shall make good all damage caused thereto by the building operation by vehicles, or by workmen under his control. The Contractor shall be entirely responsible for all apparatus, equipment and appurtenances furnished by him or his sub-contractors.

Site Security:

The Contractor shall provide temporary fencing to the site to prevent unauthorised access. No person shall be allowed on site without the permission of the Contractors representative.

Cleaning:

Upon completion of each Sub-contractor's work comprised in this contract, he shall take down and clear away all plant and temporary work involved in his section of the work and leave the building and site ready for the next Trade. All trade debris is to be removed from the site and the Works left clean with all services and mechanical parts in working order.

Maintenance:

The Contractor & Sub-contractors shall maintain the Works for 90 days after Practical Completion, and any damage done through faulty workmanship or materials shall be made good at the Contractors expense.

Completion:

At the completion of the contract the Main Contractor shall provide written guarantees specified. The Main Contractor shall be responsible for applying for and receiving from the Territorial Authority a Code of Compliance Certificate. The building shall not be occupied until a Code of Compliance Certificate has been issued. The Final Payment Certificate shall not be issued unless the Contractor is in receipt of the Code Compliance Certificate, as-built drawings and Guarantees.

Trade Sections:

The specification is divided into trade sections for convenience and reference only, and it shall not be construed that each trade is a separate and complete contract. While reasonable care is taken to classify each trade, no claims will be admitted from Sub-contractors for work not specifically mentioned in a trade section, but which is provided for, (express or implied), elsewhere in the specification or shown on the drawings.

SITE PREPARATION

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B1/VM1, NZS 4431:1989.

Scope:

Contractor is advised to visit the site before signing a Contract Agreement to satisfy himself as to the site conditions, ground levels & all other matters affecting the execution of the works.

Clear site of vegetation & stockpile The Contractor shall assume that all trees and plants outside the building areas shall be retained. The Contractor shall be responsible for leaving the site clear and ready for final planting.

Bulk excavation to form platform.

Hard-filling as required.

EXCAVATION

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B1 Appendix A, NZS 4431:1989.

Scope:

Site strip as required.

The Contractor shall employ a Registered Surveyor to set out the positions of the foundations. Reference points, datums, and profiles or similar shall be established clear of the excavation to ensure they are not damaged or dislodged, and to allow easy and accurate checking at all times.

Excavate for foundation walls to the widths and depths as shown on the drawings and to an approved solid bearing. The Contractor shall clear and strip the areas on which fill material is to be placed. Saturated, weak or organic soils exposed by clearing and stripping shall be excavated and removed from site. At the discretion of the Engineer on site excavated material may be acceptable.

Excavations shall be kept free of water. Any ground water in the excavations shall be kept away by means of a sump dug clear of the excavation or by other dewatering systems as appropriate. All footings to be approved by the Local Council Building Inspector before pouring of concrete commence.

In the event of excavations for foundations being too deep in error, the Contractor shall, at his expense, fill the excavation to the true level with mass concrete as required by an Engineer.

Should any evidence of uncertified ground fill, peat rubbish or anything else, which would indicate that the ground would not have a minimum bearing capacity of 100kPa be discovered during excavation, a Structural Engineer shall be engaged to carry out soil tests, and if necessary alter foundation design.

Remove from building area & stockpile on site all surplus material from excavation not required for backfilling, levelling & grading. Owner shall use material for landscaping purposes.

Materials:

Backfill foundation walls and service trenches with 150mm compacted layers of AP40 to a minimum density of 750kg/m³, in layers 75mm min. and 150mm max. Compacted fill shall be well-graded rock free from organic matter and top soil. All hardfill shall be compacted with a vibrating roller or plate compacter in order to achieve not less than 90% density (NZS 4402 Pt 2).

Take care to not cause damage to any waterproof coatings or polythene protecting foundation walls from ground water entry.

Rubbish:

Allow to remove all rubbish from the site associated with the execution and completion of this section of the works.

FOUNDATION BY ENGINEER

Preliminary: Refer to the Drawings, PS1 & Specification supplied by Engineer.

DRIVEWAY CONSTRUCTION

Formed Driveway:

The Contractor is to maintain and protect Public Property and that of drainage, electricity, gas, highway, water, and telephone authorities and is to make good or pay for the reinstatement of all damage there to. Base course shall not be laid until the work under Drain layer is completed and power mains have been laid and all kerb & channel and walls have been laid.

Excavation and Grading:

Excavate to 250mm below finished driveway levels and grade to required falls. Provide and lay 150mm finished thickness of sub-base material, laid and compacted in 2 layers. Sub-base material shall be approved well-graded alluvial gravel (pit run) of 65mm max. size. It shall be laid at optimum moisture content and mechanically compacted to a level surface in accordance with NRB Specification F/1: Aug 1986.

Base course:

Provide and lay a 75mm finished layer of stabilised base course over the sub-base to driveway, finishing 25mm below the finished levels. Base course shall be crushed base course complying with NRB Specification M/4: June 1985. Place base course in such a manner as to minimise segregation. Consolidate base course by rolling with approved steel wheel rollers at optimum moisture content. In general the laying and compaction of the base course shall comply with NRB Specification B/2: July 1987. The finished surface shall be dense, tight, evenly graded to falls and free of dust and loose material, and to the approval of the Designer.

Finishing:

All concrete that is to remain visible when the building is complete shall comply with finish F6 as specified in NZS 3114:1987. The surface shall be finished to smooth even grades with no local depressions or bumps exceeding 6mm in 3m, and shall be such as to direct water into channels and sumps. Finish neatly against concrete kerbs, channels, slabs and foundations at other boundaries and at the correct surface level. Full precautions shall be taken to prevent disfigurement of any concrete work. Any disfigurement or damage shall be made good at the Contractors expense.

Exposed Aggregate:

A trial run is recommended before general application to determine timing and the depth of etching required. Agitate Retarder thoroughly before use. Place concrete in formwork (3 parts cement, 4 parts sand, 6 parts aggregate by volume is a typical mix) and wood float surface covering all stones. Brush, spray or roller on Retarder liberally, to the fresh concrete surface just as the surface water disappears.

Protect the coated surface from wind, rain or hot sun. Within 12 - 24 hours after application remove retarded top layer of mortar with a stiff broom and hosed water, leaving a clean exposed aggregate surface. If extremely small aggregate is used, it is important not to start the wash off too early, as bare spots may be created.

METALWORK

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC:B1, B2, D1, F4, AS/NZS 1163 , AS/NZS 1554.

Scope:

Site measure, manufacture and/or supply, and deliver to site.

600x600 roof access hatch in garage ceiling.

All other metalwork required to complete the work detailed.

Materials:

All exterior steelwork and that exposed to moisture shall be galvanised. All interior steelwork shall receive two coats of QD primer. Allow for balustrading to be powder coated, colour to be advised. All exposed bolts, nuts and washers shall be hot dipped galvanised.

Fixing:

Provide a written 5-year guarantee against faulty materials and Workmanship.

CARPENTRY

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B1, B2, D1, E2, E3, F4, G1, G3, G5, G6, G7, F4, H1, NZS 3602, NZS 3604, NZS 3617.

Scope:

Framing
Trusses
Bracing
Soffits
Cladding substrate
Door, window & air seal installation
Insulation
Ceiling battens
Linings
Skirtings
HWC stand
Bath frame
Miscellaneous Trims
Hardware & Miscellaneous Hardware
Installation of fittings
Assist other trades

Materials:

Timbers: All timbers shall be of their respective kinds and grades as specified and thoroughly seasoned. Timbers shall comply in all respects with NZS 3631 National Grading Rules and Kiln dry timber framing in accordance with NZS 3602.

In general, the following grades apply: all structural timber to be treated in accordance with NZBC Clause B2/AS1. Refer to the schedule on the working drawings.

Moisture Content: Framing timbers shall be left to dry to a moisture content of 16% before internal linings may commence.

Preservative Treatment: All treated framing timbers shall be Tanalith N.C.A. preservative treatment or other approved means to the N.Z.T.P.A. & comply with NZBC B2/AS amendments dated from May 2011

Gauging & Thicknesses: Rafters, purlins, plates, studs, dwangs and all other framing timbers shall be gauged and/or thicknesses to produce regular plane faces to walls, ceiling and all other surface finishes.

Fixing Of Timbers: All fixing of timbers shall be carried out in accordance with N.Z.S. 3604.

Framing tolerances must comply with the requirements of NZS 3604:2011. All framing must be made flush. All exposed wooden trim, and both faces and edges of all other dressed exterior finishing timbers shall be primed on all faces with approved exterior primer before being fixed in position.

Damp Proofing: Between all faces of framing timbers in contact with concrete, place a full length and width damp proof course 3 ply bituminous fabric.

Building Wrap: A building wrap complying with NZBC E2/AS1 Table 23 or breather - type membrane covered by a valid BRANZ Appraisal must be used in all circumstances. Building wrap must be installed horizontally and be continuous around corners. The wrap must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints. Where studs are at greater than 450mm centres, polypropylene strap or additional vertical cavity battens must be installed at maximum 300mm centres to prevent bulk insulation bulging into the cavity.

Flexible sill and jamb flashing tapes complying with NZBC E2/AS1, Paragraph 4.3.11 must be used around all penetration openings. All penetrations must have internal air seals applied.

Priming: Priming shall be Taubmans Exterior Wood-primer or equal approved. Prime all faces, edges, back joints and abutting surfaces of all exterior finishing timbers. All exterior joinery shall not be exposed for more than 6 weeks. Any surface so exposed, shall be re-primed.

Wall Framing: Frame up new walls with 90 x 45 kiln dried & treated studs at 600 crs and dwangs, as noted, plumb and true to line. Secure external wall bottom plates with Pryda or Mitek bottom plate anchors (or similar) @ 900 c/c. If the wall contains a sheet brace element, one anchor must be positioned 250mm from sheet edge (in addition to bracing requirements). Nail with 30 x 3.15mm Pryda or Mitek Product nails – 2 into edge of plate and 2 per tab, and one 75 x 4mm concrete nail adjacent to anchor, min 70mm from front edge, in accordance with manufacturer's instructions. Anchor plate required within 100mm of the 6kN stud to plate fixing.

Secure internal wall plates and Ramset fasteners to other walls at 600 or 900 crs (see Ramset Bottom Plate Fixing Solutions 2013 documentation). Plates at each end of braced walls shall have 12 dia Dynabolt fixing to slab.

Roof Framing: Frame up roof with gang nail trusses and framing timbers as indicated on the drawings. All trusses shall be secured with “Z” nails or framing anchors.

NOTE: fabricator of trusses shall provide a Registered Certificate for truss design.

Beams: Build in timber beams as shown. All beams to have minimum 50mm landing onto wall plates and shall be double studded under and blocked to provide support.

Ceilings:

Install USG BORAL GC37 metal ceiling battens as detailed at 600 crs for ceiling linings.

Insulation: Supply and fix R2.6 Ultra Fibreglass batts to exterior walls and walls between house & garage

R3.6 Fibreglass batts to ceilings

R2.6 Fiberglass batts to walls

Where required, Ceiling Battens are to be cut around top cords and chamfered to maintain the 25mm air gap required between insulation & roof underlay.

Bracing: Refer to bracing schedule on the drawings and calculation sheets. Provide and fix 7.5mm ply to areas noted on the drawings. All fixed in accordance with the Manufacturer's recommendation for Bracing.

NOTE: that to areas of braced wall, wall lining also form part of the bracing and shall be fixed as for sheet bracing element specified in and to comply with N.Z.S. 3604:2011 Bracing Requirements.

Plywood: Supply and fix H3.1 treated 7.5mm ply for Bracing as indicated on the drawings and Bracing Plan. Fix with 40 x 2.8mm SS annular grooved nails at 150mm crs, to perimeter of sheet and 300 crs to intermediate fixings

Exterior Linings:

Provide and fix 4. 5mm Hardiflex porch and soffit linings, V butt jointed

Interior Linings

(USG BORAL Board) 10mm USG BORAL plasterboard shall be used as lining material throughout the construction, taped and stopped and left ready for respective finishes. All board shall be fixed in accordance with the Manufacturer's instructions and specification, to no. 4 finish for painting. All board shall be sealed before finishes are applied. All linings are to be screw fixed.

10mm Wet Area Lining to Bathroom & Ensuite

13mm USG BORAL ceiling lining

Other linings as required for bracing

Wall linings adjacent to appliances and facilities shall have surfaces that can be easily maintained in hygienic condition, as per G3/AS1 clause 1.6.

Skirtings & Trim: Provide and fix 60x12 bevelled MDF skirtings, all mitred and scribed to jambs.

Sealants: All sealants used on this job shall be Expandite or equal approved, as recommended by the manufacturer.

Silaflex MS - where a paintable sealant required

Silaflex RTV - use for glass and cement

Silaflex N - use for metal work

Silaflex B - use for concrete, brick and timber

Air seals around windows to be approved PF rod and sealant installed in accordance with manufacturer's instructions

Cladding substrate: 7.5mm Construction plywood.

HWC stand restrained to NZBC:G12/AS1/6.11.4.

Hardware & Miscellaneous Hardware: as selected

Workmanship:

Co-operate with all other trades in setting out their work. Cut for, attend on and make good all other trades. Provide all fastenings, fixings, blocks and backings, unless otherwise specified for securing the work of other trades.

Work shall finish true to line and face and erected, plumb and level. Framing shall be accurately cut and fitted together, finely spiked, bolted, or connected as shown or specified. Punch all nails in exposed work. Where proprietary timber connectors are used, they shall be used strictly in accordance with the Manufacturer's instructions. All workmanship shall comply with N.Z.S.3604:2011 and The New Zealand Building Code Handbook and approved documents.

BRICK VENEER

- Preliminary:** Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract
- Standards:** NZBC: B1, B2, E2, NZS 4210, SNZ HB 4236, NZS 4229, NZS 4230, NZBC E2/AS1, AS/NZS 2699
- Scope:** Masonry Veneer to House & Garage.
- Materials: Bricks:**
70 series Ultra Lite brick veneer, factory-manufactured of uniform colour and texture, free from chipping.
- Bricks are to be thoroughly mixed from at least 3 pallets at any time.
- Mortar:** 4 parts sand to 1 part cement. Mortar colour to be selected
- Ties:** Ties in accordance with NZS 4210, Seismic Zone A, shall be hot-dipped galvanised, not more than 600 c/c horizontally & 320c/c vertically.
- Ventilation:** Rake out every third perpend directly above foundations, in courses below sill, galvanised lintels and soffits to allow for egress of moisture and allow to keep free from mortar droppings during the full duration of the laying.
- Workmanship:** All workmanship shall be carried out by trained and skilled tradesmen and shall be of a high standard. All work shall comply with N.Z.S. 4210:2001, Code of Practice for masonry construction, materials and workmanship and NZS3604:2011. Laying is to be in best tradesman-like manner, straight, true and free of deviations.
- Maintenance:** Building Owners are responsible for the maintenance of the brick veneer system. Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Weep holes must be kept clear of dust, dirt, spider webs and the like to ensure that moisture can continue to drain from the cavity.
- Completion:** On completion, clean down all bricks, remove blemishes, mortar disfigurements, etc. Remove all rubbish from the site associated with execution and completion of this section of the works

JAMES HARDIE LINEA WEATHERBOARD

Framing:	Framing is to be H1.2 treated and set-out must comply with NZS 3604 with studs @ 600 c/c and dwangs @ 600 c/c. Double studs are required at internal corners. Extra packers may be required at external corners.
Building Wrap:	Proprietary building wrap, fixed in accordance with NZBC:E2 /AS1. Walls which are not lined on the internal face eg. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding.
Flashings:	All wall openings, penetrations, intersections, connections, windows sills heads and jambs must be flashed prior to weatherboard installation. The building wrap must be appropriately incorporated with penetration and junction flashings. Materials must be lapped in such a way that water tracks down to the exterior on the face of the building wrap.
Cavity Vent Strip:	Must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. The vent strip is to be kept clear and unobstructed to allow free drainage and ventilation of cavities.
Cavity Battens:	Are to be minimum H3.1 treated, be minimum 18mm thick, the same width as the studs and be fixed by the cladding fixings to the main framing through the building wrap.
Fixing:	The horizontal lap of the weatherboards shall be 30mm. They must be kept dry and under cover whilst in storage prior to and during fixing. Cut ends which are exposed or where sealant is applied to the boards must be primed. An H3.1 treated timber cant strip must be provided to support the bottom board on the wall. All concealed nails must be driven flush with the board surface. When concealed fixing nails must be driven behind the lap of the boards, except at all corners and vertical edges of openings where the boards must be face fixed / exposed nailed. Cavity fixing Concealed nails are to be 60 x 3.15mm Hardiflex nails.
Jointing:	The ends of the weatherboards are jointed off-stud by means of a tongue & groove joint. T&G joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Sealant must be provided in the T&G joint. Preparation and Priming: Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade builders fill, allow to cure and sand smooth ready for priming. Prime the filled holes in accordance with paint manufacturer's specifications.
Sealants:	All sealants must demonstrate the ability to meet the relevant requirements of the NZBC. Application and use of sealants must comply with manufacturer's instructions
Painting:	Remove any surface dirt, grime or other contaminants and ensure the James Hardie Weatherboards are dry before painting. All James Hardie Weatherboards are pre-primed on their face and bottom edge with a factory-applied acrylic base coat, and must be painted within 90 days of installation. All exposed faces, including the top edges under the sills and bottom edges, accessories must be finished with two coats of quality exterior paint system. They can be painted dark colours when installed with aluminium mouldings only. When using uPVC corner moulds or flashings, the light reflective value of the colour used must be more than 40% as required. Note: Stains containing linseed oil are specifically designed for wood and may not be suitable for fibre cement cladding products, primed or unprimed.
Warranty:	Provide 25 year warranty covering manufacturing defects in the weatherboards and 12 months covering James Hardie accessories.

ROOFING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC:E2

Scope:

Roof to house, garage

Materials:

Dimond or equal long-run Colorsteel roofing and accessories

BMT	0.4mm
Grade	G300
Product	Colorsteel G2z
Colour	To be advised
Profile	Corrugated
Flashings	Coated to match Colorsteel roofing

Underlay:

Thermakraft 215 self-supporting roof underlay to full roof area.

Fixing:

In accordance with manufacturer's instructions. The roofer shall supply & fix all roofing, including purlins, hips, ridges, valleys etc. all in accordance with manufacturer's instructions.

Obtain guarantee Provide 10-year guarantee against water penetration due to faulty material or workmanship.

ALUMINIUM WINDOWS & DOORS

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B1, B2, E2, E3, F2, G4, G7, NZS 4211 – Specification for performance of windows, AS/NZS 4403, NZS 4223:2008 Parts 1, 2 & 4, NZS 4223:2016 Part 3, Glazing Standards Powder Coating shall be in accordance with BRANZ Building Information Bulletin 218, and British Standard 6496 of Powder Coating.

Scope:

Site measure openings to be fitted with joinery units

Doors

Windows

Garage doors

Flashings

Materials:

Aluminium: All sections are to be extruded from 6063 alloy, T5 temper. Windows shall use 35mm sections with condensation channels and 3 ply bituminous fabric flashings. WANS support bars required to all doors and windows wider than .6m. Manufacturer of windows and performance of windows shall comply with NZS 4211.

Hardware: Colour Matched Hardware, Double Tongue Latches.

Reveals: To be 20mm solid timber, H3.1 treated, mitred and grooved to take linings.

Glass: As specified in glazing section. Double Glazed (excluding Garage), (obscure glass to wet areas).

Colour: Powder coated selected colour with a consistent minimum thickness of 50 microns to all surfaces.

Garage doors: 2 x Colorsteel Sectional Ribline Door & Opener with two Remotes.

Flashings: Colorsteel, colour to match.

Fixing:

Co-operate with the Plumber for supply of Colorsteel flashing to window head, where required. The window sub-contractor shall provide a warranty covering all sections of the work in the supply, fixing and glazing of all windows and doors, for a period of Five (5) years.

EXTERIOR JOINERY

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: E2, G4.

Scope:

Site measure openings to be fitted with joinery units.

Front Entry door & sidelights.

Materials:

Standard profiles run from solid, complete with 2 weather grooves, in powder coated aluminium frame.

Fixing:

In accordance with best trade practice.

Mortice and tenon housing and dwelling shall be used wherever practical. Screws shall be used in preference to nails or brads and glue blocks shall be fitted wherever required.

All joints shall be accurately cut and fitted and well glued.

Nails and brads shall be neatly punched and holes suitably stopped.

INTERIOR JOINERY

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B2, G1, G2, G3. NZS 3610.

Scope:

Allow to take delivery from the Joiner of all joinery specified in doors and fittings and build in to complete the installation as shown on the drawings.

Doors

Kitchen Joinery

Rails & Shelves to wardrobes & cupboards

Materials:

Doors: hollow core, paint finish, Pressed Panel MDF, or Grooved MDF, or Flush Panel MDF doors with 30mm grooved jambs to take wall linings. Hung on 1 ½ pairs butt hinges.

Cavity sliders to be CA sliders complete with all hardware.

Aluminium Sliders with GIB® Panels to Bedroom wardrobes

Hardware as selected

Kitchen Joinery: Allow to fabricate and install kitchen units in Prefinished MDF with laminate finish such as Melamine or equal.

Formica top with (180 degree) rolled front.

2mm PVC to all edges

White laminated internal carcass and shelves.

Drawers on metal drawer slides, with cutlery inserts.

Overlay doors on spring load hinges.

Overlay drawer fronts.

Shelves on adjustable shelf studs.

Pantry cupboards with 5 no adj. shaped shelves.

Satin Chrome Handles

SS sink and drainer.

Lyrio Squareneck sink mixer

Sink mixer

Make allowances for appliances. Ensure neat tight fit.

Shelves & Cupboards: Cupboards and robes shall be to a trim height of 2m with sliding doors in a grooved frame. Provide 18mm prefinished MDF board shelves, all edges banded, to robes and 3 shelves to other cupboards.

Workmanship:

All joinery shall be constructed in accordance with the best trade practice.

Accurately set out, neatly executed and finish all joinery work, both in the shop and on the job.

Exposed timber shall be brought to a first class finish, properly dressed and glass papered with arrises off.

Site Measure: Before manufacture of joinery, measure on the job and verify that all dimensions shown are correct or are adjusted so that all joinery will correctly fit the space provided. No extra will be paid in respect of work arising through failure to measure and verify. The Joiner shall ensure that all exterior joinery is correctly made in respect of any dimensional variation occurring in the building.

Timber: All timbers shall be of their respective kinds and grades, specified in accordance with NZS 3631 National Grading Rules. All timber must be dried to a moisture content from 10% - 14%, based on dry oven kiln weight. Timber showing signs of faulty or excessive kiln drying will be rejected.

Any preservative treated timber used for exterior joinery shall have been treated by the Tanalith C.A. non-leaching process. Dipped treatment is NOT acceptable for exterior use. Joinery and finishing timber must be stacked and protected under cover until required for use.
Timber Grades: Interior Carcase Work & Frames 18mm MDF, Exterior doors Exterior approved only

Hardware: Supply and fix all hinges, cupboard catches, friction stays and any other hardware specified herein or on the drawings, for particular fittings.

All hardware forms part of this sub trade and shall be fixed in the shop before fabrication. All exterior joinery for a paint finish shall be primed before leaving the joinery shop.

Finishing: All exposed timber shall be brought to a first class finish, properly dressed and glass papered with arrises off for respective finishes.

Timber Joinery: The assembly of all joinery shall be appropriate to the nature of the job and consistent with good trade practice. Mortising, tenoning, grooving, matching, tonguing, housing and rebating shall all be employed as necessary and where detailed, to provide a first class job.

All joinery timbers shall be machine dressed on all four faces. All joints shall be accurately cut and fitted and well glued to develop the full strength of the joint. Screws shall be used in preference to nails or brads and glue blocks shall be fitted wherever required. Nails and brads shall be neatly punched and holes suitably stopped.

Allowances shall be made during assembly for shrinkage and measures shall be taken to prevent undue warping or twisting. All exposed timber shall be brought to a first class finish by machine glass papering or hand finishing to a fine finish.

PLUMBING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B2, C/VM1, E1, E3, G1, G2, G3, G4, G10, G12, G13/AS1 & AS2, NZS 7601, NZS 7602, NZS 7643, NZS4305; AS/NZS 4936, AS/NZS 5065.

Scope:

New water connection from boundary;
Plumbing to wc's, tub, shower, bath, vanities, wash hand basins, sink, dishwasher, waste disposal unit,
Waste pipes to GT's, and vent pipes;
WC installations & connections;
Flashings to windows, doors, brickwork, vents etc;
Installation & connection of HWC. NZS 4606, including tempering valve;
Fascia/Spouting & downpipes;
External hose taps x 3.

Materials:

Piping: All hot and cold water polybutylene pipe with copper fittings installed in accordance with NZS 7643. All piping shall be run in the ceiling cavity or wall framing and shall be lagged in all positions, both hot and cold. All pipework shall adequately supported and the full installation shall comply with the NZBC water supply conditions.

Cold Water Supply: Allow to supply and install new 20mm diameter MDPE or HDPE. All supplies to wet areas shall be in 20mm dia. with 15mm dia. branches as required.

Plumbing fittings: As selected.

Tub: Allow to supply and install Robinhood Laundry tub, complete with taps and valves.

Wastes: Supply and install UPVC, diameters as shown on drawings laid down to the sizes supplied by the NZBC and approved documents. Wastes shall run in the wall framing and not be exposed on exterior. All wastes to be laid so as to enter gully traps below grating.

Flashings: Provide and fix 0.55mm Endura Colorsteel flashings to all roof penetrations, using Aledge to penetrations or a proprietary flashing system.
Provide 0.45mm Endura Colorsteel flashings to window heads to Builder for building in. Sealant used in conjunction with metal shall be Selleys Dow Corning 780 Silicone Sealant.
Under no circumstances shall lead flashings be used.

Hot Water: 300 Litre Mains Pressure Electric hot water cylinder.
Electric thermostats and energy cut-off devices shall comply with NZS 6214 or AS 1308.
Water temperature in cylinder to be set at 60°C to ensure Legionella bacteria is killed. Tempering valve used to reduce this to 55°C as required by NZBC G12.

Energy cut-off devices shall be designed to:

- a) Be reset manually, and
- b) Disconnect the energy supply before the water temperature exceeds 95°C.

Relief valve drains shall:

- a) Be of copper pipe,
- b) Have no restrictions or valves,
- c) Have a continuous fall from the relief valve to the outlet,
- d) Discharge in a visible position which does not present a hazard or damage to other building elements (except when used in association with free outlet storage water heaters),
- e) Have a minimum diameter of the same size as the valve outlet,
- f) Have the number of changes in direction plus the length of the relief drain (in meters) not exceeding 12. For example: 7 meters of pipe allows the total number of bends to be 5.

- g) Be connected to a relief valve in accordance with the valve manufacturer's specification,
- h) Comply with NZBC G12 Paragraph 6.7.3 when relief valve drains are combined, and
- i) Comply with Paragraphs 6.7.4 and 6.7.5 when freezing is likely.

Fascia/Spouting: Colorsteel, selected colour, complete with downpipe droppers for rectangular downpipes

Downpipes: Shall be Colorsteel or similar rectangular 75 x 50mm fixed to buildings with 2 no brackets, all straight and plumb, and finishing 75mm above grating.

Fixing:

Workmanship: All workmanship shall be of the best trade practice and executed by a Licensed Plumber in accordance with the Building Act 2004 Compliance Documents G12 Water Supplies AS1 & G13 Foul Water AS1.

Materials:

All materials shall be of their best respective kinds and shall conform to the NZS applicable. All materials, pipes and fittings shall be copper and/or UPVC. complying with the relevant NZS for sewer and storm water drainage, as required by the NZBC. Cement, sand, etc, used shall be as specified under 'Concrete'. Supply and install all fittings and materials required to complete the job.

All waste or water pipes in or under concrete floors and all other hot water piping shall be fully lagged. All pipework shall be concealed. Subject all water installations to a full water test. Take separate supplies to serve showers. Ensure shower supplies are not affected by the draw off from any other fixture.

DRAINAGE

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC: B1, E1, G10, G13/AS1 & AS2, AS/NZS 5065, NZS/AS 3500.

Scope:

Pipe to sewer connection at boundary, fall min 1:60;
Pipe to stormwater connection at boundary, fall min 1:100;
Installation of Gulley Traps;
Backfill;
Driveway sump.

Materials:

100mm diameter UPVC pipes. All pipework shall be concealed.
Backfill with excavated material.

Workmanship:

Excavate for storm water and sewer drains, to the required depths and gradients to provide a disposal system in compliance with the N.Z.B.C. and to the satisfaction of the Local Drainage Inspector. After drains have been inspected, tested and approved, the trenches and other excavations shall be backfilled in accordance with The New Zealand Building Code Handbook and approved documents. If drains are installed in different positions to those indicated on the drawings, the Drainlayer shall supply an as-built drawing with accurate dimensions.

Completion:

At completion, leave the whole of the plumbing and fitting system, water supply and flashing in good working order, free from leaks, defects and with all waste materials removed.

ELECTRICAL

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: B2, F7, G4, G8, G9, NZ Electrical Codes of Practice ECP50 & ECP051, NZS 6703.

Scope:

The work comprises the provision of:

Underground mains supply from junction box at boundary and supply to meter box.

Installation of flush type switchboard with M.C.B.'s where shown on the plan.

Wiring of circuits to serve all lights, power points and fittings.

Electrical Fixtures and fittings: All electrical installations to be in accordance with NZECP 51:2004 & NZBC G9.

Temporary power as required

Earthing system

Power outlets

Lights: Interior & exterior. All lighting to be in accordance with NZBC D1 & G8

Cooktop & wall oven installations.

Rangehood installation

Waste Disposal

HWC installation & connection

Heater installations

Extract Fans: Ventilation of Sanitary & Laundry rooms: refer to floor plan

Heated towel rail installations

Telephone Jacks

TV Jacks

TV Aerial (digital)

Door Bell

Heat pump

Smoke Alarms: F7 AS1 3.2.2 and 3.2.3: for positions refer to floor plan.

Coiled cable for landscaping by others

Security system wiring

Fittings:

Co-ordinate with the Local Authority in the establishment of loadings and requirements for the site. The supply to the house shall be single phase and neutral. Meter board box shall be fabricated from galvanised sheet metal and installed for a flush exterior finish with block veneer. Box shall have sufficient space for supply metering night rate metering and any other controls required by the Power Authority.

All wiring shall be heavy T.P.S. of required size. All plug and switch plates shall be P.D.L. flush type. Each power outlet to be switched. Arrange with the General Contractor for layout of work and for provision of nogging, blocking or cutting, etc. All wiring to be concealed.

Light switches and power outlets shall be P.D.L. 600 Series, white finish.

Switchboard shall be P.D.L. Distribution Board flush fittings or equal approved with circuit breakers

Exterior lighting to be as noted on the drawings

Fittings as selected

All recessed downlights shall be white, CA rated meeting the requirements of NZE. Downlights are to be positioned 50mm from combustible timber, however insulation can be abutted as the downlights are CA rated.

RCD fittings to Bathroom & Ensuite.

Exterior Grade fittings for external use

Smoke Detectors (Battery): Ionisation type, 10 year lithium powered, hush and test facility, inbuilt sounder (mini. 85dBA), surface mounted, tamper proof, guaranteed for life of battery, and minimum UL listed. Make: First Alert SA88LTH

Installation:

All installation to be in accordance with NZECP 51& 54, NZBC G8 & NZBC G9, NZBC D1 (minimum illuminance of 20lux to access route).

Workmanship:

All workmanship shall be of the best trade practice and executed by a Registered Electrician and to the satisfaction of the Local Authority's Inspector. Obtain and pay all necessary permits and charges incidental to this contract. In all cases, work shall comply with the N.Z.B.C. Electrical Wiring Regulations, and amendments and any New Zealand Electrical Codes of Practice applicable to this work.

On completion, leave the entire electrical installation in perfect working order, passed and approved by the Local Electrical Power Authority.

Clear away all debris.

GLAZING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC: F2, NZS 4223:2008 Parts 1, 2 & 4, NZS 4223:2016 Part 3, NZS 4211.

Scope:

Aluminium Joinery glazed off site.

Double Glazing

Glazing to Front door & Sidelight

Mirror

Hob Splashback

Materials:

Glass: All glass shall be free from waves, bubbles, leaching and other imperfections.

Lights up to 0.5sqm = 3mm

Lights 0.5 - 1.5sqm = 5mm

Lights over 1.5sqm = 6mm

Laminated glass where less than 500mm from floor level.

Grade A safety glass required to all doors without transoms

Grade A safety glass required to all shower screens

Overhead glazing to be Grade A safety glass

Obscure glass to wet areas

Mirrors: 750mm wide to suit vanities, polished edge

Hob Splashback to be Satinlite glass

PAINTING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract.

Standards:

NZBC:B2, E2, G7.

Scope:

Soffits
Gable Vent
Exterior cladding
Front door
Interior walls & ceilings
Interior doors & window reveals
Skirtings & trims

Materials:

Dulux Tradeline in unopened containers
Ceilings – Flat Finish
Walls & Exterior – Low Sheen Finish Doors
Reveals & Bathrooms – Satin Enamel Finish
External: 1 undercoat, 2 top coats
Internal: All plasterboard shall have sealer applied over No. 4 stopping finish, all in accordance with the plasterboard manufacturer's specification
1 coat plasterboard sealer or 1 undercoat, 2 top coats acrylic
3 coats polyurethane for clear finish
Wallpaper: Size walls, hang plumb
Colours: all colours to be as selected and approved by Owner

Application:

Thoroughly prepare all surfaces, rub down between coats and leave a first class finish. Stop all cracks and nail holes, etc. No painting shall be done under adverse weather conditions. All paintwork shall be 3 coats in 1 undercoat and 2 top coats. All work shall be of the highest standard, performed by skilled tradesmen in accordance with best trade practice, using tools and equipment suitable for ensuring a first class job.

No external work shall be done during frosty or inclement weather. Any work damaged by dust, rain or any other cause shall be rubbed down and recoated. The top and bottom edges of all doors etc. shall be painted to the same number of coats as the exposed faces.

No coat of paint, varnish or polish shall be applied until the undercoat is perfectly dry and hard. All finished surfaces shall be left smooth, even and free from brush marks, lap marks, corner dribbles or other trades. All fittings, fixings and hardware shall be removed before preparatory processes are commenced and shall be refixed on completion of the painting. Adequately protect all finished work, including glass from paint splashes.

On completion, clean down all surfaces involved, including glass, rubbish, splashes and blemishes, etc. Remove all rubbish and leave ready for occupation.

TILING

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC: B1, B2, D1, E2, E3, G3, NZS/AS 1884:2013.

Scope:

This section of work includes the waterproof membrane, supplying, laying, grouting and sealing of tiles.

Laying:

1 row of tiles above vanities, basins, bath & benches.

Waterproofing to extend to 1.5m radius from rose on floor, 1.5m along walls and 1.8m above finished floor level.

Tiling shall be carried out following the guidelines and practices described in the BRANZ publication: "Good Tiling Practice".

Set out is to be confirmed at the time of selecting tiles and before work is commenced. Tiles shall be fixed straight and even with no ridges. Cracked or chipped tiles shall not be used.

Where required tiles shall be cut using a saw to produce straight edges with no chips or cracks.

Cut tiles shall be laid with cut edges concealed from view.

Joints to tiles shall be finished smooth and be sealed against moisture.

Seal bottom edge of tiles at benches with selected colour-matched silicone type sealant. Sealant to be fungus resistant.

Grouting of tiles to be sealed once dry to stop moisture penetration inwards.

Interior tiles shall be laid over wet area lining as shown on the drawings and construction detailing.

Guarantees:

The tiles shall provide a Guarantee to cover against defective workmanship and materials supplied by him for a period of not less than 2 years after Certified Practical Completion.

FLOOR COVERINGS

Preliminary:

Refer to the Preliminary Section of the Specification for clauses equally binding on all sections of this contract

Standards:

NZBC: B1, B2, D1, E2, E3, G3, NZS/AS 1884: 2013.

Scope:

Interior rooms as required

Materials:

Carpet: On underlay with Smoothedge & Naplock bars.

Vinyl: 2m wide, approved adhesive. Ensure moisture content of concrete is below maximum level.

