



WAIMAKARIRI
DISTRICT COUNCIL

Consent Issued BC141564

BC No: BC141564

SITE DETAILS:

41 Koura Drive, Rangiora

LEGAL:

Lot 146 DP 476266

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 8240

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

Statutory Forms

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

PLEASE NOTE

- Although your Consent documentation states 48 hours notice is required, it is not always possible to carry out an inspection within this period.
- If an inspection of the building works is not carried out in accordance with the Inspection Schedule it could affect the issue of the Code Compliance Certificate.

To book inspections ring WDC on
03 311 8240

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
Consent Issued BC 141564

Site Inspection Sheet

Application

Horncastle Homes Ltd, Horncastle Homes Ltd PO Box 8255 Riccarton Christchurch 8440	No.	BC141564
	Issue date	18 September 2014
	Overseer	Dawn Rosie

Project

Description	1100 New (& prebuilt) House, Unit, Bach, Crib, Town Hou New or Relocated Dwelling
Intended Life	
Intended Use	Housing - Detached dwellings
Estimated Value	\$235308.00
Location	132 Northbrook Road RANGIORA
Legal Description	Lot 146 DP 476266
Valuation No.	2165902300

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.

Site Inspection Sheet Consent Issued BC 141564
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Compacted Hardfill Pre-DPM (CH)
Foundation & Floor Slab (Pre-Pour Single Pour) (FSL)
Structure Pre-Roof Pre-Wrap (SPBW)
Building Wrap & Sill Tape (BWF)
Cavity Battens & Flashings (CB)
Mid-Height Veneer
Drains (D)
Preline & Plumbing (PRP)
Pre-Stopping (PS)
FINAL (FIN)

Form 5

Building consent BC141564

Section 51, Building Act 2004

The building

Street address of building: 132 Northbrook Road RANGIORA

Legal description of land where building is located: Lot 146 DP 476266

Valuation number: 2165902300

Building name:

Location of building within site/block number:

Level/unit number:

The owner

Name of owner: Horncastle Homes Ltd

Contact person: Anna Cammock

Mailing address: PO Box 8255, Riccarton, Christchurch 8440

Street address/registered office:

Phone number: Landline: 033664747

Mobile:

Daytime: 033664747

After hours: 033664747

Facsimile number:

Email address: anna@horncastle.co.nz

Website:

First point of contact for communications with the council/building consent authority:
Horncastle Homes Ltd

Building work

The following building work is authorised by this building consent:

Dwelling With Attached Garage

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

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 Code Compliance Certificate

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

All inspections listed must be requested. It is advisable to give at least 48 Hours Notice. Please note that the consent fees allow for a single inspection of construction stages of the project as specified in the inspection schedule. Any extra inspections required will be invoiced and must be paid for before a code compliance certificate is issued. Inspections shall be carried out in accordance with the attached schedule of inspection types. It is the owner's responsibility to ensure all necessary inspections are carried out as required. Please contact the building consent authority if you are unsure what requires inspection - do not cover or enclose any building work without inspection.

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 & blocklaying 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.

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.

The owner/applicant/agent will need to supply a Building Location Certificate for this Lot prior to the first inspection being booked. The certificate shall confirm that the building is wholly contained within the Lot to which it relates and meets the District Plan requirements for site coverage, setbacks and recession planes.

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

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

Schedule of Specified Systems is not required

Compliance schedule

Attachments

Copies of the following documents are attached to this building consent:

Consented Plans

Consented Specifications

Inspection List

Form 6 Application for Code Compliance



Signature

Libica Hurley

Building Unit Administrator

On behalf of: Waimakariri District Council

Date: 18 September 2014

Form 6

Application for code compliance certificate

Section 92, Building Act 2004

The building consent

Building consent number: BC141564

Issued by: Waimakariri District Council

Valuation number: 2165902300

*The owner

Name of owner: Horncastle Homes Ltd

†Contact person: Anna Cammock

Mailing address: PO Box 8255, Riccarton, Chch 8440

Street address/registered office:

Phone number: Landline: 033664747

Mobile:

Daytime: 033664747

After hours: 033664747

Facsimile number:

Email address: anna@horncastle.co.nz

Website:

The following evidence of ownership is attached to this application: [copy of certificate of title, lease, agreement for sale and purchase, or other document showing full name of legal owner(s) of the building]

Application

All building work to be carried out under the above building consent was completed on «IssueDate»

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 8255

Riccarton

Christchurch 8440

Signature of the owner

Name of person signing

Date: 18 September 2014

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.

‡Delete this section if the application is not being made on behalf of the owner.

§Delete if the agent 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:



WAIMAKARIRI
DISTRICT COUNCIL

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

Consent Issued BC141564

BC141564

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

NOT FOR COMMERCIAL PROJECTS.

Under The Building Act 2004, Sections 33 & 45

BC No.

THE BUILDING

Note: Only complete items here that are applicable to your project.

1. Site address (street/road/township):

3. Building Name: (eg: where buildings have Official Names)

2. Legal Description of the land where the building is located:

4. Location of Building within Site:

(only applicable to multi-development sites)

5. Number of Levels:

6. Level/Unit No:

7. Floor Area - Existing:

New:

Total:

8. Current Lawfully Established Use

(eg: 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 or 1960-1970)

Lot:

DP:

Valuation Number:

OWNER

10. Owner's Name: (Company or Organisation name)

11. Contact Person: (If Owner is not an Individual)

12. Mailing Address:

Postcode:

13. Street Address / Registered Office:

14. Mobile:

Landline:

15. Email:

16. The following evidence of ownership is attached to this application:

Copy of Certificate of Title (current within 1 month)

If Certificate of Title is not issued:

Signed copy of Sale and Purchase Agreement

AGENT

Only required if the application is being made on behalf of the owner. Agent must be authorised by the owner to make this application.

17. Name of Agent:

18. Contact Person:

19. Mailing / Billing Address:

20. Street Address / Registered Office:

21. Mobile:

Landline:

22. Email:

23. Authorisation from owner, see page 11

(required when application not signed by owner)

24. *Note: The Agent will be the first point of contact for communications with the Council / Building Consent Authority regarding this Application / Building Work and will receive all correspondence including all invoices.*

APPLICATION

25. I request that the following (please select one) be issued for the Building Work described in this Application:

Project Information Memorandum Only: (PIM)

Building Consent for PIM No:

Building Consent: (including 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

OFFICE USE ONLY - Fee Paid on Application

\$

Date:

Receipt:

Officer:

THE PROJECT

26. Type of Building Work (*ie: dwelling, alteration/addition...*)
27. Specify the intended use of the building (*ie: residential...*)
28. Will the building work result in a change of use of this building?
 Yes No
 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. List Building Consents previously issued for this building (if any) (*ie: is this project being constructed in stages? Is this consent for a relocated or transportable building?*):
31. Estimated Value (incl GST) \$
(ie the estimated aggregate of the values of all goods and services to be supplied for the building work and includes GST).

PROJECT INFORMATION MEMORANDUM

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, and/or Sales and Purchase Agreement.
 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)

32. The following documents are attached to this application:

- 1 copy -building plans (site plans, floor plans, elevation plans) **Plans preferred size A3.**
- 1 copy of each - specifications, producer statements, truss details (*refer below*)
- 1 copy -Certificate of Title and/or Sale and Purchase Agreement. Current C/T required (issued within one month of application) All plans to be dimensioned, scaled and accurate
- Project Information Memorandum
- Development Contribution Notice (if applicable)
- Certificate attached to Project Information Memorandum (Resource Management Act)
- Certificate of design work from Licenced Building Practitioner
- Restricted Building Work - see page 8
- Key personnel - see page 9

33. See page 10 for a Schedule confirming the Building Work will comply with the Building Code.

NB: Where a buildable truss design certificate is used for the granting of a Building Consent, **an 'as built' truss design must be provided to us for assessment ten days prior to the structure and pre-roof inspection.** A set fee will be charged at the time of granting of the consent to cover the assessment of the as built truss design information.

Where a Building Consent has been granted using an 'as built' truss design certificate, no further information will be required unless the design/layout of the roof has changed from consented design and layout.

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 it's unique report reference number below.

Report number

NOTES

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

(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 processed, 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.

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.

INSPECTIONS

During the process of construction, inspections will be necessary to confirm all work complies with your approved Building Consent documentation. Please ring the Council on 03 311 8240 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 contact the Planning Unit to determine the process from there. Ring 03 311 8900.

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*

DOCUMENTATION CHECKLIST

FOR OFFICE
USE ONLY:
*these have been
provided*

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

APPLICATION FORM (one copy required)

- 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
- Earthquake Zone
- Snow Zone/Altitude
- Corrosion Zone (if applicable)
- Building is specifically Engineer-designed
- Complies with NZS 3604: 2011
- Both Specific Design and NZS 3604

DESIGN DOCUMENTS (one copy required)

- 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

**FOR OFFICE
USE ONLY:**
*these have been
provided*

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

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 and materials
Upper level decks or balconies over lower level room must be fully detailed including the storm water 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 and building papers
Insulation systems and materials
Flashing details and documents
Roof penetrations
Shower floor details and wall to shower base junction detail
Sealing to wet area fixtures
Water splash prevention
All other building components that are not otherwise detailed or are unusual in any way

SPECIFICATION - One copy

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

Provide a written specification to cover all of the trades involved in the project. All materials used in the project are fully specified including fixings of all materials and components.

The specification can be written on the drawings as long as all materials are fully covered.

FOR OFFICE
USE ONLY:
*these have been
provided*

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

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 secondhand, engineer's certification required.

Current Potable Water Test

Effluent Disposal Design & ECan's copy of the submitted application form or approval

Wastewater system designs when required to be done by a Chartered Professional Engineer such as in a hazard zone

GEOTECHNICAL REPORT

Unique report reference number provided, if applicable.

RESTRICTED BUILDING WORK

Will the building include any restricted building work? Yes No

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

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

KEY PERSONNEL**BUILDER**

Name:

Reg. No:

Address:

Phone No:

Fax No:

Email:

DESIGNER(S)

Name:

Reg. No:

Address:

Phone No:

Fax No:

Email:

CERTIFYING DRAINLAYER

Name:

Reg. No:

Address:

Phone No:

Fax No:

Email:

CERTIFYING PLUMBER

Name:

Type:

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:

BUILDING CODE COMPLIANCE

The building work will comply with the building code as follows:

[if you are not sure which 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		
B2 Durability		
C1 Objectives of clauses C2-C6		
C2 Prevention of fire occurring		
C3 Fire affecting areas beyond the fire source		
C4 Movement to place of safety		
C5 Access and safety for firefighting operations		
C6 Structural stability		
D1 Access routes		
D2 Mechanical installations for access		
E1 Surface water		
E2 External moisture		
E3 Internal moisture		
F1 Hazardous agents on site		
F2 Hazardous building materials		
F3 Hazardous substances and processes		
F4 Safety from falling		
F5 Construction and demolition hazards		
F6 Lighting for emergency		
F7 Warning systems		
F8 Signs		
G1 Personal hygiene		
G2 Laundering		
G3 Food preparation and prevention of contamination		
G4 Ventilation		
G5 Interior environment		
G6 Airborne and impact sound		
G7 Natural light		
G8 Artificial light		
G9 Electricity		
G10 Piped services		
G11 Gas as an energy source		
G12 Water supplies		
G13 Foul water		
G14 Industrial liquid waste		
G15 Solid waste		
H1 Energy efficiency		

OFFICE USE ONLY

Further information required? Yes No

Application accepted? Yes No Date of acceptance:

Further information provided? Yes No Officer:

OWNER / AGENT SIGNATURE - Hard Copy

Signed by or on behalf of the Owner:

I am the:

Owner

Agent

Name:

Date:

Note: if acting on behalf, please read the following declaration before signing - "I hereby declare that I am authorised to act as Agent of the Owner".

NB: Ensure agent authorisation section is completed - see below.

OWNER / AGENT SIGNATURE - Electronic

By typing your name in the box below you are giving your authority for the application to proceed and accept the associated charges.

Signed by (please type your name):

I am the:

Owner

Agent

Date:

Note: If acting on behalf, please read the following declaration before signing - "I hereby declare that I am authorised to act as Agent of the Owner".

NB: Ensure agent authorisation section is completed - see below.

AGENT AUTHORISATION

I authorise

to act as agent on my behalf for the Building Consent process.

Name:

Date:

Signed:
(by owner)**FOR ELECTRONIC – Please type name.**

By typing your name in the box you are giving your authority for the application to proceed and accept the associated charges.

I wish to receive my Building Consent in the following format:

Electronically via File Transfer Portal⁽¹⁾

On CD

Hard Copy

Please provide an 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.*

(3) *The CD or hard copy documents as well as the weather tight storage box are to be collected from the Rangiora Service Centre unless arrangements have been made to have these delivered to you.*

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

PLEASE NOTE - One set of "On-site" hard copy consented documents must be available at all times for inspections. If there are no consented documents on-site this will result in a failed inspection.

All the relevant information on this form is required to be provided under the Building Act and/or Resource Management Act for the Waimakariri District Council to assess your application. Under these Acts this information has to be made available to members of the public. 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.

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:

Suburb:

Town/City:

Postcode:

THE OWNER(S)

Name(s):

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

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

I _____ ~~carried out~~ / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
All RBW design work relating to B1 <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Foundations and subfloor framing <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
Walls <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Roof <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Columns and beams <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Bracing <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Other <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Damp proofing <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Roof cladding or roof cladding system <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Ventilation system (for example, subfloor or cavity) <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Wall cladding or wall cladding system <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Waterproofing <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	
Other <input type="radio"/>		<input type="radio"/> Carried out <input type="radio"/> Supervised	

Design work that is RBW	Description of RBW	Carried out or supervised	Reference to plans and specifications
Tick <input checked="" type="checkbox"/> if included. Cross <input checked="" type="checkbox"/> if excluded	If appropriate, provide details of the RBW	Tick <input checked="" type="checkbox"/> whether you carried out this design work or supervised someone else carrying out this design work	If appropriate, specify references
FIRE SAFETY SYSTEMS: C1 - C6			
Emergency warning systems Evacuation and fire service operation systems <input type="radio"/> Suppression or control systems Other		<input type="radio"/> Carried out <input type="radio"/> 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.			

WAIVERS AND MODIFICATIONS

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

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

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

ISSUED BY

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

Name:

LBP or Registration number:

The practitioner is a: ☐ Design LBP ☐ Registered architect ☐ Chartered professional engineer

Design Entity or Company (optional):

Mailing address (if different from below):

Street address/Registered office:

Suburb:

Town/City:

PO Box/Private Bag:

Postcode:

Phone number:

Mobile:

After hours:

Fax:

Email address:

Website:

DECLARATION

I _____ 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:

*Adams.***SIGN HERE**

Date:

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

THE BUILDING

Street address: Lot 146 Stage 5

Suburb: Kippenberger Subdivision

Town/City: Christchurch

Postcode:

THE OWNER

Name(s): Horncastle Homes Ltd

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, Matthew Cusiel 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			
Foundations and subfloor framing (✓)	<i>Design of Ribraft floor slab</i>	() Carried out (✓) Supervised	
Other (✕)		() Carried out () Supervised	

ISSUED BY

Name: Matthew Cusiel, CPEng	LBP or Registration number: 161509
The practitioner is a: () Design LBP () Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): The Engineering Company Ltd	
Mailing address (if different from below):	
Street address / Registered office: 2/596 Ferry Rd	
Suburb: Woolston	Town/City: Christchurch
PO Box/Private Bag:	Postcode: 8023
Phone number: 03 366 7955	Mobile:
After Hours:	Fax:
Email address: matt.cusiel@engco.co.nz	Website:

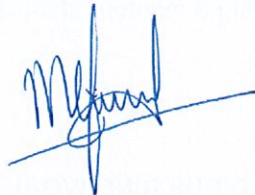
DECLARATION

I Matthew Cusiel *[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: 25 March 2014

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

R. W. Muir
Registrar-General
of Land

Search Copy

Identifier **601937**
Land Registration District **Canterbury**
Date Issued 08 April 2013

Prior References

591071

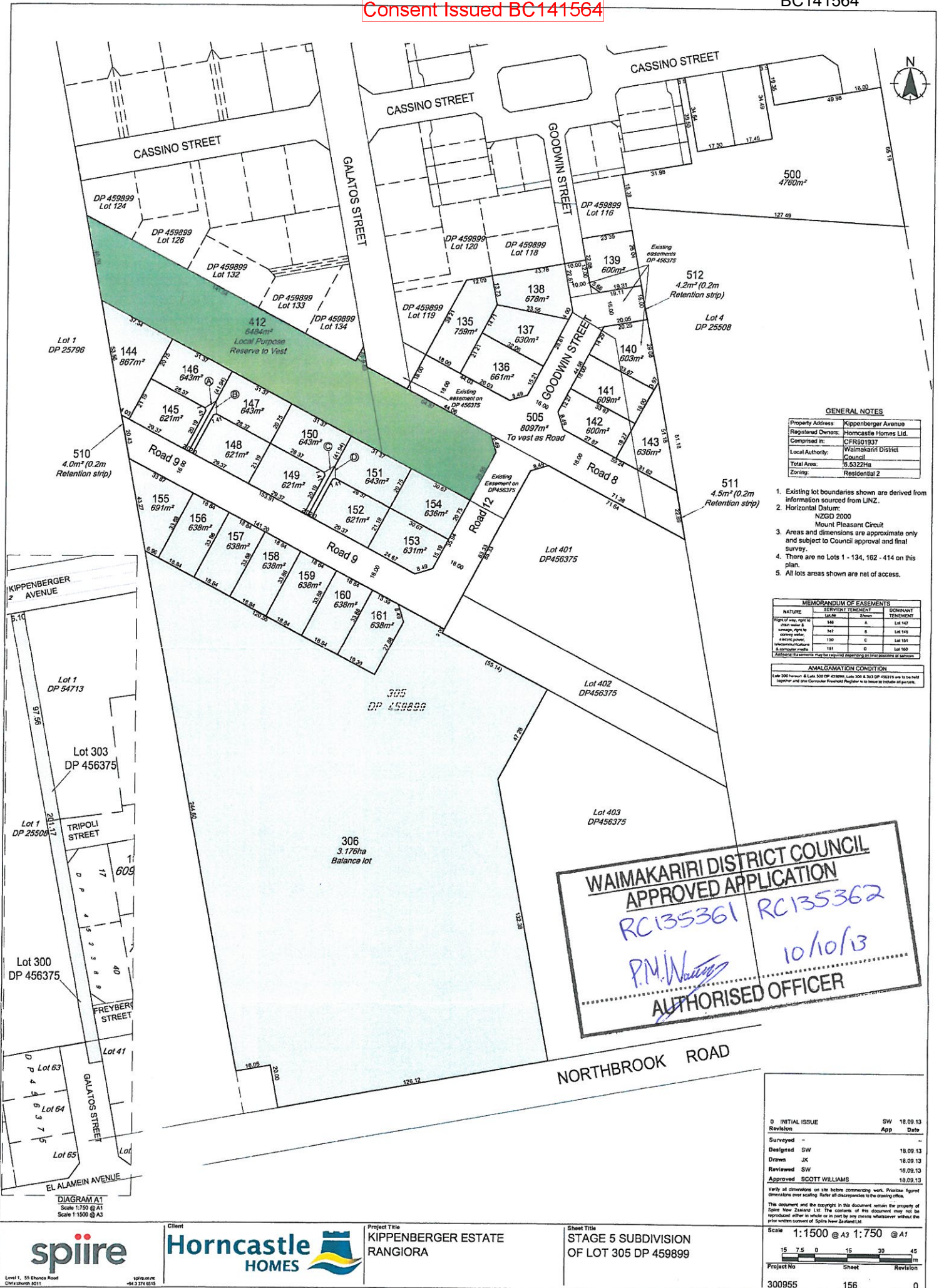
Estate	Fee Simple
Area	7.0521 hectares more or less
Legal Description	Lot 305, 500 Deposited Plan 459899 and Lot 300, 303 Deposited Plan 456375

Proprietors

Horncastle Homes Limited

Interests

Subject to a right of way over part Lot 300 DP 456375 marked O and part Lot 303 DP 456375 marked P, both on DP 456375 specified in Easement Certificate 731407 - 23.2.1968 at 2:25 pm
6431668.3 Mortgage to Bank of New Zealand - 24.5.2005 at 9:00 am (affects Lot 500 DP 459899 and Lots 300 and 303 DP 456375)
8945449.3 Mortgage to Bank of New Zealand - 16.12.2011 at 5:03 pm (affects Lot 305 DP 459899)
Subject to a right of way (in gross) over part Lot 300 DP 456375 marked O on DP 456375 in favour of the Waimakariri District Council created by Easement Instrument 9093473.4 - 11.6.2012 at 5:53 pm
Subject to Section 241(2) and Sections 242(1) and (2) Resource Management Act 1991(affects DP 459899)



GENERAL NOTES

Property Address:	Kippenger Avenue
Registered Owners:	Horncastle Homes Ltd.
Comptrol:	CFR001937
Local Authority:	Waimakariri District Council
Total Area:	5.5322Ha
Zoning:	Residential Z

- Existing lot boundaries shown are derived from information sourced from LINZ.
- Horizontal Datum: NZGD 2000
- Mount Pleasant Circuit
- Areas and dimensions are approximate only and subject to Council approval and final survey.
- There are no Lots 1 - 134, 162 - 414 on this plan.
- All lots areas shown are net of access.

MEMORANDUM OF EASEMENTS			
NATURE	SERVIENT TENEMENT	SHOWN	DOMINANT TENEMENT
Right of way, right to drain water & sewerage, right to carry overhead power lines, right to use for drainage purposes & other purposes	146	A	Lot 147
	147	B	Lot 146
	150	C	Lot 151
	151	D	Lot 150

AMALGAMATION CONDITION	
Lots 300 to 305 & Lots 306 to 311 DP 459899, Lots 300 & 303 DP 456375 are to be held together and are to remain in the same ownership.	

WAIMAKARIRI DISTRICT COUNCIL
APPROVED APPLICATION
RC135361 RC135362

PM. N. Williams

10/10/13
AUTHORIZED OFFICER

0 INITIAL ISSUE	SW	18.09.13
Revision	App	Date
Surveyed	-	-
Designed	SW	18.09.13
Drawn	JK	18.09.13
Reviewed	SW	18.09.13
Approved	SCOTT WILLIAMS	18.09.13

Verify all dimensions on site before commencing work. Prioritize figured dimensions over scaling. Refer all measurements to the drawing office.

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Scale 1:1500 @ A3 1:750 @ A1

15	7.5	0	15	30	45
Project No	Sheet	Revision			

300955 156 0

spiire

Horncastle
HOMES

Project Title
KIPPENBERGER ESTATE
RANGIORA

Sheet Title
STAGE 5 SUBDIVISION
OF LOT 305 DP 459899

Client

Scale

Project No

Sheet

Revision

300955

156

0



215 High Street
Private Bag 1005
RANGIORA 7440
New Zealand

Phone: (03) 311 8900
or: (03) 327 6834
Fax: (03) 313 4432
www.waimakariri.govt.nz

11 September 2014

Our Reference: PM141564P

Horncastle Homes Ltd, Horncastle Homes Ltd
PO Box 8255
Riccarton
Christchurch 8440

Dear Sir/Madam

PROJECT INFORMATION MEMORANDUM

Please find enclosed your Project Information Memorandum in respect of the proposed work at 132 Northbrook Road 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:

Occupation of Dwellings

No residential dwelling shall be occupied, in whole or in part, on Lots 135 -166 inclusive prior to the issue of the 224(c) Conditions Certificate for the subdivision, RC135361.

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 attached ECAN liquefaction study map, and the following will apply.

The shading on the enclosed ECAN liquefaction study 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.

Damaging liquefaction unlikely

Before consent to develop or build can be granted by Council, shallow subsurface investigations must be carried out by a soils technician or other suitably trained and supervised person under the guidance of a CPEng qualified engineer.

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

As Built Service Plans

As no 224c application has yet been submitted for Stage 5 of this subdivision; we have no information available in regards to Service As Built plans. It is the applicant's responsibility to locate all service laterals prior to commencing any building work.

Offence to sell

As from 30/11/04 it is an offence under the Building Act 2004 Section 364 for a residential property developer to transfer a household unit without a code compliance certificate.

This transfer includes either the sale of the unit or allowing a purchaser to have possession of

the unit. A residential property developer means a person, who in trade, does any of the following things in relation to a household unit for the purpose of selling the household unit: builds the household; or, arranges for the household unit to be built; or, acquires the household unit from a person who built it or arranged for it to be built. The residential property developer and purchaser can agree, using Form 1 of the Building (Forms) Regulations 2004 (<<http://www.building.govt.nz/uploads/2004385.pdf>>) that Section 364 does not apply

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



Gillian Beilby
PIMs Officer



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by the World Health Organisation Collaborating Centre on Community Safety.

Project Information Memorandum

Sections 31-38, Building Act 2004

Application

Horncastle Homes Ltd	No.	PM141564P
PO Box 8255	Issue date	11 September 2014
Riccarton		
Christchurch 8440	Received date	21 August 2014
	Responsible Officer	Gillian Beilby

Project

Description	New or Relocated Dwelling
	Dwelling With Attached Garage
Intended Life	Indefinite, but not less than 50 years
Intended Use	Dwelling
Estimated Value	\$235308.00
Location	132 Northbrook Road RANGIORA
Legal Description	NO legal fields are recorded on this land parcel
Valuation No.	2165902300

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.



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by the World Health Organisation Collaborating Centre on Community Safety.

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

Snow Zone 4

Earthquake Zone 2

This building project is located approximately 19.5m above mean sea level.

The AMSL is given for snow loading only and not to be used as datum for minimum floor levels or other design purposes.

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:

Installing a Woodburner /solid Fuel Burner, or other forms of heating in your home.

The applicant is advised to check with Environment Canterbury (Canterbury Regional Council) as to what type of fire if any may be installed into your proposed dwelling, this is determined by the Clean Air Zones. Tel: 0800324636

This property is within the clean air zone one.

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 attached ECAN liquefaction study map, and the following will apply.

The shading on the enclosed ECAN liquefaction study 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.

Damaging liquefaction unlikely

Before consent to develop or build can be granted by Council, shallow subsurface investigations must be carried out by a soils technician or other suitably trained and supervised person under the guidance of a CPEng qualified engineer.

Note: A shallow soil Investigation has been carried out on this site by **Lewis & Barow** and supplied with the application – This will be reviewed as part of the building consent process.

Attachments:

Ecan Liquefaction hazard map

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



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Comments:

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

- a) 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.
- b) 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.
- c) 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 & 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

No as built plans available to date.

DETAILS OF AUTHORISATIONS THAT HAVE BEEN GRANTED

Resource Consent

Comments:

Resource Consent 135361 – Stage 5 of the subdivision. – No 224c issued to date.

Attachments:

A copy of the 223c is attached for your reference.



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by the World Health Organisation Collaborating Centre on Community Safety.

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

Occupation of dwellings

Environment Canterbury (Canterbury Regional Council) – liquefaction hazard

As built plans

Offence to sell

Comments:

Occupation of Dwellings

No residential dwelling shall be occupied, in whole or in part, on Lots 135 -166 inclusive prior to the issue of the 224(c) Conditions Certificate for the subdivision, RC135361.

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 attached ECAN liquefaction study map, and the following will apply.

The shading on the enclosed ECAN liquefaction study 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.

Damaging liquefaction unlikely

Before consent to develop or build can be granted by Council, shallow subsurface investigations must be carried out by a soils technician or other suitably trained and supervised person under the guidance of a CPEng qualified engineer.

A shallow soil investigation has been carried out on this site by Lewis & Barow and supplied with the application – This will be reviewed as part of the building consent process.

As Built Service Plans

As no 224c application has yet been submitted for Stage 5 of this subdivision, we have no information available in regards to the service as built. It is the applicants responsibility to locate all service laterals prior to commencing any building work.

Offence to Sell

As from 30/11/04 it is an offence under the Building Act 2004 Section 364 for a residential property developer to transfer a household unit without a code compliance certificate. This transfer includes either the sale of the unit or allowing a purchaser to have possession of the unit. A residential property developer means a person, who in trade, does any of the following things in relation to a household unit for the purpose of selling the household unit: builds the household; or, arranges for the household unit to be built; or, acquires the household unit from a person who built it or arranged for it to be built. The residential property developer and purchaser can agree, using Form 1 of the Building (Forms) Regulations 2004 (<<http://www.building.govt.nz/uploads/2004385.pdf>>) that Section 364 does not apply

Attachments:

Nil

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? No
Type of access required Vehicle crossing done at the time of subdivision.



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Advice Notes

None applicable to this project

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: Gillian Beilby

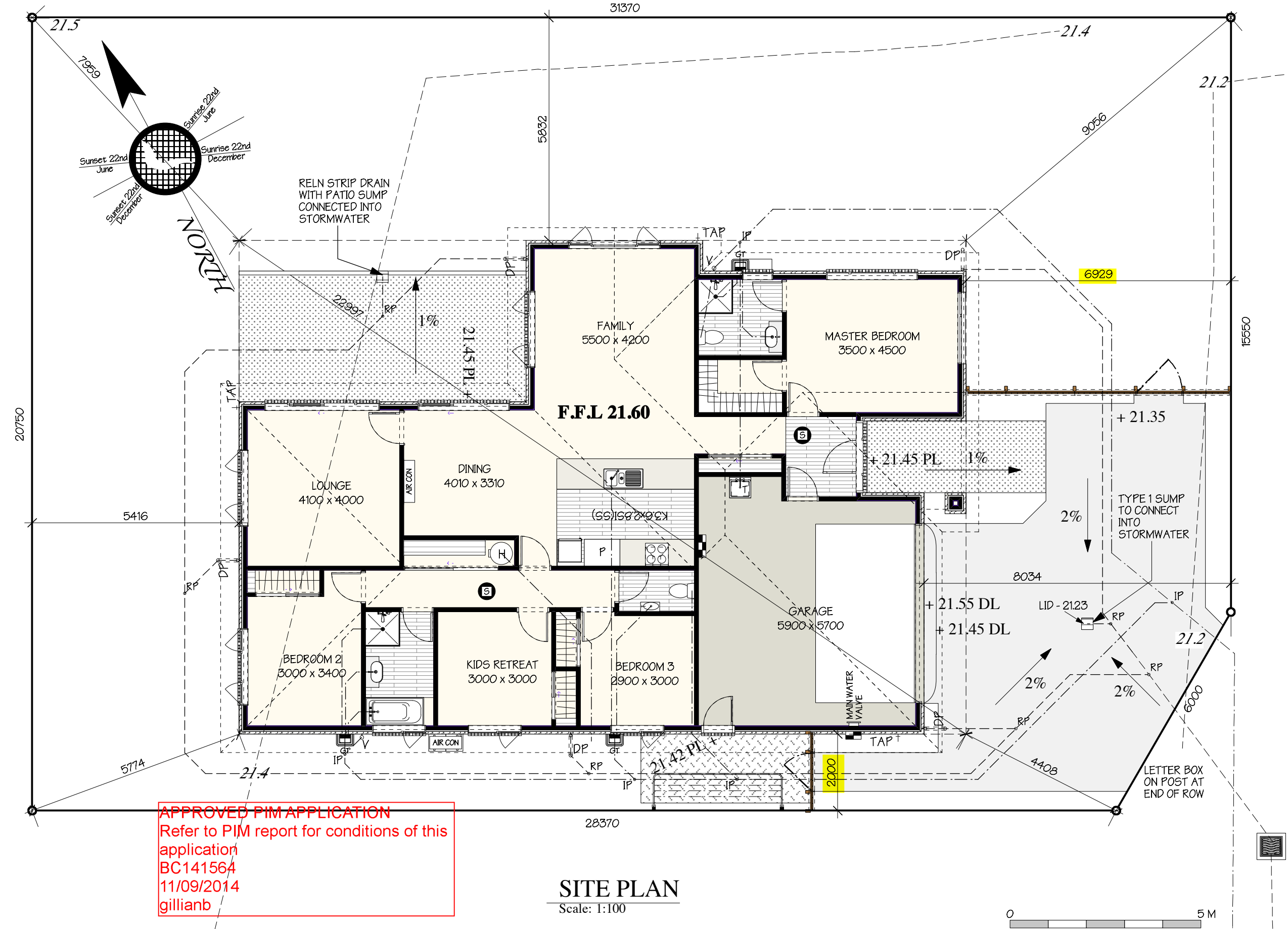
Date: 11/09/2014

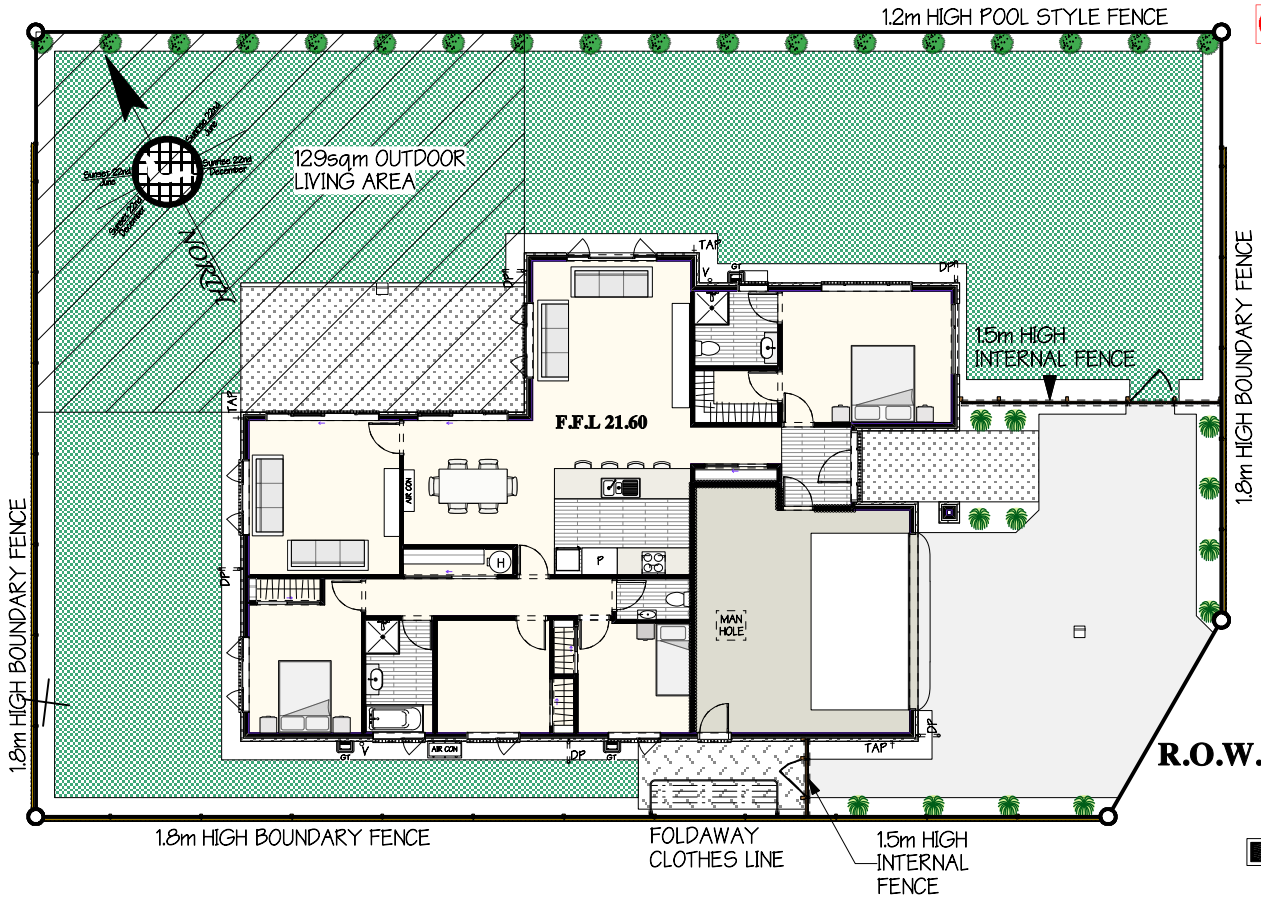


Accredited as an International 'Safe Community'
by the World Health Organisation Collaborating Centre on Community Safety.

Consent Issued BC141564

BC141654 DRAWING LIST		
Page Number	Page revision date	Drawing Title
SITE		
A1.0		SITE PLAN
A1.1		LANDSCAPE & SITE DETAILS
PLANS		
A2.0		SET OUT PLAN
A2.1		FOUNDATION PLAN
A2.2		SLAB PLAN
A2.3		BRACING PLAN
A2.4		INSULATION & ELECTRICAL PLAN
A2.5		FLOOR PLAN
ELEVATIONS		
A3.0		ELEVATIONS
SECTIONS		
A4.0		SECTIONS B
A4.1		SECTIONS A & C
DETAILS		
A5.0		FOUNDATION DETAILS
A5.1		FRAMING DETAILS
A5.2		ROOFING DETAILS
A5.3		PLUMBING DETAILS
A5.4		CLADDING DETAILS
A5.5		CLADDING DETAILS
SCHEDULES		

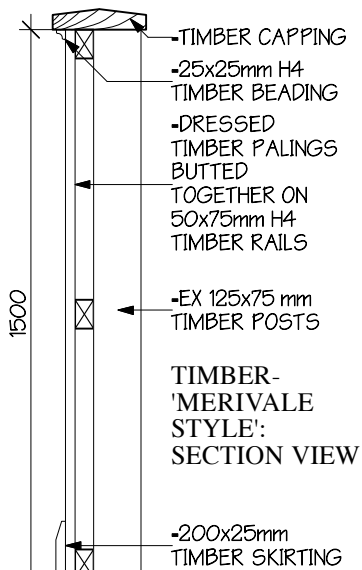




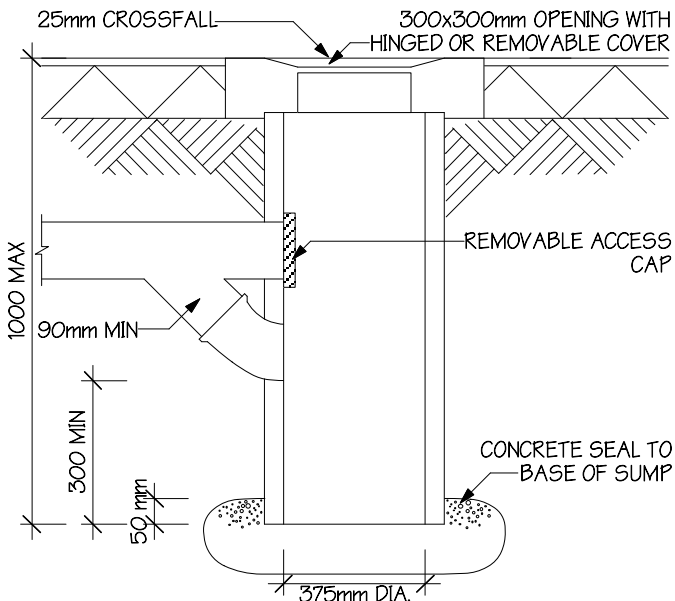
LANDSCAPE PLAN
Scale: 1:200

LANDSCAPING NOTES:
-READYLAWN LAYOUT IS
INDICATIVE ONLY (TO BE
CONFIRMED BY OWNER ON SITE)
-BASIC SHRUB LAYOUT TO BE
CONFIRMED BY OWNER ON SITE

SURFACE FINISHES & AREAS		
DRIVEWAY	ASPHALT	64.50 sqm
SERVICE COURT	PLAIN CONCRETE	8.06 sqm
ENTRY PATH	EXPOSED AGGREGATE	8.79 sqm
PATIOS	EXPOSED AGGREGATE	25.68 sqm
1.8m STD. FENCE		58.71 m
1.2m POOL STYLE		37.38 m
1.5m MERV. FENCE		8.90 m
LAWN		265.04 sqm

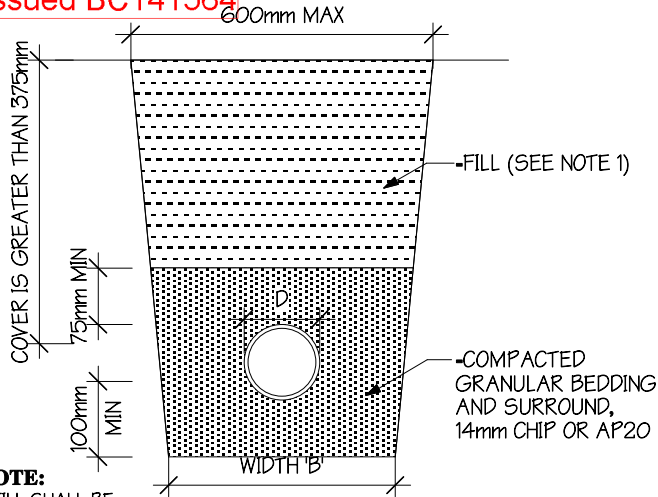


FENCE DETAIL
Scale: 1:20



TYPE 1 WATER SUMP
Scale: 1:20

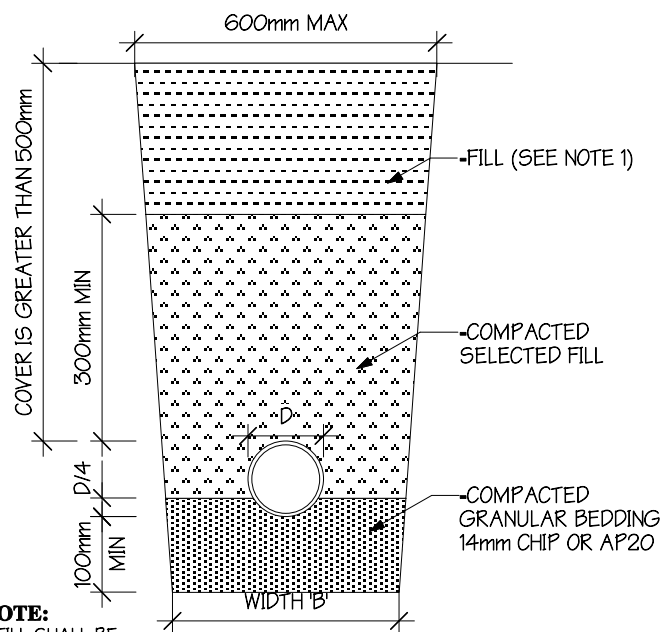
Consent Issued BC141564



NOTE:
1. FILL SHALL BE:
-ORDINARY WHERE DRAINS ARE LOCATED BELOW GARDENS AND OPEN COUNTRY
-COMPACTED SELECTED FILL WHERE THE DRAINS ARE LOCATED BELOW RESIDENTIAL DRIVEWAYS AND SIMILAR AREAS SUBJECT TO LIGHT TRAFFIC
2. WIDTH 'B' SHALL BE THE PIPE DIAMETER + 200mm

BEDDING & BACKFILLING

BEDDING TYPE 'D' OF NZS 7643
COVER GREATER THAN 375mm

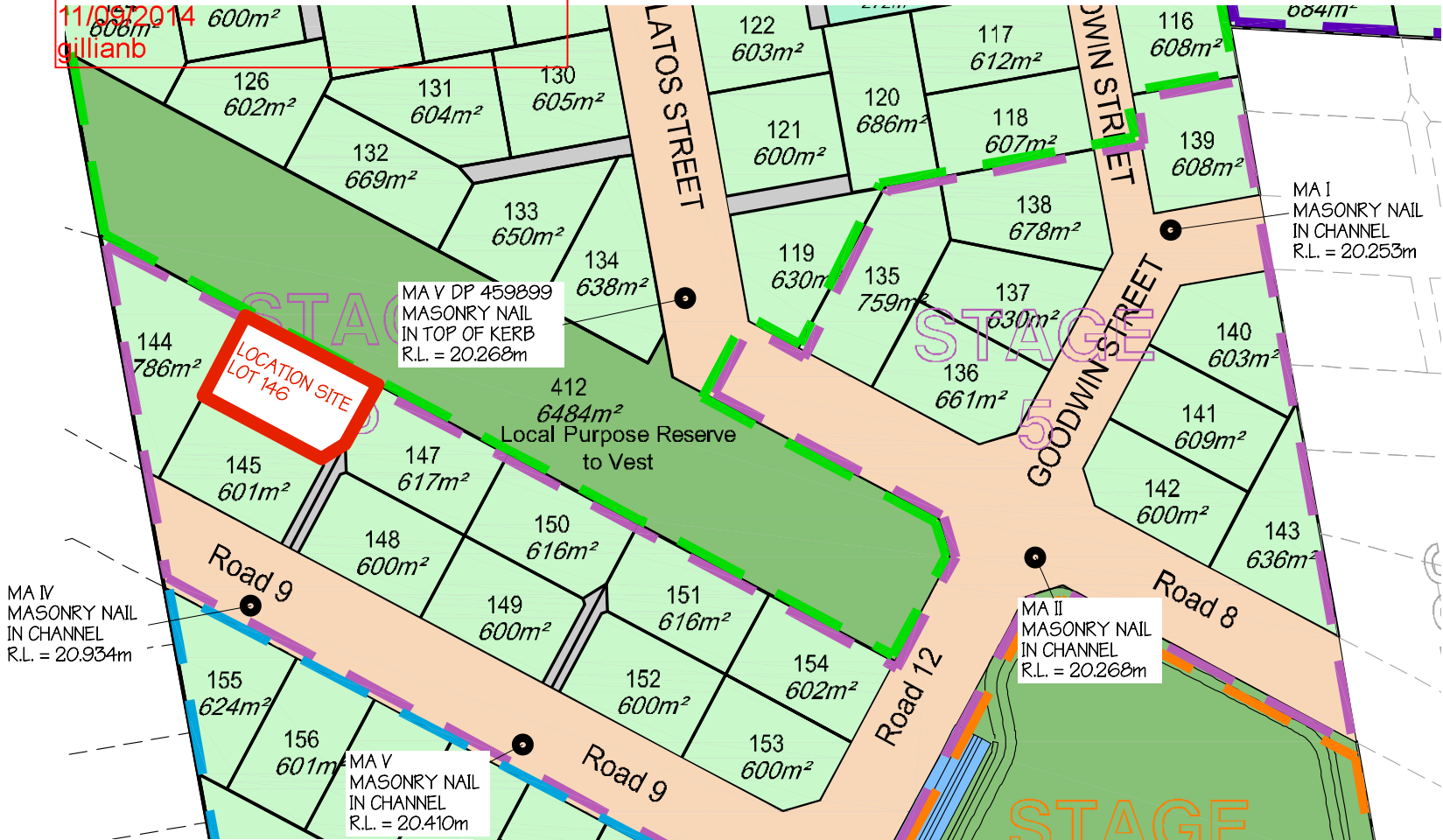


NOTE:
1. FILL SHALL BE:
-ORDINARY WHERE DRAINS ARE LOCATED BELOW GARDENS AND OPEN COUNTRY
-COMPACTED SELECTED FILL WHERE THE DRAINS ARE LOCATED BELOW RESIDENTIAL DRIVEWAYS AND SIMILAR AREAS SUBJECT TO LIGHT TRAFFIC
2. WIDTH 'B' SHALL BE THE PIPE DIAMETER + 200mm

BEDDING & BACKFILLING

BEDDING TYPE 'B' OF NZS 7643
COVER GREATER THAN 500mm

APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
BC141564
11/09/2014
gillianb



LOCATION PLAN NTS

NOTE:
-GRADE 'A' SAFETY GLAZING IN ALL BATHROOMS WHERE GLAZING IS UNDER OR WITHIN 2m OF FLOOR LEVEL. (NZS:4223)
 = SAFETY GLAZING.
-ALL DOORS AND ALL WINDOWS OVER 600mm TO BE FITTED WITH SUPPORT BARS. BARS & FITTING POSITION TO BE SUPPLIED BY ALUMNIUM SUPPLIER (9.110.5 v).
-S.S = SAFETY STAYS FITTED TO WINDOW.
* WALL IS BRACED WITH 7.5 PLY TO OUTSIDE FACE (ALLOW EXTRA FOR REVEAL THICKNESS)

- Notes
1. HARDIES LINEA WEATHERBOARDS (180mm) ON H3.1 20mm BATTENED CAVITY & BUILDING WRAP. CUT ENDS OF WEATHERBOARDS TO BE PRIMED. CAVITY TO FINISH WITH A UPVC VENT STRIP
 2. COLOURSTEEL GUTTER & FASCIA
 3. 135x16 HARDIES CLD TRIM ABOVE WINDOWS & DOORS
 4. 70 SERIES CLAY BRICK VENEER CLADDING
 5. DOUBLE GLAZED POWDER COATED ALUMINIUM FRAMED WINDOWS & DOORS WITH H3.1 TIMBER REVEALS
 6. CORRUGATED COLORSTEEL ROOFING

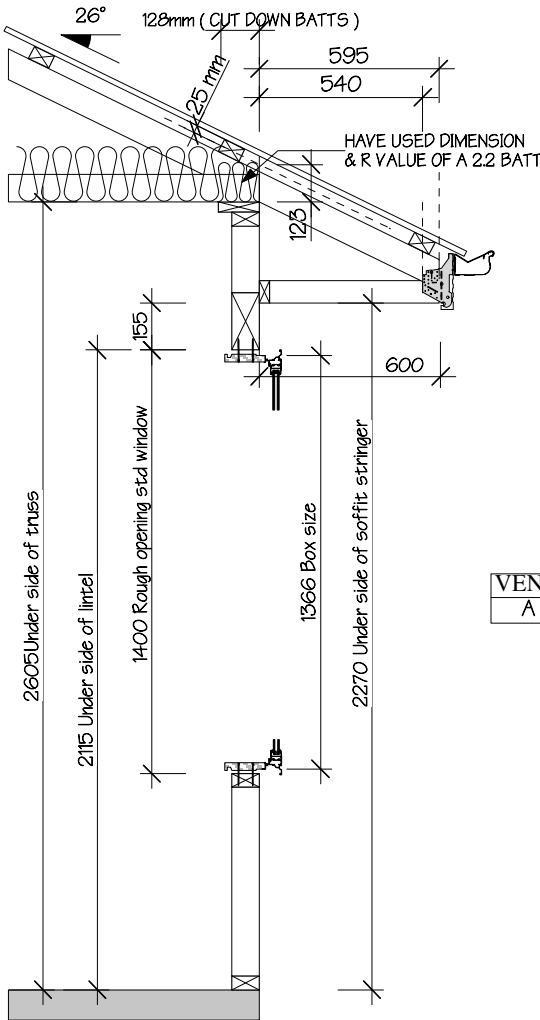
RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	1
ENVELOPE COMPLEXITY	0	1	3	6	0
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					2

Consent Issued BC141564



ELEVATION 1
Scale: 1:100

TIMBER TREATMENT SCHEDULE:	
SG8 KILN DRIED PINUS RADIATA	
EXTERNAL WALLS:	H1.2 TREATED
INTERNAL WALLS:	H1.2 TREATED
ALL BEAMS & LINTELS:	H1.2 TREATED
ALL FRAMES TO HAVE:	H1.2 BOTTOM PLATE
TRUSSES & EAVE FRAMING:	H1.2 TREATED
ECOPLY BARRIER:	H3.2 TREATED
WINDOW & DOOR REVEALS:	H3.1 TREATED
CHIMNEY FRAMING:	H1.2 TREATED
VALLEY BOARDS:	H1.2 TREATED
PURLINS:	H1.2 TREATED
COLUMN FRAMING:	H1.2 TREATED
GARAGE DOOR REVEALS:	H3.1 TREATED
CAVITY BATTENS:	H3.1 TREATED



RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	2
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					4

APPROVED PIM APPLICATION
Refer to PIM report for conditions of this application
BC141654
11/09/2014
gillianb

VENEER LINTEL TABLE
A

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	1
ENVELOPE COMPLEXITY	0	1	3	6	0
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					2



ELEVATION 2
Scale: 1:100

WINDOW SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
WC01	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC02	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC03	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC04	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC05	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC06	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC07	W5P	1880 mm	2000 mm	3.33 sqm	0.87 sqm
WC08	W17	800 mm	1400 mm	0.81 sqm	1.01 sqm
WC09	W106	2400 mm	2000 mm	3.84 sqm	1.52 sqm
WC10	W23	2400 mm	1400 mm	2.83 sqm	1.73 sqm

DOOR SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
DC01	D7	3000 mm	2115 mm	4.32 sqm	3.23 sqm
DC02	D5	2400 mm	2115 mm	3.43 sqm	2.47 sqm
DC03	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC04	D82	2480 mm	2050 mm	0.00 sqm	2.35 sqm
DC05	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC06	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC07	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC08	D78	1680 mm	2050 mm	0.00 sqm	1.55 sqm
DC09	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC10	G69	4680 mm	2115 mm	0.00 sqm	19.26 sqm
DC11	D24R	875 mm	2115 mm	0.94 sqm	1.52 sqm
DC12	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC13	D76	1280 mm	2050 mm	0.00 sqm	1.15 sqm
DC14	D54 OT	890 mm	2050 mm	0.71 sqm	1.63 sqm
DC15	D76	1280 mm	2050 mm	0.00 sqm	1.15 sqm
DC16	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC17	PT3R	1880 mm	2115 mm	1.60 sqm	1.73 sqm
DC18	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC19	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
DC20	D78	1680 mm	2050 mm	0.00 sqm	1.55 sqm
DC21	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm

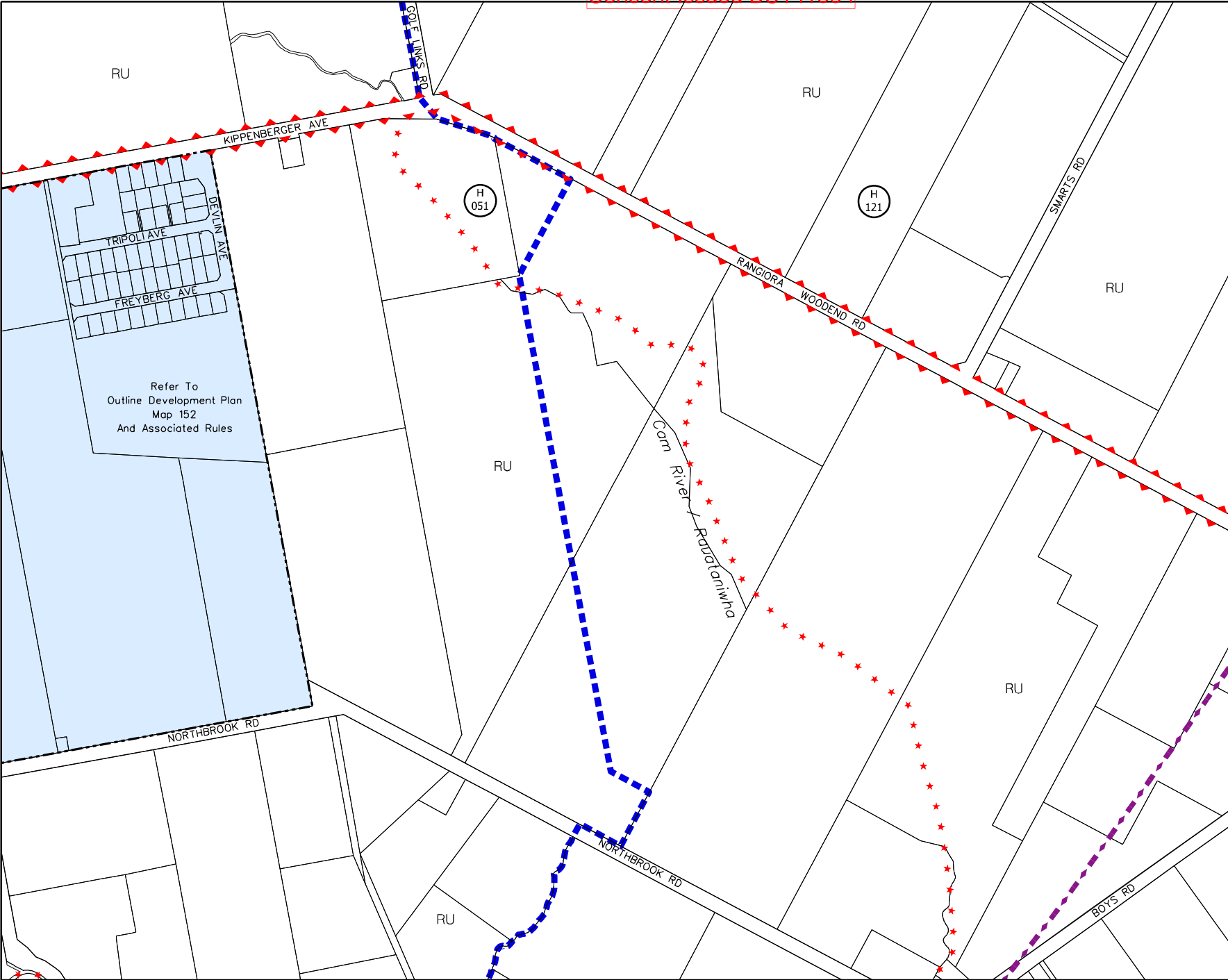
2570 STUD
STANDARD WINDOWS
Scale: 1:25

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOFWALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	2
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE					4

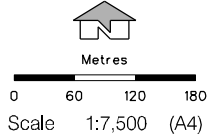
- See note #6
See note #2
See note #4
See note #5



ELEVATION 3
Scale: 1:100
















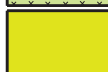























NOTE:
Disclaimer - refer to map legend sheet



111	35	
113	114	115
117	47	128A

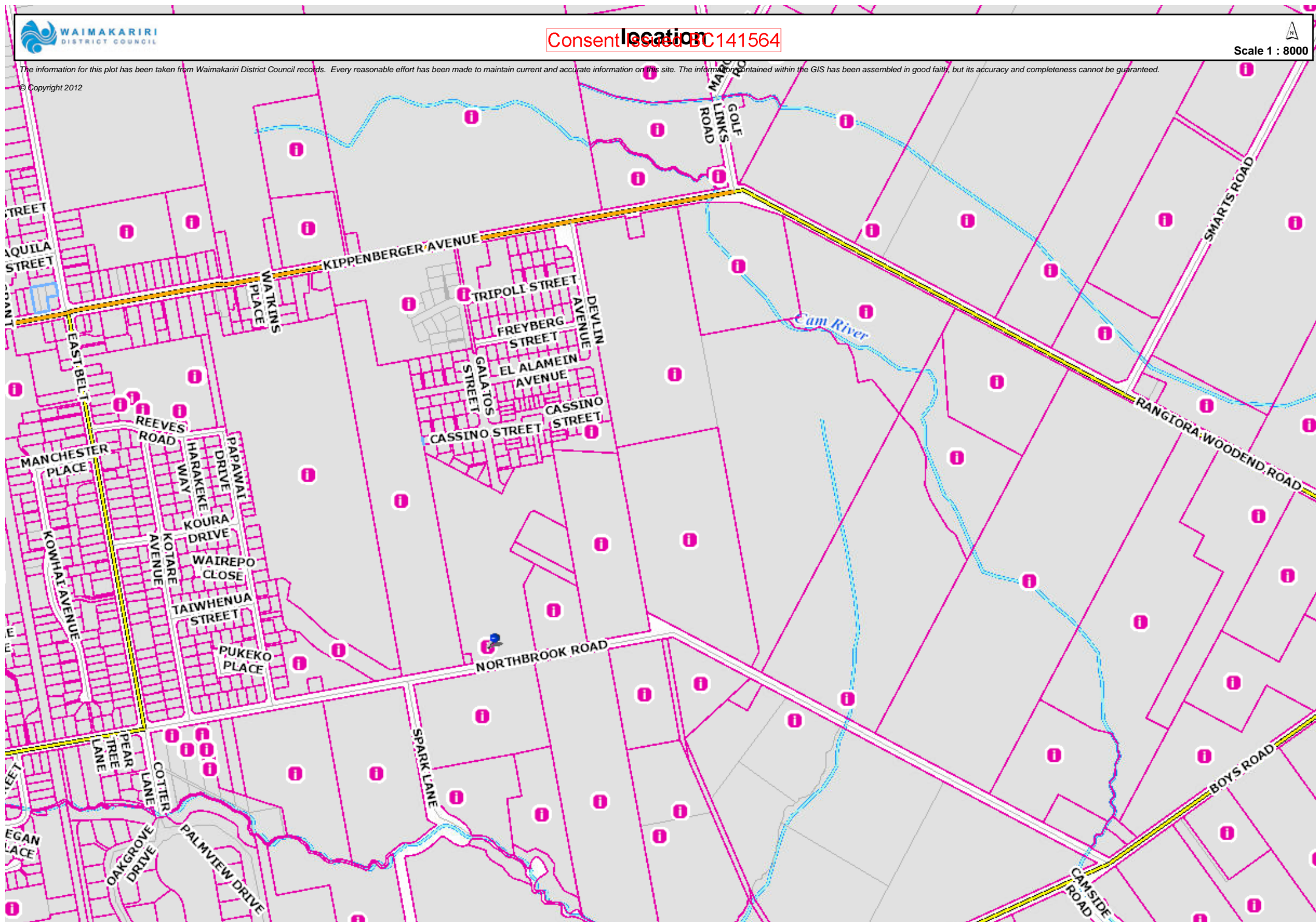
Rangiora
114

URBAN LEGEND (Sheets 77 to 133)

	Zone Business 1		Zone Residential 7		Designations		River Reaches subject to esplanade provisions
	Zone Business 2		Zone Rural		Heritage Sites		Limited Access Road
	Zone Business 3		Zone Maplesham Rural 4B		Vegetation and Habitat Sites		Road to be Closed
	Zone Business 4		Subdivision Constraint (Rural)		Notable Plant Sites		Outline Development Plan Required Boundary
	Zone Residential 1		Subdivision Constraint Area (Policy 18.1.1.8)		Archaeological Sites		Coastal Marine Area boundary
	Zone Residential 2		Pegasus Rural Zone See Map 142		Waahi Tapu / Waahi Taonga		Waimakariri District boundary
	Zone Residential 3		Localised Flooding Area		Transpower High Voltage Lines	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 4A		Goat control area	NOTE: These notations do not necessarily indicate the precise position of the Site, nor relate to the size of any Site.			
	Zone Residential 4B	Note: See Rule 23.1.1.17 for goat control (Includes Outstanding Landscape areas)				Average Noise Exposure Contours; Christchurch International Airport	
	Zone Residential 5					Transit New Zealand Designation	
	Zone Residential 6					Noise Level in dBA Ldn	
	Zone Residential 6A			50		Tranz Rail Designation	

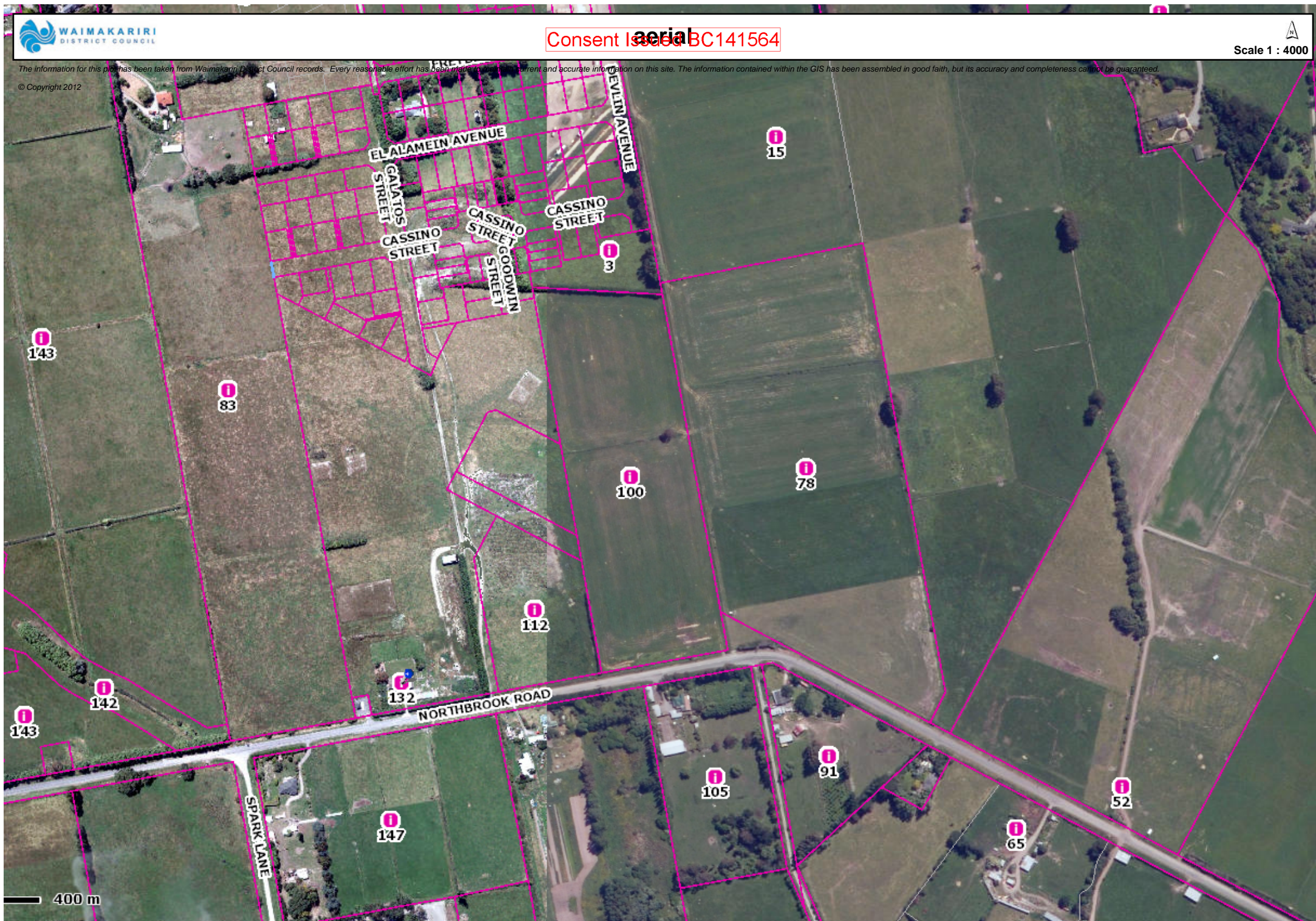
The information for this plot has been taken from Waimakariri District Council records. Every reasonable effort has been made to maintain current and accurate information on this site. The information contained within the GIS has been assembled in good faith, but its accuracy and completeness cannot be guaranteed.

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The information for this plan has been taken from Waimakariri District Council records. Every reasonable effort has been made to ensure that the information is current and accurate information on this site. The information contained within the GIS has been assembled in good faith, but its accuracy and completeness cannot be guaranteed.

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ENVIRONMENT CANTERBURY (ECAN) LIQUEFACTION HAZARD STUDY

What does it mean for the Waimakariri District?

You may have seen the recently released Environment Canterbury (ECan) liquefaction assessment report, which is based on liquefaction studies and reports from the last 20 years, as well as information collected from the September 2010 and February 2011 earthquakes.

A link to the full report is available on the New Foundations website at newfoundations.org.nz

The report addresses flat land throughout Christchurch City Council, and Hurunui, Selwyn and Waimakariri Districts - land outside of areas already zoned by the Canterbury Earthquake Recovery Authority (CERA) and the Department of Building and Housing (DBH).

The map included in this update highlights the reported findings – the red boundary line indicates what areas have been assessed as damaging liquefaction unlikely and liquefaction assessment needed.

The Ministry of Business, Innovation and Employment (MBIE) has revised its guidelines for repairs and rebuilds in Canterbury to take this information into consideration. MBIE guidelines for repairs and rebuilds in Canterbury can be found at dbh.govt.nz/canterbury-earthquake-residential-building

The following information outlines both land assessment areas and what these classifications mean for current homeowners and future builds and developments.

For further information about the study contact ECan directly or go to ecan.govt.nz. Associated building enquiries can be directed to the Waimakariri District Council Building Unit on 03 311 8900.

Damaging liquefaction unlikely

1. Before consent to develop or build can be granted by Council, a geotechnical assessment is required to be undertaken by an engineer.
2. This assessment evaluates the suitability of the land for building on. Standard foundation investigations will normally be adequate for residential dwelling construction.

Liquefaction assessment needed

1. Before consent to develop or build can be granted by Council, a geotechnical assessment is required to be undertaken by a geotechnical engineer.
2. This assessment evaluates the suitability of the land for building on and is likely to include physically drilling down to 15m.
3. Waimakariri District Council has recorded liquefaction susceptibility information on its Land Information Memorandums (LIM) since 2001. This process will remain the same with the addition of this information on new Property Information Memorandums (PIM).

A PIM is a document you can request when planning a building project. It is prepared by Council and contains any information or requirements Council is aware of that could affect a building project.

A LIM is a document containing information that Council holds about a property.

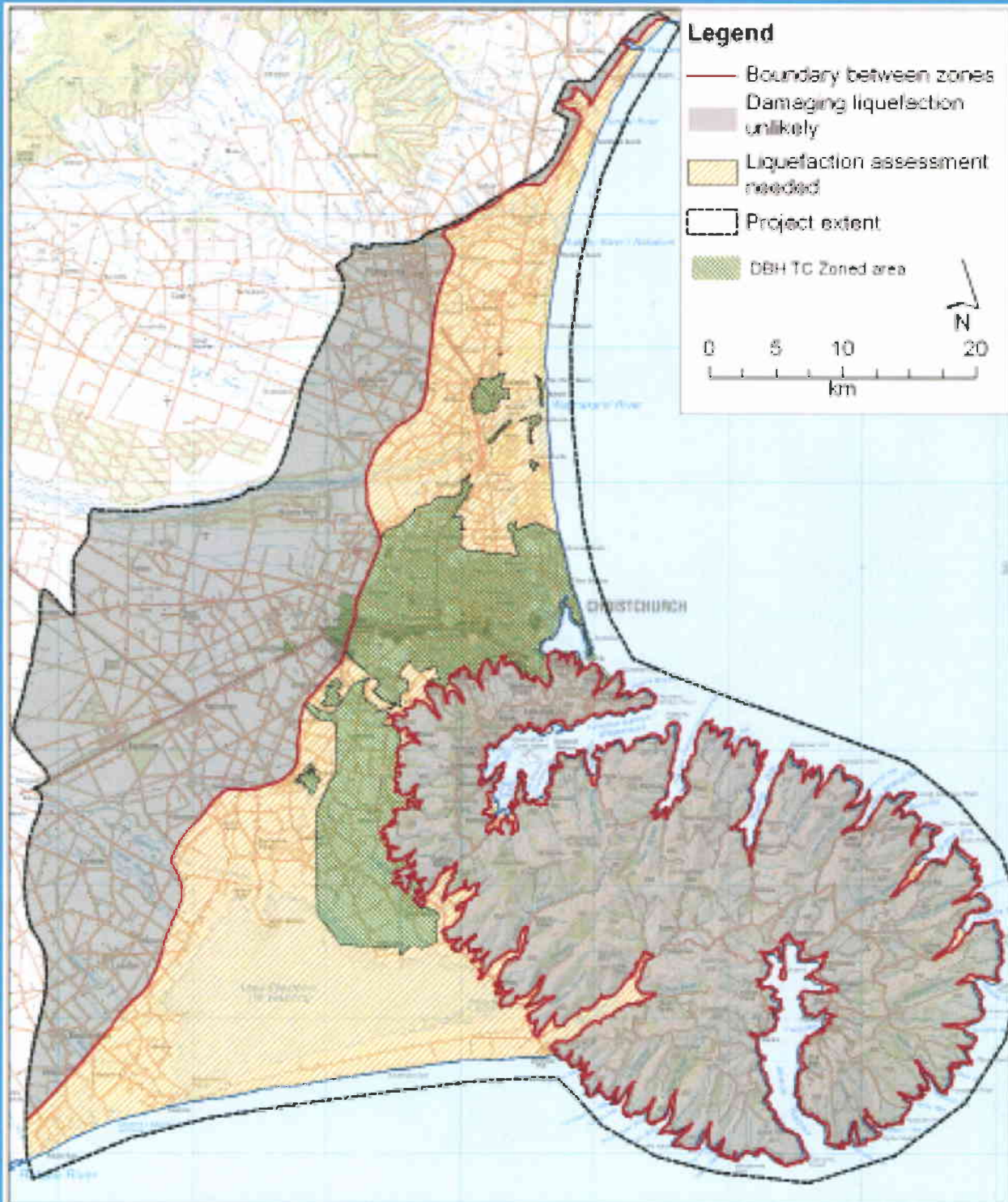
PIM wording:

The shading on the 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.

LIM wording:

This property is in an area categorised as "liquefaction assessment needed". See Environment Canterbury Report number R12/83 for more information.
<http://files.ecan.govt.nz/public/r12-83-liquefaction-hazard-canterbury-report.pdf>

ENVIRONMENT CANTERBURY (ECAN) LIQUEFACTION HAZARD STUDY





TA Approvals

Territorial Authority	Waimakariri District Council TA Certification Division	TA Reference	RC135361
Survey Number	LT 476266	Survey Purpose	LT Subdivision
Surveyor Reference	1003HHL-Kippenberger Stage 5	Land District	Canterbury
Surveyor	Andrew Darren Fry		
Surveyor Firm	Mainland Surveying Limited		
Dataset Description	Lots 135-161, 306, 412, 505 & 510 - 512 being Subdivision of Lot 305 DP 459899 and Easement Over Lot 401 DP 456375		

TA Certificates

I hereby certify that plan LT 476266 was approved by the Waimakariri District Council pursuant to section 223 of the Resource Management Act 1991 on the 18th day of June 2014. ☒

The approval of the Council under Section 223 of the Resource Management Act 1991 is subject to the granting or reserving of the easement set out in the Memorandum of Easements attached as a supporting document to plan LT 476266 ☒

The approval of the Council under Section 223 of the Resource Management Act 1991 is subject to the amalgamation condition set out hereon ☒

Signature

Signed by Yvonne Sally Fear, Authorised Officer, on 18/06/2014 02:10 PM

Receipt Information

Transaction Receipt Number	8039320
Signing Certificate (Distinguished Name)	Fear, Yvonne Sally
Signing Certificate (Serial Number)	1292460487
Signature Date	18/06/2014

*** End of Report ***



Title Plan - LT 476266

Survey Number LT 476266
Surveyor Reference 1003HHL-Kippenberger Stage 5
Surveyor Andrew Darren Fry
Survey Firm Mainland Surveying Limited
Surveyor Declaration

Survey Details

Dataset Description Lots 135-161, 306, 412, 505 & 510 - 512 being Subdivision of Lot 305 DP 459899 and Easement Over Lot 401 DP 456375
Status Initiated
Land District Canterbury
Submitted Date
Survey Class Class A
Survey Approval Date
Deposit Date

Territorial Authorities

Waimakariri District

Comprised In

CT 601937
 CT 591073

Created Parcels

Parcels	Parcel Intent	Area	CT Reference
Lot 135 Deposited Plan 476266	Fee Simple Title	0.0759 Ha	
Lot 136 Deposited Plan 476266	Fee Simple Title	0.0662 Ha	
Lot 137 Deposited Plan 476266	Fee Simple Title	0.0630 Ha	
Lot 138 Deposited Plan 476266	Fee Simple Title	0.0679 Ha	
Lot 139 Deposited Plan 476266	Fee Simple Title	0.0600 Ha	
Lot 140 Deposited Plan 476266	Fee Simple Title	0.0603 Ha	
Lot 141 Deposited Plan 476266	Fee Simple Title	0.0609 Ha	
Lot 142 Deposited Plan 476266	Fee Simple Title	0.0600 Ha	
Lot 143 Deposited Plan 476266	Fee Simple Title	0.0636 Ha	
Lot 144 Deposited Plan 476266	Fee Simple Title	0.0867 Ha	
Lot 145 Deposited Plan 476266	Fee Simple Title	0.0621 Ha	
Lot 146 Deposited Plan 476266	Fee Simple Title	0.0694 Ha	
Lot 147 Deposited Plan 476266	Fee Simple Title	0.0694 Ha	
Lot 148 Deposited Plan 476266	Fee Simple Title	0.0621 Ha	
Lot 149 Deposited Plan 476266	Fee Simple Title	0.0621 Ha	
Lot 150 Deposited Plan 476266	Fee Simple Title	0.0694 Ha	
Lot 151 Deposited Plan 476266	Fee Simple Title	0.0694 Ha	
Lot 152 Deposited Plan 476266	Fee Simple Title	0.0621 Ha	



Title Plan - LT 476266

Created Parcels

Parcels	Parcel Intent	Area	CT Reference
Lot 153 Deposited Plan 476266	Fee Simple Title	0.0631 Ha	
Lot 154 Deposited Plan 476266	Fee Simple Title	0.0636 Ha	
Lot 155 Deposited Plan 476266	Fee Simple Title	0.0691 Ha	
Lot 156 Deposited Plan 476266	Fee Simple Title	0.0638 Ha	
Lot 157 Deposited Plan 476266	Fee Simple Title	0.0638 Ha	
Lot 158 Deposited Plan 476266	Fee Simple Title	0.0638 Ha	
Lot 159 Deposited Plan 476266	Fee Simple Title	0.0638 Ha	
Lot 160 Deposited Plan 476266	Fee Simple Title	0.0638 Ha	
Lot 161 Deposited Plan 476266	Fee Simple Title	0.0639 Ha	
Lot 306 Deposited Plan 476266	Fee Simple Title	3.1768 Ha	
Lot 412 Deposited Plan 476266	Vesting on Deposit for Recreation Reserve (Territorial Authority)	0.6469 Ha	
Lot 505 Deposited Plan 476266	Vesting on Deposit for Road	0.8084 Ha	
Lot 510 Deposited Plan 476266	Fee Simple Title	0.0003 Ha	
Lot 511 Deposited Plan 476266	Fee Simple Title	0.0004 Ha	
Lot 512 Deposited Plan 476266	Fee Simple Title	0.0003 Ha	
Area A Deposited Plan 476266	Easement		
Area B Deposited Plan 476266	Easement		
Area C Deposited Plan 476266	Easement		
Area D Deposited Plan 476266	Easement		
Area E Deposited Plan 476266	Easement		
Area F Deposited Plan 476266	Easement		
Total Area		6.4023 Ha	

Schedule / Memorandum

Land Registration District

Canterbury

Plan Number

DP 476266

Job Ref: 1003HHL-Kippenberger Stage 5

Territorial Authority (the Council)

Waimakariri District Council

Consent Reference: RC135361

Memorandum of Easements			
Purpose	Shown	Servient Tenement	Dominant Tenement / Grantee
Right of way, right to drain water and sewage, right to convey water, electricity, telecommunications & computer media	A	Lot 146	Lot 147
	B	Lot 147	Lot 146
	C	Lot 150	Lot 151
	D	Lot 151	Lot 150
Right to convey telecommunications & computer media in gross	A	Lot 146	Chorus New Zealand Limited
	B	Lot 147	
	C	Lot 150	
	D	Lot 151	

NOTES:

Amalgamation Condition

Lot 306 hereon and Lots 300 and 303 DP 456375 and Lot 500 DP 459899 shall be held together pursuant to Section 220 of the Resource Management Act 1991 and one computer freehold register be issued for the Lots (DLR Ref:1169627)

Schedule / Memorandum

Land Registration District

Canterbury

Plan Number

DP 476266

Job Ref: 1003HHL-Kippenberger Stage 5

Territorial Authority (the Council)

Waimakariri District Council

Consent Reference: RC135361

Schedule of Easements			
Purpose	Shown	Servient Tenement	Grantee
Right to convey electricity in gross	E	Lot 401 DP 456375 CFR 591073	Mainpower New Zealand Limited
Right to drain water in gross	F	Lot 412	Waimakariri District Council

Note

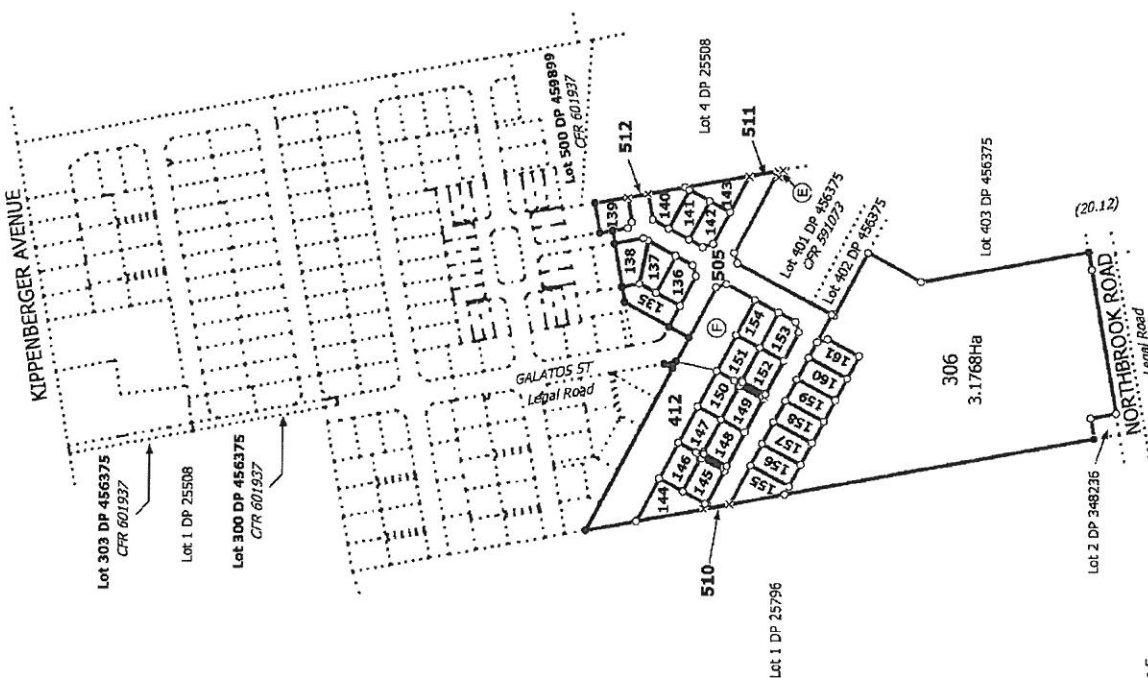
Lots 135-161 are to be subject to a proposed consent notice

Lots 144, 146, 147, 150, 151 and 154 are to be subject to a proposed consent notice

Lots 510, 511 and 512 are to be subject to a proposed consent notice



Diag. A



AMALGAMATION CONDITION

Lot 306 hereon and Lots 300 and 303 DP 456375 and Lot 500 DP 459899 shall be held together pursuant to Section 220 of the Resource Management Act 1991 and one computer freehold register be issued for the Lots (DLR Ref:1169627)

NOTES:

There are not Lots 1-134, 162-305, 307-411, 413-504 & 506-509 on this plan.

