



WAIMAKARIRI
DISTRICT COUNCIL

AS BUILT TRUSS LAYOUT REQUIRED –

This must be received by the Building Unit
AT LEAST 10 WORKING DAYS PRIOR to the
Structure Pre-Roof Pre-Wrap Inspection

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

BC No: 180473

SITE DETAILS:

17 LILIAN STREET

KAIAPOI

LEGAL:

LOT 45 DP 460884

**APPROVED BUILDING CONSENT DOCUMENTS AND PLANS
(FULL SET SUPPLIED)**

- ON SITE COPY -

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

INSPECTIONS

for bookings or building enquiries

please phone the BUILDING UNIT on:

03 311 8906

or

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

- Please refer to your inspection schedule for details of inspections to be carried out.
- 2-3 working day's notice should be given and provision made to allow access.
- The Code Compliance Certificate will be issued once the:
 - Final inspection has been carried out and passed
 - Audit of WDC building consent file has been completed
 - Payment of any outstanding invoices is received

Dial Before You Dig

Safety near underground cables and services

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

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

Working near electricity cables

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

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

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

Steps to ensure safe digging

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

Underground electricity cables

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

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

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

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

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

Underground council services

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

Contact MainPower

To report a fault:
0508 60 70 80

For electricity emergencies:
0508 60 70 80

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



mainpower

Dial before you dig.

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

03 311 8300

Think for Safety's Sake

www.mainpower.co.nz

DWELLING & OTHER WORKS - NOT COMMERCIAL

SECTION 1

Statutory Forms

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

PLEASE NOTE

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

To book inspections ring WDC on
03 311 8906

All inspections are subject to a separate charge.

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

Using engineers & other professionals

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

Confirmation of installation of products

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

Applying for a Code Compliance Certificate (CCC)

When you are satisfied your project is complete please book a final inspection and complete and sign *form 6*, application for Code Compliance Certificate which is enclosed with your building consent. You should have this form ready for when the building Inspector arrives on site to carry out the final inspection. Please note all outstanding monies must be paid prior to the issue of the CCC.

Grant or refuse a CCC

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

Lapsing of your consent

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

Site Inspection Sheet

Application

Phoenix Homes NZ Limited, C/- W2 Limited PO Box 130111 Armagh Christchurch 8141	No.	BC180473
	Issue date	28 May 2018
	Overseer	Steve Dale

Project

Description	1100 New (& prebuilt) House, Unit, Bach, Crib, Town Houses BC - New or Relocated Dwelling, Gas Fire or Boiler Unit, New Detached Dwelling, 01 Standard Building Consent(20 W Processing Days)
Intended Life	Indefinite (50+)
Intended Use	Residential
Estimated Value	\$500000.00
Location	17 Lilian Street KAIAPOI
Legal Description	LOT 45 DP 460884 0.068000 Ha
Valuation No.	2175402026

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

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

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

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

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

BC180473 *Main BC*
Building Name: New Dwelling
Location within Site: Entire site
Level/Unit Number: Lot 45
Compacted Hardfill - pre DPM -
Foundation / Floor Slab - Also includes engineers pre-pour site notes to be submitted to inspector
Pile Holes - Deck
First Floor Framing -
Structure Pre Roof Pre Wrap - Also includes engineers structural inspection site notes to be submitted to inspector
Membrane - Pre Installation -
Building Wrap & Sill Tape -
Cavity Battens & Flashings (1) - Eterpan
Cavity Battens & Flashings (2) - Vertical Cedar WB
AAC-AAC Panel Part Installed -
Pre Plaster & Flashings -
Drains - All drains to be under test
Plumbing - First floor drainage completed / under test
Preline - Includes potable plumbing under pressure test
Prestopping -
Wet Area Tanking -
Final -



Form 5

Building consent BC180473

Section 51, Building Act 2004

The building

Street address of building: 17 Lilian Street KAIAPOI

Legal description of land where building is located: LOT 45 DP 460884 0.068000 Ha

Valuation number: 2175402026

Building name: New Dwelling

Location of building within site/block number: Entire site

Level/unit number: 2

The owner

Name of owner: Phoenix Homes NZ Limited

Contact person: Ellen Liang

Mailing address: 34 Beachvale Drive Kaiapoi 7630

Street address/registered office:

Phone number: Landline:

Mobile: 0275588511

Daytime:

After hours:

Facsimile number:

Email address: director@phoenixhomes.co.nz

Website:

First point of contact for communications with the council/building consent authority:
W2 Limited

Building work

The following building work is authorised by this building consent:

TWO STOREY DWELLING WITH ATTACHED GARAGE AND GAS FIRE 17 LILIAN STREET KAIAPOI LOT 45 DP 460884

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

Housing - Detached dwellings

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

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

This building consent is subject to the following condition:

The Building Act 2004, s90, states that agents authorised by the building consent authority (the Council) for the purposes of this section are entitled, at all times during normal working hours or while building work is being done, to inspect –

- (a) land on which building work is being or is proposed to be carried out; and
- (b) building work that has been or is being carried out on or off the building site; and
- (c) any building.

This building consent is issued with the following advice notes:

Comply with the endorsements on the plan.

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

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

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

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

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

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

Licensed building practitioners records of work shall be provided to the building consent authority for foundations, carpentry / primary structure, roof cladding, wall cladding systems, brick & block laying as applicable at the conclusion of the relevant work.

Intended Life of the building (work) is less than 50 years: BA2004 113(2)(a) The building (work) must be altered, removed, or demolished on or before the end of 20 years from the date of issue of this consent (being the specified intended life of the building); or BA2004 114(2)(b) The owner of a building must give written notice to the territorial authority if the owner proposes to extend the life of a building that has a specified intended life.

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

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

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

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

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

The smoke alarm installer, registered electrician, shall supply a construction statement on satisfactory completion of the commissioning test. The statement to state that the smoke alarm has been installed to NZS 4514:2009.

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

The installer shall provide the building consent authority a PS3 for the installation of the fibre cement sheet cladding prior to issue of Code Compliance Certificate

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

The installer shall provide the building consent authority a PS3 for the installation of the roofing/decking membrane prior to issue of Code Compliance Certificate

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

The installer shall provide a PS3 for the installation of the Heating Unit prior to issue of Code Compliance Certificate

Critical Siting: 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/s to which it relates and meets the District Plan requirements for site coverage, setbacks, recession planes and critical finished floor levels (FFL= 3.2m AMSL).

Compliance schedule

A Compliance Schedule is not required for this building.

Attachments

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

Consented Plans

Consented Specifications

Inspection List

Form 6 Application for Code Compliance



Shirley Cresswell
Building Unit Administrator

On behalf of: Waimakariri District Council
Date: 28 May 2018

Form 6

Application for code compliance certificate

Section 92, Building Act 2004

The building consent

Building consent number: BC180473

Issued by: Waimakariri District Council

Valuation number: 2175402026

The owner

Name of owner: Sovereign Palms Limited

Contact person: Ellen Liang

Mailing address: 34 Beachvale Drive Kaiapoi 7630

Street address/registered office:

Phone number: Landline:

Mobile: 0275588511

Daytime:

After hours:

Facsimile number:

Email address: director@phoenixhomes.co.nz

Website:

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

Agent

Name of agent: W2 Limited

Contact person: Matt Wilkie

Mailing address: PO Box 130111 Armagh Christchurch 8141

Street address/registered office:

Phone number: Landline:

Mobile:

Daytime: 033660966

After hours:

Facsimile number:

Email address: design@w2.co.nz; office@w2.nz

Website:

Relationship to owner:

Application

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

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

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:

Applicant: 34 Beachvale Drive Kaiapoi 7630

Agent: PO Box 130111 Armagh Christchurch 8141

Signature of agent on behalf of and with the authority of the owner

Name of person signing

Date:

Attachments

The following documents are attached to this application:

☐ Certificates from the personnel who carried out the work

☐ Certificates that relate to the energy work



WAIMAKARIRI
DISTRICT COUNCIL

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

PRODUCER STATEMENT PIPEWORK TESTING

BC No.

Issued by (Plumber):

At (address):

For (Owner):

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

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

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

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

Max working pressure was:

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

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

All work complies with the NZBC

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

SIGNATURE OF LICENSED CERTIFYING PLUMBER:

Signature:

Registration Number:

Company Name:

Date:



WAIMAKARIRI
DISTRICT COUNCIL

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

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

BC180473

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

BC No.

THE BUILDING

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

THE OWNER

10. Owner's name:
(Company or organisation name if applicable)
11. Contact person:
12. Mailing address:
13. Street address / Registered office:
14. Mobile: Landline: Email:
15. The following evidence of ownership is attached to this application:
 - Copy of Certificate of Title OR Council to provide (additional charge of \$15)
(Current within 1 month of being issued and must include a deposited plan [diagram])
 - Signed copy of Sale and Purchase Agreement
(If Certificate of Title is not issued)

THE AGENT

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

16. Agent's name:
(Company or Organisation name if applicable)
17. Contact person:
18. Mailing address:
19. Street address / Registered office:
20. Mobile: Landline: Email:

APPLICATION

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

- | | |
|--|--|
| <input type="checkbox"/> Project Information Memorandum (PIM) only | <input type="checkbox"/> Building Consent for PIM No: <input type="text"/> |
| <input type="checkbox"/> Building Consent with PIM | <input type="checkbox"/> Building Consent without PIM (Compliance Check applies) |
| <input type="checkbox"/> Exemption from the need for B/C
(Refer Schedule 1, Part 1, Section 2, BAA13) | <input type="checkbox"/> Amendment to Building Consent |

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

PLEASE NOTE - If USB or Hard Copy please confirm if you wish to pick it up from the council or have it posted/couriered (couriered will incur an additional cost).

- Electronically via Sharefile Transfer Portal ⁽¹⁾
- USB: (post) OR (pick-up) OR (courier)
- Hard copy: (post) OR (pick-up) OR (courier)

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

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

Company name:
(If applicable)

Contact person:

Mailing address:

Mobile: Landline: Email:

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

24. Please also provide:

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

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

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

PLEASE NOTE - One set of "On-site" hard copy consented documents must be available at all times for inspections.
If the applicant chooses to print their own "On-site" copy of documents it must be a full set in colour, to scale and legible.
If there are non-consented documents on-site this will result in a failed inspection.

PROJECT

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

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

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

If yes provide details

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

29. Intended life of the building:

Indefinite but not less than 50 years Or specified as years

30. Is this a staged consent: Yes No

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

31. List Building Consents previously issued for this building (if any):

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

32. Estimated value (incl GST) \$

(i.e. the estimated aggregate of the values of all goods and services to be supplied for the building work and includes GST).

GEOTECHNICAL REPORT

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

Report number:

PROJECT INFORMATION MEMORANDUM

The following matters are involved in the project:

- Subdivision
- Alterations to land contours
- New or altered connections to public utilities
- New or altered locations and/or external dimensions of buildings
- New or altered access for vehicles
- Building work over or adjacent to any road or public place
- Disposal of stormwater and wastewater
- Building work over any existing drains or sewers or in close proximity to wells or water mains
- Other matters known to the applicant that may require authorisations from the territorial authority:

NOTES

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

A large, empty rectangular box with a light gray border, occupying most of the page. It is intended for notes or comments, as indicated by the text above it.

BUILDING CODE COMPLIANCE

The building work will comply with the building code as follows:
(If you are not sure what clauses are applicable, consult with your builder, designer or architect).