SECTION 6

Technical Information

(Manufacturer's Information)

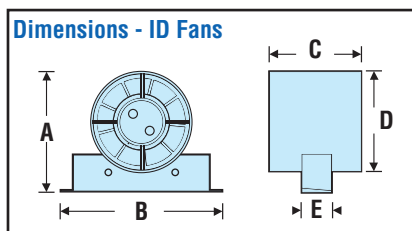
- Septic Tank & Effluent Design incl. fencing**
- ECAN Approval Documents**
- Gas Fire**
- Heating Unit**
- Solar Panels**
- Central Heating Systems**
- A4 Details/Acceptable Solution Extract**
- Well/Water Test**



IN-LINE FANS - ID Fan Models

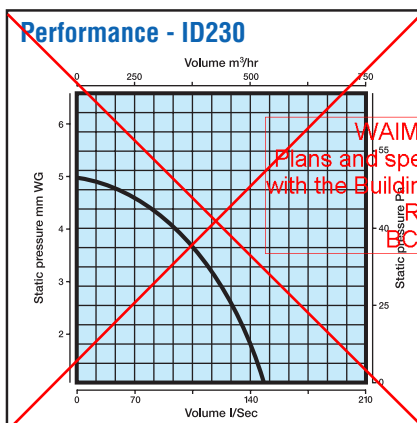
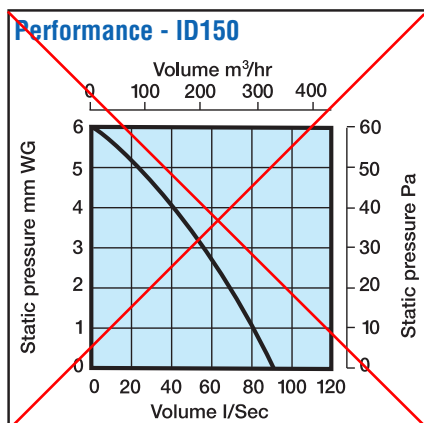
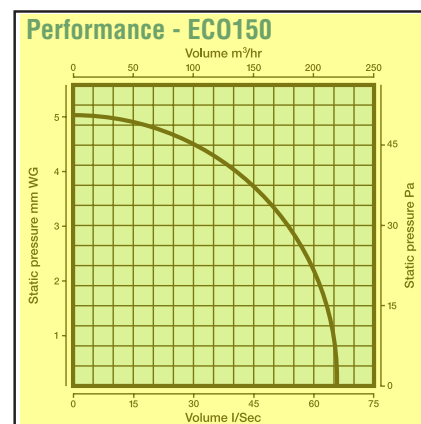
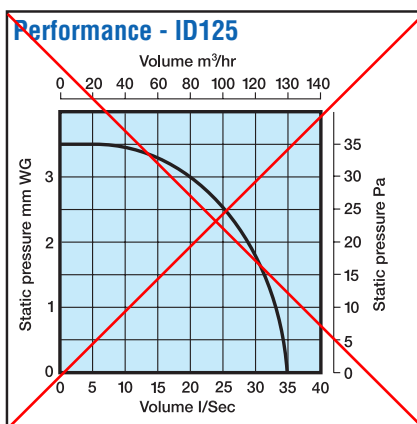
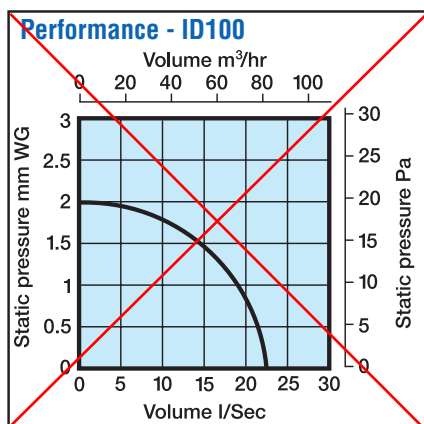
DIMENSION INFORMATION

Models	A	B	C	D	E
ID100	130	155	90	100	27
ID125	150	155	99	118	27
EC0150 (white)	187	153	109	150	27
ID150	187	153	109	150	27
ID230 (square model)	286	286	155	230	-



TECHNICAL SPECIFICATION

Models	ID100	ID125	EC0150	ID150	ID230
Power	220 - 240V	220 - 240V	220 - 240V	220 - 240V	220 - 240V
Fan Performance	23l/s, 85m ³ /hr	36l/s, 130m ³ /hr	64l/s, 230m ³ /hr	87l/s, 313m ³ /hr	152l/s, 550m ³ /hr
Fan Wattage	20W	25W	25W	25W	80W
Maximum Pressure	20Pa	35Pa	50Pa	60Pa	50Pa
Fan Speed	2400 rpm	2000 rpm	2400 rpm	2400 rpm	1250rpm
Sound Level	41 dB(A)	41 dB(A)	40 dB(A)	40 dB(A)	50dB(A)
Max. Operating Temp	40°C	40°C	40°C	40°C	40°C
IP Rating	IPX4	IPX4	IPX4	IPX4	IPX4



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



Consent Issued BC170237

BC170237



STEEL & TUBE
ROOFING PRODUCTS

Spouting & Fascia Systems

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Christchurch



Traditional

Contemporary

Fascia System

Commercial

SPOUTING & FASCIA SYSTEMS JULY 2009



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, 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 Zinalume™ 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.

WAIMAKARIRI DISTRICT COUNCIL
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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 Zinalume™ 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

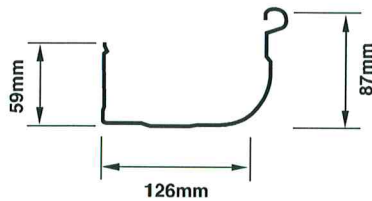
Surfaces may be washed with water and a soft bristled brush. For hard to access areas, waterblasting at pressures up to 20MPa may be more appropriate. In all cases spouting should be cleaned out at least every six months; more frequently in marine areas or where fallout from leaves etc, is severe. Refer 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.

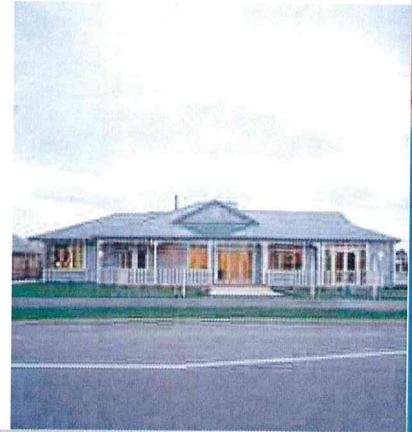
Traditional

Multiline Quad



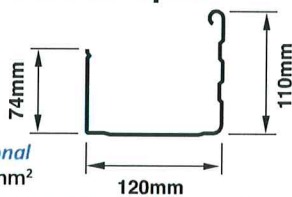
Cross Sectional Area 6850mm²

- Multiline Quad captures the colonial look with its 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.



Contemporary

Multiline Square

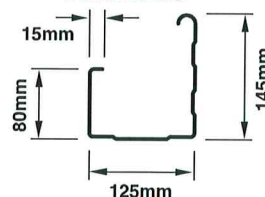


Cross Sectional Area 6600mm²

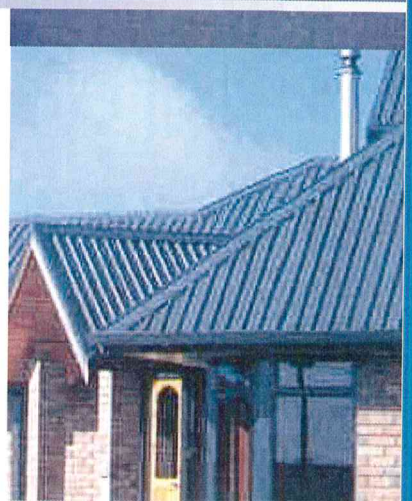
- Multiline Square gutter is ideal for use in external gutter applications where modern square lines are required, and has a high face to better cover the end view of domestic roofing systems.
- Multiline Square has an optional slotted overflow system.
- Multiline Square is fixed using concealed clips to maintain a clean uncluttered appearance.

Cross Sectional Area 1000mm²

Plumbline

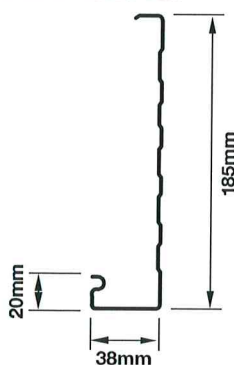


- Plumbline provides a large capacity domestic spouting which is also at home on smaller commercial work.
- Plumbline has a strong profile with a double swaged face and swaged base.
- Plumbline is fixed using concealed clips for emphasis of its bold lines.



Fascia System

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.

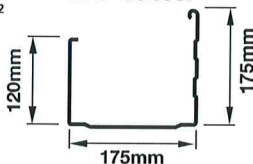


Steel & Tube Roofing Products fascia systems are available exclusively through Approved Installers.

Commercial Gutters

Cross Sectional Area 21000mm²

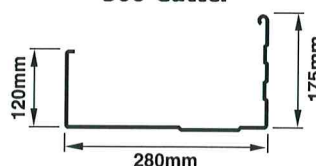
175 Gutter



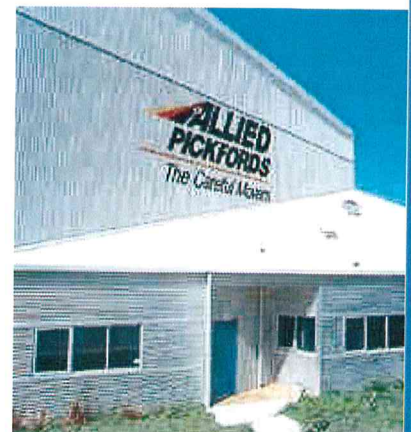
- The most commonly specified commercial gutters are 175mm and 300mm. However, as each are specifically folded, the dimensions can be varied greatly to suit any application provided appropriate fixing brackets are sourced.
- Standard pressed internal brackets are available for the 175 gutter, however for extra strength, specially

Cross Sectional Area 33600mm²

300 Gutter



- fabricated steel external brackets are recommended (colour matched if required).
- Steel & Tube Roofing Products provide details regarding industrial gutter bracket design and 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:

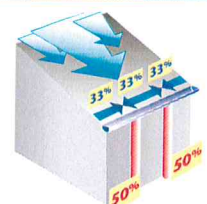
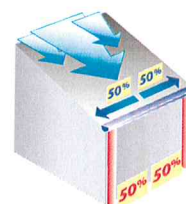
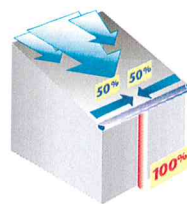
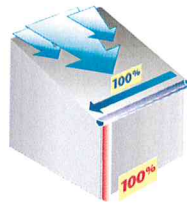
- **Select spouting = Multiline Quad**
- **Select rainfall = 100mm/hr**
- **Select roof pitch = 30°**

Therefore, outlets should take a maximum of 54m² of roof area each.

Roof Pitch	Typical Maximum Roof Area (m ²) per outlet									
	Spouting						Downpipes			
	Multiline Quad			Multiline Square			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	89	59	44	60	85	155	100 73
10-24°	59	39	30	81	54	40	60	85	155	100 73
25-34°	54	36	27	74	50	37	50	70	130	80 61
35-44°	50	33	25	68	45	34	40	60	10	70 50
45-55°	46	31	23	63	43	32	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
29 South End Avenue
Otaika
PO Box 1869
Whangarei 1040
Tel: 09 438 4600
Fax: 09 438 0342

NORTH SHORE
2 Ride Way
North Harbour
Industrial Estate
PO Box 100182
North Shore
North Shore City 0745
Tel: 09 415 8080
Fax: 09 415 9192

AUCKLAND
30 Business Parade North
Highbrook
PO Box 204216
Highbrook
Manukau 2161
Tel: 09 274 4056
Fax: 09 274 8972

HAMILTON
40 Northway Street
Te Rapa
PO Box 10458
Te Rapa
Hamilton 3241
Tel: 07 850 9200
Fax: 07 850 9330

TAURANGA
28A Jean Batten Drive
Mt Maunganui
PO Box 2001
Seventh Avenue
Tauranga 3140
Tel: 07 578 1089
Fax: 07 577 0186

WELLINGTON
41 Randwick Road
Lower Hutt
PO Box 36082
Wellington Mail Centre
Lower Hutt 5045
Tel: 04 568 4359
Fax: 04 568 6770

CHRISTCHURCH
106 Antigua Street
Sydenham
PO Box 7306
Sydenham
Christchurch 8240
Tel: 03 377 0994
Fax: 03 377 2680



STEEL & TUBE
ROOFING PRODUCTS



BRANZ Appraised

Appraisal No. 484 [2012]

MAPEGUM WPS, MAPELASTIC, MAPELASTIC SMART AND MAPELASTIC AQUADEFENSE WET AREA MEMBRANES

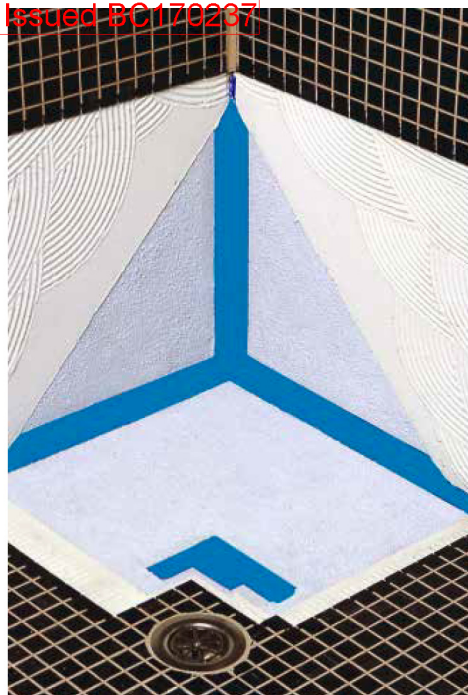
Appraisal No. 484 [2012]

This Appraisal replaces BRANZ
Appraisal No. 484 [2005]

Amended 29 January 2016

Consent Issued BC170237

BC170237



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Mapei New Zealand Ltd

P O Box 12 326

Penrose

Auckland

Tel: 09 921 1994

Fax: 09 921 1993

Web: www.mapei.co.nz



BRANZ

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 Mapegum WPS and Mapelastic AquaDefense are premixed membranes. Mapelastic and Mapelastic Smart are two-part membranes. They are liquid-applied waterproofing membranes for use under ceramic or stone tile finishes in internal wet areas.

Scope

- 2.1 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes have been appraised for use as waterproofing membranes for internal wet areas of buildings, within the following scope:
- on floor substrates of concrete, flooring grade particle board, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
 - when protected from physical damage by ceramic or stone tile finishes; and,
 - where floors are designed and constructed such that deflections do not exceed $1/360^{\text{th}}$ of the span.
- 2.2 The use of Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.
- 2.3 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints are specific to each building, and are therefore the responsibility of the building designer and building contractor and are outside the scope of this Appraisal.
- 2.4 Ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.5 The membranes must be installed by Mapei New Zealand Ltd trained applicators.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant



Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [b] 15 years and B2.3.2. Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes meet these requirements. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes will meet this requirement. See Paragraphs 11.1 - 11.7.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes meet this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

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

- **Mapegum WPS** - A one-part, fast drying, polymer-based, ready-to-use, liquid-applied membrane. It is supplied as a light grey-coloured paste in 5, 10 and 25 kg buckets.
- **Mapelastic** - A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 24 kg multi-wall bags and a Part B liquid in 8 kg plastic containers. When dry, the membrane is grey in colour.
- **Mapelastic Smart** - A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 10 kg plastic containers. When dry, the membrane is light grey in colour.
- **Mapelastic AquaDefense** - A one-part solvent free, ultra-quick drying synthetic resin based paste in water dispersion liquid applied membrane. It is supplied as a light blue coloured paste in 15 kg drums.
- **Mapeband and Mapeband Gaskets** - A rubber-coated polyester tape for waterproofing expansion joints and sealing around drains and pipes. Available as a tape 120 mm wide in rolls 50 m long, and also in ready-made internal and external corners (90 and 270 degrees) and pipe gaskets 118 x 118 mm and 300 x 300 mm, "T" profiles 515 mm x 315 mm and cross profiles 515 x 515 mm.
- **Mapeband PE120** - Is a PVC fabric tape used to reinforce wall/wall and floor/wall joints. It is only used with Mapegum WPS and Mapelastic AquaDefense. Available as a tape 120 mm wide in rolls 10 m and 50 m long, and also as preformed angles 90° and 270°.
- **Mapetex Sel** - Is a macro-holed non-woven fabric, used to reinforce the first and second layer of the waterproofing membranes. It is supplied as a polypropylene, white fabric in rolls 100 mm, 200 mm and 1.0 m wide x 25 m long.
- **Mapenet 150** - Is a glass fibre mesh used to reinforce the membranes. It is supplied as a blue mesh in rolls 1.0 m wide and 50 m long.
- **Mapeband SA** - is a self-adhesive Butyl Rubber tape used to reinforce all joints. It is supplied as a 2 mm thick, 100 mm wide tape in rolls 25 m long.
- **Mapei Primer 3296** - is an acrylic primer for absorbent surfaces. It is an opaque colour and supplied in 5 and 10 kg drums.

Handling and Storage

- 5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 24 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes. 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 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.
- 7.2 Mapegum WPS and Mapelastic AquaDefense are designed to be used where a quicker curing time is required, such as in cool or humid conditions.
- 7.3 The membranes must be protected from physical damage by the application of ceramic or stone tile finishes.
- 7.4 Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ "Good Practice Guide to Tiling".
- 7.5 Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed $1/360^{th}$ of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

Substrates

Plywood

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

Fibre Cement Compressed Sheet/Fibre Cement Sheet Tile Underlay

- 8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Fibre cement sheet tile underlay must be covered by a valid BRANZ Appraisal for use in internal wet areas. Installation must be in accordance with the manufacturer's instructions.

Particleboard

- 8.3 Particleboard must be specified for end use in accordance with NZS 3602.

Concrete and Concrete Masonry

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

Wet Area Wall Linings

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

Durability

Serviceable Life

- 9.1 The Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.
- 10.2 In the event of damage to the membranes, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.
- 10.3 Drainage outlets must be maintained to operate effectively, and ceramic or stone tile finishes must be kept clean.

Internal Moisture

- 11.1 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.
- 11.2 Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of code compliance for overflow is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.
- 11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of code compliance to NZBC Clause E3.3.3 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 [b] and 3.1.2 [b].
- 11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.
- 11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ "Good Practice Guide to Tiling", and flooring and wallboard manufacturers.
- 11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.
- 11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber and plywood floors are used.

Installation Information

Installation Skill Level Requirement

- 12.1 Installation of the membranes must be completed by applicators that have been trained by Mapei New Zealand Ltd
- 12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Mapei New Zealand Ltd Technical Literature and this Appraisal.

Preparation of Substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.
- 13.2 Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424. The relative humidity of the concrete must be 75% or less before membrane application.
- 13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have a reinforcement installed as set out in the Technical Literature.
- 13.4 Substrates must be primed with suitable primer and allowed to cure before the Mapegum WPS is installed. There is no priming required for Mapelastic, Mapelastic Smart and Mapelastic AquaDefense. Absorbent surfaces should be primed with Mapei Primer 3296 prior to the application of the Mapelastic or Mapelastic Smart.

Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.
- 14.2 Both Mapelastic and Mapelastic Smart require the liquid and powder to be mixed and left to stand for 5 minutes before re-mixing, then applying. Mapegum WPS and Mapelastic AquaDefense must be thoroughly stirred before application.
- 14.3 The membrane must be applied in a minimum of two coats at the rates set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the Mapegum WPS must be a minimum of 1.0 mm, Mapelastic AquaDefense membrane must be a minimum of 1.0 mm and the Mapelastic and Mapelastic Smart Membrane must be a minimum of 2.0 mm.
- 14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a notched steel trowel (finished with a flat steel trowel).
- 14.5 Reinforcement fabric or Mapeband is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.
- 14.6 Clean up may be undertaken with water.

Tiling

- 15.1 The membranes must be fully cured before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.
- 15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ "Good Tiling Practice Guide". The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Mapei New Zealand Ltd.

Inspections

- 16.1 The Technical Literature must be referred to during the inspection of membrane installations.
- 16.2 Critical areas of inspection are:
- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
 - Moisture content of the substrate prior to the application of the membrane.
 - Acceptance of the substrate by the membrane installer prior to application of the membrane.
 - Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
 - Membrane curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

- 17.1 Safe use and handling procedures for the membranes are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

Basis of Appraisal

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

Tests

- 18.1 The following testing has been undertaken by various organisations:
- Mapegum WPS and Mapelastic Wet Area Membranes in accordance with; EN 14891 for initial tensile adhesion strength, tensile strength after water contact, tensile adhesion strength after heat ageing, tensile adhesion strength after contact with lime water, tensile adhesion strength after contact with chlorine water, tensile adhesion strength after freeze-thaw cycles, waterproofing and crack bridging ability; DIN 53504 for tensile strength and maximum elongation after exposure to air and water immersion [Mapegum WPS only] and; Mapei internal method for water absorption after exposure and water immersion.
 - Mapelastic Smart in accordance with EN 1502-4 for bond strength to concrete, freeze thaw, flexibility, static and dynamic crack bridging, water vapour permeability, impermeability to water and bond strength after water immersion, heat ageing, freeze-thaw and alkali ageing.
 - Mapelastic in accordance with; EN 14891 for crack bridging after 28 days exposure to air, crack bridging after 7 days exposure to air and 21 days immersion in water, adhesion to concrete surface after 28 days exposure to air, adhesion to concrete surface after 28 days exposure to air and 21 days immersion in water; DIN 52615 for resistance to water vapour transmission and; Mapei internal method for deformability under low temperatures.
 - Mapegum WPS in accordance with; EN 1384 for tensile adhesion strength after exposure and water immersion; UNI 8202/22 for water absorption after exposure and water immersion and; DIN 53505 for shore A hardness.
 - Mapelastic AquaDefense in accordance with AS/NZS 4858 Appendix A including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission to ASTM E96-92 and cyclic movement resistance requirements of AS/NZS4858:2004 Appendix B. Testing to ANSI 118.10-1999 including seam strength, breaking strength, dimensional stability, resistance to fungi, static head and shear strength to ceramic tile and cement mortar. Also tensile adhesion on a plywood substrate and low temperature flexibility of the membrane.
- Test methods and results were reviewed by BRANZ and found to be satisfactory.
- 18.2 Testing of Mapegum WPS and Mapelastic has been undertaken by BRANZ for durability in accordance with AS/NZS 4858: 2004, Appendix A covering tensile strength and elongation after immersion in water, bleach, detergent, and after heat ageing.
- 18.2 Testing for suitability of Mapelastic over particleboard in accordance with AS/NZS 4858: 2004, Appendix C has been undertaken by BRANZ and found to be satisfactory.

Other Investigations

- 19.1 An assessment was made of the durability of the Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes by BRANZ technical experts.
- 19.2 Site visits have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.
- 19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 20.1 The manufacture of the membranes has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 20.2 The quality management system of the membranes manufacturer has been assessed and found to be satisfactory.
- 20.3 The quality of manufacture of the membranes is the responsibility of the manufacturer.
- 20.4 The quality of supply of the membrane system materials to the market is the responsibility of Mapei New Zealand Ltd.
- 20.5 Quality on site is the responsibility of the Mapei New Zealand Ltd trained applicators.
- 20.6 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Mapei New Zealand Ltd and this Appraisal.
- 20.7 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Mapei New Zealand Ltd.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS/NZS 2269: 2012 Plywood-Structural.
- AS 3958.1: 2007 Guide to the installation of ceramic tiles.
- AS/NZS 4858: 2004 Wet area membranes.
- DIN 53504 May 1994 Determination of tensile stress/strain properties of rubber.
- EN 1348: 1997/A1 Adhesives for tiles – Determination of tensile adhesion strength for cementitious adhesives.
- EN 14891 March 2003 Liquid applied waterproofing membranes for use beneath ceramic tiling – Definitions, specifications and test methods.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.
- Good Practice Guide to Tiling, BRANZ, March 2004.
- UNI 8202 – 22: 1987 Building. Water proof sheets. Determination of behaviour in water.

Amendments

Amendment No. 1, dated 12 November 2013.

This Appraisal has been amended to include an additional product.

Amendment No. 2, dated 29 January 2016.

This Appraisal has been amended to include a new reinforcement product.



In the opinion of BRANZ, **Mapegum WPS, Mapelastic, Mapelastic Smart and Mapelastic AquaDefense Wet Area Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Mapei New Zealand Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Mapei New Zealand Ltd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Mapei New Zealand Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Mapei New Zealand Ltd** or any third party.

For BRANZ



Pieter Burghout

Chief Executive

Date of Issue:

18 July 2012



BRANZ Appraised
Appraisal No. 648 [2016]

EARTHWOOL GLASSWOOL INSULATION

Appraisal No. 648 [2016]

This Appraisal replaces BRANZ
Appraisal No. 648 [2009]

BRANZ Appraisals

Technical Assessments of products
for building and construction.



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BRANZ

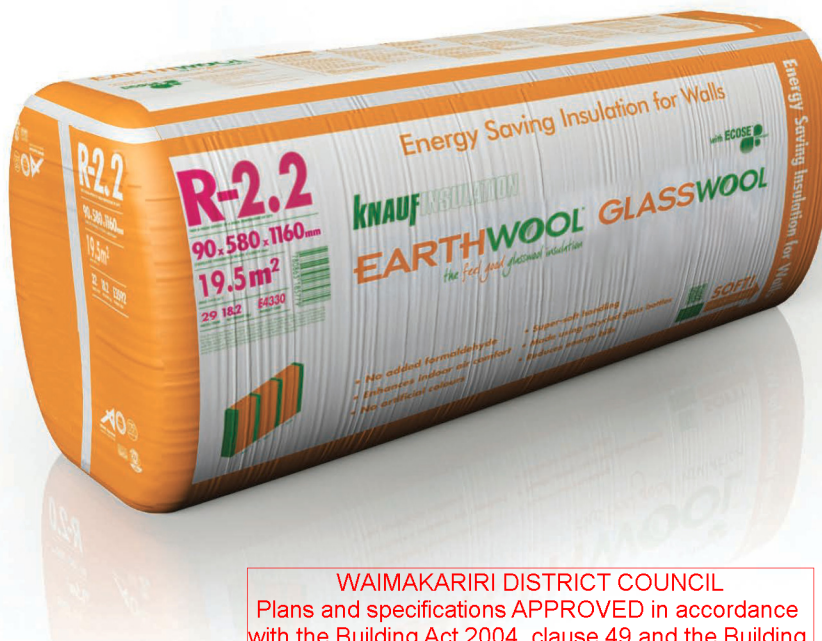
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Consent Issued BC170237

BC170237



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Product

- 1.1 Earthwool glasswool insulation is a range of thermal insulating material manufactured from ECOSE Technology resin bonded glass wool fibres. The insulation is pre-cut to suit a wide range of thermal insulation requirements and framing set-outs in walls, roofs and ceilings of buildings.

Scope

- 2.1 Earthwool glasswool insulation has been appraised as a thermal insulation material for framed or part-framed walls, ceilings and roofs of domestic and commercial buildings.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Earthwool glasswool Insulation if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years and B2.3.1 [b] 15 years. Earthwool glasswool insulation will meet these requirements. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Earthwool glasswool insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Earthwool glasswool insulation meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a] and H1.3.2 E. Earthwool glasswool insulation will contribute to meeting this requirement. See Paragraphs 14.1 and 14.2.

Technical Specification

4.1 Earthwool glasswool insulation is an ECOSE Technology resin bonded fibrous glass wool insulation. It is manufactured from recycled and/or virgin glass and ECOSE Technology resin and is formed into segments, blankets and rolls. Earthwool glasswool insulation is available as set out in Table 1.

Table 1: Earthwool glasswool insulation product range

R-value	Nominal Thickness [mm]	Length [mm]	Width [mm]	Nett Area [m ²]	Density [kg/m ³]
Acoustic					
1.3	50	2700	600	32.4	11.0
1.4	50	1160	430	18.9	14.0
1.4	50	1160	450	19.8	14.0
1.4	50	1160	580	25.6	14.0
1.4	50	1160	600	26.4	14.0
1.9	75	2700	600	22.7	11.0
2.0	75	1160	430	11.9	14.0
2.0	75	1160	450	12.5	14.0
2.0	75	1160	580	16.1	14.0
2.0	75	1160	600	16.7	14.0
Wall Segments					
2.2	90	1160	580	19.5	10.8
2.4	90	1160	580	13.4	14.5
2.6	90	1160	430	6.9	20.3
2.6	90	1160	580	9.4	20.3
2.8	90	1160	430	4.9	29.1
2.8	90	1160	580	6.7	29.1
3.2	140	1160	580	14.8	9.3
3.6	140	1160	580	10.0	13.4
4.1	140	1160	580	6.1	21.0
Ceiling Segments					
2.7	125	1160	430	12.0	8.8
3.2	150	1160	430	10.0	8.7
3.2^	105	1160	430	5.5	23.3
3.6	175	1160	430	10.5	7.3
3.6	175	1200	600	15.1	7.3
4.1	195	1160	430	8.9	7.7
5.2	210	1160	430	5.5	11.2
6.3	275	1160	430	5.5	9.0
Ceiling Rolls					
1.8	70	13,500	1200	16.2	12.1
2.9	115	8500	1200	10.2	12.2
3.2	135	8000	1200	9.6	11.0
3.6	150	7000	1200	8.4	11.0

Table 1: Earthwool glasswool insulation product range cont...

R-value	Nominal Thickness [mm]	Length [mm]	Width [mm]	Nett Area [m ²]	Density [kg/m ³]
Handy Rolls					
2.2	90	18,000	430	7.7	10.7
2.2	90	18,000	580	10.4	10.7
DriTherm Masonry Wall Insulation					
1.5	50	1100	600	5.3	29.5
Commercial Rolls					
1.4	55	37,000	1200	44.4	11.1
1.6	60	28,000	1200	33.6	13.4
1.9	75	26,000	1200	31.2	11.6
2.4	100	22,000	1200	26.4	10.2
2.6	105	18,500	1200	22.2	11.5
3.1	120	14,500	1200	17.4	13.1
3.3	130	13,500	1200	16.2	12.7

Note: ^ Skillion Roof

- 4.2 Earthwool glasswool insulation is brown in colour and is packaged in pre-printed plastic compression bags with labelling in compliance with AS/NZS 4859.1.
- 4.3 Accessories used with Earthwool glasswool insulation, which are supplied by the insulation installer, are plastic strapping and fixings.

Handling and Storage

- 5.1 Earthwool glasswool insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the packs. The packs must be stored in an orientation that avoids excessive compression of the product.
- 5.2 In general, insulation products are sensitive to the length of time they are stored under compression packaging. Product that does not recover to its nominal thickness may not achieve the stated R-value.

Technical Literature

- 6.1 Refer to the Appraisal listing on the BRANZ website for details of the current Technical Literature for Earthwool glasswool insulation. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Earthwool glasswool insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Earthwool glasswool insulation can be used to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Greater construction R-values can be achieved where specific design is used. For construction R-values, refer to the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.
- 7.2 Earthwool glasswool insulation thermal resistance [R-value] has been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.

- 7.3 Earthwool glasswool insulation segment, blanket and roll products are designed to be friction-fitted between wall, ceiling or roof framing. They can also be laid directly on a ceiling lining, or over ceiling battens or joist/truss chords. In other horizontal situations, the insulation must be adequately supported by a suitable durable material. Earthwool glasswool skillion roof insulation is designed to be friction-fitted between rafters.
- 7.4 Where the insulation is installed in exterior walls, the insulation material nominal thickness must be selected to provide a snug close fit which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.
- 7.5 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- 7.6 To prevent moisture transfer and to provide roof ventilation, a separation of 25 mm minimum is required between the insulation and any rigid substrate or flexible roof underlay. Selecting the specifically designed skillion roof insulation product with a controlled thickness can assist with this requirement.
- 7.7 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.8 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246. See Paragraphs 10.1 - 10.3.

Durability

Serviceable Life

- 8.1 Where the building is maintained so that the provisions of the NZBC E2 and E3 Clauses are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance, Earthwool glasswool insulation can expect to have a serviceable life of at least 50 years.

Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of dampness repaired. Cavities must be clean and dry before fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

Prevention of Fire Occurring

- 10.1 Earthwool glasswool insulation is considered a non-combustible material and need not be separated from heat sources such as fire places, flues and chimneys. However, when used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated from fire places, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1.

Downlights

- 10.2 Recessed luminaires shall be of a type and be installed in accordance with NZBC Acceptable Solutions C/AS1 to C/AS6, Section 7.4.
- 10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires in existing buildings.

Control of Internal Fire and Smoke Spread

- 11.1 Earthwool glasswool insulation has been classified non-combustible when tested to AS 1530.1 and can therefore be assigned a material Group Number of 1-S. Unless foamed plastic building materials are also used as part of the wall or ceiling construction, there are no internal surface finish requirements in Risk Group SH in accordance with NZBC Acceptable Solution C/AS1, Paragraph 4.2. When used in an occupied space, Earthwool glasswool insulation does not need to be enclosed in any Risk Group. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6 for the specific internal surface requirements for walls or ceilings in other Risk Groups.

External Moisture

- 12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.
- 12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1 Paragraph 10.2 [a] or lower moisture content if required by the lining manufacturer.

Internal Moisture

- 13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.
- 13.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2 E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

- 14.1 Earthwool glasswool insulation will contribute to meeting the requirements of NZBC Clause H1 Performance H1.3.1 [a] and H1.3.2 E by compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraphs 7.1 - 7.7.
- 14.2 Earthwool glasswool insulation R-values have been determined by BRANZ testing to AS/NZS 4859.1 and are given in Table 1.

Installation Information

Installation Skill Level Requirements

- 15.1 Installation of Earthwool glasswool insulation must be completed by an installer with an understanding of insulation installation.

General

- 16.1 Installation of Earthwool glasswool insulation must be in accordance with the Technical Literature, Installation Instructions and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.
- 16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.
- 16.3 Earthwool glasswool insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.
- 16.4 Earthwool glasswool insulation is supplied in segments, blanket and roll form (Table 1) to suit framing layouts. The segment products are sized to fit between standard framing centres. The product is able to be cut to suit wall cavities and when fitted between roof or ceiling framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced. In wall cavities the insulation must be neatly friction-fitted between framing members to prevent sagging. In ceilings or roofs, the insulation may be fitted between framing members or fitted over framing members and butted tightly. The insulation must extend to the external wall plate. The insulation must not be folded, tucked or compressed. A close, even fit provides the most efficient thermal performance. Whenever possible, the insulation should be fitted beneath wiring or plumbing.
- 16.5 The clearance requirements for heating appliances, and downlights must be followed. Refer also to NZS 4246.

Inspections

- 16.6 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Earthwool glasswool insulation installations.

Health and Safety

- 17.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

The following is a summary of the technical investigation carried out:

Tests

- 18.1 BRANZ has carried out thermal resistance testing of Earthwool glasswool insulation in accordance with AS/NZS 4859.1.
- 18.2 Tests have been carried out in accordance with AS 1530.1. Earthwool glasswool insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.

Other Investigations

- 19.1 An assessment of the durability of Earthwool glasswool insulation has been made by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature and Installation Instructions have been reviewed by BRANZ and found to be satisfactory.
- 19.3 The fibre used to manufacture Earthwool glasswool insulation is certified to the European Certification Board for Mineral Wool Products [EUCEB].

Quality

- 20.1 The manufacture of Earthwool glasswool insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.
- 20.2 Knauf Insulation Pty Limited is responsible for the quality of the product supplied.
- 20.3 Quality of installation of the product on site is the responsibility of the installer.
- 20.4 Quality of maintenance of the building to ensure the insulation remains dry is the responsibility of the building owner.

Sources of Information

- AS 1530.1: 1994 Combustibility test for materials.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- NZS 4214: 2006 Method of determining the total thermal resistance of parts of buildings.
- NZS 4246: 2016 Energy efficiency – Installing bulk thermal insulation in residential buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- Compliance Documents for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition, August 2007.
- Ministry of Business, Innovation and Employment Records of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



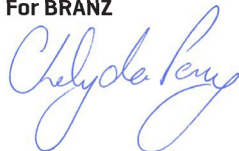
In the opinion of BRANZ, **Earthwool glasswool insulation** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Knauf Insulation Pty 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. **Knauf Insulation Pty 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 **Knauf Insulation Pty 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 **Knauf Insulation Pty Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

01 December 2016

Wattage	13w	
Lumen Output	850	900
Colour Temp	3000k	4000k
Beam Angle	100 °	
Approx Lamp Life	50,000HRS	
CRI	>80	
Cut Out	90mm	
ORDERING CODES		
MATT WHITE BEZEL	TLAD3010WD	TLAD4010WD
BRUSHED NICKEL BEZEL	TLAD3010BD	TLAD4010BD

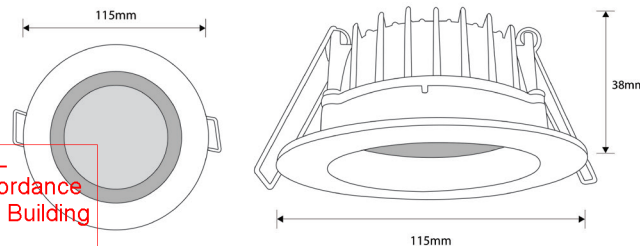


The Tradetec Arte is an excellent luminaire for any household looking to take the step into energy- and cost-efficient lighting.