Lot areas are shown on the diagram sheets for plan clarity.

Easement identifiers are shown on the diagram sheets for plan clarity.

Lot 412 is to vest as Recreation Reserve in the Waimakariri District Council.

Lot 505 is to vest as road in the Waimakariri District Council.

1003441-Kippenberger Stage 5

Land District: Canterbury

Digitally Generated Plan

Generated on: 11/06/2014 5:51pm Page 5 of 9

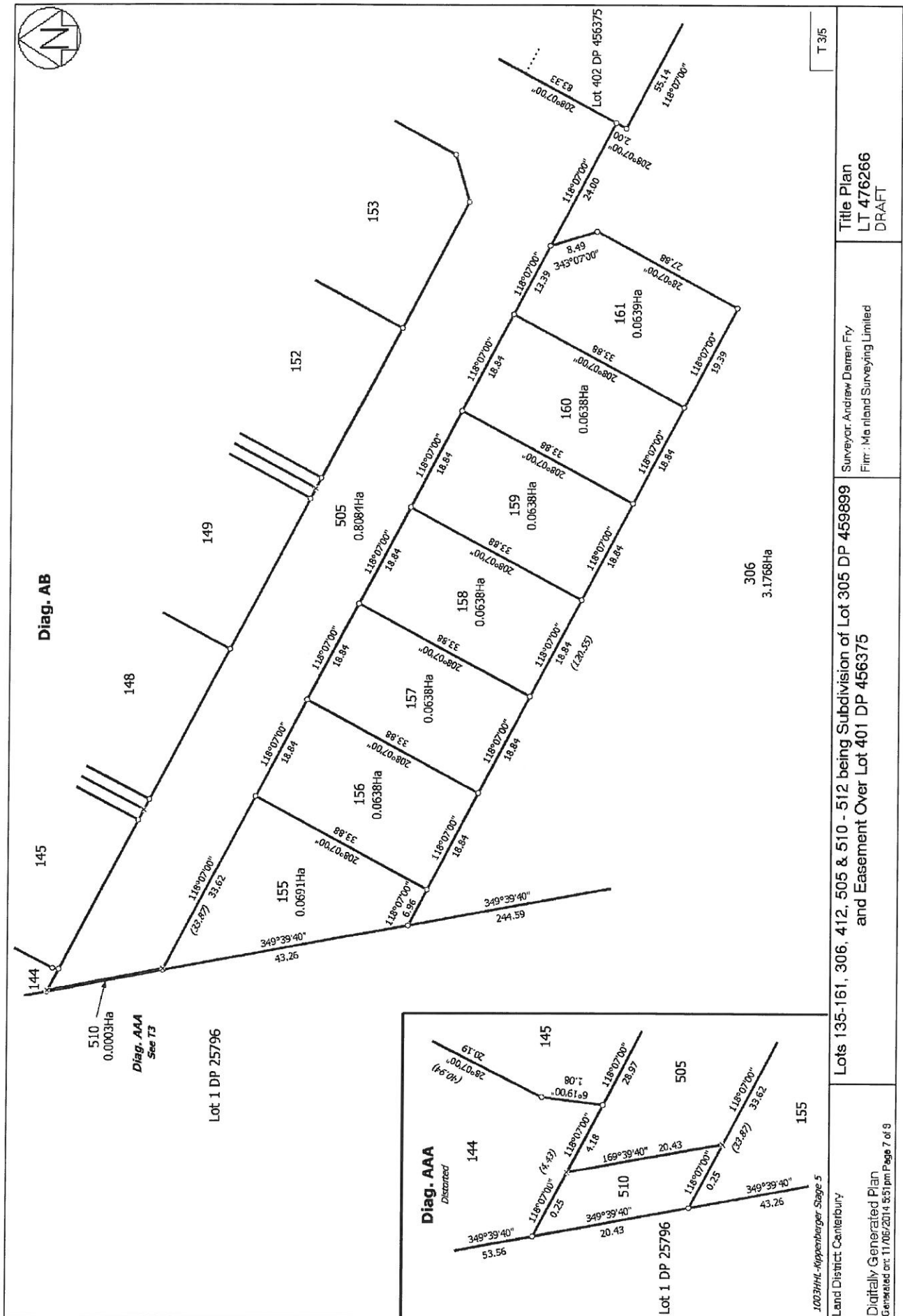
Lots 135-151, 306, 412, 505 & 510 - 512 being Subdivision of Lot 305 DP 459899 and Easement Over Lot 401 DP 456375

Surveyor: Andrew Darren Fry
Firm: Mc Island Surveying Limited

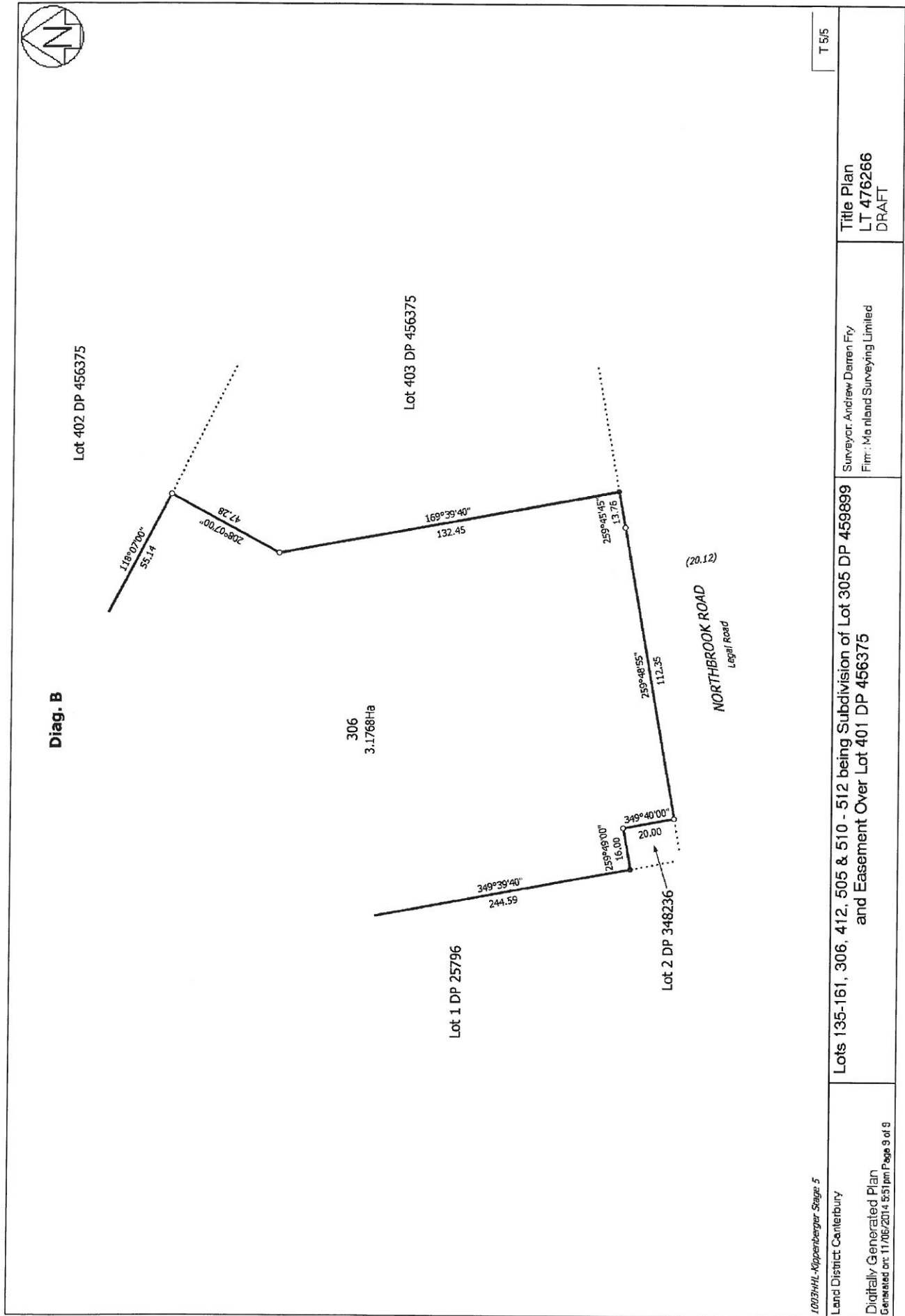
Title Plan
LT 476266
DRAFT

T1/5









Geotech, Engineer Reports & Conditions PS1 & 2

- Calculations**
- A4 Details**



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

21 November 2013

File: 21286

Horncastle Homes Limited
PO Box 8255
Riccarton
Christchurch 8440

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Attention: Shelley

Your Reference: J4146

Dear Shelley

Re: Shallow Geotechnical Investigation –Lot 146 Stage 5 Kippenberger Subdivision, Rangiora.

1. Introduction

Lewis & Barrow Ltd has carried out a Shallow Geotechnical Investigation and prepared this report at the request of Horncastle Homes Limited to determine the type of foundation required for a proposed single storey dwelling.

Investigation included the following:

- Confirm the Geology of the site.
- Four Scala Penetrometer Tests to a max depth of 1.65m.
- Four 50mm diameter hand auger boreholes down to a maximum depth of 3.6m.
- Preliminary evaluation of shallow liquefaction potential of this site.

2. Site

The property is a predominantly level site and is approximately 617 square metres in area.

The site is currently zoned as Green Zone "DBH Residential Technical Category Not Applicable – Rural and Unmapped" by the Ministry of Business, Innovation & Employment's (MBIE) Guidance indicating that the area has not been assigned a Technical Category to classify the land damage potential following earthquake induced liquefaction events.

A Geotechnical Investigation Report for Subdivision Consent was issued by Tonkin and Taylor Limited in October 2012 concluding the area of stages 5 to 7 of the subdivision are generally suitable for residential development and the a MBIE Technical Category 1 classification will be appropriate on completion of a subdivision pre-load earthworks program. However the report indicates long term settlement of the organic peat layers and reactivity of the bearing soils need to be taken into account for foundation design on this site.



3. Geology

The GNS publication "Geology of the Christchurch Area" 2008 shows that the site is underlain by grey to brown fan alluvium of the Canterbury Range Front.

Bore logs taken in the area of the site by Tonkin and Taylor Limited show alluvial silts overlying gravel at 3.7m.

4. Results of Site Tests

Attached 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 of each depth alongside the soil types. At the time of testing the topsoil had been removed from the site and the final subgrade formation levels have been achieved. The topsoil is to be replaced on the site on completion of the building works.

The auger bores show silts and peat lenses to the extent of testing at 3.6m. The Tonkin & Taylor Limited testing in the vicinity of this site showed similar silts to gravel at 5m below ground level. The penetrometer bearing tests show there is an available Ultimate Bearing Capacity of 300kPa at 0.1m below existing ground level.

5. Groundwater

An average natural groundwater table depth of 1.14m as measured is shown on the plots of the auger holes. This is similar to the findings of the Tonkin & Taylor Limited investigation. Groundwater is usually highest about October and lowest about April each year.

6. Liquefaction

The site auger shows shallow silts with a ground water level at 1.14m and the site penetrometer testing shows the silts have a medium bearing capacity indicating a shallow liquefaction potential is likely to exist on this site. The Tonkin and Taylor bore logs show that conditions that could cause deep seated liquefaction are not likely to exist on this site.

The Tonkin & Taylor Ltd subdivision report indicates that the post surcharging earthworks liquefaction parameters show a Technical Category 1 classification is appropriate for the area of this site.

7. Lateral Spreading

Lateral spreading is the post liquefaction movement of liquefied soils towards a free edge such as a water course or sloped ground surface.

The Tonkin & Taylor Limited report indicates lateral spreading is considered a low risk for the area of this site.

8. Seismic Considerations

Peak ground accelerations (PGA) have been assessed for each event of the Canterbury earthquake sequence at the Ashley School recording device 3.8km north of the site.



As each of these events vary in magnitude and time, the PGA's have been adjusted to be equivalent to the design M7.5 event, i.e. the shaking of a M7.1 event is shorter than a M7.5 event and hence the effective equivalent M7.5 PGA will be less. These values are set out as follows:

Earthquake	Date	Conditional Mean P.G.A.	Equivalent P.G.A. for M7.5 Event
M7.1	4 September 2010	0.21g	0.19g
M6.2	22 February 2011	0.09g	0.06g
M6.0	13 June 2011	0.06g	0.04g
M5.9	23 December 2011	0.11g	0.07g

The equivalent design PGA's for a M7.5 event are:

To have no damage and be serviceable (Serviceability Limit State S.L.S.) 0.13g.

To not fail catastrophically (Ultimate Limit State U.L.S.) 0.35g.

As this site has not experienced any equivalent M7.5 P.G.A. events of more than 1.7 times the design S.L.S. value (0.22g), the site cannot be regarded as having been "sufficiently tested" to SLS design levels by the Canterbury Earthquake sequence to date.

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

9. Foundation Recommendations

The site has been classified by Tonkin & Taylor Limited as Technical Category 1 in accordance with the MBIE liquefaction ground damage classification system and hence liquefaction mitigation measures are minor for this site compared to the long term settlement and soil reactivity requirements for the site.

The foundations to the building proposed for this site shall be designed by a Chartered Professional Engineer for a maximum a maximum strip Ultimate bearing capacity of 300kPa. A ϕ of 0.5 is appropriate.

Section 5.3 of the Tonkin & Taylor Ltd subdivision report gives a number of specific foundation design requirements for the proposed building as follows:

- The maximum exerted ultimate bearing pressure to the overall building foot print shall not exceed 12kPa.
- The overall building plan area is to be designed as close to square as is practicable.
- A double reinforced raft foundation system is to be used to accommodate predicted differential settlements.
- The foundation system shall be designed to be capable of spanning or cantilevering 3.0m over localised soft areas.
- Reactivity movement of the bearing soils of up to 40mm is to be taken into account in the design and construction of the proposed foundation in accordance with the requirements for Class M to AS 2870.
- The maximum design settlement criteria for the site are (includes long term and seismic settlements):
 - ULS = 25mm total and 15mm differential over 6m
 - SLS = 15mm total and 10mm differential over 6m.
- The building platform area at design foundation level is to be proof rolled by a roller of greater than 10 tonnes in the presence of a Spire Consulting Limited Geotechnical Engineer and the final platform level approved for construction. Suitable certification of this rolling and inspection is to be provided by Spire Consulting Limited.



A further requirement of the Tonkin & Taylor Limited report (which covers stage 5, 6 and 7) is that the earthworks be monitored to IPENZ CM4 level. The Spire Consulting Limited earthworks plan for stage 5 of the development shows that all fill is less than 0.3m deep and hence is classified as non-Engineered and does not require monitoring.

Given the requirements for a maximum exerted mass of 12kPa and the foundation span and differential settlement requirements it is recommended that a polystyrene waffle slab foundation system such, as the Firth TC2 RibRaft, be used on this site.

10. Limitations

1. This report has been prepared for the benefit of Horncastle Homes Limited as our client with respect to the brief. The reliance by any other parties on the information or options contained in this report shall, without prior review and agreement in writing be at such other parties sole risk.
2. The recommendations and opinions contained in this report are based on the information gained. The nature and continuity of subsoil conditions away from the test locations are inferred and it must be appreciated that actual conditions could vary from the assumed model.
3. If any fill, or soils other than those noted in the above report are encountered in the excavations then the author of this report must be consulted for further advice as the foundation design may need to be modified.
4. This report assumes acceptance of the Tonkin and Taylor Limited subdivision geotechnical assessment report held by the Territorial Authority and completion of the subdivision earthworks monitoring in the area of this site by Spire Consulting Limited.

Yours faithfully,



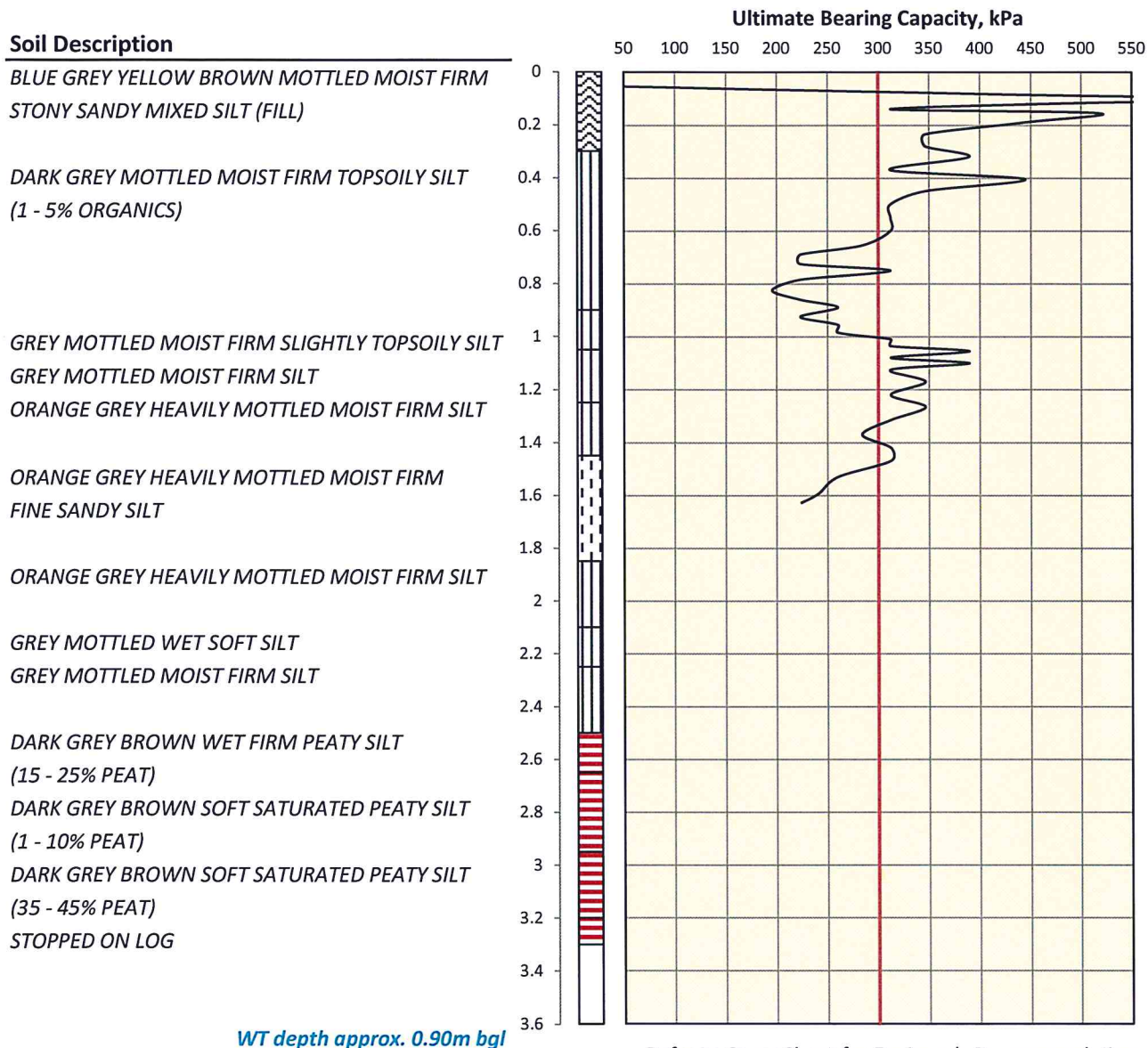
Chris Gordon
Structural Engineer
BE MIPENZ CPEng IntPE(NZ)



Bore Hole No. 1

SOIL PROFILE AND SCALA PENETROMETER RESULTS

Sheet 1 of 5



Site Address: **Lot 146 Kippenberged Stage 5**

Client: **Horncastle Homes Ltd**

Technical Category: **NA**
Reason for Test: **Council Requirement**

Plotted by: **NB**
Field Worker: **RL**

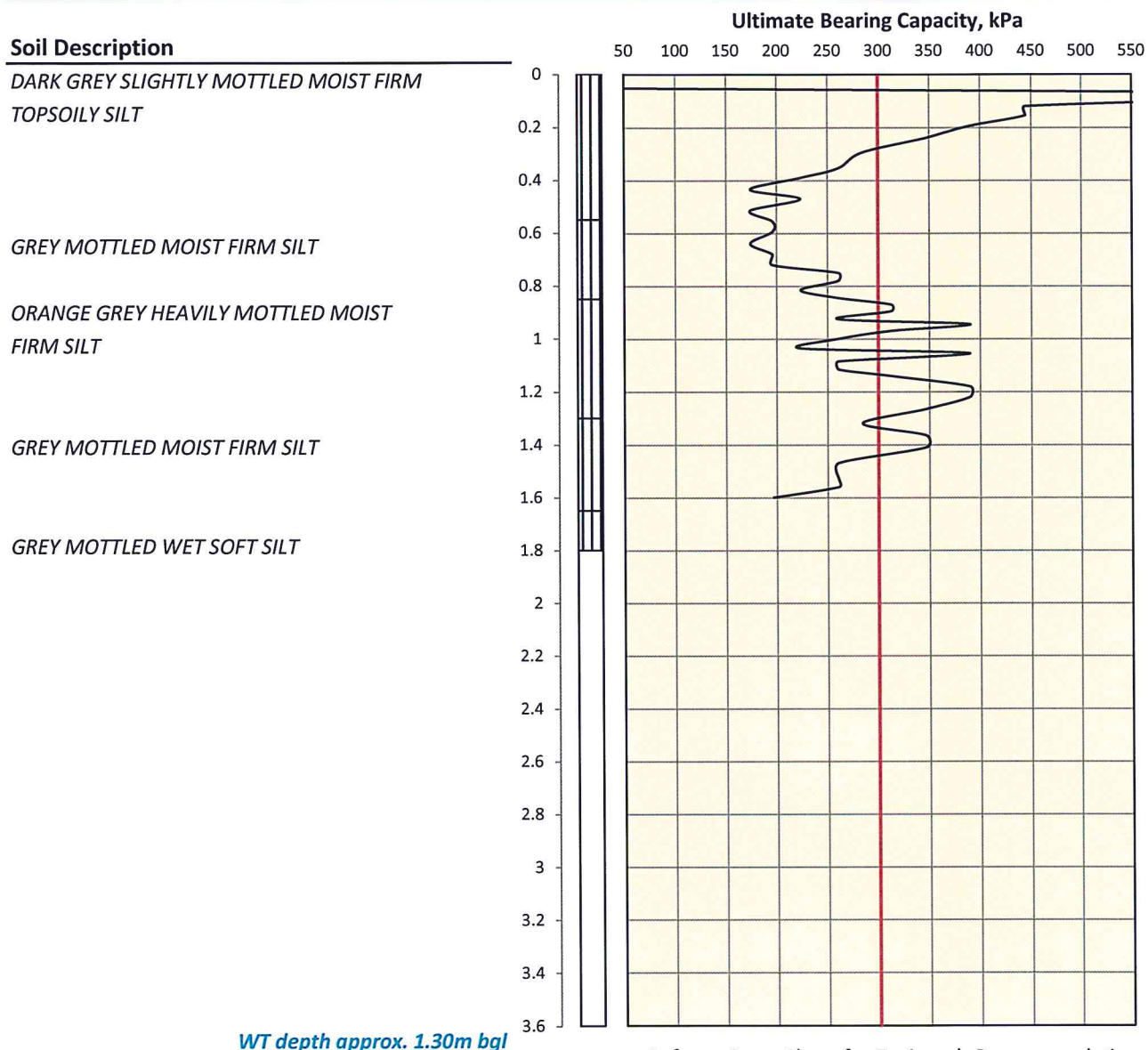
This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found 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



Refer to Cover Sheet for Engineer's Recommendations

Site Address: **Lot 146 Kippenberged Stage 5**

Client: **Horncastle Homes Ltd**

Technical Category: **NA**
Reason for Test: **Council Requirement**

Plotted by: **NB**
Field Worker: **RL**

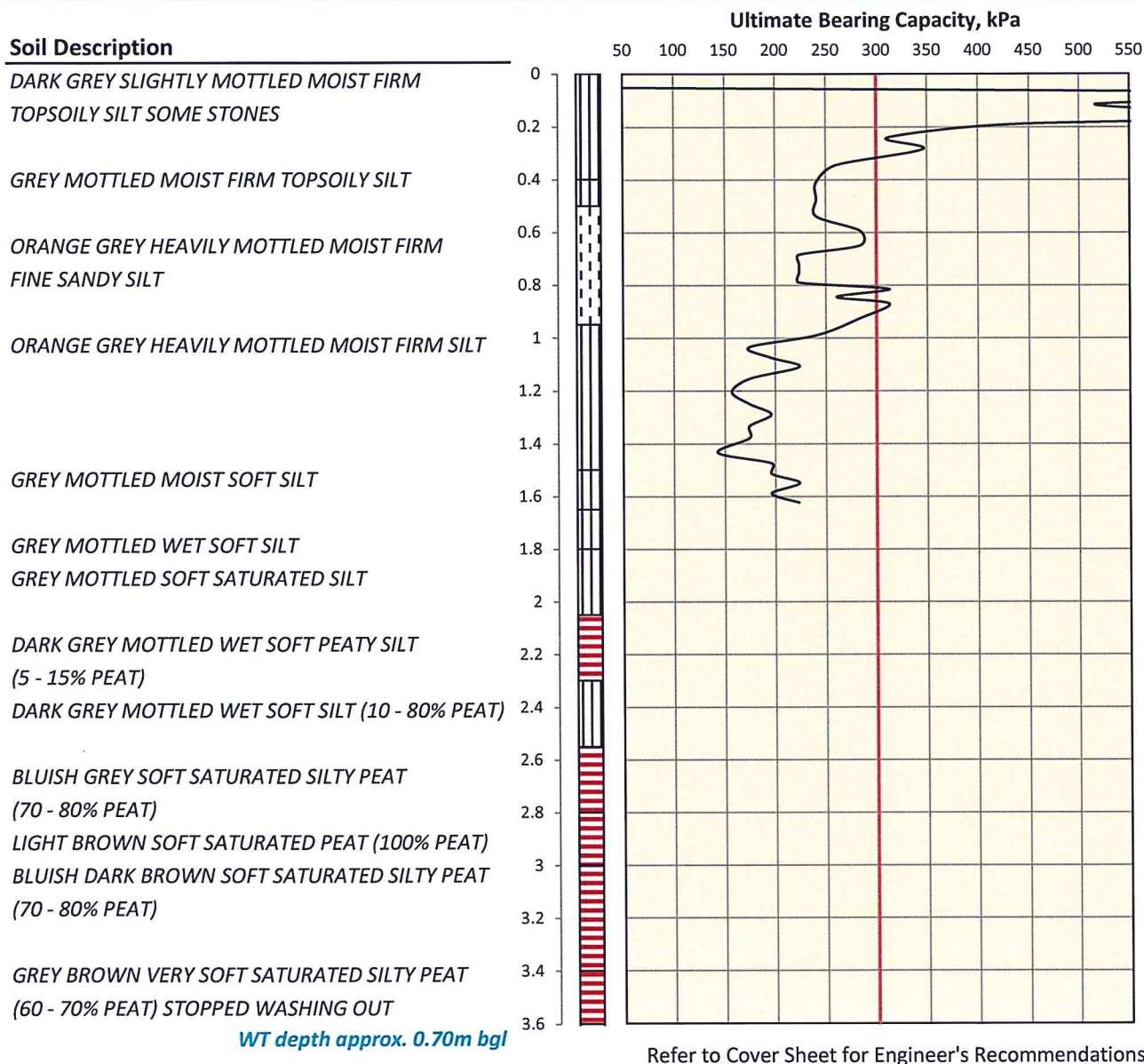
This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found 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 146 Kippenberged Stage 5**

Client: **Horncastle Homes Ltd**

Technical Category: **NA**
Reason for Test: **Council Requirement**

Plotted by: **NB**
Field Worker: **RL**

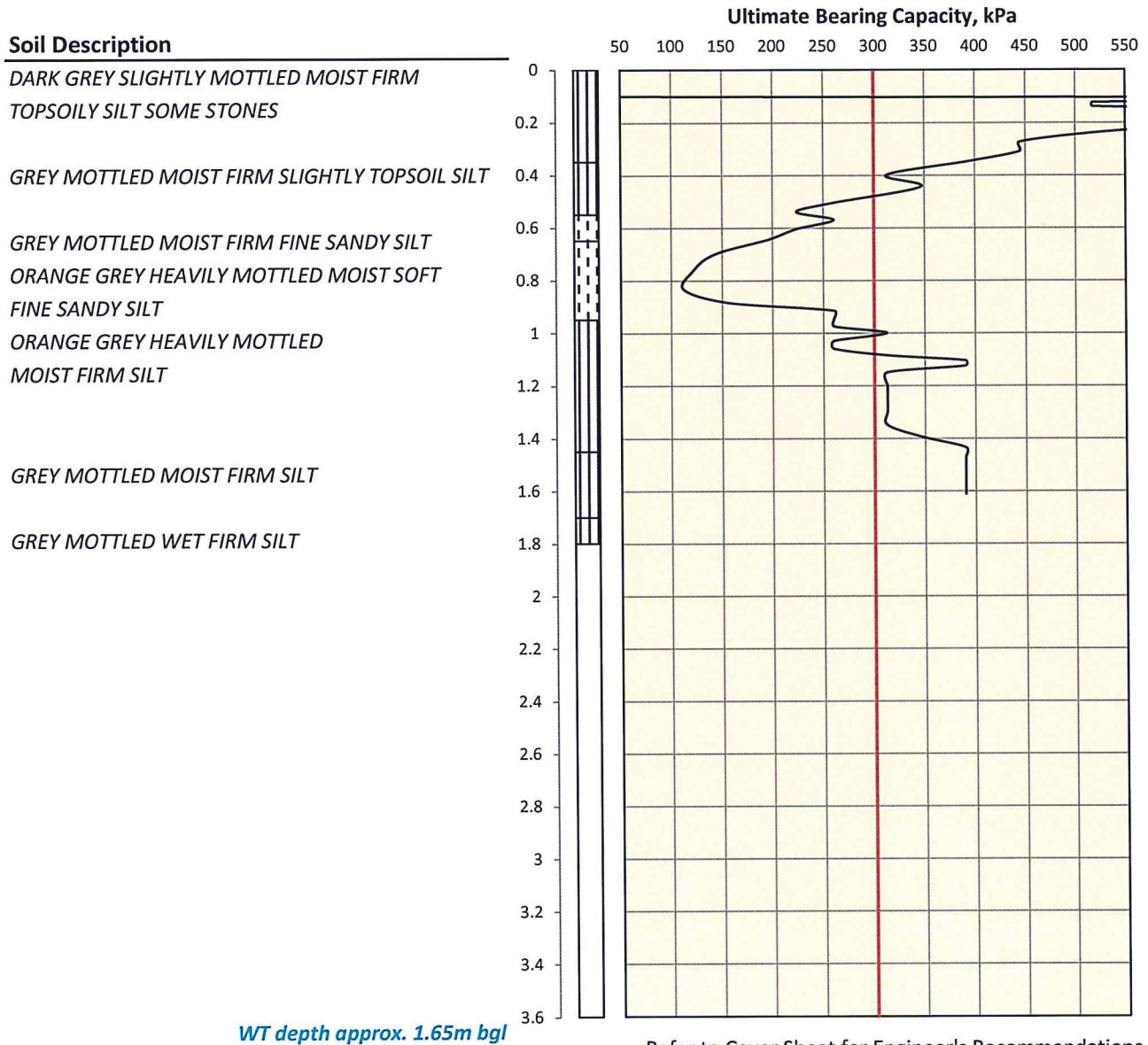
This report (letter, soil test results sheets and site plan) must be read with the P.I.M. If there is anything adverse regarding ground bearing capacity on the P.I.M. this report shall be referred back to the Engineer for review. If any fill or soils other than those noted in the above report are found 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



Refer to Cover Sheet for Engineer's Recommendations

Site Address: **Lot 146 Kippenberged Stage 5**

Client: **Horncastle Homes Ltd**

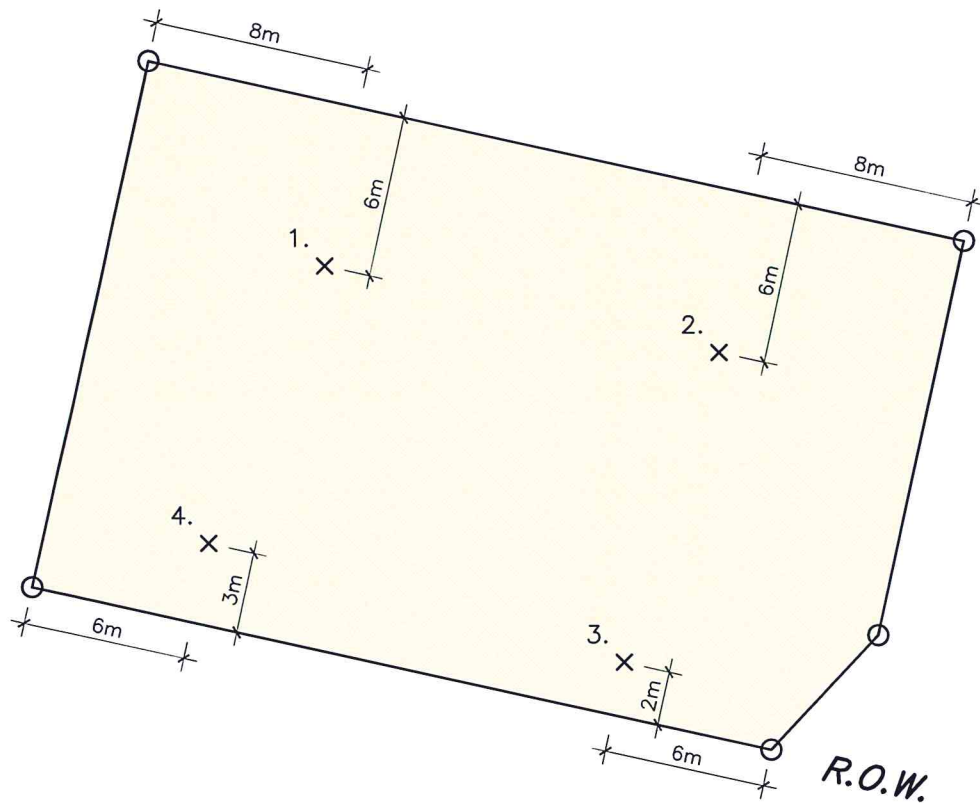
Technical Category: **NA**
Reason for Test: **Council Requirement**

Plotted by: **NB**
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



SITE PLAN

SHEET **05** OF 5

1. **X** Approximate Position of Penetrometer Test and Auger Hole.

ADDRESS: LOT 146 KIPPENBERGER STAGE 5

Building Code Clauses B1/VM1 and B1/VM4

PRODUCER STATEMENT – PS1 – DESIGN

ISSUED BY:		The Engineering Company Ltd <small>(Design Firm)</small>	
TO BE SUPPLIED TO:		Waimakariri District Council <small>(Building Consent Authority)</small>	
IN RESPECT OF:		New Dwelling <small>(Description of Building Work)</small>	
AT:		Lot 146, Stage 5 Kippenberger Subdivision, Rangiora <small>(Address)</small>	
LOT	146	DP	SO

We have been engaged by Firth Industries to provide the **structural design** of the work listed, shown on the attached **ENGCO** drawings titled:

HORNCastle HOMES LTD., LOT 146 KIPPENBERGER ESTATE, RANGIORA

Item	Covered by this PS-1	Drawing or Detail
1.	Ribraft slab design for loss of bearing	14040.11/S1 – S6 (24.03.2014)

in respect of the requirements of Clause(s) B1 of the Building Code for the **part** the proposed building works specified only. The design has been prepared in accordance with **VM1/AS1** the approved Compliance & Guidance Documents issued by Department of Building & Housing.

On behalf of the Design Firm, and subject to:

- (i) The design has been prepared in accordance with the recommendations of the geotechnical report by Tonkin & Taylor report "Kippenberger Estates Subdivision, Stages 5-7, Ref 51147.011.R2 – Oct 2012.
- (ii) ENGCO is responsible for conducting all inspections required for the issue of code compliance, in accordance with the attached schedule.
- (iii) All proprietary products meeting their performance specification requirements;

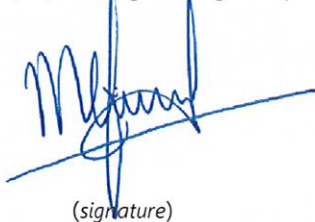
I believe on reasonable grounds the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed above will comply with the relevant provisions of the Building Code.

I, Matthew Cusiel, am a Chartered Professional Engineer, CPEng#161509, and am a Member of IPENZ.

The Engineering Company Ltd holds a current policy of Professional Indemnity Insurance no less than \$200,000.

Signed by M. Q. Cusiel, BE(hons), MIPENZ, CPEng, IntPE

on behalf of The Engineering Company Ltd, 8/1025 Ferry Rd, Ferrymead, Christchurch



(signature)

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Date: 2 September 2014

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.

LOCATION

Lot 146, Stage 5 Kippenberger Subdivision, Rangiora

Schedule of Engineering Inspections	
Inspection Stage	Timing of Inspection
Slab pre- pour	Once all reinforcing is placed and chaired

It is the contractor's responsibility to notify The Engineering Company Ltd 48 hours before engineering inspections are required. The total number of inspections will depend upon the construction methodology and staging. Additional inspections from those listed above may be required upon conditions found on site. See also, local territorial authority requirements for construction monitoring.

Project: Lot 146 Kippenberger – Horncastle
Job No: 14040.11
Date: September 2014
By: MC
Page: 1

TC2 Ribraft Slab – Design Notes

Lot 146, Stage 5 Kippenberger Subdivision, Rangiora

1. Geotechnical Reference:

Refer Tonkin & Taylor report “Kippenberger Estates Subdivision, Stages 5-7, Rangiora” – Ref 51147.011.R2 – Oct 2012. **Lewis & Barrow** have synthesised the recommendations of this report and conducted shallow bearing DCP tests.

Report Synopsis:

- Slab required for TC1 conditions but shall be doubly reinforced to allow for differential settlements
- The slab shall be capable of spanning over a 3m soft patch.
- The slab shall be designed to allow for a moderate amount of shrink/swell potential, in accordance with Class M (AS 2780)
- DCP tests confirm 300kPa ult. bearing capacity is available from 100mm below the surface.

2. Slab Design Considerations:

The slab has been designed to ensure it may span over a 3m soft patch (of circular shape).

In addition, to account for the expansive soils, the slab has been designed for a seasonal shrink / swell potential extending back 1.0m below the slab around the perimeter.

- LC 1 = Cantilevering of slab 1.0m at edge
LC 2 = Cantilevering of edge beam at corners due to 3.0m loss of bearing across the corner
LC 3 = Edge beam spanning a 3.0m loss of bearing
LC 4 = Ribraft slab spanning a 3.0m loss of bearing with a LB wall and beam in the centre
LC 5 = Internal beam supporting a LB wall with 3.0m loss of bearing

These load cases are described on the following page.

Slab edge beams are typically extended into the slab at re-entrant corners to provide continuity of the beams where they must span soft patches at these locations.

Load combinations to all load cases are 1.2G & 1.5Q

3. Slab Design:

Steel fibre reinforcement (SFR) has been added to the concrete primarily to meet the shear strength requirements. A spreadsheet is used to calculate the neutral axis depth in accordance with NZS3101 – appendix to section C5, so that the section flexural capacity can be calculated with various steel configurations. The value “a” is adjusted until the internal section actions balance (i.e. $C = T$). Once the neutral axis is known by iteration, the section strength can be determined. The section capacities for the five critical load cases are attached.

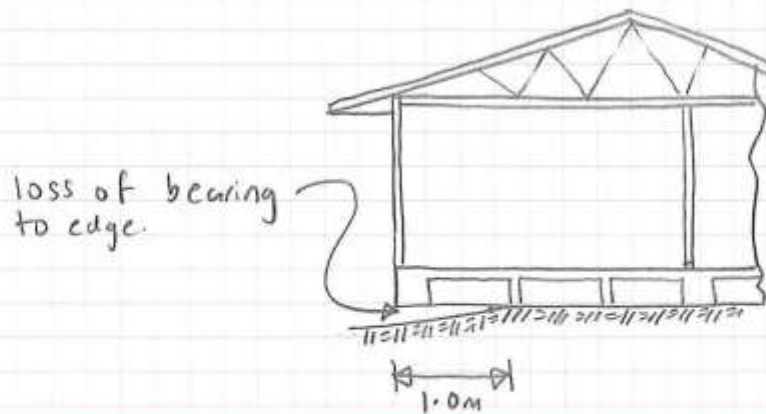
4. House Description:

The proposed house is a single storey, 70 series brick veneer (Heavy weight) clad timber framed house with a light clad trussed roof. See plan & elevations attached.

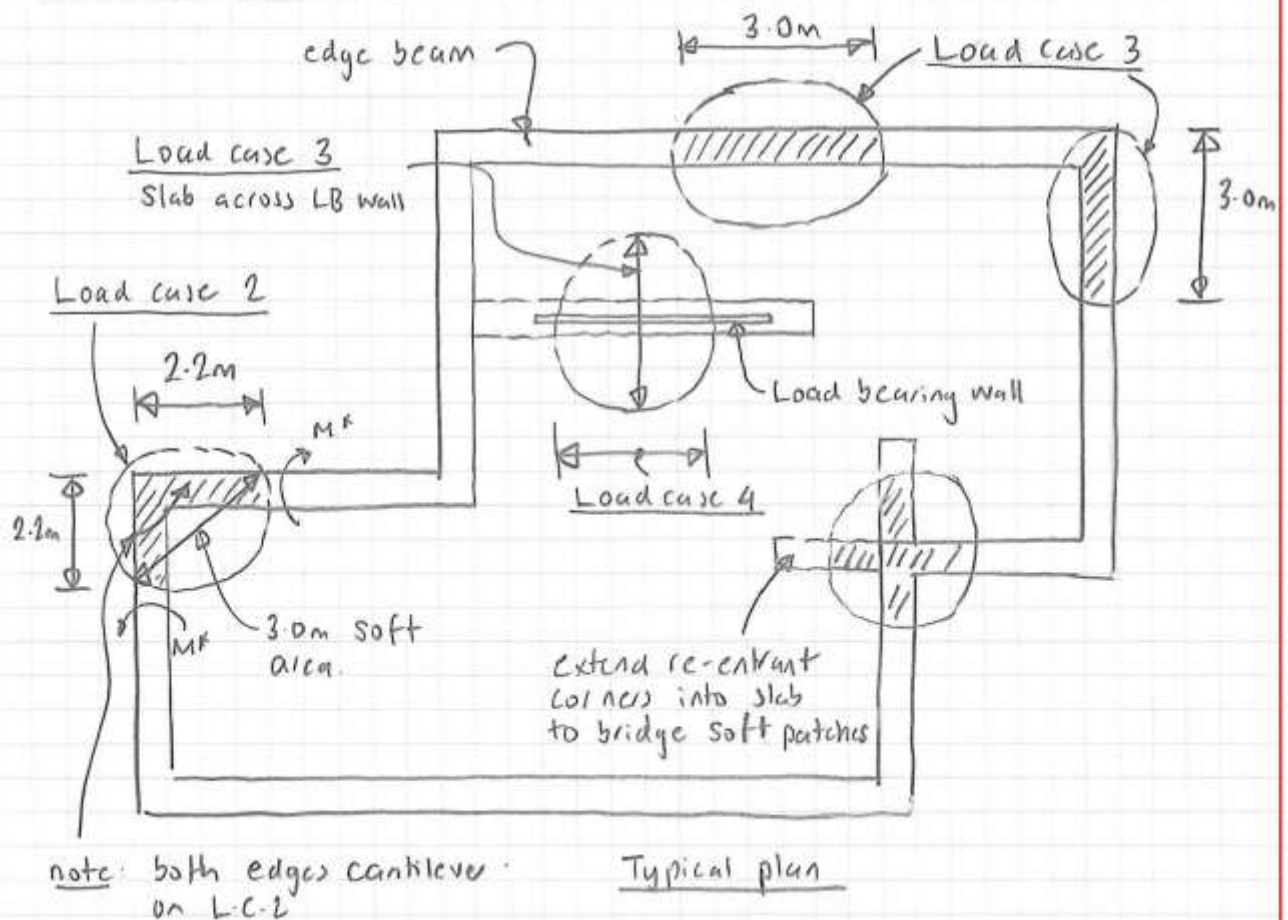
WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Summary of Load Cases 1 to 5

Load Case 1 - 1.0m loss of edge bearing due to shrink / swell potential



Load Case 2-5 - Slab spanning 3.0m soft spots



NOTE:

-GRADE 'A' SAFETY GLAZING IN ALL BATHROOMS WHERE GLAZING IS UNDER OR WITHIN 2m OF FLOOR LEVEL. (NZS4223)

□ = SAFETY GLAZING.

-ALL DOORS AND ALL WINDOWS OVER 600mm TO BE FITTED WITH SUPPORT BARS. BARS & FITTING POSITION TO BE SUPPLIED BY ALUMINIUM SUPPLIER (9.110.5 v).

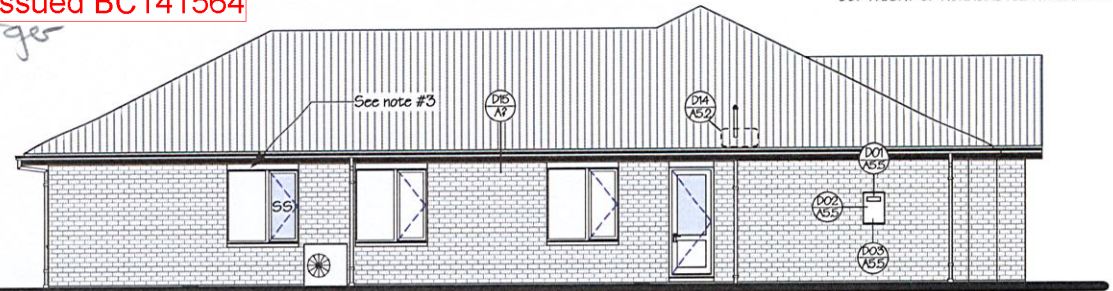
-S.S = SAFETY STAYS FITTED TO WINDOW.

* WALL IS BRACED WITH 7.5 PLY TO OUTSIDE FACE (ALLOW EXTRA FOR REVEAL THICKNESS)

Notes

- HARDIES LINEA WEATHERBOARDS (180mm) ON H3.1 20mm BATTENED CAVITY & BUILDING WRAP. CUT ENDS OF WEATHERBOARDS TO BE PRIMED. CAVITY TO FINISH WITH A UPVC VENT STRIP
- COLOURSTEEL GUTTER & FASCIA
- 135x16 HARDIES CLD TRIM ABOVE WINDOWS & DOORS
- 70 SERIES CLAY BRICK VENEER CLADDING
- DOUBLE GLAZED POWDER COATED ALUMINIUM FRAMED WINDOWS & DOORS WITH H3.1 TIMBER REVEALS
- CORRUGATED COLORSTEEL ROOFING

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	1
ENVELOPE COMPLEXITY	0	1	3	6	0
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE	0	2	4	6	2

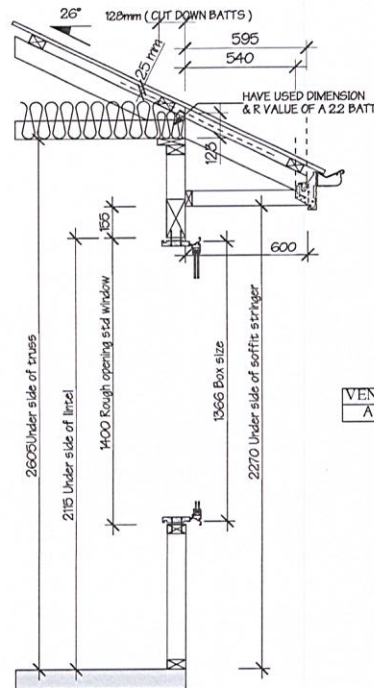
**ELEVATION 1**

Scale: 1:100

TIMBER TREATMENT SCHEDULE:

SG8 KILN DRIED PINUS RADIATA

EXTERNAL WALLS:	H12 TREATED
INTERNAL WALLS:	H12 TREATED
ALL BEAMS & LINTELS:	H12 TREATED
ALL FRAMES TO HAVE:	H12 BOTTOM PLATE
TRUSSES & EAVE FRAMING:	H12 TREATED
ECOPLY BARRIER:	H3.2 TREATED
WINDOW & DOOR REVEALS:	H3.1 TREATED
CHIMNEY FRAMING:	H12 TREATED
VALLEY BOARDS:	H12 TREATED
PURLINS:	H12 TREATED
COLUMN FRAMING:	H12 TREATED
GARAGE DOOR REVEALS:	H3.1 TREATED
CAVITY BATTENS:	H3.1 TREATED



RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	2
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE	0	2	4	6	4

light weight roof
on timber trusses
⇒ $q = 0.35 \text{ kPa}$

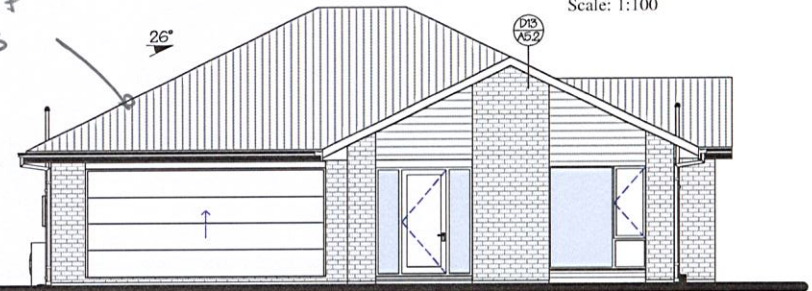
70 series brick veneer
on timber framing
 $q = 1.6 \text{ kPa}$

VENEE LINTEL TABLE

A 60x60x6L

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	1
ENVELOPE COMPLEXITY	0	1	3	6	0
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE	0	2	4	6	2

2.4m Stud

**ELEVATION 2**

Scale: 1:100

WINDOW SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
WC01	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC02	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC03	W19R	1400 mm	1400 mm	1.56 sqm	0.76 sqm
WC04	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC05	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC06	W22	2000 mm	1400 mm	2.10 sqm	1.52 sqm
WC07	WSP	1800 mm	2000 mm	3.33 sqm	0.87 sqm
WC08	W17	800 mm	1400 mm	0.81 sqm	1.01 sqm
WC09	W10G	2400 mm	2000 mm	3.84 sqm	1.52 sqm
WC10	W23	2400 mm	1400 mm	2.83 sqm	1.73 sqm

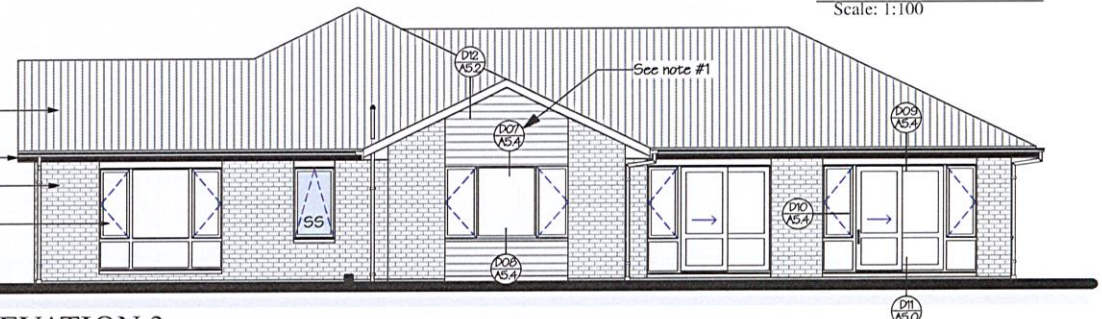
DOOR SCHEDULE					
ID	MODEL	WIDTH mm	HEIGHT mm	GLAZED AREA sqm	VENTILATION AREA sqm
CD2	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD3	D76	1280 mm	2050 mm	0.00 sqm	1.15 sqm
CD4	D54 OT	890 mm	2050 mm	0.71 sqm	1.63 sqm
CD5	D76	1280 mm	2050 mm	0.00 sqm	1.15 sqm
CD01	D7	3000 mm	2115 mm	4.32 sqm	3.23 sqm
CD02	D5	2400 mm	2115 mm	3.43 sqm	2.47 sqm
CD03	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD04	D82	2480 mm	2050 mm	0.00 sqm	2.35 sqm
CD05	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD06	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD07	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD08	D78	1680 mm	2050 mm	0.00 sqm	1.55 sqm
CD09	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD10	G69	4680 mm	2115 mm	0.00 sqm	19.26 sqm
CD11	D24K	875 mm	2115 mm	0.94 sqm	1.52 sqm
CD16	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD17	PTSP	1800 mm	2115 mm	1.60 sqm	1.73 sqm
CD18	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD19	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm
CD20	D78	1680 mm	2050 mm	0.00 sqm	1.55 sqm
CD21	D53	840 mm	2050 mm	0.00 sqm	1.53 sqm

2570 STUD STANDARD WINDOWS

Scale: 1:25

RISK FACTOR	L	M	H	VH	SUBTOTALS
WIND ZONE	0	0	1	2	1
NUMBER OF STOREYS	0	1	2	4	0
ROOF/WALL INTERSECTION	0	1	3	5	0
EAVES WIDTH	0	1	2	5	2
ENVELOPE COMPLEXITY	0	1	3	6	1
DECK DESIGN	0	2	4	6	0
TOTAL RISK SCORE	0	2	4	6	4

- See note #6
See note #2
See note #4
See note #5

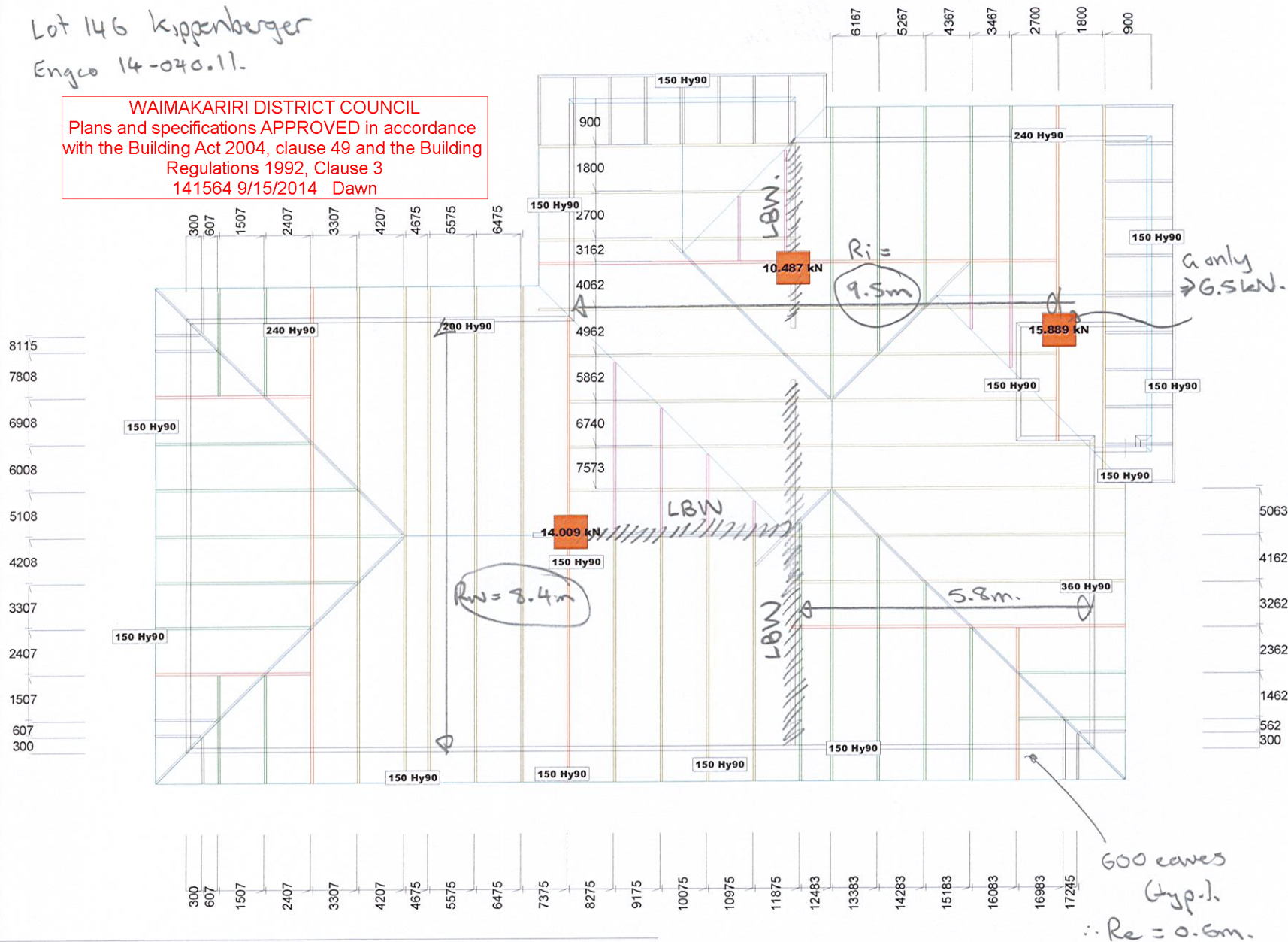
**ELEVATION 3**

Scale: 1:100

BUILDING CONSENT LAYOUT

Lot 146 Kippenberger
Engco 14-040.11.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn



CARTERS
Your Building Partner

Christchurch Manufacturing
19-21 Broughs Road, Christchurch
03 359 2731

JOB No **RG137202**

Client: HORNCastle HOMES
Job Name: J4146 - Turnkey
Address: Lot 146, Kippenberger

Pitch: 26.0deg
Roof Material: Galv Iron .5mm
Soffit Overhang: 600mm
Wind Area: High
Snow Load(factored): 0.428kPa

Trusses and rafters at 900mm
max centres unless stated otherwise.

This layout is to be read in conjunction
with the Architectural plans.

DRAWN BY Brent Yellowlees

DATE 13 Mar, 2014

PAGE 2 of 2

These lintels have been sized using
one of the following :

The GANGLAM 04/2008 and
FLITCH BEAM 12/2007
selection manuals from MiTek NZ Ltd.

hy90 and hyONE lintels have been sized
using designIT v5 NZ software
(incl. sub versions) or selection manuals,
hy90 Edition 1, and hyONE April 2008,
as provided by CHH Woodproducts.

Unless otherwise stated the timber grade
for all lintels is SG8. Lintels not shown
are to be selected as per NZS3604: 2011.

All walls shown on this layout are
considered to be load bearing.



See Page 1 for Truss
Layout and Fixings

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5
LOSS OF BEARING ACTIONS FOR RIBRAFT SLABS ON TC2 SITES in accordance with DBH guidelines

Job name: Lot 146 Kippenberger
File: EngCo 14-040.11
House Location: Lot 146 Kippenberger

Date: 22/03/14
Client: Horncastle

INPUT CELLS IN BLUE ONLY

SEE EXPLANATION OF LOAD CASES ON FOILLOWING SHEETS "Design Notes" - Pages DN-1 & DN-2

Actions		Building Element Weights (single storey dwellings only)			
Roof & External wall loading	Wall Cladding:	70 Series Veneer	Wt =	1.60	kPa
	Wall Height:	2.4 m			
	Estimated %'age of openings:	10 %	Wall weight = Ht x (1-%'openings) x Wt =	3.46	kN/m
	Roof Cladding:	Long run Iron	Roof Wt =	0.35	kPa (incl frame & ceiling)
	Eave width, Re:	0.6 m	L.D. = Re + Rw/2 =	4.8	m
	Truss span to exterior wall, Rw:	8.4 m	Roof weight = L.D. x Wt =	1.68	kN/m
	Other loads to exterior walls:	0 kN	Total Weight at edge (from roof & wall):	5.14	kN/m
Slab and edge beam details	Pod thickness:	300 mm			
	Slab thickness, Tf:	100 mm	Total Slab Ribraft Wt (inc. SDL) =	3.80	kPa
	S.D.L.'s - (partition walls, etc):	0.25 kPa	Edge beam Wt =	2.88	kN/m
	Edge beam width, Be:	300 mm	Total Load at base of edge beam:	11.82	kN/m
Interior load bearing wall loading	Roof span to Interior wall, Ri:	9.5 m	L.D. = Ri/2 =	4.75	m
	Internal wall weight:	1.00 kN/m	Int. Roof wt =	1.66	
	Internal beam width, Bi:	300 mm	Int. beam Wt =	2.88	
			Total Load at base of internal beam:	5.54	kN/m
Live Loading	Q, Live load:	2.5 kPa	EQ comb Factor =	0.4	
			Post EQ Live Load:	1.00	kPa

Load Case 1		2m loss of edge bearing - Slab Actions (Hogging)	
M*/rib @ 1.2m:	M*g = Wall/Roof Wt x 2.0m + Edge beam Wt x (2m-width/2) + slab wt x (2m-edge beam)^2 / 2 =	21.1	kNm/m
	M*q = Q x comb. factor x 1.9m^2/2 =	1.8	kNm/m
	Earthquake load combination = (M*g & 0.4.M*q) x 1.2m (rib spacing) =	27.5	kNm/rib
	V*g = Wall/Roof Wt + Edge beam Wt + slab wt x (2m-edge beam) =	11.8	kN/m
V*/rib @ 1.2m:	V*q = Q x comb. Factor x 1.9m =	1.9	kN/m
	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =	16.5	kN/rib

Load Case 2		2m loss of edge bearing - EDGE BEAM Actions at corner (hogging)	
L = 2.0m	M*g = (Wall/roof /Edge bm Wt + Slab Wt x 0.6m width) x L^2 / 2 + (Wall/roof/Edge bm Wt) x 0.9m x 2m =	35.0	kNm
	M*q = (Q x comb. factor) x 0.9m width x L^2 / 2 =	1.8	kNm
M*:	Earthquake load combination = M*g & 0.4.M*q =	36.8	kNm
V*g = (Wall/roof/Edge beam Wt + Slab Wt x 0.6m width) x 2.0m + (Wall/roof/edge bm Wt) x 0.9m =		27.8	kN
	V*q = (Q x comb. factor) x 0.6m width x 2.0m =	1.2	kN
V*:	Earthquake load combination = (V*g & 0.4V*q) =	29.0	kN

Load Case 3		4m loss of bearing - EDGE BEAM Actions (spanning over 4m gap)	
L = 4.0m	-ve M*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L^2 / 8 =	-ve	20.6 kNm
	-ve M*q = (Q x comb. factor) x 0.9m width x L^2 / 8 =	-ve	1.8 kNm
hogging (-ve) M*:	Earthquake load combination = M*g & 0.4.M*q =	-ve	22.4 kNm
	+ve M*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L^2 / 12 =	+ve	13.7 kNm
sagging (+ve) M*:	+ve M*q = (Q x comb. factor) x 0.9m width x L^2 / 12 =	+ve	1.2 kNm
	Earthquake load combination = M*g & 0.4.M*q =	+ve	14.9 kNm
V*g = (Wall/roof Wt + Edge beam Wt + Slab Wt x 0.6m width) x L / 2 =			20.6 kN
	V*q = (Q x comb. factor) x 0.9m width x L / 2 =		1.8 kN
V*:	Earthquake load combination = (V*g & 0.4V*q) =		22.4 kN

Load Case 4		4m loss of bearing - INTERNAL SLAB with L.B central wall (P, kN) - spanning over 4m gap			
Central Load on Rib = Int slab beam wt + Int. wall wt + Int. roof wt:		5.54	kN (per m width of beam crossing ribs)		
L = 4.0m	M*g = Slab Wt .L^2 / 8 + P.L / 8 =	-ve	10.4	kNm	
	M*q = Q x comb. Factor.L^2 / 8 =	-ve	2.0	kNm	
M*/rib @ 1.2m:	Earthquake load combination = (M*g & 0.4M*q) x 1.2m (rib spacing) =	-ve	14.8	kNm	
	V*g = Slab Wt.L / 2 + P/2 =		10.4	kN	
	V*q = (Q x comb. factor).L / 2 =		2.0	kN	
V*/rib @ 1.2m:	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =		14.8	kN	

Load Case 5		4m loss of bearing - INTERNAL 300mm BEAM with L.B central wall (P kN/m) - spanning over 4m gap	
Distributed wall & roof weight, W:		2.66	kN/m
Additional point Load, P:		6	kN (assume central)
L = 4.0m	M*g = (Beam Wt + 0.9m Slab Wt + W) .L^2 / 8 + P.L / 4 =	23.9	kNm
	M*q = (Q x comb. Factor) x 1.2m width .L^2 / 8 =	2.4	kNm
-ve & +ve M*:	Earthquake load combination = M*g & 0.4.M*q =	26.3	kNm
V*g = (Rib Wt + 0.9m Slab Wt +P).L/2 + P/2 =		20.9	kN
	V*q = (Q x comb. factor) x 1.2m width.L/2 =	2.4	kN
V*:	Earthquake load combination = (V*g & 0.4V*q) x 1.2m (rib spacing) =	23.3	kN

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ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

LOAD CASE 1 - 2m loss of edge bearing - Cantilevering of slab ribs (Hogging only)

Contract: Lot 146 Kippenberger		Location: Lot 146 Kippenberger		Date: 22-Mar-14	File: EngCo 14-040.11
member actions (from first page) :		M*-ve: 27.5 kNm/1.2m	M*+ve: N.A. (Tension at top only)	V* : 16.5 kN/1.2m	
		RED CELLS FROM PREVIOUS INPUT	INPUT CELLS IN BLUE		

1. Member and reinforcing details (see design notes)

Section details						fibre details					sectional properties			
f'c	20	Mpa	As,mesh/m	146	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	110000	mm ²	
b.eff	800	mm	As,mesh eff	117	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	104.55	mm	
df	100	mm	Mesh name:	SE-62							Act top =	80455	mm ²	
bw	100	mm				kh =	0.653				Act Bottom =	29545	mm ²	
h	400	mm												
d'	35	mm	from top											
d	350	mm	from top											
flange reo	230	mm ²	Mesh/H12	fy	500	MPa			As(min) flange =	76.4	from C5A-17 of NZS3101			
web reo	113	mm ²	H12	fy	500	MPa			As(min) rib =	28.1	assumes pure bending			

2. Bending strength - flange in tension (hogging)

a=	80.12	mm	c=	94.3	
(adjust "a" so C = T)					
			T (reo) =	114.90	kN
			T (fibre) =	21.31	kN
C=	136.21	kN	T (Total) =	136.21	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.289		fibre flange	4.02	
σ3 (at reo)	0.241		fibre web	1.13	
			reo	37.34	
			total	42.48	
M* = 27.5			ΦMn	36.1	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	6.97	mm	c=	8.2	
(adjust "a" so C = T)					
			check less than :	100	
			T (reo) =	56.50	kN
			T (fibre) =	38.25	kN
C=	94.75	KN	T (Total) =	94.75	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.387		fibre flange	1.51	
σ3 (at reo)	0.241		fibre web	1.66	
			reo	19.58	
			total	22.75	
M* = N.A.			ΦMn	19.3	kNm
					N.A.

4. Shear Strength

shear strength of hogging section						shear strength of sagging section					
pw=	0.00630		kf=	1.5		pw=	0.00323				
Vb=	21.70	kN	(kf must be less than:)			Vb=	16.01	kN			
Vfd	8.08	kN	k1	1.76		Vfd	7.74	kN			
Φ Vc	22.3	kN				ΦVc	17.8	kN			
			n=	3							
			(n lesser of:)								
			n1	3							
			n2	3.00							
Vb1	21.70	(= 0.7+10pw).v(f'c.dbw)				Vb1	16.01				
vb2	27.75					vb2	26.61				
											OK

Load case 1 solution:

400mm deep x 100mm wide rib - SE-62 mesh - Additional H12 bar under mesh - 100mm slab -300mm pod - 20Mpa SFR concrete

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

Load Case 2 : 2m loss of edge bearing - Edge Beam Actions at corner (hogging)

Contract Lot 146 Kippenberger	Location: Lot 146 Kippenberger	Date: 22-Mar-14	File: EngCo 14-040.11
member actions: M*-ve: 36.8 kNm	M*+ve: N.A. (tension at top only)	V* : 29.0 kN	
RED CELLS FROM PREVIOUS INPUT		INPUT CELLS IN BLUE	

1. Member and reinforcing details (see design notes)

Section details						fibre details					sectional properties			
f'c	20	Mpa	As,mesh/m	146	mm ²	r1	1.5	MPa	modifier	0.45	Ag = 160000 mm ²			
bf	700	mm	As,mesh eff	102	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top = 162.50 mm			
df	100	mm	Mesh name:	SE-62							Act top = 88750 mm ²			
bw	300	mm				kh =	0.653				Act Bottom = 71250 mm ²			
h	400	mm												
d'	35	mm	from top											
d	350	mm	from top											
flange reo	328	mm ²	Mesh / 2-H12		fy	500	MPa		As(min) flange =	84.3	from C5A-17 of NZS3101			
web reo	226	mm ²	2-H12		fy	500	MPa		As(min) rib =	67.7	assumes pure bending			

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check minimum reinforcement requirement

2. Bending strength - flange in tension (hogging)

a=	39.89	mm	c=	46.9	
(adjust "a" so C = T)					
			T (reo) =	164.10	kN
			T (fibre) =	39.35	kN
C=	203.45	kN	T (Total) =	203.45	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.282		fibre flange	3.71	
σ3 (at reo)	0.241		fibre web	3.96	
			reo	56.62	
			total	64.29	
M* = 36.8			ΦMn	54.7	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	13.54	mm	c=	15.9	
(adjust "a" so C = T)					
			check less than : 100		
			T (reo) =	113.00	kN
			T (fibre) =	48.15	kN
C=	161.15	KN	T (Total) =	161.15	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.390		fibre flange	1.23	
σ3 (at reo)	0.241		fibre web	4.94	
			reo	38.78	
			total	44.95	
M* = N.A.			ΦMn	38.2	kNm
					N.A.

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw=	0.00300		kf=	1.285714	n=	3	pw	0.00215	
Vb=	48.96	kN	(kf must be less than:)		(n lesser of:)		Vb=	42.98	kN
Vfd	20.77	kN	k1	1.76	n1	3	Vfd	19.91	kN
ϕ Vc	52.3	kN			n2	9.00	ϕ Vc	47.2	kN
Vb1	48.96	(= 0.7+10pw).√(f'c.dbw)			Vb1	42.98			
vb2	83.25				vb2	79.83			
					<div>V* = 29.0 ϕ Vc = 47.2</div>				
					<div>OK</div>				

Load case 2 solution:

300mm wide edge beam x 400mm deep - 2-H12 top bars and 2-H12 bottom bars - 20Mpa SFR concrete

ENGCO Consulting Ltd - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

LOAD CASE 3 - 4m Loss of bearing on edge beam

Contract Lot 146 Kippenberger		Location: Lot 146 Kippenberger		Date: 22-Mar-14	File: EngCo 14-040.11
member actions:	M*-ve: 22.4	kNm	M*+ve: 14.9	kNm	V* : 22.4 kN
RED CELLS FROM PREVIOUS INPUT			INPUT CELLS IN BLUE		

1. Member and reinforcing details (see design notes)

Section details				fibre details				sectional properties					
f'c	20	Mpa	As,mesh/m	146	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	160000	mm ²
bf	700	mm	As,mesh eff	102	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	162.50	mm
df	100	mm	Mesh name:	SE-62							Act top =	88750	mm ²
bw	300	mm				kh =	0.653				Act Bottom =	71250	mm ²
h	400	mm											
d'	35	mm	from top										
d	350	mm	from top						check minimum reinforcement requirement				
flange reo	328	mm ²	Mesh / 2-H12	fy	500	MPa			As(min) flange =	84.3	from C5A-17 of NZS3101		
web reo	226	mm ²	2-H12	fy	500	MPa			As(min) rib =	67.7	assumes pure bending		

2. Bending strength - flange in tension (hogging)

a=	39.89	mm	c=	46.9	
(adjust "a" so C = T)					
			T (reo) =	164.10	kN
			T (fibre) =	39.35	kN
C=	203.45	kN	T (Total) =	203.45	kN
fibre stress profile			moments (about c)		
σ2 (at c=)	0.441		fibre flange	3.71	
at flange junction	0.282		fibre web	3.96	
σ3 (at reo)	0.241		reo	56.62	
			total	64.29	
M* = 22.4			ΦMn	54.7	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	13.54	mm	c=	15.9	check <	100
(adjust "a" so C = T)			check less than : 100			
			T (reo) =	113.00	kN	
			T (fibre) =	48.15	kN	
C=	161.15	KN	T (Total) =	161.15	kN	
fibre stress profile			moments (about c)			
σ2 (at c=)	0.441		fibre flange	1.23		
at flange junction	0.390		fibre web	4.94		
σ3 (at reo)	0.241		reo	38.78		
			total	44.95		
	M*= 14.93		φMn	38.2	kNm	
					OK	

4. Shear Strength

shear strength of hogging section					shear strength of sagging section				
pw=	0.00300		kf=	1.2857143	n=	3			
Vb=	48.96	kN	(kf must be less than:)		(n lesser of:)				
Vfd	20.77	kN	k1	1.76	n1	3			
Φ Vc	52.3	kN			n2	9.00			
Vb1	48.96	(= 0.7+10pw).√(f'c.dbw)			Vb1	42.98			
vb2	83.25				vb2	79.83			
									OK

Load case 3 solution:

300mm wide edge beam x 400mm deep - 2-H12 top bars and 2-H12 bottom bars - 20Mpa SFR concrete

ENGCO Consulting - Steel fibre reinforced (SFR) Ribraft slabs calculator to NZS3101 - Appendix C5

Load Case 4 : 4m loss of bearing under 100mm ribs across INTERNAL BEAM with L.B central wall (P kN/m)

Contract	Lot 146 Kippenberger	Location:	Lot 146 Kippenberger	Date:	22-Mar-14	File:	EngCo 14-040.11
member actions:	M*-ve: 14.8	kNm/1.2m	M*+ve: 14.8	kNm/1.2m	V* :	14.8	kN/1.2m
RED CELLS FROM PREVIOUS INPUT				INPUT CELLS IN BLUE			

1. Member and reinforcing details (see design notes)

Section details						fibre details					sectional properties			
f'c	20	Mpa	As,mesh/m	146	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	110000	mm ²	
bf	800	mm	As,mesh eff	117	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	104.55	mm	
df	100	mm	Vmesh name:	SE-62							Act top =	80455	mm ²	
bw	100	mm				kh =	0.653				Act Bottom =	29545	mm ²	
h	400	mm												
d'	35	mm	from top											
d	350	mm	from top											
flange reo	117	mm ²	mesh only	fy	500	MPa			As(min) flange =	76.4	from C5A-17 of NZS3101			
web reo	113	mm ²	H12	fy	500	MPa			As(min) rib =	28.1	assumes pure bending			

2. Bending strength - flange in tension (hogging)

a=	47.58	mm	c=	56.0	
(adjust "a" so C = T)					
			T (reo) =	58.40	kN
			T (fibre) =	22.48	kN
C=	80.88	kN	T (Total) =	80.88	kN
fibre stress profile					
σ2 (at c=)	0.441		moments (about c)		
at flange junction	0.283		fibre flange	4.20	
σ3 (at reo)	0.241		fibre web	1.28	
			reo	19.93	
			total	25.41	
M* = 14.8			ΦMn	21.6	kNm
					OK

3. Bending strength - flange in compression (sagging)

a=	6.97	mm	c=	8.2	check <	100
(adjust "a" so C = T)			check less than :			100
			T (reo) =	56.50	kN	
			T (fibre) =	38.25	kN	
C=	94.75	kN	T (Total) =	94.75	kN	
fibre stress profile			moments (about c)			
σ2 (at c=)	0.441		fibre flange	1.51		
at flange junction	0.387		fibre web	1.66		
σ3 (at reo)	0.241		reo	19.58		
			total	22.75		
M*=	14.8		ΦMn	19.3	kNm	OK

4. Shear Strength

shear strength of hogging section						shear strength of sagging section					
pw=	0.00320		kf=	1.5		pw	0.00323				
Vb=	16.65	kN	(kf must be less than:		n=	3	Vb=	16.01	kN		
Vfd	8.08	kN	k1	1.76	(n lesser of:)		Vfd	7.74	kN		
Φ Vc	18.5	kN			n1	3	Φ Vc	17.8	kN		
					n2	3.00					
Vb1	16.65	(= 0.7+10pw).V(f'c.dbw)					Vb1	16.01			
vb2	27.75						vb2	26.61			
									V* =	14.8	
									Φ Vc =	17.8	
									OK		

Load case 4 solution:

100mm wide rib x 400mm deep with H12 bottom bar - 100mm slab with DM-146 mesh - 20Mpa SFR concrete

Load Case 5 : 4m loss of bearing - INTERNAL 300mm BEAM with L.B central wall (P kN/m) - spanning over 4m gap

Contract Lot 146 Kippenberger		Location: Lot 146 Kippenberger		Date: 22-Mar-14		File: EngCo 14-040.11	
member actions:	M*-ve: 26.3	kNm/1.2m	M*+ve: 26.3	kNm/1.2m	V* :	23.3	kN/1.2m
RED CELLS FROM PREVIOUS INPUT				INPUT CELLS IN BLUE			

1. Member and reinforcing details (see design notes)

Section details			fibre details						sectional properties				
f'c	20	Mpa	As,mesh/m	146	mm ²	r1	1.5	MPa	modifier	0.45	Ag =	170000	mm ²
bf	800	mm	As,mesh eff	117	mm ²	fr4	1	MPa	modifier	0.37	N.A. depth from top =	155.88	mm
df	100	mm	Mesh name:	SE-62							Act top =	96765	mm ²
bw	300	mm				kh =	0.653				Act Bottom =	73235	mm ²
h	400	mm											
d'	35	mm	from top										
d	350	mm	from top										
flange reo	343	mm ²	Mesh / 2-H12		fy	500	MPa		As(min) flange =	91.9	from C5A-17 of NZS3101		
web reo	226	mm ²	2-H12		fy	500	MPa		As(min) rib =	69.6	assumes pure bending		

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check minimum reinforcement requirement

2. Bending strength - flange in tension (hogging)

a=	41.62	mm	c=	49.0	
(adjust "a" so C = T)					
			T (reo) =	171.40	kN
			T (fibre) =	40.84	kN
C=	212.24	kN	T (Total) =	212.24	kN
fibre stress profile		moments (about c)			
σ2 (at c=)	0.441	fibre flange	4.23		
at flange junction	0.282	fibre web	3.93		
σ3 (at reo)	0.241	reo	58.99		
		total	67.16		
M* = 26.3		ΦMn	57.1	kNm	OK

3. Bending strength - flange in compression (sagging)

a=	12.14	mm	c=	14.3	check <	100
(adjust "a" so C = T)					check less than :	100
			T (reo) =	113.00	kN	
			T (fibre) =	52.13	kN	
C=	165.13	kN	T (Total) =	165.13	kN	
fibre stress profile		moments (about c)				
σ2 (at c=)	0.441	fibre flange	1.43			
at flange junction	0.390	fibre web	4.95			
σ3 (at reo)	0.241	reo	38.86			
		total	45.24			
	M*= 26.33	ΦMn	38.5	kNm		OK

4. Shear Strength

shear strength of hogging section				shear strength of sagging section			
pw=	0.00313		kf=	1.2857143	n=	3	
Vb=	49.61	kN	(kf must be less than:)		(n lesser of:)		
Vfd	20.77	kN	k1	1.76	n1	3	
Φ Vc	52.8	kN			n2	9.00	
Vb1	49.61	(= 0.7+10pw).v(f'c.dbw)			Vb1	42.98	
vb2	83.25				vb2	79.83	OK

V* = 23.3
ΦVc = 47.2

Load case 5 solution: 300mm wide internal beam x 400mm deep - 2-H12 top bars & DM-146 mesh and 2-H12 bottom bars - 20Mpa SFR concrete

**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

Truss Details & Bracing Details

(Include Fixings of Gib & Ecoply)

- Design IT Calcs
- Hyspan etc.