Clause (Tick relevant clause numbers of Building Code)	Means of compliance (Refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications; if not applicable, put n/a)	Waiver / modification required (State nature of waiver or modification of building code required; if not applicable, put n/a)
<input checked="" type="checkbox"/> B1 Structure	B1/AS1	
<input checked="" type="checkbox"/> B2 Durability	B2/AS1	
<input checked="" type="checkbox"/> C1 - C6 Protection from fire	C1/AS1	
<input checked="" type="checkbox"/> D1 Access routes	D1/AS1	
<input type="checkbox"/> D2 Mechanical installations for access		
<input checked="" type="checkbox"/> E1 Surface water	E1/AS1	
<input checked="" type="checkbox"/> E2 External moisture	E2/AS1	
<input checked="" type="checkbox"/> E3 Internal moisture	E3/AS1	
<input type="checkbox"/> F1 Hazardous agents on site		
<input checked="" type="checkbox"/> F2 Hazardous building materials	F2/AS1	
<input type="checkbox"/> F3 Hazardous substances and processes		
<input checked="" type="checkbox"/> F4 Safety from falling	F4/AS1	
<input checked="" type="checkbox"/> F5 Construction and demolition hazards	F5/AS1	
<input type="checkbox"/> F6 Visibility in escape routes		
<input checked="" type="checkbox"/> F7 Warning systems	F7	
<input type="checkbox"/> F8 Signs		
<input type="checkbox"/> F9 Means of restricting access to residential pools		
<input checked="" type="checkbox"/> G1 Personal hygiene	G1/AS1	
<input checked="" type="checkbox"/> G2 Laundering	G2/AS1	
<input checked="" type="checkbox"/> G3 Food preparation and prevention of contamination	G3/AS1	
<input checked="" type="checkbox"/> G4 Ventilation	G4/AS1	
<input checked="" type="checkbox"/> G5 Interior environment		
<input type="checkbox"/> G6 Airborne and impact sound		
<input checked="" type="checkbox"/> G7 Natural light	G7/AS1	
<input checked="" type="checkbox"/> G8 Artificial light	G7/AS1	
<input checked="" type="checkbox"/> G9 Electricity	G9/AS1	
<input checked="" type="checkbox"/> G10 Piped services	G10/AS1	
<input checked="" type="checkbox"/> G11 Gas as an energy source	G11/AS1	
<input checked="" type="checkbox"/> G12 Water supplies	G12/AS1	
<input checked="" type="checkbox"/> G13 Foul water	G13/AS1	
<input type="checkbox"/> G14 Industrial liquid waste		
<input type="checkbox"/> G15 Solid waste		
<input checked="" type="checkbox"/> H1 Energy efficiency	H1/AS1	

COMPLIANCE SCHEDULE

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

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

There are no specified systems in the building

RESTRICTED BUILDING WORK

Does the building work include any restricted building work? Yes No

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

LICENCE CLASS	NAME	LICENSED BUILDING PRACTITIONER NUMBER (or registration number if treated as being licensed under section 291 of the Building Act 2004)
FOUNDATIONS		
CARPENTRY		
EXTERIOR PLASTERER		
BRICKLAYER		
BLOCKLAYER		
ROOFER		

KEY PERSONNEL

BUILDER

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

DESIGNER(S)

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

CERTIFYING DRAINLAYER

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

CERTIFYING PLUMBER

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

CERTIFYING GASFITTER

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

REGISTERED ELECTRICIAN

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

STRUCTURAL ENGINEER

Name: Reg. No.:

Address:

Phone No.: Fax No.:

Email:

OWNER / AGENT AUTHORISATION

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

Name:

Date:

I am the Owner Agent

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

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

AGENT AUTHORISATION (TO BE AUTHORISED BY OWNER)

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

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

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

Name (Owner):

Date:

TERMS OF TRADE

I/We understand that:

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

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

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

PHOENIX HOMES NZ LIMITED (6248227) Registered

To maintain this company [log on here](#)

[View previous names](#)

Last updated on 20 Mar 2017

Company Summary Addresses Directors (1) Shareholdings (1) Documents (4) PPSR Search

Company number: 6248227

NZBN: 9429045987281

Incorporation Date: 07 Mar 2017

Company Status: Registered

Entity type: NZ Limited Company

Constitution filed: No

AR filing month: July

[Ultimate holding company](#) No

[Company addresses:](#) **Registered Office**
34 Beachvale Drive, Kaiapoi,
Kaiapoi, 7630 , New Zealand
Address for service
34 Beachvale Drive, Kaiapoi,
Kaiapoi, 7630 , New Zealand

[View all addresses](#)

[Directors](#) Showing 1 of 1 directors

Jun LIANG
34 Beachvale Drive, Kaiapoi,
Kaiapoi, 7630 , New Zealand

Company record link: <http://app.companiesoffice.govt.nz/co/6248227>

DOCUMENTATION CHECKLIST

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

PIM

This section must be completed if you are applying for a PIM.

DO NOT complete this section if a PIM has already been issued.

The following documents are attached to this application:

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

BUILDING CONSENT

(DO NOT complete this section if the Application is for a Project Information Memorandum only)

The following documents are attached to this application:

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

**OFFICE
USE ONLY**

These have
been provided:

APPLICATION FORM (One copy)

- 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 3604:2011

DESIGN DOCUMENTS (One copy)

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

SITE PLAN (One copy)

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

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

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

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

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

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)

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

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

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

CROSS SECTION AND CONSTRUCTION DETAILS (One copy to scale usually 1:50 or 1:20 for sections and 1:10 for details - minimum scale)

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

SPECIFICATION (One copy)

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

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

BC180473

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

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

OFFICE USE ONLY
These have been provided:

GEOTECHNICAL REPORT

- Unique report reference number provided, if applicable

OFFICE USE ONLY

Further information required? Yes No

Date of acceptance: Officer:

OFFICE USE ONLY

Fee paid on application: \$ Date: Officer:

Date payment processed: Receipt Officer:

IMPORTANT INFORMATION

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

APPLICATION INFORMATION

- (a) Project Information Memorandum (PIM):
A PIM will be issued within 20 working days provided all the required information is supplied with the application. Processing time is stopped whenever further information is required and starts again when the correct information is received. It is not mandatory to apply for a PIM. Applicants can choose not to apply for a PIM when they consider that the information would not be relevant for their building project. A fee is required to accompany your PIM application (as per Council's fees and Charges Schedule).
- (b) Compliance Check:
Where a PIM is not sought, a Compliance Check will be undertaken to ensure your proposal complies with the District Plan.
- (c) Building Consent (BC):
A Building Consent will be processed within a maximum allowable time of 20 working days provided all the information required has been supplied. Processing time is stopped whenever further information is required and starts again when the correct information is received. Once the Building Consent has been granted, you will receive notification, which will include an invoice for the fees payable. Once the fees are paid in full, your Building Consent will be issued. Work must not start until the Building Consent is issued, and any Resource Consent requirements have been resolved. A Building Consent lapses and is of no effect if the building work to which it relates does not commence within 12 months after the date of issue of the Building Consent or any further period that the Building Consent Authority may allow.
- (d) Combined Project Information Memorandum & Building Consent Applications:
Applications for a combined PIM/BC will only be accepted when sufficient information is provided to permit the Building Consent to be processed. If insufficient information is provided, then further information will be requested, or your application may be returned to you.
- (e) If the applicant does not own the land, they must provide written approval from the owner to submit this application.

LEVIES PAYABLE

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

Building Act 2004 – <http://www.legislation.govt.nz/act/public/2004/0072/latest/whole.html>

Building Levy Order 2005 – <http://www.legislation.govt.nz/regulation/public/2005/0033/latest/whole.html#DLM313989>

Building Research Levy Act 1969 - <http://www.legislation.govt.nz/act/public/1969/0023/latest/whole.html>

INSPECTIONS

During the process of construction, inspections will be necessary to confirm all work complies with your approved Building Consent documentation. Please phone the Council Building Unit on 03 311 8906 at least 48 hours in advance of requiring an inspection to ensure that this can be arranged.

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

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

RESOURCE CONSENT

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

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

CODE COMPLIANCE CERTIFICATE

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

*Fees apply

AGENCY

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

The Agent will be the first point of contact for all communications with the Council/Building Consent Authority regarding this application under Sections 33 and 45 and if authorised, the application for a Code Compliance Certificate under Section 92 of the Building Act 2004. They will receive all correspondence and must be authorised by the Owner - see page 8. All amendments require new authorisation.

IAS-VJun14



Sales & Purchase Agreement

Stage 1

This is a legal document. You should read this carefully before you sign it.

To Sovereign Palms Ltd, (the Vendor)

I/We hereby offer to purchase Lot 45 the freehold property situated at 17 Lillian Street, Sovereign Palms, Kaiapoi, DP 460884 on the following terms and conditions.

<u>Purchase Price</u> (Zero Rated)	\$	164,347.83
<u>Deposit</u> to be paid on acceptance	\$	16,434.83
<u>Settlement</u>	\$	147,913.00

to be paid on or before 6 months from Possession Date

Possession Date – on or before 30 March 2018

Deposits will be held in Cameron & Co's Trust Account without disbursement until Title issues.

Name of Purchaser(s)	Phoenix Homes NZ Ltd	Leon Liang 027 558 8511 Contact day time telephone number
Address of Purchaser(s)	34 Beachvale Drive, Kaiapoi 7630	Email: director@phoenixhomes.co.nz
Signature of Purchaser(s)	X	Purchaser(s)'s Solicitor Karen Faalilo
Signature of Vendor p.p. Sovereign Palms Limited		Property Transfer Office Ltd PO Box 16709 Hornby Christchurch 8441
	Dated this 23 day of June 2017	

Zero Rating GST - The vendor warrants that they are GST registered and the purchaser is or will be registered for GST by settlement and that the intended use is for making taxable supplies and does not intend to use the property as a principal place of residence. The purchaser accepts that if any incorrect information is provided, there could be a GST liability.
Purchasers GST number #122-295-664

Vendor's Solicitor Ari Segaran of Cameron & Co, PO Box 1985, Christchurch 8140

Sovereign Palms is a Fibre ready subdivision

Any new homes built in the subdivision should be installed with telecommunications cabling that complies with the Telecommunications Carrier's Forum's Premises Wiring Code. Information about this code and wiring requirements is available on the website www.shorus.co.nz/wiring.

- Special Conditions of Contract - The purchaser/s acknowledges that the following covenants will be binding on this land and any successive purchaser/s and unless already registered as land covenants any transfer of the said land shall contain covenants to this effect.
- The purchaser shall not erect any dwelling other than one new dwelling house with a minimum floor area, including garaging, of not less than: 200.m2 for sections over 750.m2 - 175.m2 for sections 750.m2 and under - 150.m2 for sections under 600.m2 or any back section
 - The dwelling must be built on site and from individual designs. No re-locatable, kitset homes or second hand materials may be used without specific written permission from the Vendor and in strict compliance with any conditions included in the said permission.
 - Plans for any dwelling and or garage must be approved in writing by the Vendor, prior to construction. These plans must detail exterior cladding, lot & D.P. number. The purchaser agrees that any concrete block garage wall must be covered with the same exterior cladding as the majority of the dwelling.
 - The purchaser agrees not to construct, place or permit any caravan, hut or other structure, for any kind of permanent or temporary residential use other than a new house as per clause a.
 - Construction must not commence until all capped boundary fences are erected. The purchaser agrees that no front or side fences will be erected within two metres of the section's boundary fronting the road, unless a corner site. The purchasers of any corner section may request written consent from the Vendor to allow a fence fronting the road to be within one metre of the section's boundary on one of the road boundaries.
 - The purchaser agrees to partially construct the driveway crossing, up to and including road metalling, prior to construction commencing.
 - Gas bottles must not be visible from the street.
 - The purchaser agrees to keep their vacant section mown, tidy and rubbish free.

1. Vacant possession of this property shall be given and taken on the date stated above or the date of settlement at which date rates shall be apportioned.
2. The vendor shall prepare a settlement statement which shall be tendered to the purchaser a reasonable time prior to settlement.
3. The balance of the purchase price as detailed in the settlement statement shall be paid by the purchaser to the vendor without deduction in cleared funds.
4. The instruments transferring title to the purchaser will be prepared and registered as electronic instruments.
 - A. The purchaser's solicitor will prepare the transfer instrument in Landonline workspace, then certify and sign the transfer instrument a reasonable time prior to the settlement date.
 - B. The vendor's solicitor will prepare, certify, sign and pre-validate the transfer instrument a reasonable time prior to the settlement date in the Landonline Workspace along with all other instruments required to transfer title to the purchaser and release the same instruments upon settlement so the purchaser's solicitor can then submit them immediately after settlement for registration.
5. Where a plan of subdivision including the land in this agreement is lodged for deposit in the Land Transfer office then the purchaser is deemed to have accepted the title except for any objections or requisitions which the purchaser is entitled to make which have been notified in writing to the vendor's solicitor within 5 working days of the date of deposit of the plan and prior to settlement. If the vendor is unable or unwilling to satisfy any objection or requisition then either party may give 3 working days notice in writing that the contract is cancelled, any deposit paid will be refunded and neither party will have any claim against the other.
6. Sovereign Palms Ltd and the Waimakariri District Council shall not be liable or called upon to erect or contribute to the erection of any boundary or dividing fences between the said property and any other adjoining property owned by the vendor but this provision shall not enure for the benefit of any subsequent purchasers of the said adjoining property.
7. The purchaser accepts that the land and improvements have been inspected and purchases solely in reliance upon his/her own judgment and not upon any representation or warranty made by the vendor or any agent of the vendor.
8. The purchaser will not lodge any caveat against any title to the land at anytime the land is not contained in its own certificate of title.
9. If from any cause whatsoever (except the default of the vendor) any part of the purchase price is not paid to the vendor on the due date specified the purchaser shall pay to the vendor interest at the rate of 15% per annum on the remainder of the purchase money, from the date due until completion of the purchase but this stipulation is without prejudice to any of the vendor's rights under this agreement.
10. If the purchaser makes default in payment of any money due including interest or in the performance or observance of these conditions (time being strictly of the essence) and such default shall be continued for the space of ten working days the vendor without prejudice to their other remedies may; A. Sue the purchaser for specific performance or for damages for breach of contract or both; or B. Cancel the contract without the necessity of giving any notice or making any formal demand (Section 8 of the Contractual Remedies Act notwithstanding) and in that event they may pursue all or any of the following remedies: (1) Re-enter upon and take possession of the property and its profits if any without responsibility for loss (2) Forfeit and retain all moneys paid by the purchaser (3) Sue the purchaser for damages against which the vendor shall be required to give credit for any moneys forfeited and retained by the vendor (4) Resell the property whether by auction or by private contract, either for cash or on credit and upon such terms as the vendor may think fit with the power to vary any contract for sale. Any deficiency in price and all expenses reasonably incurred in any resale or any attempted resale shall be recoverable by the vendor from the purchaser as liquidated damages.
11. From the date of possession the purchaser will maintain the section prior to construction commencing and during construction, ensure any damage or mess created within the subdivision is cleaned/tidied up promptly.
12. The vendor reserves the right to cancel the contract if any deposit is not paid within 10 working days from when due.
13. The vendor reserves the right to supply the purchaser's name, address and telephone number to any neighbor wishing to make contact in respect of fencing or consents etc.
14. This agreement may be executed in two or more counterparts, all of which will together be deemed to constitute one and the same agreement. A party may enter into the agreement by signing a counterpart copy and sending it to the other party, by either facsimile or email.