Key Features:

- 3 Year Replacement Warranty
- Die-cast Aluminium Construction
- Recessed low glare design
- 100° Beam angle
- IP44 rated
- *Dimmable down to 10%

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with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant



*When using a Martec dimmer (MTD300VA)



Consent Issued BC170237
SUPPLIER DECLARATION OF CONFORMITY (SDoC)
In accordance with ISO/IEC 17050-1:2004

BC170237

SDoC identification Number¹: LPL-15-04

Issuer details

Name² (of New Zealand manufacturer or importer):

Lighting Pacific (2011) Ltd

Telephone: 0800 707 272

New Zealand Company No. (if applicable): 3295070

Email Address: steve@lpled.co.nz

Contact Address:

38 Victoria Street
Petone
Wellington
5012

Medium Risk Article – Details³ (Product name, type, rating, brand, model, batch numbers, and serial numbers, as applicable):

Recessed Luminaire
Brand: Tradetec
Model: Arte fixed/Arte gimble
Input: 240-250V~, 50/60Hz, Max 18W
Output: 700mA Max, 24VDC, tc 80°C, ta 50°C

The Medium Risk Article listed above, fully complies:

With cited standard(s), as listed⁴:

Standard number and issue year: AS/NZS 60598.1:2003

Edition / Amendment status: Luminaires

Standard title:

Luminaires - General requirements and tests

Standard number and issue year: AS/NZS60598.2.2.2001
60598.2.2:2001incl incl

Edition / Amendment status: Incl Amdt. A

Standard title:

Luminaires – Particular requirements – Recessed Luminaires

AS/NZS ZZ modified Yes ☒ No ☐ N/A ☐

AS/NZS ZZ modified Yes ☒ No ☐ N/A ☐

OR Complies with the Conformity Cooperation Agreement⁵ Yes ☐ No ☒

Names and addresses of any testing organisation or body

Name(s): Spectrum Laboratories

Address(es): Unit 1/25 Highbrook Drive, East Tamaki,
PO Box 204-252, Highbrook, Manukau, 2161.

Name(s): ACMA

Address(es): 18 Hood Street, Rosedale, Victoria, Australia

Reference to relevant test reports/certification and the issue date that show how compliance is achieved

Standard(s) or document(s) used, to show how compliance with cited standard is achieved:

Test Report : Spectrum Laboratories
Test Report : SAA

Report Certification or Document reference N°(s):

5626
SAA120637EA

16/01/2015
16/01/2015

Reference to any management quality system involved: Nil

Additional information⁶: The differences between both the EN and IEC standards has been addressed prior to local Annex ZZ deviation testing.

Declaration

I hereby declare that the above specified fittings or electrical appliances comply with the requirements of Regulation 83 of the Electricity (Safety) Regulations 2010.

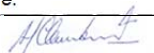
Signed for and on behalf of:

Lighting Pacific (2011) Ltd

Name and position as authorized by the issuer⁷:

Steve Clareburt - Managing Director

Signature:



Issuer Identification (as affixed to the article)



Date:

20/01/2015



BRANZ Appraised
Appraisal No. 899 [2015]

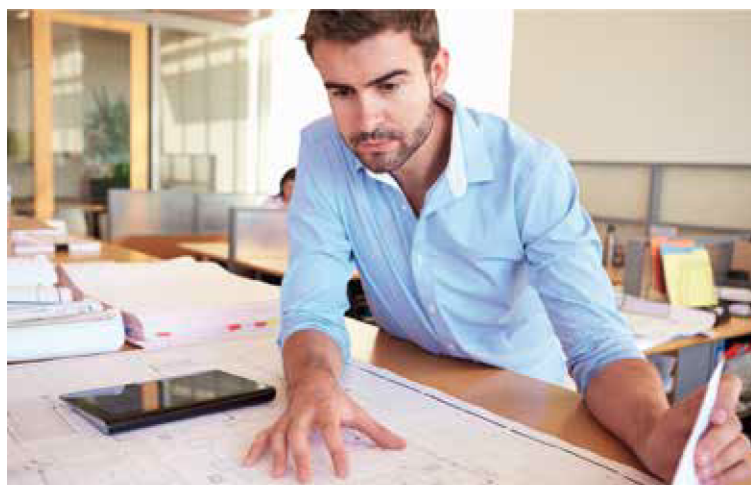
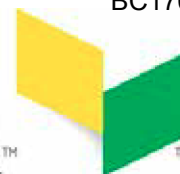
USG BORAL BRACING SYSTEMS

Appraisal No. 899 [2015]

Consent Issued BC170237

BC170237

USG BORAL
INNOVATION INSPIRED BY YOU.™



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



USG Boral Building Products NZ

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Tel: 04 237 1170
branz.co.nz



Product

- 1.1 USG Boral Bracing Systems are a range of wall bracing systems based on the use of USG Boral Sheetrock® Ceiling and Wall, and USG Fiberock® Aqua-Tough™. USG Boral Bracing Systems are used to resist earthquake and wind loads on timber frame buildings designed and constructed in accordance with NZS 3604: 2011. The USG Boral Bracing Calculator provides an electronic means of calculating bracing demand and resistance.

Scope

- 2.1 USG Boral Bracing Systems have been appraised for use as interior wall bracing systems in buildings within the scope limitations of NZS 3604: 2011.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 **In the opinion of BRANZ, USG Boral Bracing Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. USG Boral Bracing Systems meet the requirements for loads arising from self-weight, earthquake, wind and impact [i.e. B1.3.3 (a), (f), (h) and (j)]. See Paragraphs 8.1 – 8.9.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. USG Boral Bracing Systems meet this requirement. See Paragraphs 9.1 – 9.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. USG Boral Bracing Systems meet this requirement and will not present a health hazard to people.

- 3.2 The bracing demand calculation and bracing distribution rules published in the USG Boral Bracing Calculator are in accordance with Section 5 of NZS 3604: 2011. Bracing resistance is provided by bracing element ratings determined in accordance with NZS 3604: 2011, Paragraph 8.3.1.2.
- 3.3 NZS 3604: 2011 is an **Acceptable Solution** for compliance with New Zealand Building Code Clause B1 Structure.

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with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Technical Specification

4.1 The USG Boral Plasterboards and accessories used with USG Boral Bracing Systems and supplied or specified by USG Boral Building Products NZ are as follows:

USG Boral Plasterboards

USG Boral Sheetrock® Ceiling and Wall

- USG Boral Sheetrock® Ceiling and Wall is a paper-bound, gypsum-plaster core sheet lining material. It is available in 10 and 13 mm sheet thicknesses and sheet widths of 1200 mm and 1350 mm. Sheets are available in various edge profiles and lengths from 2400 mm to 6000 mm. Refer to Table 1. The nominal sheet weight is 5.9 kg/m² for 10 mm sheet thickness and 6.9 kg/m² for 13 mm sheet thickness. USG Boral Sheetrock® Ceiling and Wall face paper is buff in colour.

Table 1: USG Boral Sheetrock® Ceiling and Wall Available Sheet Sizes

Sheet Thickness [mm]	Sheet Edge Profile	Sheet Width [mm]	Sheet Length [mm]						
			2400	2700	3000	3600	4200	4800	6000
10 mm	RE/RE	1200	✓	✓	✓	✓	✓	✓	✓
10 mm	RE/SE	1350				✓		✓	✓
13 mm	RE/RE	1200	✓	✓	✓	✓	✓	✓	✓
13 mm	RE/SE	1350				✓		✓	

RE = recessed edge, SE = square edge

USG Fiberock® Aqua-Tough™

- USG Fiberock® Aqua-Tough™ is a paper-less, gypsum-plasterboard reinforced with cellulose fibre. It is available in 10, 13 and 16 mm sheet thicknesses and a sheet width of 1200 mm. Sheets are only available with a recessed edge profile and lengths of 2400 mm, 2700 mm and 3000 mm. The nominal sheet weight is 10 kg/m² for 10 mm thick sheets, 12 kg/m² for 13 mm thick sheets and 15 kg/m² for 16 mm thick sheets. USG Fiberock® Aqua-Tough™ is off-white in colour.

USG Boral Accessories and USG Boral Jointing Compounds

- As specified in the Technical Literature.

Board Substitutions

4.2 In certain situations, as specified in the Technical Literature, substitution of 10 mm USG Boral Sheetrock® Ceiling and Wall in UB1S and UB2S bracing systems is permitted with specific USG Boral plasterboards. These boards are: 13 and 16 mm USG Boral Firestop®, 10 mm, 13mm and 16 mm USG Fiberock® Aqua-Tough™, 13 mm USG Boral Multistop™, and 10 and 13mm USG Boral Wet Area Board. All boards are fixed with 32 x 6g screws, except for 16 mm thick products which must be fixed with 51 x 7g screws.

Components and Accessories

4.3 System components and accessories for USG Boral Bracing Systems, which are supplied by the building contractor are:

Fasteners

- 32 mm x 6 g drywall, gold passivated, bugle head, coarse thread screw with an 8 mm head for fixing to timber framing.
- 51 mm x 7 g drywall, gold passivated, bugle head, coarse thread screw with an 8 mm head for fixing to timber framing.

Adhesive

- Adhesive must comply with AS 2753 for adhering plasterboard to timber framing.

Plywood

- Plywood must be a minimum of 7 mm thick complying with AS/NZS 2269 D-D Grade Structural.
- Plywood fixings are 50 x 2.8 mm hot-dipped galvanised steel flat-head nails.

Fasteners, Anchors and Connections

- Pryda Bracing Anchor – galvanised steel 87 mm high x 85 mm long x 50 mm wide x 4 mm thick angle bracket. The bracket is supplied with 7 Type 17 screws 5.5 x 35 mm.
- Coach screws 12 mm x 150 mm and 50 x 50 x 3 mm washer hot-dipped galvanised for fixing to timber floors.
- Cast-in bolts M12 x 150 mm minimum and 50 x 50 x 3 mm washers for fixing to concrete floors.
- Proprietary fixings with a minimum characteristic strength of 15 kN may be used, instead of cast-in bolts.
- Shot fired fasteners for fixing internal line bracing systems to concrete slabs. Refer to fastener proprietor for specifications.
- Galvanised or stainless steel strap 25 x 0.9 mm top and bottom plate connections.
- Strap fixings 30 x 2.5 mm hot-dipped galvanised or stainless steel flat-head nails.

Note: For corrosion protection requirements refer to NZS 3604: 2011 Section 4.

Ceiling Battens

- Timber ceiling battens as specified in NZS 3604: 2011.

Handling and Storage

- 5.1 The best results are achieved when USG Boral 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 Technical Literature. 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 USG Boral Bracing 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 The tabulated bracing ratings given in Table 2 of this Appraisal are for manual calculations which have been rounded and are conservative. NZS 3604: 2011 provides methods to distribute the bracing units in walls to resist forces and a method for modifying the wall bracing capacity for alternative wall heights. The use of ceiling diaphragms is defined in the Technical Literature.
- 7.2 USG Boral Bracing Systems are for use in dry, internal situations only.
- 7.3 USG Boral Plasterboards must not be exposed to temperatures of 52°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

USG Boral Bracing Calculator

- 7.4 The USG Boral Bracing Calculator contains design procedures and an electronic calculation method for bracing demand calculated in accordance with NZS 3604: 2011, Section 5. Floor loadings can be selected in accordance with either NZS 3604: 2011 Bracing Demand Tables 5.5 – 5.10 for 2 kPa floor loads or less, or Tables 14.1 – 14.3 for 3 kPa floor loads.

- 7.5 The bracing demand calculations contained in the USG Boral Bracing Calculator are based on first principles engineering and calculate wind and earthquake demand based on the building parameters entered. Resulting bracing demand calculations are project specific and can differ from values derived using NZS 3604: 2011 wind and earthquake demand tables. The USG Boral Bracing Calculator has been assessed as part of this Appraisal.

Framing

- 7.6 Timber framing grade, spacing and construction must comply with NZS 3604: 2011. Timber treatment must comply with NZBC Acceptable Solution B2/AS1.
- 7.7 USG Boral Building Products NZ recommends the use of kiln-dried stress-graded framing timber. The minimum actual framing dimensions are 90 x 45 mm for external walls and 75 x 45 mm for internal walls.
- 7.8 Joints in the top plates of bracing panels must be tied together with 3 kN and 6 kN top plate connectors using 25 x 0.9 mm galvanised mild steel strap, 3 nails each side of joint for 3 kN and 6 nails each side of joint for 6 kN.

Board Substitutions

- 7.9 On occasions, properties additional to bracing may be required of the plasterboard lining. Refer to Paragraph 4.2.

Structure

Bracing

- 8.1 The bracing units (wind and earthquake) published for manual calculations in USG Boral Bracing Systems are given in Table 2.
- 8.2 The bracing unit ratings embedded in the USG Boral Bracing Calculator are less conservative and vary with wall length.
- 8.3 The Technical Literature provides comprehensive construction and panel hold-down details. These include bottom plate fixings using bolts (concrete) or coach screws (timber) and the Pryda Bracing Anchor or nailed stud-to-plate straps.
- 8.4 The bracing units are derived from the BRANZ P21 test method based on a wall height of 2.4 m. For greater wall heights the bracing rating is calculated by multiplying the appropriate value shown in Table 2 by a factor $f=2.4$ and divided by the wall height in metres. Walls lower than 2.4 m shall be rated as if they were 2.4 m high.

Ceiling Diaphragms

- 8.5 USG Boral Plasterboard ceiling diaphragms are used to space bracing lines further apart than 6 m. The basic shape of a ceiling diaphragm must be square or rectangular and the length must not exceed twice the width.
- 8.6 For ceiling diaphragms not steeper than 15° and not exceeding 7.5 m in length, any USG Boral Plasterboard listed in Paragraph 4.2 (except 10 mm USG Boral Sheetrock® Ceiling and Wall) may be used provided the perimeter fixing of the sheets and the diaphragm boundary are fixed at 150 mm centres to framing as required by NZS 3604: 2011.

Openings in Bracing Elements

- 8.7 Small openings of 90 x 90 mm or less may be placed anywhere except within 90 mm of the edge of the bracing element. Holes of a maximum diameter of 125 mm may be placed in the body of the sheet a minimum of 300 mm from the edge of the bracing element.

Water-splash Areas

- 8.8 USG Boral Bracing Systems must not be located in shower cubicles or behind baths and the like. USG Boral Bracing Systems may be used in water-splash areas provided they are protected as required by NZBC Clause E3.

Impact Resistance

8.9 USG Boral Plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Table 2: USG Boral Bracing Systems Bracing Ratings

Type	Minimum length [m]	Maximum Length [m]	Lining	Other Requirements	BU/m	
					Wind	Earthquake
10mm USG Boral Sheetrock® Ceiling and Wall						
UB1S	0.4	6.0	10 mm USG Boral Sheetrock® Ceiling and Wall one side	n/a	55	50
UB2S	0.4	4.8	10 mm USG Boral Sheetrock® Ceiling and Wall both sides		65	60
10 mm USG Fiberock® Aqua-Tough™						
UB1FR	0.4	1.2	10 mm USG Fiberock® Aqua-Tough™ one side	Panel hold-downs	105	125*
	1.2	4.8			145*	140*
UB2FR	0.4	1.2	10 mm USG Fiberock® Aqua-Tough™ both sides		115	130*
	1.2	2.4			150*	150*
UBFRP	0.4	1.2	USG Fiberock® Aqua-Tough™ one side, 7mm plywood the other		105	130
	1.2	2.4			150*	150*

Notes:

Where linings are specified on both faces, each face must be fastened as a bracing element.

* Timber Floors – A limit of 120 BU/m applies to NZS 3604: 2011 timber floors.

Durability

9.1 USG Boral Bracing Systems, including linings and their fixings have a serviceable life of at least 50 years. The ability of the systems to remain durable is dependent on them remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

9.2 The building must be maintained weatherproof and USG Boral Plasterboard must be protected from external and internal moisture in accordance with NZBC Clauses E2 and E3.

9.3 Holes resulting from damage to the lining, up to 100 x 100 mm square, will have no significant effect on the performance of the bracing panel. Such holes may be repaired by patching, stopping and finishing as appropriate. Independent expert advice must be sought to assess the effect and repair of larger areas of damage.

9.4 Bracing elements require no ongoing maintenance, apart from decoration and the repair of any damage.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to USG Boral Plasterboard 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.

Fire Affecting Areas Beyond the Fire Source

Internal Surface Finishes

- 11.1 Table 3 shows the Material Group Numbers for USG Boral Plasterboards without applied paint or wallpaper finishes. When an applied finish is used over USG Boral Plasterboards, the Material Group Number must be obtained from the manufacturer of the finish product or system, for the complete lining system. USG Boral Plasterboards can be used as internal surface linings where permitted by NZBC Performance Clause C3.4 [a].
- 11.2 In all Risk Groups, where foamed plastics building materials or combustible insulating materials form part of a wall system, the complete system including the internal lining and finishes must achieve a Group Number of not more than three.
- 11.3 In buildings with a SH Risk Group classification, there are no internal surface finish requirements for USG Boral plasterboards (with or without an applied finish), unless foamed plastics building materials or combustible insulating materials form part of the wall system.

Table 3: Surface Finish Properties

Product	Material Group Number
USG Boral Firestop®	1-S
USG Boral Multistop™	1-S
USG Boral Sheetrock® Ceiling and Wall	1-S
USG Boral Wet Area Board	1-S
USG Fiberock® Aqua-Tough™	1-S

Internal Moisture

- 12.1 USG Boral Plasterboard must be used in dry internal situations, and must not be used where likely to be exposed to liquid water, or where extended exposure to humidity above 90% RH is expected, e.g. such as may be expected in sauna rooms, commercial kitchens and the like.

Installation Information

Installation Skill Level Requirement

- 13.1 Installation of USG Boral Bracing 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

- 14.1 USG Boral Bracing Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Framing

- 14.2 To achieve an acceptable decorative finish, the Technical Literature specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. USG Boral Building Products NZ recommend a moisture content of 8–18% where buildings are to be air conditioned or centrally heated.

Cutting

- 14.3 USG Boral 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.
- 14.4 USG Fiberock® Aqua-Tough™ is stronger than paper-faced plasterboard, but can still be cut by scoring and snapping. The sheets may also be cut with a hand saw or a power saw fitted with a dust extraction system. Cut edges may be smoothed with a sanding block or rasp.

Sheet Fixing

- 14.5 Corner fixings must be 50 mm away from the sheet corner. Fixings must be no closer than 12 mm from the paper-bound sheet edge of plasterboards or recessed edges of USG Fiberock® Aqua-Tough™, and no closer than 18 mm from a cut edge on plasterboards or sheet ends on USG Fiberock® Aqua-Tough™. Fixings must be driven at right angles to the sheet until the head is seated in a slight dimple just below the surface of the paper liner or the board surface in the case of USG Fiberock® Aqua-Tough™. Fixings must not be over-driven.
- 14.6 USG Boral wall bracing sheets are fixed at 150 mm centres around the perimeter framing of the bracing element. At the corners of the wall bracing elements, a special fastening pattern is required in both directions with fasteners spaced at 50 mm, 100 mm, 150 mm, 225 mm and 300 mm from the corner and there-after at 150 mm centres. Fixing to other framing is either mechanical or by using plasterboard adhesive.
- 14.7 All USG Boral Plasterboard ceiling diaphragms require fixings around the perimeter of each sheet and the diaphragm boundary at 150 mm centres. See Paragraphs 8.5 to 8.6 and refer to the Technical Literature.
- 14.8 The USG Boral Bracing Systems requirements for horizontal or vertical sheet installation must be met. Full sheets must be used wherever possible.
- 14.9 Plywood is nail fixed at 150 mm centres around the perimeter of each sheet and at 300 mm centres to intermediate framing.

Jointing and Finishing

- 14.10 All bracing element sheet joints must be reinforced with paper tape and finished in accordance with the USG Boral Bracing Systems Technical Literature.

Health and Safety

- 14.11 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

- 15.1 Bracing tests were carried out by SCION in accordance with BRANZ Technical Paper P21 to determine the performance of USG Boral Bracing Systems when the building is subjected to lateral wind or earthquake loading. SCION's test facilities, procedures and results have been reviewed by BRANZ and found to be satisfactory.
- 15.2 USG Fiberock® Aqua-Tough™ and the plasterboard liner papers have been subject to an accelerated aging regime by BRANZ to assess their long term properties.

Investigations

- 16.1 The USG Boral Bracing Calculator has been assessed by BRANZ and found to be satisfactory.
- 16.2 The USG Boral Bracing Systems Technical Literature has been examined by BRANZ and found to be satisfactory.
- 16.3 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.
- 16.4 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
- 16.5 USG Boral Plasterboards have been assessed for the following properties: MOR, MOE, nail pull resistance, edge hardness, hard and soft body impact resistance and humidified deflection.

Quality

- 17.1 The manufacturing process of the Australian manufacturer USG Boral Building Products Pty Ltd and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory.
- 17.2 The quality management systems of USG Boral Building Products Pty Ltd have been assessed and registered by SAI Global as meeting the requirements of ISO 9001, Registration No. QEC0400.
- 17.3 The manufacture of USG Fiberock® Aqua-Tough™ 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 covering quality aspects associated with the product. BRANZ also undertakes an ongoing review of product quality on an inwards goods basis.
- 17.4 USG Boral Building Products NZ is responsible for the quality of the product supplied.
- 17.5 The quality of the application and finish on-site is the responsibility of the installation, stopping and finishing contractors.
- 17.6 Designers are responsible for the design of buildings.
- 17.7 Building owners are responsible for the maintenance in accordance with the instructions of USG Boral Building Products NZ.

Sources of Information

- AS/NZS 2269: 2012 Plywood - Structural.
- AS/NZS 2588: 1998 Gypsum plasterboard.
- BRANZ Technical Paper P21: 2010 A wall bracing test and evaluation procedure.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



In the opinion of BRANZ, **USG Boral Bracing 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 **USG Boral Building Products NZ**, 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. **USG Boral Building Products NZ**:
 - 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 **USG Boral Building Products NZ**.
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 **USG Boral Building Products NZ** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

03 December 2015



TECHNICAL DATA

SHEETROCK® Brand Wall Board

SHEETROCK® BRAND Wall Board is USG Boral's newest engineered lightweight alternative to Regular 10mm plasterboard. This plasterboard panel has a high strength to weight composite design.

The non-combustible gypsum core is encased in 100% recycled face and back papers. The natural finish face paper is folded around the long edges to protect the core and the ends are cut square and even. The long edges of the panels are recessed, allowing joints to be reinforced with USG Boral joint finishing systems.

ADVANTAGES

- Light weight, easy to install and handle
- Available in 2 types of edge profiles



WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC170237 4/04/2017 lachlant

BOARD SPECIFICATION

Feature	Description
Thickness	10mm
Edge Profiles	Recessed edge, Recessed edge/Square edge
Sheet Size (width x length)	1200 x (2400-6000mm), 1350 x (3600-6000mm) [Please refer to Size & Availability Chart for more sizes] Product availability: Certain products and sizes may only be available on order or in pack lots.
Paper Colour	Buff
Mass	5.4 kg/m ² nominal
Fire Hazard Properties	Group 1 – In accordance with BCA Specification C1.10a Fire Hazard Properties – Floors, Walls and Ceilings
Combustibility	Non Combustible material as defined in BCA Deem-to-Satisfy Provisions C1.12
VOC	Less than 0.5mg/m ³ TVOC*
Manufacture	Manufactured in Australia to the requirements of AS/NZS 2588:1998 Gypsum plasterboard and in accordance with AS/NZS ISO 9001:2008 – Quality management systems – Requirements

*Total Volatile Organic Compounds

INTENDED FOR

- Non-fire rated wall and ceiling applications.
- New residential or commercial construction.
- Repair and alterations of existing buildings.

LIMITATIONS

- Avoid exposure to sustained temperatures exceeding 42°C.
- Avoid exposure to excessive, repetitive or continuous moisture before, during and after installation. Eliminate sources of moisture immediately.
- Maximum wall frame spacing is 600mm.
- Maximum ceiling frame spacing is 450mm.
- Must be stored under cover.

FINISHING AND DECORATING

For high-quality finishing results, USG Boral recommends the following products:

- USG Boral ready-mixed joint compounds eg. RediBase™, Total Lite™ or LiteFinish™
- USG Boral setting-type joint compounds eg. BaseCote® or EasySand™
- SHEETROCK® Brand joint tape
- SHEETROCK® Brand paper faced metal bead and trim
- USG Boral, SHEETROCK® Brand Tuff-Hide™ primer-surfacer

Refer AS/NZS 2589:2007 Gypsum linings – Application and Finishing, to determine the level of finishing needed to ensure a surface properly prepared to accept the final decoration.

Where plasterboard walls and ceilings will be subjected to severe artificial or natural side lighting, or be decorated with a gloss paint (egg shell, semi-gloss or gloss), the plasterboard panel surface should be skim coated with joint compound. This equalises suction and texture differences between the plasterboard face paper and the finished joint compound before painting. Refer AS/NZS 2311:2009, Guide to the Painting of Buildings. As an alternative to skim coating, or when a Level 5 finish is required, use USG Boral Tuff-hide™ primer-surfacer.

INSTALLATION

CEILING LOADS AND SPANS

Gypsum board spans and loads directly supported on ceiling linings must not exceed the maximum values indicated in the table below.

Loads in excess of maximum allowable must be supported independently from a roof or ceiling structure.

GYPSON BOARD FASTENERS

For full installation details, refer to USG Boral website www.usgboral.com or call TecASSIST on 1800 811 222.

Maximum loads and spans for internal ceilings

Total load ¹ (kg/m ²)	Board type	Wind class			
		N1	N2	N3	N4
Less than or equal to 2.0	10mm SHEETROCK® Brand Ceiling Board 13mm SHEETROCK® Brand Standard Board	600	600	600	600
	10mm SHEETROCK® Brand Wall Board	450	450	450	450
Above 2.0 and no greater than 2.6 ²	10mm SHEETROCK® Brand Ceiling Board 13mm SHEETROCK® Brand Standard Board	600	600	450	450
	10mm SHEETROCK® Brand Wall Board	450	450	NA	NA

Nail length (mm)

Plasterboard thickness	Timber frame				Steel frame
	Boral smooth shank gold passivated nails ³	Boral annular ring shank nails ³ and uni-nails ³	Galvanised nails ³ (2.8mm dia UNO)	Type W screws ⁴	Type S ⁵ and Type D ⁶ screws
1 x 10mm	40 softwood	30	40 softwood	6-9 x 25W wall	6-18 x 25 ⁷ D,S
	30 hardwood		30 hardwood	6-9 x 32W ceiling	
1 x 13mm	40 softwood	30	40 softwood	6-9 x 32W	
	30 hardwood		30 hardwood		

¹ Total load includes weight of insulation and any fixtures directly supported on ceiling linings.

² One third fixing method only

³ Nail lengths are minimums, however care is needed when selecting longer nails to avoid nail bending in hardwoods or popping of plasterboard with unseasoned timber.

⁴ "W" is a single start, needle point, bugle head type W gypsum screw for fixing to hardwood and softwood framing. In some instances double start thread screws are permissible (refer USG Boral).

⁵ "S" is a double start, needle point, bugle head type S gypsum screw for fixing to steel gauges of up to 0.80mm BMT.

⁶ "D" is a double start, drill point, bugle head type D gypsum screw for fixing to steel gauges 0.80 to 2.00mm BMT.

⁷ For ease of construction with framing steel gauges of less than 0.8mm BMT use 30mm minimum screw length.

ACOUSTICS

Steel Stud Walls

Wall linings	Stud size (mm)	64	92
	Insulation	Rw	
1x10mm SHEETROCK® Brand Wall Board both sides	Nil	30	31
	TSB2	34	37
	50G11, 50P14	35	38
	75G11, 75P14	–	39

Insulation legend:

Glasswool Insulation

Insulation designation	Insulation type
50G11	50mm Pink® Partition 11 by Fletcher Insulation
75G11	75mm Pink® Partition 11 by Fletcher Insulation
50G14	50mm Pink® Sonobatts by Fletcher Insulation
70G14	70mm Pink® Sonobatts by Fletcher Insulation

COMPLIANCE

- Manufactured under AS/NZS ISO 9001:2008 “Quality Management Systems – Requirements” to meet or exceed AS/NZS 2588:1998 “Gypsum Plasterboard”.
- Complies with the requirements of Building Code of Australia and relevant Australian Standards.
- Classified as non-combustible according to BCA section C1.12.
- Qualifies as low VOC emitting material, less than 0.5mg/m³ TVOC.
- Classified as non-hazardous in accordance with NOHSC Australia.

SUSTAINABILITY

USG Boral products are manufactured from a combination of natural gypsum, and paper liner made from 100% reclaimed and recycled paper waste. Plasterboard waste can be reclaimed and recycled into new plasterboard, or reused as soil conditioner.

Timber Stud Walls

Wall linings	Stud size (mm)	70	90
	Insulation	Rw	
1x10mm SHEETROCK® Brand Wall Board both sides	Nil	29	30
	TSB2	35	37
	70G14, 70P14	36	38

Polyester Insulation

Insulation designation	Insulation type
TSB2	TSB2 by Tontine Insulation (or equivalent)
50P14	50mm thick, 14kg/m ³ density
70P14	70mm thick, 14kg/m ³ density
75P14	75mm thick, 14kg/m ³ density

WASTE MANAGEMENT

Waste collection services are available to divert acceptable plasterboard waste away from landfill for recycling or re-processing for other uses. For information on waste collection services available, please contact your local USG Boral office.

VOLATILE ORGANIC COMPOUNDS (VOC) AND FORMALDEHYDE MINIMISATION

USG Boral products, compounds and adhesive have been independently tested to confirm compliance with Green Star specification limits for VOCs and are formaldehyde free.

REFERENCES

Refer www.usgboral.com for Material Safety Data Sheet, Volatile Organic Compound Emission details and other additional information.

SALES ENQUIRIES **1800 003 377**

TecASSIST® **1800 811 222**

PLASTERBOARD BRACING MANUAL

NEW ZEALAND



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

GENERAL INFORMATION

PREFACE

USG Boral Building Products is a plasterboard and ceilings joint venture between USG Corporation and Boral Limited and is one of the leading manufacturer's in this field.

Operating throughout Asia, Australia, the Middle East and New Zealand USG Boral Building Products combines innovative building products and superior technology for the construction sector and provides products and systems that exceed the compliance requirements of each market.

USG Boral Building Products is well positioned to service the Australian and New Zealand markets with manufacturing facilities in New South Wales, Queensland, Victoria and New Zealand, (Suspended ceilings and Steel Studs).

For more information on USG Boral Building Products refer to www.usgboral.com or phone 0800 USGBORAL (0800 874 467).

INTRODUCTION

USG Boral bracing system technology has been specifically designed and rigorously tested in New Zealand to provide structural bracing for both residential and light commercial buildings within the scope and limitations of the current NZS3604:2011 Standard. The USG Boral Bracing System has been tested in accordance with the BRANZ P21 (2010) Test & Evaluation Method - racking test limited states design; cited in NZS3604:2011 Timber Framed Buildings to determine wind and earthquake ratings of bracing elements. This aligns with the new loadings standard AS/NZS 1170.

TEC ASSIST

For technical assistance please refer to www.usgboral.com or phone 0800 USGBORAL (0800 874-467)

WARRANTY

For more information on USG Boral Building Products warranty please refer to www.usgboral.com or phone 0800 USGBORAL (0800 874-467)

LIABILITY

USG Boral will not accept any liability for its bracing products and systems which are not correctly installed as stipulated in this manual.

BENEFITS OF USING USG BORAL BRACING SYSTEMS

USG Boral Bracing Systems use superior lightweight plasterboard technology to provide structural performance to panel bracing systems.

Lightweight plasterboard technology is the future of plasterboard providing quick and simple installation, durability and quality finish.

LIMITATIONS OF USE

For use:

- To be used within the scope and limitations of the current NZS3604:2011 Standard
- For interior use only
- USG Boral bracing systems are not permitted for use in wet areas behind showers and baths.

WHO MAY INSTALL BORAL BRACING SYSTEMS

Installation of the USG Boral Bracing Systems must be undertaken by or supervised by a Licensed Building Practitioner with the appropriate license category where the building work has been identified as Restricted Building Work.

HEALTH & SAFETY

It is important to follow good site practice at all times and to ensure appropriate safety precautions are taken when installing the USG Boral Bracing systems and all supporting components.

COMPATIBILITY WITH ASSOCIATED PRODUCTS

The USG Boral Bracing Systems and their components are compatible with most associated building products, however it is recommended that the installer seeks advice if in doubt.

PERFORMANCE

The performance of the USG Boral Bracing Systems is detailed in Table 1. The values for wind and earthquake are obtained from testing and evaluation that has been carried out in accordance with NZS3604:2011 and P21[2010] test and evaluation procedures.

USG BORAL BRACING - CONTENTS

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USG BORAL BRACING SYSTEMS SUMMARY TABLE

The bracing values detailed within Table 1 below have been determined from testing carried out on the USG Boral Bracing systems and is in accordance with the current NZS3604:2011 Standard and the P21 [2010] test and evaluation method.

TABLE 1: USG BORAL WALL BRACING SYSTEMS							
BRACING SYSTEM REFERENCE	SYSTEM DESCRIPTION	BOARD TYPE	HOLD DOWNS	MINIMUM WALL LENGTH (M)	MAXIMUM WALL LENGTH (M)	WIND VALUE BU'S/M	EARTHQUAKE VALUE BU'S/M
UB1S	10mm Sheetrock on one side 0.4m to 6.0m	Sheetrock Ceiling and Wall board	No	0.4	6.0	55	50
UB2S	10mm Sheetrock on both sides 0.4m to 4.8m	Sheetrock Ceiling and Wall board	No	0.4	4.8	65	60
UB1FR	10mm Fiberock on one side with hold downs 0.4m to 4.8m	Fiberock	Yes	0.4	1.2	105	125
				1.2	4.8	145	140
UB2FR	10mm Fiberock on both sides with hold downs 0.4m to 2.4m	Fiberock	Yes	0.4	1.2	115	130
				1.2	2.4	150	150
UBFRP	10mm Fiberock on one side 7mm DD structural plywood on the other side with hold downs 0.4m to 2.4m	Fiberock & Plywood	Yes	0.4	1.2	105	130
				1.2	2.4	150	150

1. Maximum hold down rating for NZS3604:2011 timber floors is 120BU's/m

2. Maximum hold down rating for NZS3604:2011 concrete floors is 150BU's/m

Where wind and earthquake values exceed the floor ratings (refer items 1 & 2 above) ratings must be reduced to the required maximum permitted ratings for timber or concrete floors.