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The diagram is a structural floor plan for a building. It features a grid of columns and beams. The columns are labeled with codes such as R2, R3, J4, J4A, J3C, J3, J3A, J3D, J3A, J3, J3B, R3, R2, T5, T6, T6, T6, T6, J1F, J1E, J1B, J1A, J1, J1C, R1, R2, and HB1. The beams are labeled with codes such as HB5, R2, J4, J4A, TG2, TR5, T4, T4, T4, T4, T5, T6, T6, T6, T6, J1F, J1E, J1B, J1A, J1, J1C, R1, R2, and HB1. The plan also shows a staircase and a lift shaft. The staircase is located in the upper right corner, and the lift shaft is located in the lower right corner. The plan is labeled with various codes and dimensions, and includes a title block in the top left corner.

Truss "As-Build" designs may be sent to Buildinginfo@wmk.govt.nz

BC141564

9kN and 16kN

BUILDING CONSENT LAYOUT

Consent Issued BC141564



Christchurch Manufacturing
19-21 Broughs Road, Christchurch
03 359 2731

JOB No **RG137202**

Client: HORNCastle HOMES
Job Name: J4146 - Turnkey
Address: Lot 146, Kippenberger

Pitch: 26.0deg
Roof Material: Galv Iron .5mm
Soffit Overhang: 600mm
Wind Area: High
Snow Load(factored): 0.428kPa

Trusses and rafters at 900mm
max centres unless stated otherwise.

This layout is to be read in conjunction
with the Architectural plans.

DRAWN BY Brent Yellowlees

DATE 13 Mar,2014

PAGE 2 of 2

These lintels have been sized using
one of the following :

The GANGLAM 04/2008 and
FLITCH BEAM 12/2007
selection manuals from MiTek NZ Ltd.

hy90 and hyONE lintels have been sized
using designIT v5 NZ software
(Incl. sub versions) or selection manuals,
hy90 Edition 1, and hyONE April 2008,
as provided by CHH Woodproducts.

Unless otherwise stated the timber grade
for all lintels is SG8. Lintels not shown
are to be selected as per NZS3604: 2011.

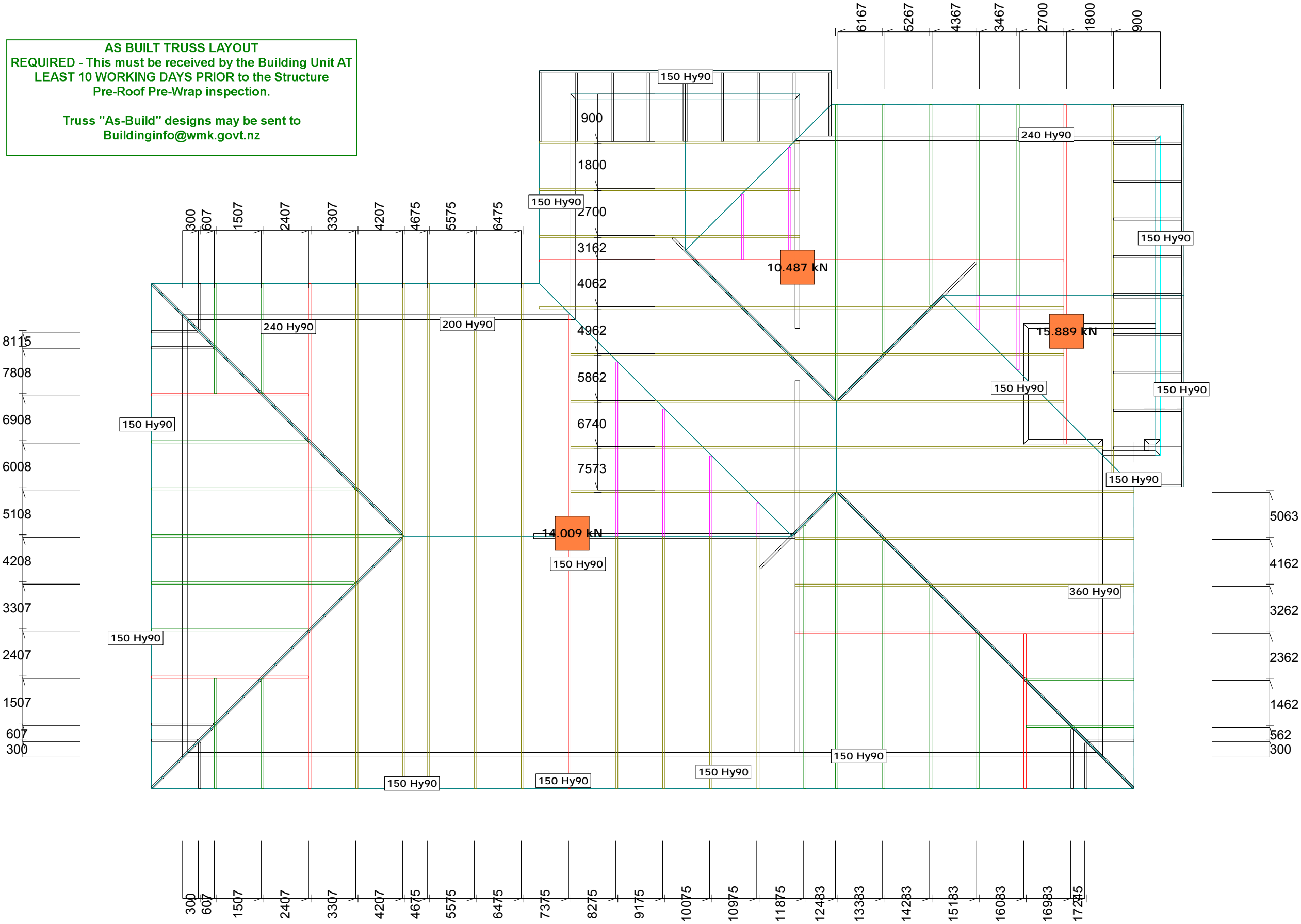
All walls shown on this layout are
considered to be load bearing.



See Page 1 for Truss
Layout and Fixings

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



_kN NOTIFICATION OF POINT LOADED LINTELS AND POINT LOADS ON INTERNAL
OR EXTERNAL WALLS WHERE THE DOWNLOAD IS HIGHER THAN 10kN.
Note: If no point loads indicated, loading does not exceed 10kN.

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Consent Issued BC141564

MiTek New Zealand Limited

BC141564

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.mitekknz.co.nz

MiTek 20/20 Engineering 4.6.6.193

Printed: 15:10:07 13 Mar 2014

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.6

ISSUED BY: MiTek New Zealand Limited

TO: Christchurch Manufacturing

IN RESPECT OF: MiTek® Truss Designs

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **RG137202** 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, 13 March 2014

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

WAIMAKARIRI DISTRICT COUNCIL
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MITEK FABRICATOR DESIGN STATEMENT

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

MiTek 20/20® TRUSS DESIGN DATA

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

Job Details				Importance Level :	2	Design Working Life :	50 years
Roof Truss				Pitch:	26.000 deg	Nominal Overhang:	600 mm
Timber Group:				Ceiling		Wind	
Roof				Material:	Standard	Area:	High (44.0 m/s)
Material:				Dead Load:	0.200 kPa	Pressure Coeff:	Cpe = varies; Cpi = -0.30, 0.20
Dead Load:				Restraints:	400 mm centres	Snow	
Restraints:				Live Load:	Qc = 1.400 kN	Location:	at 100 m
Live Load:						Open Ground Load:	0.900 kPa
Qc = 1.100 kN						Basic Roof Load:	0.630 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)
*ET1	1	6110	26.000	900	J3C	1	2407	26.000	900	T6	4	4230	26.000	900
*ET2	1	4380	26.000	900	J3D	1	2407	26.000	900	T7	3	4380	26.000	900
*HB1	1	7986	19.028	900	J4	2	1507	26.000	900	T8	1	6110	26.000	900
*HB2	1	2068	19.028	900	J4A	2	1507	26.000	900	T9	1	5890	26.000	900
*HB3	1	3755	19.028	900	*R1	1	1153	26.000	900	TG1	1	5880	26.000	900 LB
*HB4	1	4409	19.028	900	*R2	6	891	26.000	900	TG2	1	8460	26.000	900
*HB5	2	6776	19.028	900	*R3	2	1198	26.000	900	TR1	1	5880	26.000	900
J1	1	2362	26.000	900	*R4	1	5580	26.000	900	TR2	1	5880	26.000	900
J1A	2	2362	26.000	900	*R5	1	7310	26.000	900	TR3	1	9430	26.000	900
J1B	2	2362	26.000	900	*R6	9	1305	0.000	686	TR4	1	9430	26.000	900
J1C	1	2362	26.000	900	*R7	1	1205	0.000	686	TR5	1	8460	26.000	900
J1D	2	2362	26.000	900	*R8	6	1305	0.000	722	V1	1	3330	26.000	900
J1E	2	2362	26.000	900	*R9	6	1305	26.000	722	V2	1	2430	26.000	900
J1F	1	2362	26.000	900	T1	1	10170	26.000	900	V3	1	1530	26.000	900
J2	1	1462	26.000	900	T1A	1	10170	26.000	900	V4	1	630	26.000	900
J2A	1	1462	26.000	900	T2	1	9430	-26.000	900	V5	1	2145	26.000	900
J3	2	2407	26.000	900	T3	1	9430	26.000	900	V6	1	1245	26.000	900
J3A	2	2407	26.000	900	T4	4	8460	26.000	900	V7	1	1415	26.000	900
J3B	1	2407	26.000	900	T5	1	8460	26.000	900	V8	1	648	26.000	900

Total quantity : 98

The computer design input has been carried out by:

Name of Computer Operator: Brent Yellowlees

Qualifications and Title: Truss Detailer

Signed:



A Division of Carter Holt Harvey

Dated: Thursday, 13 March 2014

Job: RG137202

Client: HORNBY LUMBER
Phone:

Christchurch Manufacturing
Consent Issued BC141564

J4146 - Turnkey
Lot 146, Kippenberger

Slab Thickening Report : Page 1
BC141564

Description:
Building Consent No.:
MiTek 20/20 Engineering 4.6.6.193

MiTek New Zealand Limited.

Phone:

Printed: 15:10:23 13 Mar 2014.

TRUSS BEARINGS EXCEEDING 10KN REPORT - Ultimate Limit State Loads

MiTek® Truss List

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

Critical Trusses	Qty	Span (mm)	Joint	Bearing Reactions (kN)	
				Down	Uplift
T2	1	9430	M	10.487	7.564
T5	1	8460	L	14.469	10.796
T9	1	5890	K	15.889	11.638

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

GIB EzyBrace® Systems



GIB EzyBrace® System Specification – GS1-N

JUNE 2011

Specification Code	Minimum Length (m)	Lining requirement
GS1-N	0.4	Any 10mm or 13mm GIB® Standard Plasterboard to one side only

WALL FRAMING

Wall framing to comply with;

- NZBC B1 - Structure; AS1 Clause 3 Timber (NZS 3604:2011)
 - NZBC B2 - Durability AS1 Clause 3.2 Timber (NZS 3602)
- Framing dimensions and height as determined by NZS 3604 stud and top plate tables for load bearing and non-bearing walls. The use of kiln dried stress graded timber is recommended.

BOTTOM PLATE FIXING**Timber Floor**

Pairs of hand driven 100 x 3.75mm nails at 600mm centres; or

Three power driven 90 x 3.15 nails at 600mm centres.

Concrete floor**INTERNAL WALL BRACING LINES**

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

EXTERNAL WALL BRACING LINES

In accordance with the requirements of NZS 3604 for external plate fixing.

WALL LINING

Any 10mm or 13mm GIB® Plasterboard lining.

Sheets can be fixed vertically or horizontally.

Sheet joints shall be touch fitted.

Use full length sheets where possible.

PERMITTED SUBSTITUTION

For permitted GIB® Plasterboard substitutions refer to Page 21 in GIB Ezybrace® Systems 2011.

FASTENING THE LINING**Fasteners**

32mm x 6g GIB® Grabber® high thread screws; or 30mm GIB® Nails.

Fastener centres

50,100,150, 225, 300mm from each corner and 150mm thereafter around the perimeter of the bracing element.

For vertically fixed sheets place fasteners at 300mm centres to intermediate sheet joints.

For horizontally fixed sheets place single fasteners to the sheet edge where it crosses the stud.

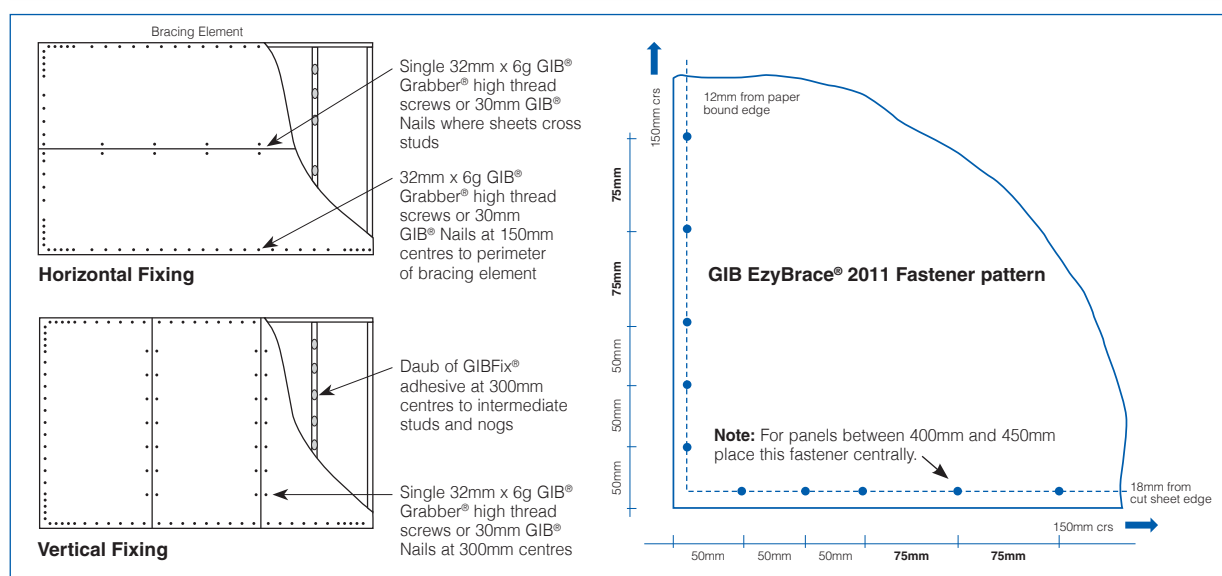
Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs.

Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

JOINTING

All fastener heads stopped and all sheet joints paper tape reinforced and stopped in accordance with the GIB® Site Guide.

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In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This Specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems 2011 and has been appraised in accordance with the BRANZ Appraisal No. 294 (2011).



ECOPLY [®] STRUCTURAL	ECOPLY [®] STRUCTURAL	ECOPLY [®] STRUCTURAL	ECOPLY [®] STRUCTURAL	ECOPLY [®] STRUCTURAL
Square EDGE	FLOORING	ROOFING	Grooved LINING	Cut To SIZE

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ECOPLY[®] STRUCTURAL

BARRIER

Rigid Air Barrier
Specification & Installation Guide

JANUARY 2014





BARRIER

Contents

1.0 Ecoply® Barrier.....	3
2.0 Ecoply® Brand.....	4
3.0 Technical Information and CAD Details	4
4.0 Ecoply Barrier Advantages	4
4.1 Architects / Designers	4
4.2 Builders.....	5
4.3 Homeowners	5
5.0 Ecoply® Barrier System	6
5.1 Tapes	6
5.2 Coating – Panels.....	6
6.0 Design Considerations.....	7
7.0 Installation.....	8
7.1 Installation.....	8
7.2 Installation – Sealing Tape.....	9
7.3 Installation – Sill Tape	12
7.4 Installation – Frame Flashing Tape.....	13
7.5 Service Penetrations.....	14
7.6 Structural Bracing	15
7.7 Ecoply® Barrier Bracing Specification – EPB1	16
7.8 Ecoply® Barrier Bracing Specification – EPB2.....	17
7.9 Ecoply® Barrier Bracing Specification – EPBG.....	18
7.10 GIB Handibrac® – Recommended Installation Method.....	19
7.11 Top Plate Hold Down Connections.....	20
8.0 Fire Rated Systems	21
9.0 Cladding System Installation.....	21
10.0 Working Instructions	21
11.0 Referenced Documents.....	21
12.0 Frequently Asked Questions	22
13.0 Ecoply® Barrier Installation Checklist.....	23

The information contained in this manual relates specifically to Ecoply Barrier branded structural plywood manufactured by Carter Holt Harvey Woodproducts and cannot be used with any other plywood manufacturers product however similar they may appear.

Alternative plywood products can differ in a number of ways which may not be immediately obvious and substituting them for Ecoply products is not appropriate and could in extreme cases lead to premature failure and/or buildings which do not meet the requirements of the New Zealand Building Code





1.0 ECOPLY® BARRIER

Ecoply® Barrier provides a weathertight rigid air barrier for drained and vented cavity systems outside the building frame, effectively replacing traditional building wrap in the cavity while providing structural bracing, and forming a strong secondary line of defence against moisture penetration into the building envelope.

Ecoply Barrier is suitable for use in both residential and commercial buildings and consists of a 7 mm thick CCA treated structural plywood panel which is coated on the face and edges using an polyester powder coating process for increased sheet durability and protection from moisture penetration.

Ecoply Barrier meets the NZ Building Code requirements for rigid underlays as outlined in Section 9.1.4, the performance requirements of Table 23 of E2/ AS1 and has been tested for wind speed exceeding Extra High wind zone as defined in NZS 3604. Testing has been completed to provide solutions for buildings outside the scope of NZS 3604, contact CHH Woodproducts for further information.

The Ecoply Barrier system is BRANZ appraised for use as a rigid sheathing and temporary weather-protecting sheathing on timber framed buildings.



BRANZ Appraised
Appraisal No.827 [2014]

Ecoply Barrier panels are engineered to allow the wall system to breathe and dry out, while also preventing the intrusion of exterior moisture. Once the full system has been installed, the system provides a lasting protective barrier.

What is a rigid air barrier?

A rigid air barrier is a barrier against air pressure and water infiltration from the outside to the interior of the building. A rigid air barrier acts as a secondary line of defence against water penetrating into the wall system – the primary defence being the exterior wall cladding.

Definition of an Air Barrier:

- Impermeable to airflow — the system must be continuous (no holes, openings or penetrations) and resistant to air pressure differentials
- Continuous over the entire building enclosure
- Able to withstand the forces that may act on them during and after construction

The Ecoply Barrier system is a full sheathing system developed to prevent unwanted air movement and replace traditional building wrap.

2.0 ECOPLY® BRAND

Ecoply® Barrier is manufactured by CHH Woodproducts under a third party audited quality control programme to monitor compliance with AS/NZS 2269 – Plywood Structural.



3.0 TECHNICAL INFORMATION AND CAD DETAILS

Product test reports, technical data sheets and CAD drawings referenced in this guide are downloadable from www.chhwoodproducts.co.nz

Carter Holt Harvey® Ecoply Barrier (Rigid Air Barrier) is compliant with NZBC Clause B2.3.1 (a), not less than 50 years when used where the cladding durability requirement or serviceable life is not less than 50 years, e.g. structural bracing,

and compliant with NZBC Clause B2.3.1 (b), 15 years where the cladding durability requirement is 15 years.

When specifying or installing product visit www.chhwoodproducts.co.nz or call 0800 326 759 to ensure you have current product literature.

4.0 ECOPLY® BARRIER ADVANTAGES

4.1 ARCHITECTS / DESIGNERS

Construction practices are moving toward providing greater energy efficiency and an airtight building envelope. These principles of high performance building are common in nearly all current green building standards and construction codes. Proper sealing between wall assembly components prevents unwanted air movement in and out of conditioned air spaces.

- A rigid air barrier provides a more robust cavity and prevents the insulation bulging, which would increase the chance of moisture bridging from the cladding to the framing line
- Provides both structure support and protection from moisture. Structural bracing is achieved when installed as per Ecoply® Barrier bracing specifications
- Bracing benefits may result in cost savings by reducing internal lining bracing elements (Refer to section 7.6 on bracing - pg 15)
- BRANZ appraised system, fully tested and code compliant rigid air barrier system
- Manufactured from sustainable plantation pine available FSC certified (SCS-COC-001316) upon request
- Low formaldehyde emission level (E0)



BRANZ Appraised
Appraisal No.827 [2014]

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4.2 BUILDERS

Ecoply® Barrier lets you say goodbye to flexible wall underlays forever. Builders no longer have to worry about installing traditional housewrap or building paper on a windy day or having to return for re-work due to rips, tears or wrap that has blown off the home. The Ecoply Barrier system can typically save 2-4* weeks off the total house build time*, by allowing a faster building close in, for an earlier interior start and a quicker overall build time.

The Ecoply Barrier System installs quickly with two easy steps – fasten the panels and tape the seams. Once completed, the system provides moisture protection both during and after construction.

- Immediate close-in of structure, allowing interior and exterior work to be completed in parallel
- Reduced builder liability; strong secondary line of defence and solid material for sealing penetrations
- Schedule your subcontractors sooner
- No call backs for rips, tears or wrap that has blown off
- Easy to work light material, simple and easy to install
- 90 day exposure during construction cycle. No hold-ups while the cladding has to be installed i.e. brick layers etc
- Onsite visibility, secure site



4.3 HOMEOWNERS

An airtight building envelope means less airflow into and out of the home. And since conditioned air is expensive air, homeowners can take comfort in knowing that Ecoply Barrier will provide a strong secondary line of defence against the elements.

- Get possession faster; builders building with Ecoply Barrier can typically reduce up to 2-4* weeks off a typical house build*
- Structurally rigid home

*Timeframes and efficiencies are indicative only. Construction production gains will differ with respect to individual builder's abilities and other contributing circumstances outside the control of CHH Woodproducts.



5.0 ECOPLY® BARRIER SYSTEM

TABLE 1: PRODUCT RANGE

Description	Weight (kg/m²)	Thickness	Width	Length
Ecoply® Barrier – structural plywood with factory applied proprietary coating to sheet surface and edges	Approx 4.0	7 mm	1200 mm	2440 mm
				2745 mm
TAPE				
Sill Tape - one piece stretchable sill tape for window and door sills	-	2 Rolls per Box	150 mm	20 m
Frame Flashing Tape – for a secure and permanent seal of all Ecoply Barrier openings (Use in conjunction with Sill Tape)	-	2 Rolls per Box	150 mm	30 m
Sealing Tape – for a secure and permanent seal of all Ecoply Barrier vertical joints	-	10 Rolls per Box	60 mm	30 m

COMPONENTS NOT SUPPLIED BY CHH WOODPRODUCTS;

- PVC HORIZONTAL FLASHING: use Ecoply® Horizontal Jointer (Product Code RDZF7) supplied by E2 Flashing Solutions
- BRACING HOLD DOWN CONNECTORS: GIB Handibrac® hold down brackets manufactured by Mitek™ NZ complete with mechanical fastener with a minimum 15 kN uplift capacity for concrete floors and 150 mm x 12 mm galvanised coach screw for timber floors
- FASTENERS: not supplied by CHH Woodproducts

5.1 TAPES

The Ecoply Barrier – Sill Tape, Frame Flashing Tape and Sealing Tape transform our sheathing plywood panels into a seamless protective barrier for your construction project. All tapes are proven to deliver an airtight and watertight seal. The Ecoply Barrier 'rigid air barrier system' tapes save you time and money on the job; and you can leave the site with confidence it will perform.



TABLE 2: TAPES

Technical Data	Sealing Tape	Sill Tape	Frame Flashing Tape
Description	For a secure and permanent seal of all Ecoply Barrier vertical and horizontal joints	One piece stretchable sill tape, for use on all window / door frame sills	For a secure and permanent seal of all Ecoply Barrier openings (Except window / door frame sill)
Carrier Paper	Special fleece made from PP	Butyl rubber with PE film	Special fleece made from PP
Width / Length	60 mm x 30 m	150 mm x 20 m	150 mm x 30 m
Release Paper	Siliconized Paper	Siliconized Foil (Split 90 mm / 60 mm)	Siliconized Paper (Split 90 mm / 60 mm)
Temperature Resistance	Long Term -40°C to +90°C	Long Term -40°C to +90°C	Long Term -40°C to +90°C
Processing Temperature	Over -10°C	From -10°C	Over -10°C
Colour	Grey	Black	Grey

Storage: All sealing tapes must be stored in clean dry conditions and not in an area with direct sunlight.

5.2 COATING - PANELS

The film formulation provides resistance to the effects of exposure to weathering including sun and moisture, typically experienced during the construction and normal service life of cavity substrate systems. The factory applied powder coat film is specifically formulated for exclusive use on Ecoply Barrier plywood panels.

- The film, formed by the powder coating process, allows water to be repelled and reduces water absorption rates compared to uncoated wood based materials

- The edges of Ecoply Barrier sheets are coated and sealed to wrap approximately 40 mm around the edges of the sheet (Plywood face totally coated, with overlap on the rear of boards)
- High film build (70+ microns), delivers a smoother and more durable sheet surface allowing easier moisture drainage in cavity construction applications
- Sealer coating contains low Volatile Organic Compounds (VOC)
- The Beige coloured sealer coating can be exposed to the external environment for 90 days prior to cladding installation

6.0 DESIGN CONSIDERATIONS

Responsibility

The Specifier for the project must ensure that the details in the specification are appropriate for the intended application and that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

Preservative Treatment

Ecoply® Barrier is treated in accordance with AS/NZS 1604.3 with H3.2 CCA (Copper Chrome Arsenate) water borne treatment. H3.2 CCA treated plywood in accordance with AS/NZS 1604.3 is described as suitable for: "outside above ground applications" suitable to periodic moderate wetting.

Cut Sheets

Ecoply Barrier is envelope preservative treated. If a sheet end is cut place the cut end to the top. Always have a sealed sheet end at the bottom to minimize potential moisture ingress into the panel. All other cuts and penetrations must be covered by a suitable flexible flashing tape and installed as per Ecoply Barrier literature. When installed as per the above requirements, cut edges and penetrations are not required to be retreated with a brush on preservative treatment however if desired CHH Woodproducts recommends the use of Holdfast Metalex End Seal.

Dimensional Sheet Change

Detailing and construction using Ecoply Barrier must allow for natural movement in line with normal cycles of moisture change occurring in the environment. The total expansion both along and across a 2440 x 1200 mm panel can be in the order of 1.5 mm to 3 mm dependent on the environment. Detailing and construction practise should take the potential for natural movement into consideration. Ecoply Barrier sheets may exhibit slight sheet bowing across the sheet resulting from the preservative treatment and surface coating processes. This is to be expected and will not affect the products structural performance or weather tightness when installed as per specifications.

Formaldehyde

Formaldehyde occurs naturally in the environment and is emitted by processes such as combustion, decay and naturally by all timber species. Ecoply Barrier meets the lowest formaldehyde emission classification (E0 - less than 0.5 mg/ litre).

Wind Loadings

Ecoply Barrier meets the NZ Building Code requirements for rigid underlays as outlined in Section 9.1.4, the performance requirements of Table 23 of E2/ AS1 and has been tested for wind speed exceeding Extra High wind zone as defined in NZS 3604. Testing has been completed to provide solutions for buildings outside the scope of NZS 3604. Contact CHH Woodproducts for further information.

Sustainability

Ecoply Barrier is manufactured from radiata pine, a plantation grown medium density softwood. It is grown on tree farms which are tended and harvested to provide wood for plywood manufacture. The crop is managed on a sustainable basis to yield millable trees. Ecoply Barrier is available Forestry Stewardship Council (SCS-COC-001316) certified upon request.

Health & Safety

Ecoply Barrier should be handled in accordance with the Material Safety Data Sheet (MSDS) for H3.2 CCA treated Ecoply. Always wear safety glasses or non fogging goggles when working with Ecoply Barrier. If wood dust exposure is not controlled when machining (sawing, drilling etc) a P1 or P2 replaceable filter or disposable face piece respirator should be worn. Wear comfortable work gloves to avoid skin irritation and the risk of splinters. Wash hands with mild soap and water after handling panels.

Storage & Handling

Ecoply Barrier requires care in storage and handling. The following suggestions will help keep the plywood in good condition prior to installation:

- The storage area should be protected from sun, rain and wind that would otherwise bring about rapid changes in temperature and humidity
- Support for the sheets must be provided at both ends and middle to avoid distortion. Ensure bearers in packs above are aligned over bearers below (to avoid inducing curves in sheets)
- The stack should be kept dry and clear of ground contact, and placed so that it will not be exposed to mechanical damage
- The sheets should be stacked flat, NOT on edge

Maintenance

Ecoply Barrier will not normally require maintenance. However, if damage occurs to the cladding or lining protecting the Ecoply Barrier or to the Ecoply Barrier itself, repairs or replacement should be carried out to ensure the integrity of the rigid air barrier. Small perforations in the panels can be covered by the Frame Flashing Tape or Sealing Tape (150 mm or 60 mm Width, Grey Colour)

Limitations

The information contained in this document is current as at 1st January 2014 and is based on data available to CHH Woodproducts at the time of going to print. It is important that you call 0800 326 759 to confirm that you have the most up to date information available or refer to www.chhwoodproducts.co.nz to download current specification literature.

CHH Woodproducts has used reasonable endeavours to ensure the accuracy and reliability of the information contained in this document and, to the extent permitted by law, will not be liable for any inaccuracies, omissions or errors in this information nor for any actions taken in reliance on this information.

7.0 INSTALLATION

7.1 INSTALLATION

Step 1 Framing:

Install the Ecoply® Barrier sheathing panels positioned with the water-resistive powdercoat film facing outwards. The panels must be installed with the long side of the panel orientated vertically to the framing members.

All Ecoply Barrier sheet edges must be fully supported by framing:

- Studs must not exceed 600 mm centres
- Nogs must be provided at 1200 mm centres maximum
- The minimum framing width for fixing Ecoply Barrier is 45 mm at sheet joints
- Framing must be kept as dry as possible at all times
- Do NOT glue to frame

All timber framing sizes and set outs must comply with NZS 3604 (or be specifically designed to NZS 3603:1993 – Timber Structures Standard), with stud and nog centres and timber widths required by this specification. Use kiln dried framing e.g. Laserframe® in accordance with timber framing manufacturers specification and treated in accordance with B2/AS1 or NZS 3602.

Step 2 Fastener Durability:

Fasten the panels to the framing members. It is of particular importance in coastal areas, areas subject to salt spray and other corrosive environments that the correct fastener is verified prior to installation.

- Fasteners shall be a minimum of hot dip galvanised for all B & C zones excluding sea spray zone D where stainless steel fasteners are required. Where stainless steel is required, annular grooved nails must be used

Step 3 Fasteners:

Fastener heads should be flush with the panel surface. It is not required to tape over overdriven fasteners unless the fastener head completely penetrates the thickness of the face veneer.

- Cladding fasteners must be increased in length by a minimum of 7 mm to achieve the required fastener pull out loadings. (Ecoply Barrier is 7 mm thicker than building wrap)

TABLE 4: FASTENER TYPE

Fixing Type	Minimum Nail Length
Hand Driven	50 x 2.8 mm nails (flat head), hot dipped galvanised or better
Power Driven – Paslode Pneumatic Cladding coil Nailer	Paslode Impulse 50 x 2.8 mm hot dipped galvanised or better, ring round head drive B20557

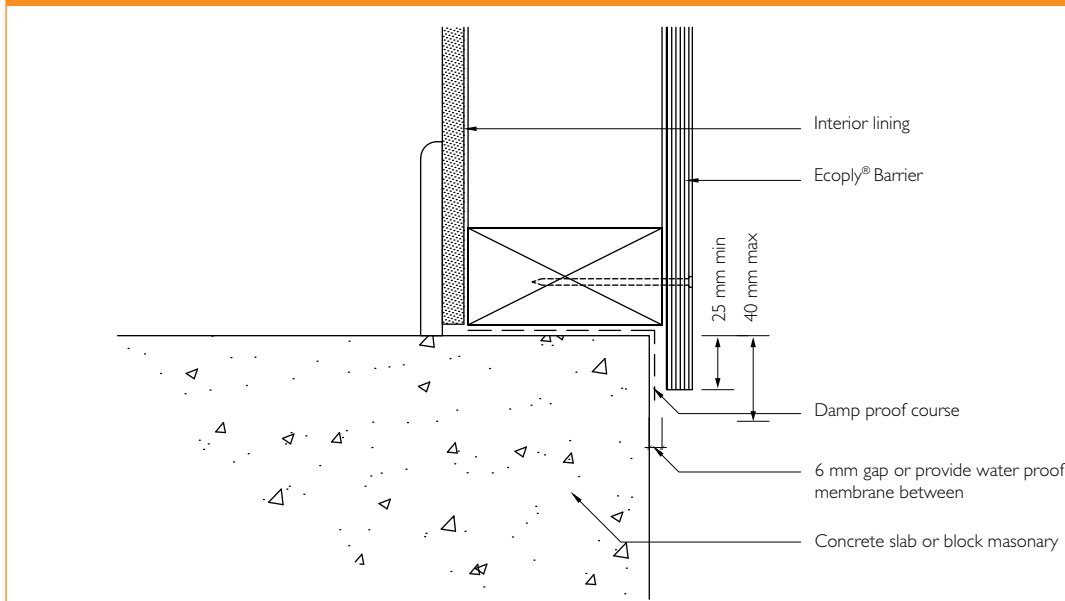
NOTE: Please refer to Step 2 Fastener Durability.

Step 4 Sheet Layout:

When using Ecoply Barrier, flexible wall underlay is not required. Ecoply Barrier has been BRANZ appraised and tested to demonstrate product performance against the requirements of Table 23 of clause E2 / AS1 of NZBC. The sheets are jointed keeping an expansion gap of 2-3 mm maximum between the plywood panels.

- All sheet edges must be supported by the framing
- Fastener pattern unless otherwise specified (Refer to Ecoply Bracing Specifications for Bracing)
 - 150 mm centres at sheet edges
 - 300 mm centres within sheet body up to and including 'Very High' wind zone or;
 - 150 mm centres within sheet body in 'Extra High' wind zone
- Sheets must overhang the bottom plate by a minimum of 25 mm over timber and concrete foundations. (Refer to BAR005: Overhang clearances.) With a maximum overhang of 40 mm

BAR005: Overhang Clearances



Ground Clearances

Minimum ground clearances must be maintained for the cladding being installed in accordance with Clause E2/AS1 - Figure 65 and Table 18, and with NZS 3604: 2011 for timber floors. The adjacent ground must slope away from the building

in accordance with NZBC requirements. Ecoply® Barrier must not be installed where product will remain in contact with non-draining water, damp, or soil. (Refer to BAR005: Overhang clearances)

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141564 9/15/2014 Dawn

7.2 INSTALLATION – Sealing Tape

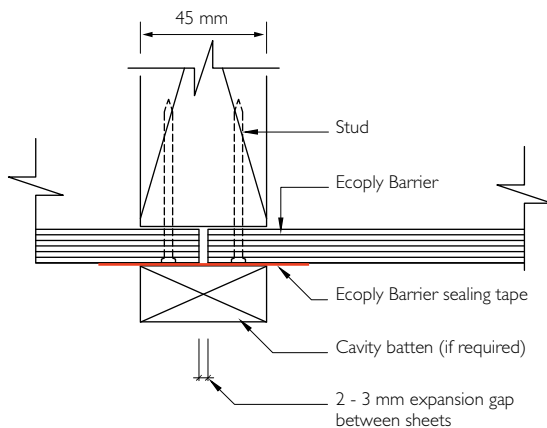
Apply Ecoply Barrier Sealing Tape after all sheathing panels are fully fastened to wall framing members. Only designated Ecoply Barrier Sealing Tape should be used to seal all vertical seams of the plywood panels. Ensure that the panel is free of sawdust and dirt prior to taping. Ecoply Barrier Sealing Tape requires pressure for an adequate seal. Make sure the tape is centred over the seam within +/- 20 mm to provide adequate coverage and that wrinkles in tape are minimal.

Vertical Sheet Joints:

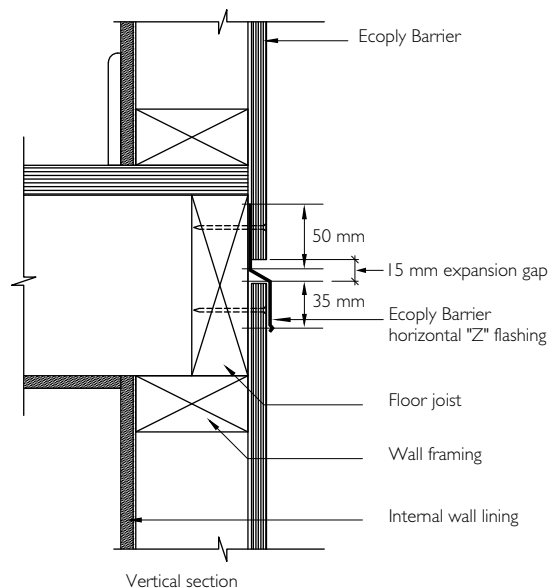
- Seal vertical joints by running Ecoply Barrier Sealing tape over the joints (60 mm x 30 m)
- Sealing Tape must not be exposed to weathering for more than 90 days prior to installation of the exterior cladding system



BAR006: Vertical Sheet Joints



BAR007: Horizontal Sheet Joints



Horizontal Sheet Joints:

- Use Ecoply® Barrier PVC horizontal 'Z' flashing (Product Code RDZF7) for horizontal sheet joints. Refer to BAR007: Horizontal Sheet Joints.

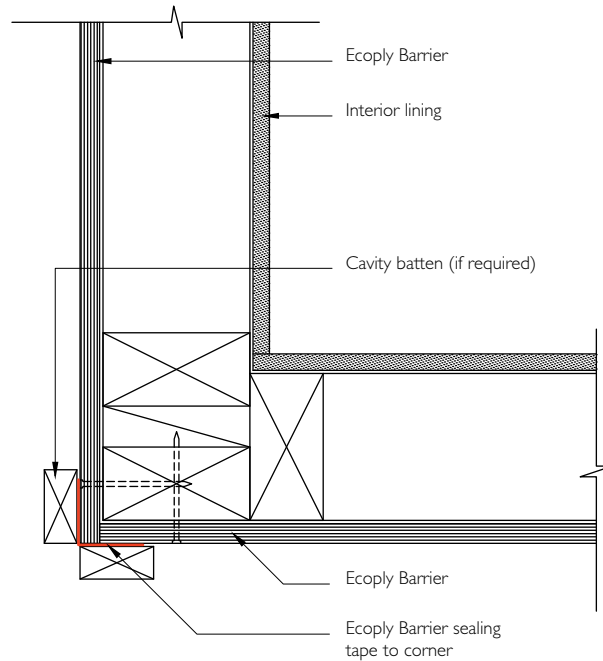
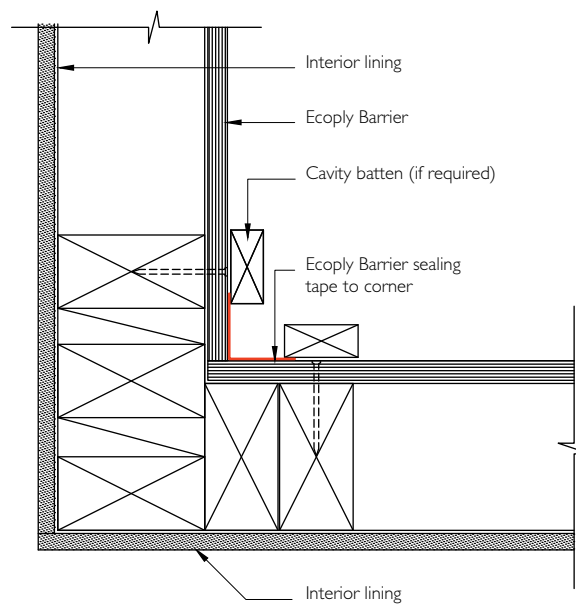
Tape Splices and Joints:

- Whenever tape splices occur at a vertical junction, create an overlapping splice of at least 50 mm
- Make sure to apply adequate pressure for a secure bond between the plywood panel and the tape
- Take special care to remove any wrinkles or voids at splice areas

The Ecoply Barrier PVC horizontal 'Z' flashing is manufactured by E2 Flashing Solutions. Contact E2 Flashing Solutions on (03) 358 5775 or visit www.e2flashingolutions.co.nz for further information.

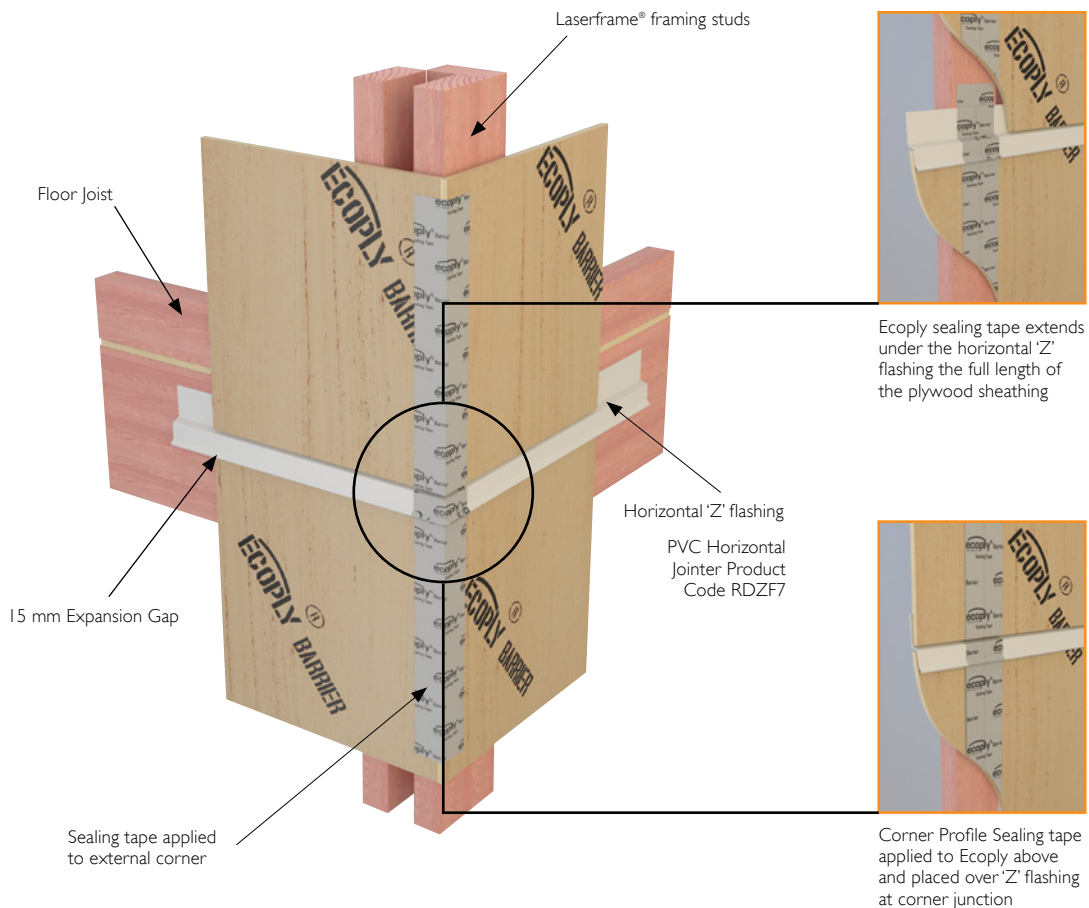
Internal and External Corners:

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60 mm Grey Colour). (Refer to BAR008 & BAR009: External and internal corner)

BAR008: External Corner**BAR009: Internal Corner**

Corner Junctions to Horizontal joints:

- Corners must be sealed with Ecoply® Barrier Sealing Tape (60 mm Grey Colour)
- At horizontal joints sealing tape must extend under horizontal 'Z' flashing

BAR010: External Corner to Horizontal Joint

7.3 INSTALLATION – Sill Tape

Apply Ecoply® Barrier Sill Tape to the horizontal trimmer section of the window or door opening. The exposed timber framing on the sill of the window opening must be totally covered with the Ecoply Barrier Sill Tape (150 mm Black Colour) – one continuous piece. The tape is sealed over the face of the Ecoply Barrier.

Take special care to remove any wrinkles or voids at corner junctions, Ecoply Barrier Sill Tape requires pressure for adequate adhesion.

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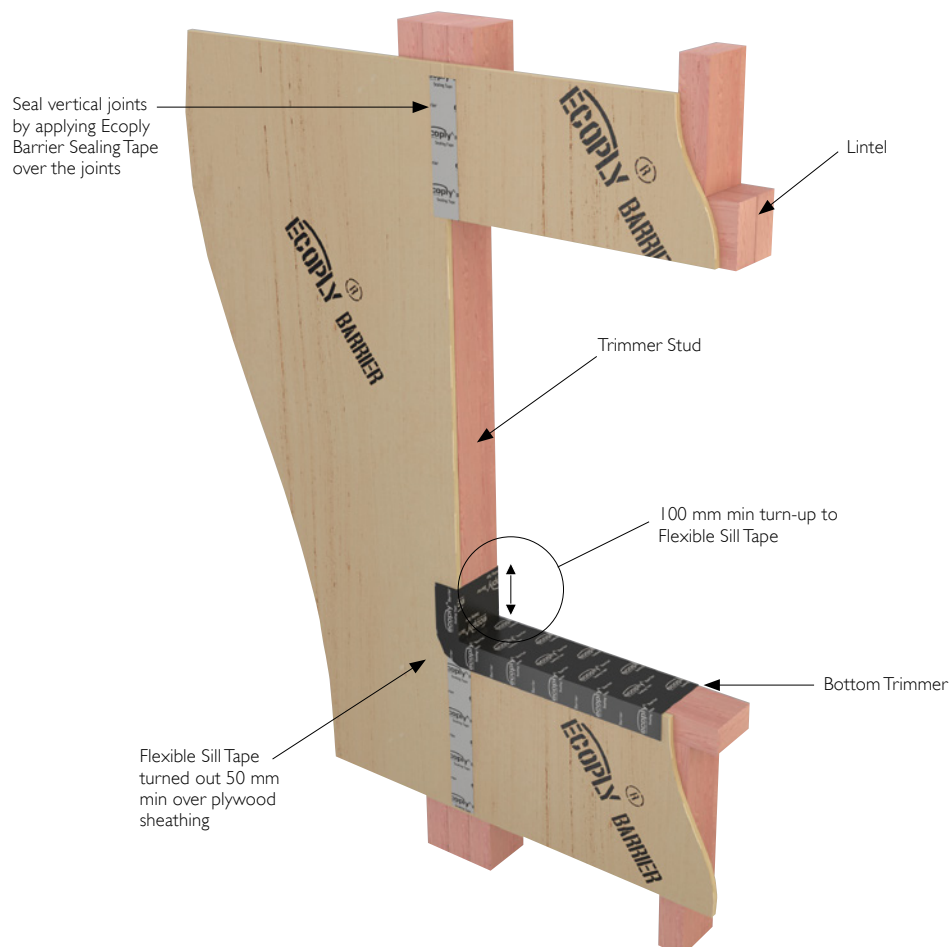
Horizontal Sill Flashing Detail:

- Cut the Ecoply Barrier Sill Tape 200 mm longer than the horizontal window/door bottom trimmer
- Ensure that the framing is free of sawdust and dirt prior to taping
- Apply the Sill Tape to cover the bottom of the opening, overhanging onto the Ecoply Barrier by at least 50 mm and extending 100 mm up trimmer stud
- Carefully bend the flexible Sill Tape to mould into the corners providing a tight seal

NOTE: Door openings are to be treated similarly to window openings. The bottom trimmer may be either a timber or concrete floor:



BAR012: Window Penetration Sill Tape Installation



7.4 INSTALLATION – Frame Flashing Tape

Apply Ecoply® Barrier Frame Flashing Tape to the vertical trimmer stud and lintel of the window or door opening. The exposed timber framing must be covered with the Ecoply Barrier Flashing Tape (150 mm Grey Colour). The tape is sealed over the face of the Ecoply Barrier.

Take special care to remove any wrinkles or voids at corner junctions, Ecoply Barrier Frame Flashing Tape requires pressure for an adequate adhesion.



Vertical Jamb Detail:

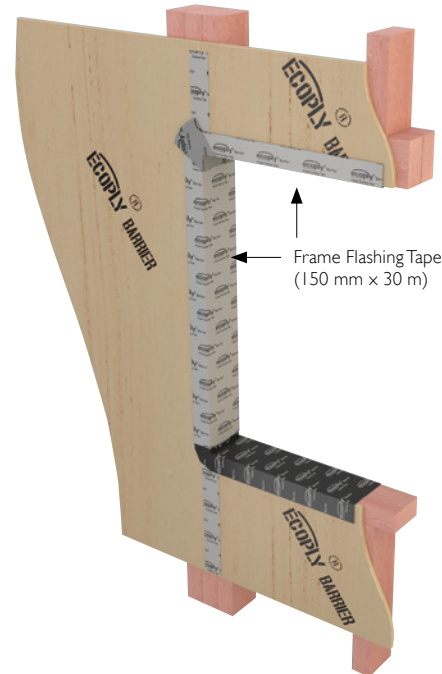
- Cut the Ecoply Barrier Frame Flashing Tape 100 mm longer than the vertical opening size
- Ensure that the trimmer stud is free of sawdust and dirt prior to taping
- Apply the Frame Flashing Tape to cover the entire trimmers' opening. The tape should extend a minimum of 100 mm around the corner at the head of the window framing. And over-lap the Sill Tape on the trimmer stud by a minimum of 50 mm
- Carefully slit the tape from the corner to get a smooth adhesion to the plywood sheathing panel. Bend the Frame Flashing Tape to mould into the corners providing a tight seal
- Cut and apply a small strip 100 mm x 150 mm to reinforce the corner

Horizontal Head Detail:

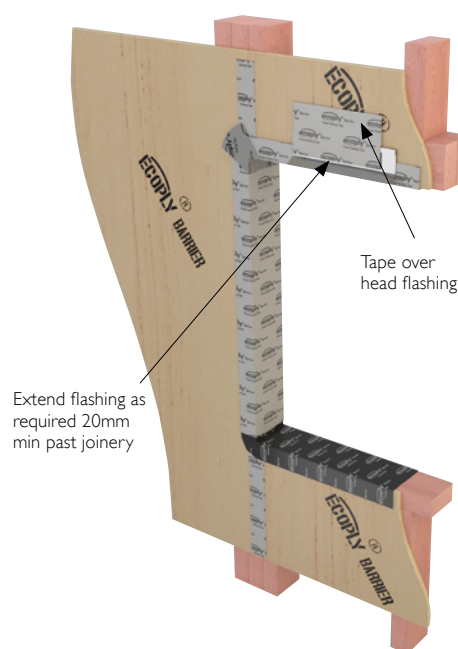
- Once both trimmer studs are installed, cut the Frame Flashing Tape for the horizontal head trimmer and flashing to suit. Making sure to over-lap the existing tape from the trimmer by at least 50 mm (Do not extend tape past the corner)
- Specific installation requirements pertaining to window and door systems should be sort from the joinery manufacturer

NOTE: Door frames are to be treated similarly to window openings.

BAR013: Window Penetration Sill Tape Installation



BAR014: Window Penetration Frame Sealing Tape Installation with Head Flashing



7.5 SERVICE PENETRATIONS

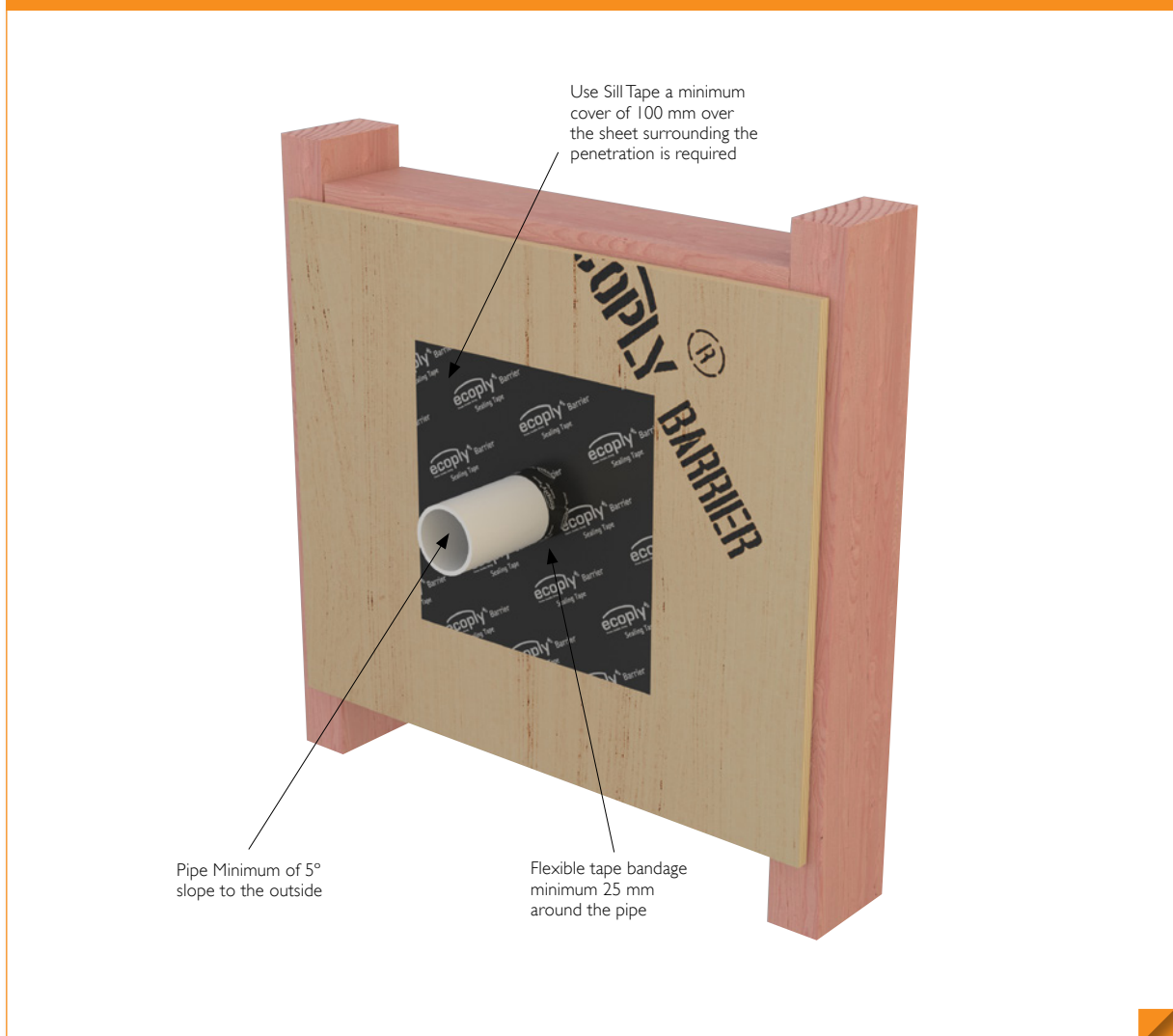
- Service penetrations must be sealed using a flexible flashing tape. Ecoply® Barrier Sill Tape (150 mm Black Colour) is recommended for this purpose. (Refer to BAR011: Penetration and Services)
- A minimum cover of 100 mm over the sheet surrounding the penetration is required
- Use a flexible flashing tape bandage around the pipe (25 mm minimum width)

Service penetrations in bracing elements

Small openings (e.g. power outlets) of 90 x 90 mm or less maybe placed no closer than 90 mm to the edge of the braced element, or waste pipe outlets of max. 150 mm diameter placed at no closer than 150 mm to the edge of the braced element.



BAR011: Penetration & Services



7.6 STRUCTURAL BRACING

Designed to comply with the NZBC.

Structure

NZS 3604 Timber Framed Buildings is listed as an Acceptable Solution under clause 3.0 Timber in Acceptable Solution B1/AS1 Structure. CHH Woodproducts have developed a range of wall bracing elements tested using P21 testing methods referenced in NZS 3604:2011.

Demand is calculated by following Section 5, Bracing Design of NZS 3604 or using the GIB® EzyBrace software, downloadable from www.gib.co.nz

EPB bracing systems properties can be easily loaded into the EzyBrace software by way of an Excel patch downloadable from www.chhwoodproducts.co.nz/ecoply-bracing together with loading instructions.

Specific design

Because Ecoply® Barrier is structural plywood manufactured to AS/NZS 2269, it is suitable for design and use in earthquake and wind bracing systems constructed in accordance with NZS 3603 and AS/NZS 1170.

Structural plywood to AS/NZS 2269 is the only sheet brace material with properties defined in a published New Zealand engineering design code, NZS 3603 Timber Structures, and so can be designed in compliance with Verification method B1/VM1 under clause 6.0 Timber for use in buildings over three storeys in height.

Timber Floors

When carrying out a bracing design for buildings with timber floor structures, the maximum bracing rating that can be accounted for when summing up the bracing units is 120 BUs/m. This does not exclude the installation of bracing elements that are rated higher than 120 BUs/m, however the extra bracing capacity can not be accounted for in the bracing design.

Specific design of floor and sub-floor framing is required for elements rated higher than 120 BUs/m.

Durability

Ecoply Barrier plywood is manufactured to meet the requirements of NZS 3602 Timber and Wood based products for use in Buildings. If the product is used, handled and installed in accordance with CHH Woodproducts product literature it will meet the durability requirements of the NZ Building Code.

Adjustments for wall height

Use section 5 of NZS 3604 to calculate bracing values or GIB EzyBrace:

Adjustment of bracing capacity of walls of different heights and walls with sloping top plates shall be obtained by the following method:

(a) For wall bracing elements of heights other than 2.4 m, the bracing rating determined by test or from table below should be multiplied by $2.4 \div \text{element height in metres}$, except that elements less than 2.4 m high shall be rated as if they are 2.4 m high.

(b) Walls of varying heights, should have their bracing capacity adjusted in accordance with section 5 of NZS 3604 using the average height.

Joining panels for walls higher than maximum sheet length

Ecoply Barrier bracing panels must be fixed from top plate to bottom plate. For wall heights over 2.44 m, Ecoply Barrier is available in 2.745m sheet lengths. Alternatively, a part sheet can be stacked above a full sheet, butt joined on a single row of nogs with each sheet/part sheet independently nailed off as per the nail spacing in the Ecoply Barrier bracing specifications (e.g. 2.4 m x 1.2 m sheet with a 0.3 m x 1.2 m part sheet above it to give a 2.7 m x 1.2 m bracing element).

TABLE 5: SUMMARY P21 RATINGS FOR 2.4 M HIGH ECOPLY® BARRIER WALL ELEMENTS

Specification No.	Minimum Wall Length	Lining Requirements	Hold Down	BUs/m Wind	BUs/m Earthquake
EPBI	0.4 m	Ecoply® Barrier one side	Yes GIB HandiBrac®	80	95
	0.6 m			95	105
	1.2 m			120	135
EPBS	0.9 m	Ecoply® Barrier one side	No additional fastening ¹	80	80
EPBG	0.4 m	Ecoply® Barrier one side and 10 mm GIB® Standard plasterboard other side	Yes GIB HandiBrac®	100	115
	1.2 m			150	150

Note: The EPBS brace type is intended for use with Ecoply Barrier where total wall lengths are entirely direct fixed and brace elements greater than 900 mm in length exist. Brace elements shorter than 900 mm must use EPBI or EPBG brace types with hold downs at each end of the element.

¹ As per NZS 3604: 2011. No specific additional fastening required.

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7.7 ECOPLY® BARRIER BRACING SPECIFICATION – EPBI

SINGLE SIDED STRUCTURAL PLYWOOD BRACE

Specification No.	Minimum Wall Length	Lining Requirements	BU's/m Wind	BU's/m Earthquake
EPBI_0.4	0.4 m	7 mm Ecoply® Barrier one side	80	95
EPBI_0.6	0.6 m	7 mm Ecoply® Barrier one side	95	105
EPBI_1.2	1.2 m	7 mm Ecoply® Barrier one side	120	135

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber of minimum SG8, such as Laserframe®, is recommended.

Bottom plate fixing

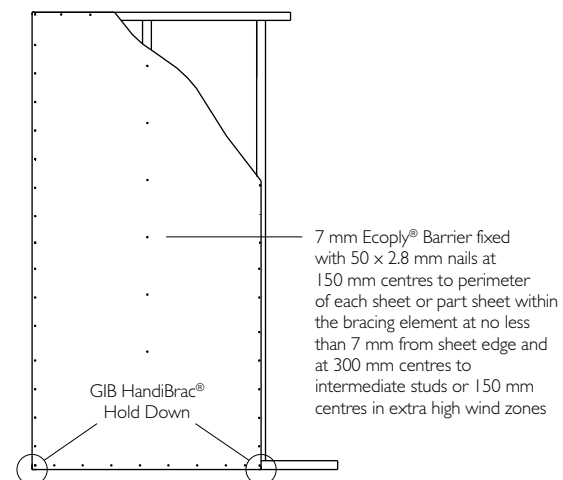
Use GIB Handibrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

One layer of 7 mm Ecoply® Barrier fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Fastening the Ecoply® Barrier

Fasteners

Fasten with 50 x 2.8 mm hot dip galvanised or stainless steel flat head nails. Place fasteners no less than 7 mm from sheet edges.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier Specification and Installation Guide for these circumstances and further fastener selection advice.

Where stainless steel nails are required, annular grooved nails must be used.

Ecoply® Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply Barrier manufactured by Carter Holt Harvey and SG8

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7.8 ECOPLY® BARRIER BRACING SPECIFICATION – EPBS

SINGLE SIDED STRUCTURAL PLYWOOD BRACE NO ADDITIONAL HOLD DOWN

Specification No.	Minimum Wall Length	Lining Requirements	BU's/m Wind	BU's/m Earthquake
EPBS_0.9	0.9 m	7 mm Ecoply® Barrier one side	80	80

Note: The EPBS brace type is intended for use with Ecoply Barrier where total wall lengths are entirely direct fixed and brace elements greater than 900 mm in length exist. Brace elements shorter than 900 mm must use EPBI or EPBG brace types with hold downs at each end of the element.

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber of minimum SG8, such as Laserframe®, is recommended.

Bottom plate fixing

Bottom plates are fixed in accordance with the requirements of NZS 3604. No specific additional fastening required.

Lining

One layer of 7 mm Ecoply® Barrier fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Fastening the Ecoply® Barrier

Fasteners

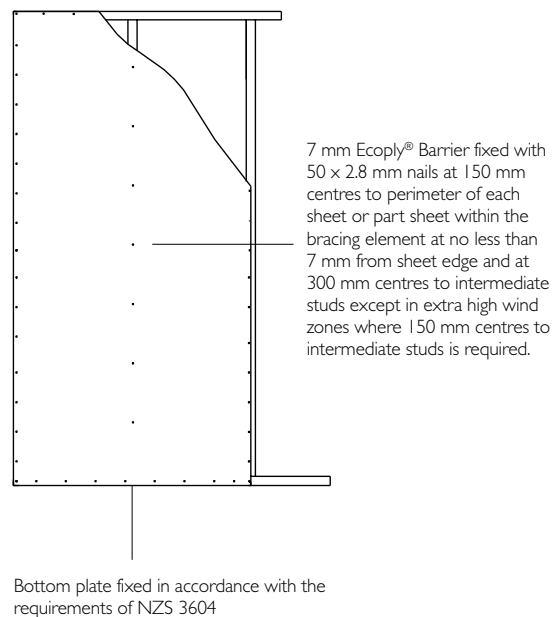
Fasten with 50 x 2.8 mm hot dip galvanised or stainless steel flat head nails. Place fasteners no less than 7 mm from sheet edges.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 in the Ecoply Barrier Specification and Installation Guide for these circumstances and further fastener selection advice.

Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



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7.9 ECOPLY® BARRIER BRACING SPECIFICATION – EPBG

STRUCTURAL PLYWOOD BRACE WITH PLASTERBOARD OTHER SIDE

Specification No.	Minimum Wall Length	Lining Requirements	BU's/m Wind	BU's/m Earthquake
EPBG_0.4	0.4 m	7 mm Ecoply® Barrier one side and 10 mm GIB® Standard plasterboard other side	100	115
EPBG_1.2	1.2 m		150	150

Framing

Wall framing must comply with:

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

Framing dimensions and height are as determined by the NZS 3604 stud and top plate tables for load bearing and non load bearing walls. Kiln dried verified structural grade timber must be used. Machine stress graded timber, such as Laserframe®, is recommended.

Bottom plate fixing

Use GIB HandiBrac® hold-down connections at each end of the bracing element. Refer to manufacturer installation instructions supplied with the connectors for correct installation instructions and bolt types to be used for either concrete or timber floors. Within the length of the bracing element, bottom plates are fixed in accordance with the requirements of NZS 3604.

Lining

Side 1: One layer of 7 mm Ecoply® Barrier exterior wall cladding fixed directly to framing. If part sheets are used, ensure nailing at required centres is carried out around the perimeter of each sheet or part sheet. A 2-3 mm expansion gap should be left between sheets.

Side 2: One layer of 10 or 13 mm GIB® Standard plasterboard vertically or horizontally fixed. Sheet joints are touch fitted and fastener heads and joints stopped in accordance with the GIB® Site Guide.

Fastening the Ecoply® Barrier

Fasteners

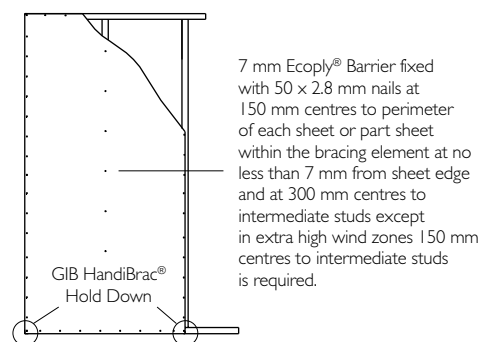
Fasten with 50 x 2.8 mm hot dip galvanised or stainless steel flat head nails. Place fasteners no less than 7 mm from sheet edges.

In certain circumstances stainless steel fasteners may be required. Refer to section 7.1 of the Ecoply Barrier Specification and Installation Guide for these circumstances and further fastener selection advice.

Where stainless steel nails are required, annular grooved nails must be used.

Fastening centres

Fasteners are placed at 150 mm centres around the perimeter of each sheet and 300 mm centres to intermediate studs. Where more than one sheet forms the brace element each sheet must be nailed off independently.



Fastening the GIB® Plasterboard

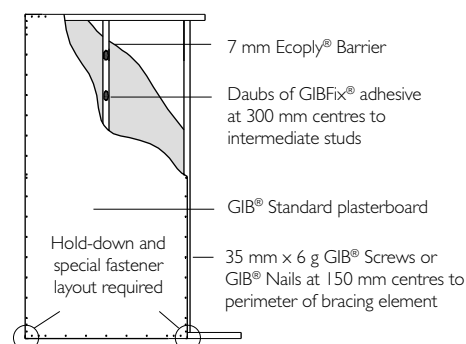
Fasteners

32 mm x 6 g GIB® Grabber® Screws or 35 mm GIB® Nails

Fastening centres

Fasten 50, 100, 150, 225 and 300 mm from each corner and 150 mm thereafter around the perimeter of the bracing element. For vertical fixing place fasteners at 300 mm centres at intermediate sheet joints. For horizontal fixing place single fasteners in the tapered edge where sheets cross studs.

Place fasteners 12 mm from paper bound edges and 18 mm from cut sheet edges. GIB® plasterboard must be treated in every respect in accordance with relevant GIB® literature.



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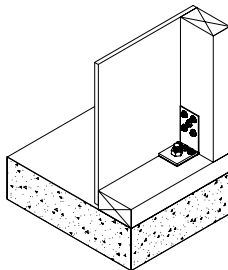
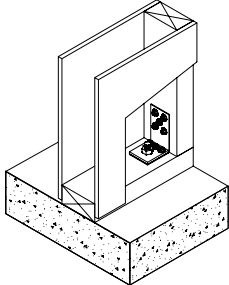
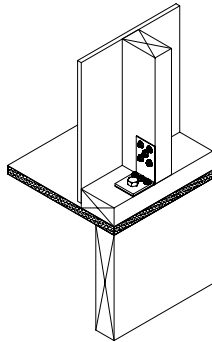
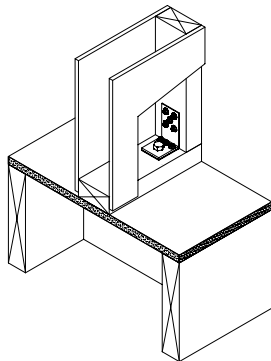
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7.10 GIB HANDIBRAC® - RECOMMENDED INSTALLATION METHOD

Developed in conjunction with MiTek™ NZ, the GIB HandiBrac® has been tested for use as a hold-down in all EPB bracing elements.

- The GIB HandiBrac® registered design provides for quick and easy installation
- The GIB HandiBrac® provides a flush surface for the wall linings because it is fitted inside the framing. There is no need to check in the framing as recommended with conventional straps
- The GIB HandiBrac® is suitable for both new and retrofit construction
- The design also allows for installation and inspection at any stage prior to fitting internal linings

Concrete Floor		Timber Floor	
External walls	Internal walls	External walls	Internal walls
			
Position GIB HandiBrac® as close as practicable to the internal edge of the bottom plate	Position GIB HandiBrac® at the stud/plate junction	Position GIB HandiBrac® in the centre of the perimeter joist or bearer	Position GIB HandiBrac® in the centre of the floor joist or full depth solid block
Hold-down fastener requirements			
A mechanical fastening with a minimum characteristic uplift capacity of 15 kN or screw bolt supplied with the bracket		12 x 150 mm galvanised coach screw or screw bolt supplied with the bracket	

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7.1.1 TOP PLATE HOLD DOWN CONNECTIONS

Additional nailing of the Ecoply® Barrier to the top plate in accordance with the details shown in Figure 1 and described below will provide sufficient top plate hold down capacity to comply with a Type B fixing or 4.7 kN uplift capacity as listed in Table 8.18, NZS 3604:2011.

Fastening

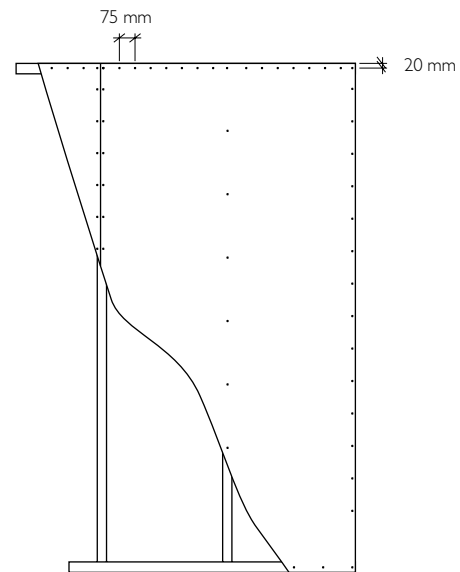
Nails must be 50 mm x 2.8 mm flat head hot dip galvanised or stainless steel as described in the Ecoply Barrier Specification and Installation Guide for Fastener Durability.

Nailing to the top plate is at 75 mm centres and 20 mm from the sheet edge.

The remainder of the sheet perimeter is fastened at 150 mm centres no less than 7 mm from the sheet edge and 300 mm at intermediate studs (or 150 mm centres for Extra High wind zones) as with standard nailing for Ecoply Barrier.

Standard nailing of the Ecoply Barrier to the top plate in accordance with the Ecoply literature will provide a top plate hold down capacity that exceeds a Type A fixing or 0.7 kN uplift capacity as listed in Table 8.18, NZS 3604:2011.

Figure 1: Top Plate Hold Down Connections using Ecoply® Barrier



Ecoply® Bracing Systems are designed to meet the requirements of the New Zealand Building Code and have been tested and analysed using the P21 method referenced in NZS 3604:2011 listed as an acceptable solution B1/AS1 Structure. Testing was carried out using Ecoply Barrier manufactured by Carter Holt Harvey and SG8

timber framing and GIB® products manufactured by Winstone Wallboards Ltd. Substituting materials may compromise performance of the system. GIB® and GIB HandiBrac® are registered trade marks of Fletcher Building Holdings Ltd.

JANUARY 2014

8.0 FIRE RATED SYSTEMS

Where compliance with NZ Building Code Clauses C3 – Spread of Fire and Clause C4 – Structural Stability is required CHH Woodproducts recommends the use of GIB® Fire Rated Systems overlaid directly with the Ecoply® Barrier rigid air barrier system.

Refer to the current GIB® Fire Rated System literature for specifications and installation requirements downloadable from www.gib.co.nz

Where Ecoply® Barrier overlays GIB® fire rated panels fastener lengths for the fixing of Ecoply Barrier panels must be increased by the thickness of the GIB® panel to ensure the required fastener pull out loadings are achieved.

9.0 CLADDING SYSTEM INSTALLATION

- Cladding must be installed as soon as possible
- Claddings must comply and be installed in line with NZ Building Code and cladding supplier specifications
- Cladding maintenance advice should be sought from the cladding manufacturer
- Cladding fastener lengths must be increased by a minimum of 7 mm to ensure the required fastener pull out loadings are achieved

10.0 WORKING INSTRUCTIONS

Always use safe working practices when handling and installing Ecoply Barrier plywood Sheathing. For further information refer to Material Safety Data Sheets available online from CHH Woodproducts.

Hole Forming - Making penetrations in Ecoply® Barrier Sheets.

- Mark the centre of the hole on the sheet
- Pre drill a pilot hole
- Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a electric drill
- For irregular rectangle or circular holes a perforation in the sheet can be made by drilling a series of smaller holes around the perimeter of the hole, then tapping out the waste piece from the plywood sheathing or cut using a jig-saw.

Cutting Sheets - Making cuts to Ecoply® Barrier Sheets.