Special Conditions

Rates are payable by the purchaser from the date of possession. Any other council charges or fees incurred as a result of starting construction will be payable by the purchaser.

Deposits can be paid directly to Cameron & Co Trust Account (01 6800 436 710) 02

Sovereign Palms Ltd PO Box 13349 Christchurch 8141
 Telephone (03) 366 3729 Fax (03) 365 4423 Email watson@sovereignpalms.com

CERTIFICATE OF DESIGN WORK

ISSUED BY W2 Limited

LBP

Licensed Building Practitioner

Stuart Winterbourn

TO BE SUPPLIED TO

Building consent authority

Waimakariri District Council

IN RESPECT OF

Building Consent Application

AT

Lot 45 DP 460884

W2 JOB NUMBER 17094



Section 45 and Section 30C, Building Act 2004

THE BUILDING

Street address: 17 Lilian Street, Sovereign Lakes

Suburb: **Kaiapoi**

Town/City: Canterbury

Postcode:

THE OWNER

Name(s): Jun Liang – Phoenix Homes

Mailing address: 34 Beachvale Drive

Suburb: Kaiapoi

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 (V)	
<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	lead designer who carried out some of the RBW design myself but also supervised other designer – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
<input type="checkbox"/>	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
<input type="checkbox"/>	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 **Stuart Winterbourn** 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
Tick (✓) if included Cross (X) if excluded	[If appropriate, provide details of the restricted building work]	[Specify whether you carried out this design work or supervised someone else carrying out this design work]	[If appropriate, specify references]

Primary structure

All RBW Design work relating to B1	(✓)	() Carried out (✓) Supervised	
Foundations and subfloor framing	()	() Carried out () Supervised	
Walls	()	() Carried out () Supervised	
Roof	()	() Carried out () Supervised	
Columns and beams	()	() Carried out () Supervised	
Bracing	()	() Carried out () Supervised	
Other	()	() Carried out () Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2	(✓)	() Carried out (✓) Supervised	
Damp proofing	()	() Carried out () Supervised	
Roof cladding or roof cladding system	()	() Carried out () Supervised	
Ventilation system (for example, subfloor or cavity)	()	() Carried out () Supervised	
Wall cladding or wall cladding system	()	() Carried out () Supervised	

Waterproofing ()		() Carried out () Supervised	
Other ()		() Carried out () Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ()		() Carried out () Supervised	
--	--	-----------------------------------	--

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

WAIVERS AND MODIFICATIONS

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

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

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

ISSUED BY

Name: Stuart Winterbourn	LBP or Registration number: 216752
The practitioner is a: () Design LBP () Registered architect (v) Chartered professional engineer	
Design Entity or Company (optional): W2 Limited	
Mailing address (if different from below):	
Street address / Registered office: 96 Disraeli Street	
Suburb: Sydenham	Town/City: Christchurch
PO Box/Private Bag: 130 111	Postcode: 8141
Phone number: 366 0966	Mobile:
After Hours:	Fax:
Email address: design@w2.co.nz	Website: www.w2.co.nz

DECLARATION

I Stuart Winterbourn, LBP, BE Hons (Civil), MIPENZ, CPEng 216752

state that I have applied the skill and care reasonably required of a competent design professional in

W 2 L I M I T E D P O B O X 1 3 0 1 1 1 C H R I S T C H U R C H 0 3 3 6 6 0 9 6 6 W W W . W 2 . C O . N Z

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: 29/03/2018

SECTION 2

Geotech, Engineer

Reports & Conditions

PS1 & 2

- **Calculations**
- **A4 Details**



Sovereign Lakes Subdivision, Kaiapoi

Lot 45

Lot-Specific Geotechnical Report

4 June 2013

<p>Development Proposal</p>	<p>Domestic dwelling with garage to NZS3604 incorporating all relevant supplementary recommendations issued by the Ministry of Business, Innovation and Employment (MBIE) (previously the Department of Building and Housing).</p> <p>At the time of writing this report key reference resources include¹:</p> <ul style="list-style-type: none"> • http://www.dbh.govt.nz/canterbury-earthquake-residential-building • Repairing and rebuilding houses affected by the Canterbury earthquakes; MBIE, December 2012 <p>NB Certain foundation details included in the current version of NZS3604 are precluded from use.</p> <p>¹ Web links and reference documents can change / evolve over time. Reference should always be made to the most recent Ministry guidance for advice on design requirements.</p>
<p>Earthworks / Ground Preparation</p>	<p>The lot has been subject to relatively minor earthworks (cut) to produce a level platform.</p>
<p>Fieldwork</p>	<p>5 x dynamic cone penetration tests and 1 x hand auger bore. <i>Refer to attached investigation plan for positions.</i></p>
<p>Ground Conditions</p>	<p>Published geology</p> <p>The Sovereign Lakes Subdivision is predominantly underlain by Holocene sand, silty sand and gravelly sand deposits of an extensive historic dune field that lies along the coastal fringe from Sumner to the Waipara River. The gravel may represent beach gravels or may be fluvial gravel in former channels. Some areas of the site have a mantle of silty soil.</p> <p>Lot-specific comments</p> <p><i>Refer to attached ground investigation test results.</i></p> <p>The ground profile encountered in the auger borehole is consistent with the published geology.</p> <p>The groundwater level is typically in the order of 1 to 2 metres below ground level. Comments on groundwater observations made during the fieldwork are included in the attached investigation records.</p>
<p>Bearing Capacity</p>	<p>The following comments are based on the assumptions for compliance stated on the attached Ground Investigation Test Results (see green shaded area):</p> <ul style="list-style-type: none"> • The dynamic cone penetration tests confirm the soil penetration resistance at the test locations generally complies with the criteria for <i>Good Ground</i> as defined in NZS3604. • The soil below the underside of the foundations may be assumed to have a static ultimate bearing capacity 'index' value of not less than 300kPa. <p>The assumptions for compliance stated above are specific to the foundations only as referred to in Section 3 of NZS3604 (Site Requirements).</p> <p>The indicated dimensions on the Ground Investigation Test Results page, if</p>

	<p>adopted, will result in compliance with <i>Good Ground</i> and relate specifically to the ground directly below the foundation.</p> <p>For guidance on the ground enclosed by the perimeter foundation for concrete slab-on-grade foundations, refer to the Ground Preparation section of this report.</p>
Liquefaction Hazard Assessment	<p>A Liquefaction Hazard Assessment has been carried out by Coffey Geotechnics for the Sovereign Lakes Subdivision (June 2012). Addendum 1 (June 2013) accommodates the updated MBIE guidance (Dec 2012).</p> <p>The liquefaction characteristics of the area satisfy the deformation limits for Green Zone Technical Category 1 (TC1) land in accordance with MBIE guidance.</p> <p>Future land performance expectation for TC1 land is "Liquefaction damage is unlikely in a future large earthquake" (MBIE, Table 3.1).</p>
Foundation Requirements	<p>Use foundations provided in NZS3604 Timber Framed Buildings, as modified by MBIE amendments and guidance documents.</p> <p>At the time of writing this report a key reference is:</p> <ul style="list-style-type: none"> • <i>Revised guidance on repairing and rebuilding houses affected by the Canterbury earthquake sequence</i>; MBIE December 2012. <p>An overview of the design process is provided in Figure 5.1 of the MBIE guidance. For this TC1 site the <u>minimum foundation requirements</u> are:</p> <ul style="list-style-type: none"> • Foundation Type A (timber floor with piles) as per NZS 3604; or • Foundation Type B (timber floor with concrete perimeter footing) built as per NZS 3604 but with enhanced perimeter foundation; or • Foundation Type C* as per NZS 3604 but with tied reinforced concrete, as modified by B1/AS1, which requires ductile reinforcing in slabs: refer to MBIE information sheet at http://www.dbh.govt.nz/seismicity-info. <p>* Homeowners can choose a more robust Type C slab foundation option to provide greater structural resilience against earthquake-induced damage. For this site the TC2 Options 2, 3 or 4 would be suitable. Refer to MBIE December 2012 guidance; Section 5. Owners should check the relative cost of each option for their project as we have found that the most resilient option (Option 4) is not necessarily the most expensive.</p>
Ground Preparation	<p>We recommend the good practice to compact (tamp or roll) the ground in foundation excavations to ensure the founding zone is tight and free of soft/loose soil prior to placing concrete.</p> <p>For Type C foundations (concrete slab-on-grade) requirements for the ground enclosed by the perimeter foundation is covered separately in NZS3604, Section 7.5. For example, Section 7.5.9 gives details for the bearing of the granular fill for the slab itself. For the granular base requirements (Section 7.5.3) a minimum of 75mm granular fill is required under the slab.</p>

<p>Ground Inspection</p>	<p>We recommend the good practice for a competent, suitability experienced person to verify the ground at the actual foundation locations and the ground enclosed by the perimeter foundation is consistent with the ground conditions encountered during investigation (i.e. as reported above – see <i>Ground Conditions</i>). Coffey can provide this service.</p> <p>The inspection should pay particular attention to the topsoil. We note that at Sovereign Lakes the material that has been placed as “topsoil” can in fact be brown sand (not <i>organic topsoil</i>) and compacts down well. If this is the case, a competent inspector may be able to make an informed decision to reduce the amount of excavation required for the foundations and the slab. It is only during the site’s ground preparation that these observations and decisions can be made.</p>
---------------------------------	--

Limitations

This report has been prepared only for the use of our client, Sovereign Palms Ltd, their professional advisers, Waimakariri District Council and future owners of the lot referred to herein, in relation to the specific project described. No liability is accepted in respect of its use for any other purpose or by any other person or entity.

The opinions, recommendations and comments given in this report result from the application of normal methods of site investigation. As factual evidence has been obtained solely from test methods that by their nature only provide information about a relatively small volume of subsoils, there may be special conditions pertaining to this site that have not been disclosed by the investigation and that have not been taken into account in the report. If variations in the subsoils occur from those described or assumed to exist, then the matter should be referred to us immediately.

Closure

If you have queries or you require further clarification on any aspects of this report, please do not hesitate to contact the undersigned.

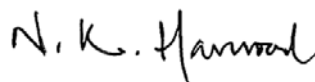
For and on behalf of Coffey Geotechnics (NZ) Limited



R M Hawksworth

BSc(Hons)

Project Engineering Geologist

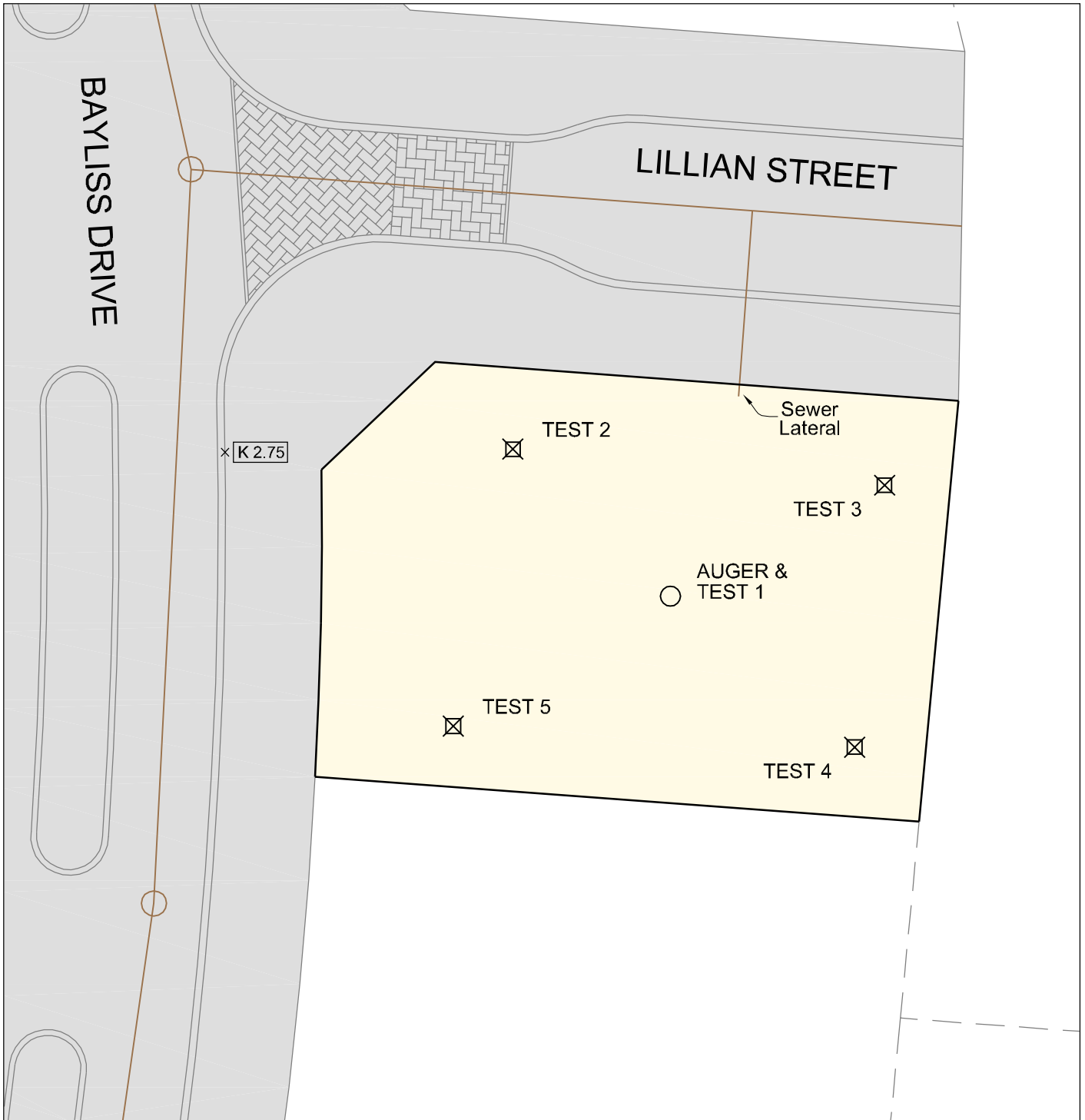


N K Harwood

BEng(Hons) MSc MIPENZ CPEng

Principal Geotechnical Engineer

*Attachments: Geotechnical Investigation Location Plan
Ground Investigation Test Results*