For the calculating of USG Boral Bracing Systems refer to the USG Boral software calculator to calculate the wind and earthquake demand requirements and to calculate the achieved values using the USG Boral Bracings Systems detailed within this manual. Contact USG Boral for a copy of the bracing calculator software. 0800 USG BORAL (0800 874-267)

USG BORAL WALL BRACING SYSTEM UB1S

USG Boral Bracing Systems have been tested in accordance with the P21[2010] racking test procedure and the current NZS3604:2011 Standard. Detailed in the tables below are the performance values of the USG Boral UB1S bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral bracing system the correct components must be used and installed in accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB1S - PERFORMANCE

UB1S

10mm Sheetrock plasterboard installed vertically or horizontally on one side	
Bracing Element Wall Lengths	0.4 to 6.0m
Bracing Units/meter – Wind	55
Bracing Units/meter – Earthquake	50

USG BORAL SYSTEM UB1S - COMPONENTS

USG Boral Lining Type	10mm Sheetrock Ceiling & Wall Plasterboard on one side
Fasteners	6g x 32mm coarse threaded Gypsum Screws for timber substrate
Hold – Down Anchors	N/A
Hold – Down Brackets	N/A
Hold – Down Straps	N/A
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS3604 Standard, Section 8
Jointing Plaster	USG Boral range of plaster compounds

Note: It is not permitted to use nails or use adhesive to replace fasteners

USG BORAL SYSTEM UB1S - SPECIFICATIONS

USG Boral Plasterboard Lining Types	The following USG Boral plasterboard linings are permitted for use with the USG Boral UB1S bracing system • 10mm Sheetrock Ceiling & Wall Plasterboard
Fasteners	6g x 32mm Coarse threaded Gypsum Screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig 3)
Hold – Down Anchors	Not applicable for this system
Hold – Down Brackets	Not applicable for this system
Hold – Down Straps	Not applicable for this system
Adhesive	A Suitable Drywall Adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS3604 standard. Minimum framing grade of SG8. Maximum stud centres 600mm.
Jointing Plaster	USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds to be in accordance with the current AS/NZS 2589 Standard. Minimum plaster joint finish to be Level 4.
Minimum bracing Wall Length 400mm	400mm. The minimum permitted wall length of the UB1S Bracing system must not be less than 400mm.
Maximum bracing Wall Length 600mm	6000mm. The maximum permitted wall length must not exceed 6000mm.
Wall Height	Wall heights as determined by the current NZS3604 Standard. Bracing element height to be determined by the following calculation. $\text{Adjusted rating} = \left(\frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$
Bottom plate fixing	Timber floors: Install 2 x 100 x 3.75mm nails or use 3 x 90 x 3.15 gun nails at 600mm centres as per NZS3604:2011 Concrete floors: Refer to masonry nail manufacturers specifications or contact USG Boral on 0800 USG BORAL (0800 874-267)

FIG 1: UB1S BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

Sheets to be fixed to framing with 6g x 32mm Gypsum Drywall Screws at 300mm centres

Drywall Adhesive to intermediate studs

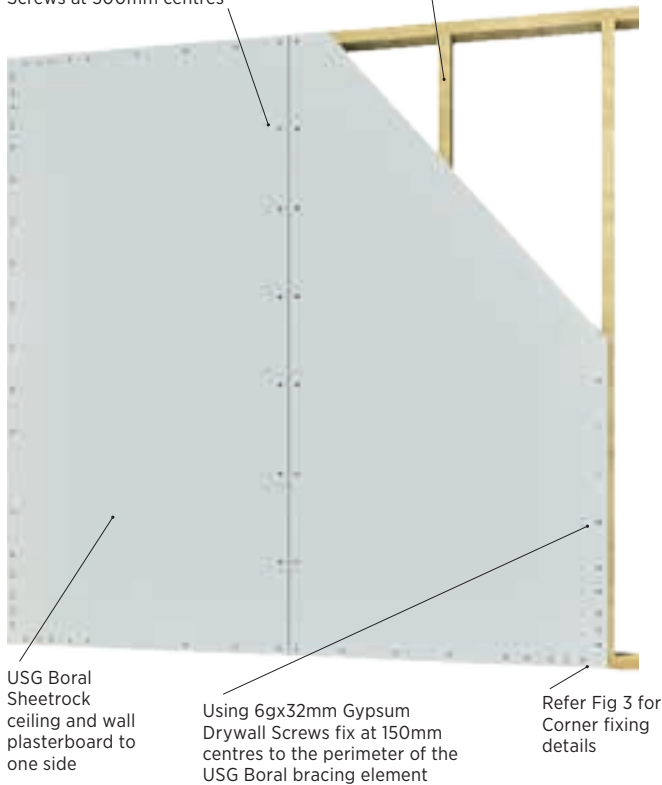


FIG 2: UB1S BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY

2.4m long bracing element detailed

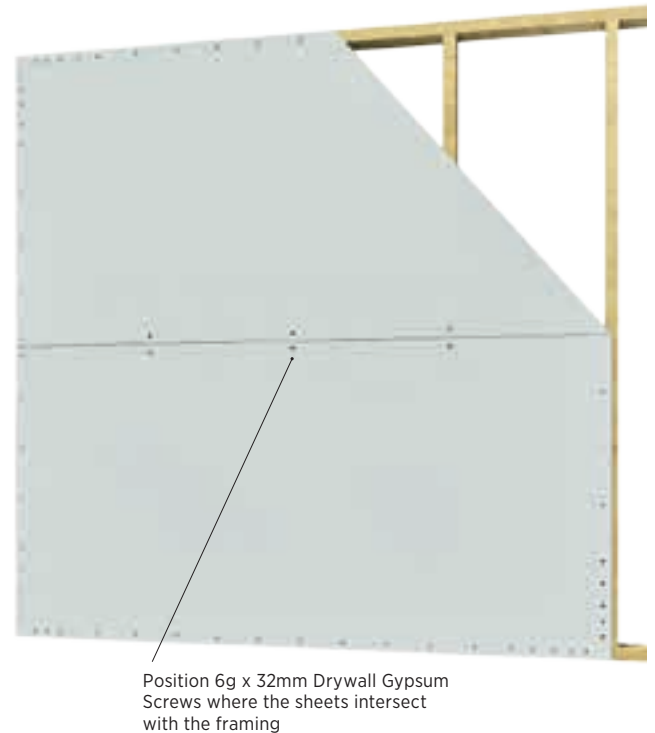
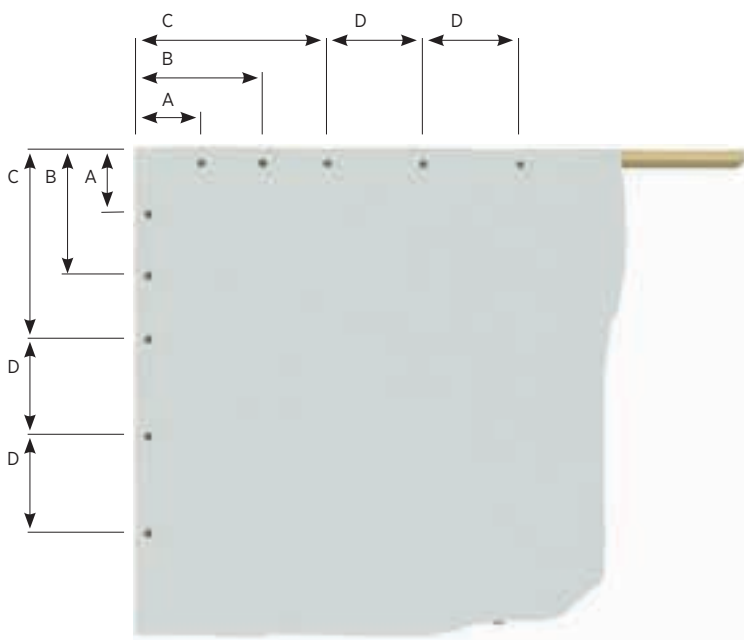


FIG 3: UB1S CORNER FIXING DETAILS

Each corner of the bracing element



Corner Fastener Centres are

A = 50mm

B = 100mm

C = 150mm

D = 75mm

The remainder of
Perimeter Fastener Centres = 150mm

USG BORAL WALL BRACING SYSTEM UB2S

USG Boral Bracing Systems have been tested in accordance with the P21[2010] racking test procedure and the current NZS3604:2011 Standard. Detailed in the tables below are the performance values of the USG Boral UB2S bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral bracing system the correct components must be used and installed in accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB2S - PERFORMANCE

UB2S

10mm Sheetrock Ceiling & Wall Plasterboard installed vertically or horizontally on both sides	
Bracing Element Wall Lengths	0.4 to 4.8m
Bracing Units/meter – Wind	65
Bracing Units/meter – Earthquake	60

USG BORAL SYSTEM UB2S - COMPONENTS

USG Boral Lining Type	10mm Sheetrock Ceiling & Wall Plasterboard on both sides
Fasteners	6g x 32mm coarse threaded Gypsum Screws for timber substrate
Hold – Down Anchors	N/A
Hold – Down Brackets	N/A
Hold – Down Straps	N/A
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS3604 Standard, Section 8.
Jointing Plaster	USG Boral range

Note: It is not permitted to use nails or use adhesive to replace fasteners

USG BORAL SYSTEM UB2S – SPECIFICATIONS

USG Boral Plasterboard Lining Types	The following USG Boral plasterboard linings are permitted for use with the USG Boral UB2S bracing system • 10mm Sheetrock Ceiling & Wall Plasterboard
Fasteners	6g x 32mm Coarse threaded Gypsum Screws to be installed at 150mm centres to the perimeter of the bracing element. (For corner fixing details refer to Fig 3)
Hold – Down Anchors	Not applicable for this system
Hold – Down Brackets	Not applicable for this system
Hold – Down Straps	Not applicable for this system
Adhesive	A Suitable Drywall Adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS3604 standard. Minimum framing grade of SG8. Maximum stud centres 600mm.
Jointing Plaster	USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds to be in accordance with the current AS/NZS 2589 Standard. Minimum plaster joint finish to be level 4.
Minimum Wall Length 400mm	400mm. The minimum permitted wall length of the UB2S Bracing system must not be less than 400mm.
Maximum Wall Length 4800mm	The maximum permitted wall length of the UB2S Bracing system must not exceed 4800mm
Wall Height	Wall heights as determined by the current NZS3604 Standard. Bracing element height to be determined by the following calculation. $\text{Adjusted rating} = \left(\frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$
Bottom plate fixing	Timber floors: Install 2 x 100 x 3.75mm nails or use 3 x 90 x 3.15mm gun nails at 600mm centres as per NZS3604:2011 Concrete floors: Refer to masonry nail manufacturers specifications or contact USG Boral on 0800 USG BORAL (0800 874-267)

FIG 1: UB2S BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

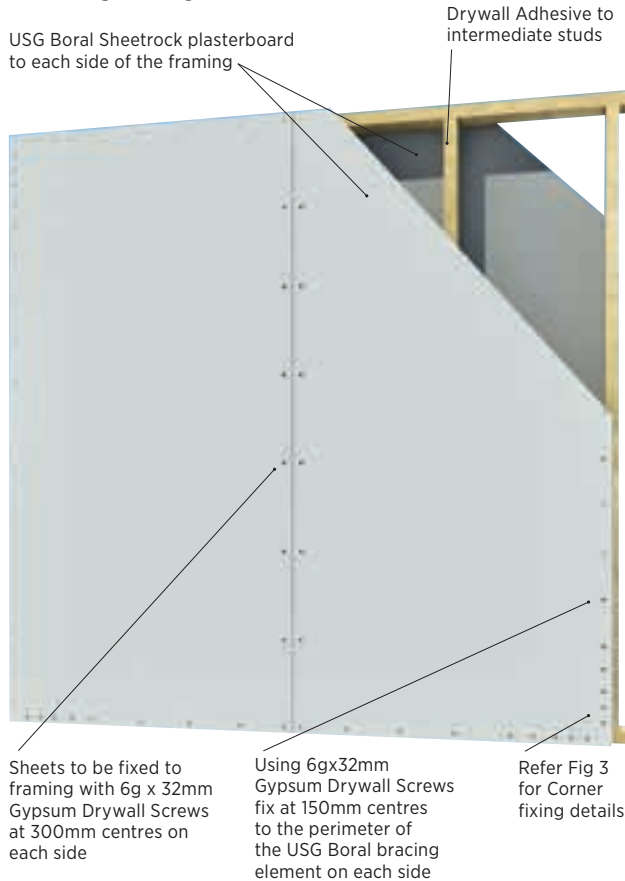


FIG 2: UB2S BRACING SYSTEM WITH SHEETS INSTALLED HORIZONTALLY

2.4m long bracing element detailed

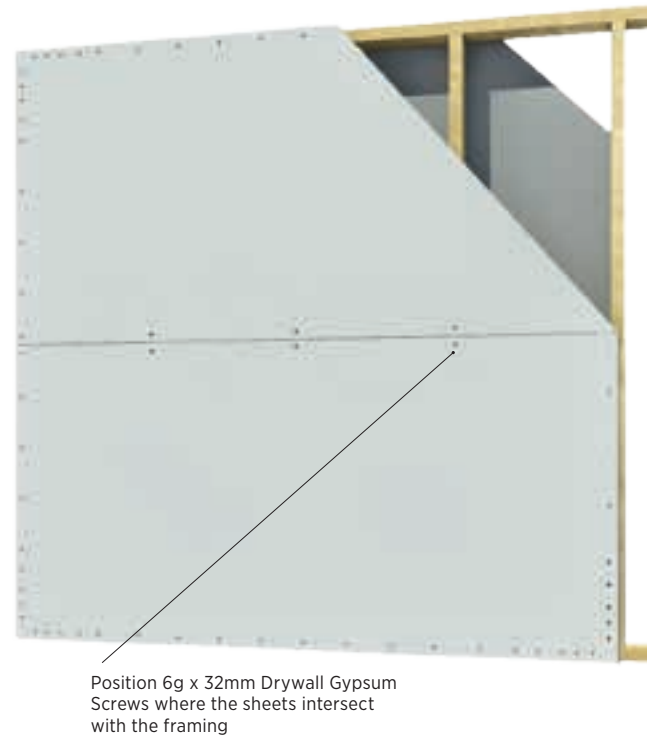
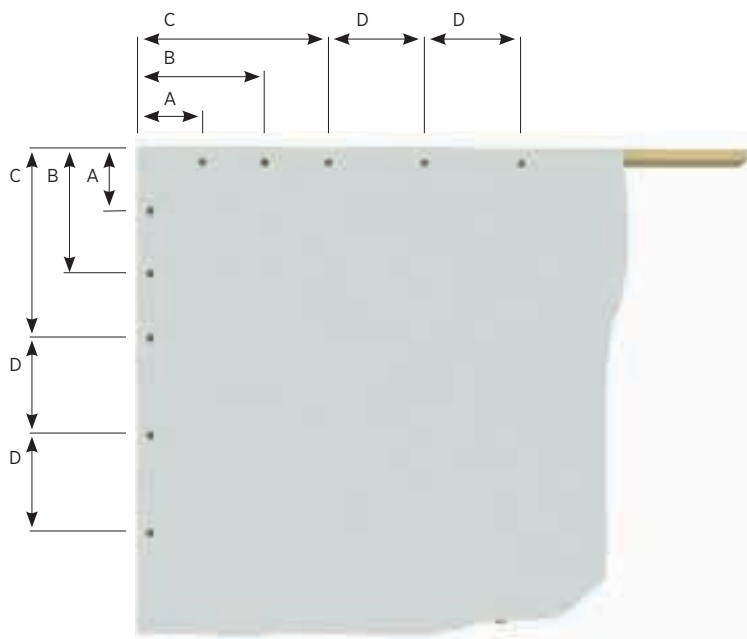


FIG 3: UB2S CORNER FIXING DETAILS

Each corner and each side of the bracing element



Corner Fastener Centres are

A = 50mm

B = 100mm

C = 150mm

D = 75mm

The remainder of
Perimeter Fastener Centres = 150mm

USG BORAL WALL BRACING SYSTEM UB1FR

USG Boral Bracing Systems have been tested in accordance with the P21[2010] racking test procedure and the current NZS3604:2011 Standard. Detailed in the tables below are the performance values of the USG Boral UB1FR bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral bracing system the correct components must be used and installed in accordance with the USG Boral Bracing Manual installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB1FR - PERFORMANCE

UB1FR

10mm Fiberock Aqua-Tough installed vertically on one side

Bracing Element Wall Lengths	0.4 to 1.2m	1.2m to 4.8m
Bracing Units/meter – Wind	105	145
Bracing Units/meter – Earthquake	125	140

Refer to maximum ratings for concrete and timber floors Table 1

USG BORAL SYSTEM UB1FR - COMPONENTS

USG Boral Lining Type	10mm USG Boral Fiberock Aqua-Tough on one side
Fasteners	6g x 32mm coarse threaded Gypsum Screws for timber substrate
Hold – Down Anchors	Yes
Hold – Down Brackets	Yes
Hold – Down Straps	N/A
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS3604 Standard, Section 8.
Jointing Plaster	USG Boral range of plaster compounds

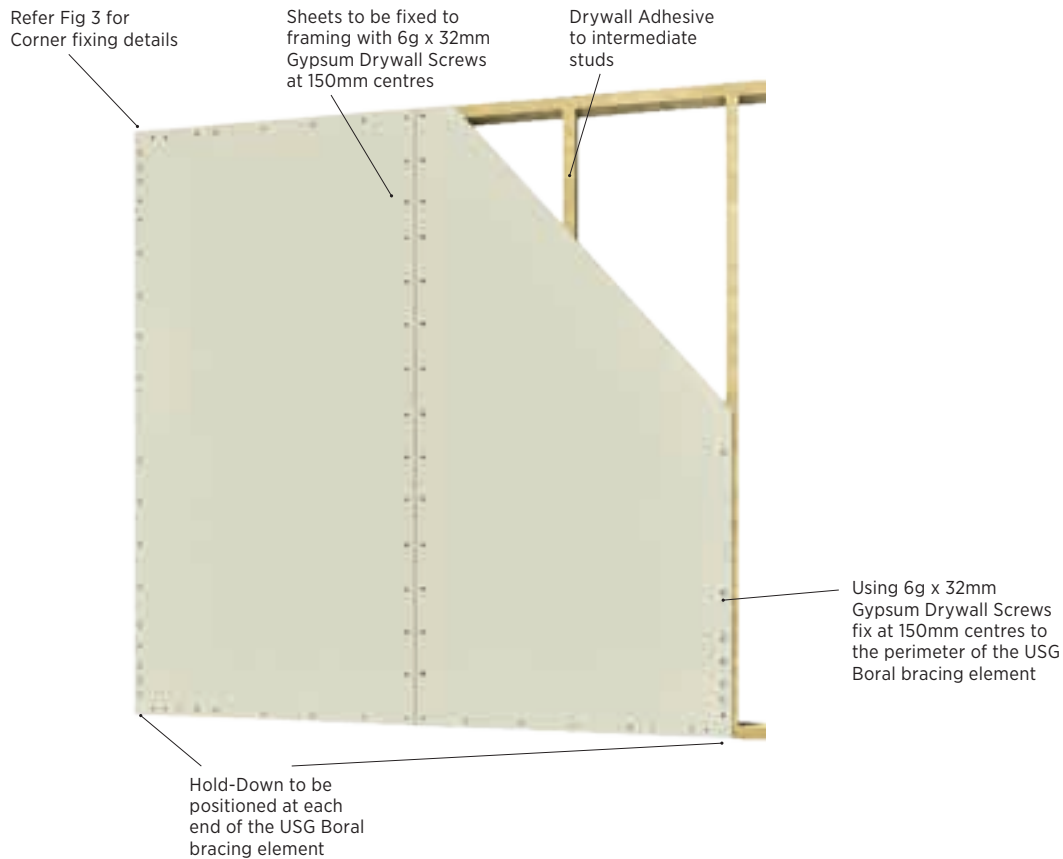
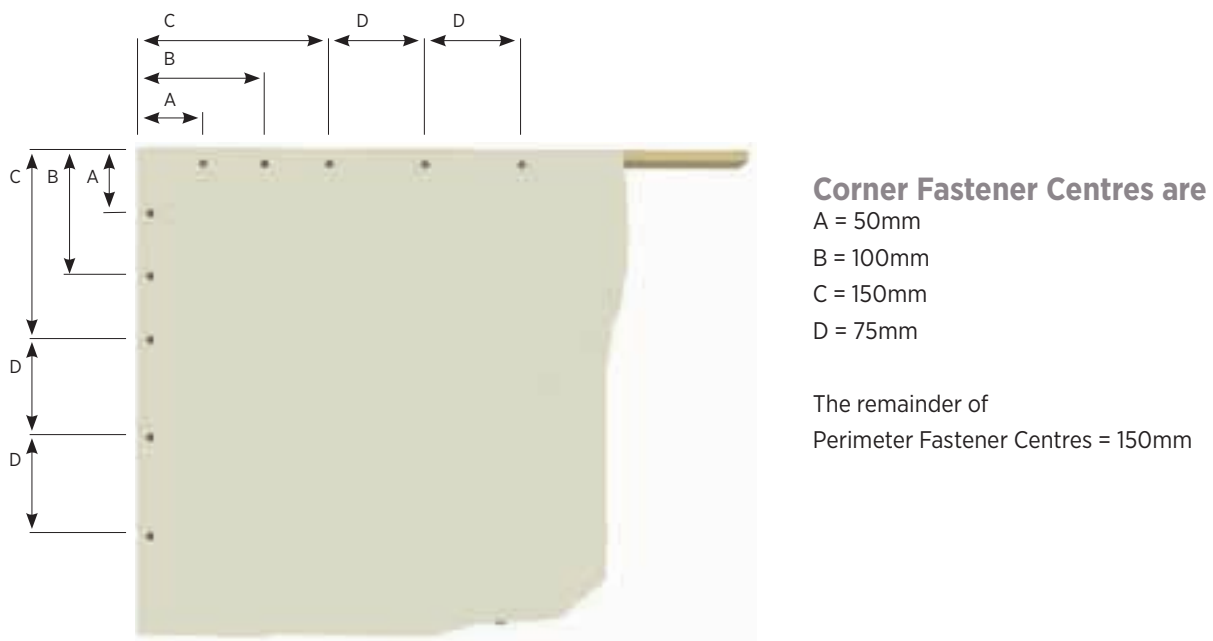
Note: It is not permitted to use nails or use adhesive to replace fasteners

USG BORAL SYSTEM UB1FR - SPECIFICATIONS

USG Boral Lining Types	The following USG Boral linings are permitted for use with the USG Boral UB1FR bracing system. • 10mm Fiberock Aqua-Tough
Fasteners	6g x 32mm Coarse threaded Gypsum Screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details (Refer to Fig 2).
Hold-Down Anchors (Minimum 15kN Characteristic uplift strength)	Concrete floors: Install M12 Galvanized bolts with 50 x 50 x 3mm washer. Bolts are to be set into the concrete at a minimum depth of 75mm. Timber Floors: Install M12 x 200mm Galvanized Coach Screws with 50 x 50 x 3mm washer. (Ensure bolts are secured into solid blocking).
Hold – Down Brackets or straps	Install either Hold-Down brackets or 400 x 25 x 0.9mm galvanised or stainless steel straps.
Adhesive	A Suitable Drywall Adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS3604 standard. Minimum framing grade of MSG8. Maximum stud centres 600mm.
Jointing Plaster	USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds to be in accordance with the current AS/NZS 2589 Standard. Minimum plaster joint finish to be Level 4.
Minimum Wall Length 400mm	The minimum permitted wall length of the UB1FR Bracing system must not be less than 400mm.
Maximum Wall Length 4800mm	The maximum permitted wall length of the UB1FR Bracing system must not exceed 4800mm.
Wall Height	Wall heights as determined by the current NZS3604 Standard. Bracing element height to be determined by the following calculation. $\text{Adjusted rating} = \left(\frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$

FIG 1: UB1FR BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

**FIG 2: UB1FR CORNER FIXING DETAILS**

USG BORAL WALL BRACING SYSTEM UB2FR

USG Boral Bracing Systems have been tested in accordance with the P21[2010] racking test procedure and the current NZS3604:2011 Standard. Detailed in the tables below are the performance values of the USG Boral UB2FR bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral bracing system the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UB2FR - PERFORMANCE

UB2FR

10mm Fiberock Aqua-Tough installed vertically on both sides.

Bracing Element Wall Lengths	0.4 to 1.2m	1.2m to 2.4m
Bracing Units/meter – Wind	115	150
Bracing Units/meter – Earthquake	130	150

Refer to maximum ratings for concrete and timber floors Table 1

USG BORAL SYSTEM UB2FR - COMPONENTS

USG Boral Lining Type	10mm Fiberock Aqua-Tough on both sides
Fasteners	6g x 32mm coarse threaded Gypsum Screws for timber substrate.
Hold – Down Anchors	Yes
Hold – Down Brackets or Straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS3604 Standard, Section 8
Jointing Plaster	USG Boral range

Note: It is not permitted to use nails or use adhesive to replace fasteners

USG BORAL SYSTEM UB2FR - SPECIFICATIONS

USG Boral Lining Types	The following USG Boral linings are permitted for use with the USG Boral UB2FR bracing system. • 10mm Fiberock Aqua-Tough
Fasteners	6g x 32mm Coarse threaded Gypsum Screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details (Refer to Fig 2).
Hold-Down Anchors (Minimum 15kN Characteristic uplift strength)	Concrete floors: Install M12 Galvanized bolts with 50 x 50 x 3mm washer. Bolts are to be set into the concrete at a minimum depth of 75mm. Timber Floors: Install M12 x 200mm Galvanized Coach Screws with 50 x 50 x 3mm washer. (Ensure bolts are secured into solid blocking).
Hold – Down Brackets or straps	Install either Hold-Down brackets or 400 x 25 x 0.9mm galvanised or stainless steel straps..
Adhesive	A Suitable Drywall Adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS3604 standard. Minimum framing grade of SG8. Maximum stud centres 600mm.
Jointing Plaster	USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds to be in accordance with the current AS/NZS 2589 Standard. Minimum plaster joint finish to be Level 4.
Minimum Wall Length 400mm	The minimum permitted wall length of the UB2FR Bracing system must not be less than 400mm.
Maximum Wall Length 2400mm	The maximum permitted wall length of the UB2FR Bracing system must not exceed 2400mm.
Wall Height	Wall heights as determined by the current NZS3604 Standard. Bracing element height to be determined by the following calculation. $\text{Adjusted rating} = \left(\frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$

FIG 1: UB2FR BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

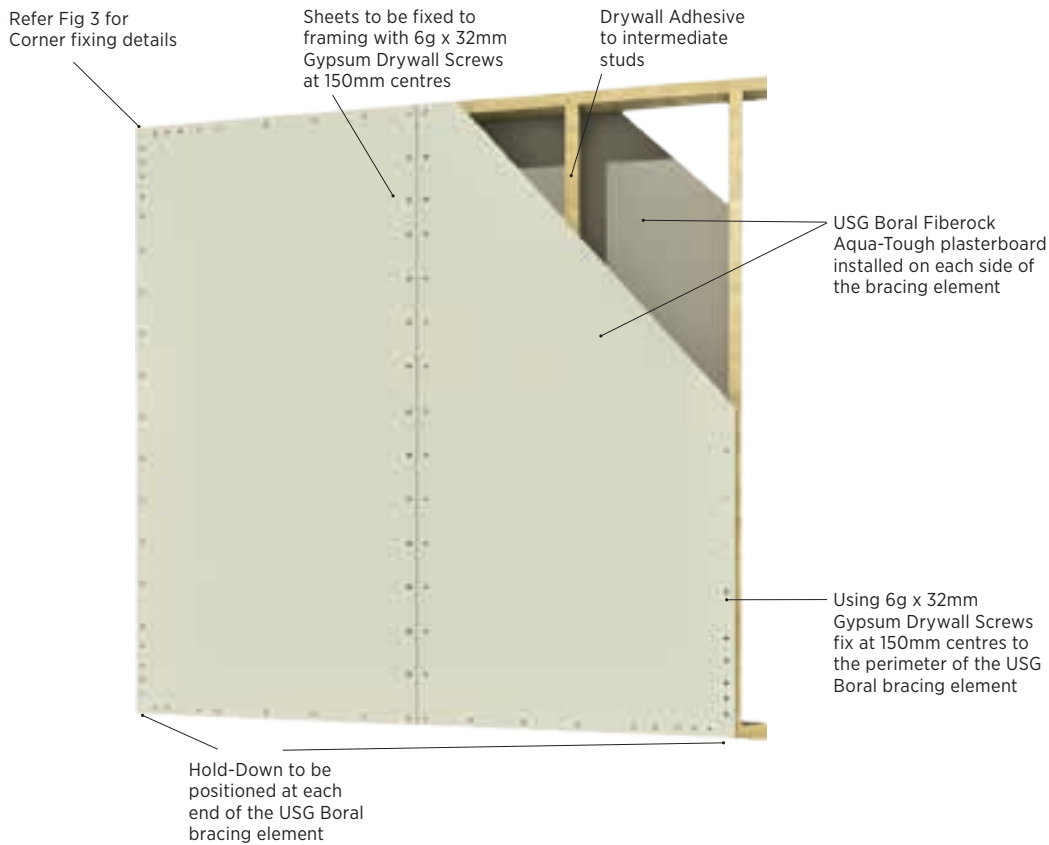
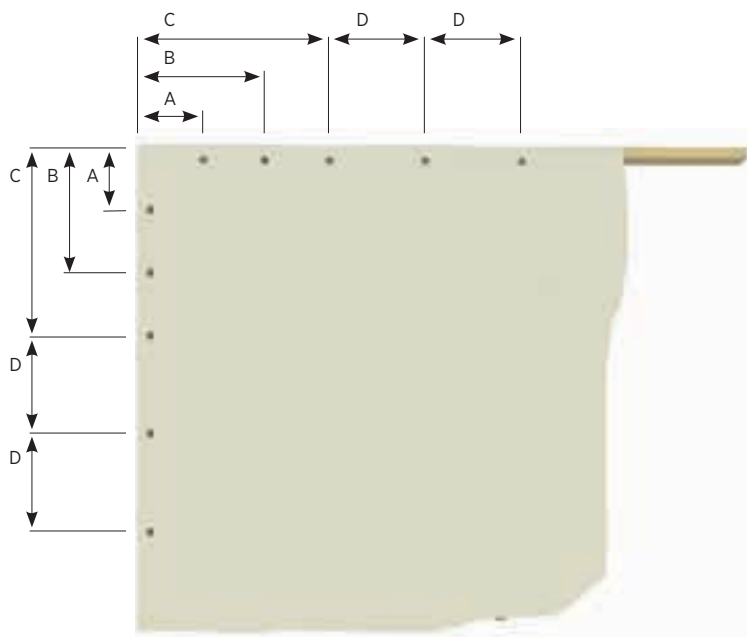


FIG 2: UB2FR

Corner fixing details for the USG Boral Fiberock Aqua-Tough lining (Each corner and on both sides of the bracing element)



Corner Fastener Centres are

A = 50mm

B = 100mm

C = 150mm

D = 75mm

The remainder of

Perimeter Fastener Centres = 150mm

USG BORAL WALL BRACING SYSTEM UBFRP

USG Boral Bracing Systems have been tested in accordance with the P21[2010] racking test procedure and the current NZS3604:2011 Standard. Detailed in the tables below are the performance values of the USG Boral UBFRP bracing system that apply to both timber and concrete floor constructions. To achieve the required performances of the USG Boral bracing system the correct components must be used and installed in strict accordance with the installation instructions and diagrams.

USG BORAL BRACING SYSTEM UBFRP - PERFORMANCE

UBFRP

10mm Fiberock Aqua-Tough installed vertically on one side and 7mm DD Structural Plywood on the other side.

Bracing Element Wall Lengths	0.4 to 1.2m	1.2m to 2.4m
Bracing Units/meter – Wind	105	150
Bracing Units/meter – Earthquake	130	150

USG BORAL SYSTEM UBFRP - COMPONENTS

USG Boral Lining Type	10mm Fiberock Aqua-Tough on one side
Plywood	7mm DD Structural Plywood on other side
Fasteners - Firebrock	6g x 32mm coarse threaded Gypsum Screws for timber substrate
Fasteners - Plywood	50mm x 2.8mm Galvanised flat head nails
Hold - Down Anchors	Yes
Hold - Down Brackets or Straps	Yes
Adhesive	Suitable drywall stud adhesive that complies with AS 2753
Framing	Minimum framing grade of SG8. Refer current NZS3604 Standard, Section 8
Jointing Plaster	USG Boral range

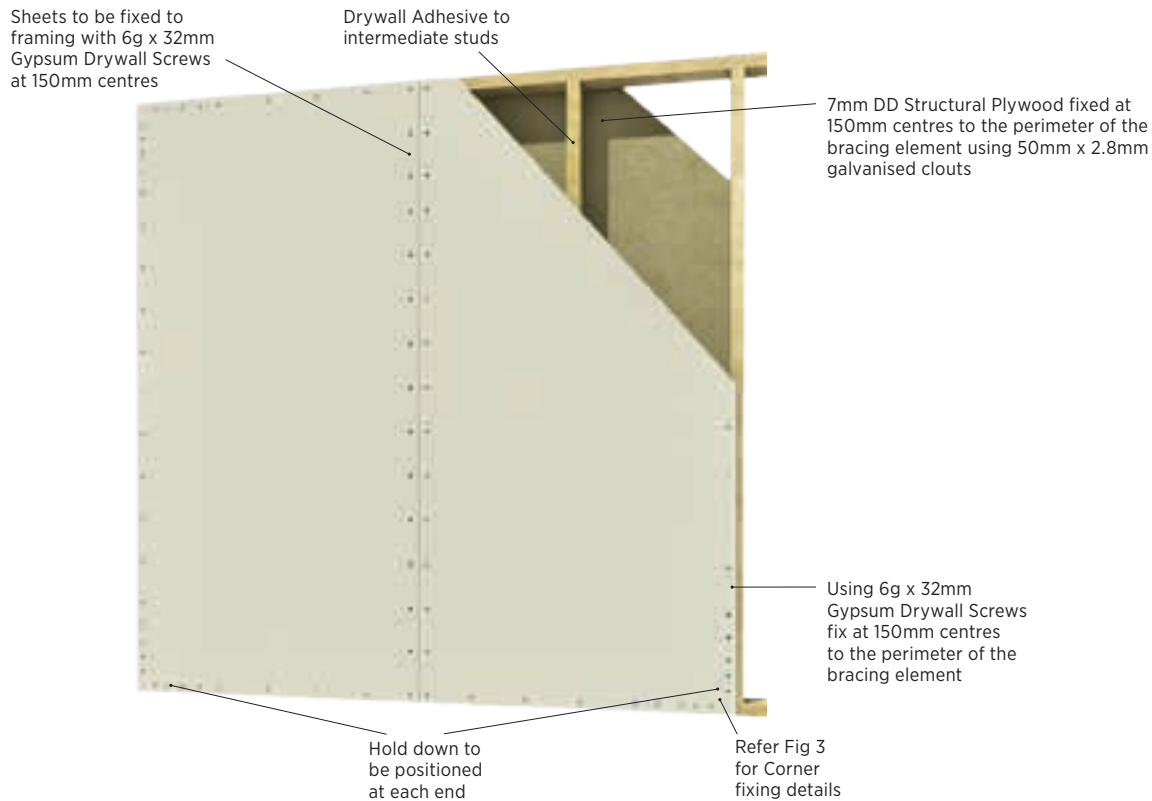
Note: It is not permitted to use nails or use adhesive to replace fasteners

USG BORAL SYSTEM UBFRP - SPECIFICATIONS

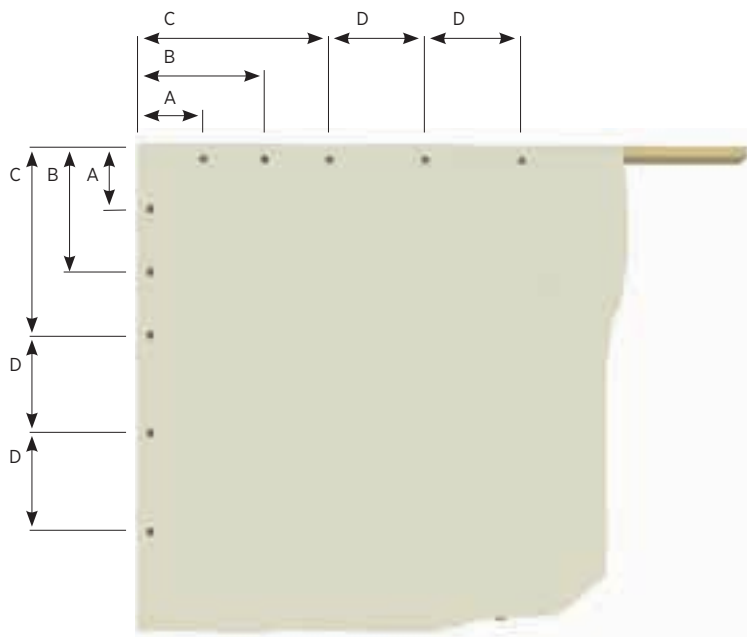
USG Boral Lining Types	The following USG Boral linings are permitted for use with the USG Boral UBFRP bracing system. • 10mm Fiberock Aqua-Tough
Fasteners - Fiberock	6g x 32mm Coarse threaded Gypsum Screws to be installed at 150mm centres to the perimeter of the bracing element. For corner fixing details (Refer to Fig 2)
Fasteners - Plywood	50mm x 2.8mm Galvanised flat head nails to be installed at 150mm centre to perimeter of each sheet
Hold-Down Anchors (Minimum 15kN Characteristic uplift strength)	Concrete floors: Install M12 Galvanized bolts with 50 x 50 x 3mm washer. Bolts are to be set into the concrete at a minimum depth of 75mm. Timber Floors: Install M12 x 200mm Galvanized Coach Screws with 50 x 50 x 3mm washer. (Ensure bolts are secured into solid blocking).
Hold - Down Brackets or Straps	Install either Hold-Down brackets or 400 x 25 x 0.9mm galvanised or stainless steel straps.
Adhesive	A Suitable Drywall Adhesive is permitted to intermediate studs only. Place daubs of adhesive at 300mm centres. It is not permitted to use nails or drywall stud adhesive to replace fasteners. Ensure fasteners do not pass through adhesive.
Framing	Framing is to be determined from the current NZS3604 standard. Minimum framing grade of MSG8. Maximum stud centres 600mm
Jointing Plaster	USG Boral range or suitable drywall plaster compounds are to be applied to all joints and fastener heads within the bracing element. Application of the paper tape and plaster compounds to be in accordance with the current AS/NZS 2589 Standard. Minimum plaster joint finish to be Level 4.
Minimum Wall Length 400mm	The minimum permitted wall length of the UBFRP Bracing system must not be less than 400mm.
Maximum Wall Length 2400mm	The maximum permitted wall length of the UBFRP Bracing system must not exceed 2400mm.
Wall Height	Wall heights as determined by the current NZS3604 Standard. Bracing element height to be determined by the following calculation. $\text{Adjusted rating} = \left(\frac{2.4\text{m}}{\text{Actual wall height}} \right) \times \text{the bracing value}$

FIG 1: UBFRP BRACING SYSTEM WITH SHEETS INSTALLED VERTICALLY

2.4m long bracing element detailed

**FIG 2: UBFRP**

Corner fixing details for the USG Boral Fiberock Aqua-Tough lining (Each corner of the bracing element)

**Corner Fastener Centres are**

A = 50mm

B = 100mm

C = 150mm

D = 75mm

The remainder of

Perimeter Fastener Centres = 150mm

USG BORAL BRACING HOLD DOWN CONSTRUCTION DETAILS FOR CONCRETE AND TIMBER FLOORS

The USG Boral bracing hold down construction details described in this section are required for USG Boral Bracing Systems UB1FR, UB2FR & UBFRP.