- Ecoply Barrier can be cut using any circular-saw or hand-saw tool
- When sawing, clamp a straight edge to the sheet as a guide. Run the saw base along the straight edge to make a precise cut

11.0 REFERENCED DOCUMENTS

NZBC B1/AS1 Structure

NZBC B2/AS1 Durability

NZBC E2/AS1 External Moisture

AS/NZS 1170.2 Structural design actions – Wind Actions

NZS 1170.5: 2004 Structural design actions – Earthquake actions – New Zealand

AS/NZS 1604.3: 2012 Specification for preservative treatment – Plywood

AS/NZS 2269: 2012 Plywood Structural Specifications

NZS 3602: 2003 Timber and Wood based products for use in Building

NZS 3603: 1993 Timber Structures Standard

NZS 3604: 2011 Timber Framed Buildings

IBC AC148 Acceptance Criteria for Flexible Flashing Materials

12.0 FREQUENTLY ASKED QUESTIONS

Q. Do fastener heads need to be taped over?

A. Fastener heads are not required to be taped over; unless the fastener head completely penetrates the thickness of the face veneer.

Q. Do I need to tape all of the seams between the Ecoply® Barrier plywood panels?

A. Yes. All seams between the panels must be taped with the Ecoply Barrier Sealing Tape (60 mm width Grey Colour) to ensure that it functions as a structural rigid air barrier system.

Q. Can Ecoply Barrier Sealing Tape, Sill Tape and Frame Flashing Tape be installed in the rain?

A. Yes. The tapes require pressure for an adequate seal, and will require an extra period of time to fully adhere to the surface.

Q. What is permeance, and why is it important?

A. Permeance is a property that defines the ease at which water molecules diffuse through a material, typically measured in “perms.” While water resistive barriers are designed to keep liquid water out of the wall system, they are also generally designed to allow moisture vapor to pass through so that the wall system can “breathe” meaning moisture vapor will not accumulate and condense in the wall system.

Q. How long can I leave Ecoply Barrier panels exposed before I install roof and wall coverings?

A. Ecoply Barrier panels can be left exposed for up to 90 days.

Q. What is the weight of an Ecoply Barrier Sheet?

A. 2440 mm 11.712 kg m² & 2745 mm 13.176 kg m² (guideline only)

Q. What is the R-value of Ecoply Barrier?

A. The thermal resistance or insulating effectiveness of plywood panels can be calculated using NZS 4214 e.g. Plywood has a conductivity (K) of 0.13 W/mK so a 7 mm panel has a thermal resistance $R = 0.007/0.13 = 0.05$

Q. How much should be left for expansion?

A. Allow 2-3 mm between square edges of Ecoply Barrier Panels.

Q. Where can I purchase Ecoply Barrier from?

A. Ecoply Barrier is available from all leading building merchants in NZ.

Q. Where can I locate information on steel framing insulation?

A. Steel frame specification documents can be downloaded at www.nashnz.org.nz

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13.0 ECOPLY® BARRIER INSTALLATION CHECKLIST

RIGID AIR BARRIER CHECKLIST

The below installation areas are considered critical to the successful installation of Ecoply® Barrier when used as a rigid air barrier:

Using this sheet as a checklist during installation will aid in problem free product installation and long term product durability post construction.

TASK	Tick when checked
Install	
Ecoply Barrier panels positioned with the water-resistive powder coat film facing outwards	<input type="checkbox"/>
Sheet edges fully supported by framing	<input type="checkbox"/>
Sheet Cuts	
Cut sheet ends are placed to the top	<input type="checkbox"/>
Fastener Material Type	
Galvanised fasteners or better used (Stainless steel annular groove nails required in sea spray zones or other corrosive environments – Zone D)	<input type="checkbox"/>
Sheet Fastener Pattern	
Around sheet edge – maximum 150 mm centre spacing	<input type="checkbox"/>
At intermediate framing – maximum 300 mm centre spacing or 150 mm in Extra High wind zone	<input type="checkbox"/>
Expansion gap between Sheets (Vertical sheet joints)	
2-3 mm Gap between vertical edges of sheets	<input type="checkbox"/>
NOTE: Expansion gaps are required between vertical edges of sheets to accommodate natural expansion and contraction of sheets	
Ground Clearances	
Ground clearances maintained for claddings in accordance with E2/AS1 and NZS 3604	<input type="checkbox"/>
Sheets overhang the bottom plate by a minimum of 25 mm & maximum 40 mm over timber and concrete foundations	<input type="checkbox"/>
Vertical Sheet Joints	
Seal all vertical joints including corners with Ecoply Barrier Sealing Tape (60 mm x 30 m) or Frame Sealing Tape (150 mm x 30 m)	<input type="checkbox"/>
All vertical window and door frames sealed with Ecoply Barrier Frame Sealing Tape	<input type="checkbox"/>
Horizontal Sill Flashing Detail	
Apply Ecoply Barrier Sill Tape to the horizontal sill section of a window or door opening	<input type="checkbox"/>
Make sure the tape extends 100 mm up both window / door studs	<input type="checkbox"/>
Horizontal Sheet Joints	
Use Ecoply Barrier PVC horizontal Z Flashing (Product code RDZF7)	<input type="checkbox"/>
Service Penetrations	
Waste Pipe outlets of max. 150 mm diameter placed at no closer than 150 mm to the edge of braced element	<input type="checkbox"/>
Use a flexible flashing tape to seal the service penetration: minimum cover 100 mm, 25 mm minimum width around the pipe penetration	<input type="checkbox"/>

Refer to Ecoply Barrier Specification and Installation Guide for full installation specifications and suggested details.

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January 2014



H1 Calculations

Risk Matrix

REFER TO PLANS

Specifications



HORNCASTLE
HOMES

Schedule of Materials

Date: 18th August 2014

Customer Turnkey

At Lot 146

Location Kippenberger

Job No. J4146

Constructed By: Horncastle Homes Limited

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Foundations	
Sheet Damp Proofing	Polythene - Sheet 250 Micro Black
Concrete	20 Mpa FIRTH RP2019TC2 Fibre mix grade
External Cladding / Concrete Block	
Brick Size	70 Series Clay Veneer
Brick Type	Monier
Feature Cladding Type:-	Linea
Soffit Linings	4.5mm HardieSoffit
Carpentry	
Note:	All timber - Kiln Dried Pinus Radiata MS8
Framing Timber (External Wall)	Pinus Radiata - H1.2 Treated
Framing Timber (Internal Wall)	Pinus Radiata - H1.2 Treated
Framing Timber (Bottom Plates)	Pinus Radiata - H1.2 Treated
Framing Timber (Internal Load Bearing Walls)	Pinus Radiata - H1.2 Treated
Framing Timber (Beams)	Pinus Radiata - H1.2 Treated
Framing Timber (Lintels)	Pinus Radiata - H1.2 Treated
Framing Timber (Trusses)	Pinus Radiata - H1.2 Treated
Framing Timber (Skillion Roof Framing)	Pinus Radiata - H1.2 Treated
Framing Timber (Rafters)	Pinus Radiata - H1.2 Treated
Building Wrap	Eco ply barrier
Plywood Bracing	7mm H3.2 Construction Grade
Insulation	
Walls	R2.6 94mm Ultra Wall Pink Batts
Ceiling	R 3.6 155mm Ultra Ceiling Pink Batts
Fascia, Gutter & DP's	
Fascia	Multiline Fascia
Gutter	Metal Gutter
Downpipes	Round PVC
Roofing	
Roof Type	Colortile
Roof Battens	Pinus Radiata - H1.2 Treated - Cut ends to be treated
Purlins	Pinus Radiata - H1.2 Treated - Cut ends to be treated
Aluminium Joinery	
Brand	Aluminium Systems Limited (ASL)
Finish - Brand/Type:	Fairview 35mm suite
Windows:-	
Sashes - Type:	Double & Single Boxed ~ Headed
Stays - Type:	Interlock
Catches - Type:	Interlock
Locks - Type:	Interlock
Doors:-	
Hinges - Type:	Aluminium Systems Limited (ASL)
Latch / Locks - Type:	Milton (Interlock)
Handles / Finish - Type:	Verona
Glass - Type:	Double Glazed
Unit Thickness	20mm
Window & Door Reveals	Pinus Radiata - H3.1 Treated
Plumbing / Gas	
Mechanical Ventilation	See Attached Exhaust Fans Specification
Pipework	Polybutene
HWC	Rheem 300 Liter Mains Pressure
Electrical	
Electrical Hardware (switches, Socket outlets)	PDL 600 Designer
Smoke Detectors	Chubb Battery Operated
Interior Linings	
Standard Plasterboard Walls:	10mm Gib Board
Standard Plasterboard Ceiling:	10mm Gib Board
Special Plasterboard Bracing Walls	10mm Gib Braceline
Special Plasterboard Wet Areas	10mm Gib Aqualine
Skirting Type	
Internal Doors	MDF Hollowcore



HORNCASTLE
HOMES

Specification

of work shown on the accompanying drawings

Date: 18th August 2014

Customer Turnkey

At Lot 146

Location Kippenberger

Job No. J4146

Constructed By: Horncastle Homes Limited

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Owner

Name Turnkey
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 348 8905

Builder

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 348-8905
Fax 348-8906

Designer

Name Horncastle Homes Limited
Mailing Address PO Box 8255, Riccarton, Christchurch
Phone 341-3693
Fax 348-8906

Project Location

Street Address Lot 146
Legal Description Lot 146
DP 459899

Project Description

Type New building
Intended Use: Single residential building
Intended Life: Indefinite but not less than 50 years.

Compliance Information**SITE DATA**

Soil Type (NZS 3604, Clause 3.2)
Exposure/corrosion zone (NZS 3604, figures 4.1, 4.2)
Wind region (NZS 3604, figure 5.1)
Topographical class (NZS 3604, tables 5.3, 5.4)
Wind zone (NZS 3604, tables 5.1 and 5.2)
Earthquake zone (NZS 3604, figure 5.4)

BUILDING DATA

Building classification (NZS 3604, table 1.1)
Floor live load (NZS 3604, table 1.2)
Overall height of building (in metres) 5.513m

Product Information

010 010 101	THE WORKS
	The works are as described in this specification and shown on the drawings.
010 010 102	PERSONNEL
	Owner: The person defined as "owner" in the New Zealand Building Code.
	Contractor: The person contracted by the owner to carry out the contract.
010 010 103	THE SITE
	The site of the works, the site address and the legal description are listed under PROJECT INFORMATION.
	Confine access and work to the area of site indicated on the drawings
010 010 104	SPECIFICATION SECTIONS
	Sections are for reference and convenience only and do not constitute individual trade sections or work elements. Read all sections together and read 010 010 100 GENERAL REQUIREMENTS with all other sections.
010 010 105	INTERPRETATIONS
	Required: Required by the documents, or by a statutory authority.
	Proprietary: Identifiable by naming the manufacturer, supplier, installer, trade name, Brand name, catalogue or reference number.
	Approval: Approval in writing.
	Direction: Direction in writing.
	Notified: Notified in writing.
010 010 106	INCONSISTENCIES
	If there are any inconsistencies, errors or omissions in or between documents, the contractor must seek direction in resolving it. Figured dimensions take precedence over scaled dimensions; drawings to a larger scale take precedence over drawings to a smaller scale and drawings take precedence over specification.
010 010 107	SUBSTITUTIONS
	A substitution may be proposed where specified products are not available, or if substitute products are brought to the attention of and are considered by the owner as equivalent or superior to those specified. Except where a specified product is not available, the owner is not bound to accept any substitutions. Notify proposed substitution of specified products. Include sufficient information to allow the owner to confirm that the substitution is equivalent or superior to that specified.
010 010 108	THE WORDS "PROVIDE" OR "FIX"
	The words "provide" (or "supply") or "fix" if used separately mean "provide and fix" unless explicitly stated otherwise.
010 010 109	MANUFACTURERS AND SUPPLIERS
	Manufacturers and suppliers requirements, instructions, specifications or details are those issued by them for their particular material, product or component and are the latest edition.
010 010 110	REFERENCED DOCUMENTS
	Reference is made to various New Zealand Building Code (NZBC) acceptable solutions and verification methods for criteria and/or methods used to establish compliance with the Building Act 2004. Reference is also made to various Standards produced by Standards New Zealand (NZS, NZMP, AS/NZS) and to listed Acts, Regulations and various industry codes of practice and practice guides. The latest edition (including amendments and provisional editions) at the date of this specification applies unless stated otherwise. Documents cited both directly and within other cited publications are part of this specification.
010 010 111	PRECEDENCE OF REFERENCED DOCUMENTS
	This specification takes precedence in the event of it being at variance with and requiring a higher standard than, the cited documents. Resolution of any variance must be confirmed in writing and where building consent approval is affected, the change notified to the territorial authority.
010 010 112	BUILDING CONSENT COMPLIANCE
	It is an offence under the Building Act 2004 to carry out any work not in accordance with the building consent. Refer the resolution of matters concerning compliance to the owner for a direction. Where building consent approval is affected refer any change to the territorial authority
010 010 113	STATUTORY OBLIGATIONS
	Comply with all statutory obligations and regulations of regulatory bodies controlling execution of the works.
010 010 114	BUILDING CONSENT
	Obtain the original or copies of the building consent form and documents from Horncastle Homes Limited and keep on site. Liaise with the territorial authority and/or the building certifier for all required notices and all inspections required during construction to ensure compliance. Return the consent form and documents to Horncastle Homes Limited on completion.
010 010 115	INSPECTIONS
	Do not proceed with work noted on the Building Consent for inspection until it has been inspected and passed by the territorial authority inspector.
010 010 116	PRODUCER STATEMENTS
	When producer statements verifying construction are required, provide copies to both the territorial authority and the owner. Provide producer statements in the form required by the Building Act 2004.
010 010 117	TRADE GUARANTEES AND WARRANTIES
	Where specific trade guarantees/warranties are offered covering materials and/or execution of proprietary products or complete installations, provide copies of all guarantees/warranties to Horncastle Homes Limited.

010 010 119	<p>HEALTH AND SAFETY Make the works safe and provide and maintain a safe working environment. Ensure that all those working on or visiting the site are aware of the rules governing site safety, are properly supervised and are not unnecessarily exposed to hazards. Ensure the Horncastle Homes site safety sign is erected on the front boundary and is visible to the public at all times. Health & Safety site sign is to have the following wording: "Authorised personal only beyond this point. Please report to site foreman".</p>
010 010 120	<p>PROTECT THE WORKS Protect parts of the work liable to damage until completion of the works. Take all precautions necessary to protect the works from damage by unauthorised entry or inclement weather. Brace and support all parts of the works against damage during construction.</p>
010 010 121	<p>STORAGE AND PROTECTION Provide temporary storage areas and protective covers and screens. Fillet stack and protect all framing and structural members from moisture and contamination. Completely protect finishing materials from the weather and damage and store in accordance with the manufacturers requirements. Protect fabricated elements from the weather and damage, and store in accordance with suppliers requirements.</p>
010 010 122	<p>ANTIQUITIES AND ITEMS OF VALUE AND INTEREST Report immediately the finding of any fossils, antiquities, or objects of value. Ensure they remain undisturbed until approval is given for their removal.</p>
010 010 123	<p>MEANS OF COMMUNICATION All directions and approvals in writing.</p>
010 010 124	<p>PROGRAMME Provide a programme for the contract works, including the work of separate contractors being carried out concurrent with this contract. Form of programme: A dated bar chart, identifying the contract work's critical path and all key dates for the provision of labour, materials and elements. Supply a copy of the programme, and any updates to Horncastle Homes Limited.</p>
010 010 125	<p>WORKING HOURS Work on site is restricted to 7:30am to 6:00pm, Monday to Friday, excluding statutory holidays. Work outside these hours may be permitted, with prior approval in writing by Horncastle Homes Limited.</p>
	<p>RESTRICTIONS Do not: - smoke on site - light rubbish fires on the site - bring dogs on to or near the site</p>
010 010 126	
010 010 127	<p>QUALITY ASSURANCE Carry out and record regular checks of material quality and accuracy. Provide all necessary materials, equipment, plant, attendances, supervision, inspections and programming to ensure required standards are met.</p>
010 010 128	<p>DAMAGE AND NUISANCE Prevent damage and nuisance from water, fire, smoke, vehicles, dust, rubbish, noise and other causes resulting from the contract works. Comply with the requirements of the territorial authority and relevant Acts and Standards.</p>
010 010 129	<p>SET OUT AND DATUM Set out the works to conform with the drawings. Establish a permanent site datum to confirm the existing ground floor level and its relationship to other existing and new building levels.</p>
	<p>EXECUTION OF THE WORK Conform to the requirements of this specification. Ensure work is level, plumb, and true to line and face.</p>
010 010 130	<p>Employ only experienced workers familiar with the materials and techniques specified.</p>
	<p>MATERIALS AND PRODUCTS Use only new materials and products, unless stated otherwise, of the specified quality and complying with cited documents.</p>
010 010 131	<p>COMPATIBILITY Ensure all parts of a construction or finish are compatible and their individual use approved by the manufacturers and suppliers of other parts of the system. Source all parts of a system from a single manufacturer or supplier.</p>
010 010 132	<p>COMPLETE ALL SERVICES Ensure completed building services are operational, with temporary labelling removed, required labelling fixed and service instructions provided.</p>
010 010 133	<p>CLEAR AWAY Regularly clear away trade debris, unused materials and elements from the site. On completion of the work leave the building clean and ready for occupancy, with all services operating and mechanical parts in good working order. Remove temporary markings, coverings and protective wrappings.</p>
010 010 134	
010 010 135	<p>CLEAN Clean and wash down external surfaces to remove dirt, debris and marking. Clean interior surfaces including floors, glass, cabinetwork, joinery, sanitary and hardware items.</p>
010 090	
012 090	
040 010 100	.....EXCAVATION & FILL.....
040 010 101	<p>SITE SAFETY Provide proper support for excavations. Cover holes and fence off open trenches and banks.</p>
040 010 102	<p>Washed rounds 20-40mm</p>

040 010 103	EXCAVATION GUIDELINES Carry out excavation to the guidelines set by the Occupational Safety and Health Service (OSH) publication: "Approved Code of Practice for Safety in Excavation and Shafts for Foundations".
040 010 104	PROTECT EXISTING Protect from damage existing buildings, structures, roads, paving and services nominated on the drawings as being retained, throughout the course of the work.
040 010 105	PROTECT TREES Protect from damage all trees, shrubs, natural site features and existing landscaped areas nominated on the drawings as being retained, throughout the course of the work.
040 010 106	SURFACE PREPARATION Conforming with NZS 3604:2011, section 3.5, remove all turf, vegetation, trees, topsoil, stumps and rubbish from the area being built on.
040 010 107	UNDERGROUND ELEMENTS AND SERVICES Break out and remove underground elements and redundant services. Report for instructions when unexpected voids, made-up ground or services are encountered. Seal off the ends of drains or remove to territorial authority approval.
040 010 109	GENERAL EXCAVATION Trim ground to required profiles, batters, falls and levels. Remove loose material. Protect cut faces from collapse. Keep excavations free from water.
040 010 110	EXCAVATION FOR FOUNDATIONS Take foundation excavations to depths shown. Keep trenches plumb and straight, bottoms level and solid, stepped as detailed and clean and free of water.
040 010 111	INADEQUATE BEARING The penetrometer bearing tests show there is an available Ultimate Bearing Capacity of 300kPa at 0.1m below existing ground level. The building platform area at design foundation level is to be proof rolled by a roller of greater than 10 tonnes in the presence of a Spire Consulting Limited Geotechnical Engineer and the final platform level approved for construction.
040 010 112	
040 010 113	
040 090	
060 010 100	.....DRAINAGE.....
060 010 101	QUALIFICATIONS Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.
	MATERIALS Concrete: 17.5 MPa ordinary grade. Reinforcement: Grade 300 deformed bars. uPVC pipes: uPVC pipes bends, junctions, fittings and joints. Pipes to comply with AS/NZS 1260. Field drains: Plastic pipes for field drains perforated and coiled with filter fabric over. Drainage/filling materials Granular fill: Clean gravel or crushed stone or a blend of these. Particle size from minimum 7 mm to maximum 20 mm. Selected fill: Fine grain soil or granular material suitable for bedding, excluding topsoil.
060 010 102	Ordinary fill: Top soil or other excavated materials.
060 010 103	FITTINGS Gully traps: To NZBC acceptable solution G13/AS2, 3.3, complete with grating. Surface water sump gratings: Cast iron frame with lift-up grating. Strip drain channel: Proprietary, modular, variable invert, uPVC or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings. Inspection covers: Cast iron frame with screw-down cover.
060 010 104	EXCAVATE Excavate for drains to a firm even base with correct gradients set in straight runs.
060 010 105	MANUFACTURER'S REQUIREMENTS All drainage installations to the pipe and fitting manufacturer's requirements.
060 010 106	EXCAVATION GENERALLY Carry out drainage work to G13/AS2 (foul water) and E1/AS1 (stormwater)
060 010 107	LAY FOUL WATER DRAINS Lay drains in straight runs to correct gradients, to discharge into the network utility operators sewer. Set inspection fittings on a concrete base.
	INSTALL GULLY TRAPS Set on concrete 25 mm above surrounding paving or 100mm above unpaved ground and brought up to protect the top of the fitting. Trowel off.
060 010 108	
060 010 109	LAY STORMWATER DRAINS Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.
	FIELD TEST Field test drains for watertightness to the satisfaction of the territorial authority inspector.
060 010 111	
060 010 112	BACKFILL Backfill drain lines in 150 mm layers, well tamped but without disturbing the drains. Finish off with 150 mm of topsoil, slightly mounded above the finished ground line.

060 010 113	AS-BUILT DRAWINGS
060 090	Supply a 1:100 as-built drawing to the territorial authority and the owner on completion.
070 010 100	.....FOUNDATIONS.....
070 010 107	EXECUTION GENERALLY
	Comply with NZS 3604:2011 except as varied by this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
070 010 113	REINFORCEMENT
	All reinforcement and welded reinforcing mesh shall comply with AS/NZS 4671. Mild drawn steel tying wire not less than 1.2 mm diameter.
070 010 114	SPACERS AND CHAIRS
	Precast concrete or purpose made moulded PVC. Use concrete spacer blocks only where the concrete surface is not exposed in the finished work.
	CONCRETE
070 010 115	20MPa. FIRTH 2019 TC2 Fibre mix grade with 20mm nominal maximum aggregate size and 80mm slump and shall comply with NZS3109.
	HANDLE AND STORE REINFORCING
070 010 116	Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean and free of contamination that may reduce bonding capacity.
070 010 117	FALSEWORK AND FORMWORK
	Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality.
070 010 118	CUT AND BEND
	Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109. Do not rebend bars without written approval. Bend main reinforcing bars, stirrups and ties to the former pin diameters as given in NZS 3109, table 3.1.
	SECURE REINFORCEMENT
	Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums laid down in NZS 3109, clause 3.6.
070 010 119	LAPPED SPLICES
070 010 120	Set length of laps, where not dimensioned on the drawings, in accordance with NZS 3109, clause 3.7. Increase laps of plain round steel by 100%.
070 010 121	COVER
	Minimum cover to reinforcing as shown on the drawings and to NZS 3109, clause 3.8. Fix chairs for top reinforcement in slabs at 1.0 metre centres. Cover tolerances to NZS 3109, clause 3.9.
070 010 122	SURFACE FINISHES
	To comply with NZS 3114, section 105, or as denoted on the drawings. Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Surface tolerances to comply with NZS 3114, sections 104 and clause 105.3.2.
070 010 123	DAMPPROOF MEMBRANE
	Apply membrane to prepared basecourse with 150 mm laps between sheets. Tape seal laps and penetrations with 50 mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.
	Polythene, Black 250 micron
070 010 124	CASTING IN
	Build in grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required. Form pockets, chases and flashing grooves as required. No grounds exceeding 100 mm in length. Minimum cover on conduits 40 mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25 mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar. Wrap all pipes embedded in concrete with tape to break the bond and to allow for expansion.
070 010 125	CONSTRUCT FLOOR SLABS
	Construct in accordance with NZS 3604:2011, section 7.5. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3 mm gradual deviation over a 3 metre straight-edge, to the requirements of NZS 3109.
070 010 126	SAW CUTS
	Pour floor slabs cast on the ground in areas no greater than 25 square metres, with a maximum ratio of length to breadth of 1:1.5. Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring. Where saw cuts are made, cut out 100 mm of every second wire of the mesh for a length of 50 mm each side of the saw cut position. Saw cuts: 1/3rd slab depth, or 30 mm minimum.
070 010 127	SURFACE REPAIRS
	Make good surface defects as soon as forms are stripped. Make good hollows or bony areas with 1:2 mortar, finished to the same tolerances as the parent concrete. Fill tie rod holes with 1:2 mortar.
070 010 128	CURING OF CONCRETE
	Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

070 010 129	STRIKE FORMWORK Strike formwork without damaging or overloading structure. CLEAN OUT
070 010 130	Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.
070 010 131	VIBRATION - All concrete shall be thoroughly vibrated when placed with a mechanical vibrator
070 090	
080 010 100	.....FRAMING & TRUSSES.....
080 010 101	TIMBER FRAMING GENERALLY Species, grade and level of treatment as selected and as set out in NZS 3602:2003. Grading to NZS 3631 and treated to NZS 3640. Mechanical stress grading acceptable as an alternative to visual grading.
080 010 102	TIMBER FRAMING DRY, CHEMICAL FREE, MECHANICALLY STRESS GRADED Species, grade and moisture content in service as selected and as set out in NZS 3602:2003. Machine stress graded to AS/NZS 1748, with an average moisture content at supply of 16% or less. TIMBER FRAMING DRY, TREATED Species, grade and moisture content in service as selected and as set out in NZS 3602:2003. Please refer to the timber treatment schedule on the drawings for treatment levels for this Job. Treated level to comply with NZS 3640, with an average moisture content at supply of 16% or less. Either mechanically stress graded to AS/NZS 1748, or visual grading to NZS 3631.
080 010 103	FINISHING TIMBER
080 010 105	As selected.
	INSULATION
080 010 106	As selected.
080 010 107	ACCESSORIES Building wrap: Eco ply barrier Damp proof course: 2-ply/3-ply kraft felt strip saturated and coated with bitumen. Nails, bolts and screws: Steel, stainless steel, galvanised steel of pattern to suit the location and to BRANZ Bulletin 519 "Fasteners selection". To NZS 3604:2011, section 4 for durability. Nail plates connectors: Stainless steel and/or galvanised steel toothed or nailed plates to the plate manufacturer's design for the particular locations as shown on the drawings and to NZS 3604:2011, section 4 for durability. Galvanised steel and stainless steel connectors and brackets to the connector manufacturer's design for locations shown on drawings and to NZS 3604:2011, section 4 for durability.
080 010 108	ATTENDANCE Provide and fix blocks, nogs, openings and other items as required by others.
080 010 109	MOISTURE CONTENT Maximum allowable moisture content in accordance with NZS 3602:2003 for framing supporting interior linings: - Framing at erection 24% - Framing at enclosure 20% - Framing at lining 16%
080 010 110	EXECUTION GENERALLY To NZS 3604:2011 except as varied in this specification. To include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs). Set out framing in accordance with the requirements of NZS 3604:2011 and as required to support sheet linings and claddings.
080 010 112	INSTALL WALL AND ROOF FRAMING Frame walls to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604:2011, section 8. Frame roof to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604:2011, section 9 and 10.
080 010 113	INSTALL BATTENS Fabricate and fasten wall battens to suit the selected wall cladding or lining. Fasten ceiling battens in accordance with NZS 3604:2011, section 13.
080 010 115	INSTALL INSULATION Fit insulation as detailed, to the insulation manufacturer's requirements, and to the requirements of BRANZ Bulletin 494 "Thermal insulation of new houses".
080 090	
090 010 100	.....ROOFING.....
	QUALIFICATIONS
090 010 101	Use experienced, competent roofers familiar with the materials and techniques specified. WIND AND EARTHQUAKE LOADINGS Use fixings and methods capable of sustaining the loads appropriate to the area as set out in NZS 3604:2011, section 5 and confirmed under COMPLIANCE INFORMATION.
090 010 102	
090 010 104	METAL TILES Profile, metal and finish as selected. Accessories, cappings, flashings, and fixings to match and to the roofing manufacturer's requirements.
090 010 106	ACCESSORIES Roof underlays: As selected. Nails, screws, fastenings: Metal, size and pattern, to roofing manufacturer's requirements and complying with the relevant aspects of NZS 3604:2011, section 4: Durability. Flashings: As selected.

090 010 107	Tile battens: Douglas fir, or No 1 framing radiata pine to NZS 3602:2003. Sized to NZS 3604:2011, section 10. Treated hazard class H1.
090 010 108	STORAGE
090 010 109	Stack roofing and accessories on clean, level areas of the site. Cover and protect from damage and from weather until ready to fix in place.
090 010 110	SET OUT
090 010 111	Set out the planned layout before fixing commences, to ensure true lines and the correct relationship to module, grid and roof features. Overlaps to face away from prevailing wind direction.
090 010 112	LAY ROOF UNDERLAY
090 010 113	Lay and fix to NZBC acceptable solution E2/AS1
090 010 114	TAKE CARE
090 010 115	Take care to avoid damaging pre-finished roofing both during and after fixing. Mark only with chalk or spirit-based pen. Wear only soft-soled shoes on the finished surface. Remove metal filings daily.
090 010 116	INSTALL TILE BATTENS
090 010 117	Install to the roofing manufacturer's requirements, with joints fully supported and staggered.
090 010 118	INSTALL METAL TILES
090 010 119	Cut with tools specified by the roofing manufacturer. Fold ends and seal cut edges of tiles and accessories without damaging their integrity or finish, all to the roofing manufacturer's requirements. Lap metal tiles and fix complete with matching accessories, flashed to roof features and penetrations; all to the roofing manufacturer's requirements.
090 010 120	FIXINGS AND SEALANTS
090 010 121	Refer to the roofing manufacturer's literature for fixing details and to NZS 3604:2011 for fixings durability requirements. Select and use sealants only as recommended by the roofing manufacturer.
090 010 122	INSTALL COVERS AND FLASHINGS
090 010 123	Provide apron, verge and ridge flashings. Install and fix as detailed and to the roofing manufacturer's details and to comply with NZBC acceptable solution E2/AS1, 4.0.
090 010 124	PENETRATIONS
090 010 125	Flash and overflash penetrations through the roof. Fit proprietary boots to pipework penetrations.
090 010 126	COMPLETE
090 010 127	Ensure the work is complete with flashings, undercloaks, valleys, ridges and hips properly installed so the finished roof is completely weathertight.
090 010 128	CLEAR
090 010 129	Clear trade debris and unused materials from the roof and surrounds regularly during the work and at completion. Sweep down the completed roof and flush out spoutings, gutters and rainwater pipes.
090 010 130	090 090
091 010 100	.....RAINWATER SYSTEM.....
091 010 101	ALUMINIUM/ZINC ALLOY COATED STEEL SPOUTING
091 010 102	Profile, jointing, brackets and fittings brand-matched and complete to the spouting manufacturer's specifications.
091 010 103	UPVC DOWNPIPES
091 010 104	Tubes, stand-off brackets and fittings brand matched and complete to the manufacturers specifications.
091 010 105	FLASHINGS GENERALLY
091 010 106	Aluminium/zinc coated steel, copperised pure lead, 0.5 mm copper sheet, or proprietary rubberised perforated aluminium strip, all to location, compatibility and design requirements of BRANZ Bulletin 467 "Principles of flashing design".
091 010 107	ELECTROLYTIC ACTION
091 010 108	Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
091 010 109	LIAISON
091 010 110	Ensure liaison with associated installations to ensure material selections are compatible and required flashing work is completed.
091 010 111	ENSURE
091 010 112	Ensure rainwater services are operational, flashings complete and the building weathertight.
091 010 113	091 090
100 010 100	.....ALUMINIUM JOINERY.....
100 010 101	CERTIFICATION
100 010 102	Provide a certificate from a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the performance requirements of NZS 4211 and the listed project site data. Fabrication by a member of the Window Association of New Zealand.
100 010 103	WINDOWS AND DOORS
100 010 104	Brand, finish and type as selected.
100 010 105	WINDOW AND DOOR REVEALS
100 010 106	As selected.
100 010 107	GLASS
100 010 108	As selected, with glass details to 45 GLAZING and complying with NZS 4223.
100 010 109	FLASHINGS
100 010 110	As selected.
100 010 111	ORGANIC POWDER COATING FINISH
100 010 112	To the Window Association of New Zealand's "Specification for powder coatings on architectural aluminium products". All finished surfaces to show uniformity of gloss and colour (to match sample) free of all coating defects.

100 010 107	HARDWARE
	As selected.
100 010 108	SEALANT, GLAZING TAPE AND GASKETS
	To the window manufacturer's requirements.
100 010 109	FIXINGS
	Ensure fixings and bracketing are compatible with aluminium. Do not use electroplated zinc fasteners or brass fastenings.
	CONFIRM OPENINGS
	Obtain confirmation of all framing openings on site for dimension, plumb and straightness prior to fabrication or ordering of timber joinery.
100 010 110	EXECUTION GENERALLY
100 010 111	In accordance with the requirements of NZS 4211 and the Window Association of New Zealand's "Aluminium Window Handbook" and "Installation code for aluminium joinery products".
	HANDLING
	Avoid distortion of elements during transit, handling and storage. Prevent pre-finished surfaces from rubbing together. Prevent contact with mud, plaster and cement. Do not deliver to site any elements which cannot be immediately unloaded into suitable conditions of storage.
100 010 112	CORROSION PROTECTION
	Seal or suitably coat cut ends and holes drilled in aluminium before the frames are installed. Before fixing, apply bituminous coatings, slips or underlays between dissimilar metals in contact, or aluminium in contact with concrete.
100 010 113	FIX FRAMES
100 010 114	Fix frames rigidly in place without distortion, to the window manufacturer's and the Window Association of New Zealand's "Aluminium Window Handbook" requirements, plumb, true to line and face, weathertight and with all openings operating freely.
100 010 115	DRAINAGE
	Anti-condensation channels to sills. All sills to sashes and fixed lights to incorporate positive drainage to the exterior.
	GLAZING INSTALLATION
100 010 116	All glass held in aluminium beads and black PVC gaskets.
	SAFETY GLASS INSTALLATION
	Use in doors, sidelight panels, low level windows and all other locations to comply with NZS 4223, part 3, as modified by NZBC acceptable solution F2/AS1.
100 010 117	INSTALL FLASHINGS
100 010 118	Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish on head flashings to match window finish.
100 010 119	SEAL FRAMES ON SITE
	Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight.
100 010 120	SAFETY
	Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Permanent manifestations to comply with NZS 4223, part 3, 303.1.
100 010 121	CLEAN GLASS AND FRAMES
	Clean off or remove glass indicators at completion of the building. Clean glass inside and out to a shining finish. Clean down both sides of window and door frames using the methods required by the window and door manufacturer.
100 090	<div style="border: 1px solid red; padding: 5px; text-align: center;"> WAIMAKARIRI DISTRICT COUNCIL Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3 141564 9/15/2014 Dawn </div>
120 090	
150 010 100	
150 010 101	.....PLUMBING.....
	QUALIFICATIONS
	Carry out work by or under the direct supervision of a person registered under the Plumbers, Gasfitters and Drainlayers Act 2006.
150 010 102	POLYBUTYLENE WATER PIPE
	Polybutylene tubing complete with fittings and accessories brand-matched.
150 010 103	INSULATION FOR HOT WATER PIPES
	As selected.
	EXPOSED PIPES
	As selected and to the following details:
	- chrome plated copper pipe with chrome plated brass nuts and fittings
	- white polyethylene composite pipe with white nuts and accessories
150 010 104	- pipework finish to include escutcheon plates and bends and elbows protruding from walls or fittings.
150 010 105	ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE
	Ceramic-coated steel thermal storage cylinder, insulated and complete with fittings required for installation by the manufacturer.
150 010 108	VALVES, TAPS AND FAUCETS
	As selected.
150 010 109	ELECTROLYTIC ACTION
	Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.
150 010 110	EXECUTION GENERALLY
	Generally carry out the whole of this work and tests to NZBC acceptable solution G12/AS1.

INSTALL POLYBUTYLENE/POLYETHYLENE WATER SUPPLY

Size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Run pipes complete with all fittings, support and fixing, and jointed to the pipe manufacturer's specifications, all to NZBC acceptable solution G12/AS1. Conceal pipework and pressure test before wall linings are fixed.

OUTLET LOCATIONS

Ensure wall outlets for exposed pipes are level and centred on the fixture to ensure the neat installation of exposed pipework.

INSTALL HOT WATER PIPE INSULATION

Insulate hot water pipes in accordance with the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs. Where hair felt is used, wrap around pipes in two layers in opposite directions and secure with galvanised steel wire ties.

INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS

Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC acceptable solution G12/AS1, 6.11.

PENETRATIONS

Provide and fit collars and escutcheon plates to match pipework at penetrations through constructions.

INSTALL TAPS AND FAUCETS

Install taps and faucets in accordance with the tap manufacturer's requirements. Flush out on completion. Check that washers or ceramic discs are operating correctly.

COMPLETION

Pressure test to ensure no leakage and leave in proper working order. Clean tapware and fittings.

UPVC WASTE, SOIL AND VENT PIPES

UPVC pipe, complete with fittings brand-matched to the pipe manufacturer's requirements.

SANITARY FIXTURES

As selected.

SANITARY ACCESSORIES

As selected.

EXECUTION GENERALLY

Carry out this work and complete all tests to G12/G13 (NZBC).

INSTALL SANITARY FIXTURES

Fit and install sanitary fixtures and associated screens, elements and hardware, plumb, true to line and rigid, to the fixture manufacturer's requirements. Supply standard chrome plated brass wastes and plastic plugs on chrome plated chains with all basins, tubs and baths.

INSTALL TRAPS, WASTE AND VENT PIPES

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to G12/G13 (NZBC). Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to roof vents and vermin proof mesh to untrapped waste pipes.

TEST

Test soil and waste disposal systems to ensure no leakage exists and leave in working order.

ENSURE

Ensure all sanitary plumbing fittings and pipework are complete and operational.

.....TILING.....**QUALIFICATIONS**

Use tilers experienced with the materials and techniques specified.

ADHESIVES COMPATIBILITY

On proprietary substrates or waterproof membranes use only adhesives with documented compatibility approval from the respective manufacturers.

SLIP RESISTANCE

Slip resistance to comply with NZBC acceptable solution D1/AS1, clause 2.1.

TILES

As selected.

ACCESSORIES

Underlays, waterproofing membranes: As selected.

Cement-based screed: Mix of 3:1 Portland cement, wash-mix sand, gauged with liquid polymer additive to the tile manufacturer's requirements.

Tile adhesive: To the tile manufacturer's requirements.

Grout: Cement based, compressible and to suit the particular location and use.

Control joint sealant: To BRANZ "Good Tiling Practice", section 8.0.

HANDLING AND STORAGE

Handle tiles with care to avoid chipping, soiling and damage. Store on hard, level standings in non-traffic, non-work areas that are enclosed, clean and dry. Reject all damaged tiles.

SUBSTRATE

Ensure all services and accessories are in place, located to suit the tile layout, with the substrate required for tiling work.

TEMPERATURE

Do not carry out tiling where the ambient temperature is below 5 degrees C, or onto a substrate with a temperature higher than 40 degrees C.

LAYOUT

Obtain confirmation of the proposed layout of tiles, expansion joints and other visual considerations.

EXECUTION GENERALLY

160 010 110 Prepare surfaces and carry out the tiling work in accordance with BRANZ "Good Tiling Practice".

160 010 111 SURFACE PREPARATION

To BRANZ "Good Tiling Practice", section 3.0.

160 010 112 TILE FIXING, CONCRETE, CEMENT-BASED ADHESIVE

Apply and float thin (thick) bed cement-based adhesive to a minimum 3 mm (6 mm) bed thickness to the tile manufacturer's requirements. Rib surface with a notched trowel, press the tile and beat it into place with 3 mm joints, and to obtain required coverage of adhesive on the back of each tile.

160 010 113 GROUTING

Remove spacers. Prepare joints, mix and apply proprietary grout and finish off the grout uniform in colour, smooth and without voids, pinholes or low spots.

160 010 114 MOVEMENT CONTROL JOINTS

Minimum width of 6 mm, carried through tile and bedding. Where substantial movement is anticipated, carry through the rigid sheet to the structure. Ensure joints are clean, formed, filled, and the sealant inserted to the sealant manufacturer's requirements.

160 090

170 010 100ELECTRICAL.....

170 010 101 COMPLY

Comply with the Electricity Regulations 1997, AS/NZS 3000:2007 and the New Zealand Electrical Codes of Practice for listed and prescribed work and with the utility network operator's requirements. Apply for the service connection. Arrange for the required inspections of listed work. Pay all fees.

170 010 102 QUALIFICATIONS

Carry out work by or under the direct supervision of a holder of a practising certificate under the Electricity Regulations 1997.

170 010 103 CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance to the owner, as required by the Electricity Regulations 1997. Allow the network utility operator to view before the meter installation, listed work inspection, polarity check and liveing of supply.

DISTRIBUTION BOARD / SUB BOARD

Proprietary manufactured, zinc plated powder coated, or heavy duty plastic, fire resistant enclosed construction, complete with neutral and earth busbars, MCB's and main switch. All protective devices: 6kA MCB's of the appropriate rating. Fit to board manufacturer's requirements where detailed. Recess into wall and ensure fire containment properties of the enclosure is maintained.

170 010 104

170 010 105 CABLES

Tough plastic sheathed copper conductors. Minimum sizes are indicated below. Increase these as necessary due to method of installation, cable length or load.

Lighting circuits: 1.5 mm² on 16 amp MCBs.

Power circuits (domestic): 1.5 mm² on 16 amp MCBs.

Power circuits (domestic

- insulated construction): 2.5 mm² on 16 amp MCBs.

170 010 106

ELECTRICAL ACCESSORIES

As selected and to the following details:

Wall boxes: Standard size in plastic, with 2 or more gang size in metal, all screw fixed.

Switch units: 16 amp, 230 volt flush polycarbonate units. For number of switches per unit, dimmer units, neon (indicator or toggle) units, locator units and 2-way units refer to the electrical drawings.

Hot water system switch: One way 20 amp switch complete with clamp for flexible PVC conduit.

Switched socket units: 10 amp, 230 volt flush polycarbonate 3 pin combined switch units.

Shaver/earth leakage

protected socket outlets: Earth leakage protected 110/230 volt multiple plug configuration and residual current protected socket outlets, tripping at 30 mA.

Ceiling roses: White plastic mounting base with screwed cover. Terminal type.

Batten holders: Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.

LIGHT FITTINGS

170 010 107

As selected.

170 010 108

ELECTRIC-POWERED FITTINGS AND EQUIPMENT

As selected.

CABLING

Install with a maximum of 8 light outlet units or 4 switched socket units on any circuit. Separate circuits for all electric heating appliances. All cabling run concealed. No TPS cable laid directly in concrete. Locate holes in timber framing for the passage of cables at the centre line of the timber member.

170 010 109

170 010 110

INSTALL SWITCH AND SOCKET UNITS

Fit single and double switch units and socket units level and plumb where shown on the drawings. Install at the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000 mm.

Socket Units: 150 mm above work benches.

400 mm elsewhere.

Mount switches vertically and socket units horizontally. Label switch units which control electrical equipment by engraving on the rocker switch.

170 010 111

INSTALL LIGHT FITTINGS

Install selected light fittings in the locations and heights shown on the drawings and in accordance with the fitting manufacturer's requirements.

	ELECTRIC HOT WATER SYSTEM
170 010 112	Wire as a separate circuit through a wall-mounted isolating switch, with the cable from switch to element encased in flexible PVC conduit, clamp fixed at each end.
170 010 114	WIRE FOR PLUMBING FITTINGS
170 010 115	Wire for fittings to the Electricity Regulations 1997 and to the fitting manufacturer's requirements.
	INSTALL SMOKE DETECTORS
	Install detectors to the detector manufacturer's requirements, fitted neatly and without damage to the surrounding finish.
	ELECTRIC POWERED FITTINGS AND EQUIPMENT
170 010 116	Install and wire selected fittings and equipment to the Electricity Regulations 1997 and the individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment.
170 010 117	COMPLETION
	Leave all fittings, lamps and tubes operational, with equipment and diffusers clean.
170 090	
200 010 100	.....BRICKWORK
	QUALIFICATIONS
200 010 101	Carry out brickwork with persons competent and experienced in the trade.
200 010 102	BRICKS
	As selected.
	ACCESSORIES
	Lintels: To NZBC E2 table 18E and B2 table 1 for durability.
	Vermin stop: Galvanised steel wire netting strip with reinforced edges and galvanised staples for fixing.
	Dampproofing: Heavy kraft strip laminates saturated and coated with bitumen, or bituminous brush-applied liquid membrane to suit location and detail.
	Ties: Pressed mild steel, galvanised after fabrication, or as required by NZBC E2 table 18C. Design to conform with AS/NZS 2699.1, as modified by NZBC acceptable solution B1/AS1.
	Sand for mortar: Sand to comply with NZS 3103. Chloride levels to not exceed 0.04% by dry weight of sand.
200 010 103	Water: From local authority supply.
	MORTAR
	Composed of Portland cement, sand and water with an admixture to the provisions of NZS 4210, clause 2.2. Obtain written approval if intending to use cement mortar as a damp proof course and where or if intending to use hydrated lime in the mortar.
200 010 104	
200 010 106	STORAGE
	Store bricks and other materials clear of the ground, under cover and well ventilated until placed in the work.
200 010 107	VENEER WORK GENERALLY
	Comply with NZBC E2 AS1, NZS 4210, section 2.9 and "Good Practice Guide - Masonry veneer". Where not otherwise detailed on the drawings or covered in the documents listed, carry out veneer construction to the details required by "Good Practice Guide - Masonry veneer".
	LAYING GENERALLY
	To NZS 4210. Ensure bricks are dry when laid. Use bricks equally off all pallets as work proceeds.
200 010 108	Distribute facing bricks of varying colour randomly throughout so no patches or striping appears.
	BOND
200 010 109	Stretcher bond, single width unless detailed or stated otherwise.
200 010 110	INSTALLING WALL TIES
	Screw fix to face of studs without otherwise piercing or damaging the building wrap. Ties placed and spaced to NZS 4210, section 2.9, as modified by NZBC acceptable solution B1/AS1.
200 010 111	MORTARING
	To maximum practical density. Mortar fully laid, firmly placed, correctly cured and not re-tempered. Discard any mortar not used within 1-1/2 hours of mixing. Joint thickness 10 mm plus or minus 2 mm.
200 010 112	RAKE OUT
	Rake out joints as work proceeds, for pointing as detailed. Maximum depth of rake 6 mm.
	POINTING
200 010 113	Joints tooled concave after initial stiffening.
200 010 114	WEEP HOLES
	Rake out every third perpend where weep holes are required, and vent veneer as per NZBC E2 clause 9.2.6 parts c,d, and e and to "Good Practice Guide - Masonry veneer".
200 010 115	CO-ORDINATE
	Co-ordinate the building-in of exterior joinery and items required for fitting as the work proceeds. Rake out for or build in flashings as required.
200 010 116	KEEP CAVITY AND TIES CLEAR
	Keep cavity and ties clear of mortar droppings and clean the brickwork face of any marking as the work proceeds. Repair damage to building wrap immediately it occurs.
200 010 117	BASE OF CAVITY
	Flaunch base of cavity and either:
	- apply bituminous brush-on liquid applied membrane as a primer and 2 coats, or
	- lay bitumen laminate sheet, lapped and adhered, to drain water effectively out of the cavity.

CLEAN DOWN

Clean down brickwork to remove stains. Remove efflorescence with a stiff bristle broom, blot with a damp sponge and wash walls with a plentiful supply of clean water during fine weather.

200 010 118
200 090
210 010 100

.....EXTERNAL CLADDING.....

PLYWOOD BRACING

Structural plywood to AS/NZS 2269. Bracing unit ratings for an extended range of plywood wall bracing systems have been derived from tests according to clauses 6.9.1.1 and 6.9.3.1 of N.Z.S. 3604 for walls. Structural plywood is the only sheet brace material with properties defined in a published New Zealand engineering design code, N.Z.S. 3603, "Timber Structures", and so can be designed in compliance with verification method B1/VM1 under clause 6.0. Structural plywood is manufactured under a third-party-audited, product quality control programme to joint Australian/New Zealand Standard AS/NZS 2269 "Plywood – Structural".

210 010 101
210 010 103

FIBRE CEMENT SHEET CLADDING

Cellulose cement autoclaved sheets.

210 010 104

FIBRE CEMENT SOFFIT LINING

Cellulose cement autoclaved sheets.

210 010 107

ACCESSORIES

As selected and to the following details:

Building wrap: Eco ply barrier

PVC jointers: To suit sheet thickness.

Nails, screws, fastenings: Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of NZS 3604:2011, section 4: Durability.

210 010 108

METAL FLASHINGS

As selected.

210 010 109

MOISTURE CONTENT

Maximum allowable moisture content in accordance with NZS 3602:2003.

210 010 110

EXECUTION GENERALLY

To NZS 3604:2011 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

210 010 111

INSTALL ECO PLY BARRIER

Fix eco ply barrier as detailed and to the cladding manufacturer's requirements.

210 010 112

INSTALL PLYWOOD

Install to the plywood manufacturer's requirements. Refer to the plywood manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.

210 010 115

INSTALL FIBRE CEMENT SHEET CLADDING

Install to detail and to the cladding manufacturer's requirements. Refer to the cladding manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" for specific provisions.

210 010 116

INSTALL FIBRE CEMENT SOFFITS

Cut sheets dry and scribe fit to fully support all edges and joints. Nail and drill for and insert fasteners to the sheet manufacturer's requirements. Fit complete with jointers and capping moulds. Refer to the cladding manufacturer's literature for fixing details, NZS 3604:2011 for fixings durability requirements and to BRANZ Bulletin 407 "Walls on exposed sites" and Bulletin 408 "Roofs on exposed sites" for specific provisions.

210 010 118

INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to BRANZ Bulletins 467 "Principles of flashing design" and 465 "Domestic flashing installation".

USE OF SEALANTS

Selection and use of sealants to follow BRANZ Bulletin 441 "Sealed joints in external claddings - 2.

210 010 119

Sealants".

210 010 124

COMPLETE

Complete all flashings, finishings and trim so the cladding system is completely weathertight.

210 090

230 090

240 010 100

.....LINEA WEATHERBOARD.....

240 010 101

180mm James Hardie Linea Weatherboard - See James Hardie Specification for further details

240 090

280 010 100

.....PLASTERBOARD LININGS.....

FRAMING MOISTURE CONTENT

280 010 101

Maximum allowable moisture content in accordance with NZS 3602:2003.

PROTECT

Protect joinery, fittings and finishes already in place from water staining or damage from lining installation.

280 010 102

Ensure building is weatherproof before lining work commences.

280 010 103

PLASTERBOARD

As selected. Gypsum plaster core encased in a durable face and backing paper formed for standard use, bracing use, fire rated use and water resistance use.

PLASTERBOARD ACCESSORIES

External angles: Slim type 0.5 mm galvanised steel.

Casing bead: Slim type 0.5 mm galvanised steel or PVC.

Cornice: Plasterboard scotia type.

Nails: Galvanised clouts 40 mm x 2.5 mm.

Screws: 40 mm x 6 gauge zinc electro-plated bugle head gypsum drywall screws

Jointing compound

and paper tape: To the board manufacturer's requirements.

Adhesive: Multi-purpose water based wallboard adhesive.

280 010 104

280 010 106

NAILS

Zinc-plated steel, stainless steel and galvanised steel of pattern to suit location and to BRANZ Bulletin 519 "Fasteners selection".

INTERIOR FINISHING TRIM

Timber selection to NZS 3602:2003. Profile as detailed, or to match existing. Jointer profiles to suit location.

280 010 107

280 010 108

SUBSTRATE

To NZS 3604:2011, sections 8, 10, 12, 13 and the standard required by the lining manufacturer's requirements. Ensure moisture content of timber framing is at or below specified levels.

CONFIRM LEVELS OF FINISH

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained. Provide levels of finish as laid down in AS/NZS 2589: 2007.

280 010 109

LINE PLASTERBOARD CEILINGS AND WALLS

Line ceilings with plasterboard sheets, fastened to the plasterboard manufacturer's requirements. Line walls that are up to 2400 mm high by the horizontal method and walls above 2400 mm high by the vertical method, with plasterboard sheets.

280 010 110

280 010 111

SPECIAL PLASTERBOARD LININGS

Line wet area walls with water resistant plasterboard sheets using adhesive and nail fixing to studs at centres to suit the surface finish. Form bracing panels using high density plasterboard sheets fixed with clout-washers and clouts and to conform with NZS 3604:2011, sections 5.8 and 13.5. Form sound rated panels following the sheet manufacturer's specifications and details for the required sound rating. Form fire rated panels following the sheet manufacturer's specifications and details for the required fire rating.

280 010 112

FIX PLASTERBOARD EXTERNAL ANGLES

Fix full length to external corners, with clouts at 100 mm each side staggered.

280 010 114

PLASTERBOARD JOINTING AND STOPPING

Fill joint recess with bedding compound, centre the paper tape, apply second coat of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. Fill nail holes and flush up external angles with two successive coats of bedding compound followed by a coat of finishing compound. Allow to dry and lightly sand off. All to the plasterboard manufacturer's requirements.

280 010 115

LEVELS OF FINISH

Provide levels of finish to standards laid down by AS/NZS 2589: 2007. as follows:

Level 4: surfaces receiving light texture or wall covering finishes

Level 5: surfaces receiving thin coating finishes.

280 010 116

INSTALL TRIM

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber beads to wall/ceiling junctions.

280 090

290 010 100

.....GLAZING.....**MIRRORS, ADHESIVE FIXED**

Fix with adhesive mirror-mastic and double-sided adhesive tape. Adhesive mastic area 0.25 square metres per 1 square metre of mirror.

290 010 101

290 010 102

SAFETY

Indicate the presence of transparent glasses, with whiting, tape or signs compatible with the glass type. Do not apply indicators other than whiting to the glass surface. Permanent manifestations to comply with NZS 4223, part 3, 303.1.

CLEAN

Clean off or remove indicators at completion of the building. Clean glass inside and out to a shining finish.

290 010 103

290 090

300 010 100

300 010 101

.....PAINTING & PAPERHANGING.....**QUALIFICATIONS**

Carry out work using competent and experienced painters and paperhangers.

300 010 102

HEALTH AND SAFETY

Refer to the requirements of the Health and Safety in Employment Act 1992 and if elimination or isolation is not possible, then minimise the hazards in this work. Refer to BRANZ Bulletin 314 "Removing paint coatings from houses" for the required procedures and precautions when treating or removing lead based paint, burning or sanding off paint, or using solvent based paint removers.

300 010 103

PAINT

As selected and to the paint manufacturer's standards for exterior and/or interior primers, undercoats, sealers, stains, clear coatings, solvent-borne and water-borne paints.

300 010 104

GAP FILLERS

Linseed oil, putty, plastic wood, wood filler or plastic filler, to suit and to match the surface being prepared.

300 010 105	INSPECT SURFACES Inspect surfaces being painted and report to the owner any that will not, after the preparatory work laid down by the paint manufacturer, allow work of the required standard. Confirm that all areas have adequate lighting and are sufficiently free of other construction activities to enable painting and/or paperhanging work to proceed.
300 010 106	PROTECT Cover up adjoining surfaces and areas liable to damage or over-painting.
300 010 107	REMOVE HARDWARE Remove hardware and door/window furniture and replace on completion. Do not paint over permanently attached hinges, or any hardware items which cannot be removed.
300 010 108	PRIMING AND SEALING Ensure that priming and sealing work needed before or during construction is carried out when required.
300 010 109	ENVIRONMENTAL CONDITIONS Carry out work within acceptable temperature and humidity limits, with timber dry, all to the requirements of the paint manufacturer.
300 010 110	SELECTIONS Confirm all selections, colours and finishes for both paint and wallpaper with the owner.
300 010 111	SHARP EDGES, CRACKS AND HOLES Repair as required by the paint manufacturer.
300 010 112	PREPARE SURFACES Prepare surfaces as required by the paint manufacturer. Make good all damage and defects.
300 010 113	PAINT APPLICATION Apply paint by brush and/or roller to suit the location of the coating and to the paint manufacturer's requirements. Do not spray on site without express permission.
300 010 114	MANUFACTURER'S MANUALS Refer to the paint manufacturers' manuals and follow their preparation, sequence and application requirements applying to each system. Ensure all paint coats in any system are supplied by the same manufacturer.
300 010 115	SCUFF BETWEEN COATS Scuff between all coats to remove any dust pick-up, protruding fibres and coarse particles.
300 010 116	FINISHED PAINT SURFACES Finished paint surfaces to show uniformity of gloss and colour, with the correct thickness for each coat, and freedom from painting defects. Ensure finished work is clean and free of any disfigurement.
300 010 119	CLEAN Clean adjoining surfaces, glass and fittings of any paint contamination.
300 010 120	REPLACE Replace hardware without damage to the hardware or the adjoining surfaces.
300 090	
350 010 100	.....FITTINGS / JOINERY.....
350 010 103	MEDIUM DENSITY FIBRE BOARD Urea-formaldehyde resin bonded wood fibre sheet. Printed finish: a dry stamping foil of polyester film with barrier and adhesive layers impregnated with a decorated photogravure print. Melamine veneer: veneered both sides with melamine sheet. Wood veneer: veneered with selected wood veneer.
350 010 104	BENCHTOPS Construction as detailed on the drawings. Finish to be a material (ie high pressure laminate) in accordance with G3/AS1 (1.1)
350 010 105	HARDWARE Carcase connectors: One-piece steel, straight deep-cut thread, fibre board screws with press fit plastic trim cap. Carcase fasteners: Knock down type centric sphere zinc alloy connectors with connecting bolts, sleeves and dowels, to suit each particular fastening location. Hinges: Butt, broad butt, flush butt or overlay, steel, zinc-plated steel, stainless steel, or brass, to suit the location, or as detailed. Concealed hinges: All-metal zinc alloy, automatic spring and screw-fixed. Plastic button stops. Drawer runners: Groove mounting type, precision running ball-mounted single-stage extension, bright steel finish system.
350 010 106	GLUES AND ADHESIVES As approved by the manufacturer for the timber, timber product, or pre-finished timber product joint.
350 010 107	EXECUTION GENERALLY To include those methods, practices and processes contained in the current syllabus for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).
350 010 108	TRANSIT AND DELIVERY Load, transport and unload fittings without distortion or damage and keep covered to protect from the weather. Do not deliver fittings until floor, wall and ceiling surfaces are in place and the fittings can be placed in their final location.
350 010 109	FABRICATION QUALITY Check site dimensions. Carry out machining within the practices required for the particular timber or wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's requirements. Work accurate, square and true to line and face.

350 010 110	FABRICATE JOINERY FITTINGS Carry out jointing, dowelling and other operations necessary for the proper assembly of the fittings as detailed, with fixings concealed unless otherwise detailed. Use glue joints where provision for shrinkage is not required, with contact surfaces, glueing and pressure all applied to the glue manufacturer's requirements. Locate and drive connectors and fasteners to the bolt manufacturer's requirements. Scribe fit adjustable shelves with 4 shelf pins and locate force fit pin holes at 50 mm maximum centres in solid cheeks. Hang doors on concealed hinges.
350 010 111	FABRICATE DRAWERS Construct drawers as detailed, using proprietary metal section drawer runners. Fit drawers with 3 mm clearance into the drawer space.
350 010 112	INSTALL JOINERY FITTINGS Scribe fit on site and install level, square, plumb and true to line and face.
350 090	
990 010 100	.....REFERENCES.....
990 010 101	Documents listed below are, when referred to in the text, part of this specification. However, this specification takes precedence in the event of it being at variance with and requiring a higher standard than any cited document.
990 010 102	Acts and Regulations
990 010 104	Health and Safety in Employment Act 1992 Electricity Regulations 1997
990 010 105	Plumbers, Gasfitters and Drainlayers Act 2006 New Zealand Electrical Codes of Practice (ECP)
990 010 106	New Zealand Building Code acceptable solutions
990 010 107	B1/AS1 Structure - general, F2/AS1 Hazardous building materials - As Applicable
990 010 109	E1/AS1 Surface water, G12/AS1 Water supplies
990 010 110	E2/AS1 External moisture, G13/AS2 Foul Water - drainage
990 010 111	New Zealand Standards
990 010 112	AS/NZS 1748 Mechanically stress-graded timber
990 010 113	AS/NZS 2269 Plywood - Structural
990 010 114	AS/NZS 2589: 2007. Gypsum linings - Application and finishing
990 010 115	2589.1 Gypsum plasterboard
990 010 118	AS/NZS 3000:2007 Electrical Regulations - Buildings, structures and premises
990 010 119	NZS 3103 Sands for mortars and plasters
990 010 120	NZS 3109 Concrete construction
990 010 121	NZS 3114 Concrete surface finishes
990 010 122	AS/NZS 4671: 2001 Steel reinforcing materials
990 010 123	AS/NZS 4671: 2001 Steel reinforcing materials
990 010 124	G12/G13 (NZBC) National plumbing and drainage code
990 010 125	Part 2.2 Sanitary plumbing and drainage - Acceptable solutions
990 010 126	Part 3.2 Stormwater drainage - Acceptable solutions
990 010 127	NZS 3602:2003 Timber and wood-based products for use in building
990 010 128	NZS 3604:2011 Timber framed buildings
990 010 129	NZS 3631 New Zealand national timber grading rules
990 010 130	NZS 3640 Chemical preservation of round and sawn timber.
990 010 132	NZS 4211 Performance of windows
990 010 133	NZS 4223 Glazing in buildings
990 010 134	Part 1: The selection and installation of glass in buildings
990 010 135	Part 3: Human impact safety requirements
990 010 137	NZS 4251 Solid plastering
990 010 138	Part 1: Cement plasters for walls, ceilings and soffits
990 010 141	NZS 6803 Acoustics - Construction noise
990 010 142	Building Research Association of New Zealand
990 010 143	"Good Tiling Practice"
990 010 145	Bulletin 441: Sealed joints in external claddings - 2. Sealants
990 010 146	Bulletin 467 : Principles of flashing design
990 010 147	Bulletin 465: Domestic flashing installation
990 010 148	Bulletin 314: Removing paint coatings from houses
990 010 149	Bulletin 519: Selection and use of fasteners
990 010 150	Bulletin 494 & 496: Thermal insulation of new houses
990 010 152	Bulletin 407: Walls on exposed sites
990 010 153	Department of Labour
990 010 155	OSH Publication: "Approved Code of practice for Safety in Excavation and Shafts for Foundations"
990 010 156	New Zealand Metal Roofing and Cladding Manufacturers' Association Inc
990 010 157	Profiled metal roofing design and installation handbook
990 010 158	Window Association of New Zealand
990 010 159	Aluminium Window Handbook
990 010 160	Specification for powder coatings on architectural aluminium products
990 010 161	Installation code for aluminium joinery products
990 090	

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Finishing Schedule

All finishes to comply with NZBC E3 - Internal Moisture

Ensuite & WIR

Floor	Substraight Finish	Concrete Floor See plans
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Lustacryl Semi-Gloss Waterborne Enamel"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Bathroom & Separate Wc

Floor	Substraight Finish	Concrete floor See plans
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Laundry in Garage

Floor	Substraight Finish	Concrete floor Resene "Aquaproxy for Flooring Waterborne Epoxy"
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Zylone Low Sheen"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

Kitchen

Floor	Substraight Finish	Concrete floor See plans
Walls	Substraight Finish	10mm Gibralter board, finished to level 4 Resene "SpaceCote Low Sheen Kitchen & Bathroom waterborne Enamel"
Ceiling	Substraight Finish	10mm Gibralter board, finished to level 4 Resene " Ceiling Paint Flat Acrylic"
Doors & Windows		Resene " Lustacryl Semi-Gloss Waterborne Enamel" or Resene " Lusta-Glo Semi-Gloss Enamel"

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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**

THERMAKRAFT 215

BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

APPLICATION AND INSTALLATION

Product Description	<p>THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY is specifically designed for use in Domestic and Commercial type buildings.</p> <p>THERMAKRAFT 215 is a breathable, absorbent bituminous wall and roofing underlay.</p> <p>THERMAKRAFT 215 will provide the following functions:</p> <ul style="list-style-type: none"> • Reduce wind entry into the cavity, thereby assisting the performance of thermal insulation. • Highly water vapour permeable, thereby allowing excess water vapour which might otherwise condense in the structure, to escape. • Provides a temporary protection against wind, dust, rain and other weathering elements until the external cladding is applied. 						
Applications	<p>THERMAKRAFT 215 is suitable as a wall and roofing underlay where Fire Retardancy is NOT required, and with all cladding types.</p> <p>THERMAKRAFT 215 is self supporting to 1200mm rafter/purlin spacing.</p> <p>THERMAKRAFT 215 can be used as an Air Barrier.</p> <p>THERMAKRAFT 215 must not be left exposed to the elements for more than 7 days. Cladding on the same day is recommended. If Fire Retardancy (FI <5) is required, use Thermakraft COVERTEK407.</p>						
Installation Roofing	<p>THERMAKRAFT 215 may be run vertically over purlins with a 150mm lap if roof pitch >8 degrees. Fix securely to purlins with 8mm staples or 20mm clouts. The membrane should be firmly laid to avoid excessive dishing between purlins.</p> <p>THERMAKRAFT 215 may be run horizontally across rafter/trusses with a 150mm lap for roof pitches above 3 degrees. Fix securely with 8mm staples or 20mm clouts.</p>						
Control of Condensation	<p>In climatic regions where condensation risks are high, such as cold or high humidity areas, care needs to be taken in specifying the correct design and installation to prevent moisture build-up in the roof cavities. Factors which adversely affect the condensation risk in roofing systems include;</p> <table style="width: 100%;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Humid, and/or cold climatic regions • Warm/Skillion roof construction • Low roof cavity air volume and restricted air movement • Omitting Vapour Control Layers • Ceiling penetrations and entry of warm air into roof cavities </td><td style="vertical-align: top;"> <ul style="list-style-type: none"> • Occupancy activities which have high moisture loading on conditioned spaces • Low pitched roof • Bulk insulation • Building structures ability to naturally dry Construction Moisture </td></tr> </table> <p>Skillion and Warm Roof Construction are particularly sensitive to moisture accumulation and the design and installation of roof construction needs to take into account the higher condensation risks. Refer MRM Code of Practice for details.</p>	<ul style="list-style-type: none"> • Humid, and/or cold climatic regions • Warm/Skillion roof construction • Low roof cavity air volume and restricted air movement • Omitting Vapour Control Layers • Ceiling penetrations and entry of warm air into roof cavities 	<ul style="list-style-type: none"> • Occupancy activities which have high moisture loading on conditioned spaces • Low pitched roof • Bulk insulation • Building structures ability to naturally dry Construction Moisture 				
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Storage	<p>THERMAKRAFT 215 should be stored on end in dry conditions. Protect from the weather and direct sunlight.</p>						
Roll Dimensions	<table style="width: 100%;"> <tr> <td>1250mm x 40.0m = 50m²</td><td>20kg</td></tr> <tr> <td>1250mm x 20.0m = 25m²</td><td>10kg (2 per pack)</td></tr> <tr> <td>1450mm x 34.5m = 50m²</td><td>20kg</td></tr> </table>	1250mm x 40.0m = 50m ²	20kg	1250mm x 20.0m = 25m ²	10kg (2 per pack)	1450mm x 34.5m = 50m ²	20kg
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For more information regarding **Thermakraft COVERTEK407 FIRE RETARDANT SELF SUPPORTING ABSORBENT BREATHABLE SYNTHETIC NON WOVEN ROOFING UNDERLAY** refer to the "DESIGNER and USER GUIDELINES" - Direct and Cavity Fix, or contact **Thermakraft Customer Services on 0800 806 595.**

THERMAKRAFT 215

BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY

TECHNICAL SPECIFICATIONS

Technical Data

THERMAKRAFT 215 BITUMINOUS SELF SUPPORTING ROOFING UNDERLAY complies with the requirements of NZBC E2/AS1 Table 23.

Nominal Grammage 400g/m²

NZBC E2/AS1 TABLE 23 AS A WALL UNDERLAY REQUIREMENTS

NZBC E2/AS1 TABLE 23 WALL UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥100 gsm	Pass
Vapour Resistance	≤7 MN.s/g	Pass
pH of Extract	≥6 and ≤9	Pass
Shrinkage	≤0.5%	Pass
Water Resistance	≥100mm	Pass
Air Barrier	≥0.1 MN.s/m ³	Pass
Duty		Heavy

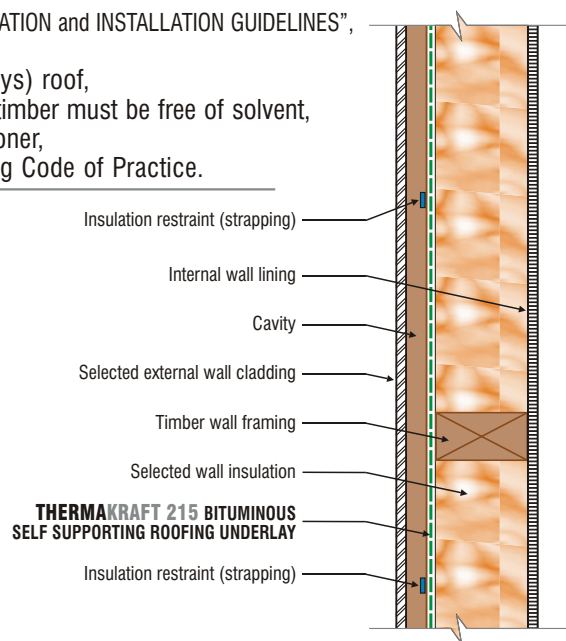
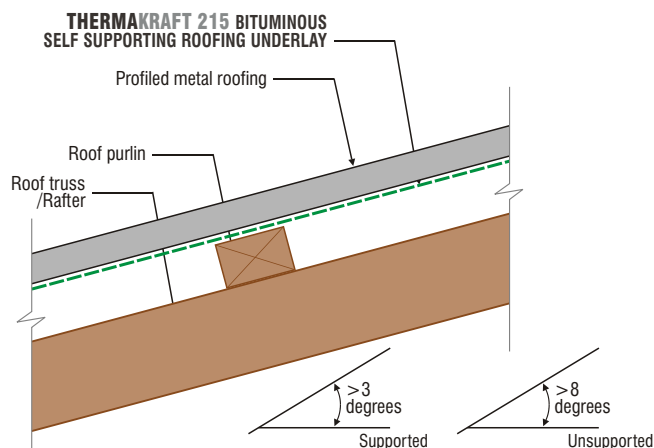
NZS2295:2206 Classification

Flammability Index		Non Fire Retardant
Wind Zone	R2	Up to Very High
NZS2295:2006 Classification	R2	Self Supporting

Durability/Limitations

For **THERMAKRAFT 215** to meet the Performance Requirements of NZBC Clause B2, Durability B2.3.1(a) 50 years and B2.3.1(b) 15 years, E2 External Moisture, **THERMAKRAFT 215**:

- must be installed in accordance to the "APPLICATION and INSTALLATION GUIDELINES",
- run length no greater than 10 metres,
- is not left exposed for more than (7 days) roof,
- when used on LOSP treated timber, the timber must be free of solvent,
- installed by a licensed building practitioner,
- installed in accordance with the Roofing Code of Practice.



The recommendations contained in Thermakraft's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to any conditions contained in the Warranty. All product dimensions and performance claims are subject to any variation caused by normal manufacturing process and tolerances. Furthermore, as the successful performance of the relevant system depends on numerous factors outside the control of Thermakraft (for example quality of workmanship and design), Thermakraft shall not be liable for the recommendations in that literature and the performance of the Product, including its suitability for any purpose or ability to satisfy the relevant provisions of the Building Code, regulations and standards.

Consent Issued BC141564

BC141564

James Hardie®

EAVES AND SOFFITS

WAIMAKARIRI DISTRICT COUNCIL
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Installation Manual

MAY 2012 | NEW ZEALAND



James Hardie
a smarter way™

Content

1	INTRODUCTION	3	5	JOINTING OPTIONS	19
	Eclipsa™ Eaves Lining	3			
	Silkline® Soffit Lining	3	6	JOINTING AND FINISHING	21
	HardieGroove™ Soffit Lining	3	6.1	General	21
	Villaboard® Soffit Lining	3	6.2	Glancing Light	21
	Hardiesoffit™ Lining	4	6.3	Level of Finishes	21
	HardieFlex™ Eaves Lining	4	6.4	Paint Finishes	22
	Product Description	5	6.5	Villaboard Soffit Lining Jointing and Stopping	22
	Accessories	6		Mixing Instructions	22
2	SAFE WORKING PRACTICES	10	6.6	Set Joints	23
			6.7	Painting	24
3	FRAMING	11	7	PRODUCT INFORMATION	25
3.1	Timber Frame	11	7.1	General	25
3.2	Steel Frame	11	7.2	Durability	25
3.3	Framing Set-Out	11	7.3	Finishes	25
3.4	Batten Requirements	12	8	MAINTENANCE	25
3.5	Skillion Roof Design	12		PRODUCT WARRANTIES	27
4	INSTALLATION	12			
4.1	General	13			
4.2	Fastener Durability	13			
4.3	Hardiesoffit Lining	14			
4.4	HardieFlex Eaves Lining	14			
4.5	HardieGroove Soffit Lining Fixing Method	14			
4.6	Eclipsa Eaves Lining and Silkline Soffit Lining	15			
4.7	Villaboard Soffit Lining (small soffits)	15			
4.8	Titan® Facade Panel in a Soffit Application	18			
4.9	Internal Swimming Pool Application	18			
4.10	Special Details	19			

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie®

Fax 0800 808 988

literaturefeedback@jameshardie.co.nz

1 Introduction

James Hardie have a wide range of soffit linings and pre-finished soffit linings that enable you to create the look you want.

Cool, wide soffits and verandahs have, over the years, been a feature which specifiers have used to provide shade from the hot summer sun and to give UV protection to exterior paintwork and interior fabrics.

Today's high energy costs demand that all avenues be explored to develop cost-efficient ways for keeping our homes cool. One

of these methods — tried and proven — is the use of wide soffits, verandahs and covered outdoor living areas. James Hardie products are resistant to fire and damage from moisture and rotting when installed and maintained as directed.

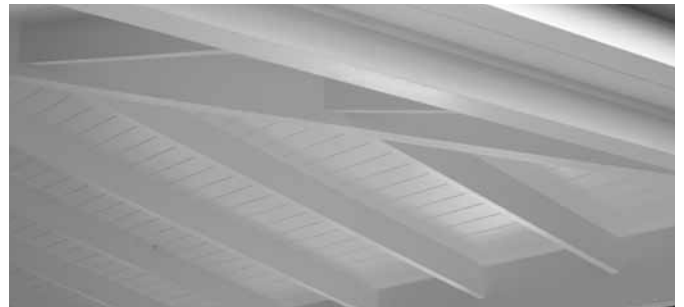
James Hardie Eclipsa Eaves Lining, HardieGroove Soffit Lining, Silcline Soffit Lining, HardieFlex Eaves Lining, Hardiesoffit Lining and Villaboard Soffit Lining are not suitable for use as a cladding.



Eclipsa™
EAVES LINING

Eclipsa™ Eaves Lining is a 4.5mm thick, pre-finished acrylic eave providing innovative style and enduring performance.

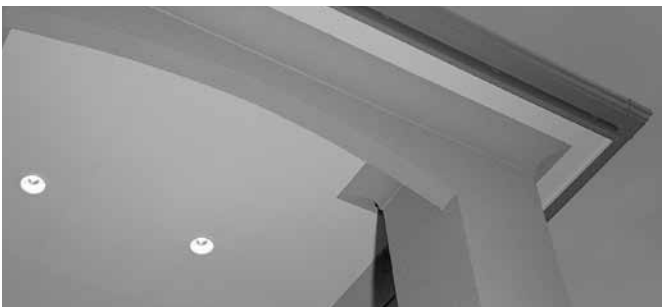
- Easy to install, saving both time and money.
- A slipsheet minimises surface marks on paint during transportation and installation.



HardieGroove™
SOFFIT LINING

HardieGroove™ Soffit Lining has the charm of traditional tongue and groove timber panelling, but has all the qualities of a modern James Hardie fibre cement product. It's perfect for enhancing design lines on modern buildings or renovating old villas and bungalows.

- HardieGroove Soffit Lining comes with a half groove length ways along the edge of the sheet to achieve concealed joints.



Silcline®
SOFFIT LINING

Pre-finished Silcline® Soffit Linings are 4.5mm in thickness and comes as a complete, easy-to-install soffit lining with jointers, cappings, Fastfix fasteners and a simple two-piece scotia to complete a good-looking soffit.

- Silcline Soffit Lining is the ideal lining for soffits, eaves, verandahs, carports and porches or wherever a decorative easy-clean ceiling lining is required, e.g. spa pools, kitchens and garages.
- When low maintenance building materials are your choice, Silcline Soffit Linings will last and meet these needs. In addition, they have a 10 year coating warranty to give you extra peace of mind.



Villaboard®
SOFFIT LINING

Villaboard® Soffit Linings are 6mm and 9mm in thickness to suit both residential and commercial applications. The recessed edges are suitable for flush jointing to give a smooth flush finish. Ideal for larger sized soffits.

- The sheets are fully sanded to give a smoother face surface.
- Two long sheet edges are supplied with a recessed finish and site-cut edges can be readily ground on site. Other combinations are also available. Refer Table 3, page 5.
- Square-edge sheets are also available. These sheets can be used for the alternative expressed, sealant-filled or uPVC joint finish.



Hardiesoffit™

LINING

Hardiesoffit™ Linings are 4.5mm thick and are specifically manufactured for the narrow soffit around the perimeter of the house or building. Standard widths of 450mm, 600mm and 750mm are available.

- Hardiesoffit Linings have an unsanded finish suitable for semi-gloss acrylics or lightly textured semi-gloss or high-gloss coatings. Smooth high-gloss coatings must be avoided as some surface undulations may be visible in critical light.
- Hardiesoffit Linings can be nail-fixed to timber or mechanically fixed to a steel frame.
- Hardiesoffit Linings can be uPVC jointed or the joints can be left expressed.



HardieFlex™

EAVES LINING

HardieFlex™ Eaves Lining are 4.5mm in thickness and are available in wider widths for use in wider soffits, ceilings and verandahs. They are complementary to the Hardiesoffit Lining and are fixed and jointed in a similar way.

- HardieFlex Eaves Lining has an unsanded finish suitable for semi-gloss acrylics or lightly textured coatings. Smooth high-gloss coatings must be avoided as some surface undulations may be visible in critical light.
- HardieFlex Sheet 6mm, can also be used in eaves application for extra rigidity on larger spanning eaves.
- When higher impact or wind resistance is required, 6mm thick HardieFlex Sheet is used.