Notes:

Positions surveyed by kb Contracting

Test = Dynamic Cone Penetration (DCP) test

Sewer lateral & kerb level is design only & subject to final as-built



Davis Ogilvie and Partners Limited
 185 Hazeldean Road, Addington
 P O Box 589, Christchurch 8140
 New Zealand
 ☎ (03) 366 1653 0800 999 333 📠 (03) 379 2348
 ✉ admin@do.co.nz 🌐 www.do.co.nz

drawn	BL (DOP)	<p>SPECIALISTS MANAGING THE EARTH</p>	client:	SOVEREIGN PALMS LIMITED		
approved	BH		project:	LOT 45 DP 460884 SOVEREIGN LAKES SUBDIVISION		
date	June 2013		title:	GEOTECHNICAL INVESTIGATION LOCATION PLAN		
scale	1:300		project no:	15326	figure no:	1
original size	A4					

This report may only be reproduced in full

GROUND INVESTIGATION TEST RESULTS

Lot 45

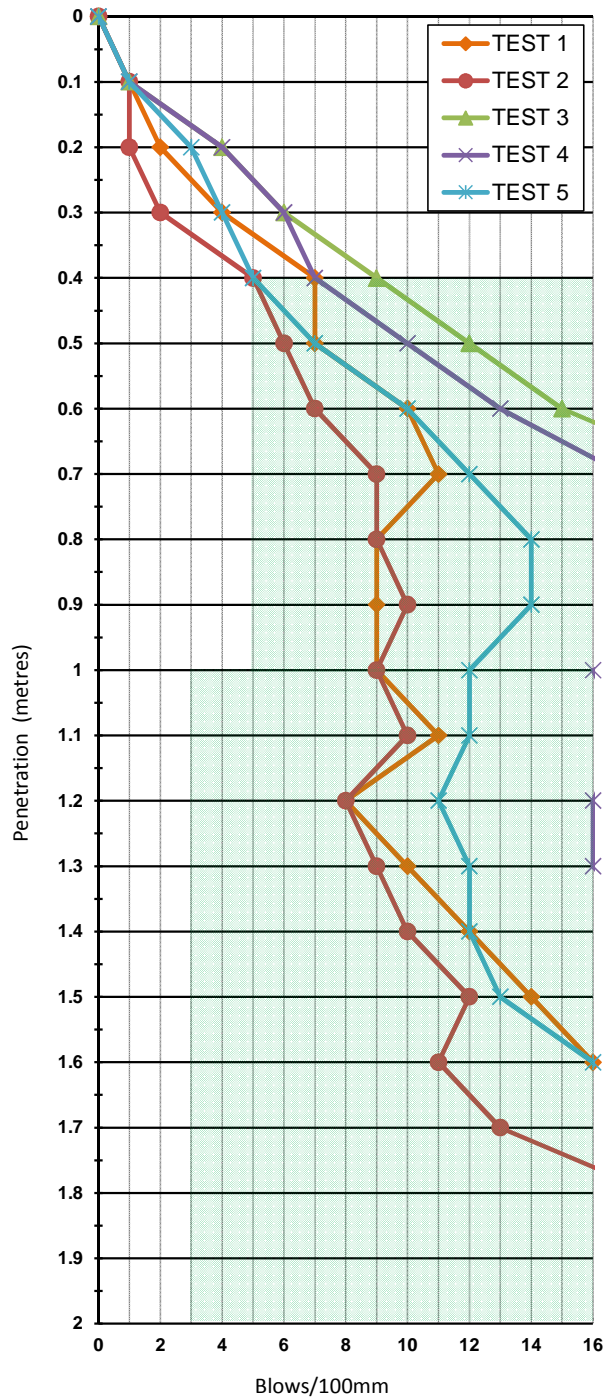
JOB NO.	GENZCHR15326	Compliance with NZS3604:2011; Section 3.
CLIENT	Sovereign Palms Ltd	"Good Ground" indicated by shaded zone, assuming:
PROJECT	Sovereign Lakes Subdivision, Kaiapoi	(i) Depth to Cleared Ground Level = 0m BGL
DATE TESTED	1/05/2013	(ii) Minimum depth to underside of footings = 0.4m BGL
LOCATION	REFER TO SITE PLAN	(iii) Footing width = 0.3m

PENETRATION RESISTANCE TEST RESULTS

HAND AUGER BOREHOLE

Depth tests start at: SURFACE

Inferred groundwater level (mBGL): 1.9



0.00	Silty fine to medium SAND; Dark brown, moist
0.25	Fine to medium SAND; Light brown, moist
0.90	Becoming pale grey, moist
1.55	Becoming grey, moist
1.65	Becoming wet
1.90	Becoming saturated

End of Bore @ 2.00 m



Coffey Geotechnics
 P.O. Box 1872
 Christchurch 8140
 www.coffey.com

TESTED BY: SG
 LOGGED BY: SG
 CHECKED BY: BH

PRODUCER STATEMENT - PS1 - DESIGN

ISSUED BY W2 Limited
 TO Leon & Ellen Liang
owner / developer
 Phoenix Homes NZ Ltd
 DESIGN ENGINEER Pavan Kumar
 TO BE SUPPLIED TO Waimakariri District Council
Building consent authority
 IN RESPECT OF New Residential House Design
 AT Lot 45, 17 Lillian Street, Kaiapoi
 W2 JOB NUMBER 17094



We have been engaged by the owner/developer referred to above to provide **structural engineering design** services in respect of the requirements of Clause(s) **B1** of the Building Code for

All or Part only (as specified in the attachment to this statement), of the proposed building work.

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

- Compliance Documents issued by Department of Building & Housing **B1/VM1 and B1/VM4** or
 Alternative solution as per the attached schedule

The proposed building work covered by this producer statement is described on **W2 Limited's** drawings titled **SOVEREIGN LAKES STRUCTURAL DRAWINGS** together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions; **Underlying soil conditions as described Geotechnical Investigation Report GENZCHRI15326, dated 04/06/2013, prepared by Coffey Geotechnics (NZ) Limited**
 (ii) 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 in the attached schedule, will comply with the relevant provisions of the Building Code.

I, **Stuart Michael Winterbourn** am: **CPEng 216752**

I am a Member of IPENZ and hold the following qualifications: **BE (Hons) Civil, CPEng, M.IPENZ**

W2 Limited holds a current policy of Professional Indemnity Insurance no less than \$200,000*.
 W2 Limited is a member of ACENZ.

SIGNED BY **Stuart Michael Winterbourn** ON BEHALF OF **W2 Limited**

Date 20 April 2018

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

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

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

INSPECTION SCHEDULE

PROJECT New Residential House Design
TO BE SUPPLIED TO Waimakariri District Council
Building consent authority
DESIGN ENGINEER Pavan Kumar
DATE 20/04/2018
AT Lot 45, 17 Lillian Street, Kaiapoi
W2 JOB NUMBER 17094



W2 Limited has been engaged to provide a CM2 level of construction monitoring.

Inspection will cover the following areas:

- Foundation slab rebar caging and base plate embedment's
- Steel frame erection
- Structural Steelwork
- Mechanical Services fixings

W2 is to be advised when the works are ready for inspection at all of the above stages. In some cases the Engineer will deem that an inspection is not necessary, this will be at the discretion of the Engineer. W2 confirms that records of its inspections will be left on site.

A Producer Statement, Construction Observation, will be issued on request once the above inspections have been completed.

It is the owners responsibility to notify W2 Limited (the Engineer) 72 hours minimum in advance to enable the above inspections to be completed.

Stuart Winterbourn
CPEng 216752

W2 Limited



STRUCTURAL CALCULATIONS OF SOVEREIGN LAKES HOUSE

Project TWO STOREY RESIDENTIAL HOUSE

Address 17 LILLIAN STREET, KAIPOI

Date OCTOBER 2017

Revision 0

Engineer PAVAN KUMAR

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

PROJECT

JOB NUMBER

17094

SUBJECT

DATE

S.NO	Description	Page.
1.	Loading calculation	1 - 6
2.	frame section/steel frames A to D	7 - 8
3.	Analysis and design report of frames A, B, C, D	9 - 29
4.	Louvre Frame	30 - 32

PROJECT

RESIDENTIAL HOUSE

JOB NUMBER

17094

SUBJECT

LOADING CALCULATION

DATE

29/11/17

LOADING:

Roof:

$$\begin{aligned} \text{Dead load} &= 0.75 \text{ kN/m}^2 \\ \text{finishes} &= 0.25 \text{ kN/m}^2 \\ &= \frac{\quad}{\quad} = 1 \text{ kN/m}^2 \approx 100 \text{ kg/m}^2 \end{aligned}$$

first floor:

$$\begin{aligned} \text{Dead load} &= 0.75 \text{ kN/m}^2 \\ \text{finishes} &= 0.25 \text{ kN/m}^2 \\ &= 1 \text{ kN/m}^2 \\ \text{Live load} &= 2 \text{ kN/m}^2 \end{aligned}$$

Snow load:

$$\begin{aligned} &0.63 \text{ kN/m}^2 \text{ (ULS)} \\ &0.22 \text{ kN/m}^2 \text{ (SLS)} \end{aligned} \left(\text{refer page 2} \right)$$

Wind load:-

$$\begin{aligned} &0.91 \text{ kN/m}^2 \text{ (ULS)} \\ &0.61 \text{ kN/m}^2 \text{ (SLS)} \end{aligned} \left(\text{refer page 3} \right)$$

Earthquake load

$$\begin{aligned} a_d(T) &= 0.6 \text{ (ULS)} \\ &= 0.19 \text{ (SLS)} \end{aligned} \left(\text{refer page 4} \right)$$

Snow & Ice Actions:

NZS 1170.3:2002

Job Name: Sovereign lakes house
 Job No: 17094
 Designer: PK
 Designer: 30/11/2017

Annual Probability Of Exceedance:

Section 3, NZS 1170.0:2002

Importance Level 2
 Design Life 50 years
 Annual Probability Of 1/150 ULS
 Exceedance 1/25 SLS

Section 3.3, NZS 1170.0:2002

Table 3.3, NZS1170.0:2002

Ground Snow Load:

Section 5, NZS1170.3:2002

Region = N5
 $h_0 = 10$ m (elevation above sea level)

Section 2, NZS1170.3:2002

$s_g = k_p 1.2 [1.5 h_0 / 1000 + 0.3]$
 ≥ 0.9 kPa

Eq 5.4(8/9), NZS1170.3:2002
 NZBC B1 2.2.13

where $k_p = 1.25$ ULS Probability Factor
 $= 0.85$ SLS

Section 5.2, NZS1170.3:2002

$s_g = 0.90$ (kPa) ULS
 $= 0.32$ (kPa) SLS

Design Snow Load:

Section 4, NZS1170.3:2002

$s = s_g C_e \mu_i$ Roof Snow Load

Eq 4.2(1), NZS1170.3:2002

where $s_g = 0.90$ ULS Ground Snow Load
 $= 0.32$ SLS Ground Snow Load
 $C_e = 1.0$ Exposure Reduction Coefficient
 $\mu_i = 0.70$ Roof Shape Coefficient (≤ 0.7)
 $= 0.7(60-\alpha)/50$ $\alpha = 2^\circ$ Roof Slope

Section 4.2.2, NZS1170.3:2002

Section 6, NZS1170.3:2002

$s = 0.63$ (kPa) ULS
 $= 0.22$ (kPa) SLS

Wind Actions:

NZS 1170.2:2002

Job Name: Sovereign lakes house
 Job No: 17094
 Designer: PK
 Date: 30/11/2017

Annual Probability Of Exceedance:

Section 3, NZS 1170.0:2002

Importance Level	2	Section 3.3, NZS 1170.0:2002
Design Life	50 years	
Annual Probability Of Exceedance	1/500 ULS 1/25 SLS	Table 3.3, NZS1170.0:2002

Site Wind Speed:

Section 2.2, NZS 1170.0:2002

$$V_{sit,\beta} = V_r M_d (M_{z,cat} M_s M_t) \quad (\text{m/s}) \quad \text{Eq 2.2, NZS1170.2:2002}$$

where	$V_r = 45$	ULS Regional 3s gust wind speed (m/s)	Section 3.2, NZS 1170.2:2002
	$= 37$	SLS	
	$M_d = 1.00$	Directional multiplier	Section 3.3, NZS 1170.0:2002
	$M_{z,cat} = 0.87$	Terrain/height multiplier	Section 4.2, NZS 1170.0:2002
	$M_s = 1.00$	Shielding multiplier	Section 4.3, NZS 1170.0:2002
	$M_t = 1.00$	Topographic multiplier	Section 4.4, NZS 1170.0:2002
		$M_t = M_h M_{lee} (1 + 0.00015E)$	
		$E = 10$	(m above sea level)