COMPONENT DESCRIPTION

Masonry Hold Down Anchor (Minimum 15kN Characteristic Uplift strength)

50 x 50 x 3.0mm Galvanised Washer

400 x 25 x 0.9mm Galvanised or Stainless Steel Strap

30 x 2.5mm Galvanised Flat Head Nails. Install six nails to each side of the stud and 3 nails to each side of the bottom plate

Bracing Anchor Bracket (can be used in the replacement of the strap)

FIG 1: INTERNAL WALL ON CONCRETE FLOOR

Detailed with Strap

Install 400 x 25 x 0.9mm Strap underneath bottom plate and on either side of stud using six 30 x 2.5mm flat head nails on each side of the stud and 3 nails on each side of the bottom plate

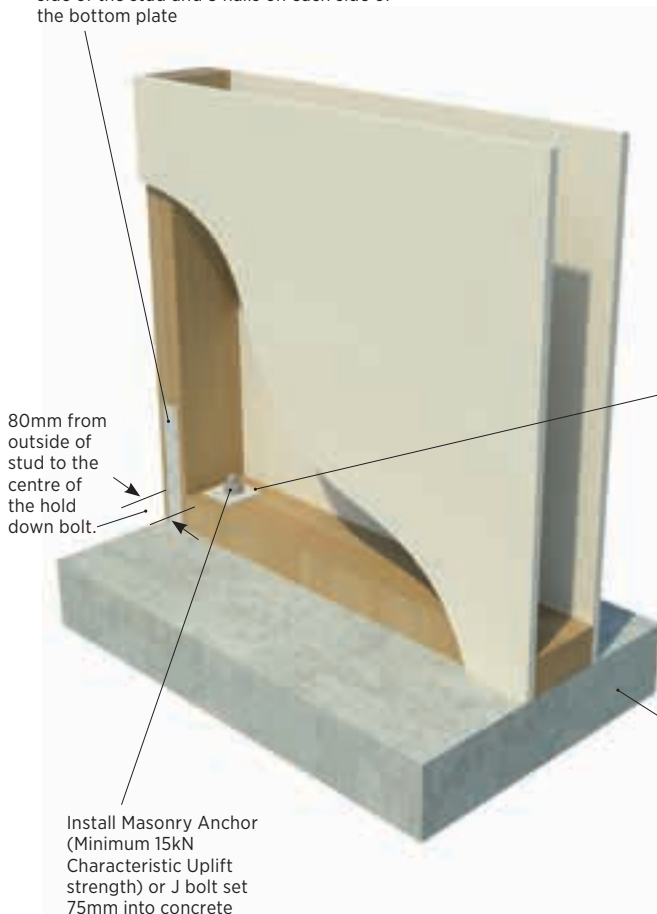
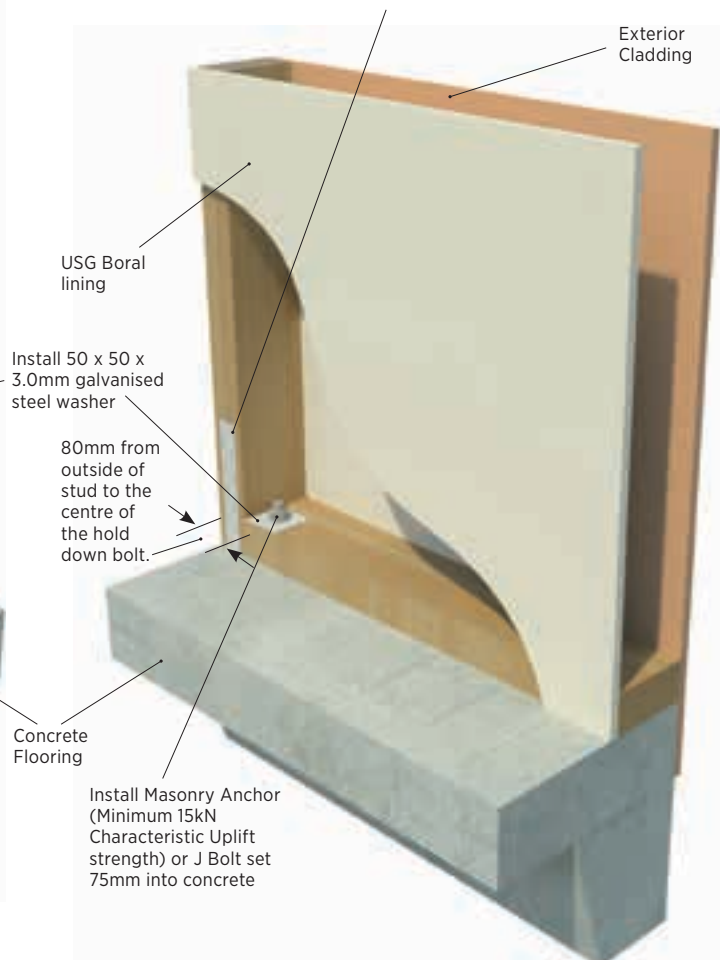


FIG 2: EXTERNAL WALL ON CONCRETE FLOOR

Detailed with Strap

400 x 25 x 0.9mm galvanised strap installed under the bottom plate. Use six 30 x 2.5mm galvanised flat head nails to secure the strap on each side of stud. 3 nails installed to each side of bottom plate



BRACING HOLD DOWN CONSTRUCTION DETAILS

FIG 3: EXTERNAL WALL ON CONCRETE FLOOR

Detailed with USG Boral Bracket

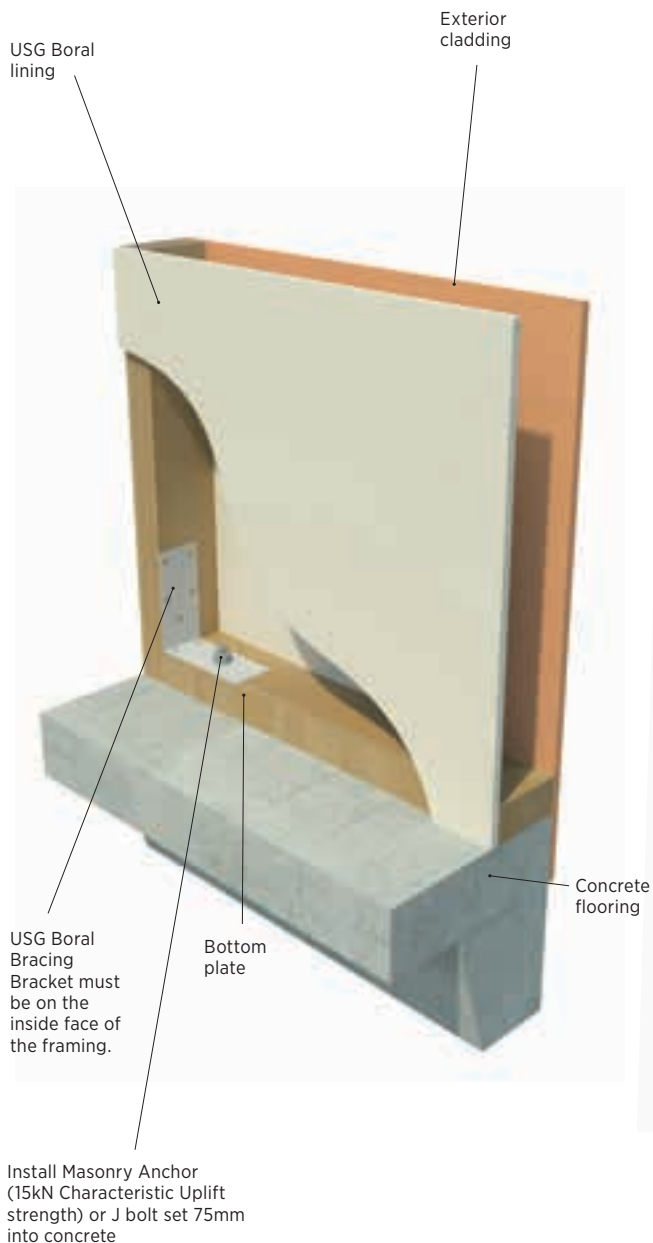
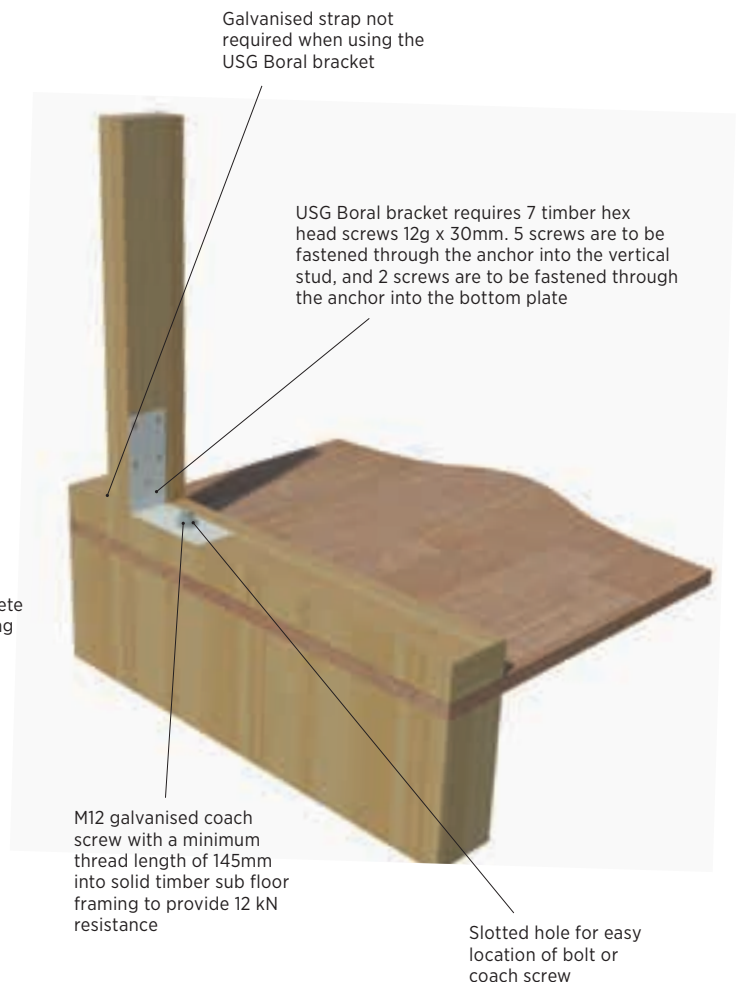


FIG 4: EXTERNAL WALL ON TIMBER FLOOR DETAILED WITH USG BORAL BRACKET

The USG Boral bracket has been developed for both timber floor and concrete floor connections. (Timber floor shown below). Hold down straps are not required when using the USG Boral bracing anchor system. Each bracing element requires 2 USG Boral brackets and 14 screws (7 screws per anchor). The USG Boral brackets are supplied as pairs including 14 screws.



USG BORAL BRACING HOLD DOWN CONSTRUCTION DETAILS FOR CONCRETE AND TIMBER FLOORS AND TOP PLATE CONNECTIONS

COMPONENT DESCRIPTION

Hold Down Bolts, M12 x 190mm Galvanised Coach Screw (12kN Uplift characteristic)

50 x 50 x 3.0mm Galvanised Washer

400 x 25 x 0.9mm Galvanised Strap

30 x 2.5mm Galvanised Flat Head Nails. Install six nails to each side of the stud and 3 nails to each side of the bottom plate

Bracing Anchor Bracket (can be used in the replacement of the strap)

FIG 5: INTERNAL TIMBER FLOOR

Detailed with Strap

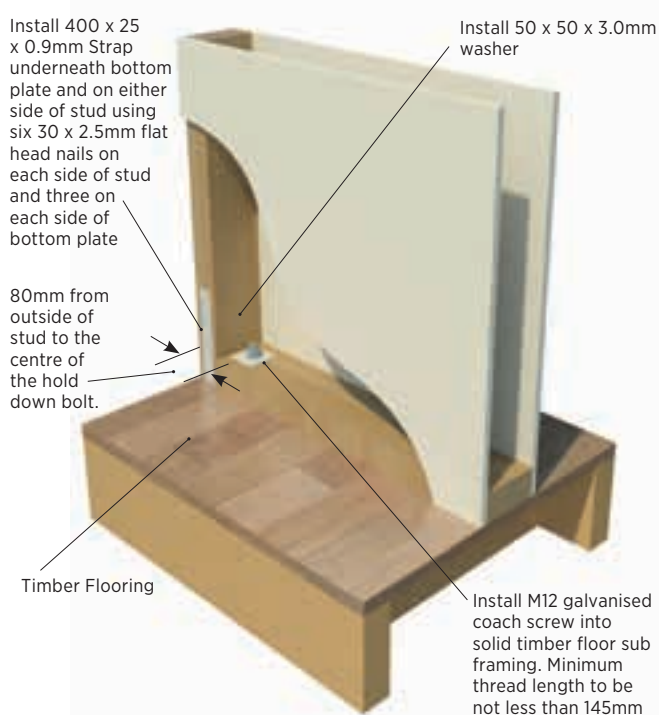


FIG 6: EXTERNAL TIMBER FLOOR

Detailed with Strap

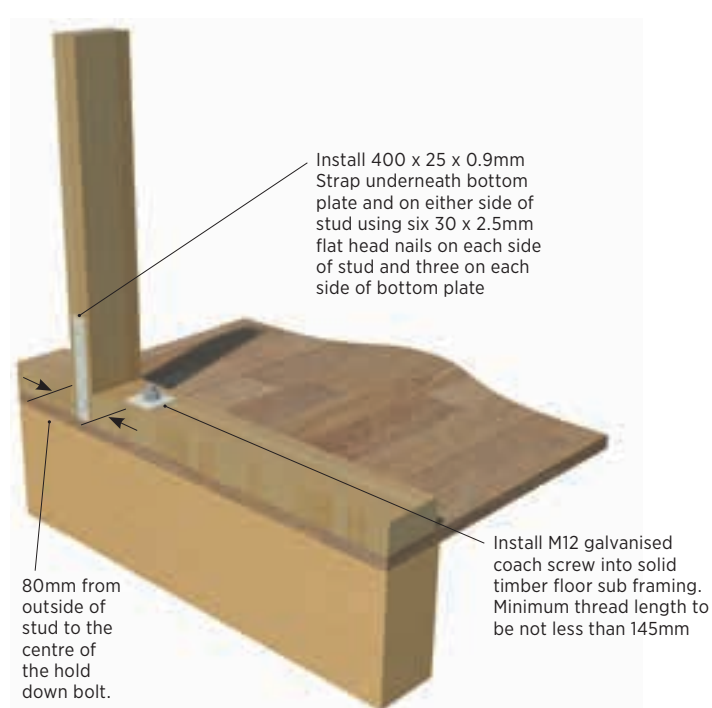


FIG 7: TIMBER FLOOR EXTERNAL WALL

Detailed with double studs and double straps

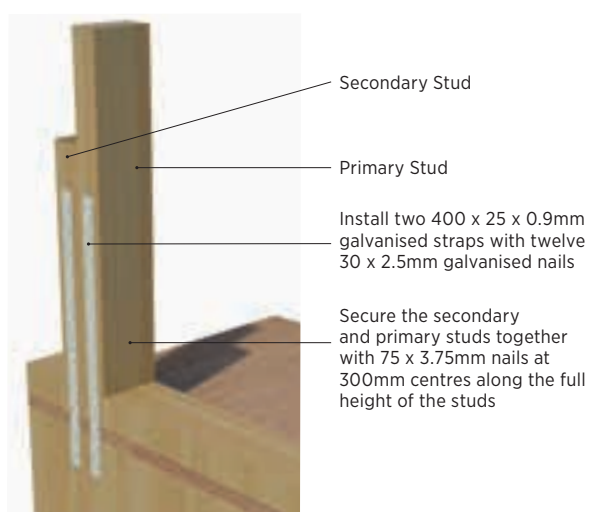


FIG 8: TOP PLATE CONNECTIONS IN BRACING ELEMENTS

The installation of all top plate connections for bracing elements must be in accordance with NZS 3604 Section 8.7.3. Joints must be made over blocking or studs with a 6 kN connection if the bracing values are greater than 100 BUs. If the rating is less than 100 BUs a 3 kN connection strap can be used.



400 x 25 x 0.9mm galvanised connection strap. A 3 kN connection strap requires three 30 x 2.5mm galvanised nails on either side of the joint. A 6 kN connection strap requires six 30 x 2.5mm galvanised nails on either side of the joint.

USG BORAL BRACING SYSTEMS CEILING DIAPHRAGMS

CEILING DIAPHRAGMS – INSTALLATION INSTRUCTIONS

Ceiling diaphragms are required to produce a horizontal bracing element to distribute lateral loads to bracing walls where the distance between bracing walls is greater than 5.0m with a single top plate and 6.0m with two top plates.

Construction of the ceiling diaphragm is to be in accordance with NZS3604:2011 Standard Sections 5.6 and 13.5 and the instructions detailed within this document.

As per the NZS3604:2011 Standard a ceiling diaphragm shall be square or rectangular in shape and its length must not be greater than twice its width.

Protrusions from ceiling diaphragms are permitted but cut outs within ceiling diaphragms are not permitted.

The ceiling diaphragm must have fixings positioned at 150mm centres to its perimeter and 300mm centres to intermediate battens. Fixings are to be no less than 12mm from the sheet edge.

The minimum sheet size permitted is to be no less than 1800mm x 900mm. Refer to Diagram 1 for ceiling diaphragm corner fixing details.

The entire area of the ceiling diaphragm must be covered with sheet linings. The installation of the sheet linings is to be carried out as described in the USG Boral Plasterboard Installation Manual.

THE MINIMUM PLASTERBOARD FASTENER TYPES PERMITTED

The information detailed within this table is as accordance with NZS3604:2011 and is applicable for single and two level timber framed structures.

CEILING DIAPHRAGM PERFORMANCE						
USG BORAL LINING TYPE	LINING THICKNESS	MASS KG/m ²	MAXIMUM LENGTH	FASTENER CENTRES	BATTEN CENTRES	MAX PITCH
Sheetrock Ceiling/Wallboard	13.0mm	6.9	12m	150mm	600mm	15°
Fiberock Ceiling/Wallboard	10.0mm	10.0				

Ceiling diaphragms must be directly connected to bracing lines that have a capacity of not less than 15BU/m. This table details the minimum fasteners permitted for installing USG Boral Plasterboard sheets to ceiling diaphragms

PLASTERBOARD FASTENERS				
USG BORAL LINING TYPE	LINING THICKNESS	MASS KG/m²	FASTENER TYPE & SIZE	
			Timber Batten	Steel Batten
Sheetrock Wall/Ceiling	13.0mm	6.9	Gypsum 32 x 6g coarse thread	Gypsum 25 x 6g fine thread
Fiberock Wall/Ceiling	10.0mm	10.0		
It is not permitted to use nails or use adhesive to replace fasteners				

Where a second layer of plasterboard is to be installed the first layer is to be installed as the ceiling diaphragm

CEILING DIAPHRAM CONSTRUCTION DETAILS

USG BORAL SHEETROCK CEILING BATTEN SYSTEM

Refer to the USG Boral technical installation manual when installing the Sheetrock Ceiling Batten System.

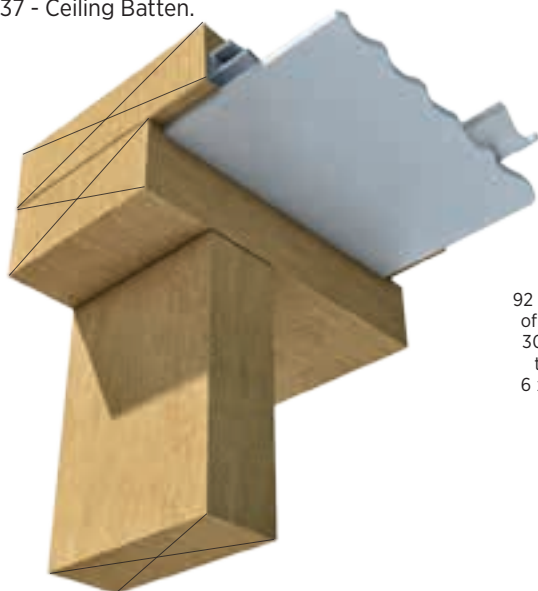
CEILING DIAPHRAGM/WALL CONNECTION CONSTRUCTION

Timber ceiling batten wall connection – continuous 150 x 40mm ribbon plate.



STEEL CEILING BATTEN WALL CONNECTION – CONTINUOUS 150 X 40MM RIBBON PLATE.

PC24 - Perimeter Channel.
FC37 - Ceiling Batten.

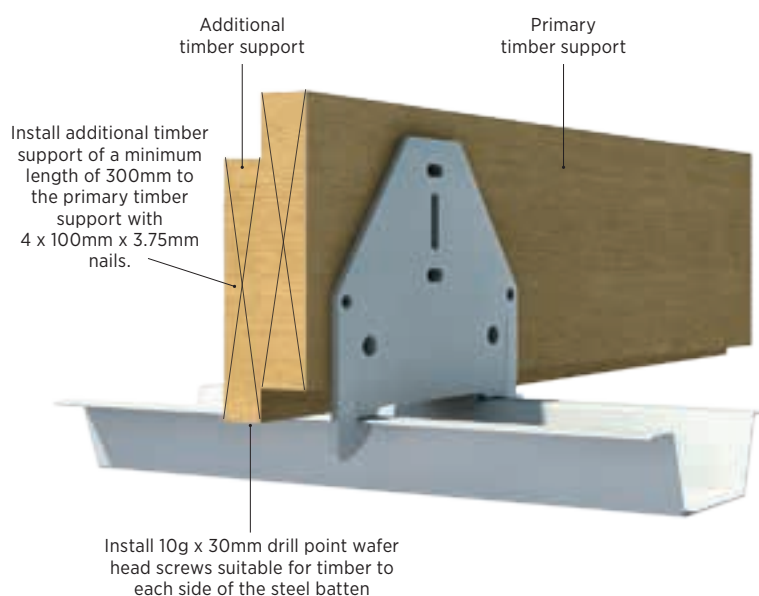


DIRECT FIX BRACKET INSTALLATION FOR CEILING DIAPHRAGMS.

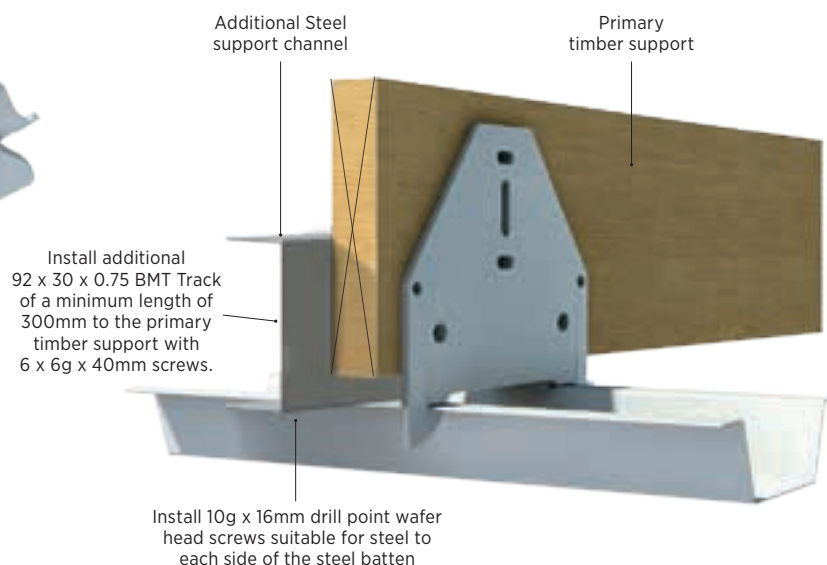
For ceiling diaphragm installations that use steel battens and direct fix brackets a solid fixing at a maximum 600mm centres to the floor or ceiling framing is required. Refer to the following construction details.

TIMBER SUPPORT BLOCKING

DF37-S Direct Fix Bracket.
DF37-L Direct Fix Bracket.
FC37 - Ceiling Batten.



STEEL SUPPORT BLOCKING



PENETRATIONS IN BRACING ELEMENTS

The following penetrations are permitted within the field of all USG Boral Bracing Element systems

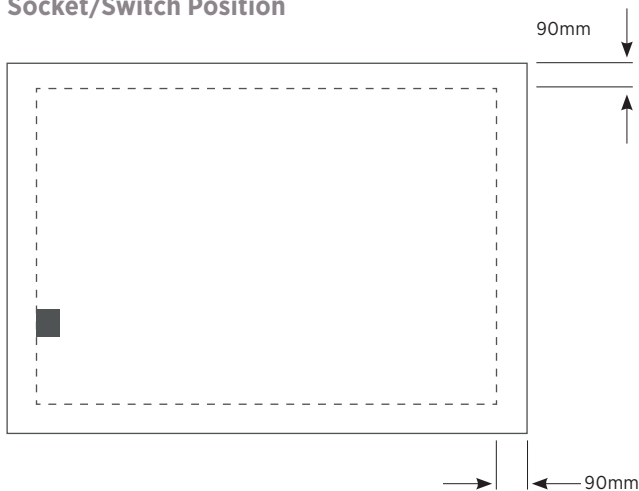
- Socket outlets – 90 x 90mm (Maximum) Socket outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element
- Switch outlets – 90 x 90mm (Maximum) Switch outlet penetrations are to be positioned not less than 90mm from the perimeter of the bracing element
- Penetration holes - 125mmØ (Maximum) hole penetrations are to be positioned not less than 300mm from the perimeter of the bracing element

For larger penetrations within bracing elements seek professional advice on Specific Engineering Design (SED) or contact USG Boral.

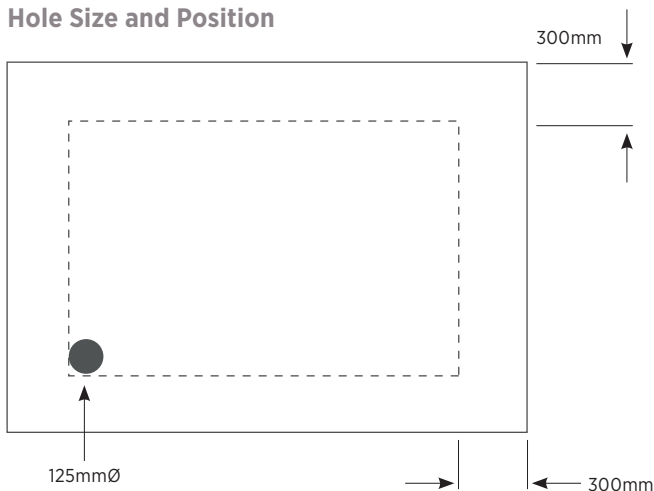
RENOVATION & REFURBISHMENT

With any renovation involving the removal of the interior linings of existing dwellings it is important to ensure that the bracing elements are correctly reinstated as per the original design.

Socket/Switch Position



Hole Size and Position



WARRANTY

USG Boral warrants its products for 10 years from the date of supply of the product. Refer USG Boral Warranty document for warranty conditions.

SUSTAINABILITY

USG Boral aims to minimise the environmental impact of its operations and to make a positive difference to the environment and communities in which it operates.

Plasterboard is manufactured from abundant natural gypsum resources and 100% recycled paper liner.

HEALTH AND SAFETY

For information regarding the safe use of USG Boral products and accessories please refer to instructions on the product packaging or contact your local USG Boral Sales Office or TecASSIST for a current copy of the Material Safety Data Sheet.

TECHNICAL ENQUIRIES

USG Boral provides free technical advice to builders, architects, contractors, engineers, regulators and home owners throughout New Zealand & Australia.

USG Boral can be contacted on weekdays 8.30am — 5.00pm on **0800 USG BORAL (0800 874-267)** or **www.usgboral.com**

SALES ENQUIRIES

Auckland	(09) 270-2595
Wellington	(04) 560-4528
Christchurch	(03) 365-4245

This Technical Information Guide is intended to provide general information and should not be used as a substitute for professional advice. There are many variables that can influence construction projects which affect whether a particular construction technique is appropriate. Before proceeding with any project we recommend you obtain professional advice to ascertain the appropriate construction techniques to suit the particular circumstances of your project having regard to the contents of this Installation Manual. We recommend you use qualified tradespersons to install this system.

The technical information contained in this manual was correct at the time of printing. Building systems, details and product availability are, however, subject to change. To ensure the information you are using is current, USG Boral recommends you review the latest building information available on the USG Boral website. For further information contact TecASSIST® or your nearest USG Boral Sales Office.

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Lapish Enterprises Ltd.

20.04.15

Mr. Geoff Tully

Technical Services Consultant

USG Boral New Zealand

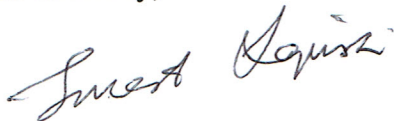
Dear Sir,

Re: Difference in bracing Performance between GIB Handibracs and 25x.9mm straps hold downs.

A question has arisen about the relevant difference in performance between 2400x400 wide bracing using Handibracs based on single P21 tests and standard 25x.9mm hold down straps tested on three specimens. The project concerned has had GIB Handibracs installed throughout the bracing locations in building.

Three tests indicate that for 400mm long walls with hold down straps provides slightly higher ratings to that supported by Handibracs. For wind BU s are 114/106 and for EQ 132/129. The difference is small and for all practical purposes they are equal.

Yours faithfully,



Ernest B Lapish MICE C. Eng.(London) FIPENZ (Structural) CPEng IntPE(NZ)
Managing Director



USG Boral Bracing systems Summary Table

USG Boral Bracing system technology has been specifically designed and rigorously tested in New Zealand to provide structural bracing for both residential and light commercial buildings within the scope of and limitations of the current NZS3604: 2011 Standard. The USG Boral Bracing systems have been tested in accordance with the BRANZ P21 (2010) Test & Evaluation Method – racking test limited states design; cited in NZS3604:2011 Timber Framed Buildings to determine wind and earthquake ratings of bracing elements. This aligns with the new loadings standard AS/NZS1170.

Detailed below within Table 1 is the range of USG Boral bracing systems and the wind and earthquake performance values determined from testing.

Table 1:

USG Boral Wall Bracing Systems							
Bracing System Reference	System Description	Board Type	Hold Downs	Minimum Wall Length (m)	Maximum Wall Length (m)	Wind Value BU's/m	Earth Value BU's/m
UB1S	10mm Sheetrock on one side	Sheetrock	No	0.4	6.0	55	50
UB2S	10mm Sheetrock on Both Sides	Sheetrock	No	0.4	4.8	70	60
UB1FR	10mm Fiberock on one side with Hold Downs	Fiberock	Yes	0.4	1.2	105	125
				1.2	4.8	145	140
UB2FR	10mm Fiberock on both sides with Hold downs	Fiberock	Yes	0.4	1.2	115	130
				1.2	2.4	150	150
UBFRP	10mm Fiberock on one side 7mm DD Structural Plywood on the other side with Hold downs	Fiberock & Plywood	Yes	0.4	1.2	105	130
				1.2	2.4	150	150

1. Maximum rating for NSZ3604:2011 timber floors is 120BU's/m
2. Maximum rating for NSZ3604:2011 concrete floors is 150BU's/m

Where the wind and earthquake values exceed the floor ratings (refer items 1 & 2 above) the ratings must be reduced to the required maximum permitted ratings for timber and concrete floors

For the calculating of USG Boral Bracing Systems refer to the USG Boral software calculator to calculate the wind and earthquake demand requirements and to calculate the achieved values using the USG Boral bracing systems.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

SHEETROCK®

CEILING BATTEN SYSTEM



THE HIGH QUALITY, LOW COST ALTERNATIVE TO TIMBER BATTENS

USG Boral Sheetrock Ceiling Battens are dimensionally stable, cost effective steel system, expressly designed for screw attaching sheetlinings such as plasterboard, fibrous plaster and fibre cement.

It is the obvious choice for all areas requiring a smoothly finished, monolithic ceiling plane, whether flat, vaulted or inclined.

APPLICATION

The USG Boral Sheetrock Ceiling Batten System offers flexibility of configuration, aesthetic appeal and fast, simple installation. It is suitable for residential constructions featuring large areas of smooth plasterboard, where a quality flat finish is required.

USG Boral Sheetrock Ceiling Battens are equally successful in new installations, interior retrofits and construction of exterior soffits.

STEEL'S SUPERIORITY

- Dimensionally stable
- Impervious to rot and fungal and insect attack
- Corrosion resistant
- Won't warp, twist or bow
- Easily worked, few tools required
- Non-combustible

USG Boral, are the leading manufacturers of commercial ceilings in New Zealand.

Over 51 years of experience is now available for residential applications with the USG Boral Sheetrock Ceiling Batten System.

Support New Zealand made products

Components

NZ Building Code Compliance:

Clause B1 - Structure

The USG Sheetrock Ceiling Batten System, when installed in accordance with the requirements of this brochure will support the stated loads including uniformly distributed live load as per AS/NZS 1170.1, Table 3.1 A1, for non-habitable roof spaces in self contained dwellings.

Clause B2 - Durability

The USG Sheetrock Ceiling Batten System when installed and used in normal dry non corrosive interior conditions will have a minimum serviceable life of 50 years.

Clause G6 - Airborne and Impact Sound

Install in accordance with Winstone Wallboard's GBDFA 60b floor/ceiling system.

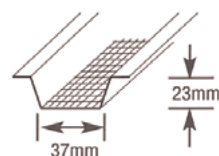
AS/NZS 2589: 2007

Gypsum linings - Application and finishing.

User friendly component design

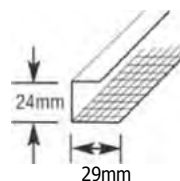
- Rolled safety edge to Batten prevents handling injuries.
- Knurled Batten and Channel faces resist screw slip damage to sheetlinings and assists faster screw fixing.
- Low profile Batten (23mm) maximises available ceiling height, and provides greater adjustability tolerance.
- Direct fix brackets for purlin, truss or joists.
- Direct fix bracket allows fast, easy and accurate adjustment for a level ceiling.
- PC24 Perimeter Channel ideal for edge fixing to walls, bulkheads.
- Perimeter Channel back is pre-dimpled every 50mm for easier screw fixing.
- Components are USG identified to ensure system compatibility. Any substitution is likely to result in lower performance and is at the risk of the builder, designer or owner.

Ceiling Batten FC37

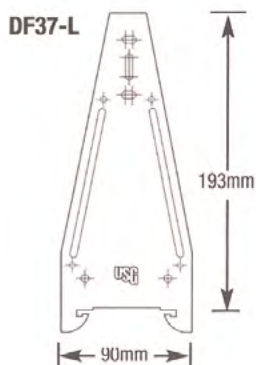


Available in 0.5 or 0.55 BMT

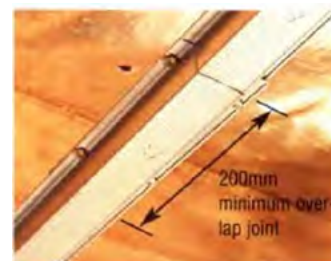
Perimeter Channel PC24



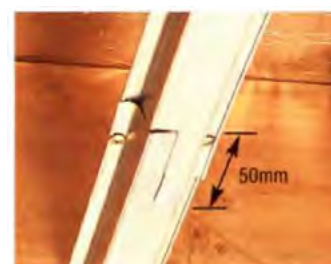
Direct Fix Brackets



Detail 1



Detail 2



Alternative Batten Splice

Installation

Sheetrock Ceiling Batten System

- Space Battens at centres to suit lining and level of finish - to maximum of 600mm. Consult board manufacturers requirement.
- Join Battens by overlapping 200mm minimum and securing with four pop rivets or 8g-16 x 12mm minimum self drilling wafer head screw. (Detail 1).
- Alternatively join Battens by slitting one end, interlocking 50mm and securing with two pop rivets, screwing or crimping (Detail 2).
- Offset joints across ceiling. Centre of splice joint shall be no greater than 200mm from fixing at 900mm span, 250mm at 1200mm span. Joints are not to be in end spans.

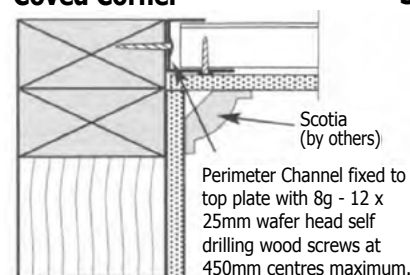
- Where Battens are parallel with Perimeter Channel, the distance between the last Batten and Perimeter Channel shall be no greater than Batten centres.

Linings

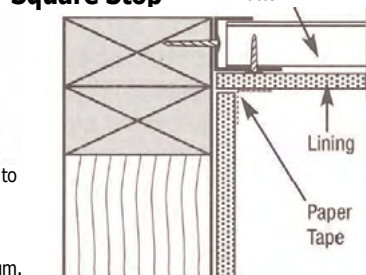
- Lining sheets are installed across the Battens.
- Butt joints centrally on Battens, stagger adjacent butt joints.
- Screw fix with appropriate self drilling bugle head screws at centres recommended by lining manufacturers.
- Locate screws between 10mm and 16mm from sheet edges.
- USG Boral Sheetrock Batten System is used in a number of applications for noise or fire control.