This manual covers the use of Eclipsa Eaves Lining, Silklane Soffit Lining, Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining in external eave and soffit applications. Further technical literature relating to these products and internal linings are available from James Hardie in the following manuals:

- Villaboard Lining Installation Manual.
- HardieGroove Lining Installation Manual.
- Fire and Acoustic Design Manual.

The specifier or other responsible party for the project must ensure the information and details in this manual are appropriate for the intended application and specific design and detailing is undertaken for areas which fall outside the scope of this document.

MAKE SURE YOUR INFORMATION IS UP TO DATE

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or you need more information, visit www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

PRODUCT DESCRIPTION

Table 1

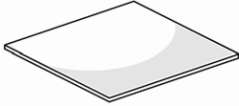
Eclipsa Eaves Lining Sheet Sizes				
Pre-finished square-cut edge sheet for use with jointers		Length	Mass (kg/m²)	Width (mm)
		4.5mm thickness	5.9	600 1200
		2400		✓ ✓

Table 2

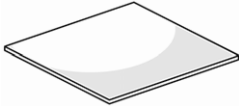
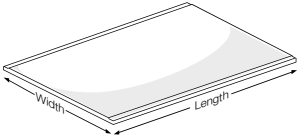
Silkline Soffit Lining Sheet Sizes				
Pre-finished square-cut edge sheet for use with jointers.		Length	Mass (kg/m²)	Width (mm)
		4.5mm thickness	5.9	600 1200
		2400		✓ ✓

Table 3

Villaboard Soffit Lining Sheet Sizes				
Smooth recessed edge for flush jointing. Square-cut edge also available for use with jointers.		Length	Mass (kg/m²)	Width (mm)
				1200
				4 rec/ edges 2 rec/ edges (long) Square edges
		6mm thickness	8.3	
		2400		✓ ✓ ✓
		2700		✓ ✓
		3000		✓ ✓
		9mm thickness	12.4	
		2400		✓ ✓ ✓
		2700		✓ ✓
		3000		✓ ✓

6mm Villaboard Lining has no chamfer on square edge sheet.
9mm Villaboard Lining has small chamfer on square edge sheet.

Table 4

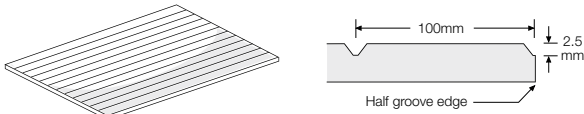
HardieGroove Soffit Lining Sheet Sizes				
Half groove length ways to achieve concealed joints.		Length	Mass (kg/m²)	Width (mm)
				1200
		7.5mm thickness	10.44	
		2400		✓
		2700		✓

Table 5

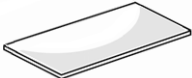
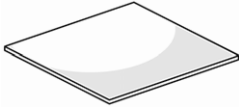
Hardiesoffit Lining Sheet Sizes				
Square-cut edge sheet for use with jointers.		Length	Mass (kg/m²)	Width (mm)
		4.5mm thickness	5.9	450 600 750
		2400		✓ ✓ ✓

Table 6

HardieFlex Eaves Lining Sheet Sizes				
Square-cut edge sheet for use with jointers.		Length	Mass (kg/m²)	Width (mm)
		4.5mm thickness	5.9	1800 2400 2700 3000
		900		✓
		1200		✓ ✓ ✓ ✓
		6mm thickness	7.8	
		1200		✓ ✓ ✓ ✓

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Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

ACCESSORIES

Table 7

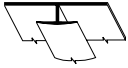

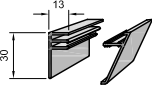
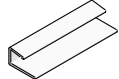
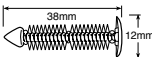


Eclipsa Eaves Lining And Silcline Soffit Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	Hardiejointer™ 5mm 2400 long 750 long 600 long 450 long	300729 300921 300920 300919		Silcline PVC 2-way Jointer 2400 long, uPVC / White	300915
	Silcline Scotia Mould (base and cap) 2400 long, uPVC / White	300916		HardieFlex Capping Mould 5mm 2400 long, uPVC / White	300538
	Fastfix Fasteners 38 x 12mm, Nylon / White	300632		Inseal 3259 1.5mm thick 50mm wide x 50mm long, Black compressible foam	300767
	Eclipsa Eaves Lining and Silcline Soffit Lining Touch-up Paint 15ml	Free Ask James Hardie on 0800 808 868			

Table 8

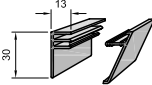

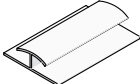

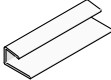
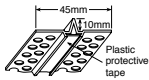





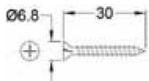
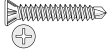
Villaboard® Soffit Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	Silkline Scotia Mould (base and cap) 2400 long, uPVC / White	300916		Inseal 3259 1.5mm thick 50mm wide x 50m long, Black compressible foam	300767
	Hardiejointer 6mm uPVC / Bone colour 2400 long 3000 long	300730 300734		9mm Hardiejointer uPVC / Bone colour 3000mm long	300736
	HardieFlex Capping Mould 6mm 2400 long 3000 long uPVC / Bone colour	300539 300540		Control Joint 2700 long, uPVC / White	300978
	Corner Angle 3000 long uPVC	300669		James Hardie Top Coat Topping compound for flush finished jointing.	3kg Pail 304492 15kg Pail 304493
	James Hardie Base Coat Base compound for flush finished jointing.	4kg Pail 304490 15kg Bag 304491		HardieBlade Saw Blade Ø185mm poly crystalline diamond blade, for fast, clean cutting of James Hardie fibre cement.	300660
	HardieDrive Screw s/s 316 30mm x 7g 100 per jar For fastening to timber frames.	300928		Villadrive Screw 6g x 30mm For fastening to timber frames. 100/jar 5kg Collated/1000	300992 300993 300994
	FibreZip® Screws Self drilling rib head screw Box 1000	303840			

Table 9

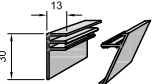



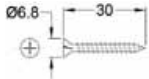
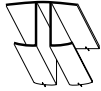
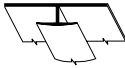
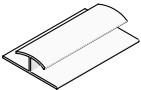
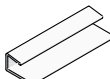
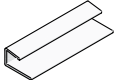
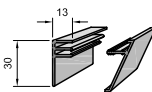
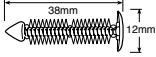




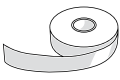

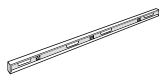

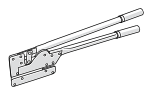
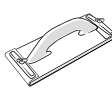


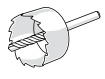

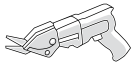
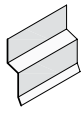







HardieGroove Soffit Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	Silkline Scotia Mould (base and cap) 2400 long, uPVC / white	300916		Inseal 3259 1.5mm thick 50mm wide x 50m long, black compressible foam	300767
	HardieBlade Saw Blade Ø185mm poly crystalline diamond blade, for fast, clean cutting of James Hardie fibre cement.	300660		James Hardie Top Coat Topping compound for flush finished jointing.	3kg Pail 304492 15kg Pail 304493
	HardieDrive Screw s/s 316 30mm x 7g. 100 per jar For fastening to timber frames.	300928		Villadrive Screw 6g x 30mm For fastening to timber frames. 100/jar 5kg Collated/ 1000	300992 300993 300994

Table 10

HardieFlex™ Eaves Lining And Hardiesoffit™ Lining — Accessories / Tools Supplied by James Hardie					
Accessories	Description	Product Code	Accessories	Description	Product Code
	Silkline PVC 2-way Jointer 2400 long, uPVC / White	300915		Hardiejointer 5mm uPVC / White 2400 long 750 long 600 long 450 long	300729 300921 300920 300919
	6mm Hardiejointer uPVC/Bone colour 2400 long 3000 long	300730 300734		HardieFlex 5mm Capping Mould 2400 long, uPVC / White	300538
	6mm Capping Mould uPVC/Bone colour 2400 long 3000 long	300539 300540		Scotia Mould (base and cap) 2400 long, uPVC / White	300916
	Fastfix Fasteners 38 x 12mm, Nylon / White	300632		Inseal 3259 1.5mm thick 50mm wide x 50mm long, Black compressible foam	300767

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Table 11

Components Not Supplied by James Hardie			
James Hardie recommends the following products for use in conjunction with its eaves and soffit linings. James Hardie does not supply these products. Please contact component manufacturer for information on their warranties and further information on their products.			
Accessories	Description	Accessories	Description
	HardieFlex Nail 40 x 2.8mm galvanised or stainless steel nails.		Second Coat Trowel 200mm For installing second coats on set joints on Villaboard Lining.
	Rondo P35 Control joint used in movement joints.		Finishing Coat Trowel For installing top coats on set joints on Villaboard Lining.
	Perforated Paper Tape Joint reinforcing tape.		Corner Tool For setting of internal corners on Villaboard Lining.
	Level/straight Edge For checking straightness of frame.		Hawk To assist in the application of finishing compounds especially with the use of trowels.
	Hand Guillotine Guillotine for cutting fibre cement.		Hand Sander For sanding set joints on Villaboard Lining.
	Collated Screw Gun		Notched Trowel For applying tile adhesive to face of Villaboard Lining.
	Hole Saw		Broadknife 150mm For setting of joints on Villaboard Lining.
	Electric shear/Fibreshear For cutting Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining, HardieFlex Eaves Lining.		Flashing to Table 20 'E2/AS1' Flashing fabricator
	Flashing Tape Proprietary tape to adhere to building wrap. Tyvek, Protecto wrap or similar		Flexible Joint Sealant Tube Sikaflex MS or similar
	Masking Tape 3M Scotch™ Blue painters tape 2090 or Sellotape 5855 Long Life		Paperback Corners 'Goldline' corner moulds
	Polyurethane Tape		Adhesive Sealant Sikaflex-11FC by Sika Seal N Flex-1 by Bostik
	Acrylic Paint Dulux X10 or similar brand		Waterproofing Admixture Multiplast Resin by Plaster Systems. Used in diluted form over Villaboard Lining sheet edges to control moisture suction before flush stopping.

2 Safe working practices

WARNING - DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'Score and Snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods – never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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141564 9/15/2014 Dawn

James Hardie recommended safe working practices

CUTTING OUTDOORS

1. Position cutting station so that wind will blow dust away from user or others in working area.
2. Use one of the following methods based on the required cutting rate:

BEST

- Score and snap
- Hand guillotine
- Fibreshear

BETTER

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

GOOD

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade

CUTTING INDOORS

- Cut only using score and snap, hand guillotine or fibreshears (manual, electric or pneumatic).
- Position cutting station in well-ventilated area

SANDING/REBATING/DRILLING/OTHER MACHINING

When sanding/rebating/drilling/machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES:

1. For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best" — level cutting methods where feasible
2. NEVER use a power saw indoors
3. NEVER use a circular saw blade that does not carry the HardieBlade™ logo
4. NEVER dry sweep — Use wet suppression or HEPA Vacuum
5. NEVER use grinders
6. Always follow tool manufacturer's safety recommendations

P1 or P2 respirators can be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

3 Framing

Working instructions

Refer to recommended Safe Working Practices before starting any cutting or machining of product.

Score and Snap

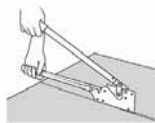
Score and Snap is a fast and efficient method of cutting the product using special tungsten tipped Score and Snap knife.



Preferably score on the face side of the product. Score against a straight edge and repeat the action to obtain adequate depth for clean break – normally 1/3 of sheet thickness. Snap upwards to achieve break. Smooth any rough edges with a rasp.

Hand Guillotine

Make guillotine cut on the off-cut side of line to allow for the thickness of the blade.



Fibreshear Heavy Duty

An electrically powered, fast, clean and effortless way of cutting James Hardie building products, especially around curves such as archways.

Make Fibreshear cut on the “off-cut” side of the line to allow for the thickness of the shear.



HardieBlade™ Saw Blade

The HardieBlade Saw Blade used with a dust-reducing and HEPA vacuum extraction allows for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



Hole-Forming

For smooth clean cut circular holes:

Mark the centre of the hole on the sheet. Pre-drill a pilot hole. Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

For irregular holes:

Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face. Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.



Storage and Handling

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping. James Hardie building products must be installed in a dry state and be protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water or moisture, etc.

Quality

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

3.1 TIMBER FRAME

Timber framing must be in accordance with NZS 3604 Timber Frame Buildings.

Specific design to NZS 3603 and AS/NZS 1170 can also be undertaken providing that:

- the framing centres do not exceed those given in this specification
- the framing member widths conform to this specification.

Also refer to the Approved Document for NZBC Clause B2 ‘Durability’ and NZS 3602 (Timber and Wood-Based Products for use in Buildings) regarding timber treatment requirements and allowable moisture contents in timber for various components of the building. Also refer to the framing manufacturer’s literature for further guidance on the use of treated timber.

3.2 STEEL FRAME

The figures in this brochure are drawn for timber framing. However, steel framing and furring channels can also be used.

All metal framing centres are to be the same as specified for timber frame in this manual.

Steel framing members must be fabricated from light-gauge sheet steel 0.55mm thick minimum to 1.6mm maximum. If heavier sections are used difficulties may be experienced in fixing the self-drilling, self-tapping fasteners. Refer to specific details for the minimum flange width requirements.

Sheets must not be fixed directly to drawn steel or hot-rolled steel sections. These must first be battened out with ex 50mm-thick (40mm minimum) timber battens or light-gauge metal furring channels.

Screw-fix 6mm or thicker sheets only.

Screw fixings can be finished flush or sunk a maximum of 0.5mm below the sheet surface ready for filling.

NOTE: The fasteners must not be over driven as will reduce the holding capacity of the sheet.

3.3 FRAMING SET-OUT

For the framing set-out of 450mm and 600mm-wide soffit refer to Figure 1.

For the framing set-out of 750mm-wide soffits refer to Figure 2.

For the framing set-out of 900mm and 1200mm-wide soffit refer to Figure 3.

Pre-finished steel fascia/gutters

When pre-finished steel fascia/gutters are used the soffit edge must be supported 4mm min. into fascia recess, similar to Figure 27.

Ribbon board to be continuous for product fixing.

NOTE: Because of the limited fascia groove available with some metal fascias a supporting ribbon board will be required with fixings at 300mm centres maximum. Pre-finished soffits can distort due to surface tension when adequate edge support is not provided.

4 Installation

Table 12

Eaves Lining Framing Centres		
Eaves And Soffit Width (Mm)	Wind Zone	Max. Soffit Bearer Centres (Mm)
Up to 450	L, M	1200
	H, VH	900
451 - 600	L, M	1200
	H, VH	600
601 - 1200	L, M, H, VH, EH*	600

*HardieFlex Sheet 6mm or Villaboard Lining 6mm must be used in EH Wind Zone with soffit bearers maximum 600mm centres.

3.4 BATTEN REQUIREMENTS

Battens are required when sheets are fixed over:

- Gypsum board exceeding 20mm in thickness
- Softboard, polystyrene or similar
- Concrete, masonry block or brick.

Timber battening is to be a minimum of 35mm deep x 40mm wide to achieve adequate sheet nail penetration.

Steel battens must be minimum 0.55mm thick, 23mm deep and have a bearing surface of 38mm min. Battens must be galvanised to meet the durability requirements of the New Zealand Building Code (NZBC) and fixed to manufacturer's specifications. All battening centres and sheet fixing is to be strictly in accordance with the framing and fixing required by this manual. Care must be taken to ensure the battens are packed and aligned to give a true even surface for the sheets to be fixed. Check the face of the battens with a long straight-edge before fixing sheets.

3.5 SKILLION ROOF DESIGN

When installing soffit linings direct to skillion roof framing ensure that sufficient ventilation has been provided within the roof space. The temperatures within these smaller roof spaces can reach extreme levels in certain conditions and this can cause cracking in flush stopped joints due to excessive movement in framing. The framing in skillion soffits and ceiling also need engineering design consideration. General design guide is to provide control joints at 4.8m x 3.6m in either direction when fixing to this type of framing.

For narrow strip soffits provide control joints at 4.8m centres.

This installation manual covers the use of James Hardie Eaves and Soffits for buildings within the scope of NZS 3604. For all other buildings specific engineering design is required.

Figure 1: Eaves and soffits 450mm, 600mm wide

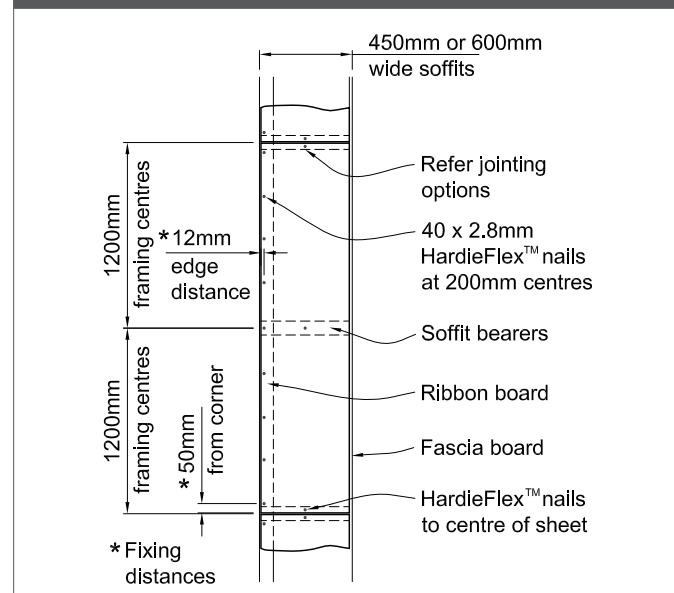
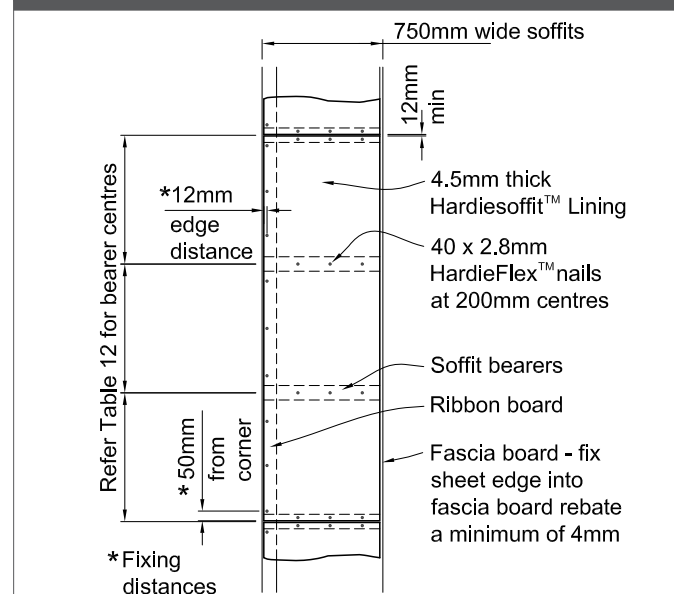


Figure 2: Eaves and soffits 750mm wide

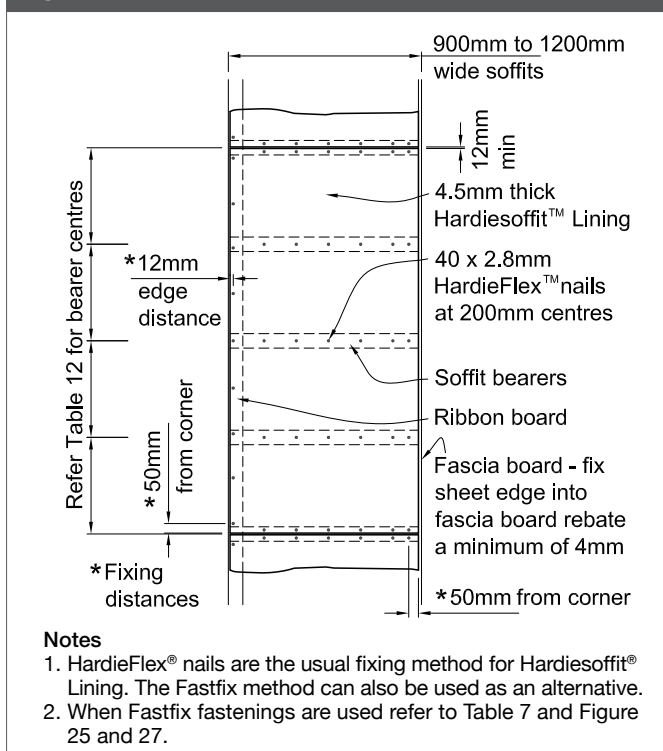


Notes

1. HardieFlex™ nails are the usual fixing method for Hardiesoffit™ Lining. The Fastfix method can also be used as an alternative.
2. When Fastfix fastenings are used refer to Table 7 and Figure 25 and 27.

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Figure 3: Eaves and soffits 900mm–1200mm wide



4.1 GENERAL

Refer to Table 12 and Figure 1, 2 and 3 regarding nail fixing centres, for framing and types of fasteners.

The eaves/soffits must be sealed against claddings to minimise moisture ingress behind the claddings. The roof must have been installed before installing the soffits linings. Where the soffits are sloping upwards away from the wall, a mechanical flashing must be provided in the soffit to wall junction. The flashing is fixed under soffit lining and laps over the face of cladding by 35mm min. Refer to Figure 18.

4.1.1 DRIP EDGE

All soffit linings must either be installed with a grooved fascia, refer Figure 13, or with exterior cladding which forms a drip edge below the soffit lining by 15mm min. Soffit linings are generally fitted into the recess formed in fascia board to form the drip edge.

4.1.2 STRUCTURAL CEILING DIAPHRAGMS

HardieFlex Eaves Lining and Villaboard Soffit Lining are suitable for use in structural ceiling diaphragms as per NZS 3604. Refer to the James Hardie Bracing Design Manual.

4.1.3 CURVED APPLICATIONS

HardieFlex Eaves Lining and Villaboard Soffit Lining can be used for curved applications.

The minimum bending radii are shown below.

Table 13

Curved Wall Minimum Bending Radii

	Along length (mm)	Across width (mm)
9mm Villaboard Lining	3000	4000
6mm Villaboard Lining	1800	2400
HardieFlex Eaves Lining	1800	2400
Hardiesoffit Lining	1800	2400

NOTE: The bending radii given above require no special pre-wetting of the sheet. Mechanical fix at 200mm centres maximum.

To maintain the smoothness of the curve, ceiling battens are generally required at spacings as shown below.

Table 14

Curved Lining — Soffit Batten Spacing

Range of Radii (mm)	Soffit batten spacing (mm)
1800	200
Above 1801 to 3000	300
Above 3001	400

4.1.4 FASTFIX FASTENERS

Fastfix fasteners (38mm long) can be used as an alternative fixing for prefinished soffit and ceiling systems in conjunction with adhesives. Drill a 6mm-diameter hole through the sheet and framing to insert the Fastfix fastener. In timber the hole must be 40mm deep.

4.1.5 MASKING TAPE

The recommended masking tape for use with Silklene Soffit Lining and Eclipsa Eaves Lining is 3M Scotch Blue painters tape 2090 or Sellotape 5855 longlife. This tape can only be left on the Silklene Soffit Lining or Eclipsa Eaves Lining for maximum 7 days, otherwise tape removal may cause paint loss.

4.1.6 FIRE RATED SOFFITS

A fire rating of 30 or 60 minutes can be achieved in a soffit when using 6mm or 9mm Villaboard Soffit Lining or 6mm or 7.5mm HardieFlex Sheet when James Hardie FRR wall systems are used. For full details refer to the James Hardie Fire and Acoustic Design Manual or Ask James Hardie on 0800 808 868.

4.2 FASTENER DURABILITY

Fasteners used in external applications must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing's material to be used in relation to the exposure conditions and are summarised in Table 15.

Table 15

Exposure conditions and nail selection prescribed by NZS 3604		
Zone / Nail Material		
Zone D*	Zone C outside sea spray zone and Zone B and geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 Stainless

* (Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made)

When using screws to fix into steel framing a minimum class-3 coated screw must be used.

4.3 HARDIESOFFIT LINING

For framing and fixing schedules refer to Section 3.

All sheet edges are to be supported by framing or a fascia board. Fixings are to be at 200mm centres to all framing (refer Figures 1 and 2).

Hardiesoffit Lining up to a max. width of 600mm can be jointed up to a maximum 150mm off the ceiling/soffit batten when using uPVC jointers.

NOTES

1. Use of 6mm thick sheets will minimise the deflection and enhance the impact resistance.
2. Sheets can be jointed as per Section 4.
3. Do not screw fix 4.5mm thick sheets.

4.4 HARDIEFLEX EAVES LINING

For framing and fixing schedules refer to Section 3.

All sheet edges are to be supported by framing or a fascia board. Fixings are to be at 200mm centres to all framing (refer Figures 1 and 2).

NOTES

1. Use of 6mm thick sheets will minimise the deflection and enhance the impact resistance.
2. Sheets can be jointed as per Section 4.
3. Do not screw fix 4.5mm thick sheets.

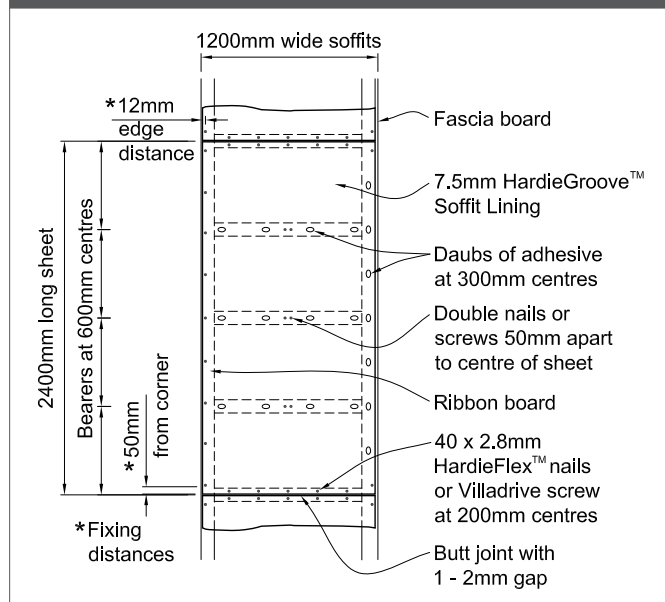
4.5 HARDIEGROOVE SOFFIT LINING FIXING METHOD

For framing and fixing schedules refer to Section 3.

The recommended fixing methods are combined nail and adhesive or screw and adhesive. However, screw or nail fixing only is an option. (Refer Figure 4).

To achieve a concealed joint, butt the long edges together (half-grooved). (Refer Figure 5).

Figure 4: Nail or screw and adhesive fixing



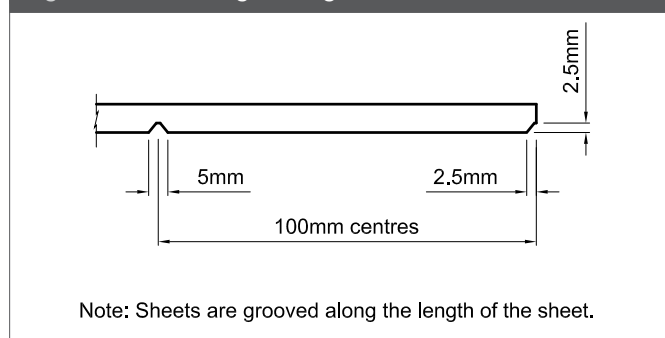
NOTES

1. Do not place nails or screws within 100mm of the adhesive daubs.
2. Suitable fixings are HardieDrive stainless steel 30mm x 7g wood screws, HardieFlex galvanised nails 40 x 2.8mm and 316 stainless steel nails 40 x 2.8mm.
3. Use only stainless steel fixings in sea spray zones.
4. When butt jointing short ends of HardieGroove Lining in ceiling/soffit applications, the short edges must be cut square and have chamfer formed.

Nails must be finished flush with the sheet surface. Screw heads can be finished 1-2mm below the sheet surface and stopped.

In steel framing the fasteners should be driven as close as possible to the stud corners to avoid deflection of the stud flange.

Figure 5: Sheet edge and groove detail



4.5.1 FINISHING

Once the sheets are in place, fill over all driven fixings with James Hardie Top Coat to the required level of finish.

- Eclipsa Eaves Lining/Silkline Soffit Lining are to be supported by bearers and fasteners at the maximum spacings specified for the 4.5mm sheets in Section 3, Table 12 and Figures 22, 25 and 26 of this manual
- To fix larger soffit, ceiling or verandah applications provide a perimeter frame to all sheet edges and intermediate nogging at the centres shown in Table 12.
- Fix the Eclipsa Eaves Lining/Silkline Soffit Lining into the fascia board groove then nail into the ribbon board at 300mm centres with 40 x 2.8mm HardieFlex nails. Ensure nails will be hidden by the scotia mould or timber scotia (refer Figure 27 and Figure 28).
- Use a 6mm-diameter masonry bit to drill holes and fix Fastfix fasteners (refer Figures 6 and 25).
- Eclipsa Eaves Lining/Silkline Soffit Lining up to a maximum 600mm width can be jointed up to a maximum 150mm off the ceiling/soffit batten when using uPVC jointers.

1200mm wide soffits

*12mm edge distance

Fascia board

Eclipse™ Eaves Lining / Silkline™ Soffit Lining

Daubs of adhesive at 300mm centres

Fastfix fasteners at 300mm centres alternative to adhesive

Ribbon board

40 x 2.8mm HardieFlex™ nails or adhesive secure at 200mm centres

2400mm long sheet

Bearers at 600mm centres

*50mm from corner

*Fixing distances

Refer to the flush jointing procedures, pages 21-24.

The diagram illustrates the construction of a soffit using Villaboard® Lining. The assembly consists of the following components and dimensions:

- Sheet Dimensions:** 2400mm long sheet, 900mm wide soffits.
- Support Structure:** Soffit bearers (Ribbon board) spaced at 600mm centres.
- Fasteners:** Double nails or screws 50mm apart to the centre of sheet.
- Adhesive:** Daubs of adhesive at 300mm centres.
- Fixing Distances:**
 - * 12mm edge distance
 - * 50mm from corner
 - * Fixing distances
- Fasteners:** 40 x 2.8mm HardieFlex™ nails or Villadrive screws at 200mm centres.

Alternately sheets can be fixed with nails/screws only at 200mm c/c at sheet edges and 250mm c/c at intermediate framing.

The diagram illustrates the assembly of a roof eave. On the left, the wall structure is shown with 'Wall framing' and 'Wall cladding'. A 'Ribbon board' is attached to the wall. The roof structure includes a 'Rafter' and a 'Soffit bearer'. A 'Fascia board' is attached to the end of the soffit bearer. A 'Villaboard® Lining' is installed over the soffit bearer. A 'Square edge covered by scotia' is shown being fixed into a rebate in the fascia board. The text 'Scotia mould or H3.1 treated timber scotia' points to the scotia. The text 'Fix square edge sheet into fascia board rebate a minimum of 4mm' indicates the required overlap.

Control joints are required in long runs of Villaboard Lining soffits/ceilings to accommodate structural movement. Control joints must also be provided where the soffits change in direction, change in level, where there is a construction joint in framing or where the soffits continue into passage ways etc. See Table 16 for maximum control joint spacing and Figure 9 for a typical control joint detail.

4.7.2 JOINTING OPTIONS

Villaboard Soffit Lining is suitable for:

- Flush-jointed narrow strip soffits around a building
- Flush-jointed ceilings over verandahs, porches and entryways to residential and small-scale commercial buildings
- Expressed, uPVC-jointed and sealant-filled joint ceilings where a smooth surface finish is required
- All edges to be supported by the framing.

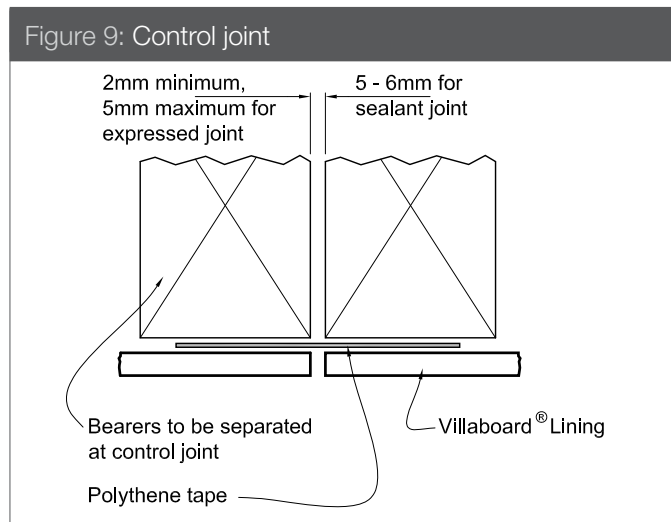
Table 16

Maximum spacing for control joints (m)		
	STEEL FRAMING	TIMBER FRAMING
General	4.8	7.2

When these ceilings are wider than one sheet width the sheets can be fixed to the framing provided the control joints are placed to limit the bay size to 7.2m x 4.8m maximum.

4.7.3 NARROW-STRIP FLUSH-JOINTED SOFFITS AND CEILINGS

In these applications sheets must be jointed on the framing as shown in Figures 1, 2, 15 and 16. Control joints, as shown in Figure 9, must be located at a distance as specified in Table 16 above. Sheets must not be fixed to the bottom cord of roof trusses.



NOTE

Refer Section 3.5 for skillion roof design.

4.7.4 VILLABOARD SOFFIT AND CEILING LINING (large areas)

For standard commercial soffits and ceilings, framing must be at 600mm maximum centres and 6mm thick Villaboard Soffit Lining can be used. For high-impact areas, heavy-use commercial areas, and high-wind areas, framing at 600mm maximum centres and 9mm thick Villaboard Soffit Lining should be used. Sheets must not be fixed to the bottom cord of roof trusses. Timber or steel ceiling battens must be fixed to the underside of the roof truss. Sheets must be

laid in an offset pattern so that adjacent end joints do not coincide. Timber ceiling battens must comply with the requirements of NZS 3604 or the specific engineering design. Steel ceiling battens must be a minimum of 37mm wide x 23mm deep x 0.55mm thick and have a bearing surface of 37mm minimum. Battens must be galvanised steel (275 g/m2 zinc coating), have a suitable coating to meet the durability requirements and be fixed to the manufacturer's specifications. Refer to the flush-jointing and finishing procedures on pages 21-24.

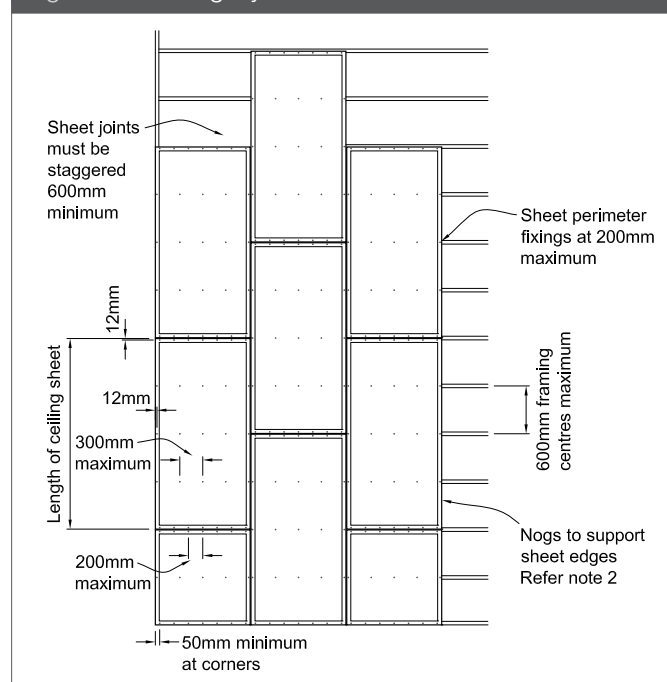
For specific engineering design projects consideration must be given to framing deflections expected due to loadings and appropriate selection of sheet jointing method must be made.

For skillion roof design refer to Clause 3.5 for further design consideration.

NOTE

1. It is recommended that flush stopping of joints is suitable when using recessed edge Villaboard Lining.
2. When nogs not installed for perimeter support, the unsupported sheet edges across the framing must be supported by back blocking using a 300 – 400mm wide Villaboard Lining strip adhered to rear face and centred between the framing.

Figure 10: Ceiling layout



4.7.5 CONTROL JOINTS

The ceilings must be divided into bays not exceeding 7.2 x 4.8m. To permit movement, control joints must be formed at the perimeter of each bay (refer Figures 11, 12, 13 and 14) and at the junction of large ceilings with narrow passage strips or where there is a change in direction (also refer Figures 12 and 13). Each bay must be independent of adjacent bays and the surrounding building structure. When the ceilings or soffits contain sloping areas then control joint centres must be reduced to coincide with the slope

change lines (refer Figure 14). Framing members (to which the sheet is fixed) must not continue across this control joint. Sheets shall be fixed across the ceiling joists or ceiling battens (refer Figures 15 and 16). Figures 12 and 13 show control joints with the battens running in the same direction as the sheet joint.

Figure 11: Control joint layout

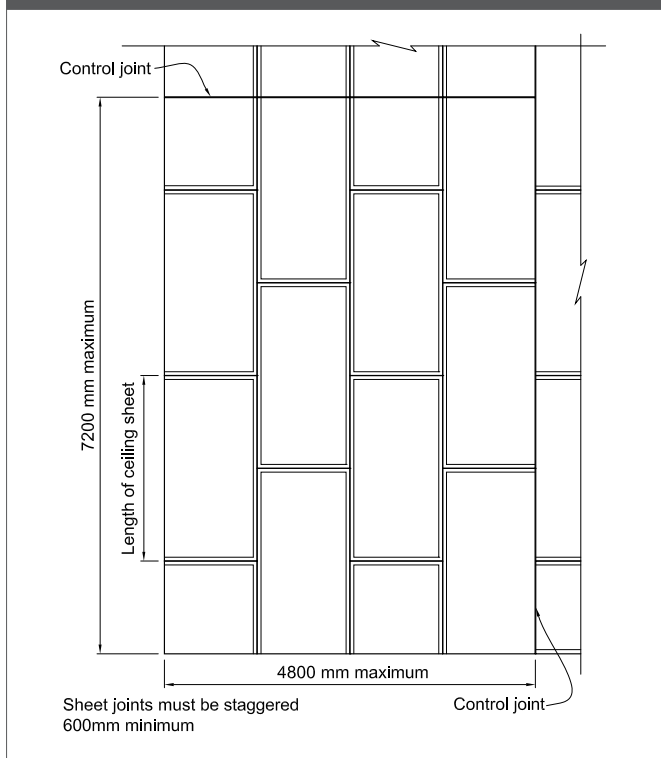


Figure 12: Steel ceiling batten control joint detail

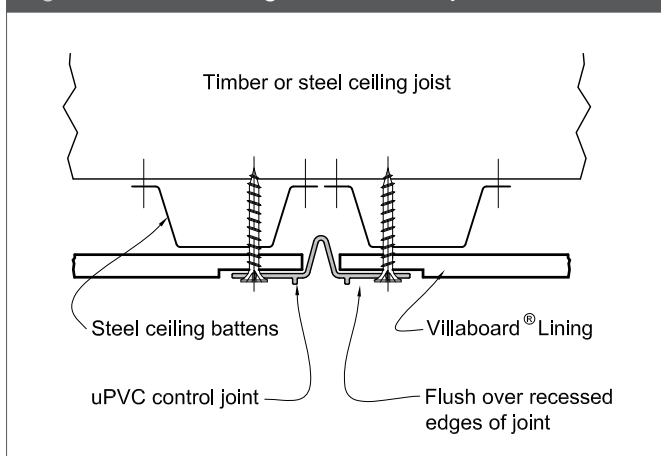


Figure 13: Timber control joint detail

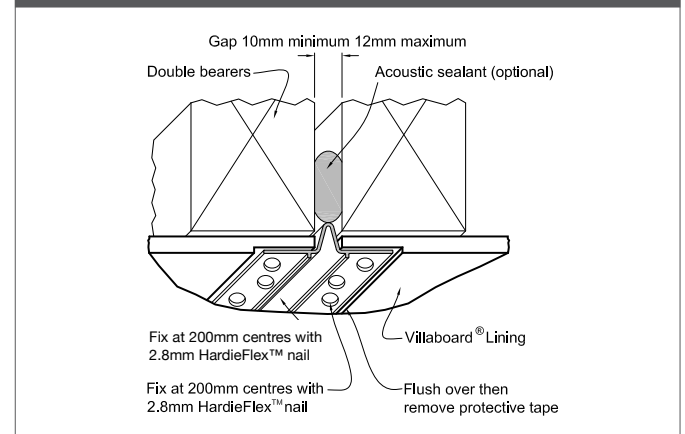
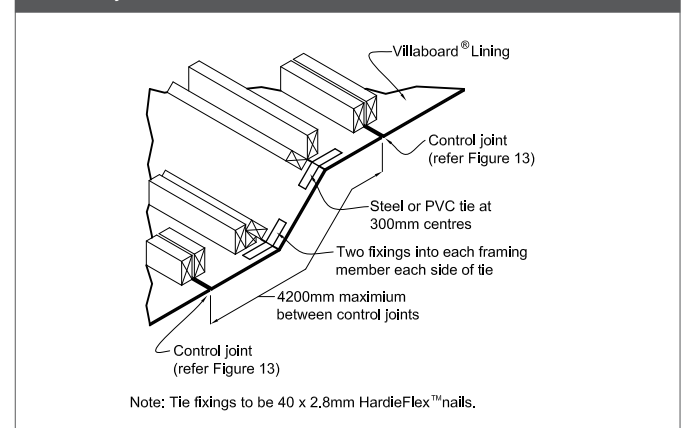


Figure 14: Directional changes to soffits and ceilings — control joint



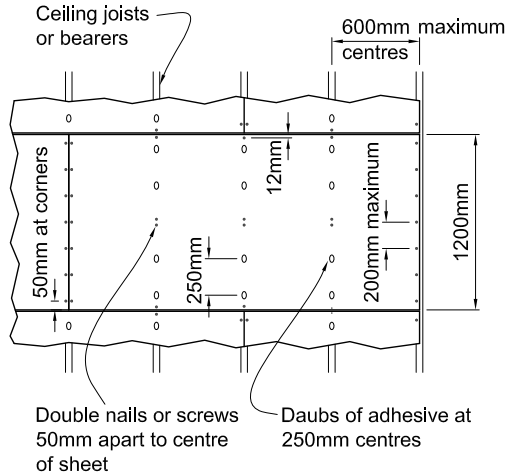
4.7.6 FIXING OPTION ONE

A smooth surface finish is obtained by minimising the visible sheet fixings. For painted finishes the combined nail or screw and adhesive method gives this superior finish (refer Figure 19).

Fix at 200mm centres down each sheet end with edge fixings in each joist or batten. Double-fix in the centre of each joist or batten (refer Figure 19). Do not place nails or screws within 100mm of adhesive daubs. Daubs of wallboard adhesive 25mm diameter and 15mm thick must be applied to the intermediate joists or battens at 250mm centres (refer Figure 19).

When nogs are not installed for perimeter support, the unsupported edges between ceiling joists or battens must be supported with back blocking using a 300-400mm wide Villaboard Lining strip adhered to rear face and centred between framing.

Figure 15: Nail or screw and adhesive fixing

**NOTES**

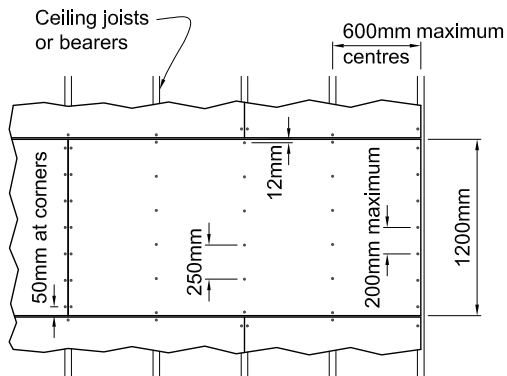
1. All surfaces to receive adhesive must be clean, free of dust, oil etc.
2. Ensure daubs of adhesive never coincide with permanent fastener points, as adhesive shrinkage may cause fastener head protrusion.

4.7.7 FIXING OPTION TWO

For an alternative nail or screw-fixing method, fasteners are to be driven along the sheet perimeter at 200mm centres and along intermediate ceiling battens at 250mm centres (refer Figure 16).

When nogs are not installed for perimeter support, the unsupported edges between ceiling joists or battens must be supported with back blocking using a 300-400mm wide Villaboard Lining strip adhered to rear face and centred between framing.

Figure 16: Nail or screw

**4.7.8 COLUMN OR WALL ABUTMENTS**

Soffit sheeting must be free to move independently from the building element it abuts with. This is critical for flush-jointed sheeting, otherwise cracking at the joint may occur.

4.7.9 BULKHEAD IN SOFFITS

The bulkhead made in soffits is generally used to carry the services through them and they can be lined with Villaboard Soffit Lining. The box framing provided must be rigid enough to carry its weight and/or services. It must provide support to all sheet edges and joints. The external/internal corner of a bulkhead can either be stopped using a James Hardie PVC corner mould or a 'proprietary paper faced rigid spine corner' corner mould.

**Paper faced rigid spine corner mould is generally available in the market.*

4.7.10 SQUARE-EDGE VILLABOARD LINING CEILINGS AND SOFFITS

Square-edge Villaboard Lining is used for butt-joint; expressed-joint or uPVC-jointed ceilings.

4.8 TITAN FACADE PANEL

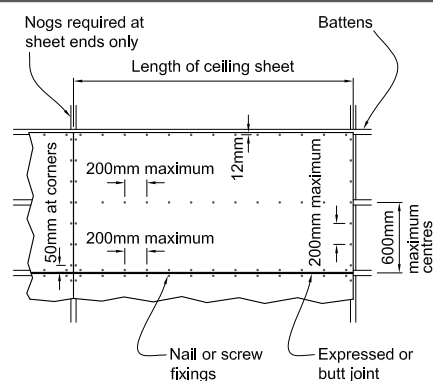
May be used as soffit with expressed joint when installed as per Figure 23 and fixings as per Villaboard Soffit Lining.

4.9 INTERNAL SWIMMING POOL APPLICATION

For fixing Villaboard Lining and HardieGroove Lining in internal swimming pool areas;

- The sheets must be back and edge sealed before installation.
- When fixing Villaboard Lining to the ceiling under a skillion roof, roof ventilation must be considered to minimise thermal movement and sheet joint cracking.
- All Villaboard Lining recessed sheet joints must be stopped. Alternatively, when using square edge Villaboard Lining, the sheet joint must be butted over an Inseal 3259 tape with an appropriate flexible sealant in the 1mm joint.
- All HardieGroove Lining joints must have continuous bead of sealant applied to edge of sheet before butting together. Only stainless steel fasteners must be used.
- Full perimeter fixing required.
- In addition, it is recommended that H3.1 treated timber ceiling battens are used to resist decay due to higher condensation levels present in this area.

Figure 17: Sheets laid along ceiling joints (expressed or butt joints)



5 Jointing options

4.10 SPECIAL DETAILS

Figure 18: Sloping soffit and wall junction

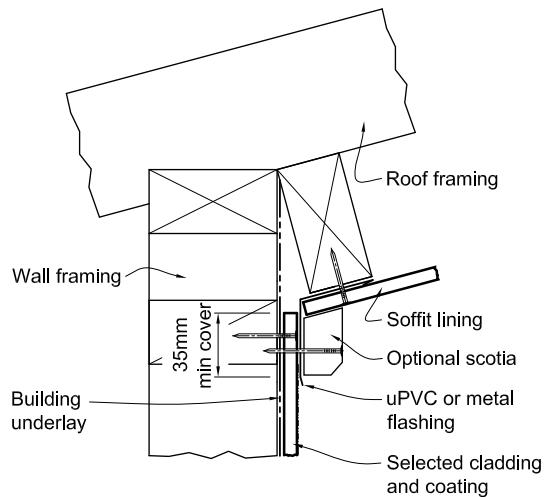


Figure 19: Gable elevation

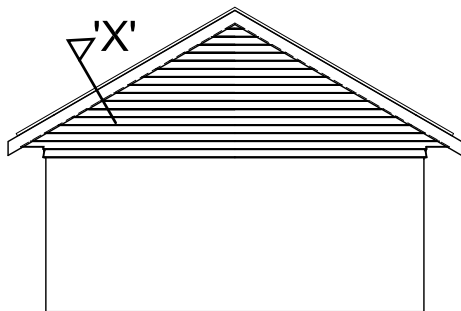
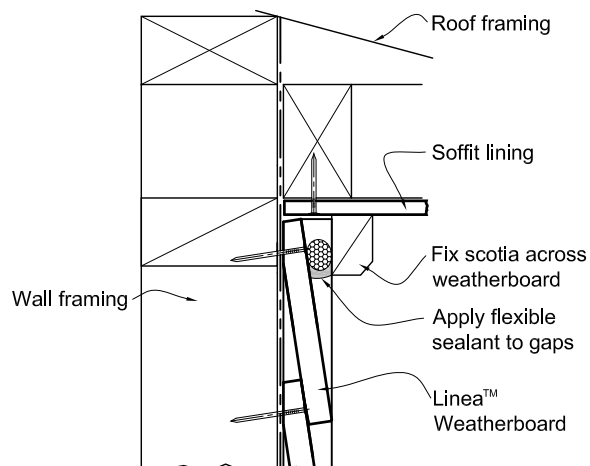


Figure 20: Sloping soffit to weatherboard cladding junction (Section 'X')



- All soffit lining sheet edges must be supported by framing and/or a fascia board.

HARDIEFLEX EAVES LINING

- Refer to Figure 22 for uPVC Hardiejointer detail
- Refer to Figure 23 for express joint detail
- Refer to Figure 24 for butt joint detail
- Refer to Figure 26 for two-way uPVC jointer

HARDIEGROOVE SOFFIT LINING

- Sheets have half groove along the long edges for butt jointing
- Sheets to have chamfer formed on site along the short edge for butt jointing

HARDIESOFFIT LINING

- Refer to Figure 22 for uPVC Hardiejointer detail
- Refer to Figure 23 for express joint detail
- Refer to Figure 26 for two-way uPVC jointer

ECLIPSA EAVES LINING

- Refer to Figure 22 for uPVC Hardiejointer detail
- Refer to Figure 25 for Fastfix Fasteners fixing detail. Use a 6mm diameter masonry drill bit to drill a hole and fix fasteners
- Refer to Figure 26 for Two-way uPVC Jointer

SILKLINE SOFFIT LINING

- Refer to Figure 22 for uPVC Hardiejointer detail
- Refer to Figure 25 for Fastfix Fasteners fixing detail. Use a 6mm diameter masonry drill bit to drill a hole and fix fasteners
- Refer to Figure 9 for two-way uPVC jointer

VILLABOARD SOFFIT LINING

- Refer to Figure 21 for flush joint details. Refer to Section 5.5 for flush jointing
- Refer to Figure 22 for uPVC Hardiejointer detail
- Refer to Figure 23 for express joint detail
- Refer to Figure 24 for butt joint detail

Figure 21: Vertical flush joint setout

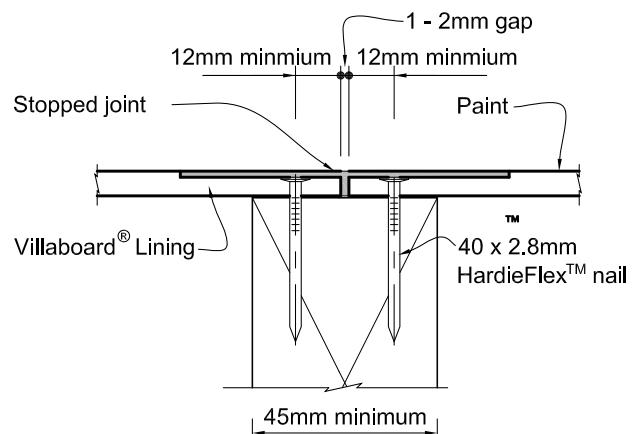


Figure 22: uPVC Hardiejointer detail

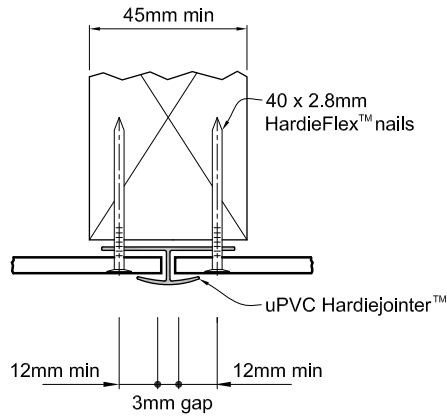


Figure 23: Exposed joint detail

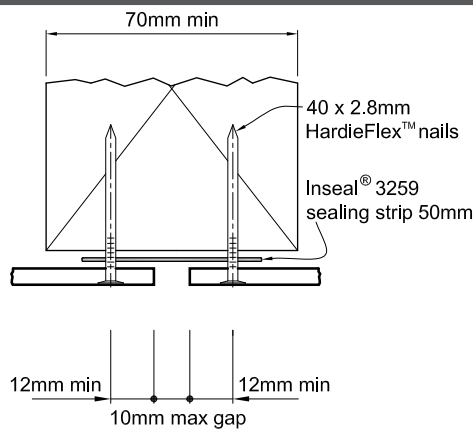


Figure 24: Butt joint detail

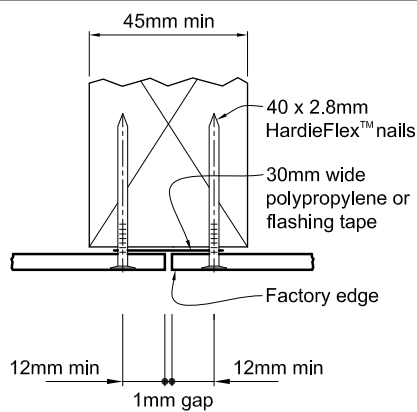


Figure 25: Fastfix fastener fixing detail

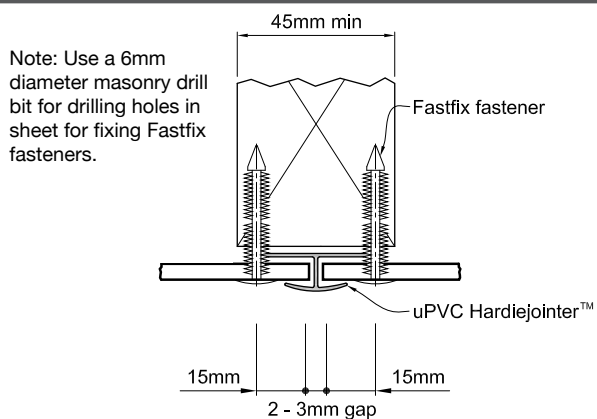


Figure 26: Two-way uPVC jointer

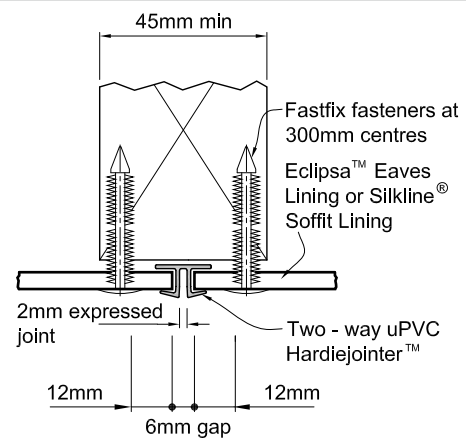


Figure 27: Cladding detail with scotia mould

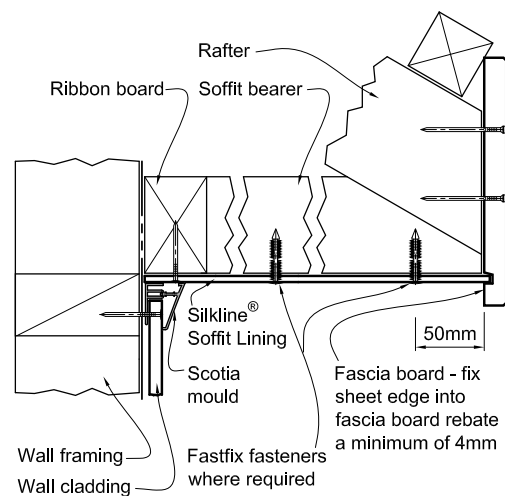
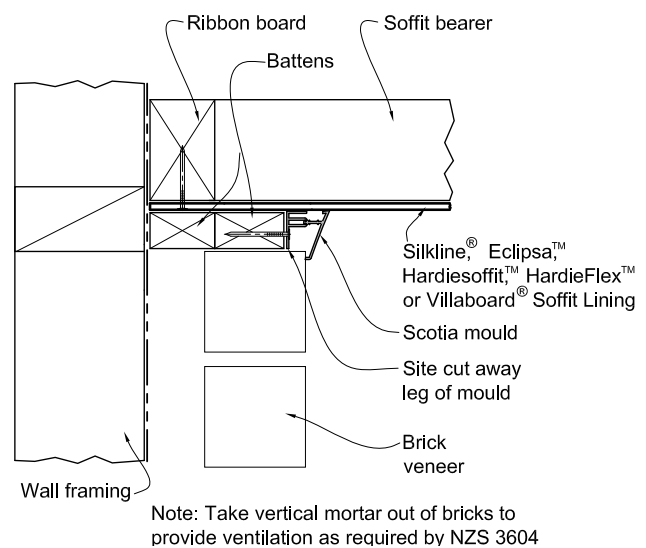


Figure 28: Brick veneer detail with scotia mould



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6 JOINTING AND FINISHING

FOR VILLABOARD LINING

6.1 GENERAL

Villaboard Soffit Lining is finished with paint complying with parts 7, 8, 9 and 10 of AS 3730. The application and maintenance must be in accordance with the manufacturer's specifications.

NOTE: Before flush stopping sheet edges must be sealed with Multiplast resin, water proofing admixture or other similar products.

6.2 GLANCING LIGHT

In some instances, due to glancing light, set joints may be noticeable in Villaboard Lining walls, especially where paint finishes have a high gloss level. Work closely with your builder or designer to minimise this.

Artificial lighting needs to be considered in relation to soffits.

Where glancing light is an issue its effect can be lessened by:

- Artificial light shading devices.
- The use of light coloured, matt finish paints.

6.3 LEVEL OF FINISHES

Different levels of finishes are typically specified for different applications. Higher levels of finishes are used to address the glancing light issues with painted Villaboard Soffit Lining referred to above. A description of the various levels of finishes and the jointing/coating requirements can be found in Table 17.

Table 17

Levels of Finishes			
Level of finish	Definition*	Typical jointing/setting	Finish
0	This level of finish may be useful in temporary construction.	No stopping, taping, finishing or accessories are required. The work is confined to gluing or screwing/nailing sheets in place.	For use in areas where finishing and stopping is not considered necessary.
1	For use in plenum areas above ceilings, in areas where the work would generally be concealed, or in building service corridors and other areas not normally open to public view.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape.	Surface free from excess jointing compound. Tool marks and ridges are generally acceptable.
2	For use in warehouse, storage or other areas where surface appearance is not of primary concern.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape and James Hardie Top Coat.	Minor tool marks and ridges are generally acceptable.
3	For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes or where heavy wall paper coverings are to be applied as the final decoration. This level of finish is not generally suitable where smooth painted surfaces or light to medium wall coverings are specified.	Joints and corner joints will be set with James Hardie Base Coat reinforced with perforated paper tape and James Hardie Top Coat.	This level of finish must be sufficiently smooth to accept heavy vinyl, tiles or textured coatings without blemishes.
4	This is generally the accepted level of finish for domestic construction. It is used where light textures or wall coverings and smooth textured finishes and satin/flat/low sheen paints are illuminated by non-critical lighting.	Refer to flush jointing recommendations on page 22. All joints and corner joints will have tape embedded in James Hardie Base Coat applied over all joints, angles, fastener heads and accessories. This application is applicable to recessed edge sheets only. The use of square edge sheets will require a high build application and coating finish.	For use where light-texture coatings or wallpaper or other lightweight wall coverings are to be applied. For painted finishes in non-critical lighting areas flat and low-sheen textured paints are to be applied. Gloss and semi-gloss paints are not generally suitable over this level of finish as any minor blemish will show under critical light. The weight, texture and sheen level of wall coverings applied over this level of finish must be carefully evaluated. Joints and fasteners must be adequately concealed if the wall-covering material is lightweight, contains limited pattern, has a gloss finish, or any combination of these features is present. Unbacked vinyl wall coverings are not suitable over this level of finish.
5	This level of finish is for use where gloss or semi-gloss paints are specified or where critical lighting conditions occur on satin, flat or low sheet paints.	Refer to page 23 steps 1–4 for jointing. Final James Hardie Base Coat application should be feathered out to approximately 200mm + each side of the joint. Then a full skim coat of James Hardie Top Coat must be applied over entire sheet surface in order to achieve a uniform finish. This application is applicable to recessed edge sheets only. The use of square edge sheets will require a high build application and coating finish.	This level of finish is for use where gloss, semi-gloss, low-sheen or non-textured paints are specified or where critical lighting conditions occur.

*Reference: AS/NZS 2589.1: 'Gypsum lining in residential and light commercial construction — Application and finishing. Part 1: Gypsum plasterboard'

6.4 PAINT FINISHES

Prior to application of paint finishes, remove any residual sanding dust and ensure the surface is suitable for paint application.

Always follow the paint manufacturer's recommendations for paint suitability, mixing and application.

NOTES

1. Use of a 'sealer coat' or 'preparation undercoat' is recommended.
2. Do not tile ceilings.

6.5 VILLABOARD SOFFIT LINING JOINTING AND STOPPING

Villaboard Soffit Lining joints are set with James Hardie jointing compounds reinforced with perforated paper tape. Recessed edge sheet joints require joint setting by using the jointing products outlined. The performance of joints is the responsibility of the installer, as this is governed by the installation practices and the standard of workmanship applied. However, James Hardie considers that the recommendations provided in Table 17 describe best practice to reduce the risk of joint cracking or other problems. There are various factors that can affect the performance of jointing compounds on edge recessed fibre cement substrates. These factors include the framing, movement, installation quality, vibrations, moisture, humidity, temperature, etc. To achieve satisfactory joint performance these factors need to be carefully considered and understood by the installer and designer when positioning joints and selecting jointing compounds. Furthermore, it is important that the jointing compound used has the physical attributes required to perform considering these factors. James Hardie compounds have been specifically developed for use with Villaboard Soffit Lining.

In addition, provision for movement needs to be made by the installation of control joints. See page 16.

COMPOUND COVERAGE

1kg of Base Coat will provide approximately 5 lm of standard joints.

1kg of Top Coat will provide approximately 5.6 lm of standard joints.

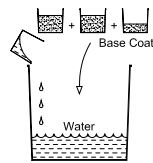
NOTE

Follow the mixing instructions carefully when mixing James Hardie Base Coat and Top Coat.

MIXING INSTRUCTIONS

Table 18

James Hardie Base Coat Mixing Instructions

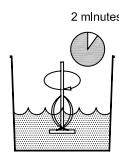
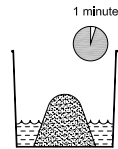


Step 1

First, add 1 part of clean water into bucket.

Then add 2½ parts James Hardie Base Coat powder

Allow to soak for 1 minute.

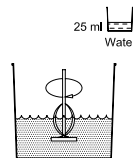


Step 2

Mix for 1½ – 2 minutes using paint mixer or equivalent. (approximately 2500-3000rpm)

James Hardie Base Coat is NOT like the plaster based compounds. Initial mixing will indicate a dry mix and further mixing **WITHOUT** further addition of water will deliver the ideal workable paste.

Warning: Inadequate or over mixing can lead to poor workability and can cause performance issues. **Do not hand mix.**



Step 3

The mix at this stage should be consistently smooth.

Based on the environmental conditions (i.e. temperature and humidity) you may add maximum of 25ml of water per 1Kg of base coat powder in the mix at this stage to adjust workability. Mix it well.

(Note: Adding excess water than the recommendation may delay the drying of base coat and may cause joint cracking due to excessive shrinkage.)

Mix should be glossy and smooth. There should be no lumps in the mix.

Important Notes:

1. Do not apply James Hardie Base Coat in temperatures above 40° C or below 5° C.
2. Allow the compounds to dry before applying the next coat. The drying time will vary between 12 to 24 hours depending upon the weather conditions.
3. Site cut and site recessed sheet edges must be sealed with an acrylic sealer e.g. Dulux Acraprime 501/1, Dulux Primercryl or similar product.
4. In corners, use James Hardie uPVC internal/external corner mould primed with Dulux Primerlock or similar. A 'GIB® Goldline™ Platinum' corner mould can also be used.
5. Use only perforated paper tapes in straight joints.
6. It is recommended that one (1) base coat bag is mixed in three (3) portions.
7. Before stopping the sheet edges, Multiplast Resin or a similar product in diluted form must be applied over the sheet edges. Mix the resin as per the manufacturers recommendations.

Product Life:

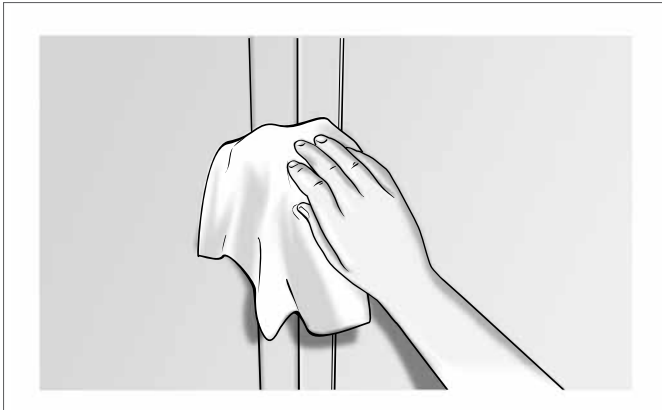
James Hardie Base Coat has a shelf life of 12 months in unopened bags when stored in a cool dry place.

James Hardie Base Coat has a bag life of 1 month if opened bags are resealed and stored in a cool dry place.

6.6 SET JOINTS

Step 1 — Preparation

Ensure that the recesses are clean and free of dust and contaminants. Sheet edges must be sealed with Multiplast resin, water proofing admixture or other similar products. If working conditions are hot and dry, dampen the area around the joint prior to working.

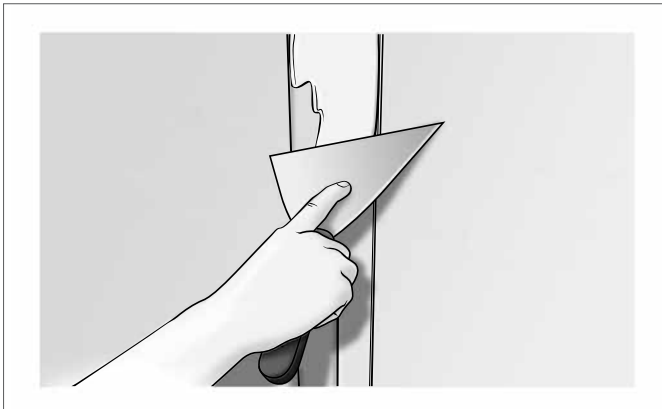


NOTE

The jointing method shown below provides a Level 4 finish. For more information about this and other finishes refer to page 21.

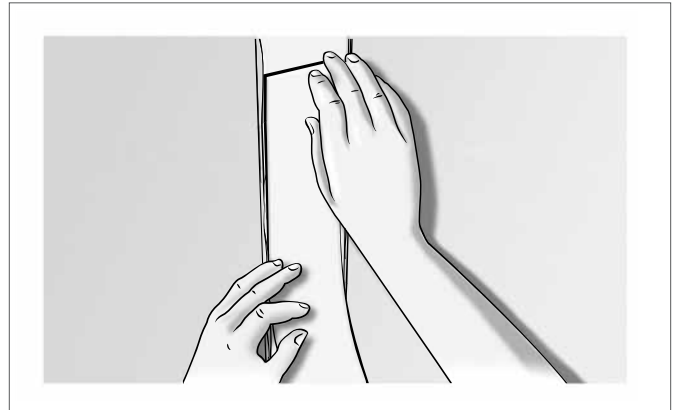
Step 2 — First Coat

Apply James Hardie Base Coat to fill the recess with a 150mm broad knife.



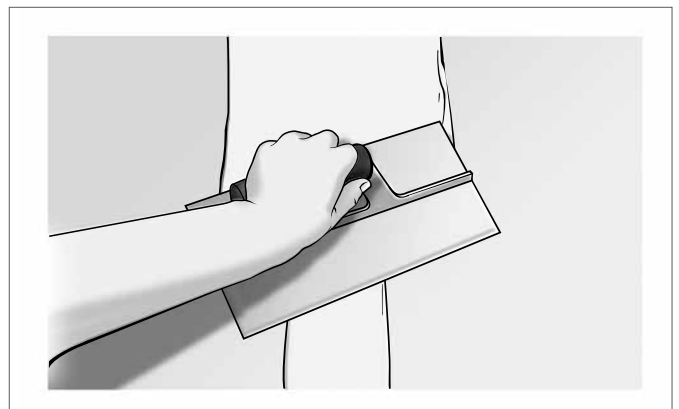
Step 3 — Embed Tape

Firmly embed the perforated paper tape centrally into the joint using a 50mm broad knife. Ensure that there are no voids under the tape and remove excess compounds.



Step 4 — Thin Layer

Immediately cover tape with a thin layer of James Hardie Base Coat applied with a 150mm broadknife.



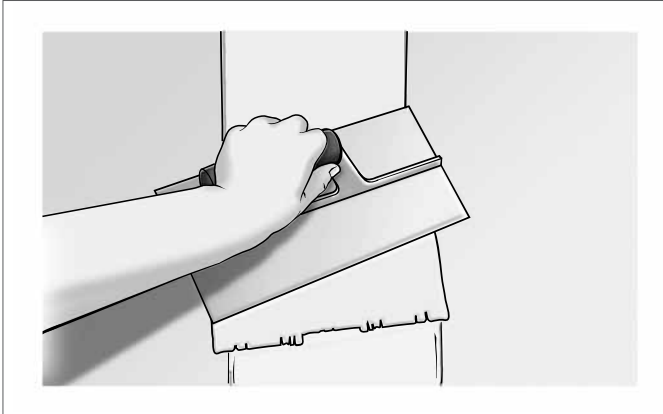
NOTE

Steps 5, 6 and 7 are only required for paint and wall paper finish.

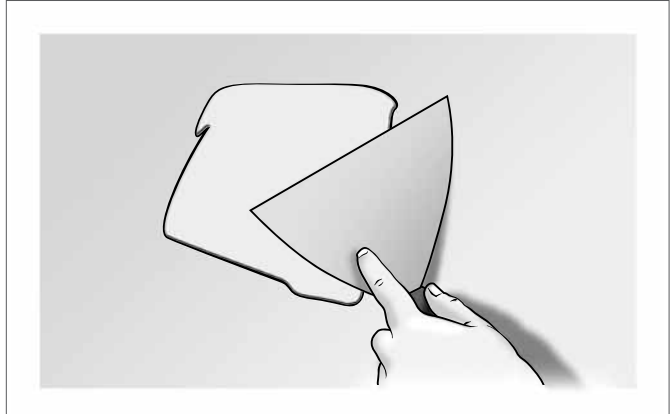
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141564 9/15/2014 Dawn

Step 5 — Second Coat

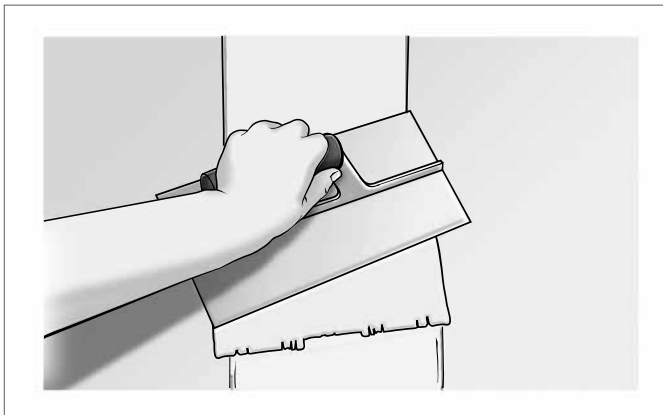
When the first coat is fully dry, use a 200mm wide second coat trowel to apply the James Hardie Base Coat. Apply this coat approximately 180mm wide, laid down over the recess and feather the edges.

**Step 7 — Fastener Heads**

Apply a finishing coat of James Hardie Top Coat to fastener heads, feathering out the edges. Allow to fully dry before sanding.

**Step 6 — Finishing Coat**

Ensure the second coat is fully dry. Using a finishing trowel, apply a coat of James Hardie Top Coat 280mm wide centrally over the joint and feather out the edges. Allow to dry fully before sanding. Sand with a 180 grit sand paper to achieve a smooth finish for painting.

**6.7 PAINTING**

Hardiesoffit Lining, HardieFlex Eaves Lining, Villaboard Soffit Lining and HardieGroove Soffit Lining sheets are to have a minimum of two coats of acrylic paint applied after fixing in order to meet the requirements of the NZBC. All sheets must be coated within 3 months of installation.

Use quality 100% acrylic paints. Economy paints are not recommended because generally they are less well bound, less moisture resistant and more prone to mould growth.

In all cases the manufacturer's specification for the selected paint must be followed. Note that some paints require an undercoat before applying finish coats.

Damp, shady situations, proximity to bush, agricultural paddocks or seaspray environments may induce an extra tendency to mould growth. Use mould-inhibiting and alkaline-resistant undercoats and consult the paint manufacturer for details of maximum mould-resistant paints.

Before painting, remove any surface grime or other contaminants and ensure the Hardiesoffit Lining, HardieFlex Eaves Lining, Villaboard Soffit Lining and HardieGroove Soffit Lining is dry. Paint must not be applied when the air temperature is below 10°C.

When using uPVC moulds avoid dark colours (paints must have light reflection of 40% or more) as excessive movement may cause buckling of the uPVC when exposed to direct sunlight.

Enamel-based paints can be used, utilising a three-coat system.

For full details apply to the selected paint manufacturer before commencing the work.

7 Product information

7.1 GENERAL

Eclipsa Eaves Lining, Silcline Soffit Lining, Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining are a cellulose fibre reinforced cement building product. The basic composition is Portland cement, ground sand, cellulose fibre and water.

Eclipsa Eaves Lining, Silcline Soffit Lining, Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining is manufactured to AS/NZS 2908.2 'Cellulose-Cement Products Part 2: Flat Sheets' (ISO 8336 'Fibre Cement Flat Sheets').

James Hardie New Zealand is an ISO 9001 'Telarc' certified manufacturer. Eclipsa Eaves Lining, Silcline Soffit Lining, Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining are classified Type A, Category 3 in accordance with AS/NZS 2908.2 'Cellulose-Cement Products'.

For Safety Data Sheets (SDS) visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

7.2 DURABILITY

Resistance to moisture/rotting

Eclipsa Eaves Lining, Silcline Soffit Lining, Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining has demonstrated resistance to permanent moisture induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Water permeability (Clause 8.2.2)
- Warm water (Clause 8.2.4)
- Heat rain (Clause 6.5)
- Soak dry (Clause 8.2.5)

7.3 FINISHES

Villaboard Soffit Lining, HardieGroove Soffit Lining, Hardiesoffit Lining and HardieFlex Eaves Lining must be paint finished within 90 days of their installation. Refer to the paint manufacturer for paint suitability, mixing and application.

8 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements for eaves and soffits to comply with NZBC Acceptable Solution B2/AS1. The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months*,
- Pre-painted soffits, such as Silcline Soffit Lining and Eclipsa Soffit Lining, when used in harsh coastal environments, the soffit must be washed down using a hose and soft brush minimum once every four months in addition to the other maintenance requirements,
- Re-applying exterior protective finishes**,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants,
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation close to or touching the building.

* Do not use a water blaster to wash down the soffits.

**Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.

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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Product Warranties

May 2012

All James Hardie eaves and soffit linings come with a 15 year product warranty. Pre-finished products such as Eclipsa Eaves Lining and Silcline Soffit Lining come with a 10 year coating warranty and 15 year warranty on the base sheet. All accessories supplied by James Hardie are warranted for a period of 15 years. For full warranty details visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) in each products warranty under "Conditions of Warranty". James Hardie has tested the performance of the Eclipsa™ Eaves Lining, HardieGroove™ Soffit Lining, Silcline® Soffit Lining, Villaboard® Soffit Lining, Hardiesoffit™ Lining and HardieFlex™ Eaves when installed in accordance with the Eclipsa™ Eaves Lining, HardieGroove™ Soffit Lining, Silcline® Soffit Lining, Villaboard® Soffit Lining, Hardiesoffit™ Lining and HardieFlex™ Eaves Lining installation manual, in accordance with the standards and verification methods required by the New Zealand Building Code (NZBC) and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

Ask James Hardie™
Call 0800 808 868
www.jameshardie.co.nz



James Hardie
a smarter way™

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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Ask James Hardie™

Call 0800 808 868

www.jameshardie.co.nz

HOLDFAST® GATOR® FLASH FIX SEALANT TAPE DATA SHEET

Product Code: 56605 (50mm x 3m), 56606 (75mm x 3m),
56607 (100mm x 3m), 56608 (50mm x 10m),
56609 (75mm x 10m), 56610 (100mm x 10m),
56500 (50mm x 25mm)

Product Name: HOLDFAST® Gator® Flash Fix Sealant Tape

Description

Gator Bond Flashing Tape is based of SBS modified rubberised asphalt with foil backing. Conformable with good adhesion to a broad range of substrates.



Technical Data

<i>Total Thickness</i>	1.0mm
<i>Elongation</i>	(ASTM412) 1500 %
<i>Permeance</i>	(ASTME96B) max. 0.003
<i>Water Absorption</i>	0.23
<i>Pliameance</i>	(ASTM D146) Passes
<i>Resistance to hydrostatic head</i>	45.72m

BRANZ Appraisal Summary – from BRANZ Report number DC1968

Tensile strength	(ASTM D412) Passed
Nail sealability	(ASTM D1970 Section 7.10) Passed
Peel Adhesion	(method A of ICBO criteria)
Tested on	Kraft Building Paper, DuPont (NZ) Ltd, Tyvek Home Wrap, Thermakraft Industries (NZ) Ltd Diflex 130, Thermakraft Industries (NZ) Ltd "Watergate", Thermakraft Industries (NZ) Ltd "Cover UP" and Marshall Waterproofing NZ/AUS Ltd Tekton – Passed
Pliability	Passed
Accelerated ageing	Passed
Concluding	Gator Bond Flashing Tape passed all requirements of the ICBO AC148 July 2001 Acceptance Criteria for Flashing Materials.

Applications

Holdfast Gator Bond Flashing Tape is used for sealing around building wrap inside corner details, inside balcony details, termination of protrusion details, detailing around drains, footings non uniform surfaces. For both, below and above ground applications.