$V_{sit,\beta} = 38.9$ (m/s) ULS
 $= 32.0$ (m/s) SLS

Design Wind Pressure:

Section 2.4, NZS 1170.0:2002

$$p = (0.5 \rho_{air}) [v_{des,\theta}]^2 C_{fig} C_{dyn} \quad (\text{Pa}) \quad \text{Eq 2.4(1), NZS1170.2:2002}$$

where	$\rho_{air} = 1.20$	Density of air (kg/m ³)
	$v_{des,\theta} = 38.9$	ULS Directional wind speed (m/s)
	$= 32.0$	SLS
	$C_{fig} = 1.00$	Aerodynamic shape factor
	$C_{dyn} = 1.00$	Dynamic response factor (=1 unless structure is wind sensitive)

$p = 0.91$ (kPa) ULS
 $= 0.61$ (kPa) SLS

Earthquake Actions:

NZS 1170.5:2002

Job Name: Sovereign lakes house
 Job No: 17094
 Designer: PK
 Designer: 30/11/2017

Annual Probability Of Exceedance:

Section 3, NZS 1170.0:2002

Importance Level	2		Section 3.3, NZS 1170.0:2002
Design Life	50 years		
Annual Probability Of Exceedance	1/500 ULS		Table 3.3, NZS1170.0:2002
	1/25 SLS		

Site Hazard Spectra:

Section 3, NZS1170.5:2002

$C(T) = C_h(T)ZRN(T,D)$ Elastic Site Hazard Spectrum Eq 3.1(1), NZS1170.5:2002

where $C_h(T) = 3$ Spectral Shape Factor Section 3.1.2, NZS1170.5:2002
 Period $T = 0.4$ (seconds)
 Soil Type $g =$ Deep Soft Soil (D)

$Z = 0.32$	Hazard Factor	Section 3.1.4, NZS1170.5:2002
$R_u = 1$	ULS Return Period Factor	Section 3.1.5, NZS1170.5:2002
$R_s = 0.33$	SLS	
$N(T,D) = 1$	Near Fault Factor	Section 3.1.6, NZS1170.5:2002

$C(T) = 0.96$ ULS
 $= 0.32$ SLS

Design Earthquake Actions:

Section 5, NZS1170.5:2002

$C_d(T_1) = C(T_1)S_p/k\mu$ Horizontal Design Action Coefficient Eq 5.2(1), NZS1170.5:2002

where $C(T_1) = 0.96$ ULS Elastic Site Hazard Spectrum
 $= 0.32$ SLS
 $S_p = 0.7$ ULS Structural Performance Factor Section 4.4, NZS1170.5:2002 if 1<ductilit
 0.7 SLS Always 0.7
 $k\mu = (\mu-1)T_1/0.7+1$
 $= 1.14$ ULS
 $= 1.14$ SLS
 $\mu = 1.25$ ULS Structural Ductility Factor
 1.25 SLS

$C_d(T_1) = 0.59$ ULS
 $= 0.19$ SLS

PROJECT

RESIDENTIAL HOUSE

JOB NUMBER

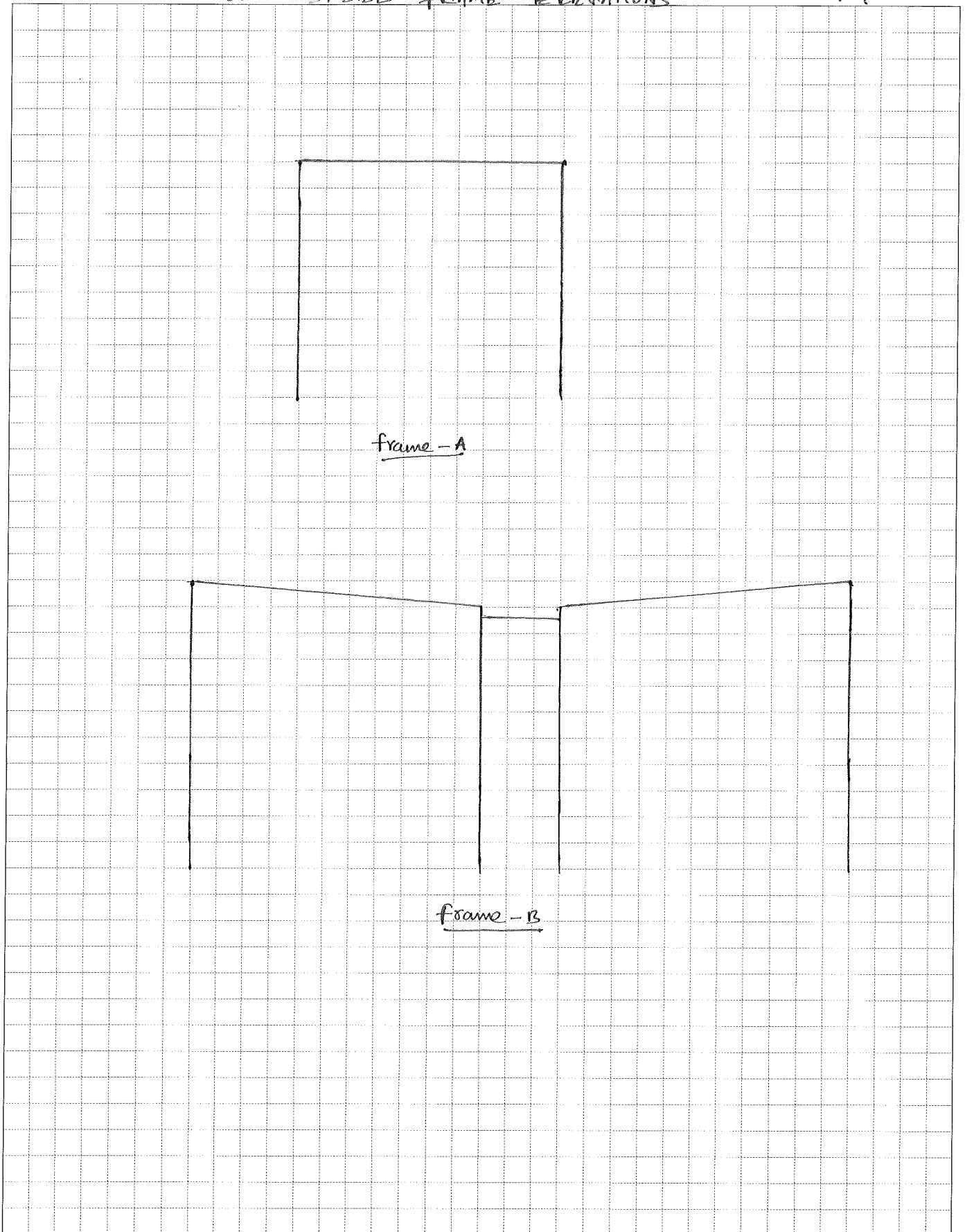
17094

SUBJECT

STRUCTURAL STEEL FRAME ELEVATIONS

DATE

29/4/14



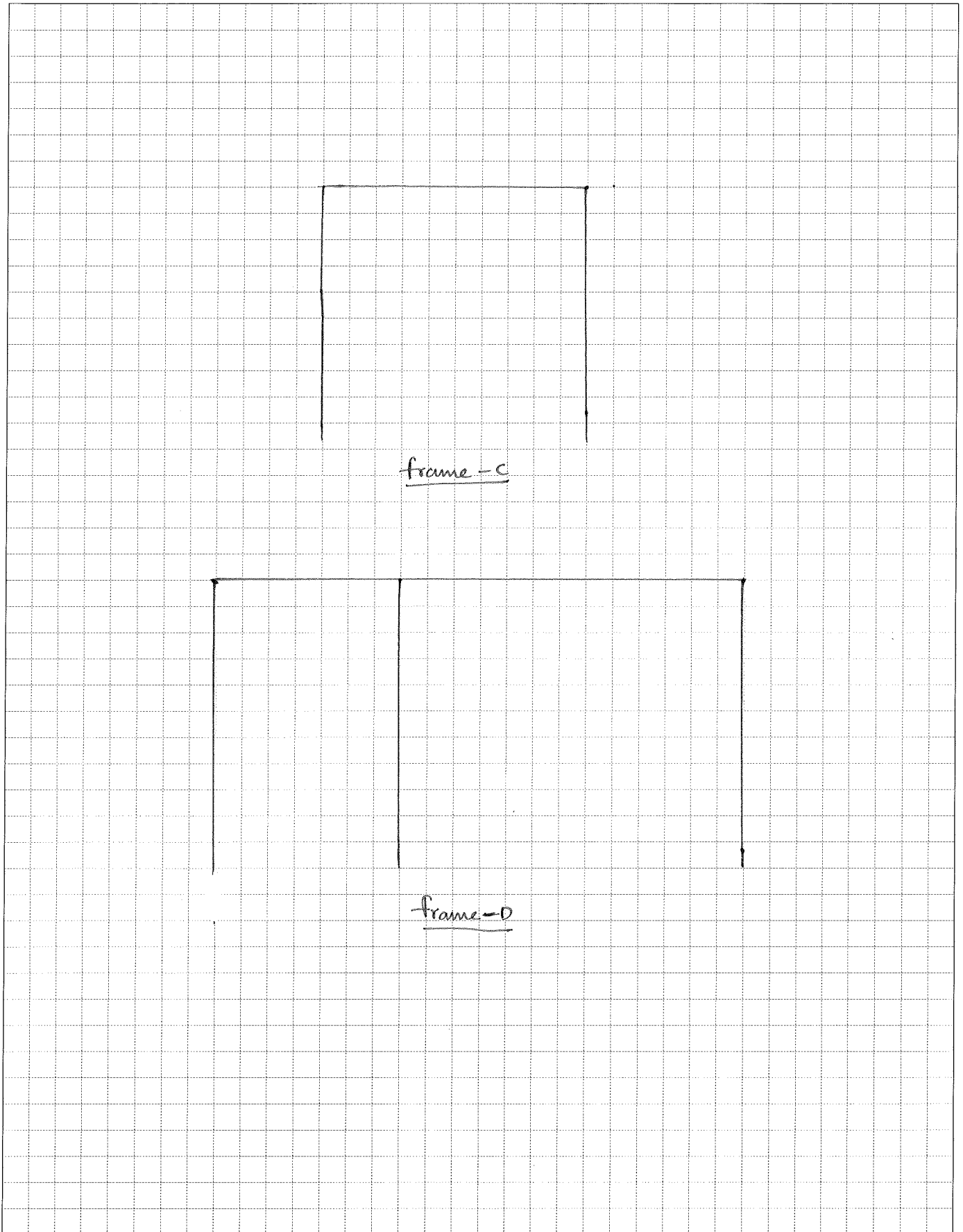
ARCHITECTURE STRUCTURAL ENGINEERING INTERIOR DESIGN