Perimeter Details

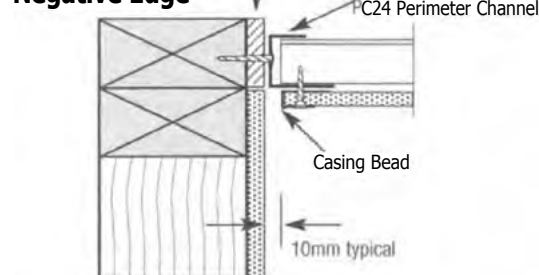
Coved Corner



Square Stop



Negative Edge



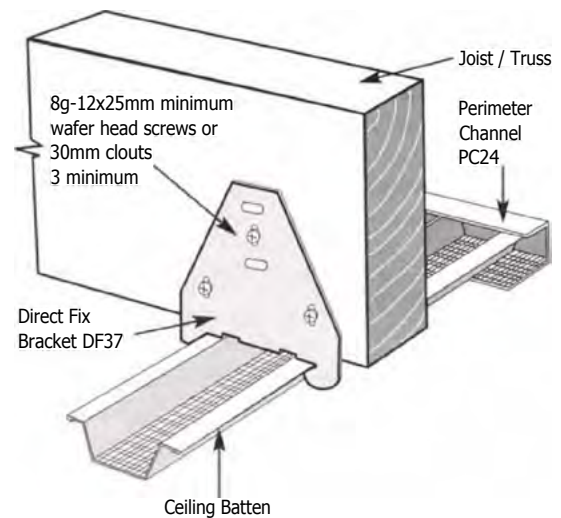
Fixing

Direct Fixing Bracket

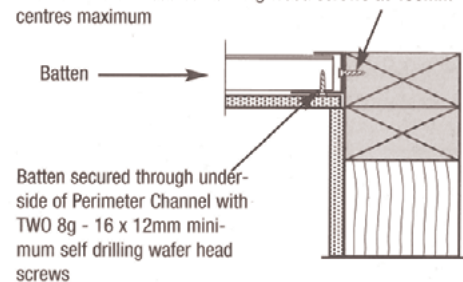
- Helps isolate noise transmission.
- Helps minimise joint cracking from structure movement.
- Maximises headroom.
- Screws or nails to joists or trusses.
- Quick, easy installation.
- 20mm slot adjustment.

Fixing the Perimeter Channel and Batten

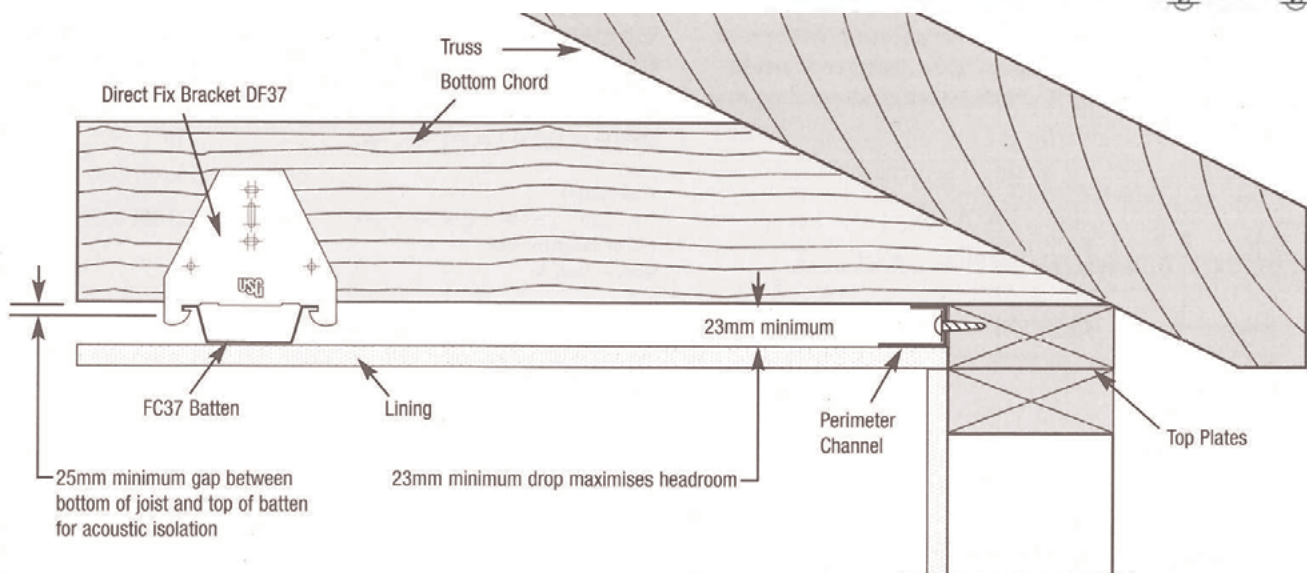
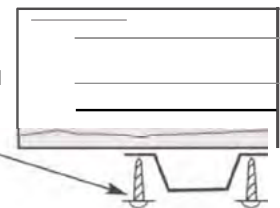
1. Establish the required finished height of the ceiling, allowing for lining thickness and any wiring, pipes etc below joists or trusses.
2. Fix the Perimeter Channel PC24 to the Top Plate or Ribbon Plate with 8g - 12 x 25mm minimum wafer head self drilling wood screws at 450mm centres maximum. Ensure Channel is level and long leg to bottom.
3. The centres of the Battens are determined by the lining board requirements. Consult the manufacturer.
4. Secure Direct Fix Brackets DF37 to joists at predetermined centres with a 8g-12 x 25mm minimum wafer head self drilling wood screw or 30 x 2.5mm galvanised clout. Use vertical slot to allow for levelling adjustment. 25mm minimum gap recommended between joist and batten for acoustic isolation.
5. Insert Batten flange into one side of Direct Fix Bracket, squeeze and rotate batten up in one movement, releasing opposite flange into slot.
6. Each Batten end shall be secured through the underside of the Perimeter Channel with two 8g - 16 x 12mm minimum self drilling wafer head screws.
7. Use a stringline, laser, or long straight edge at 90° to Battens across room to ensure Battens are straight and level. Repeat at several positions for large areas if necessary. Finish with two more screws/clouts once level, in DF37 holes or slots as suitable.
8. Battens may also be fixed directly to the underside of the trusses or joists using 8g - 12 x 25mm wafer head self drilling wood screws, but reduce isolation and are more difficult to level.



Perimeter Channel fixed to top plate with 8g - 12 x 25mm minimum wafer head self drilling wood screws at 450mm centres maximum



8g - 12 x 25mm minimum wafer head self drilling wood screws



Technical Information

Maximum Allowable Loads

Uniform Loads (kg/m²)

From the following tables select the required level of finish deflection and the span of the Sheetrock Ceiling Batten. The maximum allowable weight is determined by the Batten spacing.

Note: The lining material may dictate at what spacing the Battens should be installed. Consult the lining manufacturers requirements.

Deflection of L/600 - high finish level Level 5

Span of Batten	Batten centres		
	400 mm	450 mm	600 mm
900 mm	78kg/sq.m	69	52
1200 mm	31	27	20

Deflection of L/450 - default Level 4

Span of Batten	Batten centres		
	400 mm	450 mm	600 mm
900 mm	78kg/sq.m	78	70
1200 mm	44	39	29

Important Notes:

Shaded areas of tables indicate the ceiling lining weight, plus 0.5kPa (50 kg/sq.m) live load to comply with uniformly distributed loads in non-habitable roof spaces of self-contained dwellings. (NZS 1170.1 Table 3.1 A1) These spans will not support the 1.4 kN point load of the above category. Where roof spaces are accessible, walking planks shall be provided between roof trusses, ensuring no load can be transferred to the Battens.

Approximate Product Amounts per m²

Batten Centres @		400	450	600
Batten (linear metres)		2.5	2.22	1.66
Direct Fix Brackets	span @ 900	2.77	2.47	1.85
	span @ 1200	2.08	1.85	1.39
Perimeter Channel		as perimeter of room		

Point Load (kg)

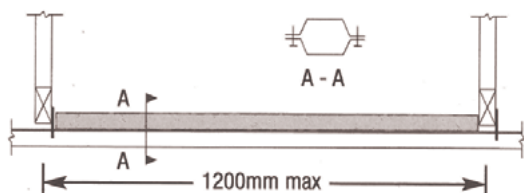
Ceiling mounted fixtures leg: light fittings) can be supported by the Sheetrock Ceiling Batten System as follows:

Span of Batten @	Max weight
900 mm	15 kg
1200 min'	7 kg*

Important Notes:

For surface attached fittings, provide additional Battens for support. For penetrating fittings eg down lights, the weight shall be no greater than 4kg.

This excludes dynamic loads (eg ceiling fans) where specific support design will be required by others. *For spans at 1200 mm centres, back to back Sheetrock Ceiling Battens and fasten with 8g-16 x 12mm self drilling wafer head screws at 150 mm centres.



Installation

Shall not commence until the building is fully enclosed and dry. Mechanical and electrical work above the system should be completed before installation commences. Timber elements are to be 12 - 16% moisture content at time of lining. If used externally, design and construction must ensure that wind blown moisture and chlorides do not have free entry into roof space. Any sources of moisture (eg shower rooms, spa pools, kitchens, laundries, etc) shall not allow moist air into the roof space, but shall duct to the exterior.

ISO 9000 Quality Assurance

USG Boral Building Products NZ is an Certified ISO 9001:2008 manufacturer - No: QEC 5044 by Telarc SAI.



Health and Safety

The material composition represents no health hazard. When handling, take care and ensure that safe work practices are adhered to at all times.

Some products may have surface treatments and sharp edges/ends. All reasonable care should be taken when handling or installing to avoid any potential injury to self or others. Users should be properly trained and supervised in the use and handling of these materials. Appropriate personal protective equipment should be used when necessary eg: gloves/glasses etc to avoid any potential injuries.

Handling & Storage

Store materials on a flat, dry surface and handle/store in a manner that will prevent distortion, scratches or damage of any kind by/to other trades.

Limitations

- Standard finish **not** for use in corrosive environments i.e. in contact with tanned timber, chemically treated insulation products or copper piping. For additional protection consult your nearest USG Boral representative.
- If Battens are used under roof applications thermal insulation must fully cover them to avoid thermal bridging and potential associated condensation/staining of the ceiling lining along the line of the Battens.
- For fire rated construction, consult USG Boral.

Notes

- In accordance with USG Boral's policy of continuous product improvement, we reserve the right to alter specifications without prior notice as technology or standards are introduced.
- All sizes and weights are nominal.
- This document has been prepared on reliance of the professional testing, advice and services provided by independent specialist organisations. USG Boral believes the contents of this brochure to be correct at the time of printing. Whilst all care has been taken to ensure accuracy, except to the extent prohibited by law, no liability is accepted for any claim by any person, whether for loss of profits or for any other direct, consequential, indirect or special loss, damage or injury suffered by any person, and whether arising from any negligence or omission on the part of any person or otherwise directly or indirectly from the use of the information contained in this document.

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USG Boral, USG Boral Logo, Sheetrock, ScrewFix

Manufactured by:

USG Boral Building Products NZ
Auckland, New Zealand



Available From:

WET AREA BOARD™

PRODUCT TECHNICAL STATEMENT

Wet Area Board is a lightweight, recessed edge plasterboard with a water resistance core. It is suitable for use in wet areas in non-fire rated systems.

USE

Wet Area Board is suitable for use in all commercial and residential wet area situations provided that its specification and installation is in accordance with USG Boral Plasterboard Installation Manual - NZ.

It is suitable for installation on framed walls and ceilings, where the building design falls within the design scope of NZS3604, or AS/NZS1170.

Where Wet Area Board is to be installed in an existing building, the installer must assure themselves that the framing and existing building are suitable for the proposed building work.

CONDITIONS & LIMITATIONS

The specification of Wet Area Board must be in accordance with USG Boral information.

USG Boral recommends that a person with the relevant carpentry skills and experience install the Wet Area Board.

Wet Area Board should not be exposed to sustained temperatures exceeding 42°C or to excessive, repetitive or continuous moisture before, during or after installation. All sources of moisture should be eliminated immediately.



NZBC COMPLIANCE

Wet Area Board complies with the following performance criteria of the NZ Building Code

PERFORMANCE CRITERIA	EVIDENCE
B1.3.1 B1.3.2 B1.3.3 (a, b, c, f, j, l, o, r) B1.3.4 (a, b, c, e)	In respect of building element Manufactured in accordance with AS/NZS2588
B2.3.1(a) B2.3.2	USG and Boral have a combined plasterboard manufacturing experience in excess of 145 years. During this time USG Boral have supplied plasterboard along with plasterboard wall and ceiling systems for use within the residential and commercial sectors.
C3.4 (a)	Material Group No 1-S BRANZ assessment FAR4435
F2.3.1	Manufactured in accordance with AS/NZS2588

When installed Wet Area Board will contribute to compliance with the following performance criteria of the NZ Building Code

PERFORMANCE CRITERIA	EVIDENCE
B2.3.1(a), B2.3.2	In Service history
E3	AS/NZS 4858 AS 3740:2010

» PRODUCT TECHNICAL STATEMENT

DESCRIPTION OF WET AREA BOARD™

BOARD SPECIFICATION	
FEATURE	DESCRIPTION
Thickness	10mm & 13mm
Edge Profiles	Recessed Edge
Sheet Size (Width x length)	1200 x (2400-6000mm) 1350 x (3600-5400mm) (Please refer to Size & Availability: Certain products and sizes may be available on order or in pack lots.)
Paper Colour	Blue/Grey
Mass	7.4kg/m ² (10mm) 9.4 kg/m ² (13mm) nominal
VOC	Less than 0.5mg/m ³ TVOC
GECA	N/A
Manufacture	Manufactured in Australia to the requirements of AS/NZS 2588:1998 Gypsum plasterboard and in accordance with AS/NZS ISO 9001: 2008-Quality management systems-Requirements

PERFORMANCE DETAILS

Fire

Wet Area Board is a non-combustible building product. It achieves a material Group 1-S depending on finished coating applied (BRANZ Assessment FAR4435).

Wet Area

Wet Area Board is suitable for use in wet areas and established through testing in accordance with AS/NZS2588:1998 and AS3740:2010.

Acoustic

Wet Area Board may be used in acoustic systems to provide required levels of sound insulation to achieve specified acoustic ratings.

INSTALLATION

Wet Area Board must be installed in accordance USG Boral Plasterboard Installation Manual – NZ.

MAINTENANCE

Wet Area Board does not require maintenance but USG Boral recommends that a visual check of the board be undertaken as part of normal maintenance, for instance when the surface coating is reapplied. In the event that damage is apparent to the Wet Area Board then it must be removed and replaced in accordance with the USG Boral Plasterboard Installation Manual - NZ

STORAGE & TRANSPORTATION

Wet Area Board, like all plasterboards, is vulnerable to potential in transit damage. It should be transported and stored horizontally. Once onsite ensure that it is covered, to avoid the possibility of exposure to moisture.

SUSTAINABILITY

Wet Area Board has been manufactured using 100% recycled liner paper. Independently tested for VOC.

QUALITY ASSURANCE

Wet Area Board is manufactured in Australia. These manufacturing sites are ISO9001:2008 accredited. Certificate details are SAI Global Cert No. QEC0400. This certification dates from 1992.

REFERENCES

Refer www.usgboral.com for information on Wet Area Board.

Test results may be available upon request, providing the information is not commercially sensitive.

WARRANTY

For details of the USG Boral warranty refer www.usgboral.com

DURABILITY STATEMENT

This statement is in relation to Clause B2 Durability of the New Zealand Building Code (NZBC). USG Boral Plasterboard products and systems are designed for internal use and when installed in accordance with the installation instructions detailed within the relevant Technical Installation literature they are fully compliant with the NZBC.

FURTHER INFORMATION

Contact USG Boral TecASSIST

Freephone: 0800 USG BORAL/(0800 874-267),

www.usgboral.com

For sales enquiries:

Auckland (09) 270-2595

Wellington (05) 560-4528

Christchurch (03) 365-4245

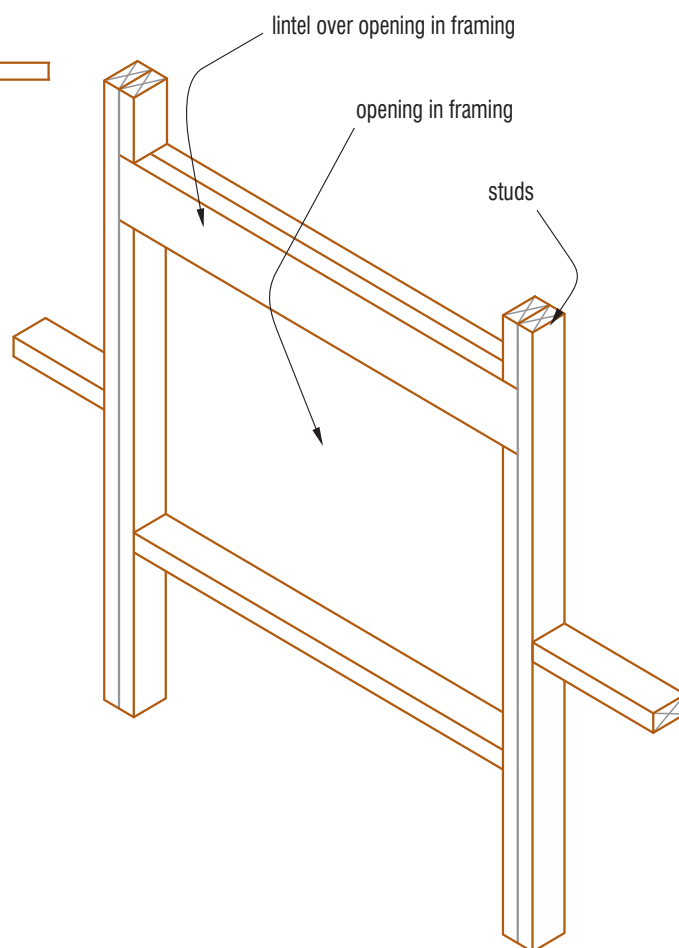
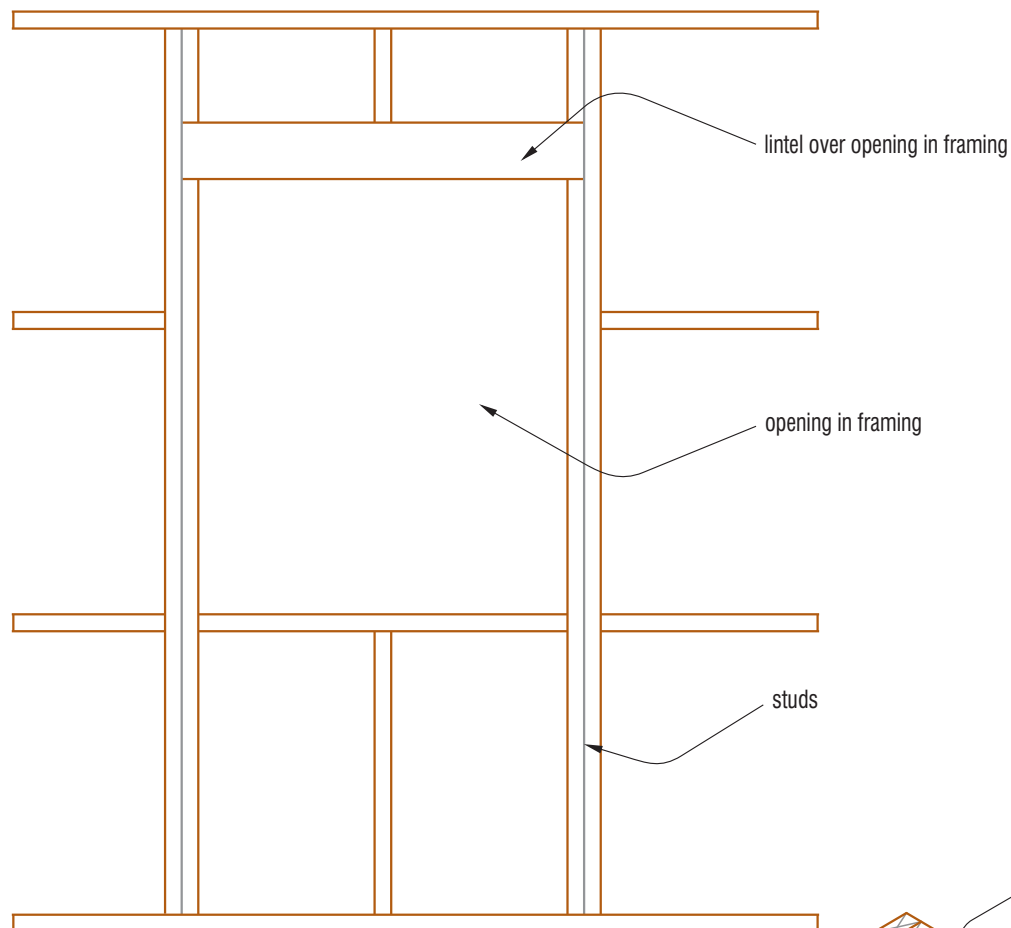
SIGN OFF & REVIEW DATE

SIGNED	David Peck
POSITION	New Zealand Manager
DATE	1 June 2015
REVIEW DATE	1 June 2016

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

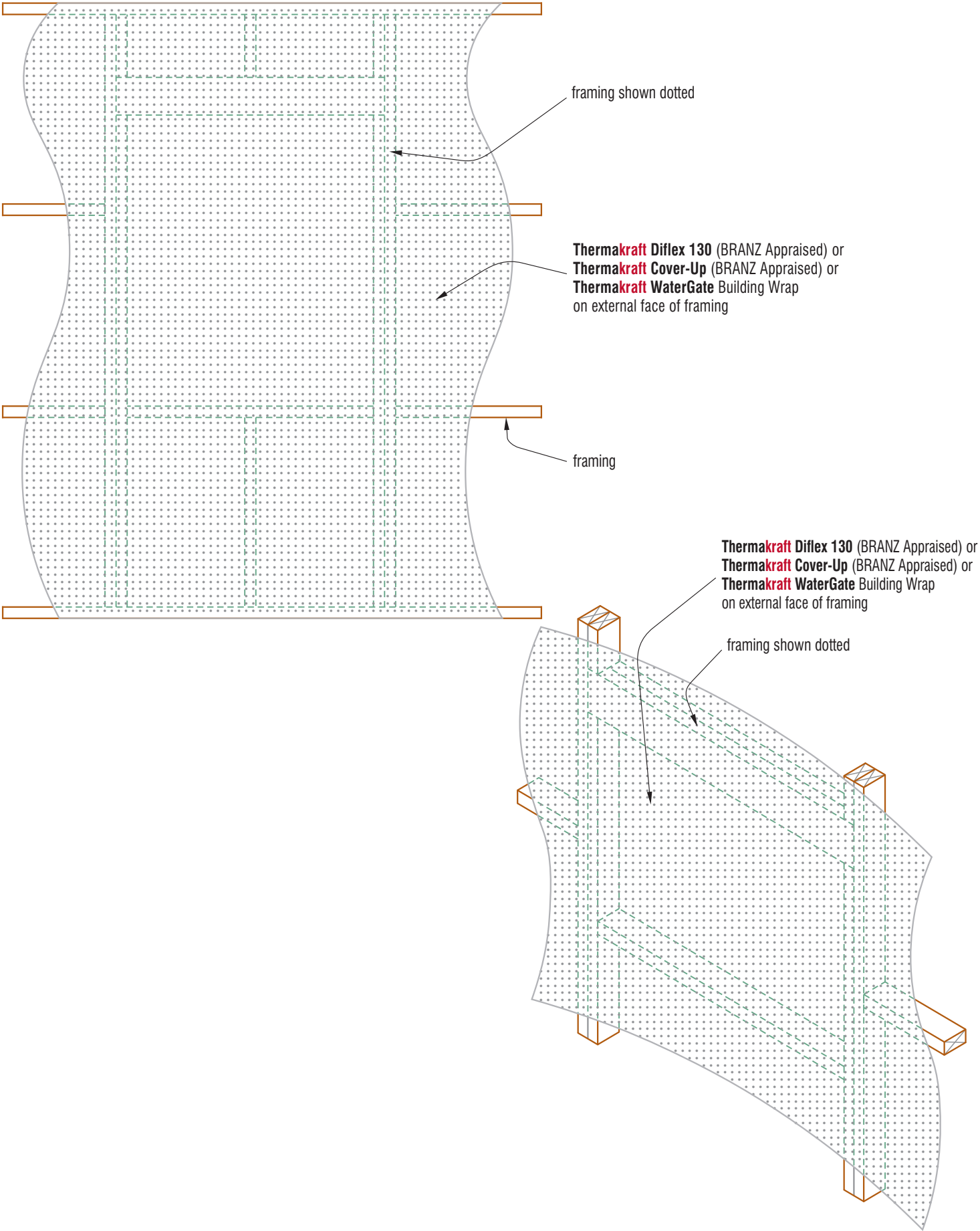


... Providing the System that matters



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

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DRAWING TITLE

Building Wrap over Framing

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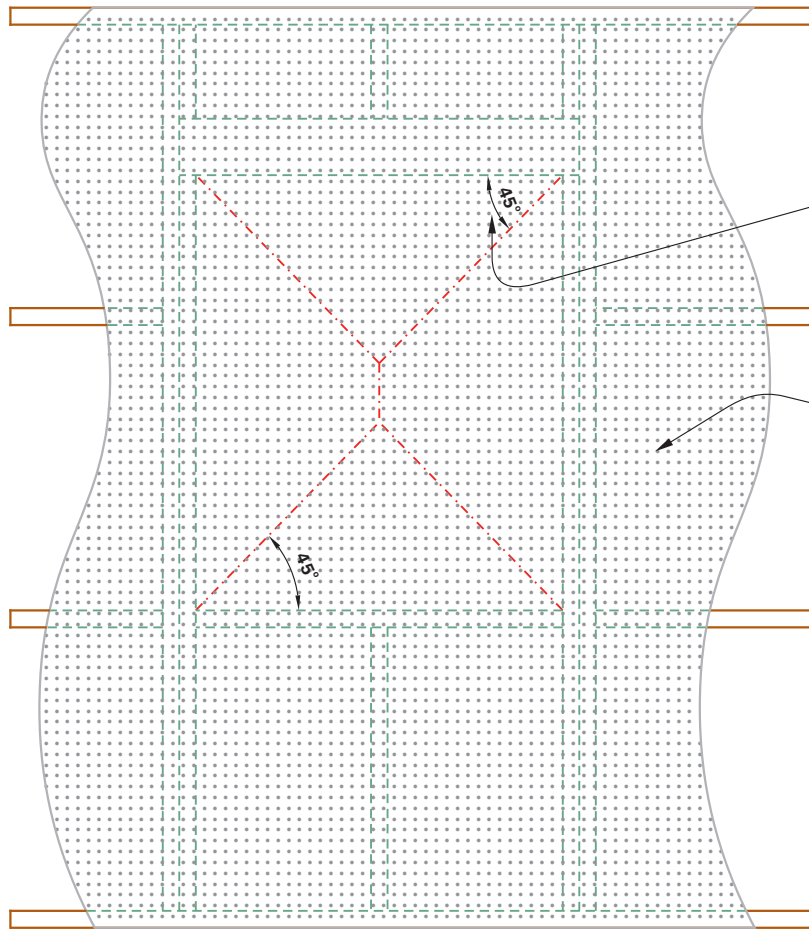
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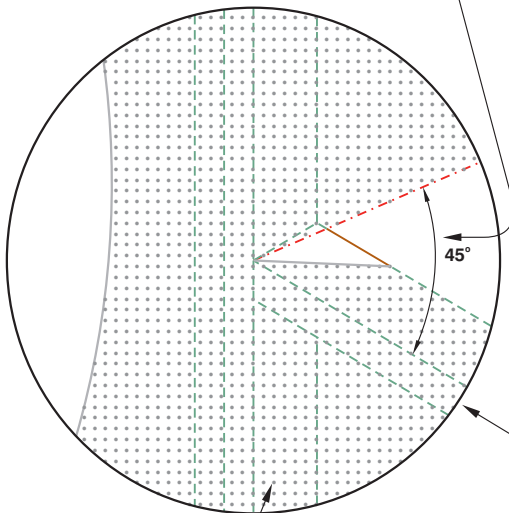


Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
to be cut at 45° to corners of openings

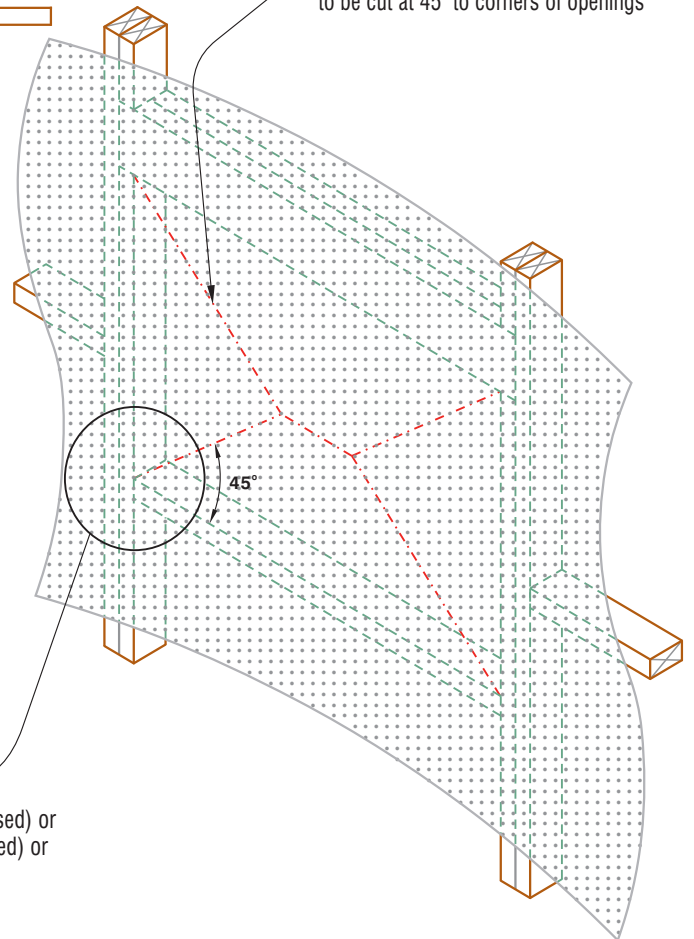
Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
on external face of framing

Thermakraft Diflex 130 (BRANZ Appraised) or
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to be cut at 45° to corners of openings

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to be cut at 45° to corners of openings



Thermakraft Diflex 130 (BRANZ Appraised) or
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fixed to external face of framing



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DRAWING TITLE

Cut Building Wrap at Opening

DATE

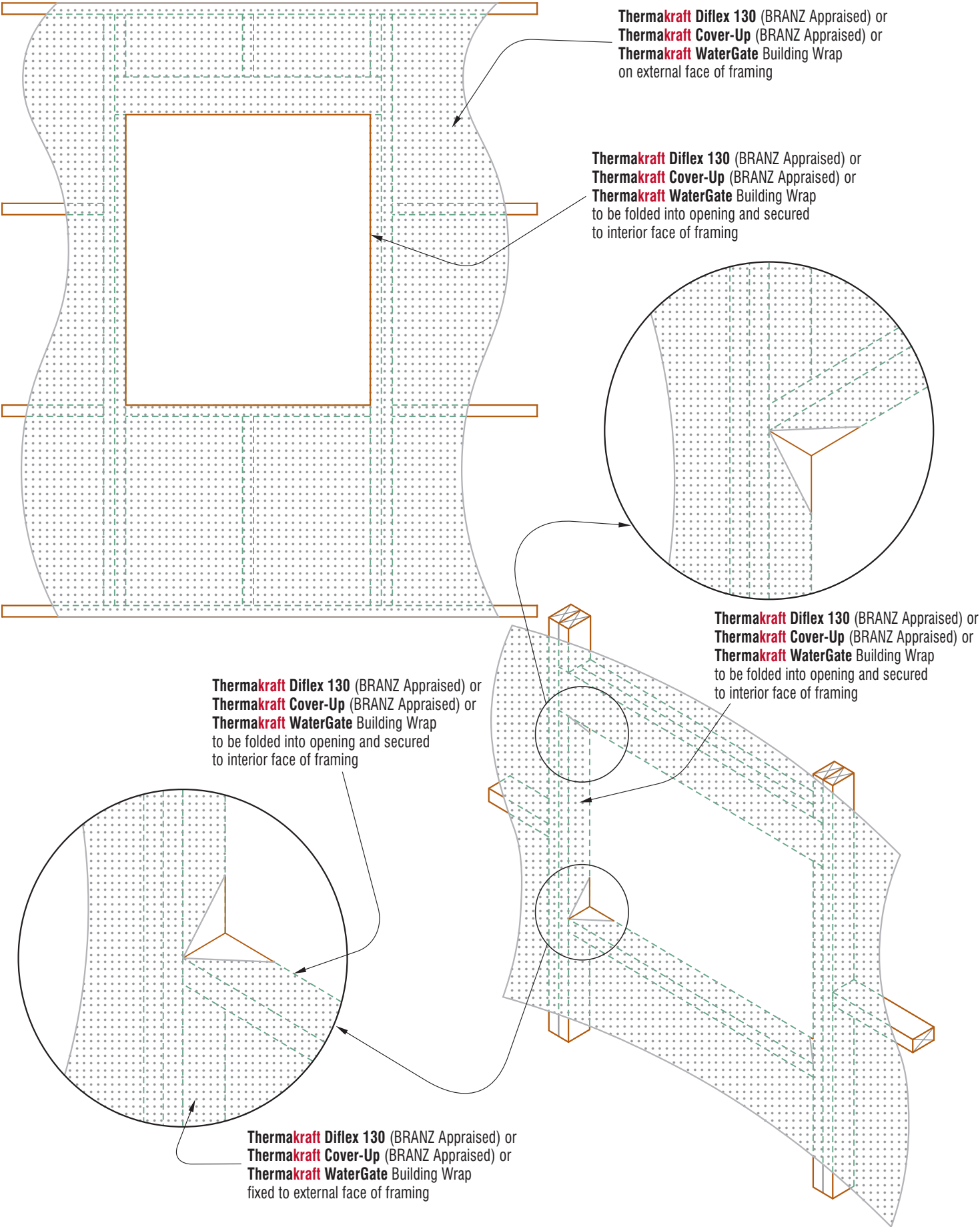
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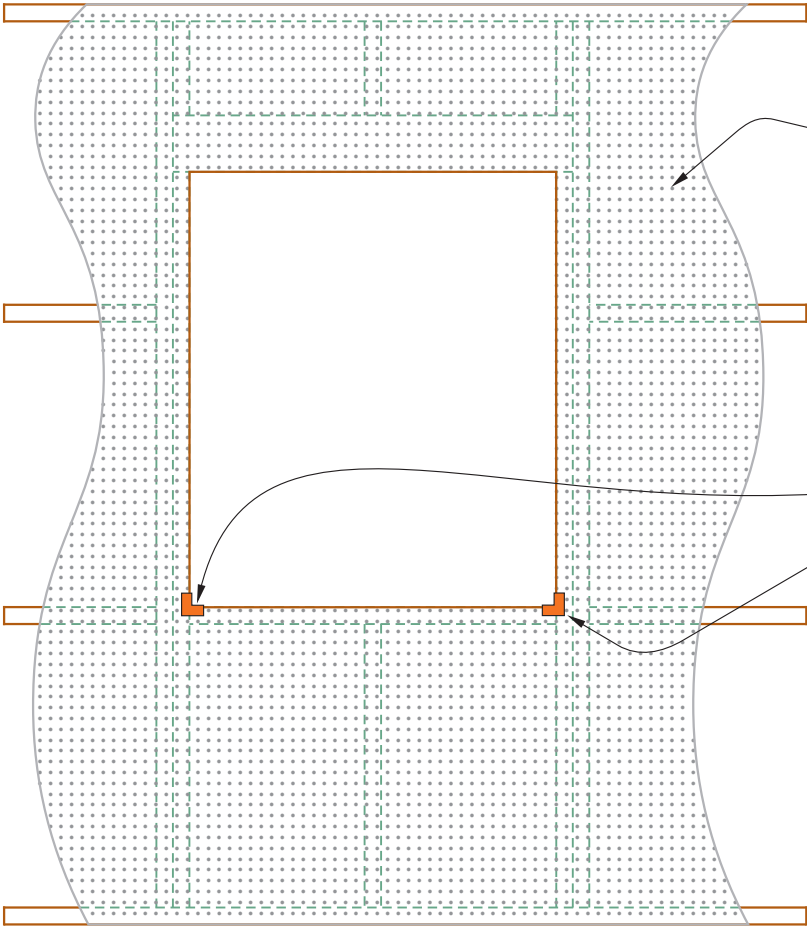
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Thermakraft WaterGate Building Wrap
on external face of framing

Thermakraft ALUBAND Corner Moulded Piece™
sill mould secured at both corners of opening