Applying

Cut Holdfast Gator Bond Flashing Tape to the required length, remove protective film and press the shelf adhering bitumous surface firmly on to the substrate. Ensure there is complete contact and avoid air inclusion. For greater conformity on irregular surfaces warm tape as applying or by pre warming roll. Warming will also be required in cold conditions.

Packaging

Colour: Aluminium Foil (Exterior), Black (Adhesive Side)
Packaging: Plastic wrapped rolls of various sizes.

Storage

Store unopened in cool and dry location.

Surfaces

Type: All usual building substrates

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Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

State: clean, dry, free of dust, loose debris and grease or other barriers to adhesion

Clean: Holdfast Bulldog Aluminium Powder Coat Cleaner

Health and Safety

Apply usual industrial hygiene.

Remark

The directives contained in this documentation are the result of our experiments and of our experience and have been submitted in good faith. Because of the diversity of the materials and substrates and the great number of possible applications which are out of our control, we cannot accept any responsibility for the results obtained. In every case it is recommended to carry out preliminary experiments.

Last Updated: 1st October 2010

SPOUTING & FASCIA SYSTEMS

Consent Issued BC141564

BC141564

The Natural Choice for Style and Strength in Rainwater Systems

As a long-time innovator in rainwater systems, Steel & Tube Roofing Products has a range of products to enhance any building. For any style of home, rural and industrial building, there are proven systems that are strong, practical, affordable and very attractive.

Features

Style at home

With a range of spouting profiles to complement conventional and contemporary styled homes, or the option of a concealed fascia gutter system, you are certain to find a look you'll love. Our range of residential spoutings are suited to any roof type or pitch, and can be attached to the Multiline External metal fascia system using our patented bracket system. Alternatively, they can be fastened directly to a timber fascia using concealed brackets. Make your choice from a wide range of modern and traditional colours, or unpainted Zincalume™ for economy and the latest style statements. Selected products are also available in copper for a timeless alternative.

Ready for the big jobs

With a range of standard industrial spoutings, or custom design and manufacture for larger projects, designers have peace of mind when selecting products for commercial and industrial applications.

It's easy to look good

To make it easy to get a great looking finish, selected products feature accessories such as ready-made stop-ends and corners, and optional Flush-Fit end laps.

Durability

Products selected and maintained in accordance with Steel & Tube Roofing Products' recommendations on environmental categories, will meet the performance expectations in regard to durability as expressed in the New Zealand Building Code.

Drinking Water

All pre-painted and metallic coated products supplied by Steel & Tube Roofing Products are guaranteed as being suitable for the collection of drinking water.

Quality

Steel & Tube Roofing Products' operations are all certified to a minimum standard of ISO 9002 for the manufacturing, marketing and delivery of metal roofing and rainwater products.

Materials

New Zealand is exposed to a wide range of environmental conditions, from harsh West Coast beaches through moderate inland locations to industrial and geothermal sites. All rainwater systems are available in a range of finishes to suit any environment. Prior to selecting a product from this guide discuss the particular site conditions with your preferred supplier to ensure the profile and finish will perform to your expectations.

Protective Film

To ensure the surface is not damaged during transport and handling, prepainted materials have a protective strippable film. This should be removed during installation, and before prolonged exposure to sunlight.

Compatibility

Contact with or water run off from dissimilar metals such as lead, copper or stainless steel should be avoided with any Colorsteel® or Zincalume™ product. In particular avoid discharging copper spouting or downpipes from upper storeys onto lower roof sections. Monel rivets should not be used.

Maintenance and Warranties

Maintenance

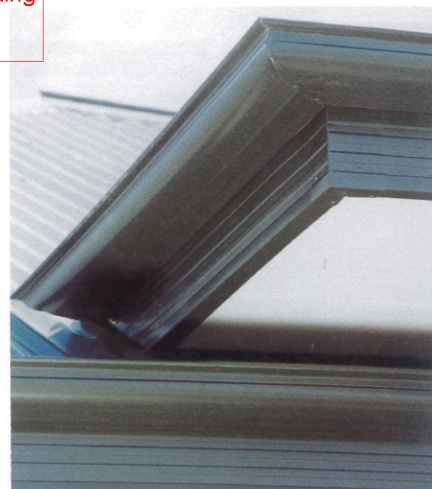
Few products are absolutely maintenance-free and all are subject to the cumulative effects of weather, dust, salt and other airborne deposits — some of which are extremely aggressive. In order to ensure the maximum service life from the chosen coating system, the property owner should note:

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.



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.

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.

Dektite®



Consent Issued BC141564

The versatile solution for hundreds of applications.

Designed to enable practically any pipe flashing operation to be carried out within minutes, **Dektite®** is simple to install - and very effective. Providing the perfect weatherproof, flexible seal, **Dektite®** protects against leakage on a wide range of pipe or vent projections, and is designed to conform to most roof profiles and pitch. For a maintenance-free seal on pipes from 0 - 440mm diameter, it's much more than a flexible solution to pipe flashing. It's a means of saving **time and money!**

Easy Selection Guide

Code	PIPE mm	BASE mm	PITCH	COLOUR
DB 0-35 DG 0-35	0-35	99x99	0 - 60°	BLACK (EPDM)* DB GREY (EPDM)* DG
DB 5-55 DG 5-55	5-55	137x137	0 - 45°	
DB 50-70 DG 50-70	50-70	178x178	0 - 45°	
DB 5-120 DG 50-120	5-120	218x218	0 - 45°	
DB 110-170 DG 110-170	110-170	284x284	0 - 45°	
DB 160-220 DG 160-220	160-220	365x365	0 - 45°	
DB 160-300 DG 160-300	160-300	453x453	0 - 45°	
DB 290-440 DG 290-440	290-440	581x581	0 - 45°	

E.P.D.M. withstands temperatures from -50°C to 115°C, & up to 150°C intermittently

* **DEKTITE®** Pipe Flashings can also be used to flash square pipes.
Just add 30% to the pipe diameter and trim the cone to suit.



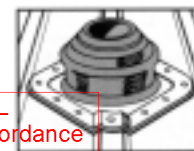
EPDM - Perfect for approved flues!

Dektite® EPDM polymer flashings have been officially tested by the Coal Corporation of Victoria, Australia and conform to all Australian and UK Standards on approved flue systems. Under no circumstances should any polymer flashing be installed on a non approved flue or an 'active' combustion heater flue.

INSTALLATION INSTRUCTIONS

BC141564

For more effective drainage always fit the Dektite on the Diamond or bias.



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Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
141564 9/15/2014 Dawn



1 Cut a neat hole in roofing sheet with minimum clearance for pipe and insert pipe through hole. Trim the cone to suit pipe size using sharp tin snips. Where necessary, support cut sections of sheet with additional framing.



2 Slide Dektite® flashing down over pipe. Lubricating the pipe with water allows the pipe to slide snugly into position.



3 Apply a neutral cure silicone* sealant by turning back the flexible flange.



4 Press base to the roof profile by hand, smooth out any awkward creases. Don't fully extend to allow for vibration.



5 Fasten using sealed rivets or washers. Fit fasteners progressively outward in opposing pairs to avoid gaps.



Dektite®

First and the Best!

*Refer to page 28 for silicone usage

HINT: When flashing a metal flue that has an exposed seam, using a neutral cure sealant, seal the seam from underside of cowl to the top of Dektite® cone.

Design for Durability

Steel & Tube Roofing and Cladding Solutions on CD-ROM or in printed form, provides design and installation details for residential and commercial applications. Contact your local branch or the Technical Helpline for your copy.

With correct product selection, installation and maintenance, your Steel & Tube Roofing Products roof will remain attractive and weatherproof for many years. Unfavourable design practices will detrimentally affect the performance of your roof and should be avoided. If any of the following situations are evident in your design you should contact your Steel & Tube Roofing Products representative for advice.

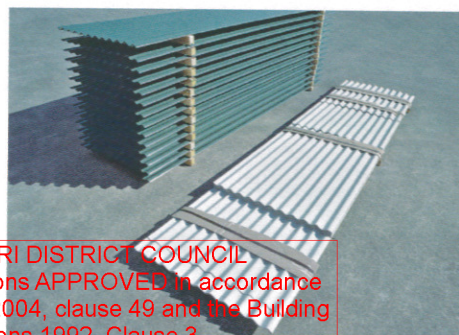
- Areas of roofing, cladding and rainwater systems unwashed by rainfall will accumulate atmospheric debris which can become corrosive when damp. These areas will require maintenance depending on the product used and the environment. Refer to the MAINTENANCE section of this publication.
- Do not discharge water runoff from inert materials such as Zinalume® steel, pre-painted roofing, tiles or clear sheeting onto unpainted galvanised roofing and gutters, as the corrosive salts formed in this situation are unstable and can lead to premature corrosion.
- Where two different metals are in contact one metal will tend to sacrifice itself to protect the other. A similar effect can occur with water flowing over dissimilar metals. In particular, avoid runoff from copper or brass onto Zinalume® steel roofing, and avoid contact with, or runoff from unpainted lead onto Zinalume® steel.
- Fasteners should be compatible with the roofing material chosen and have durability not less than the material being fastened. Stainless steel or aluminium fasteners should be used with pre-painted aluminium roofs.
- Wall cladding should terminate at least 50mm above ground level, and be kept free of vegetation.



Storage

Products are despatched from the factory in top condition, however the material can be ruined before installation by poor storage practices. Premature deterioration due to poor storage may be avoided if these simple guidelines are followed:

- On arrival, ensure sheets are dry. If wet, open the pack and separate the sheets to allow them to dry. Store packs of the product off the ground in a sheltered position providing some fall to allow water to run off. Protect packs with a loose fitting waterproof cover, allowing air to circulate.
- Contact with wet cement should be avoided at all times.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Installation

The installation of metal roofing products is a specialised field requiring knowledge and experience of numerous issues with regard to trade practice and material compatibility.

- Poor handling prior to or during installation can cause damage which may affect the appearance and ultimate performance of the product. Don't handle sheets roughly or carelessly or drag or slide sheets over each other or rough surfaces, as damage to the coating may occur. Equipment used to handle the sheets should be clean and free of dirt and grit.
- Soft soled shoes should be worn whenever walking on the product to prevent damage to the coating; traffic up the roof should be in the pans of the profile and across the roof should be on the purlin line.
- Prior to installation ensure that the tops of the purlins or girts are all in the same plane; if packing or easing is necessary ensure this is not to the detriment of the connection between the fastener and the structure.
- Sheets should be lapped away from the line of sight wherever possible to enhance aesthetic appeal and all sheets should be stop ended at the top, and lipped at the bottom on pitches below 8°.
- Ensure that the anti-capillary edge is fitted as the external overlap and is visible from the top side.
- The use of touch-up paints is not recommended; if a pre-painted sheet is excessively damaged by scratching it should be replaced. Accessories should be colour matched prior to installation.
- Regularly clean up the area by sweeping swarf, offcuts, rivet shanks and loose fasteners with a soft-bristled broom. Collect and remove all debris daily as unsightly staining from swarf and other unprotected steel items can occur overnight.
- The strippable film applied to some pre-painted products must be removed within two weeks of installation, or earlier if storage is in direct sunlight.
- Recommended references are the New Zealand Steel *Installer's Guide* and the Steel & Tube Roofing and Cladding Solutions.



Maintenance

Few products are absolutely maintenance-free and all Steel & Tube Roofing Products profiles are subject to the cumulative effects of weather, dust and other airborne deposits, some of which are extremely aggressive. ENVIRONMENTS & WARRANTIES on Page 6 will assist in identifying the category into which the site fits. In order to ensure the maximum service life from the chosen coating system, the property owner should note the following maintenance advice:

- Soft soled shoes should be worn whenever walking on roofing to prevent damage to the coating; walk only in the pans of the profile, and on the purlin line whenever possible.
- Normal rainwashing will remove most accumulated atmospheric debris, but manual washing is required for areas which do not receive adequate rainwashing. These areas, such as wall cladding under eaves, or sheltered areas where overlapping of roof areas occurs due to the design, are known as *unwashed areas*.
- Other *high risk areas* that require manual washing include around flues and extractor vents, under television aerials and trees and sites prone to mould, lichen, bird droppings or debris.
- Spoutings and gutters must be regularly inspected to remove debris, which may cause ponding.
- Surfaces may be washed with water and a soft-bristled brush, or for larger areas waterblasting at pressures up to 20 MPa may be more appropriate.
- The following table shows maintenance requirements for roofing products relative to the environment in which the building is located.



These recommendations are dependant on selection of the appropriate roofing material for the prevailing environment.

Material	Environment	Maintenance Requirement			
		Roof	Walls	Rainwater Systems	Unwashed and High Risk Areas
Pre-Painted steel	Very severe	Rainwashing Only	Wash every 3 months	Wash monthly	Wash monthly
	Severe	Rainwashing Only	Wash every 6 months	Wash every 3 months	Wash every 3 months
	Moderate	Rainwashing Only	Wash every 12 months	Wash every 6 months	Wash every 3 months
Zincalume®	Moderate	Rainwashing Only	Wash every 6 months	Wash every 3 months	Wash every 3 months

Overpainting

- Galvanised or Zincalume® products can be overpainted immediately or after weathering. Use primer and top coat from a reputable paint manufacturer suitable for galvanised steel. Do not use calcium plumbate primers if rain water is to be collected for drinking purposes.
- Pre-painted roofing is best left weathered for at least twelve months prior to overpainting, unless special steps are taken to improve adhesion.
- As with all paint systems preparation is the key. For more information on overpainting Steel & Tube Roofing Products pre-painted materials, refer to the New Zealand Steel Overpainting Guide.

Preferred Supplier

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141564 9/15/2014 Dawn

Drinking Water

- Pre-painted and metallic coated products are suitable for the collection of drinking water. On new installations the first 25mm of rainfall should be discarded to avoid contamination from any manufacturing or installation residue. Some post-painted systems are unsuitable for the collection of drinking water, check with the paint supplier for compatibility.

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Email: info@stroofing.co.nz

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BRANZ Appraised

Appraisal No.472 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 472 (2011)**

Amended 31 January 2012

**SUPERFLEX™ WET
AREA MEMBRANES**

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Consent Issued BC141564

BC141564

Product

1.1 Superflex™ Wet Area Membranes are premixed and two-part, liquid applied waterproofing membranes for use under ceramic or stone finishes in internal wet areas.



Scope

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

2.2 The use of Superflex™ Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

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

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

2.5 The membranes must be installed by Ardex New Zealand Ltd trained and approved applicators.

Building Regulations

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

New Zealand Building Code (NZBC)

3.1 in the opinion of BRANZ, Superflex™ 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. Superflex™ Wet Area Membranes meet this requirement. See Paragraph 9.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.6. Interior wet area floors and walls incorporating Superflex™ Wet Area Membranes will meet this requirement. See Paragraphs 11.1- 11.6.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Superflex™ Wet Area Membranes meet this requirement and will not present a health hazard to people.

This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

Consent Issued BC141564

constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

4.1 Materials supplied by Ardex New Zealand Ltd are as follows:

Superflex™ WPM001 Premixed Bathroom and Balcony

- A one part, polymer-based, ready-to-use, liquid-applied membrane containing micro-fibres, supplied as a light blue thixotropic paste in 6.5 kg (approximately 5 litres) and 20 kg (approximately 15 litres) pails.

Superflex™ WPM002 Two Part Bathroom and Balcony

- A fast drying, two part, flexible, cementitious-based, liquid applied membrane containing micro-fibres. It is supplied as Superflex™ WPM002 Part A Liquid in 10 and 20 kg pails and Superflex™ WPM002 Part B Powder in 10 kg multi-wall bags. When dry, the membrane is light grey in colour.

Superflex™ Primer

- A water-based primer used to seal substrates and enhance the adhesion of the membranes. It is supplied as a red coloured liquid in 20 kg plastic containers.

Handling and Storage

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

Substrates

Plywood

8.1 Plywood must be a minimum of 17mm 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 400mm in each direction, fixed with 10g x 50mm stainless steel countersunk head screws at 150mm centres on the edges and 200mm 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 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 manufacturer's instructions.

Particleboard

8.3 Particleboard must be specified for the 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 Superflex™ 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 as for new work.

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

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Superflex™ 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 Superflex™ 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 Superflex™ WPM002 Two Part is 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 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

Internal Moisture

11.1 Superflex™ 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 Superflex™ 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 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b), 3.1.2 (b) and 3.3.1 (b).

11.4 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, BRANZ "Good Practice Guide Tiling", and flooring and wallboard manufacturers.

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

Installation Information

Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by Ardex New Zealand Ltd trained and approved applicators.

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 Ardex New Zealand Ltd Technical Literature and this Appraisal.

Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. With surfaces that are even and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 The relative humidity of the concrete must be 75% or less before membrane application. Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424.

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 fiberglass mesh installed as set out in the Technical Literature.

Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.

14.2 Superflex™ WPM002 Two Part Bathroom and Balcony liquid and dry components must be mixed and left to stand for 5 minutes before re-mixing, then applying. Superflex™ WPM001 Premixed Bathroom and Balcony must be thoroughly stirred before application.

14.3 The membranes must be applied in a minimum of two coats at the rates set out in the Technical Literature to give a total finished thickness of 1.2 – 1.5 mm. Subsequent coats must be applied at an opposite direction to the previous coat.

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Application can be made by roller (medium/long nap), brush (long bristle), or a flat steel trowel.

14.5 Reinforcement fabric is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, and at any other areas such as joints in the flooring substrate, floor cracks or around penetrations in the membrane.

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 Practice Guide, Tiling". The compatibility of tile adhesive must be confirmed with the adhesive manufacturer or Ardex New Zealand Ltd.

Inspections

16.1 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

Health and Safety

17.1 Safe use and handling procedures for the 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 of Superflex™ WPM001 Premixed Bathroom and Balcony and Superflex™ Two Part Bathroom and Balcony has been undertaken by Ardex Australia Pty Ltd research and development laboratory: water vapour transmission; water absorption; tensile strength and elongation before and after UV exposure, immersion in bleach, immersion in industrial detergent and immersion in water. Test methods and results were reviewed by BRANZ and found to be satisfactory.

18.2 The following testing of Superflex™ WPM001 Premixed Bathroom and Balcony was undertaken by the Commonwealth Scientific Industrial Research Organisation (CSIRO) Australia:

- In accordance with ANSI A118.10 for ICBO Evaluation Service - dimensional stability; waterproofness; shear strength to ceramic tile and cement mortar; and fungal and micro-organism resistance.
- In accordance with AS 1145 – behaviour under cyclic strain.

18.3 Testing of Superflex™ WPM001 Premixed Bathroom and Balcony and Superflex™ WPM002 Two Part Bathroom and Balcony has been undertaken by BRANZ for low temperature flexibility and peel adhesion after heat/humidity aging.

18.4 Testing for suitability over particleboard in accordance with AS/NZS 4858-2004, Appendix C has not been undertaken because compliance with the standard has been met by satisfactory water vapour transmission test results.

The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

19.1 An assessment was made of the durability of the Superflex™ 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 membrane has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of membrane's manufacturer has been assessed and found to be satisfactory.

20.3 The quality of supply of the membrane system materials to the market is the responsibility of Ardex New Zealand Ltd.

20.4 Quality on site is the responsibility of the Ardex New Zealand Ltd approved and trained applicators.

20.5 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Ardex New Zealand Ltd and this Appraisal.

20.6 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Ardex New Zealand Ltd.

Sources of Information

- AS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS 3740 – 2010 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 1991 Guide to the installation of ceramic tiles.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2269: 2008 Plywood - Structural.
- AS/NZS 4858 - 2004 Wet area membranes.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4229: 1999 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 1990 Code of practice for the design of masonry structures.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.
- Good Practice Guide Tiling, BRANZ, March 2004.
- Good Practice Guide Membrane Roofing, BRANZ, October 2003.

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.



In the opinion of BRANZ, Superflex™ 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 Ardex 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. Ardex 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 Ardex 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 Ardex New Zealand or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 15 April 2011



BRANZ Appraised

Appraisal No.427 [2007]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 427 (2007)**

Amended 31 January 2012

**GIB AQUALINE®
WET AREA SYSTEMS**

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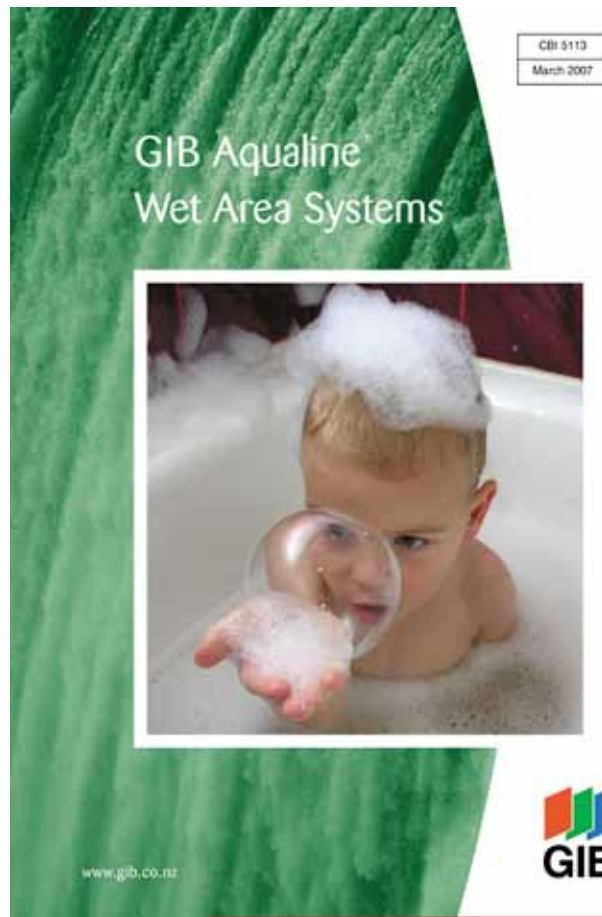
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Product

1.1 GIB Aqualine® Wet Area Systems are for the interior lining of timber and steel frame walls and ceilings in wet areas such as bathrooms, laundries, kitchens and toilets where a water resistant lining material is desirable.

1.2 GIB Aqualine® Wet Area Systems are based on 10 mm and 13 mm thick GIB Aqualine® water resistant plasterboard.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Scope

2.1 GIB Aqualine® Wet Area Systems have been appraised for use as a wet area wall and ceiling lining in buildings within the following scope:

- on framed walls and ceilings within the scope limitations on NZS 3604; and,
- on timber and light gauge steel framed walls and ceiling subject to specific design; and,

2.2 GIB Aqualine® may also be used to substitute for some other GIB® Plasterboards in fire-rated, sound-rated and bracing-rated wall and floor/ceiling constructions.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the GIB Aqualine® Wet Area Systems, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. GIB Aqualine® Wet Area 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 - 8.3.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 9.1 - 9.5.

Clause C3 SPREAD OF FIRE: Performance C3.3.1, C3.3.2 and C3.3.5. GIB Aqualine® Wet Area Systems meet these requirements by providing passive fire and smoke protection.

Clause E3 INTERNAL MOISTURE: Performance E3.3.4, E3.3.5 and E3.3.6. GIB Aqualine® Wet Area Systems meet these requirements. See Paragraphs 13.1 - 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB Aqualine® Wet Area Systems meet this requirement and will not present a health hazard to people.

Clause G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1 and G6.3.2. GIB Aqualine® Wet Area Systems meet the requirements. See Paragraph 14.1.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 The GIB® plasterboards and accessories used in the GIB Aqualine® Wet Area System and supplied or specified by Winstone Wallboards Limited are as follows:

GIB Aqualine®

4.2 GIB Aqualine® is a paper-bound, modified water-resistant gypsum-plaster core sheet lining material. The sheets have a taper on the two long sheet edges. GIB Aqualine® is available in 10 mm and 13 mm sheet thicknesses, a sheet width of 1200 mm and in lengths of 2400 mm, 2700 mm, 3000 mm and 3600 mm. The maximum weights are 7.8 kg/m² and 10.2 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB Aqualine® face paper is green in colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
6g x 25 mm and 32 mm.
- GIB® Grabber® Self Tapping Drywall screws for fixing to light gauge steel:
6g x 25 mm and 32 mm.
- GIB® Nails
30 mm and 40 mm x 2.8 mm

Adhesive and Sealants

- GIBFix® One (Acrylic)
- GIBFix® All-Bond (Solvent)

GIB® Accessories and GIB® Jointing Compounds

- As specified in the GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature.

Finishes

4.3 Finishes such as tiling, flexible sheet vinyl, paints and wallpapers have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

5.1 The best results are achieved when GIB Aqualine® is treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.

5.2 All accessories must be kept dry.

Consent Issued BC141564

BC141564

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the GIB Aqualine® Wet Area System. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

7.1 GIB Aqualine® provides a water-resistant lining as a base for finishing systems in wet areas such as bathrooms, toilets, laundries and kitchens. The typical finishes are ceramic tiles and flexible sheet vinyl to walls and paint, and wallpaper to walls and ceilings.

7.2 GIB Aqualine® must not be used in the following situations:

- For bracing applications in shower areas or adjacent baths (See Paragraphs 7.4 and 8.2).
- In areas of high humidity (above 90% RH) or continually wet such as group showers, steam rooms, or swimming pools.
- Installed over a vapour barrier.
- Applied directly to masonry, concrete or solid plaster.
- Applied over other sheet lining materials.
- Used externally of the building envelope.
- Exposed to temperatures of 52°C or greater for prolonged periods. (Refer to appliance and fitting manufacturer's for installation details.)

7.3 GIB Aqualine® may be substituted for some other GIB® Plasterboard products in specific GIB® Bracing Systems, GIB® Fire Rated Systems, GIB® Noise Control Systems and GIB Ultraline® PLUS Lining System.

Wet Areas

7.4 Wet areas are spaces where sanitary fixture and sanitary appliances are located such as bathrooms, toilets, laundries and kitchens. There are two general categories of wet areas as follows:

1. Water Splash – These are areas subject to intermittent splashing of water such as around baths, vanities, tubs and sinks.
2. Shower Areas – These are areas subject to frequent and heavy water splash such as enclosed showers, unenclosed shower zones and showers over baths.

7.5 Both the above wet area categories must be finished with surfaces and joints that are impervious and easily cleaned. Shower areas must additionally be waterproof. This can be achieved using proprietary rigid shower lining systems, flexible vinyl shower wall finish, or tiling. Tiled shower areas must include a wet area waterproofing membrane system under the tiles.

Intertency Walls – Wet Areas

7.6 Intertency drywall constructions that incorporate fire resistance and noise control must be protected from water splash. In shower areas GIB Aqualine® must not be substituted for other GIB® Plasterboards but must be an extra lining layer. Refer to the GIB Aqualine® Wet Area Systems Technical Literature.

Tiling

7.7 GIB Aqualine® is suitable as a substrate for tiling up to the following weights:

- 10 mm GIB Aqualine® up to 20kg/m²
- 13 mm GIB Aqualine® up to 32kg/m².

Note: Most ceramic and porcelain wall tiles weigh less than 20kg/m². For further information on tiling consult the BRANZ Good Practice Guide – Tiling.

Framing

7.8 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of GIB Aqualine® Wet Area Systems Technical Literature:

- Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

Structure

Bracing

8.1 GIB Aqualine® can be used in place of GIB® Standard plasterboard in GIB® bracing elements. GIB Aqualine® can be used in place of GIB Braceline® in GIB® bracing elements 900 mm or longer, provided the perimeter of the element is fixed with GIB Braceline® Nails or GIB Braceline® screws at 100 mm centres, using the GIB Braceline® corner fixing pattern.

8.2 GIB Aqualine® must not be used for bracing in shower areas or behind baths.

Impact Resistance

8.3 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications.

Durability

Serviceable Life

9.1 GIB Aqualine® has a serviceable life of at least 15 years as a fully protected shower or water splash lining. As a general wall and ceiling lining GIB Aqualine® will have a serviceable life in excess of 50 years. The ability of GIB Aqualine® to remain durable is dependent on being protected and remaining dry in service, and being maintained in accordance with this Appraisal.

Maintenance

9.2 The building must be maintained weathertight and all lining systems protected from internal and external moisture.

9.3 Finishes to water splash and shower areas, including tiles, grout, waterproof membranes, sealants and flexible sheet vinyl must be checked to ensure the integrity of the system is maintained. They must be repaired or replaced if necessary. When repairing or replacing finishes, the GIB Aqualine® substrate must be checked for defects and repaired or replaced, as required.

9.4 For flexible sheet vinyl, particular attention must be paid to joints especially at corners. Checks should be made to ensure the vinyl has not been punctured. Where damage has occurred, repairs must be made immediately.

9.5 Impact damage to GIB Aqualine® plasterboard, resulting in small holes and cracks, may be patched, stopped and finished. For larger areas of damage, expert advice on repair must be sought from Winstone Wallboards Ltd.

Outbreak of Fire

10.1 Separation or protection must be provided to GIB Aqualine® Wet Area Systems from heat sources such as stoves, heaters, flues and chimneys.

10.2 NZBC Acceptable Solution C/AS1, Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Spread of Fire

11.1 When 10 mm GIB Aqualine® is substituted into fire rated systems in place of 10 mm GIB Fyrelite®, the FRR of that system will be maintained. Similarly, the FRR is maintained when 13 mm GIB Aqualine® is substituted for 13 mm GIB Fyrelite®.

Flame Barrier

12.1 Where flame barriers are required by Acceptable Solution C/AS1 Table 6.3, GIB Aqualine® is a suitable material to provide a 10 minute flame barrier, provided all sheet joints are formed over framing, or backblocked with GIB® plasterboard.

Internal Moisture

13.1 When installed in accordance with this Appraisal, GIB Aqualine® Wet Area Systems will provide wall surfaces adjacent to sanitary fixtures and sanitary appliances that are impervious and easily cleaned.

13.2 The construction methods meet with the internal moisture requirements of the NZBC Acceptable Solution E3/AS1.

13.3 To minimise internal condensation, adequate levels of ventilation and thermal resistance must be provided to all spaces where moisture may be generated.

Airborne and Impact Sound

14.1 When GIB Aqualine® is substituted into GIB® Noise Control systems in place of the equivalent thickness GIB® Standard plasterboard or GIB Fyrelite®, the STC and IIC rating of that system will be maintained. When GIB Aqualine® is substituted in place of the equivalent thickness GIB Noiseline®, a small performance loss may occur.

Installation Information

Installation Skill Level Requirement

15.1 Installation of GIB Aqualine® Wet Area Systems can be carried out by any competent building contractor.

General

16.1 GIB Aqualine® Wet Area Systems must be installed in accordance with the Technical Literature. For inspection, reference must be made to the Technical Literature.

Cutting

16.2 GIB Aqualine® is 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.

Health and Safety

16.3 Dust resulting from the sanding of stopping and finishing compounds may be a respiratory irritant, and the use of a suitable facemask is recommended.

Framing

16.4 To achieve an acceptable decorative finish, GIB Aqualine® Wet Area Systems and the GIB® Site Guide specifies that walls must not be lined unless the moisture content of timber framing is less than 18%. Winstone Wallboards Limited recommend a moisture content of 8–12% where buildings are to be air conditioned or centrally heated.

Non-Tiled Areas

17.1 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws or GIB® Nails at 300 mm centres around the perimeter of the sheet, and with GIBFix® adhesive on all intermediate studs and dwangs. Adhesive must not be used under fasteners. A 5-10 mm gap must be left between the floor and the bottom of the sheet.

Tiled Areas

17.2 Control joints must be provided at maximum 4 m centres.

Internal corners in shower areas must be reinforced with a minimum 32 x 32 x 0.55 mm galvanised metal angle prior to lining the walls.

17.3 GIB Aqualine® sheets may be installed vertically or horizontally. Sheets are fixed with GIB® Grabber® screws at 100 mm centres to perimeter of wall and to all intermediate studs. Adhesive must not be used in place of screws.

Ceilings

17.4 Supports of timber or steel battens or ceiling joists must be 450 centres for 10 mm GIB Aqualine®, or 600 mm centres for 13 mm GIB Aqualine®.

17.5 GIB Aqualine® sheets must be fixed with GIB® Grabber® screws at 600 mm centres around perimeter and at 200 mm centre along supports. Alternatively, sheets are screw fixed at 600 mm centres along the supports and GIBFix® adhesive fixed at 200 mm centre between.

Penetrations and Sealants

18.1 All cut-outs for pipe penetrations must be made neatly using a hole saw. Cut-outs should be made approximately 12 mm diameter greater than the pipe.

18.2 A bead of silicone sealant must be placed to the full thickness of the GIB Aqualine® sheet around all pipe penetrations, at bath rims and preformed shower bases and where an impervious junction is required at the floor/wall line.

18.3 In tiled areas, a bead of silicone sealant 6 mm wide must also be placed to the full thickness of the tiles where the above situation occurs. The sealant manufacturer's technical literature must be followed for installation.

Jointing and Finishing

19.1 Jointing must be carried out in accordance with GIB® Site Guide Technical Literature.

19.2 Tiled shower areas must incorporate a waterproofing membrane over GIB Aqualine®. Waterproofing membranes are outside the scope of this Appraisal and must otherwise be specified and approved.

Investigations

20.1 The GIB Aqualine® Wet Area Systems and GIB® Site Guide Technical Literature have been examined by BRANZ and found to be satisfactory.

20.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.

20.3 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.

20.4 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

21.1 Winstone Wallboards Limited's manufacturing process and details of the quality and composition of the materials, have been examined by BRANZ and found to be satisfactory. The quality management systems of Winstone Wallboards Limited have been assessed and registered by TELARC as meeting the requirements of ISO 9001, Registration No. 581. Winstone Wallboards Limited is responsible for the quality of the product supplied.

21.2 The quality of the application and finish on site is the responsibility of the installation, stopping and finishing contractors.

21.3 Designers are responsible for the design of buildings.

21.4 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- BRANZ Good Practice Guide - Tiling, March 2004.
- New Zealand Building Code Handbook and Approved Documents, Building Industry Authority, 1992.
- The Building Regulations 1992, up to, and including October 2004 Amendment.



BRANZ

In the opinion of BRANZ, GIB Aqualine® Wet Area Systems are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to the Client, Winstone Wallboards 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. The Client:
 - 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.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by the Client.
5. 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.

For BRANZ

P Robertson
Chief Executive

Amendment No. 1, dated 29 April 2010.

This Appraisal has been amended to include a new adhesive, GIBFix® One, and to update reference to AS/NZS 1170.

Amendment No. 2, dated 31 January 2012.

This Appraisal has been amended to update reference to NZS 3604: 2011.

Date of issue: 4 April 2007

FITTING AND WIRING PDL 6312 TIMER ACCESSORY (Not included)

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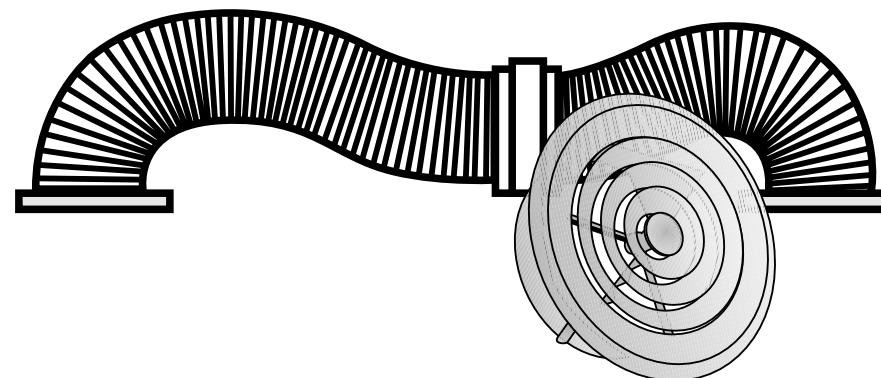
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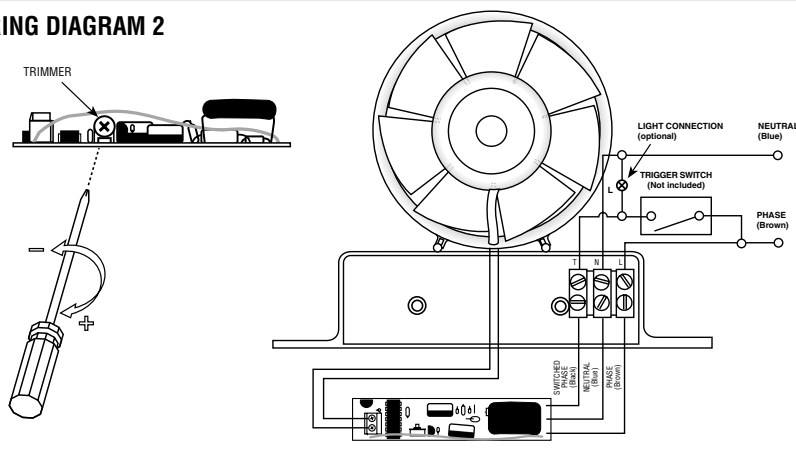
IN-LINE EXHAUST FANS

Models 6401, 6501, 6601

OPERATING INSTRUCTIONS



WIRING DIAGRAM 2



PDL EXHAUST FAN RANGE

IN-LINE EXHAUST FANS

6401 4" IN-LINE EXHAUST FAN

6501 5" IN-LINE EXHAUST FAN

6601 6" IN-LINE EXHAUST FAN

WALL/CEILING EXHAUST FANS

6402 4" WALL/CEILING EXHAUST FAN

6502 5" WALL/CEILING EXHAUST FAN

6602 6" WALL/CEILING EXHAUST FAN

ACCESSORIES (not included)

6412 4" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6512 5" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6612 6" THROUGH WALL KIT

– Includes: Square grille surround, Angled fixed grille, Gravity Louvres, Aluminium Ducting (115mm compacted, 320mm extended).

6312 ELECTRONIC TIMER (FOR IN-LINE EXHAUST FANS ONLY)

– Adjustable time : 3 to 20 minutes, Max Load : 150W

6322 ELECTRONIC TIMER (FOR WALL/CEILING EXHAUST FANS ONLY)

– Adjustable time : 3 to 20 minutes, Max Load : 150W

SPARES

GRILLES

6401G 4" IN-LINE ROUND GRILLE

6501G 5" IN-LINE ROUND GRILLE

6601G 6" IN-LINE ROUND GRILLE

DUCTING

6401D 4" IN-LINE DUCTING 3m

6501D 5" IN-LINE DUCTING 4m

6601D 6" IN-LINE DUCTING 6m

MOTORS

6401M 4" IN-LINE MOTOR

6501M 5" IN-LINE MOTOR

6601M 6" IN-LINE MOTOR

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GENERAL INFORMATION

- Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other open-fire appliances.
- This fan should not be used for the extraction of combustible gases or vapour.
- WARNING: Before obtaining access to terminals, **all** supply circuits must be disconnected.
- The appliance is not intended for use by young or infirm persons without supervision.
- Young children should be supervised to ensure that they do not play with the appliance.
- Ensure that a suitable disconnection switch is installed in the fixed wiring, in accordance with the local wiring rules and regulations.
- **Do not install within 120cm of a stove.**

SPECIFICATIONS

	MODEL		
	6401	6501	6601
Ducting Diameter(mm/inches)	100/4"	120/5"	150/6"
Duty At Free Discharge (m³/h)	85	130	230
Nominal Air Flow Pressure (mmH2O)	0.65	0.30	0.80
Voltage	230-240 Volts	230-240 Volts	230-240 Volts
Frequency	50Hz	50Hz	50Hz
Wattage	11	15	29
Sound Pressure Level At 1.5m db (A)	44	46	50
Insulation Class	II	II	II
Protection	IPX2	IPX2	IPX2
Max Running Temperature	40°C	40°C	40°C

INSTALLATION INSTRUCTIONS

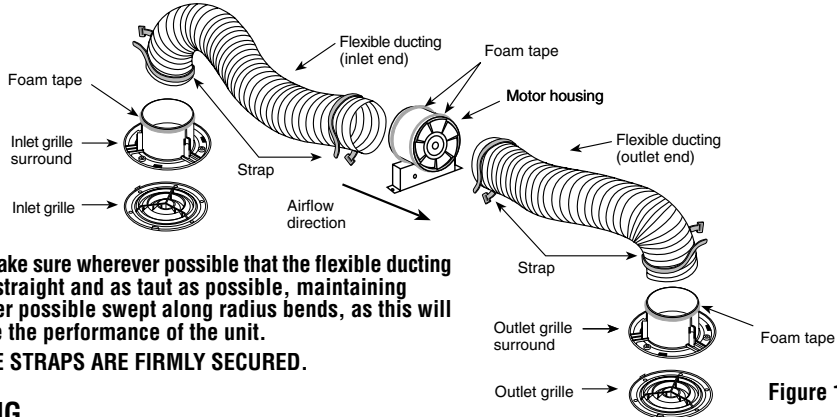
INSTALLATION (NB: the fan motor unit must only be mounted indoors)

1. Remove all parts from packaging.
2. Determine and locate positions to place the inlet grille (indoor ceiling), outlet grille (outdoor soffit) and motor unit (joist inside the ceiling). Ensure the grille areas are free from obstruction and between 2 studs or joists. NB: The shortest possible distance between the grilles is recommended for optimum performance.
3. Inside the roof ceiling, mount the motor unit to a joist using screws provided, ensuring it is held firmly to reduce vibrations. **Ensure the airflow direction label is pointing towards the outlet grille.**
4. To ensure ducting will be fully retained, stick one piece of foam tape around both circumferences of the duct at each end of motor unit (see Figure 1).
5. Drill two small witness holes to mark each position in ceiling and outdoor soffit (for inlet and outlet grilles).
6. Attach flexible ducting to inlet side of motor unit duct (completely over foam tape). Secure with one of the straps provided.
7. Stretch out a good, adequate length of the flexible ducting to reach the marked inlet grille hole position and cut. **Ensure there is adequate length of flexible ducting to reach both grilles prior to cutting.**
8. Attach remaining flexible ducting to outlet side of motor unit duct (completely over foam tape). Secure with one of the straps provided.
9. Stretch out the flexible ducting to reach near the marked outlet grille hole position and cut.
10. From the inside, locate marked hole position in ceiling for the inlet grille to be fitted and cut hole:

Model	Cut hole diameter	Alternatively, use this card as a template for marking appropriate hole size.
6401	119mm	
6501	144mm	
6601	169mm	

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11. To ensure ducting will be fully retained, stick one piece of foam tape around the circumference of the duct at the end of the inlet grille surround (see Figure 1).
12. Reach into inlet ceiling hole and pull flexible ducting through. Attach flexible ducting to inlet grille surround duct (completely over foam tape). Secure with one of the straps provided.
13. Carefully un-clip centre grille from the grille surround. Insert the inlet grille surround into the ceiling hole.
14. Secure the grille surround by turning the 3 clamp screws clockwise until the surround is flush against the surface. Do not over-tighten the screws.
15. Clip centre grille back into the inlet grille surround.
16. Repeat steps 10 to 15 for mounting the outlet grille to the outdoor soffit.



Note: Make sure wherever possible that the flexible ducting is kept straight and as taut as possible, maintaining wherever possible swept along radius bends, as this will improve the performance of the unit.

ENSURE STRAPS ARE FIRMLY SECURED.

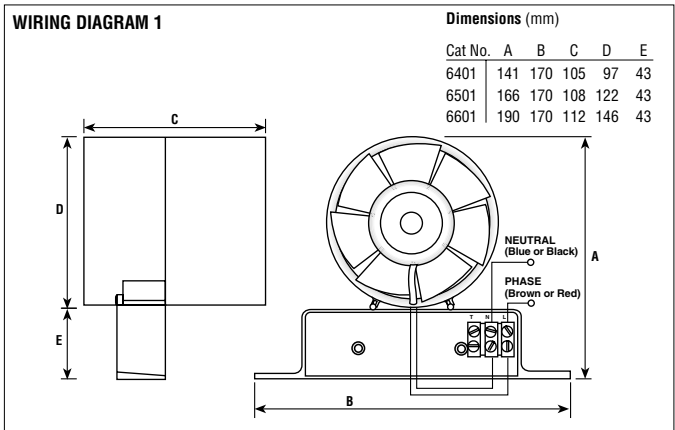
WIRING

Note: All wiring must be securely fixed and the supply cable must be a minimum of 1mm² in section and maximum cable outside diameter is to be 7mm. All wiring must comply with the current regulations.

IMPORTANT: Switch off mains supply before making any electrical connections.

STANDARD MODELS (Wiring Diagram 1)

1. Remove the cover on the fan motor unit bracket.
2. Check that the wiring from the motor is held firmly in the terminal block.
3. Connect the mains supply as shown in Wiring Diagram 1, ensuring mains supply cable is fixed with cable fastener.
4. Replace the cover on the fan motor unit bracket.



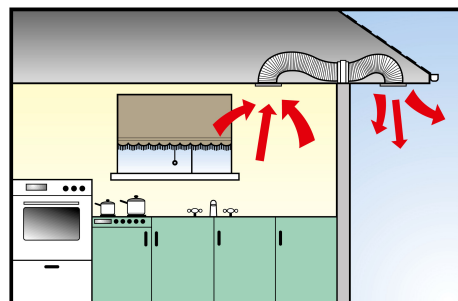
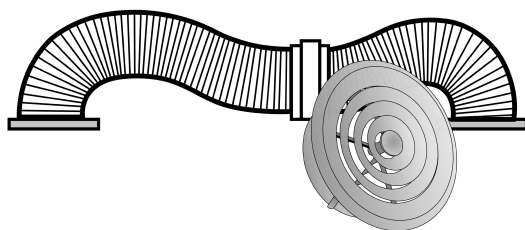
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NEW PRODUCT DATA AND APPLICATION SHEET

CATALOGUE #	DESCRIPTION	BARCODE #
6401	4" In-line Exhaust Fan	9416175168789
6501	5" In-line Exhaust Fan	9416175168796
6601	6" In-line Exhaust Fan	9416175168802

DESCRIPTION In-line Exhaust Fans



BOX QUANTITY 1

OUTER QUANTITY 4

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FEATURES

4", 5" and 6" models available.
Stylish round grilles.
Easy to install, clean, and maintain.
Air movement ranges between 85m³ (4"), and 230m³ (6").
Round grille does not need to be oriented.
Round grille is designed for mounting with clamps for fast, easy installation. Using clamps prevents cracking of ceiling materials around screw holes.
Screw fixing option available.
Quiet operation.
Motor contains a safety thermal fuse.
Heavy duty, light weight, flexible PVC ducting.
Conform to AS/NZS3350.
230-240V a.c. 50hz.
IP rating: IPX2. Max running temperature: 40 deg C.
Timer units, available as a separate accessory – allows fans to be used efficiently and economically.



PDL

Consent Issued BC141564

BC141564

NEW PRODUCT DATA AND APPLICATION SHEET

SPECIFICATIONS

Conform to AS/NZS3350.
230-240V a.c. 50hz.
IP rating: IPX2.
Max running temperature: 40 deg C.

APPLICATIONS

Ideal air movement fans for bathrooms, kitchens, laundries, toilets, living areas, bedrooms, and garages/workshops. Designed to create healthy living environments through the controlled replacement of air.

COMMENTS

In-line fans can be used in-conjunction with the appropriate sized accessory kit. These kits enable the in-line fans to be ducted externally – through the wall – where the roof or soffit area does not allow for this.

The in-line fan timer (cat 6312) is easily mounted into the foot of the fan motor and allows for efficient running of the in-line fans.

FAQs

Ducting supplied: 6401: 3M, 6501: 4M. 6601: 6M.



ACRYLIC SHOWER TRAY

INSTALLATION GUIDE

1. Before installing Shower Tray

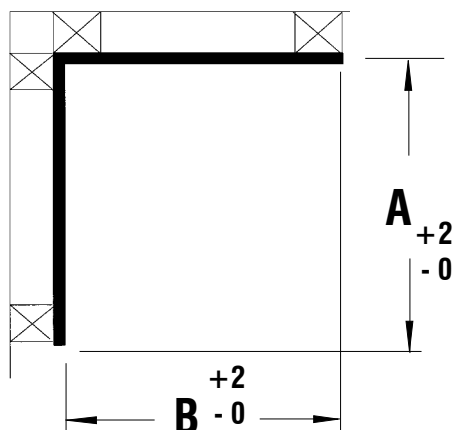
When installing an Englefield shower wall ensure that the walls are constructed in accordance with one of the following illustrations.

Measure back and side walls. The dimensions of the shower area must be within range shown below.

Ensure a stud is located as shown (dimensions A or B or C) to provide a solid support for the door and return panels.

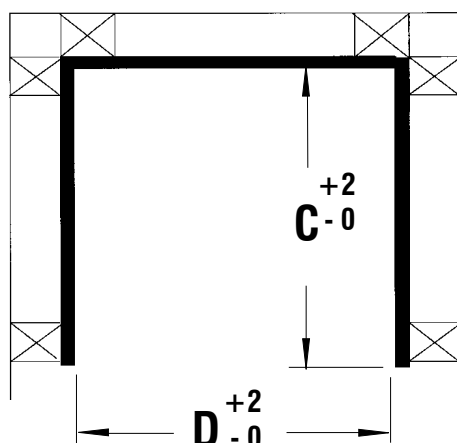
Note: Dimensions are to finished surface of approved wallboard.

Two Sided Wall



SHOWER TRAY	A	B
900 X 750	739	879
900 X 900	879	879
1000 X 1000	984	984
1200 X 900	886	1175

Alcove Wall



SHOWER TRAY	C	D
900 X 750 X 900	885	747
750 X 900 X 750	739	864
900 X 900 X 900	879	864
1000 X 1000 X 1000	984	964
900 X 1200 X 900	879	1164

APPROVED ADHESIVE: Sika shower bond

Usage : 3 cartidges for 2 sided shower wall liners,
4 cartidges for 3 sided shower wall liners.

APPROVED SEALANT: Sika Silaflex NG (Ice White)

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2. Install shower tray

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BC141564

Install the shower tray in accordance with one of the following recommended methods of installation.

Fig A, B or C.

IMPORTANT: Shower tray must be installed level!

Fig. A - Approved wall board / Englefield wall

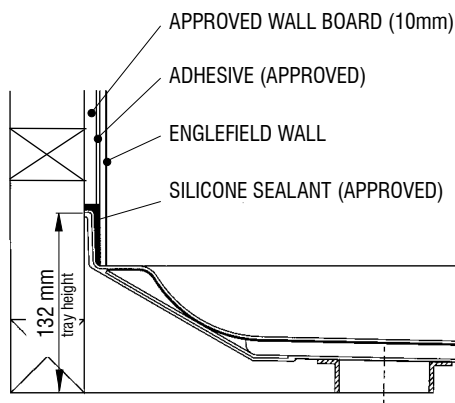


Fig. B - Approved wall board / Tiles

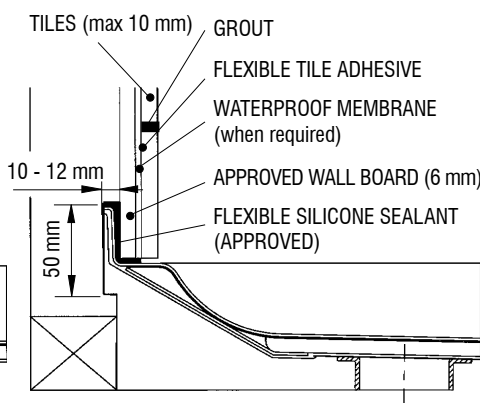
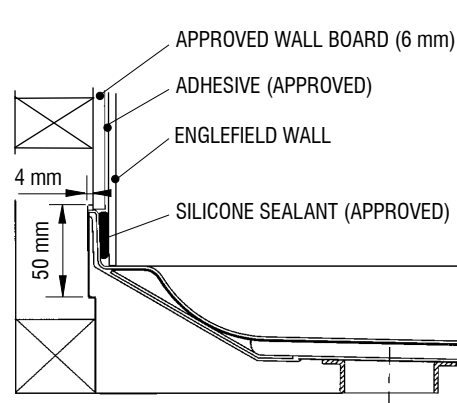


Fig. C - Approved wall board / Englefield wall



WARNING
BASE MUST BE FULLY SUPPORTED
FAILURE TO COMPLY VOIDS WARRANTY.

When installed on a wooden floor, floor board should be supported at not greater than 500 mm centres and the cut-out waste for waste connection kept to a minimum.

Many tradesmen prefer to install bases on a weak cement slurry (approx. 10:1 sand and cement) thus ensuring complete support over the entire load bearing area. However this step is not necessary providing that installation is on a flat, level surface free of bumps and protrusions.

When installed on a concrete slab floor, chases or channels left for plumbing must be completely backfilled.

Because Water Board and Building requirements can vary from area to area, Local Authority regulations must be checked prior to installation.

3. Install Duracryl Shower Wall

Follow instructions supplied with Wall.

4. Waste fitting installation

Follow instructions supplied with the waste

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FLAT SHOWER WALL
SIDE CONTOUR SHOWER WALL
CORNER CONTOUR SHOWER WALL
FLAT BATH WALL

DURACRYL WALL

INSTALLATION GUIDE

INDEX

	PAGES
Introduction	1
Tools and materials	1 - 2
Construction requirements - timber frame	3
Duracryl wall installation	3- 6
Cleaning instructions	8

INTRODUCTION.

IMPORTANT

Read all instructions carefully before starting the installation to ensure the best possible results.
It is the responsibility of the installer to ensure that the installation complies with council and local authority bylaws.

Instructions, drawings, and diagrams contained in this manual present information available at the time of printing. Although every attempt has been made to keep them up-to-date, Kohler Company reserves the right to implement product changes without further notice.

TOOLS AND MATERIALS REQUIRED.

Level

Tape

Pencil

Ruler

Drill

Drill bits

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Hole saw

Fine toothed saw

Jig saw (fine toothed blade)

Caulking gun

Construction adhesive

Sealant.

IMPORTANT

Use only recommended sealants and adhesives, suitable on acrylic and acrylic capped ABS; unsuitable products may damage the duracryl surround.

TOOLS AND MATERIALS REQUIRED.

The recommended adhesive and sealant is:

Sika Shower Bond -to adhere the acrylic shower liner to the wall.

Usage:

- 3 cartridges for 2 sided wall liners
- 4 cartridges for 3 sided wall liners

Sika Silaflex NG (White) - to seal the acrylic shower liner to shower tray.

These are available in separate Adhesive and Sealants Packs.

For stockists phone 0800 100 382.

Each Pack contain enough adhesive and sealant for a complete white or metallic shower enclosure:

- **16520A-0** Adhesive & sealant combo pack - 2 sided shower & bath acrylic wall liner for **white** framed showers.
- **16521A-SHP** Adhesive & sealant combo pack - 2 sided shower acrylic wall liner for **metallic** framed showers.
- **16522A-0** Adhesive & sealant combo pack - 3 sided shower acrylic wall liner for **white** framed showers.
- **16523A-SHP** Adhesive & sealant combo pack - 3 sided shower acrylic wall liner for **metallic** framed showers.



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CONSTRUCTION REQUIREMENTS - TIMBER FRAME

For shower, identify the type of installation required and construct timber frame in accordance with the dimensions detailed on the back of the tray carton.

Determine where the centre of the drain hole will be.

Where the drain is likely to coincide with a joist, ensure trimmers are used to create a space beneath the floor to accommodate an Easy Clean Trap or Hi Flow Waste.

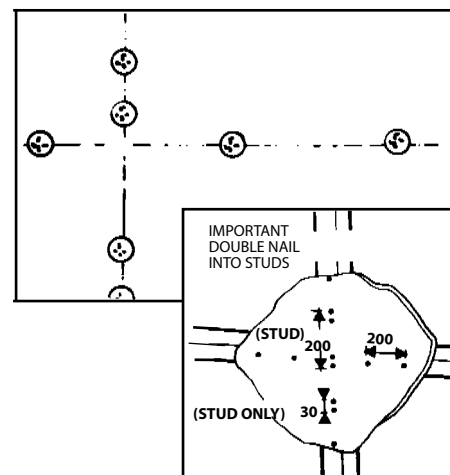
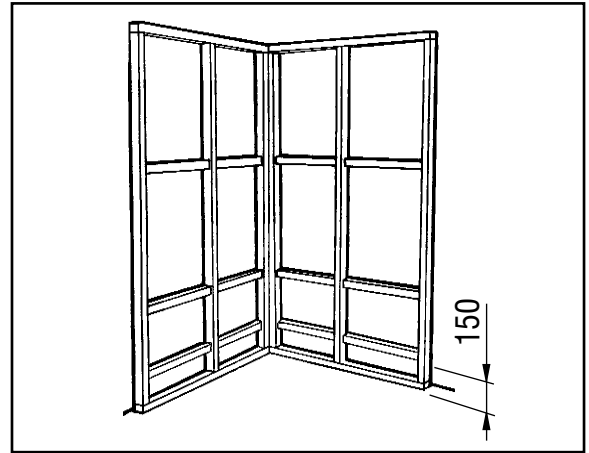
Typical timber frame is shown on the right hand side.

For bath tub, timber frame detailed in the installation guide supplied with the product.

Fix wall lining to studs.

Wall lining must be double nailed or screwed at 200 mm centres minimum.

Wall lining surface must be flat and plumb, the corner must be square.



DURACRYL WALL INSTALLATION

DRILLING AND CUTTING DURACRYL

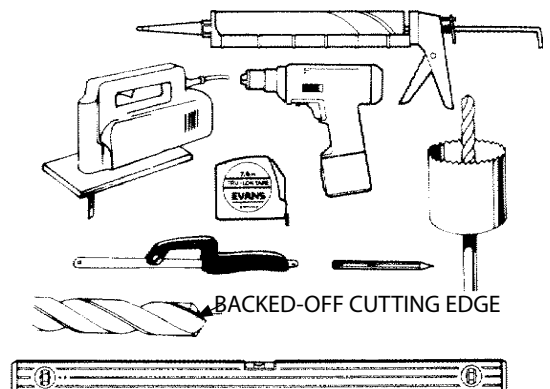
DRILLING: Small holes can be drilled with a twist drill, but the cutting edge **MUST** be backed off with an oil stone (the sharp edge dulled). Large holes must be drilled with a hole saw. Maximum drill size : 12 mm. Drill speeds : 6 mm x 1800 RPM ; 12 mm x 900 RPM.

CUTTING: If for any reason the Duracryl requires cutting, use a fine tooth hacksaw and proceed with caution.

Edges can be smoothed with a second-cut file and medium-fine sandpaper. If the surface of the Duracryl should happen to be damaged, it can be restored by polishing with an abrasive cleaner such as Meguiars Mirror Glaze 28 All metal polish or 3M Marine "one step" painted aluminium cleaner and wax.

TOOLS REQUIRED

- Tape measure
- Soft Pencil
- Drill
- Caulking gun
- Hole saw
- Drill bits
- Fine toothed saw
- Spirit level
- Jig saw (fine toothed blade)



SHOWER WALL INSTALLATION cont...

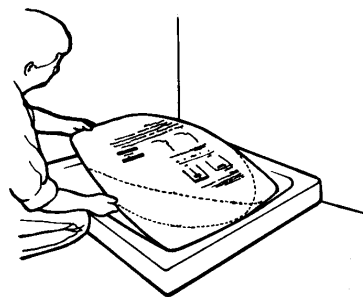
DURACRYL WALL INSTALLATION

Ensure shower tray or bath tub are installed correctly, as detailed in the installation guide supplied with the product. Peel back protective film of the tiling bead of shower tray or bath tub, in order to make a water tight seal possible.

Ensure the surface of tray or bath tub is protected during installation, and no debris can get onto the waste hole.

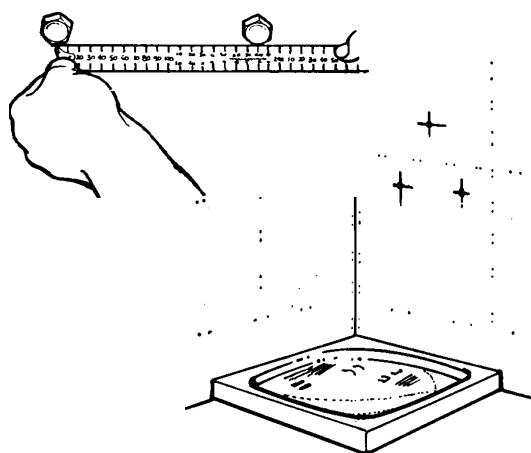
For bath tub use a drop cloth.

For shower tray, select appropriate size, then cut base protector from back of shower tray carton. Place it in shower tray.

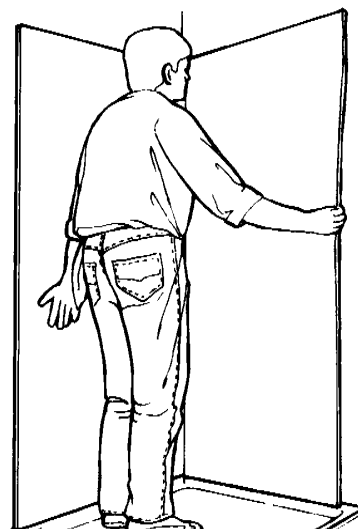


Mark and drill holes required for outlet fittings.

NOTE: Drilling and cutting instructions appear on the previous page.

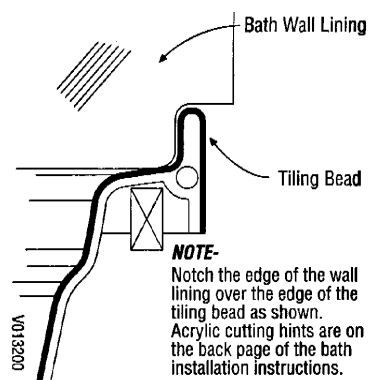


Position wall in place. Check fit to ensure wall fits squarely into corner. Tape edges to hold into position.



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Where necessary (bath tub) notch the edge of the wall to fit over the tiling bead as shown on the right hand side diagram.



SHOWER WALL INSTALLATION cont...

With a soft pencil, mark around the perimeter of the wall. This will be the basis for marking the glue pattern.

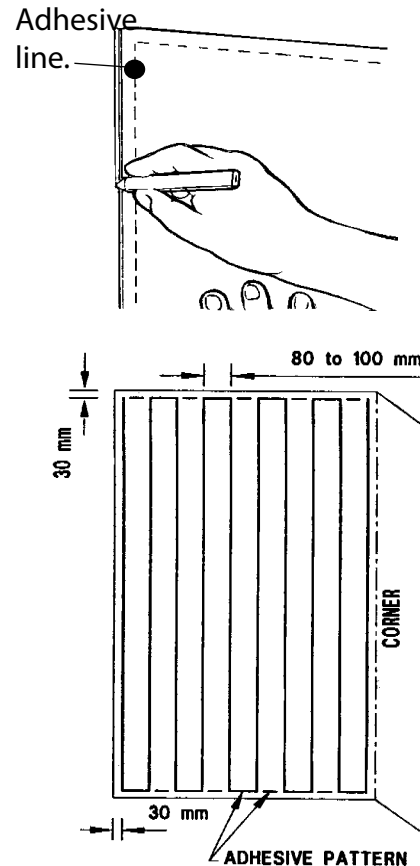
Before marking, make sure wall is pressed firmly into corner .

Carefully **measure and mark pattern** on wall board surface as shown on the right. **Do not apply the adhesive at this stage.**

NOTE: Measurements from edges, top and base. All dimensions below are in millimeters.

Refer to diagram on the right hand side for adhesive pattern for:

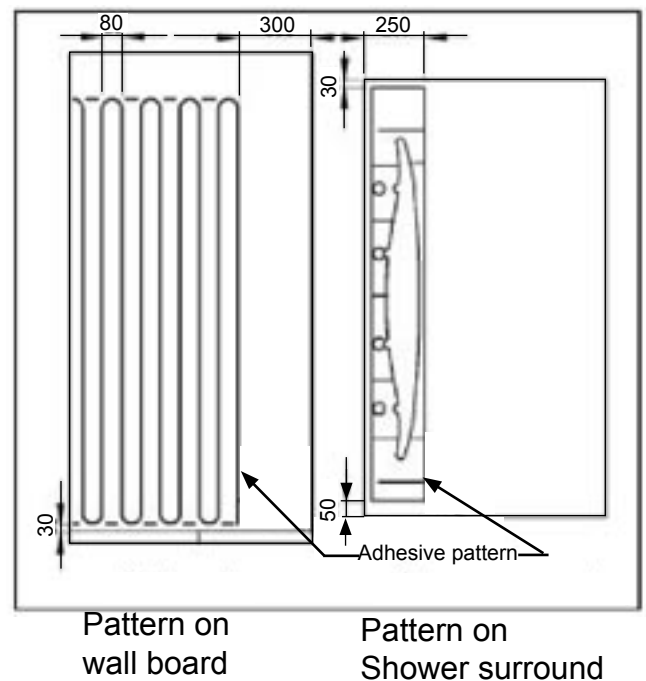
- Flat shower wall
- Side contour shower wall
- Flat bath wall



For corner contour shower wall pattern must be marked on both wall board and duracryl shower surround.

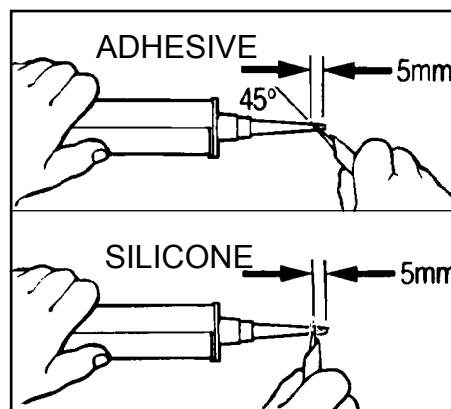
Refer to diagrams on the right hand side for both patterns.

At this stage it is essential that the back side of the duracryl wall and the surface of the wall board are wiped clean with a damp cloth. This will ensure that all dust is removed from both surfaces and provide a clean surface for the adhesive. Allow both surfaces to dry before adhesive application.



SHOWER WALL INSTALLATION cont...

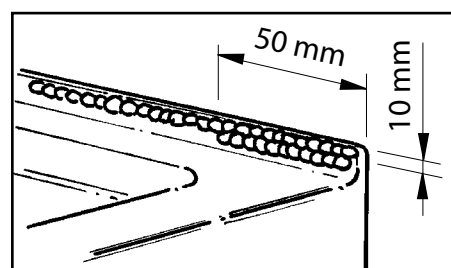
Prepare sealant and adhesive cartridges.
Cut nozzle on sealant and adhesive cartridges as shown in the picture on the right.
Pierce protective foil inside adhesive cartridge.



CAUTION

Do not apply adhesive below 5°C.
Temperatures below this point
will require adhesive to be warmed up
to assist with adhesive flow and application.
Use only in ventilated areas.

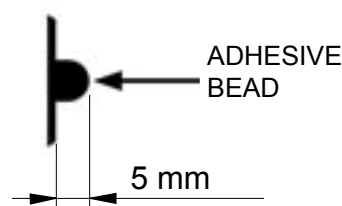
Apply sealant to shower tray or bath first as shown on the right hand side diagram.
Ensure the protective film has been peeled back from tiling bead of base before applying sealant. Leave the rest of the shower tray or bath still covered by the plastic film, to protect it during installation.
Apply a bead of sealant for 50 mm from both front corners at base of upstand as shown.
Apply a second bead to full length at top of upstand.



Apply adhesive to wall board.
Do not use on previously painted, sealed or ceramic walls.
Use only on the following substrate:

- Plaster Board
- Fibre cement
- Villaboard.

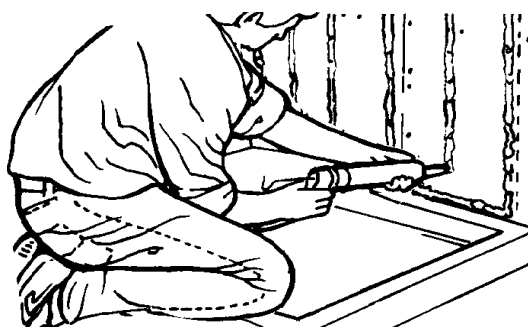
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Follow the pattern marked. Start at top working your way down.

Apply vertical pattern first then fill in horizontal lines.

For corner contour shower wall remember to apply the adhesive on the acrylic wall as show on previous page.



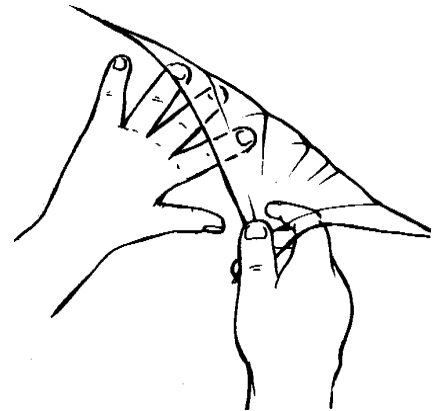
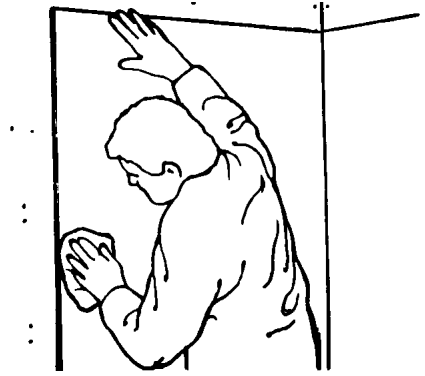
SHOWER WALL INSTALLATION cont...

To install the wall follow adhesive manufacturer instructions.

As a general rule, place wall into position. Press firmly back into corner to ensure that the wall makes full contact with corner along its entire length.

Press into corners first, then press toward edges. Use a soft clean cloth to press firmly and remove any rippling along glue lines. Check and repress if necessary.

Remove plastic film.



CLEANING INSTRUCTIONS

Use non abrasive soap and water when possible.

In addition you may safely use:

- Mr Muscle Shower Clean
- Jif Powerspray.

Avoid:

- harsh chemicals and disinfectants.
- abrasive cleaners
- solvent based cleaners
- acid or alkaline cleaners
- products containing ammonia or peroxides.

Wipe out the unit after each use to prevent build-up of soap and scum.

Always read the label instructions on any cleaner carefully before applying it to the surface.



IMPORTANT

Read the Care and Maintenance label on the wall and leave it in place for the end user.

KOHLER.

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KOHLER NZ Ltd.

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DOT 109

CFL-I SPIRAL T2 / 12W
GLS / 100W
HAPAR25 / 75W

Available with Thermal Cut-off control on request

Bayonet Cap (BC) lampholder available on request

White Ceiling Bezel - paintable

NZCEP54 - Classification: **CA (GLS)****IP 20**

Lampholder: Ceramic E27 (edison screw)

Weight: 382gms



OPTIONS

ACCESSORIES

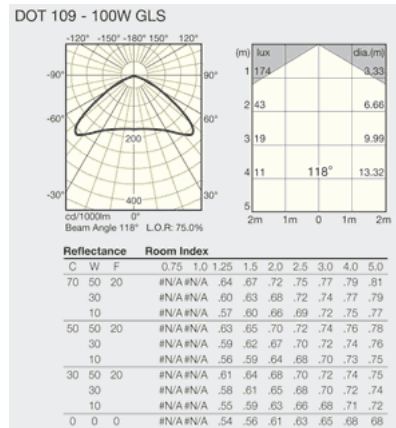
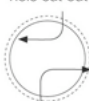


/55 Silver Painted Ceiling Bezel



A3 Halo Glass

NB: White Ceiling Bezel fitted as standard

100mm dia.
hole cut out120mm dia.
bezelContact a distributor now to discuss your lighting needs.
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DOT Vertical Series

- Light Sources
 - GLS / Halogen / Compact Fluorescent / Metal Halide
- Accessories - Glass / Moulded Polycarbonate
- Lamp Configuration - Vertical
- Overall Diameter - varies - 120mm - 192mm
- Control Gear (where applicable) - Integral / Remote

DOT 109

Hole Cut Out Diameter: 100mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White Ceiling Bezel - paintable

GLS / 100W
HAPAR25 / 75W
CFL-I Spiral T2 / 12W

**DOT 114**

Hole Cut Out Diameter: 120mm

Anti glare baffle
Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request

GLS / 100W
HAPAR25 / 75W
CFL-I Spiral T2 / 12W

**DOT 122**

Hole Cut Out Diameter: 125mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White ceiling ring - paintable

GLS / 100W
HAPAR25 / 75W
R95 / 100W
CFL-I / 18W
CFL-I Spiral T3 / 20W

**DOT 132**

Hole Cut Out Diameter: 125mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White Ceiling ring - paintable

GLS / 100W
HAPAR25 / 75W
R95 / 100W
CFL-I Spiral T2 / 12W

**DOT 162**

Hole Cut Out Diameter: 125mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White ceiling ring - paintable

CFL-I / 20W
CFL-I SPIRAL / 23W
GLS / 100W
HAPAR25 / 75W
R95 / 100W

**DOT 165**

Hole Cut Out Diameter: 125mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White ceiling ring - paintable

GLS / 100W max.
R95 / 100W max.
HAPAR25 / 75W
CFL-I / 18W max.
CLF-I Spiral T3 / 20W max.

**DOT 182**

Hole Cut Out Diameter: 125mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White ceiling plate - paintable

GLS / 100W
HAPAR25 / 75W
R80 / 100W
CFL-I Spiral T2 / 12W

**DOT 183**

Hole Cut Out Diameter: 125mm

White Ceiling plate - paintable

CFL-I / 14W
CFL-I SPIRAL T3 / 15W

**DOT 202**

Hole Cut Out Diameter: 140mm

Available with Thermal Cut-off control on request
Bayonet Cap (BC) lampholder available on request
White ceiling ring - paintable

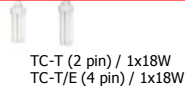
GLS / 100W
R95 / 100W
HAPAR25 / 75W
HAL (E27 base) / 100W



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**DOT
301**

Hole Cut Out Diameter: 125mm

Integral Gear
Magnetic Low Loss Ballast OR Electronic Ballast
White Ceiling Ring - Paintable**DOT
302**

Hole Cut Out Diameter: 140mm

Integral Gear
Magnetic Ballast
White ceiling ring - paintable**DOT
322**

Hole Cut Out Diameter: 140mm

Integral Gear
Magnetic Ballast
White ceiling ring - paintable**DOT
332**

Hole Cut Out Diameter: 140mm

Magnetic Low Loss Ballast
White ceiling ring - paintable**DOT
340**

Hole Cut Out Diameter: 175mm

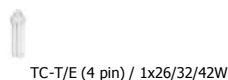
Integral Gear
Magnetic Ballast**DOT
360**

Hole Cut Out Diameter: 175mm

Magnetic Low Loss Ballast

**DOT
370**

Hole Cut Out Diameter: 175mm

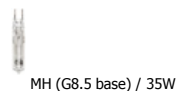
Electronic Ballast
Dimming Options Available**DOT
385**

Hole Cut Out Diameter: 175mm

**DOT
705**

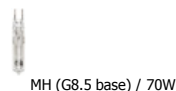
Hole Cut Out Diameter: 100mm

Available With Electronic Control Gear

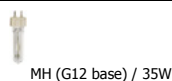
**DOT
706**

Hole Cut Out Diameter: 100mm

Available With Electronic Control Gear

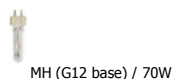
**DOT
710**

Hole Cut Out Diameter: 125mm

Narrow Beam
Available With Electronic Control Gear**DOT
712**

Hole Cut Out Diameter: 125mm

Narrow Beam



Consent Issued BC141564

Available With Electronic Control Gear

**DOT
714**

Hole Cut Out Diameter: 125mm

Narrow Beam
Electronic Control Gear

SDW-TG (GX12-1 base) / 50W

**DOT
716**

Hole Cut Out Diameter: 125mm

Narrow Beam
Electronic Control Gear

SDW-TG (GX12-1 base) / 100W

**DOT
730**

Hole Cut Out Diameter: 125mm

Wide Beam
Available With Electronic Control Gear

MH (G12 base) / 35W

**DOT
732**

Hole Cut Out Diameter: 125mm

Wide Beam
Available With Electronic Control Gear

MH (G12 base) / 70W

**DOT
734**

Hole Cut Out Diameter: 125mm

Wide Beam
Electronic Control Gear

SDW-TG (GX12-1 base) / 50W

**DOT
736**

Hole Cut Out Diameter: 125mm

Wide Beam
Electronic Control Gear

SDW-TG (GX12-1 base) / 100W

**DOT
770**

Hole Cut Out Diameter: 175mm

Available With Electronic Control Gear



MH-P (E27 base) / 100W

**DOT
780**

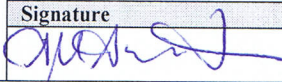
Hole Cut Out Diameter: 175mm

Available With Electronic Control Gear



MH-P (E27 base) / 150W

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SDoC identification Number¹ - HLL SDOC V4 01032012	
Issuer details	
Name² (of New Zealand manufacturer or importer)	Contact Address
Home Lighting Limited	180A Station Road Penrose
New Zealand Company Number (if applicable)	PO Box 112 077
3684557	Penrose
	Auckland 1642
Telephone	Fax
09 525 8052	09 525 8047
Email address	
ama@homedownlights.co.nz	
Medium Risk Article – Details³ (Product name, type, rating, brand, model, batch numbers, and serial numbers, as applicable)	
HD / 60, 109, 110, 114, 122, 132, 182, 301	
AMENDMENT A (NZ ONLY) TO AS/NZS 60598/2.2 CA80, CA135	
AND IC CLASSIFICATION	
The medium risk article listed above, fully complies with the standard(s), as listed:-	
Standard number & issue year:- AS/NZS 60598.1:2003 AS/NZS 60598.2.2:2001 (AMENDMENT A 2011)	
Standard Title:- LUMINAIRES – GENERAL REQUIREMENTS & TESTS 2003 AND PARTICULAR REQUIREMENTS FOR RECESSED DOWNLIGHTS 2001 INCLUDING AMENDMENT A 2011	
Edition / Amendment status:- EDITIONS 1:2003, 2.2:2001 AND AMENDMENT A 2011	
Or complies with the Conformity Cooperation Agreement - Yes	
Names and addresses of any testing organisation or body	
Name(s)	Address(es)
WAKEFIELD LABORATORIES	PO BOX 300330 ALBANY 0752
PARKSIDE LABORATORIES	PO BOX 9194 CHRISTCHURCH
SPECTRUM LABORATORIES	PO BOX 303042 NORTH HARBOUR POSTAL CTR
Reference to relevant test reports/certification, and issue date of the reports/certification, that show how compliance is achieved:-	
Report/Certification N°(s)	Issue date(s)
SPECTRUM LAB: REPORT #5343	29/02/2012
T216 ZA5 TEST HD109TC	31/01/2012
T204 ZA5 TEST HD60 TC	17/01/2012
VDE CERTIFICATE: # 400 211 03	21/11/2011
VDE CERTIFICATE: # 201 4531 03	23/04/2009
SPECTRUM LAB: REPORT # 3176A	11/11/2004
PARKSIDE LAB: REPORT # 4299	20/07/1998
PARKSIDE LAB: REPORT # 3279	21/12/1995
WAKEFIELD LAB: REPORT # 10951F	27/11/1995
Reference to any management systems involved:-	
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: HOME LIGHTING LIMITED Name⁴ & position, as authorized by the issuer ANN-MARIE AUSTIN GENERAL MANAGER
Issuer Identification: (as affixed to the article)	Signature Date  01.03.2012
HD/ 60 109 110 114 122 132 182 301	

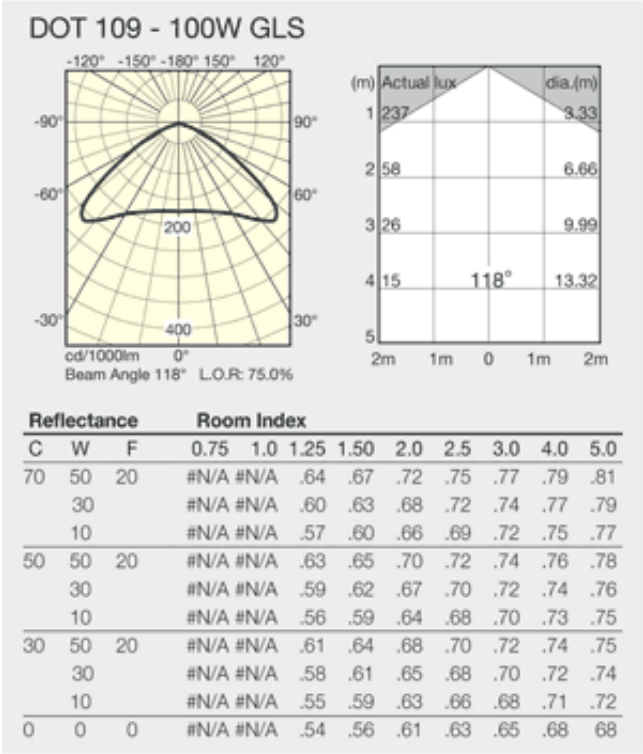
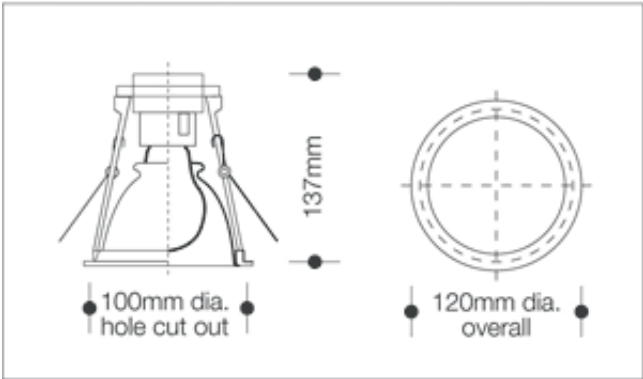
¹ Every declaration of conformity should be uniquely identified.² The responsible issuer must be unequivocally specified.³ The "Article" must be unequivocally described so that the declaration of conformity may be related to the article in question. For mass-produced products, it is not necessary to give individual serial numbers. Where variants of an article are to be covered, these must be detailed.⁴ Full name and function of the signing person(s) authorised by the issuer's management to sign on its behalf should be given. The number of signatures, or equivalent, included will be the minimum determined by the legal form of the issuer's organization.