PROJECT

JOB NUMBER

SUBJECT

DATE



PROJECT

RESIDENTIAL HOUSE

JOB NUMBER

17094

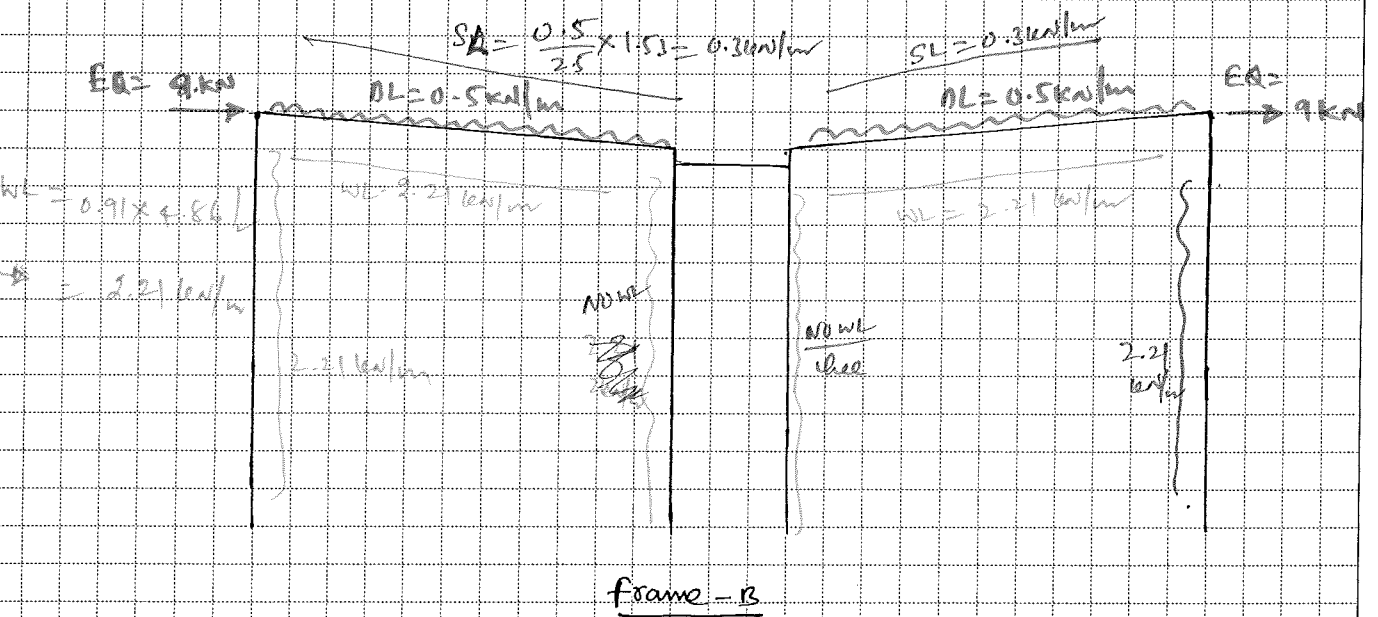
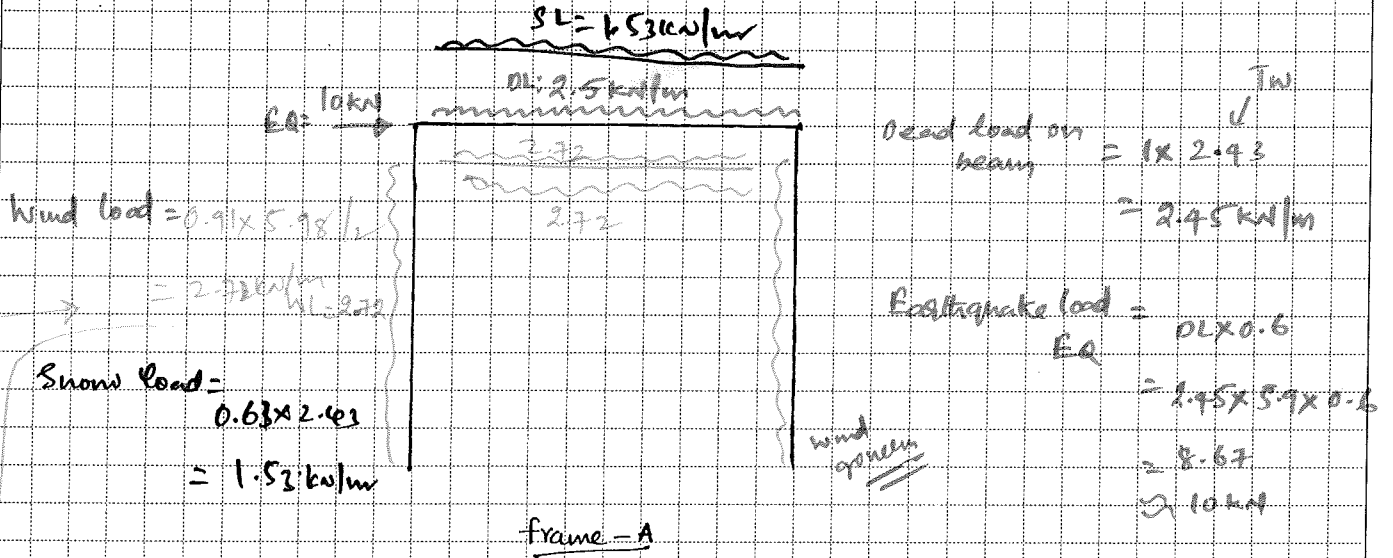
SUBJECT

STRUCTURAL STEEL FRAME ELEVATIONS

DATE

29/11/17

LOADING CALCULATION



Even though, there is no direct dead load transfer to frame B beams, to account for cladding over the beam 0.5 kN/m is considered for design.

$DL = 0.5 \text{ kN/m}$

$Earthquake \text{ load} = 1 \times 2.95 = 2.95 \text{ kN/m}$
 $= 2.95 \times 2.86 \times 0.6 = 8.6 \text{ kN}$

PROJECT

JOB NUMBER

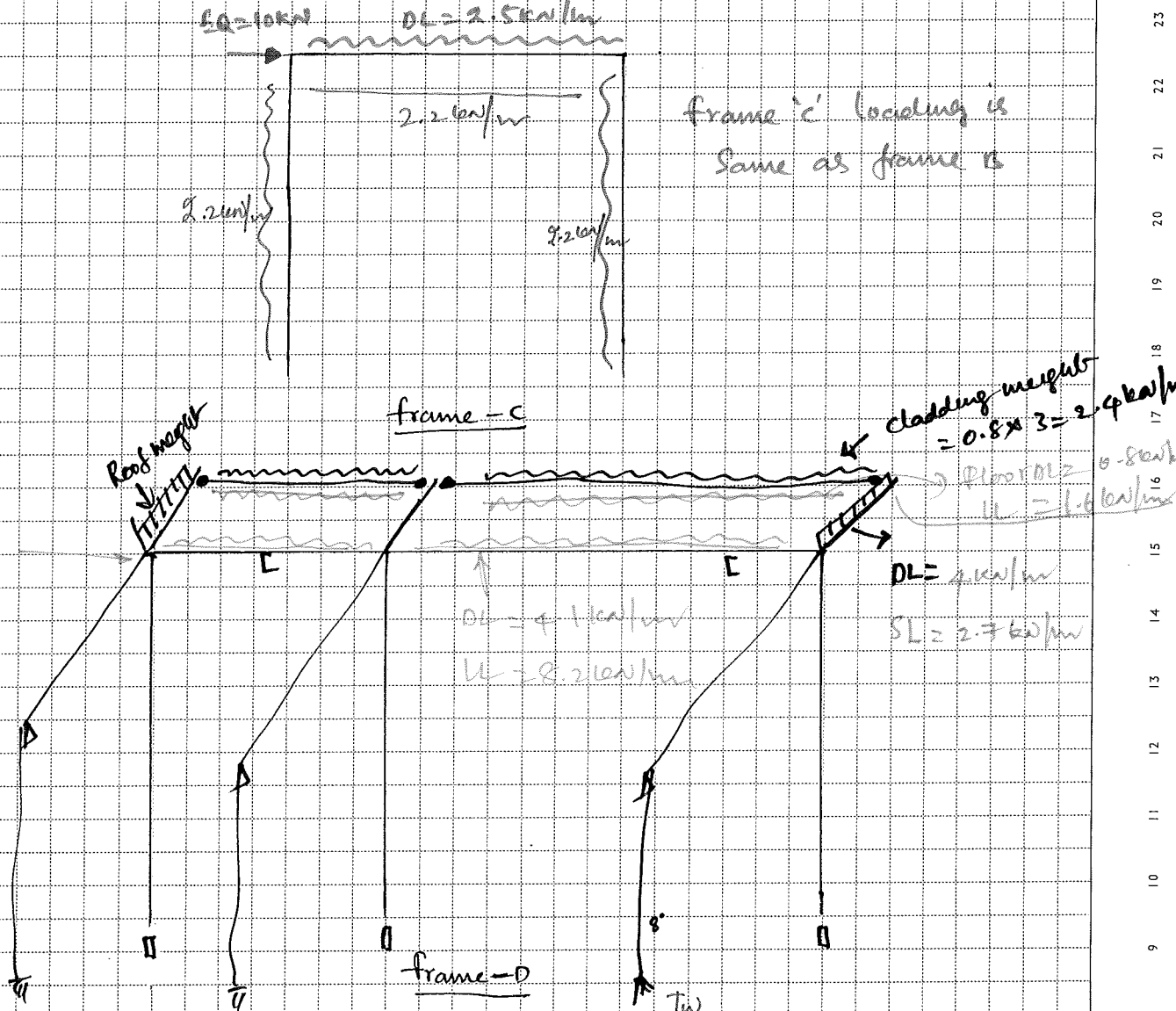
17094

SUBJECT

DATE

25/11/17

RESIDENTIAL HOUSE LOADING CALCULATION



Dead load from roof to beam = $0.8 \times 1.6 \text{ kN/m} = 1.6 \text{ kN/m}$

Earthquake load = $0.6 \times ((1 + 3 \times 2) + 0.3 \times 8.2) \times 8.6 \times$

$EQ = 50.8 \text{ kN}$

PROJECT

RESIDENTIAL HOUSE

JOB NUMBER

17094

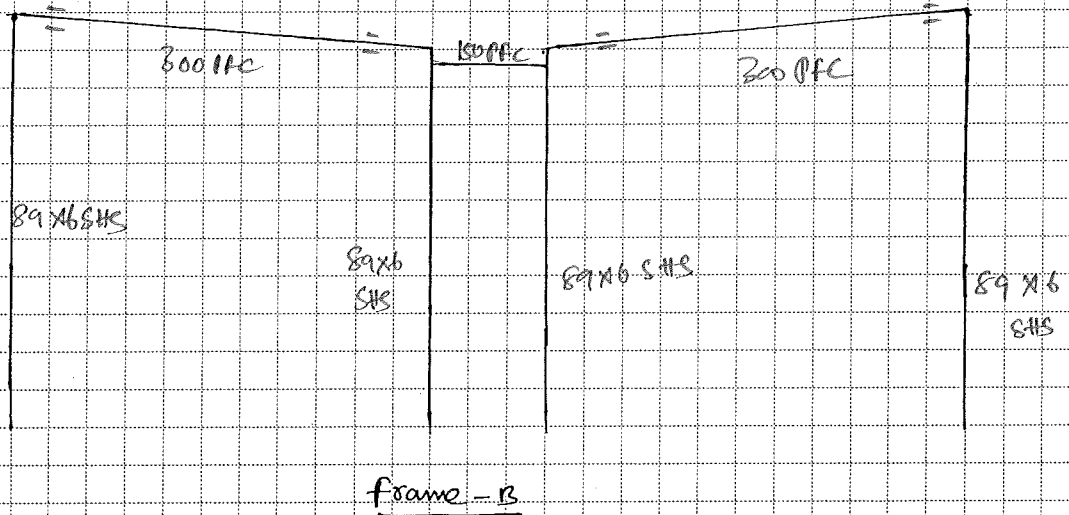
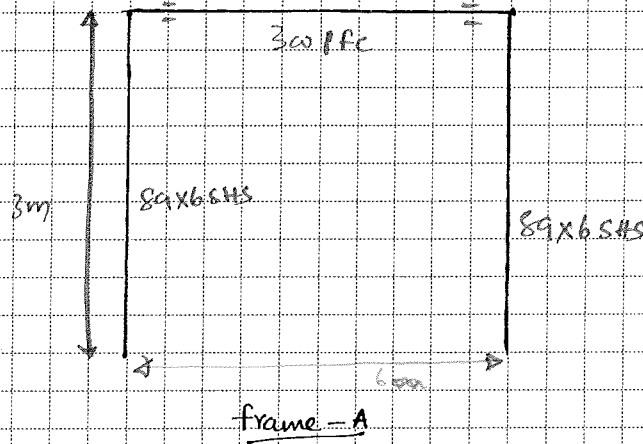
SUBJECT