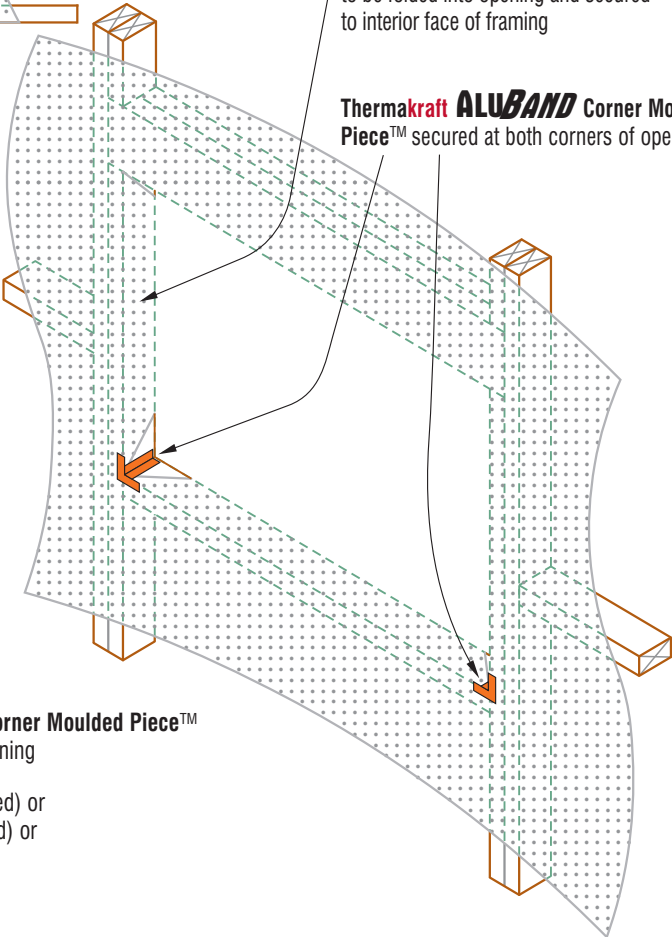
Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
to be folded into opening and secured
to interior face of framing

Thermakraft ALUBAND Corner Moulded
Piece™ secured at both corners of opening

Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
to be folded into opening and secured
to interior face of framing

Thermakraft ALUBAND Corner Moulded Piece™
secured at both corners of opening

Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
fixed to external face of framing



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DRAWING TITLE
Corner Moulded Piece

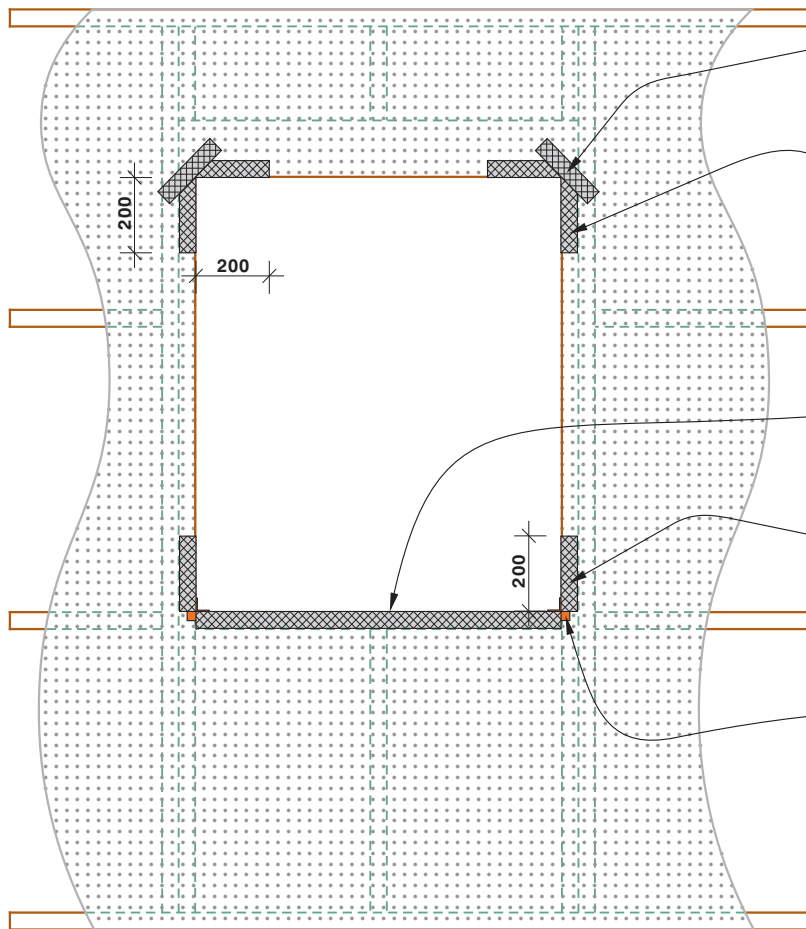
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W5



Thermakraft ALUBAND Window Sealing Tape
45° (100mm x 50mm) butterfly

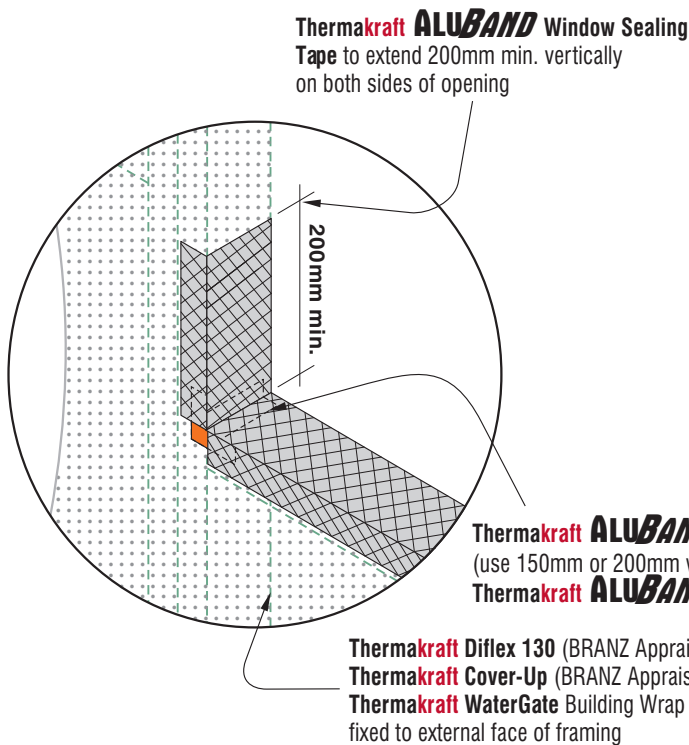
Thermakraft ALUBAND Flashing Tape
3mm min. overhang at corner

Thermakraft ALUBAND Window Sealing Tape
to extend 200mm min. in both directions

Continuous **Thermakraft ALUBAND** Window Sealing Tape
to sill (150mm or 200mm width)

Thermakraft ALUBAND Window Sealing Tape
to extend 200mm min. vertically on both sides of opening

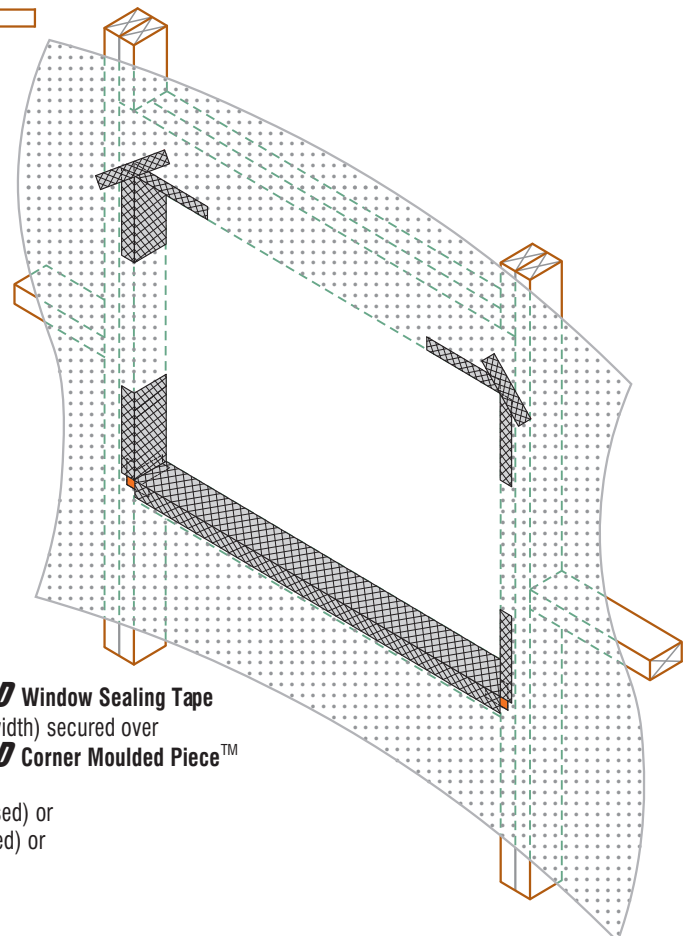
Thermakraft ALUBAND Window Sealing Tape secured over
Thermakraft ALUBAND Corner Moulded Piece™ and
Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap



Thermakraft ALUBAND Window Sealing
Tape to extend 200mm min. vertically
on both sides of opening

Thermakraft ALUBAND Window Sealing Tape
(use 150mm or 200mm width) secured over
Thermakraft ALUBAND Corner Moulded Piece™

Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or
Thermakraft WaterGate Building Wrap
fixed to external face of framing



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DRAWING TITLE

Window Sealing Tape

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W6

CSR Bradford Gold R2.2 wall insulation
(NRC 1.05), (BRANZ Appraised)

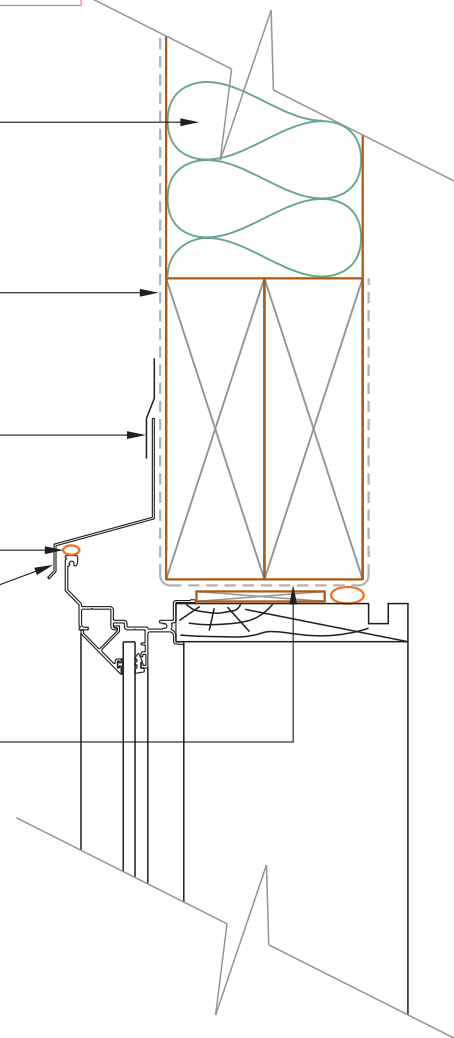
Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or Thermakraft WaterGate
Building Wrap fixed to external face of framing

50mm x 25m Thermakraft **ALUBAND** Window Sealing Tape
over head flashing

Head seal

Head flashing with 15° slope with stop end on both sides

Thermakraft Diflex 130 (BRANZ Appraised) or
Thermakraft Cover-Up (BRANZ Appraised) or Thermakraft WaterGate
Building Wrap dressed into the framed opening



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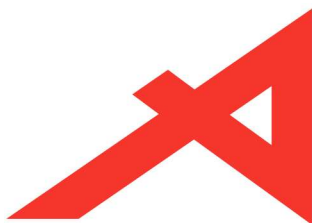
Thermakraft ALUBAND TOOL • THE METHOD



ENSURE A FIRM PRESSURE IS MAINTAINED DURING THE APPLICATION. THE EDGES OF ALUBAND MUST BE PUSHED FIRMLY INTO THE WRAP OR BUILDING MEMBRANE.



AS WITH THIS PHOTO, **NOTE THE USE OF THE ALUBAND TOOL TO PUSH THE ALUBAND TIGHTLY INTO THE CORNER MOULD. ENSURE ALUBAND IS NOT ADHERED PAST THE INSIDE FACE OF THE SILL. THE ALUBAND IS NOW READY TO BE CUT AT THE SILL/JAMB INTERSECT.**



BRANZ Appraised

Appraisal No. 795 [2012]

MASONS BARRICADE BUILDING WRAP

Appraisal No. 795 [2012]

Amended 10 November 2015



Consent Issued BC170237

BC170237

BRANZ Appraisals

Technical Assessments of
products for building and
construction.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, clause 9
BC170237 4/04/2017

Product

- 1.1 Masons Barricade Building Wrap is a flexible synthetic wall underlay for use under direct fixed and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured from a spun-bonded, non-woven polyolefin membrane, which is coated on one face with a breathable film.
- 2.1 Masons Barricade 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 Masons Barricade 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; and,
 - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.3 Masons Barricade 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; and,
 - situated in NZS 3604 Wind Zones up to and including Extra High.
- 2.4 Masons Barricade 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 Masons Barricade Building Wrap into their design in accordance with the declared properties and the instructions of Masons Plastrick Ltd.



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Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, **Masons Barricade 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. Masons Barricade 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, Masons Barricade Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Masons Barricade Building Wrap meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of the New Zealand Building Code compliance.

Technical Specification

- 4.1 Masons Barricade Wall Underlay is a white, 98 g/m² spun-bonded polyolefin, non-woven membrane, which is coated on one face with a breathable film. The product is supplied in rolls of various sizes.
- 4.2 The product is supplied in rolls 1.370 m wide x 73, 36.5 and 18.25 m long and 2.740 m wide x 36.49 and 18.24 m long. The product is printed with the Masons Barricade Building Wrap logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

Accessories

- 4.3 Accessories used with Masons Barricade Building Wrap which are supplied by the installer are:
- Fixings - staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the wall underlay to the framing.
 - Building underlay support - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall underlay 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 Masons Barricade 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. Dwargs must be fitted flush between the studs at maximum 1200 mm centres.

General

- 7.2 Masons Barricade Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber or steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.
- 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 Masons Barricade Building Wrap is suitable for use under wall claddings as a wall underlay and air barrier as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based siding or weatherboards in direct fixed installations. Masons Barricade Building Wrap 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.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Wall Underlay Properties	Property Performance Requirement	Actual Property Performance
Absorbency	$\geq 100 \text{ g/m}^2$	Does not comply
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 20 \text{ mm}$	Pass
pH of Extract	≥ 6 and ≤ 9	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical [UV aged]	Edge tear and tensile strength	Edge tear: Machine direction [average] = 118.6 N Cross direction [average] = 93.6 N Tensile strength: Machine direction [average] = 2.37 kN/m Cross direction [average] = 1.91 kN/m
Air Barrier	Air resistance: $\geq 0.1 \text{ MN s/m}^3$	Pass. Masons Barricade Building Wrap can be used as an air barrier.

- 7.5 In cavity installations where the cavity battens are installed at greater than 450 mm centres, Masons Barricade Building Wrap must be supported between the battens to prevent the 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.

Masonry Veneer

- 7.6 Masonry veneer on timber framed buildings must be in accordance with NZBC Acceptable Solution E2/AS1. Masonry veneer on steel framed buildings must be subject to specific design.

Stucco Plaster

- 7.7 Masons Barricade 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 underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm.
- 7.8 Masons Barricade 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 Masons Barricade Building Wrap is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a stand-alone 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 Masons Barricade Building Wrap meets code compliance with NZBC Clause B2.3.1 [a], not less than 50 years for building underlays used where the cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry veneer, and code compliance with NZBC Clause B2.3.1 [b], 15 years for building underlays used where the cladding durability requirement is 15 years.

Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 42 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Masons Barricade Building Wrap is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

- 10.1 Masons Barricade Building Wrap has an AS 1530 Part 2 flammability index of greater than 5. For Risk Groups other than SH, Masons Barricade Building Wrap must be enclosed by a suitable internal lining in occupied spaces [not exposed to view].

Prevention of Fire Occurring

- 11.1 Masons Barricade Building Wrap must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 to C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

- 12.1 Masons Barricade Building Wrap must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Masons Barricade 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.

Installation Information

Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Masons Barricade Building Wrap Technical Literature and this Appraisal, by competent tradespersons with an understanding of wall underlay installation.

Underlay Installation

- 14.1 Masons Barricade Building Wrap must be fixed to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.
- 14.2 Masons Barricade 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 underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut underlay must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Masons Barricade 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 Masons Barricade 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 50 mm and taping, or by taping small tears.

Inspections

- 14.7 The Technical Literature must be referred to during the inspection of Masons Barricade 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 Masons Barricade Building Wrap in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Masons Barricade Building Wrap was exposed to ultra-violet light.
- 15.2 The flammability Index of Masons Barricade Building Wrap has been evaluated in accordance with AS/NZS 1530.2.

Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 The practicability of installation of Masons Barricade Building Wrap has been assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.

Quality

- 17.1 The manufacture of Masons Barricade Building Wrap has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Masons Plastabrick Ltd.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall underlay into their design in accordance with the instructions of Masons Plastabrick Ltd.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Masons Plastabrick Ltd.

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 6, 14 February 2014].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 02 October 2015

This Appraisal has been amended to update the Appraisal Holders details and the wording in the Control of Internal Fire and Smoke Spread section.

Amendment No. 2, dated 10 November 2015

This Appraisal has been amended to add a building wrap roll size.



In the opinion of BRANZ, **Masons Barricade 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 **Masons Plastabrick 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. **Masons Plastabrick 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 **Masons Plastabrick 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 **Masons Plastabrick Ltd** or any third party.

For BRANZ



Pieter Burghout

Chief Executive

Date of Issue:

28 January 2013



BRANZ Appraised

Appraisal No. 447 [2010]

LINEA® WEATHERBOARD CAVITY CLADDING

Appraisal No. 447 [2010]

Amended 01 March 2016

BRANZ Appraisals

Technical Assessments of products
for building and construction.



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Consent Issued BC170237

BC170237



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Product

- 1.1 Linea® Weatherboard Cavity Cladding is a cavity-based bevelbacked fibre cement weatherboard wall cladding. It is designed to be used as part of an external cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 Linea® Weatherboard Cavity Cladding consists of Linea® Weatherboard, which is a bevelbacked fibre cement weatherboard, fixed over timber battens to form the cavity. The cladding is finished with a latex paint system.
- 1.3 The cladding incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity. The cavity allows for any occasional ingress of water that may get past the external skin to drain to the exterior of the building, and any remaining moisture to dry by evaporation.

Scope

- 2.1 Linea® Weatherboard Cavity Cladding has been appraised as an external wall cladding for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC; and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
 - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 Linea Weatherboard Cavity Cladding has also been appraised for weathertightness and structural wind loading when used as an external horizontally fixed wall cladding solution for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - constructed with timber framing complying with the NZBC; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- 2.3 Linea® Weatherboard must only be installed horizontally on vertical surfaces.
- 2.4 Linea® Weatherboard Cavity Cladding is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[The Appraisal of Linea® Weatherboard Cavity Cladding relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.]*

[Note: Linea® Weatherboard Cavity Cladding can be used to provide fire resistance rated construction, but these aspects have not been assessed by this Appraisal and are outside its scope.]

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Linea® Weatherboard Cavity Cladding if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Linea® Weatherboard Cavity Cladding meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 9.1 – 9.3.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years and B2.3.2. Linea® Weatherboard Cavity Cladding meets these requirements. See Paragraphs 10.1 and 10.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.7. Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraph 12.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Linea® Weatherboard Cavity Cladding meets this requirement. See Paragraphs 14.1 – 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Linea® Weatherboard Cavity Cladding meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

- 4.1 Linea® Weatherboards are bevelback weatherboards with a tongue and groove at each end for jointing. The weatherboards are pre-primed with an acrylic primer on the front face and both edges. Linea® Weatherboards are 16 mm thick and are available 135 mm, 150 mm and 180 mm wide. All boards are supplied 4200 mm long.
- 4.2 Linea® Weatherboards are manufactured from a reduced density cellulose fibre cement formulation. The boards are formed, cut to length and then cured by high-pressure autoclaving. After autoclaving, a bevel is cut on the back face of the weatherboards, the front edge at the bottom of the board is chamfered and the ends are tongue and grooved for jointing. Linea® Weatherboards are manufactured to meet the requirements of AS/NZS 2908.2.

Accessories

- 4.3 Accessories used with Linea® Weatherboard Cavity Cladding which are supplied by James Hardie New Zealand are:
- **Axent™ Trim** – a 16 mm thick fibre cement trim manufactured from a reduced density cellulose fibre cement formulation. Axent™ Trim is pre-primed with an acrylic primer on the front face and both edges, and is available in sizes of 84 mm and 100 mm wide by 2600 mm long.
 - **External and internal corner mouldings** – chromate treated aluminium external box corner, 90° internal corner 'W' mould and 135° internal corner 'W' mould. The mouldings are available in 2700 mm and 4000 mm lengths.
 - **Corner soakers** – 90° soakers are available for 135 mm, 150 mm and 180 mm Linea® Weatherboards. The soakers are available in chromate treated aluminium, copper and stainless steel.
 - **Cavity vent strip** – uPVC, available in 3000 mm lengths.
- 4.4 Accessories used with Linea® Weatherboard Cavity Cladding which are supplied by the building contractor are:
- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
 - **Flexible building underlay support** – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: mesh and wire galvanising must comply with AS/NZS 4534.]*

- **Rigid wall underlay** – Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
- **Flexible sill, head and jamb flashing tape** – flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
- **Cavity battens** – nominal 50 mm wide by 25 mm thick (minimum finished size of 45 mm wide by 18 mm thick) timber treated to Hazard Class H3.1.
- **Joinery head flashings** – folded from aluminium or galvanised steel to suit the window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Planted sill and scribes** – timber treated to Hazard Class H3.1, pre-primed before installation.
- **Window and door trim cavity air seal** – air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal suitable for use around window, door and other wall penetration openings.
- **Flexible sealant** – sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Cavity batten fixings** – 40 x 2.8 mm flat head hot-dip galvanised nails.
- **Linea® Weatherboard fixings** – 60 x 3.15 mm flat head hot-dip galvanised HardieFlex nails or stainless steel ring shank HardieFlex nails (for concealed nailing in NZS 3604 wind zones up to and including Very High), 75 x 3.15 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in NZS 3604 wind zones up to and including Very High), and 90 x 4.0 mm jolt head hot-dip galvanised nails or stainless steel ring shank nails (for face nailing in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa).
- **Axent™ Trim fixings** – 60 x 3.15 mm or 75 x 3.15 mm hot-dip galvanised jolt head nails and stainless steel ring shank jolt head nails.

[Note: Stainless steel fixings must be Grade 316 and hot-dip galvanising must comply with AS/NZS 4680].

Paint System Specification

- 4.5 Paint systems are not supplied by James Hardie New Zealand and have not been assessed, therefore they are outside the scope of this Appraisal.
- 4.6 All exposed faces, including top edges at sills and all bottom edges of Linea® Weatherboard, Axent™ Trim and accessories must be finished with a latex exterior paint system complying with any of Parts 7, 8, 9, or 10 of AS 3730.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by James Hardie New Zealand or the building contractor, whether on site or off site, is under the control of the building contractor. Linea® Weatherboards must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times either by storing under cover or providing waterproof covers to the stack. Care must be taken to avoid damage to edges, ends and surfaces. Weatherboards must always be carried on edge.
- 5.2 Accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Linea® Weatherboard Cavity Cladding. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

Framing

Timber Treatment

- 7.1 Timber wall framing behind Linea® Weatherboard Cavity Cladding must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

- 7.2 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones and maximum 400 mm centres for the NZS 3604 Extra High Wind Zone and specifically designed buildings. Nogs must be fitted flush between the studs at maximum 800 mm centres [for studs at 600 mm centres] or maximum 1200 mm centres [for studs at 400 mm centres].
- 7.3 Timber framing must have a maximum moisture content of 24% at the time of the cladding application. *[If weatherboards are fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.]*
- 7.4 Timber wall framing must have a maximum moisture content of 18% before the weatherboards are painted.

General

- 8.1 When the Linea™ Weatherboard Cavity Cladding is used for specifically designed buildings up to 2.5 kPa ULS wind pressure, only the weathertightness and structural aspects of the cladding are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.
- 8.2 Punchings in the cavity vent strip provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall.
- 8.3 At ground level the bottom edge of Linea® Weatherboards must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.
- 8.4 At balcony, deck or low pitch roof/wall junctions, the bottom edge of Linea® Weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 50 mm.
- 8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.
- 8.6 Where cladding penetrations are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities by leaving a minimum gap of 10 mm between the bottom of the vertical cavity batten and the flashing to the opening.
- 8.7 Where Linea® Weatherboard Cavity Cladding abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Interstorey Junctions

- 8.8 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 [b].

Structure

Mass

- 9.1 The mass of the 135 mm wide Linea® Weatherboard when installed on the wall is 25.7 kg/m² at equilibrium moisture content [EMC]. The mass of the 150 mm wide board is 24.9 kg/m² at EMC and the mass of the 180 mm wide board is 23.9 kg/m² at EMC. Linea® Weatherboard Cavity Cladding is therefore considered a light wall cladding in terms of NZS 3604.

Impact Resistance

- 9.2 Linea® Weatherboard Cavity Cladding will resist impacts likely to be encountered in normal residential use. The likelihood of impact damage to the cladding when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers provided for vulnerable areas.

Wind Zones

- 9.3 Linea® Weatherboard Cavity Cladding is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa ULS wind pressure where buildings are specifically designed.

Durability

Serviceable Life

- 10.1 Linea® Weatherboard Cavity Cladding installations are expected to have a serviceable life of at least 50 years provided the paint coating system is maintained in accordance with this Appraisal to ensure the Linea® Weatherboards and fixings remain dry in service. Linea® Weatherboards must be painted within 3 months of fixing.
- 10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604, Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve a 50 year serviceable life in Zone D, Linea® Weatherboards must be fixed with stainless steel fasteners. Fasteners outside Zone D may be hot-dip galvanised steel.
- 10.2 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Linea® Weatherboards in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

- 11.1 Regular maintenance is essential for Linea® Weatherboard Cavity Cladding installations to continue to meet the NZBC durability performance provision and to maximise their serviceable life.
- 11.2 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the sealant or paint coating manufacturer's instructions.
- 11.3 Regular cleaning [at least annually] of the paint coating surface is recommended to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Paint systems must be recoated at approximately 7-15 yearly intervals in accordance with the paint manufacturer's instructions.

- 11.4 Minimum ground clearances as set out in this Appraisal must be maintained at all times during the life of the cladding. *[Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of Linea® Weatherboard Cavity Cladding.]*

Control of External Fire Spread

- 12.1 Linea® Weatherboard has a peak heat release rate of less than 100 kw/m² and a total heat released of less than 25 MJ/m² in accordance with NZBC Acceptable Solution C/AS1, Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at any distance to the relevant boundary. Linea® Weatherboard is also suitable for use where a non combustible material is specified. When Linea® Weatherboard is finished with a paint coating of not more than 1.0 mm in thickness, the exterior surface finishes requirements of NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.1 do not apply in accordance with NZBC Acceptable Solutions C/AS2 – C/AS6, Paragraph 5.8.2 a).

Prevention of Fire Occurring

- 13.1 When Linea® Weatherboard Cavity Cladding is finished with a paint coating of not more than 1.0 mm in thickness, clearance separations from chimneys and flues are not required. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solutions C/AS1 – C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

- 14.1 Linea® Weatherboard Cavity Cladding, when installed in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.
- 14.2 The cavity must be sealed off from the roof and sub-floor space to meet code compliance with Clause E2.3.5.
- 14.3 Linea® Weatherboard Cavity Cladding allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet code compliance with Clause E2.3.6.
- 14.4 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.
- 14.5 The use of Linea® Weatherboard Cavity Cladding where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.

Internal Moisture

- 15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

- 15.2 Linea® Weatherboard Cavity Cladding is not a barrier to the passage of water vapour, and when installed in accordance with the Technical Literature and this Appraisal will not create or increase the risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirements

- 16.1 Installation of Linea® Weatherboard and accessories supplied by James Hardie New Zealand and the building contractor must be completed by tradespersons with an understanding of cavity construction and bevelback weatherboard installation, in accordance with instructions given within the Linea® Weatherboard Cavity Cladding Technical Literature and this Appraisal.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

- 17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Linea® Weatherboard Cavity Cladding system. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

Cavity Battens

- 17.2 Cavity battens must be installed over the building underlay to the wall framing at maximum 600 mm centres where the studs are at 600 mm centres or at 400 mm centres when studs are at 400 mm centres. The battens must be fixed in place with 40 x 2.8 mm hot-dip galvanised flat-head nails at maximum 800 mm centres.
- 17.3 Where studs are at greater than 400 mm centres, a building underlay support must be installed over the building underlay between the cavity battens at maximum 300 mm centres.

Linea® Weatherboard Installation

- 17.4 Linea® Weatherboards may be cut on site by power saw. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.
- 17.5 Weatherboards must be dry prior to installation. Before the weatherboards are installed, cut ends exposed to the exterior such as at aluminium box corners or internal corners must be sealed with an acrylic sealer to reduce the absorbency of the fibre cement.
- 17.6 Linea® Weatherboards must be installed starting at the bottom of the wall. A cant strip (H3.1 treated timber or fibre cement) must be fixed behind the bottom course of weatherboards to ensure the weatherboards are set at the correct angle. The cant strip must be continuous around the perimeter of the building. The bottom course of weatherboards must overhang the bottom plate by a minimum of 50 mm.
- 17.7 Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner, corner soaker. The necessary flashings, including window flashings, must be installed before commencing weatherboard fixing.
- 17.8 The first course of weatherboards must be full length, i.e. 4200 mm and commence from an external corner. Jointing of Linea® Weatherboards is made off the stud using the pre-cut tongue and groove joint. Tongue and groove joints may be located centrally between the studs, but must be no closer than 100 mm to the edge of a stud. A bead of sealant must be applied to the front side of the tongue before the corresponding board is inserted. Subsequent courses of weatherboards must be installed so that the tongue and groove joints are staggered by 600 mm minimum from joints in the previous course.

- 17.9 Linea® Weatherboards must have a minimum lap of 30 mm, and should be set out so as near to a full board as possible will finish under and over windows and doors and at the top of the wall. A storey rod can be used to accurately position weatherboard courses.
- 17.10 Linea® Weatherboards must be fixed to each stud using concealed fixings behind the lap of the boards or face nailing, except that face nailing must be provided at all corners and vertical edges of openings.
- 17.11 Concealed fixing must be carried out using 60 x 2.8 mm hot-dip galvanised or stainless steel Hardieflex nails depending on the location - see Paragraph 10.2. Nails must be fixed 25 mm from the top edge of the board and must be driven flush with the board surface.
- 17.12 Face nailing must be carried out using 75 x 3.15 mm hot-dip galvanised or stainless steel jolt-head nails in NZS 3604 wind zones up to and including Very High, or 90 x 4.0 mm hot-dip galvanised or stainless steel jolt-head nails in the NZS 3604 Extra High Wind Zone and specific design wind pressures up to a maximum design differential ULS of 2.5 kPa, depending on the location - see Paragraph 10.2. Nails must be fixed 15 mm up from the bottom of the board and punched a maximum of 2 mm below the surface of the board. When stainless steel nails are used, the top board at each lap must be pre-drilled.
- 17.13 Linea® Weatherboards can be hand or gun nailed. Nails must not be closer than 25 mm to the end of the board when hand nailing, or closer than 50 mm when gun nailing. *[Note: Gun nailing must only be used for concealed nailing.]*

Aluminium Joinery Installation

- 17.14 Aluminium joinery and associated head and sill flashings must be installed by the building contractor in accordance with the Technical Literature. A 7.5 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.
- 17.15 After installing the window and door joinery, Axent™ Trim, planted sills and scribes may be installed in accordance with the Technical Literature to provide additional weatherproofing for the joinery/weatherboard junction.

Inspections

- 17.16 The Technical Literature must be referred to during the inspection of Linea® Weatherboard Cavity Cladding installations.

Finishing

- 17.17 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. Linea® Weatherboards and trim must be clean and dry before commencing painting.

Health and Safety

- 18.1 Cutting of Linea® Weatherboard must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.
- 18.2 When power tools are used for cutting, grinding or forming holes, health and safety measures as set out in the Technical Literature must be observed because of the amount of dust generated.
- 18.3 Safe use and handling procedures for Linea® Weatherboard and the components that make up the cladding system are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

- 19.1 The following testing has been completed by BRANZ:
- BRANZ expert opinion on NZBC E2 code compliance for Linea® Weatherboard Cavity Cladding was based on testing and evaluation of all details within the scope and as stated within this Appraisal. Linea® Weatherboard Cavity Cladding was tested to E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5). The testing assessed the performance of the foundation detail, window head, jamb and sill details, meterbox head, jamb and sill details, balustrade to wall junction, parapet cap and internal and external corners. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for drained cavity claddings.
 - Uniform wind face load tests to simulate wind pressures on 12 mm thick Linea® Weatherboards were carried out by BRANZ, and the results were used in assessing 16 mm thick Linea® Weatherboard used in Linea® Weatherboard Cavity Cladding.
 - Cone Calorimeter testing to determine the peak rate of heat release and total heat release of Linea® Weatherboard was completed by BRANZ. The testing was carried out in accordance with AS/NZS 3837.
- 19.2 Linea® Weatherboards have been tested by a James Hardie NATA accredited laboratory in accordance with AS/NZS 2908.2. The testing covered: soak-dry, bending strength, warm water soaking, heat/rain, freeze/thaw and apparent density. The test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 19.3 Testing has been carried out by James Hardie New Zealand to determine the modulus of rupture and inter-laminar bond strength of carbonated and non-carbonated Linea® Weatherboard. The test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 20.1 Weathertightness, structural, fire and durability opinions have been provided by BRANZ technical experts.
- 20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.3 The manufacturer's Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of Linea® Weatherboard has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 21.2 The quality of materials, components and accessories supplied by James Hardie New Zealand is the responsibility of James Hardie New Zealand. The quality control system of James Hardie New Zealand has been assessed and registered as meeting the requirements of ISO 9001: 2008.
- 21.3 Quality on site is the responsibility of the installer.
- 21.4 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the building underlay, cavity battens, Linea® Weatherboard and accessories in accordance with the instructions of James Hardie New Zealand.
- 21.5 Building owners are responsible for the maintenance of Linea® Weatherboard Cavity Cladding in accordance with the instructions of James Hardie New Zealand.

Sources of Information

- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - Flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4534: 1998 Zinc and zinc/aluminium-alloy coatings on steel wire.
- AS/NZS 4680: 2006 Hot-dip galvanized [zinc] coatings on fabricated ferrous articles.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 1999 Timber framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 30 October 2013.

This Appraisal has been amended to change the Appraisal Holder, change the Product Name and to update clause changes as required by the introduction of NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 3, dated 5 March 2014.

This Appraisal has been amended to alter the scope to include NZS 3604 Wind Zone Extra High, and specific design wind pressures up to and including 2.5 kPa.

Amendment No. 4, dated 01 March 2016.

This Appraisal has been amended to remove the term Scyon®.



In the opinion of BRANZ, **Linea® Weatherboard Cavity Cladding** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **James Hardie New Zealand**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **James Hardie New Zealand:**
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **James Hardie New Zealand**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **James Hardie New Zealand** or any third party.

For BRANZ



Pieter Burghout

Chief Executive

Date of Issue:

14 September 2010

**James Hardie**
a smarter way™

Product Technical Statement

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant

Linea®
WEATHERBOARD

Product Description: Linea Weatherboard is a bevelbacked weatherboard wall cladding manufactured using low density fibre cement formulation.

Scope of Use: Linea Weatherboard is suitable for use as external wall cladding on residential buildings within the scope of E2/AS1 or light weight residential/commercial buildings with design wind pressure of 2.5kPa (uls) covered by a specific engineering design (SED). It can be installed direct fixed to the framing for residential buildings within or up to the risk score 12 calculated as per E2/AS1. Or, it can be fixed over a timber cavity batten that is nominal 20mm thick and used for buildings that are exposed to wind pressures up to 2.5kPa (uls).

Linea Weatherboard is also suitable for use in fire rated systems and bracing applications.

Limitations: Linea Weatherboard cladding must not be used in curved wall applications or in situations where it stays in contact with ground moisture.

Compliance with the NZBC: The following clauses of the NZBC are applicable to Linea Weatherboard cladding and it complies with these requirements as explained below;

Structure - B1: Uniform wind face load tests have been completed at BRANZ and the suitability of its fixings has been verified to meet wind pressure requirement in various wind zones classified in NZS 3604 and meets the requirements of B1.3.1, B1.3.2 and B1.3.4.

Durability - B2: Linea Weatherboard has been tested at a NATA accredited James Hardie laboratory in accordance with AS/NZS 2908.2 and meets the durability performance requirements as per B2.3.1(a) and B2.3.2 of this clause.

Fire Performance - C: Linea Weatherboard has been tested and is classified as non-combustible material and is suitable for use on external walls close to boundaries.

External Moisture - E2: Linea Weatherboard cavity cladding as per its details has been tested for weathertightness as per E2/VM1 (as contained within NZBC Clause E2, Third Edition, Amendment 5).

Hazardous Building Materials - F2: Linea Weatherboard complies with the requirements of F2.3.1 and will not present a health hazard.

Energy Efficiency - H1: Linea Weatherboard clad walls constructed using bulk insulation meets the construction R-Value requirements as per Table 1 of Clause H1.