HD 109



Available with Thermal Cut-off control	
AS/NZS60598.1.2	Complies
ECP54 Classification:	CA (GLS)
IP Rating:	IP20
Weight:	330gms
Lampholder: Vossloh-Schwabe Ceramic E27 (edison screw)	
White Ceiling Bezel - paintable	
NB: White Ceiling Bezel and Polished Silver Reflector fitted as standard.	



HD 109
Polished Silver
Reflector



HD 109/03
Satin Silver
Reflector



HD109
White Round
Bezel (standard)

Options



HD109/13
Polished Chrome
Ceiling Plate



HD109/14
Brushed Chrome
Ceiling Plate



HD109/55
Silver Painted
Bezel



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Accessories Order separately from downlight



A1 IP20
Dropped Glass



A3 IP20
Halo Glass



Chrome Retro-fit kits
109/13 KIT - Polished

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Building Industry Guide to Fibre Broadband

*Information for residential developers, architects, builders
and electricians about ultra-fast broadband.*

Enable's fibre broadband will deliver technology services into homes for the next 50 years and beyond. Thousands of people in our region can enjoy fibre broadband already and are demanding it in their homes.

Developers, architects and builders need to be considering what this means for their projects now!

What you need to know about fibre broadband:

- Why home owners are demanding fibre broadband services already. (Page 3)
- Developers, architects, and builders and electricians need to install fibre now. (Page 4)
- Wiring recommendations for a new or renovated home (Page 6)

About Enable

Enable is a partnership between Government agency, Crown Fibre Holdings Limited and Christchurch City owned Enable Services Limited.

It is delivering ultra-fast broadband (UFB) to over 180,000 homes and commercial premises in Christchurch, and Waimakariri and Selwyn Districts. As a local company, focused only on our region, Enable is inherently linked to the people of Christchurch and Canterbury.

We are committed to making a positive contribution to our region and ensuring that this massive infrastructure project generates significant returns to our local community.

The network build programme has already created hundreds of new jobs in our region. But the long-term benefits of having fibre broadband will have the biggest impact on our community – through innovations that create new business opportunities and services to support local people.

Delivering new possibilities

What fibre broadband offers

Enable's fibre broadband is already changing the way people use the internet and technology at home today. This is why more and more people want it in their homes now!

But this is only the beginning with many new possibilities just around the corner.

Homeline

A fibre broadband service means you can switch your telephone from the old copper network to fibre and enjoy much smarter calling and messaging. What's more, it may save you money through cheaper long-distance calling or by combining your phone and broadband in one package.

Entertainment

Fibre broadband can change the way you are entertained at home. HD YouTube, TV on Demand, iSKY and Quickflix are here today and work better over fibre. Google TV is coming and the television networks are getting ready to bring their services to you on fibre.

In Business

A fibre connection into your office or home business creates endless possibilities – from accessing exciting new solutions that make your business more productive and reduce cost, to providing new ways to connect with customers locally, nationally and globally.

Fast Internet

A fibre connection creates virtually limitless broadband capacity. This means people can do much more and access many more services online over Enable's network.

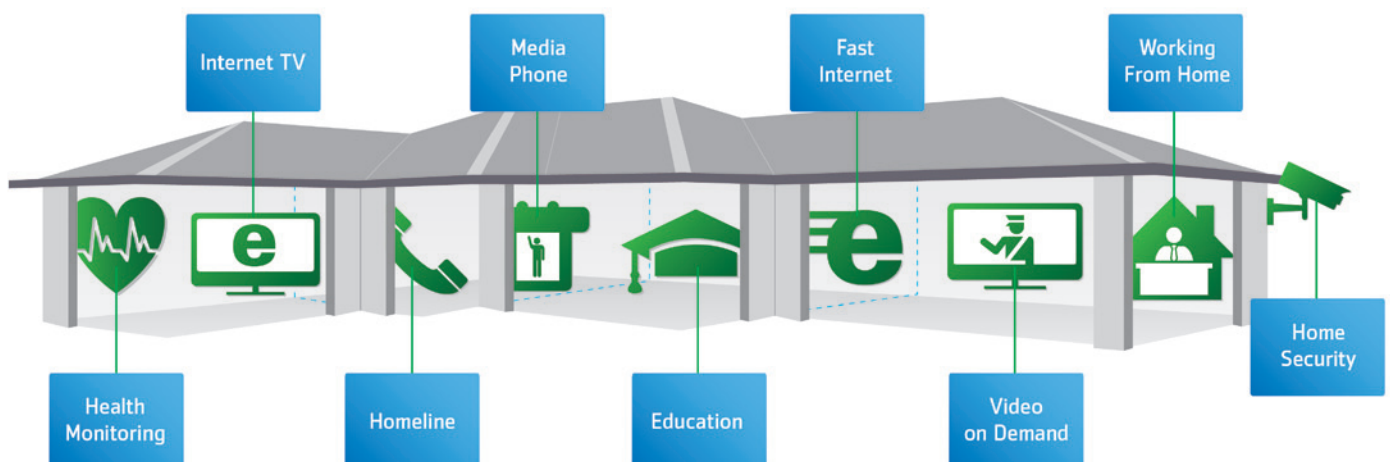
Education

Fibre broadband will transform how children learn by delivering new digital tools into the classroom and making schools (and universities) hubs of interactive learning that can be accessed through fibre at home.

Home owners can choose from a range of retail services providers that sell broadband and telephone services over Enable's fibre broadband network. A full list of service providers offering fibre broadband is available from our website.

What's more it's easy to connect to Enable's network, and a fibre broadband and telephone service costs about the same each month as a copper service.

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Developers, architects, builders and electricians should consider fibre now

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Put simply, you should be thinking about fibre broadband because your clients and prospective customers are.

The government ultra-fast broadband initiative is a high profile infrastructure project, and more and more people are beginning to understand what it means for them.

Also, telecommunication companies and network providers are aggressively marketing the potential of fibre broadband and how it will change the way we use the internet and technology in our lives.

Fibre-ready properties are more desirable to buyers

Tech-savvy home buyers already consider the availability of broadband services in their purchasing criteria for a raft of reasons – running home businesses, working from home, education or entertainment services.

With many new internet services working better or only working over fibre, this trend is growing rapidly. Homes in your subdivision can be some of the first in Christchurch to have Enable's fibre broadband available, so you can attract tech-savvy home buyers.



Bringing ultra-fast
fibre broadband
to Christchurch

enable
Delivering new possibilities

Developers / Enable is committed to delivering fibre broadband services to all new Christchurch subdivisions

The Christchurch earthquakes have resulted in an unprecedented amount of new subdivisions planned in our community – with over 20,000 new sections expected in the next few years. Enable is committed to ensuring all new Christchurch subdivisions, and ones within our coverage areas in Waimakariri and Selwyn Districts, have access to our services.

We are installing our network into new subdivisions in Christchurch already.

We want to work closely with developers to prioritise network deployment to subdivisions

This is so the benefits of having UFB available to the first home owners in a subdivision can be realised.

We are keen to be involved in the planning of the infrastructure development into a subdivision as early as possible and to work with developers to agree terms for prioritising network deployment.

Options for deployment may include the developer installing Enable's fibre ducting during the road forming stage or Enable completing all the cable laying work at a reasonable standard charge per lot.

Contact Enable at sales@enable.net.nz or on 0800 4 FIBRE (0800 434 273) to meet with us and discuss what option is right for your development.

Architects / Transforming the home environment with fibre broadband

In the next few years, Christchurch and the surrounding areas will experience an enormous amount of new home building and major renovations to existing homes.

Architects have the opportunity to maximise the potential of fibre broadband by designing homes with technology hubs and cabling that will support smart features. They have the opportunity to think creatively about how fibre broadband can transform the home environment – from automated heating and lighting to home entertainment.

Builders and electricians / Future-proofing your customers' homes

Connecting to fibre involves laying ducting from the property boundary to where the telecommunications and WiFi equipment will be located in the house. Installing this ducting and making space for network equipment during building or renovations removes future disruption for the owner.

Also, choosing the right type of telecommunications wiring in a new home or replacing wiring improves the performance of technology services, and provides additional home value.

Builders need to make sure the electricians working on their projects are installing suitable wiring.

Enable wants to work with builders to lay fibre ducting

Installing fibre on a customer's property involves either drilling or trenching to lay the external ducting and this can cause some disruption after gardens are landscaped or driveways are laid. Enable wants to work with builders and their subcontractors (particularly electricians) to avoid customer disruption and put ducting in when trenches are open for other services to be installed.

Builders and electricians should call Enable on 0800 4 FIBRE (0800 434 273) to arrange for fibre ducting to be delivered and installed at their building site.



Fibre broadband specifications for a home

Wiring recommendations for a new or renovated home

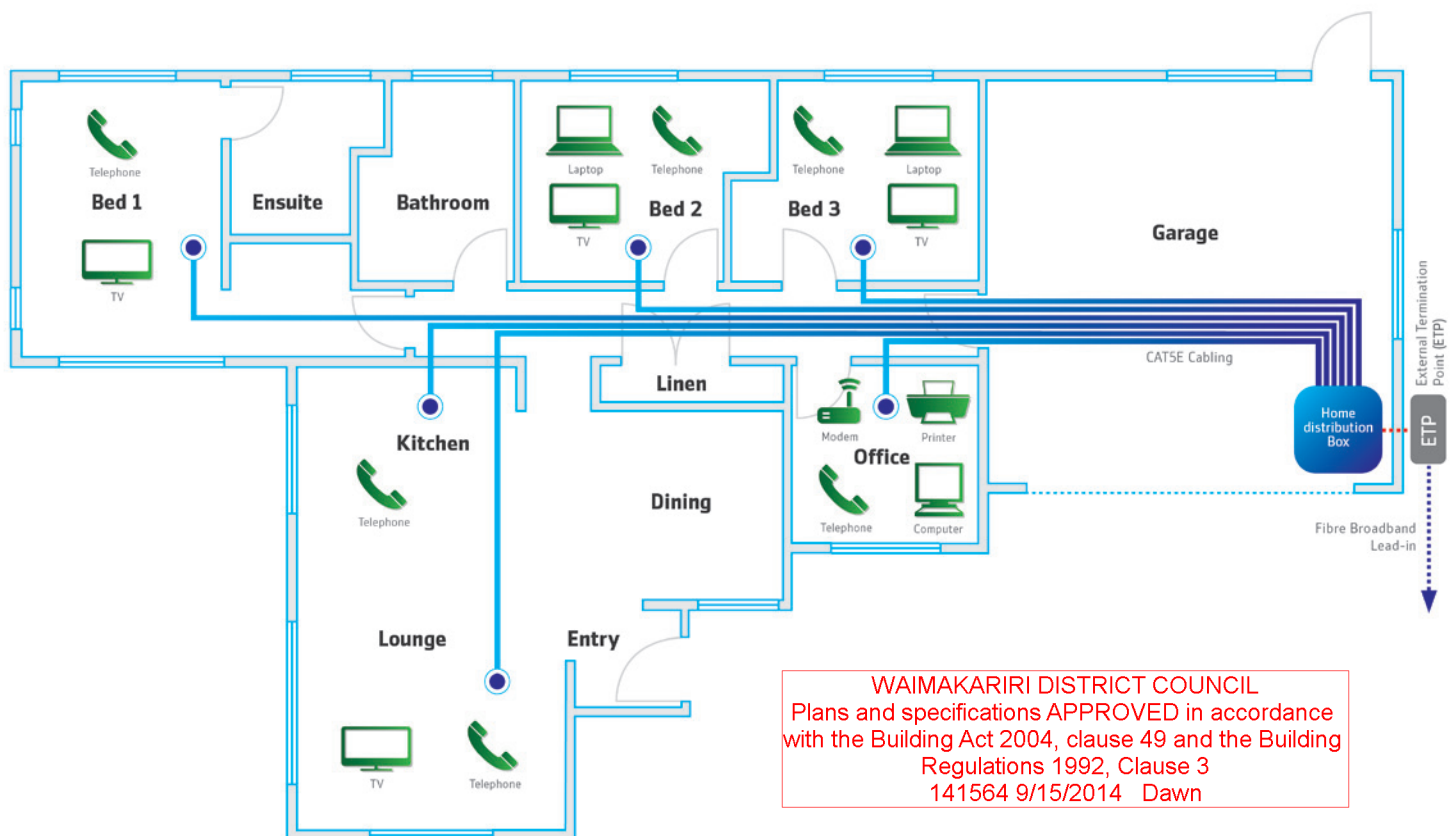
Enable's network is one important factor in delivering high-quality broadband services into the home. Another important factor is the quality of a home's wiring.

Most consumer devices use either WiFi or wired (copper) Ethernet, and it's important that there is sufficient cabling in the house to support high-bandwidth services to wired devices.

The recommended standard for a new home or home rewiring is to use Cat5e copper cabling – a high quality copper cable designed to deliver high-bandwidth services. It will future proof a home and make it ready to make the most of fibre broadband.

A structured or 'star' wiring design should be used in all rewiring or wiring for a new home – as opposed to the traditional 'daisy chain' approach to wiring a house. This means all house wiring should travel out from a central point with dedicated cabling points going into most rooms.

Example of structured wiring design – with the distribution box situated in the garage



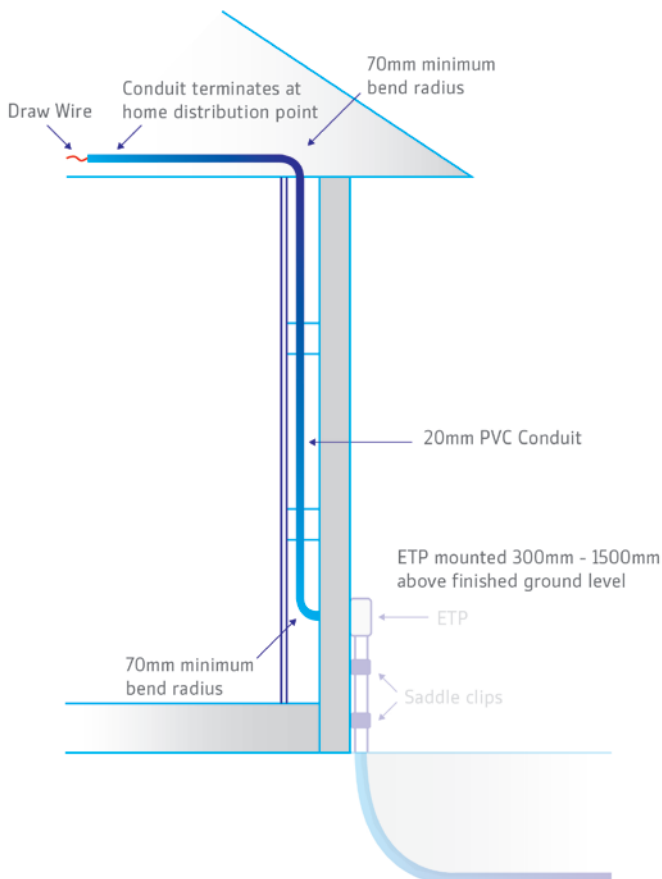
Installing an internal fibre conduit during build or renovations

Your electrician should be able to install conduit during the build/renovation to prepare a home for connecting to fibre broadband. If conduit is installed to Enable's specifications in advance, a fibre broadband installation will have less visual impact and involve less disruption.

In a new home build (particularly in new subdivisions) the conduit should begin at an external wall directly above the power/telecommunications services trench. In a renovation the conduit should begin at an external wall close to the front of the property. In both cases, the building entry point should be between 300-1500mm above ground.

It should terminate at a suitable internal location for the network equipment to be installed – for example: the garage or utility room or cupboard. It should also have access to a power point and any existing internal telephone or data cabling. Care must be taken to ensure conduit bends are used with a minimum 70mm radius so that the fibre cable can be installed.

Example of an internal fibre conduit installation – using a vertical conduit.



Include a home distribution box in home design

Enable recommends including room for a home distribution box in new builds or renovations to house the network equipment. This box must be situated inside the home and should be where the fibre conduit and structured wiring terminates. It should be accessible and located at about eye-level, and close to a mains power source.

Electricians and electrical equipment suppliers can provide a home distribution box. It should be at least 700mm (high) by 350mm (wide) – large enough to contain:

- An Optical Network Terminal (ONT): this is the point where a fibre connection is integrated with the internal wiring network, and is provided by Enable when we connect a customer to the network. It replaces the existing modem to deliver fibre services into the home, and is roughly the same size as an existing modem.
- A back-up power device: the equipment that delivers your voice and data services over fibre needs power to function. The ONT can operate off a battery back-up in the event of a power cut. These are available from electrical equipment suppliers.
- Any other network equipment that retail service providers may supply to deliver services to a home, such as a residential gateway, WiFi access point or hard drive.

20mm PVC Conduit Specifications:

- A dedicated PVC conduit for fibre broadband
- Minimum 20mm diameter
- Minimum 70mm bend radius at any point along the conduit
- Conduit must be white or red.
- A draw wire included.

For further information please email sales@enable.net.nz or phone 0800 4 FIBRE (0800 434 273)

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enable

Find out more about Enable's fibre broadband.

Visit enable.net.nz

Call 0800 4 FIBRE (0800 434 273)

[\(/home\)](#)[OUR NETWORK \(/OUR- NZ'S FIBRE FUTURE \(/NZS-FIBRE-FUTURE\)](#)[INVESTOR CENTRE \(/INVESTOR-CENTRE\)](#)[ABOUT US \(/ABOUT-US\)](#)[SEARCH \(/SEARCH\)](#)[LOGIN \(HTTP://CUSTOMER.CHC\)](#)

Homepage (/home) > NZ's Fibre Future (/nzs-fibre-future) > Fibre Subdivisions (/fibre-ready-subdivisions)

NZ'S FIBRE FUTURE (/NZS-FIBRE-FUTURE)[Ultra-Fast Broadband \(/ultrafast-broadband\)](#)[Rollout and Network Services Map \(/fibre-rollout-map\)](#)[UFB in your neighbourhood \(/in_your_neighbourhood\)](#)[Rural Broadband Initiative \(/rural-broadband-initiative\)](#)[Broadband \(/broadband\)](#)[Fibre Subdivisions \(/fibre-ready-subdivisions\)](#)[Wiring for fibre \(/wiring-for-fibre\)](#)

Fibre Subdivisions

As part of our fibre rollout programme we are installing fibre in many new subdivisions around New Zealand. Check the list to see if your new home is in a fibre ready subdivision.

You may not have to wait for UFB to rollout in your area to experience the benefits of telecommunications over fibre. If you have purchased a section and are building a new home in a fibre ready subdivision you can have fibre now.

If you are building a new home make sure you use Cat5 cabling or better to ensure you can optimise broadband speeds. We have developed information for homeowners and installers. Find out more about [wiring for fibre \(/wiring-for-fibre\)](#).

If you are building in a fibre ready subdivision you should [contact WorldxChange \(http://www.xnet.co.nz/about-us/contact/\)](#) or call 0800 123 456 to discuss your telecommunications requirements.



We have included a list of fibre ready subdivisions. This list may not be complete as developers are signing up for fibre in new subdivisions regularly. We do our best to ensure these are added to the list but to be safe ask the developer or the person you are purchasing the section from if your subdivision is fibre ready.

If you are a developer and would like to enquire about fibre in your next development contact Chorus' subdivision group on 0800 SUB DVN (0800 782 386) or email us (<mailto:tsg@chorus.co.nz>).

Fibre-Ready Subdivisions

Location	Subdivision Name or address
North Auckland	
Red Beach	Millwater (http://www.woods.co.nz)
Hibiscus Coast	Kensington Park (http://www.kensingtonpark.co.nz)
Auckland	
Mt Wellington	Stonefields (http://www.stonefields.co.nz)
Waitakere City	Ranui
Takanini	Addison (http://www.addison.co.nz)
Takanini	87-123 Airfield Road
Karaka	Karaka Lakes (http://www.karaka-lakes.co.nz)
Flatbush	Brooklands
Waikato	
Matamata	Evergreen Estate
Tauranga	
Papamoa	Generation Homes (http://www.generation.co.nz)
Poverty Bay	
Gisborne	Wheatstone
Hawkes Bay	
Napier	Parklands Residential Estate
Havelock North	Brookvale
Wellington	

Wiring for fibre
Are you building a fibre subdivision?
[Find out more](#)

[\(/wiring\)](#)

Play it Safe
0800 B4U DIG
Protect the network:
[Find out more](#)

[\(/safer_digging\)](#)

Wall PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily in standard wall constructions, or be easily cut to fit in non standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- Comfort – Reduces heat loss for a warmer home and absorbs sound for a quieter, more relaxing, home
- Cost Saving – A well-insulated home can save up to \$1,800¹ on energy bills annually
- Sustainability – Made locally from up to 80% recycled glass Pink® Batts® insulation reduces dependence on virgin materials and reduces emissions associated with the importing of overseas manufactured product
- Healthy Living – R-values up to 4.0 assist in keeping homes above 18°C as per the World Health Organisations recommendation for a healthy and comfortable home
- Product Safety – Pink® Batts® insulation is non-combustible and will not easily burn therefore creating a safer living environment
- Assurance – BRANZ appraised giving independent assurance of the 50 year durability requirements of the New Zealand Building Code

¹ [Department of Building and Housing, Your guide to a smarter home, 2008, p. 28]

Environment

Pink® Batts® insulation is a sustainable, energy efficient product.

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Green Star New Zealand Credits

Green Star NZ is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute to points under Green Star New Zealand.

Environmental Choice

Higher R-value Pink® Batts® Wall insulation products have Environmental Choice New Zealand Accreditation (refer to the product specifications)

- Independently assessed for:

- Waste Minimisation: Recycled content, and recycling of process waste
- Energy Management: Effective energy management policies and procedures
- Manufacturing Process: Not manufactured using blowing agents with a global warming potential
- Product Characteristics: Durability and performance

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® Thermal Insulation Products are manufactured in the same environmentally considerate way.

² [Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005]



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Wall

PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

Health & Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in providing a healthy and comfortable home by maintaining the minimum temperature of 18°C recommended by the World Health Organisation
- Pink® Batts® insulation has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme because of the benefit Pink® Batts® insulation provides to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



³ [Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460]

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	NZS/AS 1530.1:1994	
Flammability	Non-Flammable	✓	NZS/AS 1530.3:1993	
			Ignitability (Range 0-20)	= 0
			Spread of Flame Index (Range 0-10)	= 0
			Heat Evolved Index (Range 0-10)	= 0
			Smoke Developed Index (Range 0-10)	= 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt	

* Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

Wall PINK® BATTs® WALL INSULATION

PRODUCT DATA SHEET

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E2: External Moisture

Contributes to meeting these requirements

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® wall insulation MUST be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006: Energy Efficiency-Installing Insulation in Residential Buildings

Pink® Batts® wall insulation should NOT be:

- Crushed or folded

Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® wall insulation performance is not compromised.

Safety:

Prior to installation check for all hazards that may cause injury. Carry out repair work without delay.

- Treat all electrical cables as live. Be careful not to cut or expose cables and wires
- Beware of other sharp objects (protruding nails, splinters etc)

Note: Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf.

Equipment required:

- | | |
|---|---------------------------|
| • Protective loose fitting, long sleeved clothing | • Rubber faced gloves |
| • Safety glasses | • Step ladder |
| • Dust mask | • Knife and cutting board |
| • Rubber soled footwear | |

Installation:

Use only wall products for installing in wall applications, ceiling products are not suitable. However, wall products may be used in ceilings - particularly those with restricted space. (Please refer to Pink® Batts® Skillion Roof product data sheet for further information on insulation suitable for restricted roof cavities.) Refer to drawings/specifications where available for R-value selection.

- Ensure the product is installed dry. If the product is wet, replace it before installing
- Friction fit product between framing
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- Ensure there are no gaps, folds or compression of product
- Fill gaps around windows and doors with off-cuts
- Do not cover vents. Insulate around vents to allow unhindered ventilation
- Fit insulation behind electrical wiring* and plumbing work. Partially cut insulation and place around wires or pipes if necessary

***CAUTION:** Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989.

Wall

PINK® BATTS® WALL INSULATION

PRODUCT DATA SHEET

Specification Notes

State the following:

Product Required: Pink® Batts® wall insulation and required R-value

Product Specifications

	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER PACK (m2)	APPROX COVERAGE PER PACK* (m2)
Pink® Batts® R1.8 Wall	✓		7120118	1140 X 580	90	17.2	19.6
Pink® Batts® R2.2 Wall	✓		7120122	1140 X 580	90	13.9	15.8
Pink® Batts® R2.4 Wall	✓		7120124	1140 X 580	90	13.9	15.8
Pink® Batts® Ultra® R2.6 Wall	✓	✓	7120126	1140 X 580	90	9.9	11.3
Pink® Batts® Ultra® R2.8 Wall	✓	✓	7120128	1140 X 580	90	6.6	7.5
Pink® Batts® R3.2 140mm Wall	✓		7120132	1140 X 580	140	9.9	11.3
Pink® Batts® R3.6 140mm Wall	✓		7120136	1140 X 580	140	7.3	8.3
Pink® Batts® R4.0 140mm Wall	✓		7120140	1140 X 580	140	5.3	6.0

*Coverage relates to standard structure and actual coverage may vary.

Storage and Maintenance

Pink® Batts® insulation must be protected from damage and weather. Store under cover in clean dry conditions. The installed product must remain dry at all times. If the product has become wet or damp, the source of the dampness (e.g. leak in plumbing) must be repaired immediately and insulation replaced with new product of an equivalent R-value.

Accreditations/Appraisals/Certifications



Tasman Insulation
New Zealand Ltd Certified QMS



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TASMAN INSULATION NEW ZEALAND LTD
9-15 HOLLOWAY PLACE, PENROSE,
AUCKLAND, NEW ZEALAND

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Roof

PINK® BATTs® CEILING INSULATION

PRODUCT DATA SHEET

Application

Pink® Batts® ceiling insulation is a lightweight flexible glasswool insulation product designed to:

- Reduce heat loss through the roof in new homes, be retrofitted into existing homes with no insulation or over existing insulation for better thermal performance
- Fit easily into standard roof constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- BRANZ appraised, a durable product for 50 years as required by the NZBC
- Energy saving – a well insulated home can save up to \$1,800¹ on energy bills annually
- Non-combustible, will not burn for a safer environment
- R-values up to R5.0, to assist in keeping homes above 18°C, as per the World Health Organisation recommendation for a healthy and comfortable home
- Absorbs sound for a quieter more relaxing home

¹ Department of Building and Housing, Your guide to a smarter home, 2008, p. 28

Environment

- Manufactured using up to 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months²
- Locally manufactured in Auckland and Christchurch, minimising shipping distances compared to imported products

Green Star New Zealand Credits

Green Star New Zealand is a comprehensive environmental rating system for buildings. Pink® Batts® insulation may contribute to points under Green Star New Zealand.

Environmental Choice

Higher R-value Pink® Batts® insulation products have Environmental Choice New Zealand Accreditation (refer to the product specifications).

- Independently assessed for:
 - Waste Minimisation: Recycled content, and recycling of process waste
 - Energy Management: Effective energy management policies and procedures
 - Manufacturing Process: Not manufactured using blowing agents with a global warming potential (GWP) or ozone-depleting potential (ODP)
 - Product Characteristics: Durability and performance



Licence No 2504017.
Thermal (resistive type)
building insulants.

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® insulation products are manufactured in the same environmentally considerate way. Certification and further information is available at www.nzgbc.org.nz.

² (Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005)



Roof

PINK® BATTS® CEILING INSULATION

PRODUCT DATA SHEET

Health & Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

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- This the same classification as caffeine, tea, hair colouring, chlorinated drinking water and saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organisation recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- Pink® Batts® insulation has been accepted into the Asthma and Respiratory Foundation of New Zealand's Sensitive Choice programme. Insulating with Pink® Batts® insulation is beneficial to those suffering from asthma
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation³



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			Heat Evolved Index (Range 0-10)	= 0
			Smoke Developed Index (Range 0-10)	= 0-1
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Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glasswool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glasswool exempt	

* Refer to product specifications

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in ceilings and walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.



Roof

PINK® BATTS® CEILING INSULATION

PRODUCT DATA SHEET

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting these requirements

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® insulation **MUST** be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2006: Energy Efficiency-Installing Insulation in Residential Buildings

Pink® Batts® insulation should **NOT** be:

- Crushed or folded

Installation Instructions

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® insulation performance is not compromised.

Safety:

Prior to installation check for all hazards that may cause injury. Carry out repair work without delay.

- Ensure there is adequate lighting to identify any hazards
- Treat all electrical cables as live
 - Repair damaged, exposed or hanging cables immediately
 - Be careful not to cut or expose cables and wires
- Beware of other sharp objects (protruding nails, splinters etc.), pests (bees and wasps), loose boards and pipe work
- Avoid installing during the warmest part of the day. The roof cavity temperature can increase to uncomfortable levels

Seek professional advice if you are unsure how best to isolate the hazard or have a professional installer carry out the work on your behalf

Equipment required:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Protective loose fitting, long sleeve clothing • Dust mask • Rubber faced gloves • Rubber soled footwear • Safety glasses | <ul style="list-style-type: none"> • Step ladder • Knife and cutting board • Planks (long enough to span across joists) • Lamp and extension cord (15m long) • Install rod (25mm diameter, 1m long) for tight spaces |
|---|---|

Roof PINK® BATTS® CEILING INSULATION

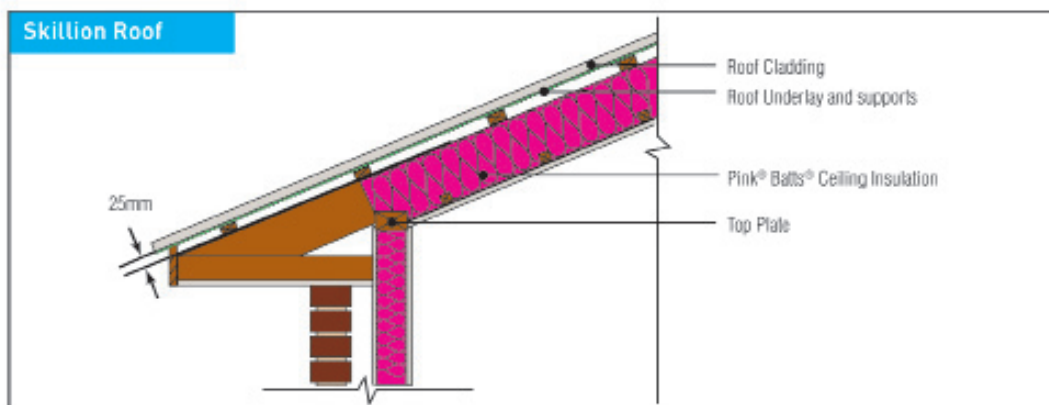
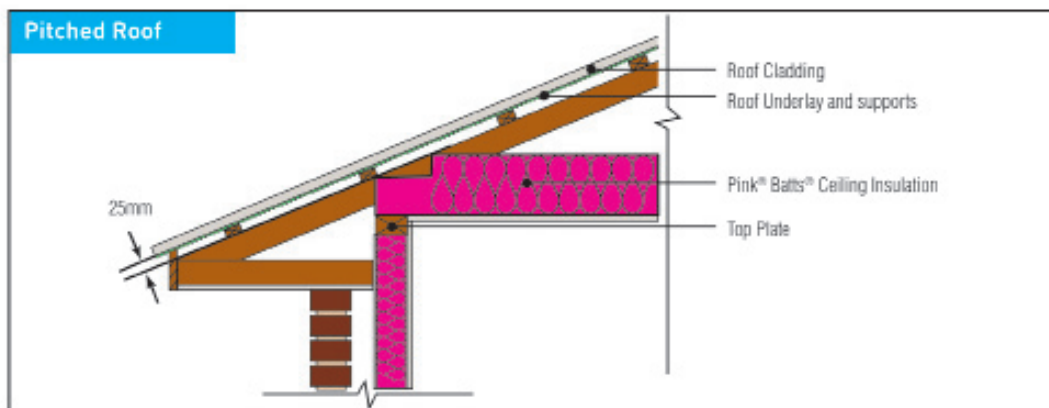
PRODUCT DATA SHEET

Installation Instructions continued...

Installation:

Confirm the correct product and R-value is used for the ceiling application. Refer to drawings/specifications where available. Ceiling insulation may only be installed in roof cavities and is not suitable for installation in walls.

- Ensure the product is installed dry. If the product is wet, replace it before installing
- Use planks laid across joists to walk and work on
- Any existing insulation should be levelled and refitted and any damp insulation to be removed
- Adhere to correct clearances around electrical fittings, heat sources etc. where required (refer to table overleaf)
- Ensure there are no gaps, folds or compression of product
- Start installation at point furthest away from the ceiling manhole
- Insulate the entire area up to the outer edge of the top plate
- Friction fit product between framing, ensuring there are no gaps, folds or compression of product
- If cutting is required, cut oversize by 5-10mm to ensure a friction fit
- For retrofitting, install over framing where insulation already exists or where appropriate. Any open air pockets beside joist/truss cord ends at the roof perimeter to be blocked off with insulation off-cuts
- Fit insulation behind electrical wiring and plumbing work



Roof

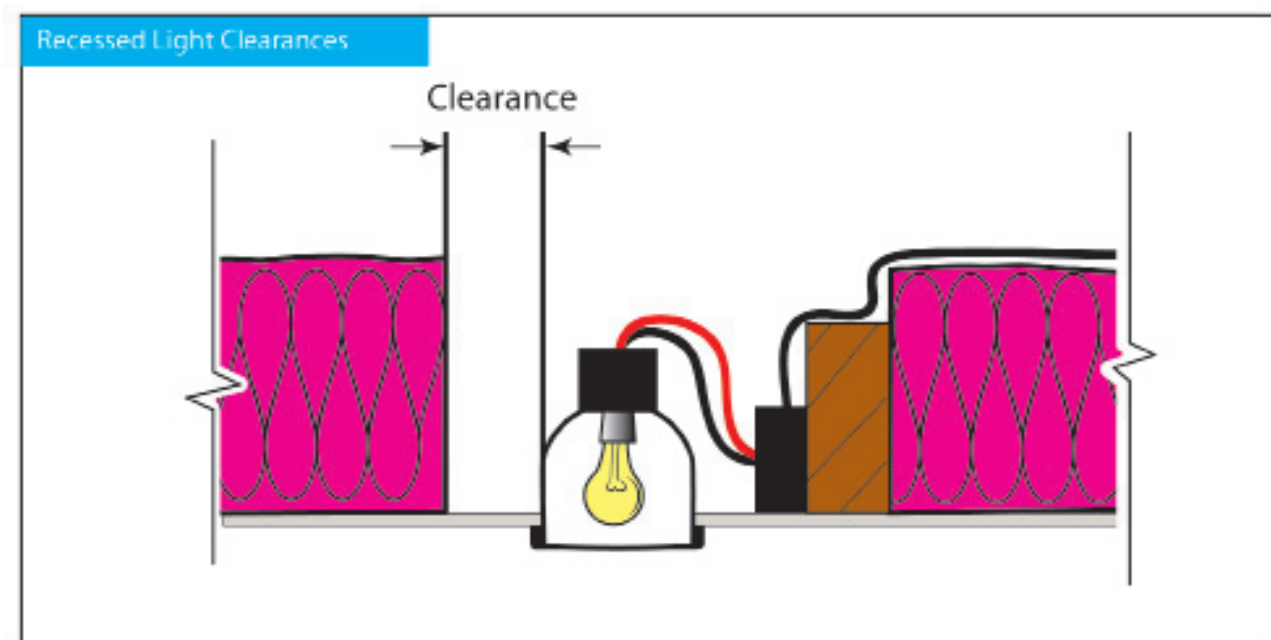
PINK® BATTs® CEILING INSULATION

PRODUCT DATA SHEET

Installation Instructions continued...

- Adhere to the clearances below to reduce risk of fire

Area	Minimum Clearance	Comments
Incandescent light	50mm	
CA Rated light	Nil	Do not install over the top
Unknown lights & Halogen	200mm	From outer edge of downlight, to ALL other insulation including existing insulation (Transformers can sit in the clearance zone, but MUST NOT be covered)
Extractor Fans	200mm	From outer edge of extractor fan to ALL other insulation including existing insulation
Flues	50mm	From outer edge of flue to ALL other insulation including existing insulation
Chimneys	50mm	From outer edge of chimney to ALL other insulation including existing insulation
Roofing material	25mm	To the roofing material i.e. - to the roof itself and building paper



Caution: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. This applies to wiring installed prior to 1989.

Tip: To verify Building Code Compliance, staple a product label at an easy to find location – away from any hot items such as downlights or water cylinders.



Roof

PINK® BATTS® CEILING INSULATION

PRODUCT DATA SHEET

Specification Notes

State the following:

Product Required: Pink® Batts® ceiling insulation and required R-value

Product Specifications

	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS** (mm)	NOMINAL TOTAL AREA PER PACK (m2)	APPROX COVERAGE PER PACK* (m2)
Pink® Batts® Classic R1.8 Ceiling	✓		7110118	1220 X 432	95	13.70	14.39
Pink® Batts® Classic R2.2 Ceiling	✓		7110122	1220 X 432	115	12.65	13.28
Pink® Batts® Classic R2.6 Ceiling	✓		7110126	1220 X 432	140	10.54	11.07
Pink® Batts® Classic R3.2 Ceiling	✓		7110132	1220 X 432	170	8.43	8.85
Pink® Batts® Classic R3.6 Ceiling	✓	✓	7110136	1220 X 432	180	7.38	7.75
Pink® Batts® Ultra® R4.0 Ceiling	✓	✓	7110140	1220 X 432	195	6.32	6.64
Pink® Batts® Ultra® R4.6 Ceiling	✓	✓	7110146	1220 X 432	205	5.27	5.53
Pink® Batts® Ultra® R5.0 Ceiling	✓	✓	7110150	1220 X 432	210	4.22	4.43

*Coverage relates to standard structure and actual coverage may vary.

**Designers should allow for an additional 10% increase for restricted cavities e.g. skillion roofs.

Storage

Pink® Batts® insulation must be protected from damage and weather. Store under cover in clean dry conditions. The installed product must remain dry at all times. The roof area should be inspected each year for leaks and excessive dampness. If the product has become wet or damp, the source of the dampness (e.g. leak in roof) must be repaired immediately and insulation replaced with new product of an equivalent R-value.

Accreditations/Appraisals/Certifications



Tasman Insulation
New Zealand Ltd Certified QMS



* Please refer to www.pinkbatts.co.nz for specific appraisal and accreditation details.



MANUFACTURED BY
TASMAN INSULATION NEW ZEALAND LTD
9-15 HOLLOWAY PLACE, PENROSE
AUCKLAND 1061, NEW ZEALAND

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Jun11/3023RevF/Page 6 of 6



Giltgrip WB FLOORING PRIMER

ISSUE 2 (08.11.04)

- Water Based / Low Odour
- Improves Adhesion to Porous Surfaces
- Stops Excessive Adhesive Penetration
- Very Low Foaming

DESCRIPTION

Giltgrip WB FLOORING PRIMER is a water-based primer for porous surfaces. It is designed especially to complement the Bostik Findley range of water based flooring adhesives.

PURPOSE FOR USE

Giltgrip WB FLOORING PRIMER is used to prime concrete, plasterboard, cement sheet, wood and other porous or highly absorbent surfaces prior to application of adhesive.

LIMITATIONS

Because of the wide range of surfaces and floorings, a test of any new combination should be conducted before using.

Not recommended for:

- Oily timber
- Oil tempered particle board
- External use.

SUBSTRATE PREPARATION

• CONCRETE BASE

Ensure that the substrate is clean, dry and structurally sound. Cleaning methods should include, sweeping and vacuuming. A tap test is recommended to help identify any potential drummy spots that may need further preparation on the concrete floor.

Refer to AS/NZS 2455.1.1995 Part 1 and AS 1884-1985 for installation practice and maintenance.

• CONCRETE WATER BEADING TEST

A water beading test should be carried out on all concrete surfaces prior to the installation of Bostik Adhesives, Primers, Moisture Seal or any of the Ultralevel flooring range on the concrete floor. Apply a small amount of water in numerous random positions across the floor. If water beads form in any of these areas this will confirm the presence of a surface coating, sealer or contaminant. If water beading occurs contact Gilt Edge Industries for further specific preparation advice.

• CONCRETE MOISTURE TEST

To help eliminate all the inherent problems that can be associated with concrete moisture content, it is recommended that prior to installations;

- New concrete must be cured for at least 28 days
- A moisture test, as suggested by Australian Standards be carried out on all concrete substrates in accordance with AS1884(1985) & DR99463 Pt 1/2 to determine the concrete moisture content.

CONCRETE LEVELLING

Place a straight edge over the concrete floor to ensure it conforms to AS1884 (1985) & DR99463/64 Pt 1/2 for direct stick overlay floors. If levelling is required only use the Bostik Ultralevel Range of self-levelling cementitious compounds. Refer to the current technical data sheet prior to any installation of these products.

• STRUCTURAL SHEET FLOORING

All structural sheet flooring must be flat sanded. Existing adhesives, oils and penetrating contaminants etc must be removed. Sweep and vacuum the sheet flooring to ensure a dust free area prior to adhesive application.

APPLICATION

Do not apply if below 10°C

Apply Giltgrip WB FLOORING PRIMER evenly by broom, nap roller, brush or spray equipment direct to floor.

Coverage: approximately 10 - 15m²/L

Dry Time: 10-20 minutes, depending on substrate and atmospheric conditions.

Allow to dry completely before applying adhesives.

TYPICAL TECHNICAL DATA

Base:	Acrylic
Colour:	White, dries clear
Viscosity:	Thin liquid
Solids:	20 %

PACKAGING

Available in 20L containers

CLEAN UP

Tools should be washed with water whilst primer is still wet.

SAFETY PRECAUTIONS

Giltgrip WB FLOORING PRIMER is not dangerous to health or flammable. A Material Safety Data Sheet is available on request.

STORAGE & SHELF LIFE

Do not allow to freeze, store out of direct sunlight, keep in original containers tightly closed when not in use.

Shelf life: minimum 12 months from date of manufacture if stored under cover between 5°C and 30°C.

Bostik Technical Services are available to pre-test any samples of substrate where the specifier / applicator may believe doubts on application suitability exists.

The tests will aid in determining the proper surface preparation method. Following this procedure will remove many of the unknown variables that affect field success. Please contact Gilt Edge Industries for further details.

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WARRANTY

Your purchase of this product is subject to Bostik's standard terms and conditions of sale. The representation and recommendations regarding the products are based on tests which we believe to be reliable. However, no guarantee of their accuracy can be made because of the great range of field conditions and variations encountered in raw materials, manufacturing equipment and methods. Thus, the products are sold with a limited warranty only, and on the condition that purchasers will make their own tests to determine the suitability of the product for their particular purposes. Under no circumstances will Bostik be liable to anyone except for replacement of the products or refund of the purchase price.

All other warranties whether express or implied, including without limitation, any warranty of merchantability of fitness of purpose are expressly disclaimed unless prohibited by law or given in writing by Bostik for a specific project.

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Wellington	Phone 04 569 7067	Dunedin	Phone 03 455 7067

Installation Guide

Acclimatisation of material before installation

Remove material from packaging, spread out if possible and allow to condition in room where installation is to take place at a constant temperature of 18°-26° for a period of 24 hours prior to installation. This temperature should be maintained during installation, and for a 24 hour period after installation.

Sub-floors

The substrate should be prepared in accordance with AS1884: 1985.

Surfaces must be:

- Permanently dry
- Smooth
- Level
- Clean
- Of sound construction

ie. The surfaces must be free of dust, oil, grease, polish, loose material or other contaminants.

Concrete Floors

The substrate must be finished using a suitable proprietary form of self-levelling compound.

Highly absorbent surfaces will require a water based primer, such as polymer 6000, to be applied first

A new concrete slab should be finished to a hand-trowel finish and have the necessary absorbency for the adhesive to disperse into the substrate

All concrete bases must be subjected to a moisture test in accordance with Appendix A of the standard.

Timber and Particleboard Floors

Sound timber sub-floors are suitable when covered with flooring grade hardboard underlay in accordance with the Standard. This always includes Structural Particleboard to eliminate later potential movement.

For other underlays which are highly absorbent, such as MDF/ThinLine and Cement Sheet, these will require the use of a primer, such as Polymer 6000, to be applied first.

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Existing Floorcoverings

All existing floorcoverings must be removed and the sub-floor made good before laying. Paper felts must not be used.

Adhesives

MEGA-BOND – Karndean Design Floorcovering Adhesive

A high quality water bases co-polymer adhesive formulated to give good initial grab and excellent open time.

Formulated for use with: Knight-Tile, Da Vinci, Renoir, Michelangelo and Van Gogh.

Australian and New Zealand Standard

Install the products in accordance with AS1884: 1985 – Floor Coverings – Resilient Sheet and Tiles – Laying and Maintenance Practice.

Coverage

Mega-Bond will cover approx. 4-5 square metres per litre, depending upon the condition of the prepared substrate and notched spreader.

Laying Procedure Using The Wet ‘Bonding’ Method

Correct Trowel Size

Ideally use a 1.0mm x 1.0mm “U” notched trowel. As an alternative, you can use a 1.6mm x 1.6mm “V” notched trowel.

Constant monitoring of the condition of the trowel notches is essential. The distance between notches must ensure that sufficient adhesive is spread to ensure 100% of the tile/plank is in contact with the adhesive spread pattern. Worn notches, especially on the larger “V” notched trowel, will cause insufficient adhesive to be applied.

Wet bonding

Stir the adhesive well and keep container closed when not in use.

Lay the tiles/planks onto freshly spread adhesive.

Do not allow for any tack-up time, which ensures best possible bond strength and eliminates the risk of tile/plank “peaking”.

Be careful not to squeeze any adhesive up between the tile/planks. ie. **Drop** tiles/planks carefully into place; **do not** slide them.

Use hand-pressure or a hand-roller across the whole surface.

Do not roll immediately to avoid “oozing”.

Roll with a 30-40kg roller as soon as the adhesive is tacky. Repeat rolling after 90 minutes. Heavy traffic and wet cleaning must be deferred for 24 hours.

Installation Guide

Laying Procedure Using The Wet 'Bonding' Method (continued)

Tile direction

Lay the tiles following the direction of the surface emboss. There is no pattern match and the tiles should be butted together at random to achieve the most natural effect.

Plank direction

Lay the planks with end-joints completely at random and not closer than one plank width to each end-joint. This will achieve the most natural appearance of a wood strip floor.

Clean up

Floor: Remove wet adhesive with a damp cloth. Remove dry adhesive with Karndean Shield Stripper.

Equipment: Remove wet adhesive with water. Remove dry adhesive with Mineral Turps or Solvent Cleaner.

Floor Surface Finish and Seal

Cleaning and polishing is a recommended option which can be organised through your retailer

Summary

- Lay to AS1884:1985.
- Prime highly absorbent surfaces – ie MDF/Thinline and Cement Sheet.
- Use Hardboard over Structural Particleboard.
- Use a 1.0mm x 1.0mm trowel (minimum) to a 1.6mm x 1.6mm trowel (maximum).
- DO NOT use a trowel that has worn notches.
- Spread adhesive 4 to 5 square metres per litre.
- LAY INTO THE ADHESIVE WET. Do not allow for any tack-up time.
- Drop tiles/planks into place. Don't slide them.
- Hand press (or use a hand-roller) across the whole surface of each tile/plank.
- DO NOT roll immediately with a floor roller.
- Roll with a 30kg to 40kg roller after adhesive has tacked-up to avoid "oozing". Roll again after 90 minutes.
- Remove excessive surface adhesive immediately using a damp cloth.
- Lay TILES directional following the direction of the surface emboss.
- Lay PLANKS at random ensuring end-joints are one plank width apart from each other.
- Finished floor MUST BE stripped and sealed using the Karndean
- Shield Maintenance System



Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE

UNIVERSAL FLOORING & PREMIUM VINYL ADHESIVE

Issue 3 (29.03.05)

- **Universal Soft Floor Covering Adhesive**
- **Low Odour & Solvent Free Water Based**
- **Direct Stick & Double Bond Installations**
- **Flexible**
- **Highly Resistant to Plasticizer Migration**
- **High Early Bond Strength**
- **Conforms to AS3553 - Adhesives for Flooring"**

DESCRIPTION

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is a water based trowelable adhesive for bonding most types of soft floor coverings - vinyls and carpets.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is formulated on special polymer emulsions and tackifiers which enables the widest options in usage, and one way wet or one way dry bonding with strong tack.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is a hard-set adhesive which displays high early bond strength.

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is specially formulated to be highly resistant to plasticizer migration from vinyls, and will not show migration staining.

PURPOSE FOR USE

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is suitable for adhering commercial and domestic vinyls (sheet, tile or slat form), linoleum, carpets, underlays, PVC backed carpets, needle felts to concrete, cement sheet or wooden subfloors.

LIMITATIONS

Because of the wide range of surfaces and floorings, a test of any new combination should be conducted before using.

Not recommended for: - Oily timber
- Oil tempered particle board
- External use.

PREPARATION

Ensure the surface is even, clean, dry and free from oil, dust or flaking paint. A very porous or highly absorbent surface (eg. concrete or wood) should be primed first with Giltgrip WB FLOORING PRIMER.

Ensure concrete subfloors are free from hydrostatic pressure, and test moisture content prior to priming or laying floor covering.

Refer to AS/NZS 2455.1:1995 Part 1 and AS 1884-1985 for installation practice and maintenance.

APPLICATION & COVERAGE RATE

Do not apply adhesive if temperature is below 10°C.

Spread UNIVERSAL PREMIUM VINYL ADHESIVE evenly with a V notch trowel.

Smooth backed Vinyls:

Trowel: 1.6 mm V-notch (coverage approx. 5 m²/L)

Ideal Open time: 10 minutes at 20°C

Hot Press Tiles

Please read in conjunction with "Guidelines for the use of Bostik Flooring Adhesives when bonding PVC & Hot Press Tiles –

Issued February 2004 or later". Confirm with your tile supplier that the Hot Press Tile that you have selected has a vinyl backing layer and is suitable for bonding with an acrylic, water based adhesive system..

Trowel: 1.6 mm V-notch (coverage approx. 5 m²/L)

Ideal Open time: 10 minutes at 20°C

Note: Windows which allow access of direct sunlight should be masked off using masking tape and paper.

Textured backed Vinyls & PVC backed carpets:

Trowel: 2.4 mm V notch (coverage approx 3m²/L).

Ideal Open time: 15 minutes at 20°C

For non-absorbent subfloors the open time may be extended to allow a more aggressive instant bond to be made.

Note: If the vinyl is light weight and has a tendency to telegraph trowel marks, then the floor covering should be laid while the adhesive is wet, or a smooth square faced trowel can be used with attention to the quantity applied.

All seams should be sealed with a vinyl seam sealer or welded using a hot air welding tool.

Carpets & Underlays (Direct Stick or Double Bond):

Trowel: 2.4 mm V-notch (coverage approx. 3 m²/L)

Ideal Open time: 20 minutes at 20°C

For a more aggressive instant bond the open time should be extended to when the adhesive has tacked up. This can be assessed by lightly pressing your finger onto the surface of the adhesive then pulling away - tack up is observed when the adhesive appears stringy / leggy.

Ensure adhesive transfer occurs into the carpet backing.

Note: Open time is influenced by substrate porosity and atmospheric conditions (i.e. Temperature, humidity, and air movement).

Roll the installation using a 25 - 35 kg roller in both directions immediately after laying. Then re-roll after 20 minutes.

Avoid heavy traffic for 24 hours after installation.

For vinyl installations refer to AS1884-1985 Floor Coverings".

Resilient Sheet and Tiles - Laying and Maintenance Practices for further preparation and laying details.

For carpet installations refer to AS/NZS2455.1-1995 Textile Floor Coverings - Installation Practices for further preparation and laying details.

TYPICAL TECHNICAL DATA

Base:	Acrylic
Colour:	Off white
Viscosity:	Thick paste
Solids:	71 %

PACKAGING

Available in 20L pails

CLEAN UP

Tools should be washed with water whilst adhesive is still wet.

SAFETY PRECAUTIONS

Giltgrip UNIVERSAL PREMIUM VINYL ADHESIVE is not dangerous to health or flammable. A Material Safety Data Sheet is available on request.

STORAGE & SHELF LIFE

Do not allow to freeze, store out of direct sunlight, keep in original containers tightly closed when not in use.

Shelf life: minimum 12 months from date of manufacture if stored under cover between 5°C and 30°C.

Bostik Technical Services are available to pre-test any samples of substrate where the specifier / applicator may believe doubts on application suitability exists.

The tests will aid in determining the proper surface preparation method. Following this procedure will remove many of the unknown variables that affect field success. Please contact your Gilt Edge Industries for further details.

WARRANTY

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Building a Secure and Weathertight Home

Ventilated Cavity Construction system

This proven system is immune to the 'weathertightness' or the leaky building rot issue that is plaguing many homes.

When built to Monier Brickmaker's Specifications the timber framing is protected from water by a full height cavity behind the brick veneer.

This cavity allows for critical air movement between weep holes at the base of the wall and air vents at the top.

- Keeps timber dry
- No rot
- No fungi No mould
- Manages water
- Lots of air movement
- Solid stable rigid cladding option
- Non load bearing
- No control joints required - minimal movement
- Ultimate substrate for solid plaster



A wall detail showing the Monier Brickmaker's Cavity Brick system

There has been considerable coverage regarding the leaky building and toxic rot issue. Exposed as a major problem in many new homes, it is going to cost millions of dollars to remedy. Very little attention however has been paid as to how to avoid this problem. There have been many suggestions such as using treated instead of untreated timber in the framing. Such a solution does not deal with the fundamental problems of water getting in past the cladded exterior or window flashings etc. The solution is to construct a home that keeps the water right away from the timber framing and the interior lining. Monier Brickmakers Cavity Brick System is just such a solution.

Since 1996, there have been more than 50,000 new homes built in New Zealand clad in 'brick veneer' -i.e. bricks supported by a structural timber frame. More than half of these have been built with Monier Brickmakers clay brick.

Most of these homes were constructed to Monier Brickmakers specifications using untreated timber framing. The brick veneer is separated from the timber framing by a minimum air gap of 40mm and as much as 75mm to manage water, and allow air flow.

The Monier Brickmakers Cavity Brick System is not waterproof, nor is it intended to be. It is a method of construction that is designed to manage water better than any other major cladding system. The water seeps through the bricks and mortar joints, runs down the inside face of the bricks, and out through the weepholes at the bottom of the brick veneer wall. Water cannot bridge the cavity to the timber framing. Monier Brickmakers brick veneer does not have to rely on intricate flashing details and complicated specifications to ensure water does not break the only line of defence. Monier Brickmakers brick veneer is a 'belts and braces' system where, flashings provide additional water tightness to the barrier created by the

cavity. When untreated timber framing is maintained in a dry environment, as described, dangerous fungi and moulds cannot thrive.

Air movement is critical in a high performance cladding system. The Monier Brickmakers Cavity Brick System provides for superior air movement that does not affect the insulation behind the building paper. There are weepholes at the bottom of the wall, above the windows and air vents along the top of the brick veneer. This simple system allows for an optimum flow of air from the bottom of the wall to the top. It achieves total protection of the structural timber by using proven construction methods and simple science. Wet bricks are dried by air movement. The continual flow of air ensures that the timber framing is maintained in a dry condition -in other words, the wall breathes.

In addition, a superior plastered or 'monolithic' external appearance can be achieved simply by using Monier Brickmakers bricks as the ideal plaster substrate. The bricks may be painted or plastered to provide a wide range of finishes. In doing this you are actually waterproofing an established and proven system for managing water.

This option provides the 'ultimate monolithic cladding solution' - (refer to Monier Brickmakers for Plaster Prestos) .

Invest in bricks and mortar - build with confidence -build with Monier Brickmakers proven rot free cladding solutions.



The surface texture of the bricks provides a wide range of choice from smooth face to wire cut face to rumbled bricks. The surface appearance also comes in a variety of finishes.

Features and Benefits

Durability

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- Virtually unaffected by environment
- Kiln fired @ 1000°C
- Proven over thousands of years

Uniqueness

- No two bricks are the same
- Each veneer has its own characteristics that make it unique
- Designed imperfections - provides the character

Versatility

- Small module allows flexibility in design
- Textures, styles and various sizes allow versatility
- Blends well with other materials

Colour

- Permanent colour throughout the product
- Unaffected by ultraviolet light
- No problems with dark colours or reflectivity

Cost

- Not expensive - comparatively priced
- Rawlinsons show cost at approximately \$86 per square metre
- Approximately 4.5% of typical project cost

Installation

- Only one trade involved
- Fewer delays from inclement weather
- Installed as a finished product

Security

- Bricks do not catch fire
- They are difficult to break through
- Your investment is secure and weathertight

Maintenance

- Just requires a wash every now and then
- Very stable and will not deteriorate

Acoustics

- Excellent sound barrier
- Consider the local environment
- STC rating of 45dBa - Close living

Timeless

- Used in every country
- Often in vogue - a safe option
- Mellows with age - never dates

Resale

Most building companies build in brick

Why Use Monier Brickmakers

- Made in New Zealand
- Largest and most experienced manufacturers of clay bricks in NZ
- Full technical support

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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Technical Specification

Contents

1	APPLICATION AND SCOPE		
1.1	Application		
1.2	Scope		
1.3	Details		
1.4	Specific Design		
2	DESIGN		
2.1	Compliance		
2.2	Responsibility		
2.3	Site and Foundation		
2.4	Ground Clearances		
2.5	Moisture Management		
2.6	Structure		
2.7	Wind Loading		
2.8	Structural Bracing		
2.9	Fire Rated Walls		
2.10	Energy Efficiency		
3	FRAMING		
3.1	General		
3.2	Dimensions		
3.3	Timber Grade		
3.4	Durability		
3.5	Frame Construction		
3.6	Tolerances		
3	4	PREPARATION	6
3	4.1	Building Underlay	6
3	4.2	Rigid Air Barrier	6
3	4.3	Flashing	6
3	4.4	Vent Strip	6
3	4.5	Cavity Battens	6
3	4.6	Intermediate Support	6
3	4.7	Corners	6
3	4.8	Junctions and Penetrations	6
3	5	FIXING SCYON® LINEA® WEATHERBOARD	7
4	5.1	General	7
4	5.2	Fastener Durability	7
4	5.3	Nail Sizes and Fixing Method	7
4	5.4	Gun Nailing	8
5	6	JOINTING	8
5	7	FINISHING	8
5	7.1	Preparation and Priming	8
5	7.2	Sealants	8
5	7.3	Painting	8
5	8	STORAGE AND HANDLING	8
5	9	MAINTENANCE	8
5	10	PRODUCT INFORMATION	9
	10.1	Manufacturing and Classification	9
	10.2	Trim	9
	10.3	Durability	9
	10.4	Product Sizes and Mass	9
	10.5	Size and Weight	9
	11	SAFE WORKING PRACTICES	10
	12	PRODUCT SIZES	11
	13	ACCESSORIES	12
	14	DETAILS	14
		PRODUCT WARRANTY	43

WE VALUE YOUR FEEDBACK

To continue with the development of our products and systems, we value your input. Please send any suggestions, including your name, contact details, and relevant sketches to:

Ask James Hardie™
 Fax 0800 808 988
literaturefeedback@jameshardie.co.nz

1 Application and scope

1.1 APPLICATION

Scyon® Linea® Weatherboard is a 16mm thick, pre-primed bevel back fibre cement weatherboard and is classified as lightweight wall cladding suitable for residential and light commercial construction using timber framed external walls. Scyon Linea Weatherboard is available in 135mm, 150mm and 180mm widths.

James Hardie also has available:

- Scyon® Axent™ Fascia in two widths. Scyon Axent Fascia is a 16mm thick, pre-primed fibre cement product designed to accommodate James Hardie soffit linings.
- Scyon® Axent™ Trim comes in a variety of widths for use as decorative trims around openings and external corners. Scyon Axent Trim is a 16mm thick, pre-primed fibre cement product.

If you are a specifier

Or other responsible party for a project ensure that the information in this document is appropriate for the application you are planning and that you undertake specific design and detailing for areas which fall outside the scope of these specifications.

If you are an installer

Ensure that you follow the design, moisture management and associated figures and material selection provided by the designer and this James Hardie Technical Specification.

All the details provided in this document must be read in conjunction with the specifiers specification.

Make sure your information is up to date

When specifying or installing James Hardie products, ensure you have the current manual. If you're not sure you do, or, if you need more information, visit www.jameshardie.co.nz or Ask James Hardie on 0800 808 868.

1.2 SCOPE

This specification covers the use of Scyon Linea Weatherboard on buildings that fall within the scope limitations of New Zealand Building Code (NZBC) Acceptable Solution E2/AS1, Paragraph 1.1.

This specification includes the use of Scyon Linea Weatherboard in both direct to stud and cavity construction method and must be read in conjunction with the current BRANZ Appraisals for Scyon Linea Weatherboard.

This specification also covers the use of Scyon Linea Weatherboard in cavity construction for specific design projects (SED) subject to a wind pressure of 2.5kPa (ULS) maximum. This document is intended for use by architects, designers, specifiers or builders who are involved in specifying Scyon Linea Weatherboard. The document also serves the purpose of an installation manual for this product.

1.3 DETAILS

Various Scyon Linea Weatherboard details are provided in the Details section of this document. This specification and details in CAD file are also available to download from our website at www.jameshardie.co.nz.

1.4 SPECIFIC DESIGN

For use of Scyon Linea Weatherboard outside this published scope, the architect, designer or engineer must undertake specific design.

For advice on designs outside the scope of this specification, Ask James Hardie on 0800 808 868.

2 Design



2.1 COMPLIANCE

Scyon Linea Weatherboard direct fixed and cavity cladding has been issued a CodeMark certificate number GM-10-30018 which confirms Scyon Linea Weatherboard is deemed to comply with the requirements of NZBC. Please refer to our website www.jameshardie.co.nz for a copy of the CodeMark certificate. Scyon Linea Weatherboard also has a BRANZ Appraisal number 446 (2010) and 447 (2010) at www.branz.co.nz or www.jameshardie.co.nz.

2.2 RESPONSIBILITY

The specifier or other party responsible for the project must ensure that the information and details in this specification are appropriate for the intended application and that additional detailing is performed for specific design or any areas that fall outside the scope of this technical specification. For applications outside the scope of this literature and figures which are not provided herein, the architect, designer or engineer must undertake specific design and it should be ensured that the intent of their design meets the requirements of the NZBC.

All dimensions shown are in millimetres unless noted otherwise. All New Zealand Standards referenced in this manual are current edition and must be complied with.

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

2.3 SITE AND FOUNDATION

The site on which the building is situated must comply with the NZBC Acceptable Solution E1/AS1 'Surface Water'. Foundation design must comply with the requirements of NZS 3604 'Timber Framed Buildings' or be as per specific engineering design. The grade of adjacent finished ground must slope away from the building to avoid any possibility of water accumulation in accordance with NZBC requirements.

2.4 GROUND CLEARANCES

The clearance between the bottom edge of cladding and paved/unpaved ground must comply with section 9.1.3 of E2/AS1. The finished floor level must also comply with these requirements. These clearances must be maintained throughout the life of the building.

Scyon Linea Weatherboards must overhang the bottom plate on a concrete slab by a minimum of 50mm as required by NZBC Acceptable Solution, E2/AS1 Table 18.

On the roofs and decks the minimum clearance must be 50mm.

Do not install external cladding such that it may remain in contact with water or ground.

2.5 MOISTURE MANAGEMENT

It is the responsibility of the specifier to identify moisture related risks associated with any particular building design.

Wall construction design must effectively manage moisture, considering both the interior and exterior environments of the building, particularly in buildings that have a higher risk of wind driven rain penetration or that are artificially heated or cooled. Walls shall include those provisions as required by NZBC Acceptable Solution E2/AS1 'External Moisture'. In addition, all wall openings, penetrations, junctions, connections, window sills, heads and jambs must incorporate appropriate flashings for waterproofing. The other materials, components and installation methods used to manage moisture in the walls, must comply with the requirements of relevant standards and the NZBC. For information in relation to designing for weathertightness, refer to BRANZ and the Department of Building and Housing (DBH) updates on the following websites, respectively www.branz.co.nz and www.dbh.govt.nz.

2.6 STRUCTURE

Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific engineering design in accordance with NZS 3603 and AS/NZS 1170. Where specific engineering design is required, the framing stiffness must be equivalent to or more than the framing provisions of NZS 3604. In all cases stud spacing must not exceed 600mm centres maximum for buildings designed to NZS 3604 and 400mm centres maximum for specific engineering design buildings subject to design wind pressures higher than 1.5kPa.

2.7 WIND LOADING

Scyon Linea Weatherboard cladding is suitable for use in all wind zones as defined in NZS 3604 and is also suitable for use in SED wind pressures up to 2.5kPa (uls).

For wind pressures higher than those mentioned above, contact James Hardie at 0800 808 868 for assistance.

2.8 STRUCTURAL BRACING

Scyon Linea Weatherboard installed as per Scyon Linea Weatherboard specific bracing details will provide bracing for buildings designed and constructed in accordance with NZS 3604. The Scyon Linea Weatherboard bracing systems have been independently tested by SCION using direct fixed construction. The following range of bracings can be achieved

- Wind 75 – 130 BU'S/m
- Earthquake 67 – 101 BU'S/m

Refer to the James Hardie Bracing Design Manual for details.

2.9 FIRE RATED WALLS

Walls clad with Scyon Linea Weatherboard using a direct fix or cavity construction method can achieve fire ratings of up to 90/90/90 when constructed in accordance with the James Hardie 'Fire and Acoustic' Design Manual. Scyon Linea Weatherboard must be face fixed for Fire Rated applications.

Refer to Fire and Acoustic Design Manual for further information about fire rated systems.

2.10 ENERGY EFFICIENCY

External walls constructed using Scyon Linea Weatherboard, and bulk insulation, where the area of glazing is 30% or less of the total wall area and constructed as per this technical specification complies with the requirements for walls in NZBC Acceptable Solution H1/AS1 (NZBC Clause H1 Energy Efficiency), Replacement Table 1. To meet the minimum thermal insulation requirements for the construction, the bulk insulation as specified in Table 1 must be used. This insulation may be substituted with insulation material having higher R-values. The thermal insulation of a wall is affected when the depth of the timber framing is increased or decreased or stud spacing is decreased. The calculation used in Table 1 is based on a timber framing size 90 x 45mm and an internal lining material such as James Hardie Villaboard® Lining or a 10mm plasterboard.

Table 1

Insulation capability		
Climate Zone	Construction R-Value Requirement	Minimum R-Value of Insulation Required
1 and 2	1.9 m ² °C/W	#R2.0
3	2.0 m ² °C/W	#R2.2

Total construction R-Value depends on the insulation material used and the framing ratio. The insulation material R-Values specified in this table are for studs spaced at 600mm c/c and nogs spaced at 800mm c/c.

To achieve higher construction R-Values the wall insulation material must be replaced with an insulation material having higher R-Values to suit the requirements.

For further guidance on insulation requirement refer to current edition of 'House Insulation Guide' published by BRANZ.

3 Framing

3.1 GENERAL

This Scyon Linea Weatherboard technical specification is only suitable for timber-framed buildings. Other framing materials are outside the scope of this specification.

For Steel Framing refer to James Hardie Claddings Installation to Steel Framing Technical Supplement.

3.2 DIMENSIONS

A 35mm minimum stud width is required unless noted otherwise in this specification.

3.3 TIMBER GRADE

Timber must be graded in accordance with NZS 3631 'New Zealand Timber Grading Rules'. The timber grade to be used must be in accordance with NZS 3604 requirements.

3.4 DURABILITY

To comply with NZBC requirements the external framing must be treated to a minimum H1.2 treatment. Refer to NZBC Acceptable Solution B2/AS1 Durability for further information about the durability requirements. For timber treatment information refer to NZS 3602 (Timber and Wood-Based Products for use in Buildings) and NZS 3640 (Chemical Preservation of Round and Sawn Timber) for minimum timber treatment selection and treatment requirements. Also refer to framing manufacturer's literature for further guidance on timber selection.

Framing must be protected from moisture at sites in accordance with the recommendations of framing manufacturers.

Note: refer to NZS 3602 for information about the allowable moisture content in timber.

3.5 FRAME CONSTRUCTION

For buildings within the scope of NZS 3604 the framing sizes and set-out must comply with NZS 3604 with stud, nog/dwang centres as required by this specification.

3.5.1 Direct fixed construction method

The following framing must be provided for direct fixed construction method:

- Studs must be provided at 600mm centres maximum.
- Nogs must be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.5.2 Cavity construction method

The following framing must be provided for cavity construction method:

- When studs are at 600mm centres the nogs must be provided at 800mm centres maximum.
- When studs are at 400mm centres the nogs may be provided at 1200mm centres maximum.
- Double studs are required at internal corners.
- Extra packers may be required at external corners.
- Extra studs are required for aluminium internal corner sections.

3.5.3 Specific Engineering Design (SED)

For EH wind zone and specific engineering design projects the timber framing is required to be designed in accordance with NZS 3603 and AS/NZS 1170. The minimum framing sizes and layout must comply with this specification.

- Stud spacing 400mm centres maximum
- Nog spacing 1200mm centres maximum
- Other requirements as per 3.5.2 above

3.6 TOLERANCES

In order to achieve an acceptable wall finish, it is imperative that framing is straight and true. Framing tolerances must comply with the requirements of NZS 3604. All framing must be made flush.

4 Preparation

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4.1 BUILDING UNDERLAY OR HOMERAB PRECLAD LINING

Building underlay must be provided as per the requirements of NZBC Acceptable Solution E2/AS1 'External Moisture' Table 23. The building underlay must be fixed in accordance with E2/AS1 and the underlay manufacturer's recommendations. Walls which are not lined on the inside face e.g. garage walls or gable ends must include a rigid sheathing or an air barrier behind the cladding which complies with the requirements of NZBC Acceptable Solution E2/AS1 Table 23. HomeRAB PreClad Lining is suitable for use in these applications. It must be installed in accordance with James Hardie Rigid Air Barriers installation manual.

4.2 RIGID AIR BARRIER

For EH wind zone or Specific Engineering Design (SED) projects where the design wind pressures are between 1.5kPa (uls) and 2.5kPa (uls), RAB Board (6mm) must be used. Refer to James Hardie Rigid Air Barriers installation manual for information regarding its installation.

4.3 FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs must be flashed prior to weatherboard installation. Please refer to moisture management requirements in Clause 2.5. The building underlay 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 building underlay. James Hardie will assume no responsibility for water infiltration within the wall due to poor installation of flashings or building underlays. The selected flashing materials must comply with the durability requirements of Table 20 of NZBC Acceptable Solution E2/AS1.

4.4 VENT STRIP

The James Hardie uPVC cavity vent strip must be installed at the bottom of all walls constructed using the drained and ventilated cavity construction method. James Hardie uPVC vent strip has an opening area of 1000mm²/m length. It is important that the openings in the vent strip are kept clear and unobstructed to allow free drainage and ventilation of cavities.

4.5 CAVITY BATTENS

Buildings with a risk score of 13-20 calculated in accordance with NZBC Acceptable Solution E2/AS1 Table 3 require Scyon Linea Weatherboards to be installed on a cavity.

The cavity battens provide airspace between the frame and cladding and are considered a "packer" only in this specification.

The timber battens must be minimum H3.1 treated in accordance with NZS 3640 (Chemical Preservation of Round and Sawed Timber) to comply with the durability requirements of B2/AS1.

Cavity battens must comply with E2/AS1 and:

- be minimum 18mm thick.
- be minimum as wide as the width of studs.
- be fixed by the cladding fixings to the main framing through the building underlay.
- until claddings are fixed the battens need only to be tacked to framing.

(Batten fixing is required temporarily to keep them straight on the wall during construction.)

The cavity battens are installed as described below:

- Fix cavity battens to studs at maximum 600mm centres.
- Battens should be fixed with 40 x 2.8mm nails at 800mm centres maximum.

4.6 INTERMEDIATE SUPPORT

Where studs are at 600mm centres an intermediate means of restraining the building underlay and insulation from bulging into the cavity shall be installed. An acceptable method to achieve this is using one of the following:

- intermediate cavity batten between the studs.
- 75mm galvanised mesh.
- polypropylene tape at 300mm centres fixed horizontally and drawn taut.

No intermediate supports are required:

- where studs are at maximum 400mm centres; or,
- when rigid sheathings instead of building underlays are used.

4.7 CORNERS

Anticipated joist shrinkage must be allowed for in the design process. Do not run trims or aluminium extrusions continuously across solid floor joists. There are a number of options to select from when detailing external corners:

- 90° corner soaker in aluminium, copper or stainless steel. Refer to Figures 7 and 33.
- Box corners using Scyon Axent Trim. Refer to Figures 3, 4 and 30.
- Mitred corners to weatherboards. Refer to Figures 5 and 31.
- Aluminium boxed corners. Refer to Figures 6 and 32.

There are a number of options to select from when detailing internal corners:

- Scribed corner. Refer to Figures 8 and 34.
- 90° or 135° Aluminium W-mould. Refer to Figures 9, 10, 35 and 36.

4.8 JUNCTIONS AND PENETRATIONS

Refer to Clause 2.5 of this specification for moisture management requirements. All windows and doors must be detailed as per the requirements of this specification. James Hardie has developed the window details for Scyon Linea Weatherboards which meet the requirements of E2 'External Moisture', an approved document of the NZBC. Refer to Figures 11 to 22 and 38 to 51.

5 Fixing Linea Weatherboard

5.1 GENERAL

The horizontal lap of Scyon Linea Weatherboards must be 30mm minimum. In certain scenarios you may require to creep up the lap. This must not exceed 33mm. Scyon Linea Weatherboards must be kept dry whilst in storage prior to and during fixing. Cut ends which are exposed after installation or where sealant is applied to the boards such as slimline box corners, internal corners, mitred external corners etc, must be primed prior to installation. Dust and loose material must be removed before priming.

A minimum H3.1 treated timber cant strip must be provided to support the bottom board on the wall. Refer to Figure 1 and Figure 26.

5.2 FASTENER DURABILITY

Fasteners must meet the minimum durability requirements of the NZBC. NZS 3604 specifies the requirements for fixing's material to be used in relation to the exposure conditions and are summarised in Table 2.

Table 2

Exposure conditions and nail selection prescribed by NZS 3604

NAIL MATERIAL

Zone D *	Zone C outside sea spray zone and Zone B and Geothermal hot spots	Bracing — All zones
Grade 316 Stainless	Hot-dipped galvanised or 316 stainless	Grade 316 stainless

* (Zone C areas where local knowledge dictates that increased durability is required, appropriate selection shall be made) Microclimate conditions as detailed in NZS 3604, Paragraph 4.2.4 require SED.

Also refer to NZBC Acceptable Solution 'E2/AS1' Table 20 and 21 for information regarding the selection of suitable fixing materials and their compatibility with other materials.

5.3 NAIL SIZE AND FIXING METHOD

Scyon Linea Weatherboards and Scyon Axent Trim must be fixed to timber with the types of nails specified in Tables 3 and 4, in accordance with the following requirements:

- Scyon Linea Weatherboard can either be face/exposed fixed or concealed fixed.
- Scyon Linea Weatherboard must be fixed into studs at maximum 600mm centres. Fixing centres to coincide with stud spacing. Refer to Figure 2 and 28.
- All concealed nails must be driven flush with the board surface.
- When concealed fixing Scyon Linea Weatherboards, nails must be driven under the lap of boards, except at all corners and vertical edges of openings where Scyon Linea Weatherboards must be face fixed. Refer to Figure 2 and Figure 28.
- Nails must be fixed 25mm from the end of the board when hand nailing. For gun nailing refer to Section 5.4.
- When using concealed fixing method, any gaps that may appear under the lap due to site conditions can be minimised

by fixing a jolt head nail as per the face fixing method in the affected area.