STRUCTURAL STEEL FRAME ELEVATIONS

DATE

29/4/19

frame sections



29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

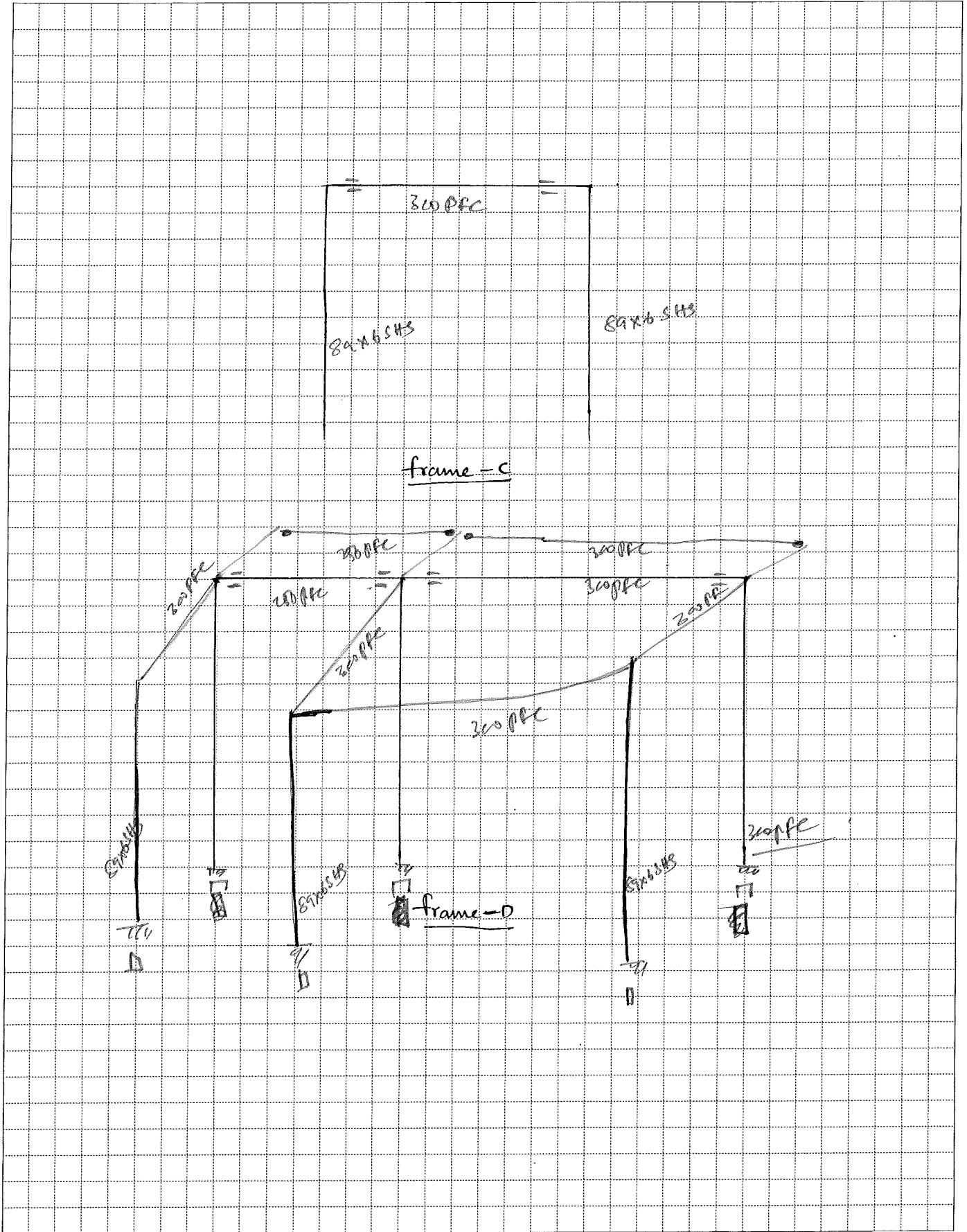
PROJECT

JOB NUMBER

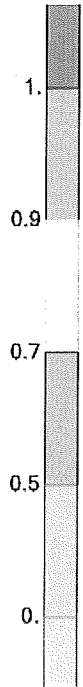
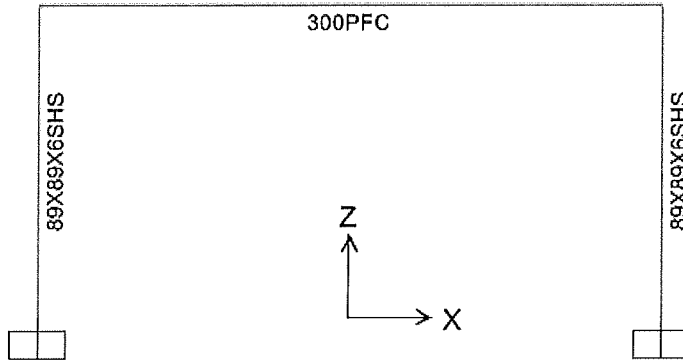
7094

SUBJECT

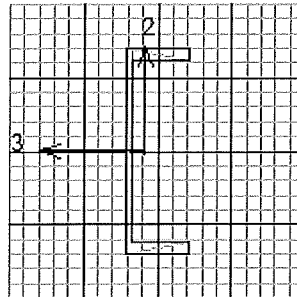
DATE



FRAME -A: Demand/capacity ratio



Beam design summary



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 3	X Mid: 0.000	Combo: DSTL5	Design Type: Beam	
Length: 6.000	Y Mid: 0.000	Shape: 300PFC	Frame Type: Sway Frame	
Loc : 3.000	Z Mid: 3.000	Class: Compact	Princpl Rot: 0.000 degrees	
PhiB=0.900	PhiC=0.900	PhiTY=0.900	PhiTF=0.900	PhiS=0.900
A=0.005	I33=7.240E-05	r33=0.119	Z33=4.827E-04	Av3=0.003
J=2.900E-07	I22=4.040E-06	r22=0.028	Z22=6.433E-05	Av2=0.002
E=1.99947978.8	fy=344737.894	Ry=1.100	S33=5.640E-04	Iw=5.821E-08
RLLF=1.000	Fu=448159.263		S22=1.170E-04	

STRESS CHECK FORCES & MOMENTS (Combo DSTL5)

Location	N*	M33*	M22*	V2*	V3*	T*
3.000	-0.865	23.836	0.000	-1.094	-0.005	-0.003

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio: 0.507 = 0.507 < 0.950 OK
= M33*/(phi*M033)

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	50.407
Minor Flexure	1.000	1.000	213.389
Major Braced	1.000	1.000	50.407
Minor Braced	1.000	1.000	213.389
LTB	1.400	1.000	298.744



AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.909	0.772
Minor Bending	1.000	1.000	1.000	1.000	1.000	0.200	1.000

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	1.179	0.229

Axial Factors	Steel Type	Kf	Kt	Alpha_b
	Hot Rolled	1.000	1.000	8.161

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.640E-04	8.528E-05	0.000	0.000	0.005

	M*	Ms	Mr	Mi	Nc
Major Moment	23.836	194.432	194.326	194.291	1323.575
Minor Moment	0.000	29.401	29.385	29.258	198.108

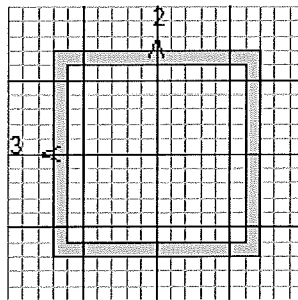
	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	51.998	52.477	52.222	52.222	52.222

	N*	Ns	Nc	Nt	Noz
Axial	-0.865	1761.611	198.108	1761.611	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	1.094	446.780	0.002	OK
Minor Shear	0.005	536.136	9.027E-06	OK

Column design Summary



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)

Units : KN, m, C

Frame : 2 X Mid: 3.000 Combo: DSTL10 Design Type: Column
 Length: 3.000 Y Mid: 0.000 Shape: 89X89X6SHS Frame Type: Sway Frame
 Loc : 3.000 Z Mid: 1.500 Class: Compact Princpl Rot: 0.000 degrees

PhiB=0.900 PhiC=0.900 PhiTY=0.900 PhiTF=0.900 PhiS=0.900

A=0.002 I33=2.060E-06 r33=0.033 Z33=4.629E-05 Av3=0.001
 J=3.540E-06 I22=2.060E-06 r22=0.033 Z22=4.629E-05 Av2=0.001
 E=199947978.8 fy=344737.894 Ry=1.100 S33=5.660E-05
 RLLF=1.000 Fu=448159.263 S22=5.660E-05

STRESS CHECK FORCES & MOMENTS (Combo DSTL10)

Location	N*	M33*	M22*	V2*	V3*	T*
3.000	-11.155	-8.304	-0.133	5.438	0.011	-0.033

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio:	0.488 = 0.488	< 0.950	OK
	= M33*/(phi*Mo33)		

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.166	1.000	105.403
Minor Flexure	1.000	1.000	90.388
Major Braced	0.642	1.000	58.035
Minor Braced	1.000	1.000	90.388
LTB	1.400	1.000	126.543

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	0.642	1.166	1.000	1.000	0.214	0.965
Minor Bending	1.000	1.000	1.000	1.000	1.000	0.901	0.752

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	2.445	0.994

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	14.963	-1.000	0.484

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	13.896	30.000	45.000	180.000	0.309	Compact
/Web	13.896	45.000	60.000	180.000	0.232	Compact
Minor/Flange	13.896	45.000	60.000	180.000	0.232	Compact
/Web	13.896	30.000	45.000	180.000	0.309	Compact
Axial/Flange	13.896		45.000		0.309	Compact
/Web	13.896		45.000		0.309	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.660E-05	5.660E-05	0.000	0.000	0.002

	M*	Ms	Mr	Mi	Nc
Major Moment	-8.304	19.512	19.512	19.512	561.308
Minor Moment	-0.133	19.512	19.512	18.908	395.497

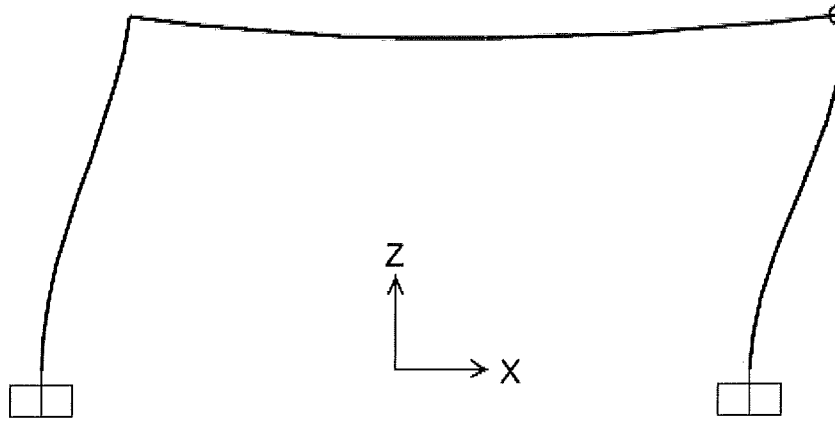
	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	250.476	19.512	18.901	18.901	18.901

Axial	N*	Ns	Nc	Nt	Noz
	-11.155	644.660	312.288	644.660	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	5.438	198.817	0.027	OK
Minor Shear	0.011	198.817	5.508E-05	OK

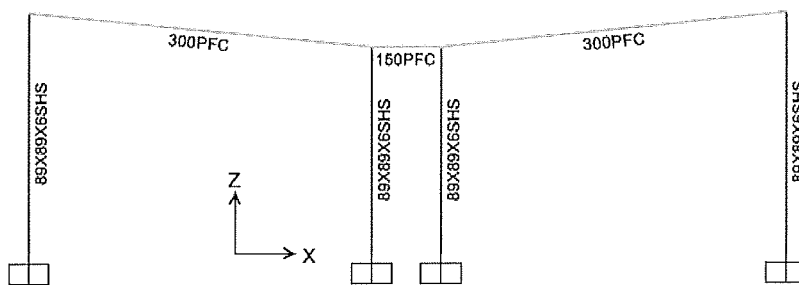
Deflection under DL + E_s (loading)



Pt Obj: 4
Pt Elm: 4
U1 = 9.339
U2 = -.3987
U3 = -.0779
R1 = .00028
R2 = -.00144
R3 = -.00012

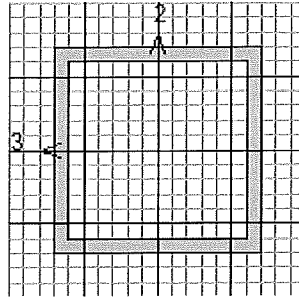
Frame B Design report.

Design/capacity ratio



12

Column design report



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 5 X Mid: 8.011 Combo: DSTL5 Design Type: Column
Length: 3.500 Y Mid: 0.000 Shape: 89X89X6SHS Frame Type: Sway Frame
Loc : 0.000 Z Mid: 1.750 Class: Compact Princpl Rot: 0.000 degrees

PhiB=0.900 PhiC=0.900 PhiTY=0.900 PhiTF=0.900 PhiS=0.900

A=0.002 I33=2.060E-06 r33=0.033 Z33=4.629E-05 Av3=0.001
J=3.540E-06 I22=2.060E-06 r22=0.033 Z22=4.629E-05 Av2=0.001
E=199947978.8 fy=344737.894 Ry=1.100 S33=5.660E-05
RLLF=1.000 Fu=448159.263 S22=5.660E-05

STRESS CHECK FORCES & MOMENTS (Combo DSTL5)

Location	N*	M33*	M22*	V2*	V3*	T*
0.000	-8.136	-8.554	0.000	-7.972	0.000	0.000

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio: 0.502 = 0.502 < 0.950 OK
= M33*/(phi*Mo33)

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	105.452
Minor Flexure	1.000	1.000	105.452
Major Braced	1.000	1.000	105.452
Minor Braced	1.000	1.000	105.452
LTB	1.400	1.000	147.633

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.283	0.792
Minor Bending	1.000	1.000	1.000	1.025	1.000	1.000	-1.00

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	2.500	0.986

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	14.958	-1.000	0.484

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	13.896	30.000	45.000	180.000	0.309	Compact
/Web	13.896	45.000	60.000	180.000	0.232	Compact
Minor/Flange	13.896	45.000	60.000	180.000	0.232	Compact
/Web	13.896	30.000	45.000	180.000	0.309	Compact
Axial/Flange	13.896		45.000		0.309	Compact
/Web	13.896		45.000		0.309	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.660E-05	5.660E-05	0.000	0.000	0.002

	M*	Ms	Mr	Mi	Nc
Major Moment	-8.554	19.512	19.512	19.512	312.038
Minor Moment	0.000	19.512	19.512	18.947	312.038

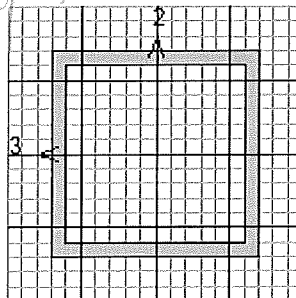
13

	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	214.694	19.512	18.947	18.947	18.947
	N*	Ns	Nc	Nt	Noz
Axial	-8.136	644.660	312.038	644.660	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	7.972	198.817	0.040	OK
Minor Shear	0.000	198.817	0.000	OK

Central column design note:



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 6 X Mid: 3.000 Combo: DSTL5 Design Type: Column
 Length: 3.000 Y Mid: 0.000 Shape: 89X89X6SHS Frame Type: Sway Frame
 Loc : 0.000 Z Mid: 1.500 Class: Compact Princpl Rot: 0.000 degrees

PhiB=0.900 PhiC=0.900 PhiTY=0.900 PhiTF=0.900 PhiS=0.900

A=0.002 I33=2.060E-06 r33=0.033 Z33=4.629E-05 Av3=0.001
 J=3.540E-06 I22=2.060E-06 r22=0.033 Z22=4.629E-05 Av2=0.001
 E=199947978.8 fy=344737.894 Ry=1.100 S33=5.660E-05
 RLLF=1.000 Fu=448159.263 S22=5.660E-05