Linea Weatherboard has a BRANZ appraisal for direct fixed and cavity construction method. Refer to BRANZ appraisal No. 446 and 447 at www.branz.co.nz

Linea Weatherboard has also been assessed under the product certification scheme by DBH and is covered under CodeMark. Refer to CodeMark certificate; www.dbh.govt.nz

Installation: Must be in accordance with the current Linea Weatherboard Technical Specification. Refer to www.jameshardie.co.nz or Ask James Hardie™ at 0800 808 868 for further information.



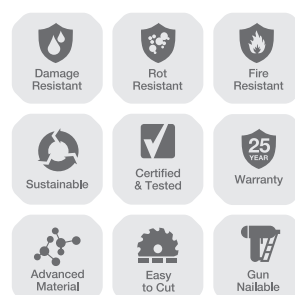
Build tough. Build beautiful. Build with Linea Weatherboard.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC170237 4/04/2017 lachlant



Durable Linea® Weatherboard is a top-quality alternative to timber cladding that hits the sweet spot between the latest technology and classic design. Linea Weatherboard is made in New Zealand to withstand even the harshest Kiwi conditions so it's very tough – resistant to fire, moisture damage and rot. The deep shadow lines give your home that attractive traditional charm and because Linea Weatherboard won't warp in the sun, you can paint your home any colour you like – even the darker shades.

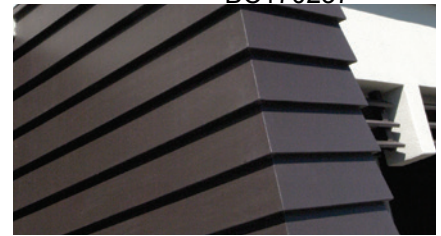
Ask James Hardie | Call 0800 808 868 | jameshardie.co.nz/linea



Linea® Weatherboard — Sheet sizes

Consent Issued BC170237

Product Code	Length (mm)	Width (mm)	Thickness (mm)
401847	4200	180	16
402533	4200	150	16
401844	4200	135	16



Linea® Weatherboard

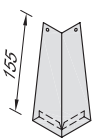
Axent™ Trim — Sheet sizes

Product Code	Length (mm)	Width (mm)	Thickness (mm)
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401943	2600	84	16

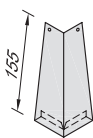


Axent™ Trim

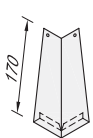
Linea® Weatherboard — Accessories



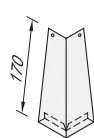
Linea® 135mm
Aluminium Ext
Corner Soaker 90°
301185



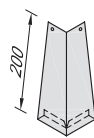
Linea® 135mm
S/S Ext Corner
Soaker 90°
301196



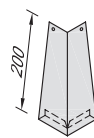
Linea® 150mm
Aluminium Ext
Corner Soaker 90°
302820



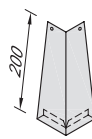
Linea® 150mm
S/S Ext Corner
Soaker 90°
302821



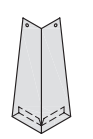
Linea® 180mm
Aluminium Ext
Corner Soaker 90°
301186



Linea® 180mm
Copper Ext
Corner Soaker 90°
301188



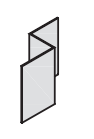
Linea® 180mm S/S
Ext Corner
Soaker 90°
301197



Linea® 180mm
Aluminium Ext
Corner Soaker 135°
301178



Linea® Alum Ext
Slimline Box
Corner 2700
301195



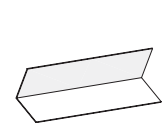
Linea® uPVC Box
Corner 'Z'
Flashing 2700
301203



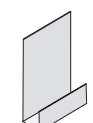
Linea® Aluminium Int
'W' Corner Mould
2700 90°
301184



Linea® Aluminium
Int 'W' Corner
Mould 2700 135°
301183



James Hardie®
Corner Underflashing
3000mm
303745



uPVC Vent Strip
18mm x 75mm
x 3000mm
302490



HardieFlex Stainless
Steel 316 Nail
60 x 3.15mm
302782



HardieFlex Hot Dip
Galvanised Nail
60 x 3.15mm
302784

Linea® Weatherboard must be installed and maintained correctly and to the extent set out in James Hardie's published literature current at the time of installation.

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Heat Pump Catalogue

**NZ'S MOST
ENERGY EFFICIENT
HEAT PUMP RANGE
INCLUDING THE
BRILLIANT e3 SERIES**



**NOW YOU CAN CONTROL
YOUR HOME COMFORT FROM
YOUR SMARTPHONE**

Come Home to Fujitsu Comfort

The Home Comfort Specialist

FUJITSU

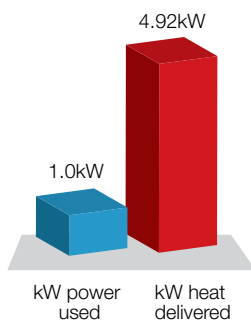
Why choose Fujitsu?



The Home Comfort Specialist

Fujitsu General has specialised in designing and producing Heat Pumps for well over 40 years. Heat Pumps is all we do!

Our advanced models are engineered to add many benefits to your home lifestyle. You will enjoy compact designs, healthy air features, leading energy savings and whisper quiet operation. In fact, you'll hardly notice your new heat pump is there – except for a warmer, healthier, very efficient and more comfortable home environment.



Heating efficiency varies by kW capacity of different models. The Example shown is for the ASTG09KMCA, which also achieves a 5 Star Energy rating.

New Zealand's most efficient heat pump range

Fujitsu has more ENERGY STAR® qualified heat pumps than any other brand (August 2015). Our commitment to energy savings is legendary, to help you choose the right energy efficient model for your home

Low running costs

With the increasing cost of power it's becoming more and more important to minimise energy consumption in the home. You already know that heat pumps are amongst the most energy efficient forms of heating, but did you know that Fujitsu leads the way in energy savings? With a new thermodynamic system on the e3 range, and additional energy saving features to ensure you will receive better economy. Our most efficient heat pump - the 3.2kW e3 model can deliver almost 5 times the heat for the amount of energy used.

That will save on your power bills!



Smartphone Control

The new PebbleAir™ from Fujitsu allows you to control your Fujitsu from your smartphone or tablet.

That means you can turn your heat pump on when you aren't at home, check and control the temperature and add a 7-day 'set-and-forget' timer function to older Fujitsu models that didn't previously have that feature.

Now you'll always come home to a warm welcome.

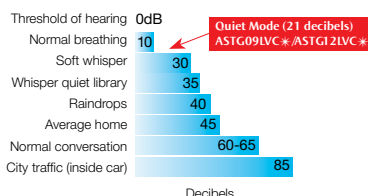


Asthma New Zealand
recommends Fujitsu

A fresher, healthier home

Fujitsu has air purifying and deodorising filters across many heat pumps in the range. These filters absorb minute dust particles, invisible mould spores, pollen and so reduce harmful and allergy creating micro organisms, to give you a healthier home environment. A warm, dry and air filtered home creates a healthy environment for all the family.

Fujitsu is recommended by Asthma New Zealand.



Just QUIETLY

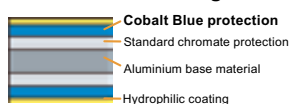
Latest fan technology plus 'quiet mode' means noise is not an issue with Fujitsu. Compare our decibel levels with other brands, and you'll see that even our larger models are whisper quiet. Only Fujitsu also gives you quiet mode on outside units of the e3 series too.

Compact outside units with blue fin heat exchanger

Fujitsu's outside units are more compact, with low operating noise from the efficient airflow structure.

Importantly, the Fujitsu outside unit heat exchanger fins are also specially coated with Cobalt Blue – to help protect against corrosion and enhance the durability as well as extend the performance life of your Fujitsu heat pump.

Blue fin heat exchanger



How Fujitsu expertise leads the way



Home Comfort Specialist

Fujitsu's advanced engineering delivers all the heat you need, just when you need it. You can be as warm as toast when it's freezing outside, and with a simple button to engage the reverse cycle mode, you can enjoy cool, dehumidified comfort in summer too.



Accredited Consultants

Fujitsu is the only company in New Zealand that runs the respected Accreditation Programme for independent heat pump consultants and installers.



Fujitsu guarantees you will get the heat you need.

To achieve Accreditation, the tradesman must satisfy Fujitsu that they have the experience, skill and equipment to recommend and install your new heat pump in accordance with the manufacturer requirements, applying sound professional trade practices.

This means that when you use an installer who has achieved our accreditation standards to install your Fujitsu heat pump, you will have the services of a real professional, and we will also give you a 6 year full parts and labour warranty – New Zealand's longest.

Comprehensive range

With more ENERGY STAR® heat pumps than any other brand, you will find the perfect match to your home and lifestyle.



Check the 'how to choose a heat pump' section on our website for tips and information on finding the heat pump that you will suit you best.

Performance Guarantee

We are so confident that you will be delighted with your new Fujitsu, that the independent heat pump consultant can offer you a written Performance Guarantee. This is additional to the product warranty - and is your assurance that the new Fujitsu Heat Pump specified for your home will deliver on its promised performance for heating, even when it's freezing.



How do you get the Performance Guarantee?

**COMFORT
SELECTOR**

Heat pump consultants displaying the 'COMFORT SELECTOR' logo on the 'where to buy' page at www.fujitsugeneral.co.nz are equipped to offer the Performance Guarantee.

The COMFORT SELECTOR is a specialist sizing tool that is really helpful when choosing your heat pump. It will:

1. Assess everything about your home, including its location in New Zealand and your individual heating needs
2. Select the perfect model for you
3. Provide you with:
 - Quotation
 - Heat Pump running costs (it will even show you the savings you can make)
 - Heat pump features and benefits
 - Efficient running tips

So now you can be sure that your choice will be the best possible heat pump for you.

THE REPORT INCLUDES:

- All about your home
- The perfect heat pump for your home
- Running costs (and savings) - heat pump features and benefits
- Efficient running tips
- Heat Performance Guarantee
- Quotation



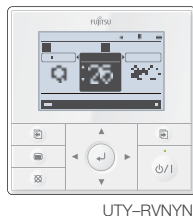


Fujitsu delivers better control

LCD Wall Controller (UTY-RVNYN)

Features:

- Includes all the control functions of the already supplied controller
- Backlit display
- 7-day programmable timer: with 8 x auto on/off scheduling possible each day
- 2 weekly settings – so can be programmed for winter and summer
- Auto-off timer – automatically turns off if left on accidentally
- Temperature limit select – so you can lessen the temperature range by single degrees
- Auto return set temperature – you can change the temperature setting within timer settings
- Economy mode – an additional economy feature
- 3 types of lock-out operation: child lock; partial lock and management lock
- Memory back-up
- Clean filter indicator



UTY-RVNYN

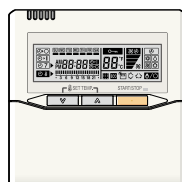
WORLD FIRST

Universal Wall Controller (UTY-RNNYN)

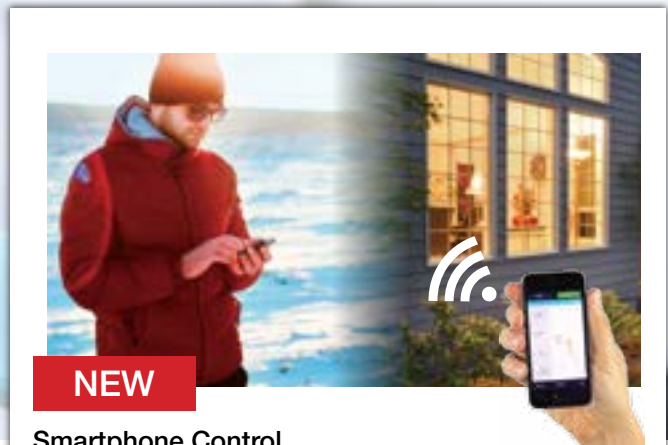
This smart optional controller is simple to use, yet has many features to add more control to your comfort with greater efficiency and convenience.

Features :

- Includes all the control functions of the already supplied controller
- 7-day programmable timer with 2 x auto on/off scheduling possible for each day
- Set-back timer, allows different temperature settings for each day
- Economy mode, saves energy by limiting maximum output
- Child lock
- Memory back-up (instant re-set) - remembers settings in case of power outages
- Clean filter indicator



UTY-RNNYN



NEW

Smartphone Control

Now it's easy to control your heat pump from your smartphone or tablet, wherever you are!

Great features!

- Controls your Fujitsu home comfort from your smartphone or tablet
- Turns your heat pump on and off, shows the room temperature and allows you to change it
- Set timers – including a 7-day timer, even on older models where this feature was not previously available
- Works on current, as well as older Fujitsu models
- Compatible with iPhones and Android smartphones, iPads and Android tablets
- Easy to set-up: 'plug-in and play'. Download the App onto your phone or tablet, plug-in the PebbleAir, pair it with your home Wi-Fi and you're ready to go!
- No installation costs, no technicians, no fuss
- Future proofed – the Pebble Air operates from the cloud to make future updates and improvements automatic on your phone App
- Patented Kiwi technology and know-how makes connection to your phone seamless and secure

Now you'll always come home to a warm welcome!

Simple Wall Controller (UTY-RSNNY)

Features:

- Basic operation function
- On/Off
- Mode change (heating/cooling)
- Temperature change: Auto: 18 to 30°C: Heating 16 to 30°C: Cooling 18 to 30°C
- Fan change: auto, high, medium, low, quiet



UTY-RSNNY

Please note that a special communication part is required when installing any optional wall controller.

Check our website for FAQ's, detailed information on how heat pumps work and our full range of models.

www.fujitsugeneral.co.nz



New levels of efficiency in heating and cooling



ASTG09KMC*

Heating capacity: 3.2kW
Heating efficiency: COP 4.92
Cooling capacity: 2.5kW
Cooling efficiency: EER 4.90

ASTG12KMC*

Heating capacity: 3.7kW
Heating efficiency: COP 4.57
Cooling capacity: 3.5kW
Cooling efficiency: EER 4.07



ASTG18KMC*

Heating capacity: 6.0kW
Heating efficiency: COP 4.23
Cooling capacity: 5.0kW
Cooling efficiency: EER 4.10

ASTG22KMC*

Heating capacity: 7.2kW
Heating efficiency: COP 4.07
Cooling capacity: 6.0kW
Cooling efficiency: EER 3.77

ASTG24KMC*

Heating capacity: 8.0kW
Heating efficiency: COP 3.77
Cooling capacity: 7.1kW
Cooling efficiency: EER 3.53

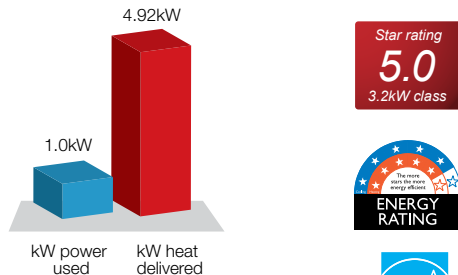


ASTG18, 22, 24KMC models only >

The Fujitsu e3™ series uses a new thermodynamic system to heat or cool your home environment. This system will deliver more heat for your dollar than previous systems. Even better, this system also delivers environmental improvements with reduced global warming potential and zero ozone depletion potential.

BRILLIANT ENERGY SAVING

Totally new thermodynamic system can deliver up to 4.92 kW of heat for every 1kW of power.



Heating efficiency varies by kW capacity of the model. The example shown is for ASTG09KMCA (3.2kW). See specifications for the COP of all models.

MORE FEATURES!

Power Diffuser

Automatically adjusts to optimise heating or cooling mode



Human Sensor

For even more energy savings. Detects human presence and adjusts accordingly.



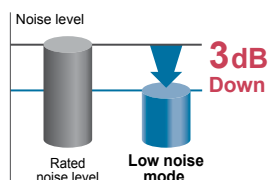
Better Control (controller on heat mode)

- 7-day timer
- Powerful operation mode (for fast heating)
- Sleep timer – adjusts to your sleeping patterns
- Optional wall controllers also available (with communication link kit UTY-XCBXZ2 for 9 and 12 models and UTY-TWBXF1 for the larger models)



Quieter outside!

- Low noise mode for outdoor unit



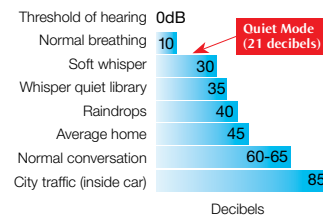
With the Fujitsu features you expect:

- Healthy air with advanced polyphenal catechin air cleaning filters



Fujitsu is recommended by Asthma New Zealand

- Quieter than a human whisper



- Slim and elegant design



Just 840mm wide

CONTROLLERS

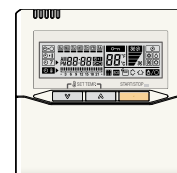
Wall controller options

The 7-day programmable timer



UTY-RVNYN

Universal wall controller



UTY-RNNYN

Simple wall controller



UTY-RSNNY

See page 5 for detailed features of each controller.

Optional wall controllers also available (with communication link kit UTY-XCBXZ2 for 9 and 12 models and UTY-TWBXF1 for the larger models).

e3™ series specifications

Model No.	Indoor Unit		ASTG09KMCA AOTG09KMCA	ASTG12KMCA AOTG12KMCA	ASTG18KMCA AOTG18KMCA	ASTG22KMCA AOTG22KMCA	ASTG24KMCA AOTG24KMCA
CAPACITY (RANGE)	HEAT	kW	3.2 (0.90 - 5.30)	3.7 (0.90 - 5.60)	6.0 (1.05 - 8.30)	7.20 (1.10 - 9.70)	8.0 (1.10 - 10.60)
	COOL	kW	2.5 (0.90 - 3.60)	3.5 (0.90 - 4.10)	5.0 (1.00 - 6.50)	6.0 (1.10 - 7.50)	7.10 (1.10 - 8.30)
INPUT POWER	HEAT/COOL	kW	0.65 / 0.51	0.81 / 0.86	1.42 / 1.22	1.77 / 1.59	2.12 / 2.01
COP	HEAT	kW	4.92	4.57	4.23	4.07	3.77
EER	COOL	kW	4.90	4.07	4.10	3.77	3.53
STAR RATING	HEAT		5.0	4.5	3.5	3.5	3.0
	COOL		5.0	3.5	3.5	3.0	2.5
RUN CURRENT	HEAT/COOL	A	3.3 / 2.7	4.0 / 4.2	6.0 / 5.2	7.5 / 6.7	9.0 / 8.5
MOISTURE REMOVAL		L/Hr	1.3	1.8	2.6	2.7	2.7
NOISE INDOOR Q/LM/H	COOL	dB(A)	21/31/36/40	21/32/37/42	29/35/40/46	32/37/42/48	32/37/42/49
NOISE OUTDOOR			47	49	47	49	52
AIR CIRCULATION	INDOOR	l/s	194	200	258	278	311
DIMENSIONS AND WEIGHTS	INDOOR	mm	268 x 840 x 203				
		kg	8.5				
	OUTDOOR	mm	540 x 790 x 290				
		kg	34				
PIPE CONNECTIONS		mm	6.35 / 9.52				
MAXIMUM PIPE LENGTH (PRECHARGED)		m	20 (20)				
MAX PIPE HEIGHT		m	15				
OPERATION RANGE	HEAT	degree	-15 to 24				
	COOL	degree	10 to 46				
REFRIGERANT			R32				

Compact Hi-Wall Premier



ASTG09LVC*

Heating capacity: 3.4kW
 Heating efficiency: COP 4.66
 Cooling capacity: 2.5kW
 Cooling efficiency: EER 4.3



ASTG12LVC*

Heating capacity: 4.8kW
 Heating efficiency: COP 4.32
 Cooling capacity: 3.5kW
 Cooling efficiency: EER 3.8



ASTG14LUC* (Premier Plus)

Heating capacity: 5.4kW
 Heating efficiency: COP 3.67
 Cooling capacity: 4.2kW
 Cooling efficiency: EER 3.36



ASTG18LVC*

Heating capacity: 6.0kW
 Heating efficiency: COP 4.03
 Cooling capacity: 5.0kW
 Cooling efficiency: EER 3.27



ASTG22LVC*

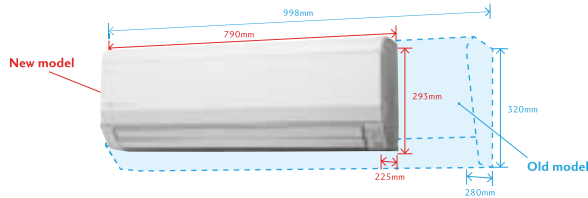
Heating capacity: 7.2kW
 Heating efficiency: COP 3.55
 Cooling capacity: 6.3kW
 Cooling efficiency: EER 3.23



This extremely popular heat pump range is very compact with smart flat panels outside and of advanced engineering inside. Fantastic energy savings are achieved with Fujitsu's improved heat exchange technology and the units also offer near silent operation, healthy fresh air filters and many extra features.

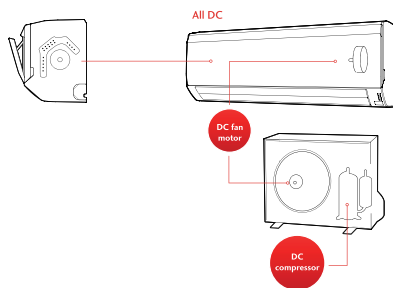
Compact design

New Zealand's most compact 7.0kW Indoor unit



Super efficient

Significantly higher energy efficiency has been achieved with Fujitsu's DC twin rotary compressor, DC Inverter control and DC fan motor technologies.



Healthy air filters

Fujitsu's advanced filter systems contribute to a fresher, cleaner and healthier living environment.



Fujitsu is recommended by Asthma New Zealand

Air cleaning filters

Air cleaning filter uses static electricity to reduce fine particles and dust in the air such as tobacco smoke, plant pollen and allergens that are too small to see.

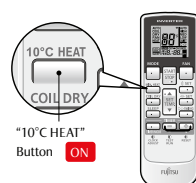
The filter contains catechin, which suppresses the growth of bacteria absorbed to the filter.

Super quiet

ALL Fujitsu wall mounted models are equipped with 4 fan speeds including quiet fan mode, allowing the indoor units to operate as low as 21 decibels. In addition to this, Fujitsu's fan technology means that our models are quiet even when working their hardest to quickly heat or cool a room.

10°C heat operation

This function on the remote control will prevent the room temperature from falling below 10°C, so the room will never be too cold when you are away.



CONTROLLERS

Remote Controller (supplied)



- Four standard timers (On/Off/Program/Sleep timers)
- Easy operation
- Easy to change modes: heating/cooling/dry/auto/fan

Wall controller options

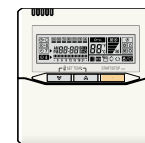
In addition to the standard remote controller (above), there are optional wall controllers available.

The 7-day Programmable Timer



UTY-RVNYN

Universal Wall Controller



UTY-RNNYN

Simple Wall Controller



UTY-RSNNY

See page 5 for detailed features of each controller.

Optional wall controllers require the communication link (UTY-TWBXF).

Compact outside units too

Fujitsu's outside units set the industry standard for compact design, yet still deliver all the power required, with efficient airflow engineering that reduces operation noise. Fujitsu's outside heat exchange units are coated with a blue corrosion resistant material to enhance durability and help extend the performance life of your heat pump.

Model ASTG14LU

This "premier plus" model includes the added energy saving features of Human Sensor and 'set-and-forget' remote control.

Compact Hi-Wall specifications

Model No.	Indoor Unit		ASTG09LVCC	ASTG12LVCC	ASTG14LUCB	ASTG18LVCC	ASTG22LVCC
	Outdoor Unit		AOTG09LVCC	AOTG12LVCC	AOTG14LUCB	AOTG18LVCC	AOTG22LVCC
CAPACITY (RANGE)	HEAT	kW	3.4 (0.50 - 4.0)	4.8 (0.90 - 5.60)	5.4 (0.90 - 6.0)	6.0 (1.05 - 8.10)	7.2 (1.10 - 8.70)
	COOL	kW	2.5 (0.50 - 3.30)	3.5 (0.90 - 4.0)	4.2 (0.90 - 5.0)	5.0 (0.90 - 5.80)	6.3 (0.90 - 7.30)
INPUT POWER	HEAT/COOL	kW	0.73 / 0.58	1.11 / 0.91	1.47 / 1.25	1.49 / 1.53	2.03 / 1.95
COP	HEAT	kW	4.66	4.32	3.67	4.03	3.55
EER	COOL	kW	4.31	3.80	3.36	3.27	3.23
STAR RATING	HEAT		4.5	4.0	2.5	3.5	2.5
	COOL		4.0	3.0	2.0	2.0	2.0
RUN CURRENT	HEAT/COOL	A	3.5 / 2.8	5.0 / 4.2	6.4 / 5.7	6.3 / 6.5	8.5 / 8.2
MOISTURE REMOVAL	L/Hr		1.3	1.8	2.1	2.6	2.7
FAN SPEEDS			4				
NOISE INDOOR Q/L/M/H	HEAT	dB(A)	22/31/37/42	22/31/38/43	27/34/40/45	30/38/42/46	32/38/42/48
NOISE OUTDOOR			47	48	50	46	48
AIR CIRCULATION	INDOOR	l/s	225	239	264	267	267
DIMENSIONS AND WEIGHTS	INDOOR	mm	293 x 790 x 225	293 x 790 x 225	282 x 870 x 185	293 x 790 x 225	293 x 790 x 225
		kg	9.5	9.5	9.5	9.5	10
	OUTDOOR	mm	620 x 790 x 290	620 x 790 x 290	540 x 790 x 290	620 x 790 x 290	620 x 790 x 290
		kg	25	34	34	37	40
OPERATION RANGE	HEAT	degree	-15 to 24				
	COOL		10 to 46				



Hi-Wall Premier – Large capacity LFC series



ASTG24LFC*

Heating capacity: 8.0kW
Heating efficiency: COP 3.54
Cooling capacity: 7.1kW
Cooling efficiency: EER 3.33



ASTG30LFC*

Heating capacity: 9.0kW
Heating efficiency: COP 3.41
Cooling capacity: 8.0kW
Cooling efficiency: EER 3.31



ASTG34LFC*

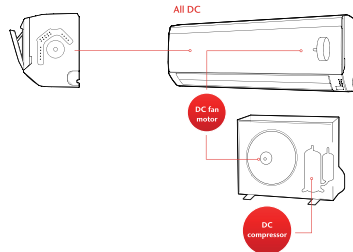
Heating capacity: 10.0kW
Heating efficiency: COP 3.3
Cooling capacity: 9.2kW
Cooling efficiency: EER 3.29



These smart looking models pack a punch with very powerful performance, but are still super energy efficient. In fact, Fujitsu has delivered one of the best power savings of all time. They will heat large areas effortlessly yet give you the quietness, energy savings and the extra features you'd expect from Fujitsu.

Super efficient with all DC engineering

Significantly higher energy efficiency has been achieved with Fujitsu's DC twin rotary compressor, DC Inverter control and DC fan motor technologies. This gives infinite control over motion speeds.



Healthy air filters

Fujitsu's advanced filter systems contribute to a fresher, cleaner and healthier living environment.



Fujitsu is recommended by Asthma New Zealand

Poly Catechin air cleaning filter

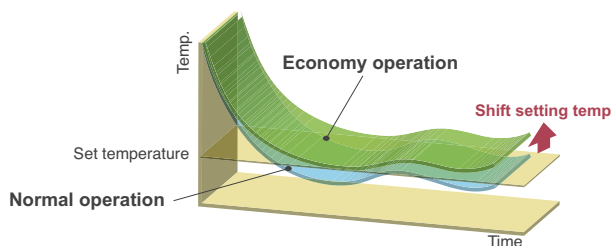
The polyphenol catechin air cleaning filter uses static electricity to clean fine particles and dust in the air such as tobacco smoke, plant pollen and allergens that are too small to see. The filter contains catechin, which suppresses the growth of the bacteria absorbed to the filter.

Negative air ions deodorising filter

This special filter comprises of super micro particles which can produce negative air ions which deodorise and absorb cooking, pet and other smells.

Economy mode

The economy mode will save energy (up to 30% of normal mode). It can be switched on once the indoor unit is operating, can lower the set-temperature a little during heating and raise it a little higher during cooling.



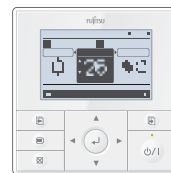
Super quiet

ALL Fujitsu wall mounted models are equipped with 4 fan speeds including quiet fan mode, allowing some of the indoor units to operate as low as 21 decibels. In addition to this, Fujitsu's fan technology means that our models are quieter even when working their hardest to quickly heat or cool a room.

CONTROLLERS

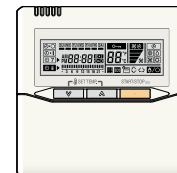
Wall controller options

The 7-day programmable timer



UTY-RVNYN

Universal wall controller



UTY-RNNYN

Simple wall controller



UTY-RSNYN

See page 5 for detailed features of each controller.

10°C heat operation

This function on the remote control will prevent the room temperature from falling below 10°C, so the room will never be too cold when you are away.



Hi-Wall Premier specifications

Model No.	Indoor Unit		ASTG24LFCC	ASTG30LFCC	ASTG34LFCC
	Outdoor Unit		AOTG24LFC	AOTG30LFTC	AOTG34LFTC
CAPACITY (RANGE)	HEAT	kW	8.0 (0.90 - 10.60)	9.0 (2.20 - 11.0)	10.0 (2.70 - 11.20)
	COOL	kW	7.1 (0.90 - 8.30)	8.0 (2.90 - 9.0)	9.2 (2.90 - 10.0)
INPUT POWER	HEAT/COOL	kW	2.26 / 2.04	2.64 / 2.42	3.03 / 2.80
COP	HEAT	kW	3.54	3.41	3.30
EER	COOL	kW	3.27	3.31	3.29
STAR RATING	HEAT		2.5	2.0	2.0
	COOL		2.0	2.0	2.0
RUN CURRENT	HEAT/COOL	A	9.5 / 9.1	11.1 / 10.2	12.8 / 11.8
MOISTURE REMOVAL		L/Hr	2.7	3.2	3.5
FAN SPEEDS			4		
NOISE INDOOR Q/L/M/H	HEAT	dB(A)	32/37/42/48	33/37/42/49	34/37/42/52
NOISE OUTDOOR			55	53	53
AIR CIRCULATION	INDOOR	l/s	311	319	339
DIMENSIONS AND WEIGHTS	INDOOR	mm	320 x 998 x 238		
		kg	14		
	OUTDOOR	mm	620 x 790 x 290	830 x 900 x 330	1,290 x 900 x 330
OPERATION RANGE		kg	41	61	86
	HEAT	degree	-15 to 24		
	COOL		-10 to 46		
			-5 to 46		



Nocria Ceiling Wall



AWTZ14LBC

Heating capacity: 6.0kW
 Heating efficiency: COP 4.44
 Cooling capacity: 4.2kW
 Cooling efficiency: EER 4.12



AWTZ18LBC

Heating capacity: 6.7kW
 Heating efficiency: COP 4.11
 Cooling capacity: 5.2kW
 Cooling efficiency: EER 3.29



AWTZ24LBC

Heating capacity: 8.5kW
 Heating efficiency: COP 3.62
 Cooling capacity: 7.4kW
 Cooling efficiency: EER 3.01



A world exclusive heat pump that is less obtrusive because it sits higher on the wall (just under the ceiling). It has revolutionary features, including vastly improved heating and cooling efficiencies, brilliant filtration systems and automatic filter cleaning - it even cleans itself!

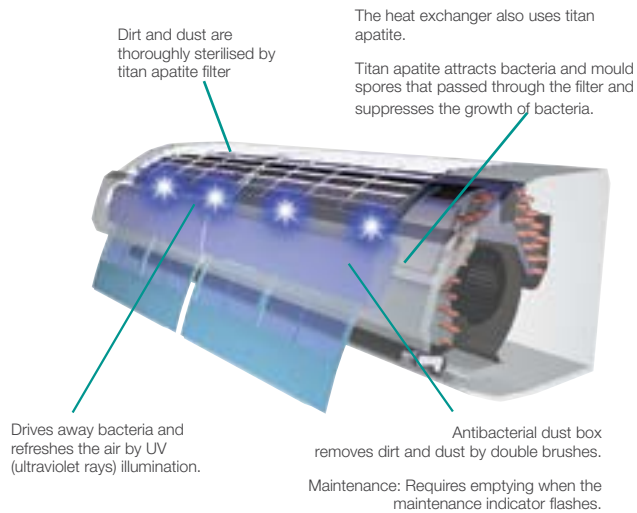
Automatic filter cleaner

WORLD FIRST

The Nocria filter is the world's most advanced. Not only are dust and allergens such as pollen, dust mite carcasses and mould spores collected in the filter, but an ultraviolet illuminator is used to sterilise the bacteria. So your home environment is not only cleaner and fresher, but is much healthier too.

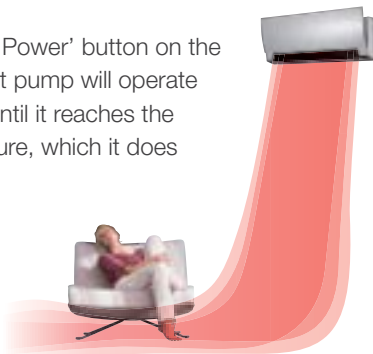
The filter is cleaned automatically – so you don't have to clean it yourself, but most importantly, the heat pump will continue to operate at 100% efficiency because it will not become clogged.

Entire filter is cleaned automatically in approximately 2 minutes.



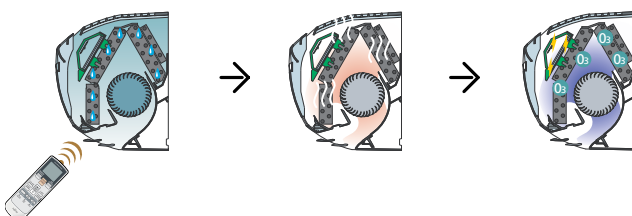
Hi power operation

When you push the 'Hi Power' button on the remote control, the heat pump will operate at maximum capacity until it reaches the desired room temperature, which it does quickly and efficiently.



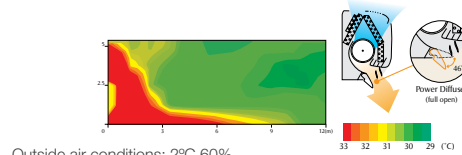
Coil drying operation

By drying the heat exchanger for approximately 18 minutes and then 2 minutes of UV filter cleaning, the Coil drying operation will prevent the growth of mold, fungus and bad odours in the unit.



Air flow performance

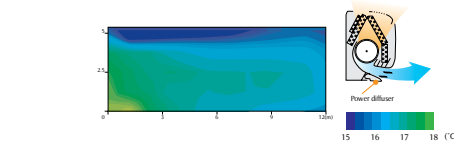
Strong vertical air flow provides powerful floor level heating.



Outside air conditions: 2°C 60%

Operation contents: Heating, Set temperature (Max set temp) 30°C, Air flow Hi, Air direction downward and front

Healthy horizontal air flow does not blow cool air directly at the occupants in the room.

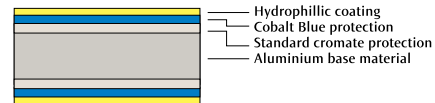


Outside air conditions: 35°C 40%

Operation contents: Cooling, Set temperature (Min set temp) 18°C, Air flow Hi, Air direction downward and front

Cobalt blue heat exchanger

The outdoor units are more compact, and the fins are coated with a blue corrosion resistant material to enhance durability and extend performance life of your heat pump.



Fujitsu is recommended by Asthma New Zealand



Nocria specifications

Model No.	Indoor Unit		AWTZ14LBC	AWTZ18LBC	AWTZ24LBC
	Outdoor Unit		AOTZ14LBL	AOTZ18LBL	AOTZ24LBT
CAPACITY (RANGE)	HEAT	kW	6.0 (0.90 - 9.10)	6.7 (0.90 - 9.70)	8.5 (0.90-11.0)
	COOL	kW	4.2 (0.90 - 5.30)	5.2 (0.90 - 5.90)	7.4 (0.90 - 8.0)
INPUT POWER	HEAT/COOL	kW	1.35 / 1.02	1.63 / 1.58	2.35 / 2.46
COP	HEAT	kW	4.44	4.11	3.62
EER	COOL	kW	4.12	3.29	3.21
STAR RATING	HEAT		4.0	3.0	2.5
	COOL		3.0	1.5	1.0
RUN CURRENT	HEAT/COOL	A	5.7 / 4.3	6.9 / 6.6	9.9 / 10.4
MOISTURE REMOVAL		L/Hr	2.1	2.8	3.0
FAN SPEEDS			5		
NOISE INDOOR Q/L/M/H	HEAT	dB(A)	29/34/39/46	29/34/39/46	36/40/43/47
NOISE OUTDOOR			47	48	54
AIR CIRCULATION	INDOOR	l/s	261	261	272
DIMENSIONS AND WEIGHTS	INDOOR	mm	250 x 899 x 298		
		kg	13.5	13.5	14
	OUTDOOR	mm	578 x 790 x 300	578 x 790 x 300	830 x 900 x 300
		kg	39	39	62
OPERATION RANGE	HEAT	degree	-15 to 24		
	COOL		-10 to 43		