- When using concealed fixing method, Scyon Linea Weatherboard can also be tied together by face fixing through the lap using 32mm brad nails if desired.
- When using a rigid air barrier like HomeRAB PreClad Lining or RAB Board, the cladding fixing nails must be increased in length equal to the thickness of the rigid air barrier.
- When face fixing Scyon Linea Weatherboard, the upper board must be pre-drilled before fixing with a jolt head nail.

Table 3

Nail requirements for Scyon Linea Weatherboards

DIRECT TO STUD FIXING

Concealed Nailing	
40 x 2.8mm HardieFlex™ nails	Finish flush with the board surface.
Face Nailing	
60 x 3.15mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

CAVITY FIXING

Concealed Nailing	
60 x 3.15mm HardieFlex™ nails	Finish flush with the board surface.
Face Nailing	
75 x 3.15mm jolt head nails	Hot-dipped galvanised jolt head nail with pre-drilling* through the top weatherboard.
	Stainless steel jolt head nail with pre-drilling* through the top weatherboard.

EH Wind Zone and SED Projects (1.5kPa - 2.5kPa Wind Pressure)

Face Nailing	
90 x 4.0mm jolt head nail	Hot-dipped galvanised jolt head nail with pre-drilling** through the top weatherboard.
	Stainless steel shank jolt head nail with pre-drilling** through the top weatherboard.

Table 4

Nail requirements for trim

Single Thickness	60mm jolt head nails. If fixing over Scyon Linea Weatherboard use predrilled* 75 x 3.15mm jolt head nails.
Double Thickness	60mm jolt head nails.
Single plus packer	If fixing over Scyon Linea Weatherboard use 75 x 3.15mm jolt head nails through a pre-drilled* hole. When fixing to timber support use 60mm jolt head nails.

* Use a 3.0mm drill bit. ** Use a 3.5mm drill bit

Note: Special fixing arrangements are required for bracing and fire-resistance rated wall systems. For more information Ask James Hardie on 0800 808 868.

5.4 GUN NAILING

Scyon Linea Weatherboard can also be gun-nailed with a D head or RounDrive nail when concealed fixing method is used.

- Gun-nailing must not be used when Scyon Linea Weatherboard is used for bracing.
- Nails must be no closer than 50mm from the ends of boards when gun nailing is used — double studs will be required.
- Be minimum length and gauge as per Table 3.
- Be finished flush with surface of board.

6 Jointing

The ends of Scyon Linea Weatherboards are jointed off-stud by means of a tongue and groove joint. Tongue and groove joints may be located centrally between studs but no closer than 100mm from the edge of a stud. The joints must be staggered by 600mm minimum. Sealant must be provided in the tongue and groove joint.

7 Finishing

Note: Protective coating of Scyon Linea Weatherboard and Scyon Axent Trim is required in order to meet the durability requirements of the NZBC.

7.1 PREPARATION AND PRIMING

The Scyon Linea Weatherboard and Scyon Axent Trim must be dry before painting. Punch and fill all exposed nails a maximum of 2mm below the surface. Fill the hole with an exterior grade builders fill, allow to cure and sand smooth ready for priming. Prime the filled holes in accordance with paint manufacturer's specifications.

It is not recommended to seal under the lap of weatherboards as it helps circulation of air behind the weatherboard cladding.

7.2 SEALANTS

All sealants must demonstrate the ability to meet the relevant requirements of the NZBC and hold a current BRANZ Appraisal. Application and use of sealants must comply with manufacturer's instructions. Sealants, if coated, must be compatible with the paint system.

7.3 PAINTING

All Scyon Linea Weatherboards are pre-primed on their face and bottom edge with a factory applied acrylic base coat.

Scyon Linea Weatherboard must be painted within 90 days of installation. There is no restriction on the LRV of paint to be applied on the Scyon Linea Weatherboard. All exposed faces, including the top edges under the sills and bottom edges of Scyon Linea Weatherboard, Scyon Axent Trim and accessories

must be finished with latex exterior paint system complying with any of parts 7, 8, 9, and 10 of AS 3730.

Dark coloured paints can be used on Scyon Linea Weatherboard and Trim. The dark colours in certain environments may fade over a period of time. Special paints/coatings are required in certain harsh environments.

8 Storage and handling

Paint selection and the preparation required is dependant on paint chosen. Refer to the paint manufacturer for information before starting painting.

Scyon Linea Weatherboards and Scyon Axent Trim must be laid flat on a smooth level surface. To ensure optimum performance, store weatherboards under cover and keep dry prior to fixing. If the weatherboards should become wet, allow to dry thoroughly before fixing. Do not carry weatherboards on the flat, carry in the vertical position to avoid excessive bending.

9 Maintenance

It is the responsibility of the specifier to determine normal maintenance requirements to comply with NZBC Acceptable Solution B2/AS1. The extent and nature of maintenance will depend on the geographical location and exposure of the building. As a guide, it is recommended that basic normal maintenance tasks shall include but not be limited to:

- Washing down exterior surfaces every 6-12 months*,
- Re-applying exterior protective finishes**,
- Maintaining the exterior envelope and connections including joints, penetrations, flashings and sealants,
- Cleaning out gutters, blocked pipes and overflows as required,
- Pruning back vegetation close to or touching the building,
- The clearances between the bottom edge of Scyon Linea Weatherboard and the finished/unfinished ground must always be maintained.
- Stainless steel flashings used in extreme coastal conditions or in sea spray zones may show some signs of staining. It is an aesthetic issue and to minimise it cladding must be washed frequently

*Do not use a water blaster to wash down the cladding.

**In extreme coastal conditions or sea spray zones, wash every 3-4 months.

**Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.

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141564 9/15/2014 Dawn

10 Product information

10.1 MANUFACTURING AND CLASSIFICATION

James Hardie New Zealand is an ISO 9001 Telarc certified manufacturer. Scyon Linea Weatherboard and Scyon Axent Trim are manufactured to meet the requirements of AS/NZS 2908.2: 2000 'Cellulose-Cement Products'. Scyon Linea Weatherboard has a classification of Type A Category 3 in accordance with this Standard. Scyon Linea Weatherboard is an advanced lightweight cement composite building product incorporating James Hardie proprietary Scyon technology.

Scyon Linea Weatherboard has a bevel back and tongue and groove at the ends for jointing. The bottom front edge of Scyon Linea Weatherboard is chamfered. The weatherboards are supplied pre-primed on their face and bottom edge with an acrylic primer.

Scyon Linea Weatherboards and Scyon Axent Trim are identified by the printing at regular intervals of the name Scyon Linea on the back face.

10.2 JAMES HARDIE TRIM

The Scyon Axent Trim, used for box corners, around windows and doors as well as special architectural features, is also made with the CLD technology and is supplied pre-primed with an acrylic primer.

10.3 DURABILITY

Scyon Linea Weatherboard and Scyon Axent Trim, when installed and maintained as per the technical specification, will meet the durability requirements for claddings as required in the NZBC Approved Document B2 'Durability'.

10.3.1 Resistance to moisture/rotting

Scyon Linea Weatherboard and Scyon Axent Trim have demonstrated resistance to permanent moisture-induced deterioration (rotting) and has passed the following tests in accordance with AS/NZS 2908.2:

- Water Permeability (Clause 8.2.2)
- Warm Water (Clause 8.2.4)
- Heat Rain (Clause 6.5)
- Soak Dry (Clause 8.2.5).

10.3.2 Resistance to fire

Scyon Linea Weatherboard is classified as 'Non-Combustible Material' which is suitable for use as external wall cladding and complies with Performance C3.7 of the NZBC Clause C3 Fire Affecting Areas Beyond the Fire Source.

10.3.3 Alpine regions

In regions subject to freeze/thaw conditions, Scyon Linea Weatherboard must not be in direct contact with snow or ice build up for extended periods, e.g. external walls in alpine regions subject to snow drifts over winter.

The Scyon Linea Weatherboard has been tested in accordance with AS/NZS 2908.2 Clause 8.2.3.

10.4 PRODUCT SIZES AND MASS

Available sizes of Scyon Linea Weatherboard and Scyon Axent Trim and its weight are given in Table 6.

10.5 SIZE AND WEIGHT

Scyon Linea Weatherboard is categorised as a Light Weight Wall Cladding as described in NZS 3604. Physical properties of Scyon Linea Weatherboard and Scyon Axent Trim are provided in Table 6.

11 Safe working practices

WARNING — DO NOT BREATHE DUST AND CUT ONLY IN WELL VENTILATED AREA

James Hardie products contain respirable crystalline silica which is considered by some international authorities to be a cause of cancer from some occupational sources. Breathing excessive amounts of respirable silica dust can also cause a disabling and potentially fatal lung disease called silicosis, and has been linked with other diseases. Some studies suggest smoking may increase these risks. During installation or handling: (1) work in outdoor areas with ample ventilation; (2) minimise dust when cutting by using either 'Score and Snap' knife, fibre cement shears or, where not feasible, use a HardieBlade™ Saw Blade and dust-reducing circular saw attached to a HEPA vacuum; (3) warn others in the immediate area to avoid breathing dust; (4) wear a properly-fitted, approved dust mask or respirator (e.g. P1 or P2) in accordance with applicable government regulations and manufacturer instructions to further limit respirable silica exposures. During clean-up, use HEPA vacuums or wet cleanup methods — never dry sweep. For further information, refer to our installation instructions and Safety Data Sheets available at www.jameshardie.co.nz.

FAILURE TO ADHERE TO OUR WARNINGS, SAFETY DATA SHEETS, AND INSTALLATION INSTRUCTIONS MAY LEAD TO SERIOUS PERSONAL INJURY OR DEATH.

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141564 9/15/2014 Dawn

James Hardie recommended safe working practices

CUTTING OUTDOORS

1. Position cutting station so wind will blow dust away from the user or others in working area.
2. Use one of the following methods based on the required cutting rate:

BEST

- Dust reducing circular saw equipped with HardieBlade™ Saw Blade and HEPA vacuum extraction.

GOOD

- Dust reducing circular saw with HardieBlade™ Saw Blade.

SANDING/REBATING/DRILLING/OTHER MACHINING

When sanding, rebating, drilling or machining you should always wear a P1 or P2 dust mask and warn others in the immediate area.

IMPORTANT NOTES

1. For maximum protection (lowest respirable dust production), James Hardie recommends always using "Best" — level cutting methods where feasible.
2. NEVER use a power saw indoors.
3. NEVER use a circular saw blade that does not carry the HardieBlade™ logo.
4. NEVER dry sweep — Use wet suppression or HEPA vacuum.
5. NEVER use grinders.
6. ALWAYS follow tool manufacturers' safety recommendations.

P1 or P2 respirators should be used in conjunction with above cutting practices to further reduce dust exposures. Additional exposure information is available at www.jameshardie.co.nz to help you determine the most appropriate cutting method for your job requirements. If concern still exists about exposure levels or you do not comply with the above practices, you should always consult a qualified industrial hygienist or contact James Hardie for further information.

Working instructions

Refer to recommended Safe Working Practices before starting any cutting or machining of product.

HardieBlade™ Saw Blade

The HardieBlade™ Saw Blade used with a dust-reducing saw connected to a HEPA vacuum is ideal for fast, clean cutting of James Hardie fibre cement products. A dust-reducing saw uses a dust deflector or a dust collector connected to a vacuum system. When sawing, clamp a straight-edge to the sheet as a guide and run the saw base plate along the straight edge when making the cut.



For irregular holes:

Small rectangular or circular holes can be cut by drilling a series of small holes around the perimeter of the hole then tapping out the waste piece from the sheet face.



Tap carefully to avoid damage to sheets, ensuring that the sheet edges are properly supported.

Storage and handling

All James Hardie building products should be stored to avoid damage, with edges and corners of the sheets protected from chipping.

James Hardie building products must be installed in a dry state and be protected from rain during transport and storage. The product must be laid flat under cover on a smooth level surface clear of the ground to avoid exposure to water or moisture, etc.

Hole-forming

For smooth clean cut circular holes:

Mark the centre of the hole on the sheet.

Pre-drill a pilot hole.

Using the pilot hole as a guide, cut the hole to the appropriate diameter with a hole saw fitted to a heavy duty electric drill.

Quality

James Hardie conducts stringent quality checks to ensure that any product manufactured falls within our quality spectrum. It is the responsibility of the builder to ensure that the product meets aesthetic requirements before installation. James Hardie will not be responsible for rectifying obvious aesthetic surface variations following installation.

12 Product sizes

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Table 6

Scyon Linea Weatherboard and Scyon Axent Trim sizes						Coverage Information			
Product	Length (mm)	Width (mm)	Thickness (mm)	End Details	Effective Cover (mm)	No. of planks/ metre height (approx.)	Mass kg/lineal m (approx. at EMC)	Mass kg/m ² (approx. at EMC)	Weight/ packs (60 units/ pack)
Scyon Linea Weatherboard 135	4200*	135	16	T & G	105	9.5	2.62	25.70	660.00
Scyon Linea Weatherboard 150	4200*	150	16	T & G	120	8.3	3.1	24.93	781.00
Scyon Linea Weatherboard 180	4200*	180	16	T & G	150	6.7	3.57	23.92	899.00
Scyon Axent Trim 84mm	2600	84	16	Square	N/A	N/A	1.6	N/A	N/A
Scyon Axent Trim 100mm	2600	100	16	Square	N/A	N/A	1.9	N/A	N/A

*Length is 4200mm plus 5mm for the tongue and groove making overall length 4205mm

*The effective thickness of finished Scyon Linea Weatherboard on the wall at the lap is approximately 33 to 35mm

13 Accessories

Table 7

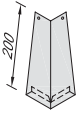
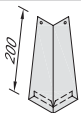
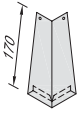
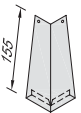
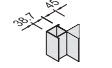
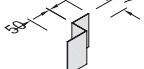
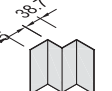
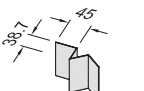

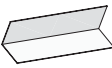
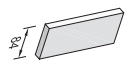
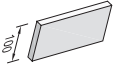




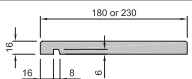
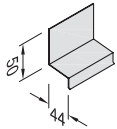
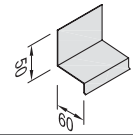



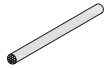



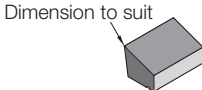

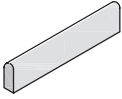



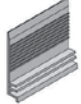

Accessories/Tools supplied by James Hardie				
	Accessory and material number		Size (mm)	Material / appearance
	External corner soaker 90° for Scyon Linea Weatherboards 180mm	<ul style="list-style-type: none"> Aluminium Copper Stainless Steel 	200 long	Self colour
		301186 301188 301197		
	External corner soaker 135° for Scyon Linea Weatherboards 180mm	<ul style="list-style-type: none"> Aluminium 	200 long	Self colour
		301178		
	External corner soaker 90° for Scyon Linea Weatherboards 150mm	<ul style="list-style-type: none"> Aluminium Stainless Steel 	170 long	Self colour
		302820 302821		
	External corner soaker 90° for Scyon Linea Weatherboards 135mm	<ul style="list-style-type: none"> Aluminium Stainless Steel 	155 long	Self colour
		301185 301196		
	External Slimline Box Corner Mould		2700 long	Etch Primed Aluminium
		301195		
	Box Corner 'Z' Flashing		2700 long	uPVC Grey
		301203		
	Internal 'W' Mould 90°		2700 long	Etch Primed Aluminium
		301184		
	Internal 'W' Mould 135°		2700 long	Etch Primed Aluminium
		301183		
	Vent Strip		3000 long	uPVC White
		302490		
	JH Corner Under Flashing 50 x 50mm		3000 long	uPVC White
		303745		
	Scyon Axent Trim 84mm		84 x 2600 long	Fibre Cement primed
		401943		
	Scyon Axent Trim 100mm		100 x 2600 long	Fibre Cement primed
		401930		
	HardieFlex™ nail - 5kg		60 x 3.15mm	316 Stainless Steel
		302782		
	HardieFlex™ nail - 5kg		60 x 3.15mm	Hot Dip Galvanised
		302784		
	HardieBlade™ Saw Blade		4 tooth - 184mm	Diamond Tipped
		300660		
	HardieBlade™ Saw Blade		6 tooth - 254mm	Diamond Tipped
		303375		
	Scyon Axent Fascia - 180mm - 230mm		4200 long	Fibre Cement primed
		401843 402230		

Table 8

Accessories not supplied by James Hardie			
James Hardie recommends the following products for use in conjunction with its Scyon Linea Weatherboard and Scyon Axent Trim. James Hardie does not supply these products. There may also be some other accessories required depending upon the application. Please contact component manufacturer for information on their warranties and further information on their products.			
	Accessory and material number	Size (MM)	Material/appearance
	Head Flashing for Direct Fixed without Scyon Axent Trim facings	To suit	Etch Primed Aluminium/Powder Coated
	Head Flashing for Direct Fixed with Scyon Axent Trim facings	To suit	Etch Primed Aluminium/Powder Coated
	HardieFlex™ nail	40 x 2.8mm	316 Stainless Steel
	HardieFlex™ nail	40 x 2.8mm	Hot Dip Galvanised
	Flexible Sealant or Expandable foam	Tube	Sika, Holdfast
	PEF Rod	Polyethylene foam	Sika or similar
	Flashing Tape	Proprietary tape to adhere to building underlay	Tyvek, Protecto wrap or similar
	Flashing Material as per Table 20, 'E2/AS1'		Flashing Fabricator
	Jolt Head Nail - Hot Dip Galvanised or 316 Stainless Steel	50 x 2.8mm 60 x 3.15mm 75 x 3.15mm 90 x 4.0mm	Self colour
	Planted Sill	As shown	H3.1 Treated Timber Timber Merchant or cut on site
	Titanium Coated High Speed Drill Bit	3.0mm	
	Timber Scriber	As required	H3.1 Treated Timber Timber Merchant or cut on site
	Fibre Cement Cutting Blade	254mm	Diamond Tipped
	Fibre Cement Cutting Blade	305mm	Diamond Tipped
	Electra Meter Box Refer Electrical Suppliers		
	Cant Strip Redway Developments 03 358 5775 Predrill the weatherboards when fixing using Redway Development Cant/Vent Strips	To suit	uPVC
	Inseal 3109 Sealing Strip	5 x 3mm x 25mm	Black Compressible Foam

14 Details

Various details outlined in the following table are available on Pages 15 to 42.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Table 9

Details				
Description	Direct fixed		Timber Cavity Batten Construction	
	Figure	Page	Figure	Page
Foundation detail and soffit detail	Figure 1	15		
Weatherboard fixing	Figure 2	15	Figure 29	27
Boxed corner	Figure 3 & 4	16	Figure 30	28
Mitre corner	Figure 5	17	Figure 31	28
Aluminium box corner	Figure 6	17	Figure 32	28
External corner soaker	Figure 7	18	Figure 33	29
Internal corner	Figure 8	18	Figure 34	29
Internal 135° aluminium 'W' mould corner	Figure 9	19	Figure 35	30
Internal 90° aluminium 'W' mould corner	Figure 10	19	Figure 36	30
Window sill with facings			Figure 38	31
Window sill with sill tray and facings	Figure 11	20		
Window door and head with facings	Figure 12	20	Figure 39	32
Window door and jamb with facings	Figure 13	20	Figure 40	32
Window door and sill without facings	Figure 14	21	Figure 41	32
Window door and head without facings	Figure 15	21	Figure 42	33
Window door and jamb without facings	Figure 16	21	Figure 43	33
Head flashing termination	Figure 17	22	Figure 44	34
One piece apron flashing joint	Figure 18	22	Figure 45	35
Pipe penetration	Figure 19	23	Figure 47	36
Meter box at head	Figure 20	23	Figure 48	37
Meter box at sill	Figure 21	23	Figure 49	37
Meter box at jamb	Figure 22	24	Figure 50	37
Timber cavity fix meter box			Figure 51	38
Deck junction	Figure 23	24	Figure 58	43
Cantilevered timber deck junction	Figure 24	25	Figure 59	44
Sloping soffit to weatherboard junction	Figure 25	25	Figure 57	42
Timber cavity batten fixing			Figure 26	26
Foundation detail			Figure 27	26
Soffit detail			Figure 28	27
Batten layout at window opening			Figure 37	31
One piece gutter/wall junction			Figure 46	36
Drainage joint			Figure 52	39
Enclosed deck balustrade to wall			Figure 53	40
Enclosed balustrade to wall			Figure 54	40
Enclosed deck	Figure 55	41	Figure 55	41
Parapet flashing			Figure 56	42

Product Warranty

March 2014

Warranty: James Hardie New Zealand ("James Hardie") warrants for a period of 25 years from the date of purchase that the Scyon® Linea® Weatherboard (the "Product"), will be free from defects due to defective factory workmanship or materials and, subject to compliance with the conditions below, will be resistant to cracking, rotting, fire and damage from termite attacks to the extent set out in James Hardie's relevant published literature current at the time of installation. James Hardie warrants for a period of 15 years from the date of purchase that the Scyon® Axent™ Trim and accessories supplied by James Hardie will be free from defects due to defective factory workmanship or materials.

Nothing in this document shall exclude or modify any legal rights a customer may have under the Consumer Guarantees Act or otherwise which cannot be excluded or modified at law.

CONDITIONS OF WARRANTY:

The warranty is strictly subject to the following conditions:

- a) James Hardie will not be liable for breach of warranty unless the claimant provides proof of purchase and makes a written claim either within 30 days after the defect would have become reasonably apparent or, if the defect was reasonably apparent prior to installation, then the claim must be made prior to installation.
- b) This warranty is not transferable.
- c) The Product must be installed and maintained strictly in accordance with the relevant James Hardie literature current at the time of installation and must be installed in conjunction with the components or products specified in the literature. Further, all other products, including coating and jointing systems, applied to or used in conjunction with the Product must be applied or installed and maintained strictly in accordance with the relevant manufacturer's instructions and good trade practice.
- d) The project must be designed and constructed in strict compliance with all relevant provisions of the current New Zealand Building Code ("NZBC"), regulations and standards.
- e) The claimant's sole remedy for breach of warranty is (at James Hardie's option) that James Hardie will either supply replacement product, rectify the affected product or pay for the cost of the replacement or rectification of the affected product.
- f) James Hardie will not be liable for any losses or damages (whether direct or indirect) including property damage or personal injury, consequential loss, economic loss or loss of profits, arising in contract or negligence or howsoever arising. Without limiting the foregoing James Hardie will not be liable for any claims, damages or defects arising from or in any way attributable to poor workmanship, poor design or detailing, settlement or structural movement and/or movement of materials to which the Product is attached, incorrect design of the structure, acts of God including but not limited to earthquakes, cyclones, floods or other severe weather conditions or unusual climatic conditions, efflorescence or performance of paint/coatings applied to the Product, normal wear and tear, growth of mould, mildew, fungi, bacteria, or any organism on any Product surface or Product (whether on the exposed or unexposed surfaces).
- g) All warranties, conditions, liabilities and obligations other than those specified in this warranty are excluded to the fullest extent allowed by law.
- h) If meeting a claim under this warranty involves re-coating of Products, there may be slight colour differences between the original and replacement Products due to the effects of weathering and variations in materials over time.

Disclaimer: The recommendations in James Hardie's literature are based on good building practice, but are not an exhaustive statement of all relevant information and are subject to conditions (c), (d), (f) and (g) above. James Hardie has tested the performance of Scyon® Linea® Weatherboard when installed in accordance with the Scyon® Linea® Weatherboard technical specification, in accordance with the standards and verification methods required by the NZBC and those test results demonstrate the product complies with the performance criteria established by the NZBC. However, as the successful performance of the relevant system depends on numerous factors outside the control of James Hardie (e.g. quality of workmanship and design) James Hardie shall not be liable for the recommendations made in its literature and the performance of the relevant system, including its suitability for any purpose or ability to satisfy the relevant provisions of the NZBC, regulations and standards, as it is the responsibility of the building designer to ensure that the details and recommendations provided in the relevant James Hardie installation manual are suitable for the intended project and that specific design is conducted where appropriate.

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Ask James Hardie™

Call 0800 808 868

www.jameshardie.co.nz

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141564 9/15/2014 Dawn



James Hardie
a smarter way™



The culmination of years of innovative research and development, Scyon's® resilient makeup challenges conventional building methods in a range of steadfast products. James Hardie® are committed to the sustainable production of building products for a tougher and greener tomorrow.

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For more information about performance, installation, warranties and warnings visit scyon.co.nz

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James Hardie
a smarter way™

We have the pit range.



We have the innovation.

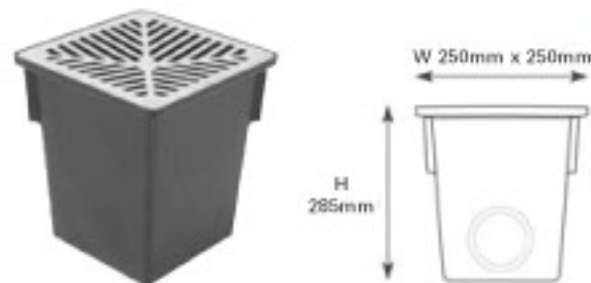
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50 years of Innovation

We have the fastest, easiest pits to install.

Conventional Pits.



Series 250

Rainwater Pit

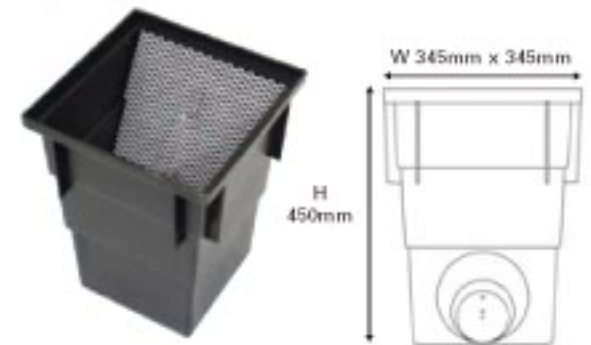
This ever popular relatively small domestic rainwater pit is traditionally used as a junction box, under down pipes and at the end of surface water drainage channel.

Pit Size 250x250x285mm.

Grate Options 248x248mm Plastic in Black and 4 colours, Plain Aluminium and 3 colours. ReIn Leaf Guard.

Riser Use series 250 Rainwater Pit with the base cut out.

Capacity 10.5 litres.



NEW Series 300 deep

Domestic Stormwater Pit

A popular, larger domestic pit, used as a junction box in trafficable areas, suits pedestrian and light vehicular traffic.

Pit Size 345x345x450mm.

Grate Options 330x330mm, Flush plain Aluminium, or 3 colours, a solid aluminium lid Class A Galvanised Steel grates in Heelguard and standard format for areas trafficked by light vehicles. Trash screen galvanised steel with handle.

Riser Height 260mm

Capacity 32 litres.



Series 300 short

Domestic Stormwater Pit

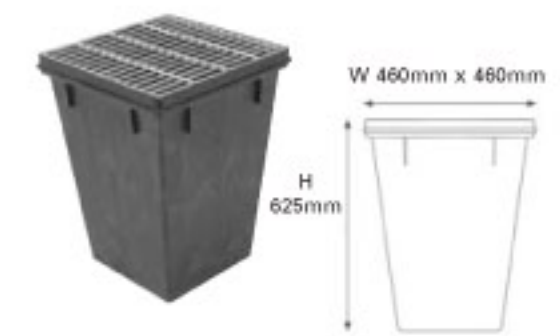
A popular, larger domestic pit, used as a junction box in trafficable areas, suits pedestrian and light vehicular traffic.

Pit Size 350x350x325mm.

Grate Options 330x330mm, Flush Plain Aluminium or 3 colours, a solid aluminium lid, Class A Galvanised steel grates in Heelguard and standard format for areas trafficked by light vehicles. ReIn Leaf Guard.

Riser Height 260mm

Capacity 22 litres.



Series 450 deep

Commercial Stormwater Pit

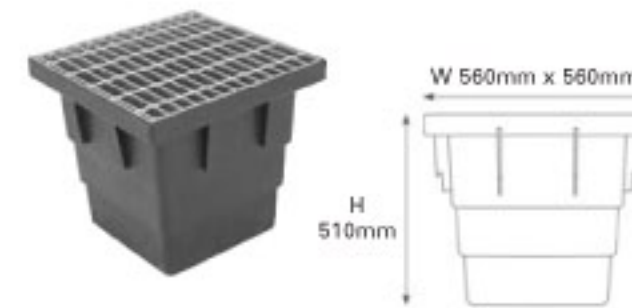
A deeper commercial stormwater pit, preferred where plenty of fall in the stormwater pipes is required, suitable for driveways and carparks.

Pit Size 460x460x625mm.

Grate Options 435x435mm Galvanised steel, Class A and Class B - Galvanised Steel Checker Plate cover Class A Trash screen Galvanised steel with handle.

Riser Height 350mm.

Capacity 75 litres.



Series 450 short

Commercial Stormwater Pit

A square medium size commercial pit. For all commercial Stormwater applications, heavy duty, suitable for driveways, carparks, and trafficable areas.

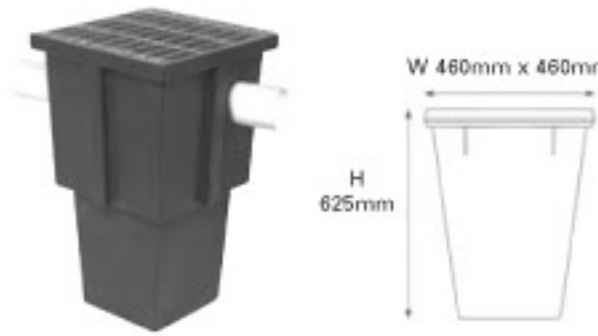
Pit Size 560x560x510mm.

Grate Options 450x450mm

Galvanised steel Class A and Class B, galvanised steel Checker Plate cover class A. Trash screen galvanised steel with handle.

Riser Height 150mm.

Capacity 75 litres.



Nviro Pit

Commercial-Domestic Silt Arrester

Suitable for domestic stormwater lines where silt and fines need to be prevented from entering the street or stormwater system. Ideal at the end of ReIn's InLine drainage system. Easy to maintain and inner 'basket' is easy to empty.

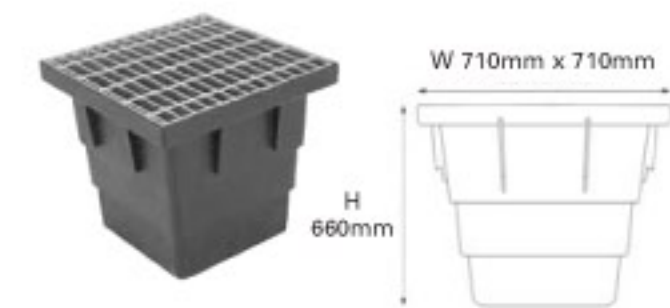
Pit Size 460x460x625mm.

Grate Options 435x435mm.

Galvanised steel Class A - Class B.

Riser Height 350mm.

Capacity 75 litres.



Series 600

Large, Commercial Stormwater Pit

Injection moulded structural foam for 'extra' strength, this is our largest pit. Suitable for commercial area's, car parks, driveways etc. where substantial volumes of surface water is encountered. The ideal 'junction' box where large bore pipe is used.

Pit Size 710x710x660mm.

Grate Options 685x685mm, Galvanised steel Class A and Class B, galvanised steel Checker Plate cover class A.

Riser Height 200mm.

Capacity 175 litres.

WAIMAKARIRI DISTRICT COUNCIL
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Installation Instructions.

- Excavate hole for pit to required depth.
- Bed pit on a sand base to set top of pit at installed level.
- Mark and cut pipe holes as required.
- Install pit in hole.
- Connect pipes.
- Seal pipe and pit with silicone.
- When installing a riser, ensure riser is secured to pit with supplied nuts and bolts, with a washer on each side of the assembly. Seal around Riser and Pit base with silicone.
- Install grate - leave grate installed whilst back-filling and concreting.
- Evenly backfill around pit.
- Support pits and risers in a concrete collar--250 and 300 series min 100mm thick x min 150 wide -- 450 and 600 series min 150 thick x min 150mm wide.





Drainage like no other

10 YEAR WARRANTY.

- Flat grate surface for safe pedestrian, bike and wheelchair traffic.
- Diagonal slots allow faster drainage.
- Textured surface for extra grip.
- Withstands 5 tonne vehicle without moving in concrete.
- Cross braced design prevents floating when concreting and movement once set.
- Bottom outlet is an advantage when the slope is slight. It also allows more concrete over pipe when paving.
- Available in 1 and 3 metre lengths. 3 metre length means less work, fewer joins, less cost.
- Male/female ends on channel allow snap together joining.
- Rounded base assists rapid water flow with self-cleaning.
- End cap closes off end, and End Outlet connects to 90mm stormwater pipe.
- Stainless steel and ductile iron grates also available.
- Also available upon request, Storm Drain Civil range able to withstand 15 tonne loading.

Strong & Easy
Drainage

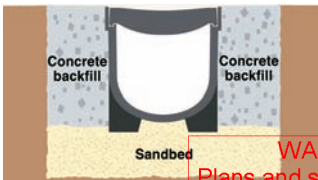


BC141564



Cut or Drill 90mm bottom outlet.

Finish concrete or
paving approx 2mm
above grate



Slide End Cap into Storm Drain.

TECHNICAL DETAILS.

	LENGTH	WIDTH	HEIGHT	WEIGHT
Storm Drain with Plastic Grate	1010mm	120mm	129mm	2.3kg
Storm Drain Stainless Steel Grate	1010mm	120mm	129mm	3.2kg
Storm Drain with End Cap/End Outlet	35mm	120mm	123mm	50gms
Storm Drain 90° Corner	170mm	170mm	127mm	400gms
Storm Drain Tee	220mm	170mm	127mm	400gms

- Form trench for ReIn Storm Drain allowing for 50mm bed of packed sand. If ReIn Storm drain will be subject to vehicle traffic, surround in concrete.
- Allow slope of approx. 30cm to every 20m.
- Join ReIn Storm Drain, joins and end caps may be sealed with silicone.
- Use ReIn end cap at highest point of Storm Drain.
- Connect the low end of the Storm Drain to a Rainwater pit, or, using 90mm PVC pipe use built in Bottom Outlet, or fit an End Outlet to allow water to clear.
- Lay Storm Drain out with corner piece connected and end cap fitted prior to concreting.
- Storm Drain can be cut to length with a hacksaw, install with grate fitted.
- Protect grate with masking tape during concrete pour.
- Top of grate must be 2mm below concrete or paver surface.



GARAGE PACK ALSO AVAILABLE WITH
4 x 1m LENGTHS CHANNEL WITH GRATE,
1 x END CAP, 1 x END CAP WITH OUTLET.

Anti-Floatation Bars.



Tee allows for quick and easy branch lines.



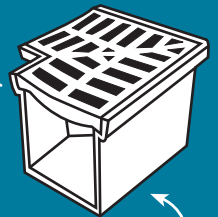
Leaf guard easily fitted to outlet end to prevent leaves and debris entering stormwater system.



Drainage made simpler.

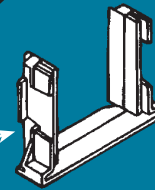


End Cap finishes off end of drain or connects to 90mm stormwater pipe.

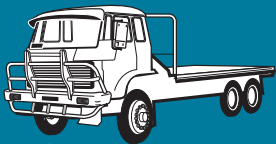


The quick easy way to create 90° corners.

Reln Rain Drain in 3m and 1m lengths. 3m lengths mean less work, fewer joins, less cost. Easy to install.



Corner clip makes 90° corners or "T" piece connections.



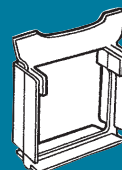
Reln Rain Drain withstands 5 tonne vehicle without moving in the concrete.

Range of fashionable colours – Black, Terracotta, Heritage Green, Portland Grey, Sandstone and Galvanised Steel.

Hold down feet stop movement once concrete sets.



Feet also prevent flotation during concrete pour.



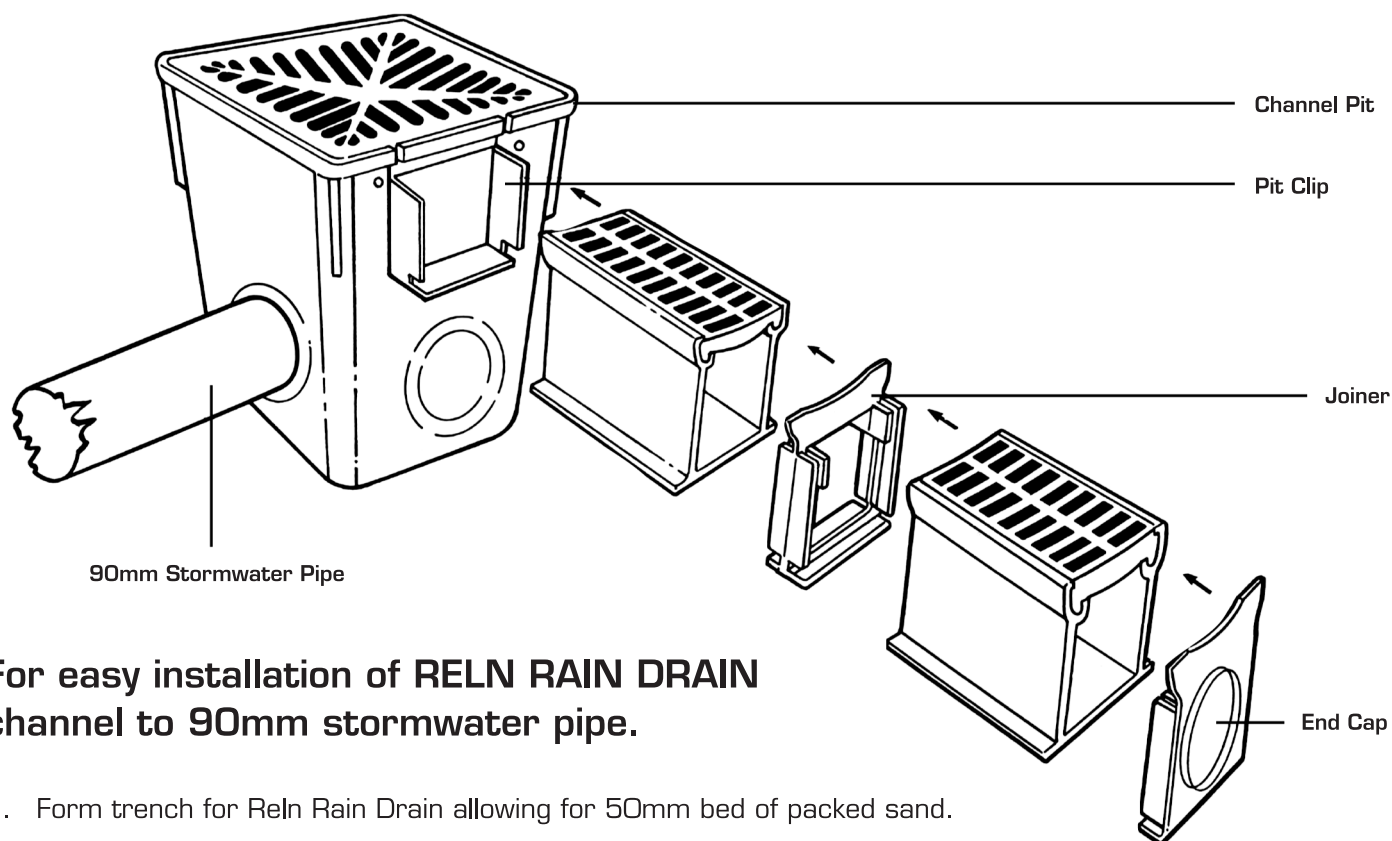
FREE joiner allows easy joining of lengths and reuse of offcuts to avoid waste.

RELN RAIN DRAIN

Use this simple Rain Drain system

Consent Issued BC141564

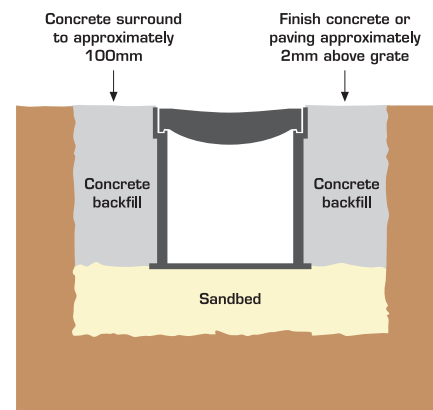
BC141564



For easy installation of RELN RAIN DRAIN channel to 90mm stormwater pipe.

1. Form trench for Reln Rain Drain allowing for 50mm bed of packed sand.
2. Allow slope of approximately 15mm every 1 metre.
3. Join lengths with free Joiner supplied.
4. Use End Cap at highest end of installation.
5. At lowest end use Pit Clip to join channel to Channel Pit which connects to the stormwater pipe to clear away water.
6. Seal joints with silicone.
7. Use Reln Leafguard inside the Channel Pit to collect debris.
8. Install with grate fitted. Protect grate from concrete splash with masking tape.
9. Pour concrete to fill trench on each side of the Rain Drain channel. For efficient water flow into grates, set grates 2mm below concrete or paver surface.
10. Allow 72 hours cure before vehicle use. Remove tape from grates.

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RELN RAIN DRAIN

Note: The Reln Rain Drain range is subject to intellectual property protection.



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Electric Water Heaters (Hot Water Cylinders)

Mains Pressure Electric Water Heaters - Model 312300



Download a Brochure

5 year warranty on the cylinder

3 year warranty on labour for cylinder

12 month warranty on parts + labour

Indoor installation

Vitreous enamel lining protects the hot water cylinder from the variety of water qualities found around New Zealand

Installation Guide

STORAGE CAPACITY

300L

INSTALLATION

Indoor

PRESSURE

Mains

ENERGY

Electric

Product Specifications

PERFORMANCE

> Storage Capacity

L

300

> No. Of People

(Moderate Climate)

3 - 5

> No. Of People

(Cold Climate)

2 - 4

Electrical Connection

VAC / Hz

240 / 50

Dimensions

1825 x 580mm (HxW)

Max Thermostat Setting

°C

70

Min Thermostat Setting

°C

60

Water Connection Inlet & Outlet

"/mm

RP ¾/20

T&PR Connection

"/mm

RP ½/15

T&PR Setting

kPa

1000

Max Water Supply Pressure w/out ECV

kPa

800

Max Input

kW

Approx Wt Empty

kg

95

Booster Thermostat Setting

°C

na

Boost Capacity (L)

L

na

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Technical Documents

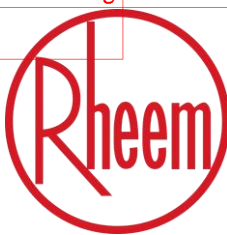


Sample Specification

[View Online](#)

Heating Element

[View Online](#)



INSTALLATION INSTRUCTIONS & OWNERS GUIDE

RHEEM MAINS PRESSURE ELECTRIC HOT WATER HEATERS

Congratulations for choosing a Rheem Water Heater

It is important that you take a few minutes
to read this booklet as it may save you
time and trouble later.

If you require any further information or your
water heater needs to be serviced, please contact the
Rheem Service Department on 0800 657 335,
or the nearest service centre
(look in the Yellow Pages under Plumbers)

Important to the Installer

Do not leave this booklet inside the element cover
after installation

Please leave the booklet with the water heater's owner

IMPORTANT INFORMATION

Revised Issue R01-11504

GENERAL

- The information contained in this manual, and all other information or advice given at any time by Rheem New Zealand Limited in connection with the purchase, installation or use of a Rheem water heater, is given in good faith. Subject to any rights the owner may have under the "Consumer Guarantees Act 1993", Rheem New Zealand Limited will not be liable to any person for any inaccuracy or omission in the information or advice arising through the fault or negligence of Rheem New Zealand Limited or any other person or through any other cause whatsoever.
- This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not play with the water heater.

ABOUT YOUR WATER HEATER

Q. DOES THE WATER QUALITY AFFECT THE WATER HEATER?

- A. Your water heater is suitable for most public water supplies, however, some water qualities may have a detrimental effect on it. **If you are in a known harsh water area please read page 7.**

Q. HOW HOT SHOULD THE WATER BE?

- A. The Optima features a user adjustable thermostat (temperature range of 60 – 75°C), which allows you to choose the most suitable temperature for your hot water needs.

The Rheemglas models (temperature range 60 - 70°C) require an authorised person to make any temperature adjustments.

For reasons of safety and economy, we advise the thermostat is adjusted to the lowest setting that meets your needs.

The New Zealand Building Code requires a temperature setting of not less than 60°C.

Q. HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

- A. Refer to the installation requirements on page 4.

Q. HOW LONG WILL THE WATER HEATER LAST?

- A. There are a number of factors that affect the life of the water heater. These include; the water quality, water pressure, water temperature and the usage pattern, however, your Rheem water heater is supported by a comprehensive warranty (refer to page 8).

The life of the water heater may be extended by arranging for an authorised person to inspect the anode and replace it, if required.

The suggested time after installation when the anode should be inspected is:

Rheemglas	8 years
Optima	10 years

For softened water supplies or in areas of poor water quality, it is recommended the anode be inspected 3 years earlier than shown (refer to "Water Quality" on page 7).

HOW THE WATER HEATER WORKS

SINGLE AND TWIN ELEMENT MODELS

Water stored within the water heater is heated by the electric heating element. The thermostat controls the electricity supply to the heating element so that a constant water temperature is maintained. As the cold water is heated it expands approximately 1/50 of its volume and, as a result, a small amount of water is discharged from the cold water expansion valve.

NON-SIMULTANEOUS ELEMENT MODELS

The two heating elements are wired for non-simultaneous operation, so that only one heating unit can operate at a time. The bottom heating unit is usually connected to an off-peak (overnight) supply and the top heating unit to a continuous supply. The red link wire must be removed from the terminal block during installation if two separate power supplies are to be used. Leaving the link in place ensures both elements operate correctly with a single power supply.

The basic operation is as follows: when the water temperature at the top of the water heater has reached the set temperature, the thermostat switches the top element off. This creates a circuit to the bottom heating element by switching the neutral.

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SAFETY

On all models, a Temperature and Pressure Relief valve is supplied with each water heater. It can be found inside the front cover and must be mounted on top of the water heater.

Also fitted to the water heater is a thermostat, which incorporates an over-temperature thermal cut-out device.

WARNING: The operation of the thermal cut-out indicates a possible dangerous situation. Do not reset the thermal cut-out until the water heater has been serviced by an authorised service person.

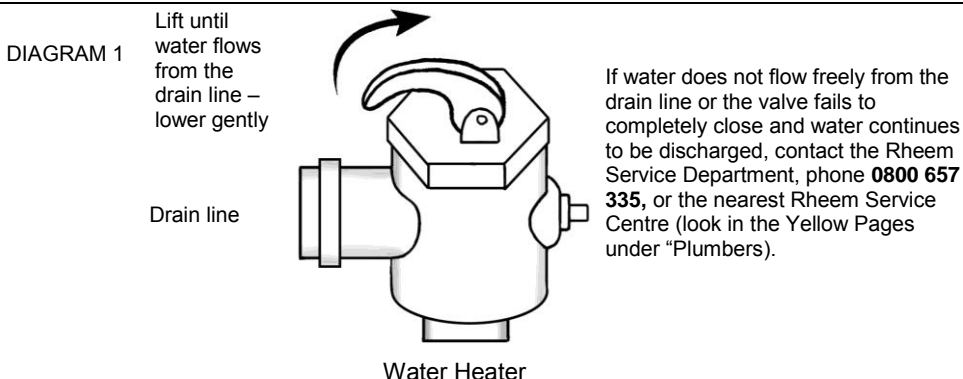
These safety devices must not be tampered with, or removed, and under no circumstances operate the water heater unless both devices are fitted.

REGULAR CARE

MANUALLY OPERATING THE TEMPERATURE AND PRESSURE RELIEF VALVE:

Valve manufacturers recommend that you operate the easing lever (see diagram. 1) on the Temperature and Pressure Relief valve once every six months. **It is very important that you raise and lower the lever gently.**

WARNING: To ensure the relief valve is working correctly, operate the relief valve easing lever at least every six months. Failure to do this may result in the water heater bursting.



GOING ON HOLIDAYS:

If you plan to be away from home for one or two nights, we suggest that you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at the isolating switch, or at the main switchboard. In locations where freezing could occur, you should leave the water heater turned on.

SAVE A SERVICE CALL

CHECK THE ITEMS BELOW BEFORE MAKING A SERVICE CALL. YOU MAY BE CHARGED FOR SERVICE IF THE FAULT IS NOT RELATED TO THE WATER HEATER MANUFACTURE OR PARTS SUPPLIED WITH THE WATER HEATER BY RHEEM.

WATER DISCHARGING FROM EXPANSION CONTROL VALVES

It is normal for the cold water expansion valve and the temperature and pressure relief valve to discharge a small quantity of water during the heating cycle. If either of these valves discharge more than a bucket full of water in 24 hours, one of the following may be the cause.

- **Continuous dribble**
Try gently raising the easing lever on the relief valve for a few seconds. This may dislodge small particles of foreign matter and clear the fault.
- **Heavy flow of hot water until the water is cold – then stops while the water reheats**

Immediately turn off the electricity supply to the water heater. Call the Rheem Service Department or look in the Yellow Pages under "Plumbers" for your nearest Rheem Service Centre to arrange an inspection.

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- **A steady flow of water (often at night)**

This may indicate that your cold water pressure sometimes rises above the design pressure of the water heater. A Pressure Limiting valve should be installed, or if one is installed, it may need replacing.

NOT ENOUGH HOT WATER (or no hot water)

- **Is the electricity turned on?**

Check the switch marked 'water heater' at the switchboard and the water heater isolating switch. Check the fuse marked 'water heater'.

WHERE THE WATER HEATER IS CONNECTED TO AN OFF PEAK (NIGHT RATE) ELECTRICAL TARIFF, THE SUPPLY MAY NOT BE AVAILABLE AT CERTAIN TIMES OF THE DAY.

- **Do you have the correct size heater for your requirements?**

Refer to the sizing guide in the Rheem sales literature or the Rheem website.

- **Is one outlet (especially the shower) using more hot water than you think?**

Carefully review the family's hot water usage and if necessary, check the shower flow rate. For maximum efficiency we recommend the flow rate through the shower is between 8 to 10 litres per minute. This can be achieved by installing a flow control valve if provision is not made to fit a flow restrictor in the shower rose.

- **Ensure the thermostat setting is appropriate.**

HIGH ELECTRICITY BILLS

- **Is one outlet (especially the shower) using more hot water than you think?**

- **Is there a leaking hot water pipe, dripping hot water tap, etc?**

Even a small leak will waste a surprisingly large quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe-work.

- **Is either of the expansion valves discharging too much water?**

- **Consider recent changes to your hot water usage pattern and check if there has been an increase in tariffs since your previous account.**

INSTALLATION

Please take careful notice of the advice given as Rheem New Zealand Limited will not be liable for any loss or damage suffered as a result of the incorrect installation of the water heater, or any failure to check the capability of the electrical supply, wiring to the water heater.

The water heater must be installed by an authorised service person or registered plumber and the installation must comply with the New Zealand Building Code, Rheem Installation Instructions, AS/NZS 3000 electrical installations and all local codes and regulatory authority requirements.

- **WATER HEATER LOCATION**

Water heaters with a galvanised outer casing are only suitable for indoor installations, whereas water heaters with a painted casing are suitable for both indoor and outdoor installations. Clearance must be allowed for servicing and removal of the water heater and it must be accessible without the use of a ladder or scaffold. (Typical clearances are: TPR valve removal 135 mm, Element Cover and Element Removal 400 mm). Also, you must be able to read the information on the rating plate and if possible, leave headroom of one water heater length so the anode can be inspected or replaced.

- **CONNECTION SIZES**

- Hot water connection: RP ¾/20.
- Cold water connection: RP ¾/20.
- Relief valve connection: RP ½/15.

- **INLET/OUTLET CONNECTIONS**

A union must always be provided at the cold water inlet and hot water outlet for disconnection reasons. Both connections are fitted with plastic liners and it is important that they remain in situ for the water heater to function properly. These liners will be pushed into the correct position as the fitting is being screwed in.

■ NON RETURN VALVE

A non return valve must be installed on the cold water line to the water heater.

■ PIPE SIZES

The cold water line to the water heater should be the same size or bigger than the hot water line from the water heater. For best results, choose the most suitable pipe size for each individual application.

■ COLD WATER EXPANSION VALVE

A cold water expansion valve must be fitted to the cold water line to the water heater.

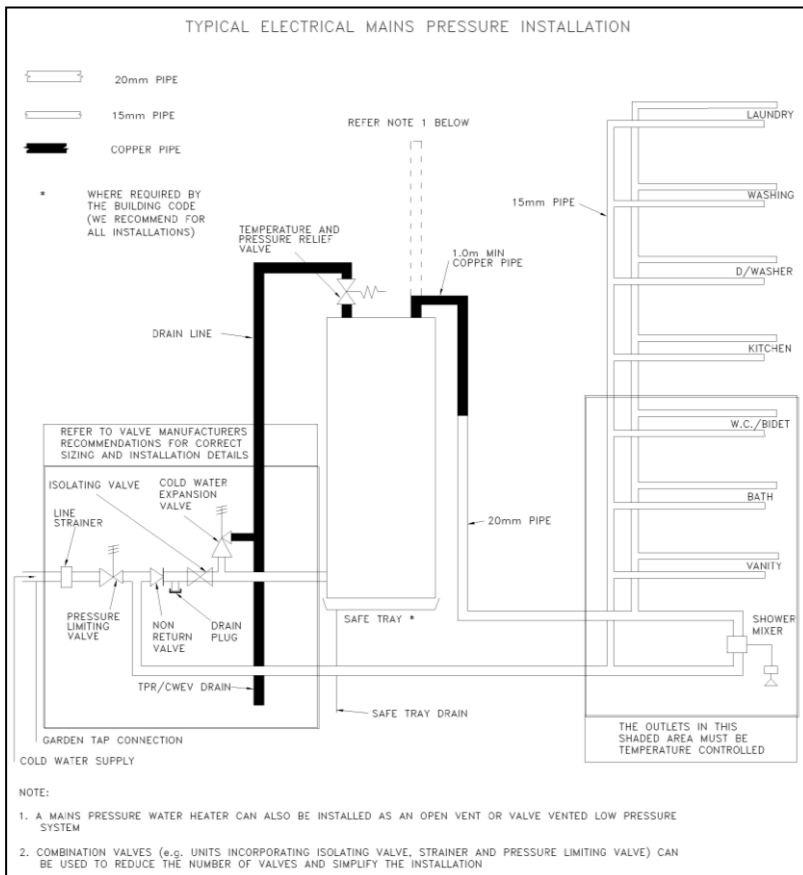
■ TEMPERATURE AND PRESSURE RELIEF VALVE

When fitting the temperature and pressure relief valve, ensure the probe has not been bent. Seal the thread with PTFE tape, or similar, as recommended by the valve manufacturer and screw the valve into the off-centre socket. Do not use a wrench on the valve body – use the spanner flats provided. Drain the TPR valve with a pipe the same size as the valve outlet. The drain must run downwards to a visible point outside the house, preferably over a gully trap.

In locations where the pipe exceeds 3 metres unbroken length, or freezing could occur, an air break must be provided within 300 mm of the TPR valve.

WARNING: The drain line from the TPR valve must be in copper. A Rheem mains pressure water heater must not be installed and operated without a suitable (valve that complies with AS 1357.1) temperature and pressure relief valve. Under no circumstances block the outlet of this valve or its drain pipe.

DIAGRAM 2:



■ **PRESSURE LIMITING/REDUCING VALVE**

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If the water supply pressure exceeds the rated pressure, a pressure limiting or reducing valve is to be fitted in the installation.

The water heater must be installed with a properly drained safe tray where there is the possibility of water damage to furniture, carpets or building. All water heaters must be restrained to protect against seismic forces. (Refer to the Zealand Building Code for acceptable solutions.)

CONNECTIONS - ELECTRICAL

The electrical installation must be completed in accordance with AS/NZS 3000. All water heaters are designed for 230 VAC, 50 Hz mains operation and a means of disconnection from the power supply must be incorporated in the fixed wiring during installation.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm plain to screw adaptor. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. For details, refer to the wiring diagram on the inside of the element cover. **A separate heating element earth wire is not required because the element earths by the thread of the element boss or the flange being in contact with the element socket.**

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory Megger reading is obtained.

- Open all of the hot water taps in the house (don't forget the shower). Open the cold water isolation valve fully to the water heater to force the air out of the taps. As water flows freely from each tap, close it. Check the pipe-work for leaks.
- Switch on the electrical supply at the isolating switch to the water heater.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the isolating switch to the water heater.
- Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

- Switch off the electrical supply at the isolation switch to the water heater.
- Close the cold water isolation valve.
- Operate the relief valve easing lever to release the pressure in the water heater.
- Drain the water heater through the drain valve or plug.
- Undo the top outlet union or operate the relief valve easing lever again to let air into the water heater and allow the water to drain.

WHAT YOU SHOULD KNOW ABOUT WATER QUALITY

Your Rheem water heater is manufactured to suit the water condition of most local authority water supplies. However, some water supplies can have a detrimental effect on the water heater and its operation and/or life expectancy. If you are unsure of your water quality, you can obtain information from your local water supply authority.

HARSH WATER AREAS

Rheem water heaters are designed for use in areas where the Total Dissolved Solids (TDS) content of the water supply is less than 2500 mg/L.

In areas where the TDS exceeds 600 mg/L it is possible the standard magnesium anode fitted to the water heater, may be excessively active. To alleviate this, the magnesium anode should be replaced with an aluminium anode. Where the TDS of the water is less than 40 mg/L, such as when the water has been deionised or is from an alpine supply, a high potential anode should be used. The changing of anodes must be carried out by a plumber or qualified service person.

CAUTION

If your water supply has a TDS greater than 600 mg/L and the anode has not been changed, there is a possibility of hydrogen gas accumulating in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (e.g. automatic washing machines and dishwashers) which are connected to the hot water supply.

The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flames near the tap whilst it is turned on. Any hydrogen gas will be dissipated as indicated by an unusual spurting of the water from the tap. Once the water runs freely again any hydrogen in the system will have been released.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. When scaling water has a saturation index greater than +0.40 an expansion control valve must be fitted on the cold water line after the non-return valve.

Where the saturation index exceeds +0.80, low watts density elements should be used. Where the saturation index is less than -1.0, a corrosive resistant heating unit should be used (contact your local Rheem Service Department or an authorised service person).

WATER HEATERS NOT INSTALLED IN ACCORDANCE WITH THE ABOVE ADVICE WILL NOT BE COVERED BY THE RHEEM WARRANTY.

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141564 9/15/2014 Dawn

WARRANTY

In addition to your legal rights, Rheem New Zealand Limited makes the following promise to the owner. We will repair or, if necessary, replace a defective domestic water heater or part, which has failed due to faulty manufacture on the following terms and conditions:

Component	Installation	Model	Warranty Period (since installation)	Warranty
All Components Except Inner Cylinder	All Installations	All Models	First 12 Months	New component or water heater (at Rheem's sole discretion) free of charge, including labour
		Optima	First 3 years	New component or water heater (at Rheem's sole discretion) free of charge, including labour
Inner Cylinder	Water heater installed in a single-family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 3 years	New water heater free of charge, including labour
			Years 4 & 5	New water heater free of charge, with installation and labour costs the responsibility of the owner
		Optima	First 5 years	New water heater free of charge, including labour
			Years 6 – 10	New water heater free of charge, with installation and labour costs the responsibility of the owner
	Water heater installed in any other than a single family domestic dwelling with a thermostat setting below 76°C	Rheemglas & Calorifier	First 12 months	New water heater free of charge, including labour
			Years 2 & 3	New water heater free of charge, with installation and labour costs the responsibility of the owner
		Optima	First 12 months	New water heater free of charge, including labour
			Years 2 – 5	New water heater free of charge, with installation and labour costs the responsibility of the owner

DURABILITY

Your Rheem water heater meets the durability requirements of New Zealand Building Code provided the water heater is:

1. Installed in accordance with the New Zealand Building Code and the Rheem Installation Instructions.
2. Maintained in accordance with these instructions.
3. Not damaged in any way.
4. Stored correctly prior to use, and
5. Your water quality remains within the requirements stated in the Installation Instructions.

WARRANTY CONDITIONS

1. The water heater must be installed and maintained in accordance with the Rheem Installation Guides supplied with the water heater, and comply fully with all the requirements of the New Zealand Building Code.
2. The warranty applies to the faulty manufacture of the water heater only and does not cover any plumbing, gas fitting or electrical parts supplied by the installer, that are not an integral part of the water heater, e.g. pipe-work, pressure limiting valve, stop valves, non-return valves, electrical switches, pumps and fuses.

WARRANTY INFORMATION**WARRANTY EXCLUSIONS:**

The Rheem Warranty does not cover repair or replacement work to the water heater or its components caused directly or indirectly by:

1. Accidental damage
 2. Acts of God
 3. Failure due to misuse
 4. Incorrect installation
 5. Attempts to repair the water heater, other than by a Rheem Authorised Service Centre, or the Rheem Service Department
 6. Excessive water pressure, negative pressure or excessive heat input
 7. Non compliance with a) the Rheem Installation Instructions, b) relevant statutory regulations, c) New Zealand Building Code requirements.
- This warranty does not include any additional costs, for removing a heater where dismantling or removal of other materials is required, that is, walls, doors or roofs. Rheem New Zealand Limited will not pay claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to leakage or other causes from a water heater.

Repairs to the water heater due to chemical/scale formation in waterways when the heater has been connected to a harmful water supply as outlined on page 7 of the owners manual.

Service under this warranty can be provided by a **RHEEM AUTHORISED SERVICE CENTRE**.

Such services will be provided during their normal business hours.

Additional mileage and cartage charges shall be made for any water heater installed in a location exceeding 25km from the nearest Rheem Service Centre.

Note: You may have other rights in addition to this warranty under the "Consumer Guarantees Act 1993".

RHEEM SERVICE DEPARTMENT, 475 Rosebank Road Avondale, Auckland Phone: 0800 657 335, Fax: 09 829 0222

Or consult the Yellow Pages under "Plumbers" for your nearest Rheem Authorised Service Centre

Jun 2011

D311K

Resene SpaceCote Low Sheen Kitchen & Bathroom waterborne enamel

Resene SpaceCote Low Sheen Kitchen & Bathroom combines the benefits of a waterborne enamel with added anti-bacterial silver protection and MoulDefender.

This breakthrough product may be used to bring enamel style toughness to broadwall areas, allowing you to get a low sheen finish with added protection.

So adaptable that it may also be used on joinery and trim.

interior

Typical uses

- Bathrooms
- Kitchens
- Laundries
- Timber doors
- Trim and joinery
- Window frames

Vehicle type	New generation acrylic
Pigmentation	Titanium dioxide
Solvent	Water
Finish	Low sheen
Colour	White and colours off-white
Dry time (minimum)	45 minutes at 18°C
Recoat time (minimum)	2 hours
Serviceable within	12-48 hours depending on film thickness, tinter levels and drying conditions
Primer required	Yes
Theoretical coverage	11 sq. metres per litre
Dry film thickness	37 microns at 11 sq. metres per litre
Usual no. of coats	2
Abrasion resistance	Very good
Chemical resistance	Fair
Heat resistance	Good
Solvent resistance	Good
Durability	Excellent
Thinning	In hot dry conditions may be thinned with up to 5% Resene Hot Weather Additive to slow drying
Clean up	Water
VOC	c. 50 grams per litre (see Resene VOC summary)

Physical properties

Vehicle type	New generation acrylic
Pigmentation	Titanium dioxide
Solvent	Water
Finish	Low sheen
Colour	White and colours off-white
Dry time (minimum)	45 minutes at 18°C
Recoat time (minimum)	2 hours
Serviceable within	12-48 hours depending on film thickness, tinter levels and drying conditions
Primer required	Yes
Theoretical coverage	11 sq. metres per litre
Dry film thickness	37 microns at 11 sq. metres per litre
Usual no. of coats	2
Abrasion resistance	Very good
Chemical resistance	Fair
Heat resistance	Good
Solvent resistance	Good
Durability	Excellent
Thinning	In hot dry conditions may be thinned with up to 5% Resene Hot Weather Additive to slow drying
Clean up	Water
VOC	c. 50 grams per litre (see Resene VOC summary)

Performance and limitations

- | | |
|--------------------|--|
| Performance | <ol style="list-style-type: none"> 1. Reduced side sheen minimises the appearance of minor surface defects. 2. Very durable, abrasion resistant finish that may be easily cleaned. Ideal for GIB® ToughZone® areas. 3. Protects against bacteria with silver and against mould with MoulDefender. 4. Non-yellowing. 5. May be used wherever solventborne enamels have traditionally been used. 6. Clean, spatter free application. 7. An Environmental Choice approved product. |
|--------------------|--|

- | | |
|--------------------|---|
| Limitations | <ol style="list-style-type: none"> 1. Do not apply at temperatures below 10°C or when it is liable to drop below 10°C during the drying period. 2. Ensure the correct primers and/or sealers are used. 3. Due to waxes used in particle and fibreboard it is essential that Resene Quick Dry (see Data Sheet D45) is used as the first coat on these substrates. 4. Although serviceable within 12-48 hours, full print and solvent resistance takes seven days to develop. |
|--------------------|---|

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Please ensure the current Data Sheet and Safety Data Sheet are consulted prior to specification or application of product. If in doubt contact Resene.



SpaceCote Low Sheen Kitchen & Bathroom

Consent Issued BC141564

BC141564

Surface preparation

Clean down thoroughly to remove all dirt, dust and loose material. Ensure surface is free from oil, grease and mould.

If moss and mould are present, treat with Resene Moss & Mould Killer (see [Data Sheet D80](#)). Sand to smooth finish and dust off. Old enamels require fine sanding to a uniform dull finish.

Prime as per the following:

Fibrous plaster, paperfaced plasterboard

Resene Broadwall Waterborne Wallboard Sealer (see [Data Sheet D403](#)). Ensure new paperfaced plasterboard is prepared to a level of finish suitable for the specified paint finish. Resene Broadwall Surface Prep & Seal (see [Data Sheet D807](#)) or Resene Broadwall 3 in 1 (see [Data Sheet D810](#)) will be required to achieve a level 5 finish.

Particle board, timber

Resene Quick Dry (see [Data Sheet D45](#)). (Where a staining type of timber exists an application of Resene Wood Primer (see [Data Sheet D40](#)) may be required).

Soft or absorbent surfaces

Where the surface to be painted is considered too soft to form a stable substrate, a saturation coat of a fully penetrating sealer, such as Resene Sureseal (see [Data Sheet D42](#)), may be required.

Varnished surfaces, laminated surfaces

Resene Waterborne Smooth Surface Sealer (see [Data Sheet D47a](#)).

Sanding dust from old lead or chromate based paints or old building materials containing asbestos may be injurious to the health if inhaled or ingested. Seek expert advice if the presence of these materials is suspected.

Application

Apply by brush, speed brush, synthetic fibre roller (Resene No.1) or spray. Thin with up to 5% Resene Hot Weather Additive in hot, dry conditions to slow drying.

New

1. Prepare and prime as above.
2. Apply two coats of Resene SpaceCote Low Sheen Kitchen & Bathroom in required colour allowing at least two hours between coats.

Repaint

1. Prepare surface and spot prime as above.
2. Apply two coats of Resene SpaceCote Low Sheen Kitchen & Bathroom in required colour allowing at least two hours between coats.

Precautions

1. Ensure the correct primer and/or sealer is used.
2. Stop all nailholes and cracked timber after priming.
3. Allow putty to thoroughly harden before painting.
4. Allow Resene SpaceCote Low Sheen Kitchen & Bathroom sufficient drying before putting into full service.
5. Serviceable within 12-48 hours depending on film thickness, tinter level and drying conditions.
6. Resene Sureseal (see [Data Sheet D42](#)) must be used where paperfaced plasterboard has yellowed due to prolonged exposure to sunlight, and in wet areas such as bathrooms, kitchens and laundries.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
141564 9/15/2014 Dawn

*Please ensure the current Data Sheet is consulted prior to specification or application of Resene products.
If the surface you propose to coat is not referred to by this Data Sheet, please contact Resene for clarification.*



BRANZ Appraised

Appraisal No.687 [2010]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 687 (2010)**

Amended 17 June 2013

**FORTRESS BOTTOM
PLATE ANCHORS**

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Consent Issued BC141564

BC141564

Product

1.1 Fortress Bottom Plate Anchors are used to resist earthquake and wind loads on the bottom plates of timber frame buildings designed and constructed in accordance with NZS 3604. The range consists of screw-type and wedge-type anchors for proprietary bracing systems hold downs to concrete slab-on-ground construction. They are also for fixing non-bracing internal and external walls to concrete slab-on-ground.



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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Scope

2.1 The Fortress Bottom Plate Anchors have been appraised for use as wall bracing system hold downs and bottom plate fixings to concrete slab-on-ground in buildings designed and constructed in accordance with NZS 3604. They are for use in internal, dry, protected environments.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Fortress Bottom Plate Anchors, 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. The Fortress Bottom Plate Anchors meet these requirements for loads from imposed gravity loads arising from use, earthquake, snow, wind and impact [i.e. B1.3.3 (b), (f), (g), (h), and (j)]. See Paragraphs 8.1 - 8.2.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. The Fortress Bottom Plate Anchors meet this requirement. See Paragraph 9.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Fortress Bottom Plate Anchors 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 when used with proprietary bracing systems.

3.3 This is an appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. The Fortress Bottom Plate Anchors meet the requirements of Section 7.5.12 of NZS 3604 which is a NZBC Compliance Document.

Description

4.1 The following fasteners are covered by this Appraisal:

Fortress 12 x 150 Screw Bolt

The screw bolts are manufactured from steel and are coated with a nominal 5 micron zinc layer. The screw anchor has a hexagonal head and a nominal shank diameter of 12 mm. The under-head anchor or shank length is 150 mm. They are identified with "F 12 x 150" stamped on the head.

Fortress 10 x 120 Screw Bolt

The screw bolts are manufactured from steel and are coated with a nominal 5 micron zinc layer. The screw anchor has a hexagonal head and a nominal shank diameter of 10 mm. The under-head anchor or shank length is 120 mm. They are identified with "F 10 x 120" stamped on the head.

Fortress 12 x 135 Through Bolt

The wedge anchor rods are manufactured from steel and are coated with a nominal 45 micron zinc layer. The wedge is manufactured from grade 316 stainless steel.

Fortress 12 x 120 Through Bolt

The wedge anchor rods are manufactured from steel and are coated with a nominal 45 micron zinc layer. The wedge is manufactured from grade 316 stainless steel. These fasteners have only been assessed for use with internal walls. They have not been assessed for use as hold down fixings for proprietary bracing systems.

Handling and Storage

5.1 Fortress Bottom Plate Anchors should be stored in a clean, dry area until they are used. Their exposure to the elements after installation should be kept to a minimum. Closing the building in within the required time to protect the framing timber from the environment will be suitable.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Fortress Bottom Plate Anchors. 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 Fortress Bottom Plate Anchors are concrete fasteners used to resist earthquake and wind loads on timber frame buildings designed and constructed in accordance with NZS 3604. They are for fixing the bottom plates of walls to concrete slab-on-ground construction. They include fasteners for in situ concrete foundation edge detail, concrete masonry foundation edge detail and internal slab detail.

Proprietary Bracing Systems

7.2 The Fortress Bottom Plate Anchors are for use as hold downs for proprietary bracing systems rated up to 150 BU/m (bracing units per metre) for the Fortress 12 x 150 screw bolt and the Fortress 12 x 135 through bolt, and bracing systems rated up to 120 BU/m (bracing units per metre) for the Fortress 10 x 120 screw bolt, as described in Table 1.

Formed Concrete Foundations

7.3 When Fortress Bottom Plate Anchors are used as fixings for external walls with formed concrete foundations the minimum concrete strength must be 17.5 MPa in Zone B, 20 MPa in Zone C and 25 MPa in Zone D (refer 4.8.2 of NZS 3604). These concrete strength requirements are as prescribed by NZS 3604 and are not a special requirement for Fortress Bottom Plate Anchors.

Concrete Masonry Header Block Foundations

7.4 In Zone D, as defined by NZS 3604, insufficient cover is able to be achieved and so Fortress Bottom Plate Anchors must not be used in external walls in concrete masonry header block foundations.

7.5 When Fortress 12 x 150 screw bolts are used as fixings for external walls with concrete masonry header block foundations in Zone B as defined by NZS 3604, then the minimum grout/concrete strength is 17.5 MPa. In Zone C the minimum grout/concrete strength is 20MPa. Fortress 10 x 120 Screw Bolts and Fortress 12 x 135 Through Bolts have not been assessed for use with concrete masonry header block foundations.

Internal Walls

7.6 When Fortress Bottom Plate Anchors are used as fixings for internal walls the minimum concrete strength is 17.5 MPa.

7.7 Holes that are drilled for the fasteners must be 10 mm deeper than their embedment depth. Care should be taken as this may require slab thickening in some situations, and this must be taken into account when the slab is laid.

Structure

Bracing systems hold downs

8.1 The Fortress Bottom Plate Anchors may be used for proprietary bracing systems hold down bolts to concrete slab-on-ground construction. The maximum characteristic uplift strengths for the fasteners are given in Table 1. The Technical Literature of the proprietary bracing system must be referenced to determine the required hold down characteristic strength for the bracing elements.

NZS 3604 Fixing of Timber

8.2 Table 2 gives the maximum fastener spacing allowed for the Fortress Bottom Plate Anchors to meet the requirements of NZS 3604 Paragraphs 7.5.12.3 and 7.5.12.4.

Durability

Serviceable Life

9.1 The Fortress Bottom Plate Anchors are expected to have a serviceable life of at least 50 years, provided they are designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

Table 1: Bracing hold-down characteristic tensile strengths

BC141564

Consent Issued BC141564

Fastener	Wall Type	Characteristic Strength	Maximum BU/m	Minimum Embedment Depth
Fortress 10 x 120 Screw Bolt	Internal wall	11 kN	120	70 mm
	External wall - formed concrete foundation	11 kN	120	
	External wall - masonry header block foundation	Not Tested	Not Tested	
Fortress 12 x 150 Screw Bolt	Internal wall*	15 kN	150	100 mm
	External wall - formed concrete foundation	15 kN	150	
	External wall - masonry header block foundation	15 kN	150	
Fortress 12 x 135 Through Bolt	Internal wall	15 kN	150	65 mm
	External wall - formed concrete foundation	15 kN	150	
	External wall - masonry header block foundation	Not Tested	Not Tested	

* Slab thickening required

Table 2: Bottom plate fastener spacings

Fastener	Wall Type	Maximum Fastener Spacing	Minimum Edge Distance*	Minimum Embedment Depth
Fortress 10 x 120	Internal wall	900 mm	60 mm	70 mm
	External wall - formed concrete foundation	900 mm		
	External wall - masonry header block foundation	600 mm		
Fortress 12 x 150	Internal wall**	900 mm	60 mm	100 mm
	External wall - formed concrete foundation	900 mm		
	External wall - masonry header block foundation	900 mm		
Fortress 12 x 135 Through Bolt	Internal wall	900 mm	60 mm	65 mm
	External wall - formed concrete foundation	900 mm		
	External wall - masonry header block foundation	600 mm		
Fortress 12 x 120 Through Bolt	Internal Wall	900 mm	N/A	50 mm

*This edge distance is to the centre of the fastener (which is 55 mm cover).

** Slab thickening required.

Maintenance

10.1 The Fortress Bottom Plate Anchors will not normally require maintenance. However, if damage occurs to the cladding or lining covering the Fortress Bottom Plate Anchors, then repairs or replacement of the cladding or lining must be carried out to ensure the integrity of the Bracing System.

External and Internal Moisture

11.1 The Fortress Bottom Plate Anchors are protected from moisture by the exterior cladding and internal lining systems of the building, which must meet the provisions of NZBC Clause E2 and Clause E3.

Fastener Installation

13.1 The Fortress Bottom Plate Anchors must be installed in accordance with the Technical Literature.

13.2 Fortress Bottom Plate Anchors are installed by drilling a hole into the concrete of a diameter and to the depth specified in the Technical Literature and tightening up the anchor with a torque wrench to the required load given in the Installation Instructions.

13.3 Prior to wall lining application, when all timber framing moisture content is 20% or less, as required by the wall lining manufacturer, fasteners must be checked for tightness.

Inspections

14.1 The Technical Literature of Fortress Bottom Plate Anchors and the bracing system proprietor must be referred to during the inspection of installations.

14.2 Critical areas of inspection for wall bracing systems are:

- The bracing schedule; and,
- Bracing rating and fastener strength; and,
- Hold down fastener type by checking the markings on the top of the anchor; and,
- Edge detail and distance; and,
- Fasteners are not to be used in header block foundations in Zone D as defined in NZS 3604.

Installation Information

Installation Skill Level Requirement

12.1 Installation of the Fortress Bottom Plate Anchors can be carried out by any competent building contractor.

Health and Safety

15.1 Suitable precautions should be taken when drilling concrete to prevent the inhalation of concrete dust. Care should also be taken when using power tools.

Basis of Appraisal

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

Tests

16.1 Testing of the Fortress Bottom Plate Anchors was carried out by BRANZ in accordance with BRANZ Evaluation Method EM1 (1999), as required by NZS 3604.

Other Investigations

17.1 Structural and durability assessments have been provided by BRANZ technical experts.

17.2 Observations have been made by BRANZ to assess the practicability of installation, and to examine completed installations.

17.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

18.1 The manufacture of Fortress Bottom Plate Anchors 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 carries out random sampling and testing of the Fortress Bottom Plate Anchors to ensure ongoing quality.

18.2 The quality of Fortress Bottom Plate Anchors supplied is the responsibility of Manufacturing Suppliers Limited.

18.3 Designers are responsible for the design of buildings incorporating the Fortress Bottom Plate Anchors and the proprietary bracing systems.

18.4 The building contractors are responsible for the quality of construction of the building structure in accordance with the Technical Literature.

18.5 Building owners are responsible for the maintenance of wall claddings and linings as applicable so that the Fortress Bottom Plate Anchors remain protected during their service life.

Sources of Information

- BRANZ Evaluation Method EM1 Method for Evaluating the Strength and Stiffness of Structural Joints, 1999.
- NZS 3604:2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
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Regulations 1992, Clause 3
141564 9/15/2014 Dawn

Amendment No. 1, dated 18 February 2011.

This Appraisal has been amended to update fastener spacings.

Amendment No. 2, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011.

Amendment No. 3, dated 17 June 2013.

This Appraisal has been amended to include the Fortress 12 x 135 Through Bolt and 12 x 120 Through Bolt.



BRANZ

In the opinion of BRANZ, **Fortress Bottom Plate Anchors** 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 **Manufacturing Suppliers 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. **Manufacturing Suppliers 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 **Manufacturing Suppliers 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 **Manufacturing Suppliers Limited** or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 29 April 2010