STRESS CHECK FORCES & MOMENTS (Combo DSTL5)

Location	N*	M33*	M22*	V2*	V3*	T*
0.000	-12.187	-10.514	0.000	-9.799	0.000	0.000

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio: 0.620 = 0.620 < 0.950 OK
 = M33*/(phi*M033)

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	90.388
Minor Flexure	1.000	1.000	90.388
Major Braced	1.000	1.000	90.388
Minor Braced	1.000	1.000	90.388
LTB	1.400	1.000	126.543

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.216	0.961
Minor Bending	1.000	1.000	1.000	1.028	1.000	1.000	-1.00

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	2.500	0.994

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	16.639	-1.000	0.613

14

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	13.896	30.000	45.000	180.000	0.309	Compact
/Web	13.896	45.000	60.000	180.000	0.232	Compact
Minor/Flange	13.896	45.000	60.000	180.000	0.232	Compact
/Web	13.896	30.000	45.000	180.000	0.309	Compact
Axial/Flange	13.896		45.000		0.309	Compact
/Web	13.896		45.000		0.309	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.660E-05	5.660E-05	0.000	0.000	0.002

	M*	Ms	Mr	Mi	Nc
Major Moment	-10.514	19.512	19.512	19.512	395.497
Minor Moment	0.000	19.512	19.512	18.844	395.497

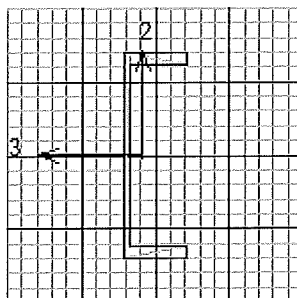
	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	250.476	19.512	18.844	18.844	18.844

	N*	Ns	Nc	Nt	Noz
Axial	-12.187	644.660	395.497	644.660	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	9.799	198.817	0.049	OK
Minor Shear	0.000	198.817	0.000	OK

Beam design report



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 8	X Mid: 5.506	Combo: DSTL5	Design Type: Brace
Length: 5.036	Y Mid: 0.000	Shape: 300PFC	Frame Type: Sway Frame
Loc : 2.518	Z Mid: 3.250	Class: Compact	Princpl Rot: 0.000 degrees

PhiB=0.900	PhiC=0.900	PhiTY=0.900	PhiTF=0.900	PhiS=0.900
------------	------------	-------------	-------------	------------

A=0.005	I33=7.240E-05	r33=0.119	Z33=4.827E-04	Av3=0.003
J=2.900E-07	I22=4.040E-06	r22=0.028	Z22=6.433E-05	Av2=0.002
E=199947978.8	fy=344737.894	Ry=1.100	S33=5.640E-04	Iw=5.821E-08
RLLF=1.000	Fu=448159.263		S22=1.170E-04	

STRESS CHECK FORCES & MOMENTS (Combo DSTL5)

Location	N*	M33*	M22*	V2*	V3*	T*
2.518	-1.741	9.984	0.000	-1.853	0.000	0.000

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio:	0.149 = 0.149	<	0.950	OK
	= M33*/(phi*M033)			

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r



Major Flexure	1.000	1.000	42.307
Minor Flexure	1.000	1.000	179.100
Major Braced	1.000	1.000	42.307
Minor Braced	1.000	1.000	179.100
LTB	1.400	1.000	250.740

AXIAL FORCE & BIAxIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.715	-0.287
Minor Bending	1.000	1.000	1.000	1.006	1.000	1.000	-1.00

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	1.421	0.271

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	9.597	0.500	0.154

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.640E-04	8.528E-05	0.000	0.000	0.005

	M*	Ms	Mr	Mi	Nc
Major Moment	9.984	194.432	194.219	194.169	1426.592
Minor Moment	0.000	29.401	29.369	29.191	271.443

Major Moment	Mo,cr	Mb	Mo	Mc	Mt
	62.831	74.901	74.368	74.368	74.368

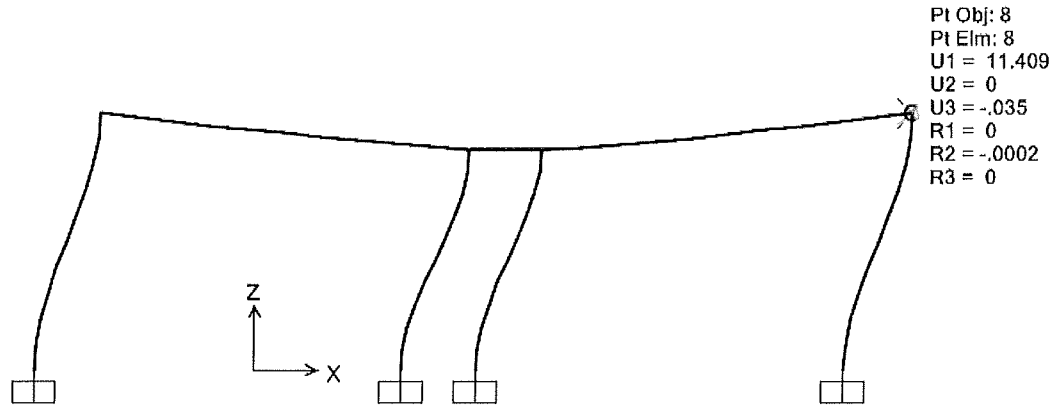
Axial	N*	Ns	Nc	Nt	Noz
	-1.741	1761.611	271.443	1761.611	0.000

SHEAR CHECK

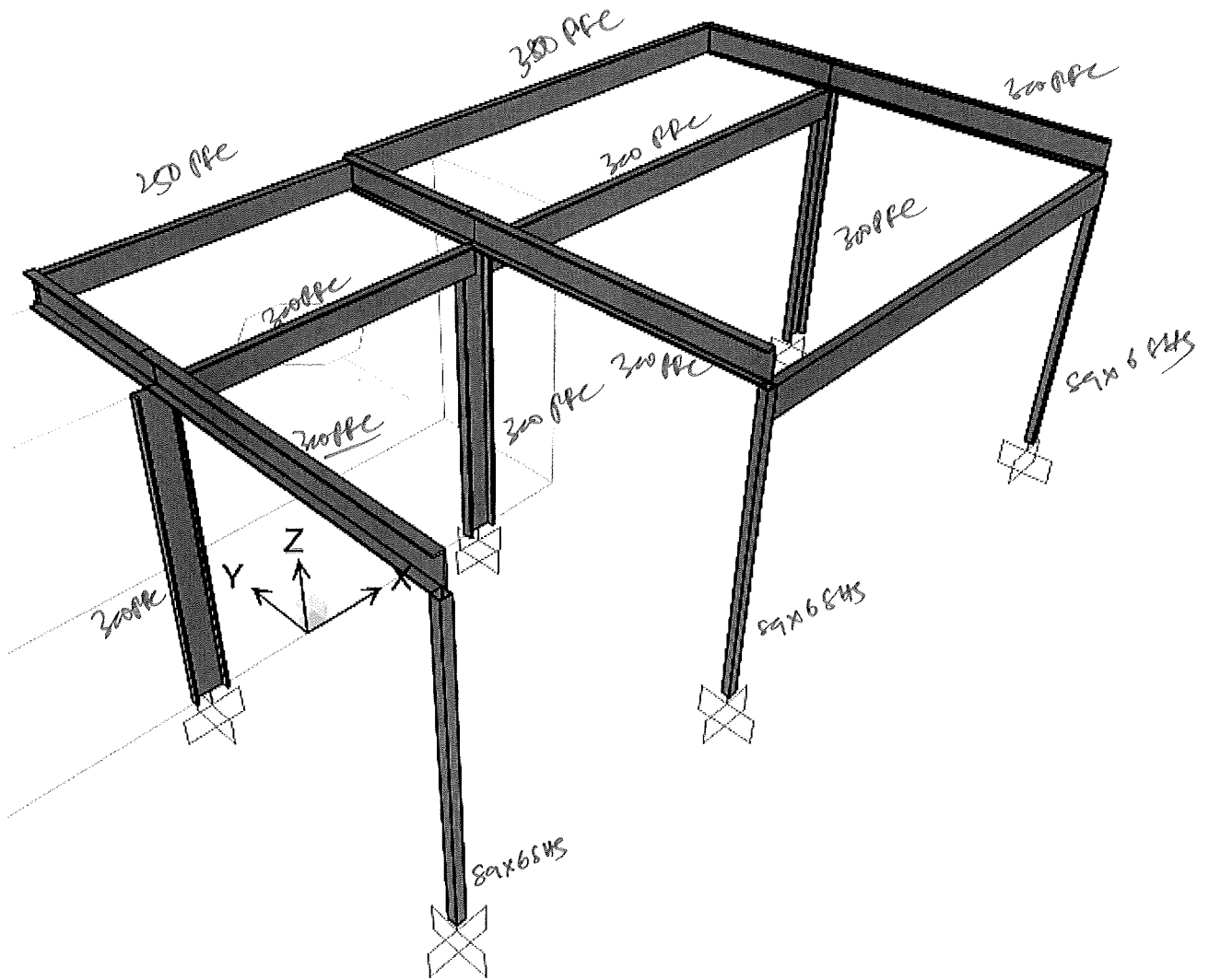
	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	1.853	446.780	0.004	OK
Minor Shear	0.000	536.136	0.000	OK

16

Deflection under DL+Es loading:-

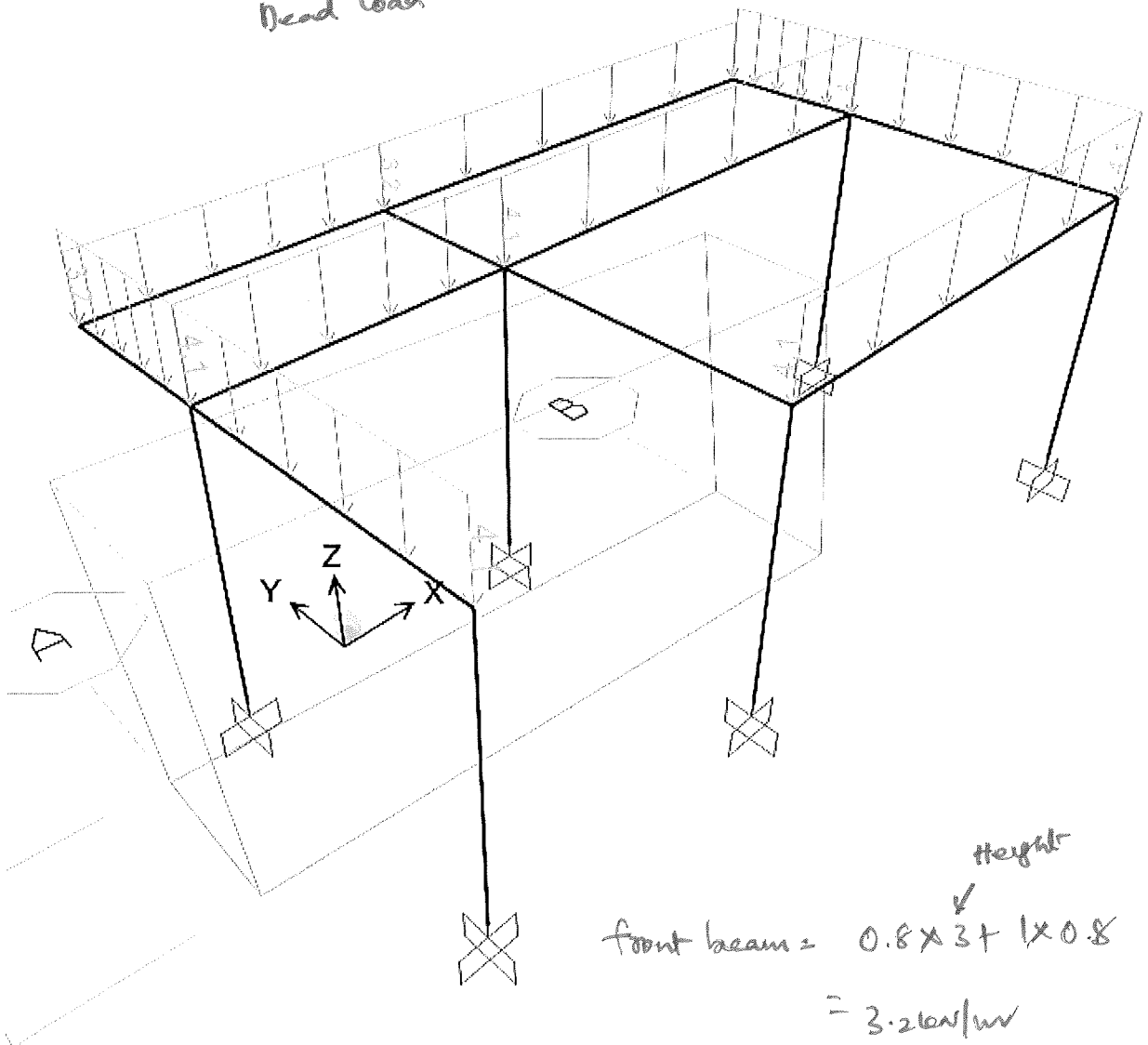


Frame D.



Frame D:

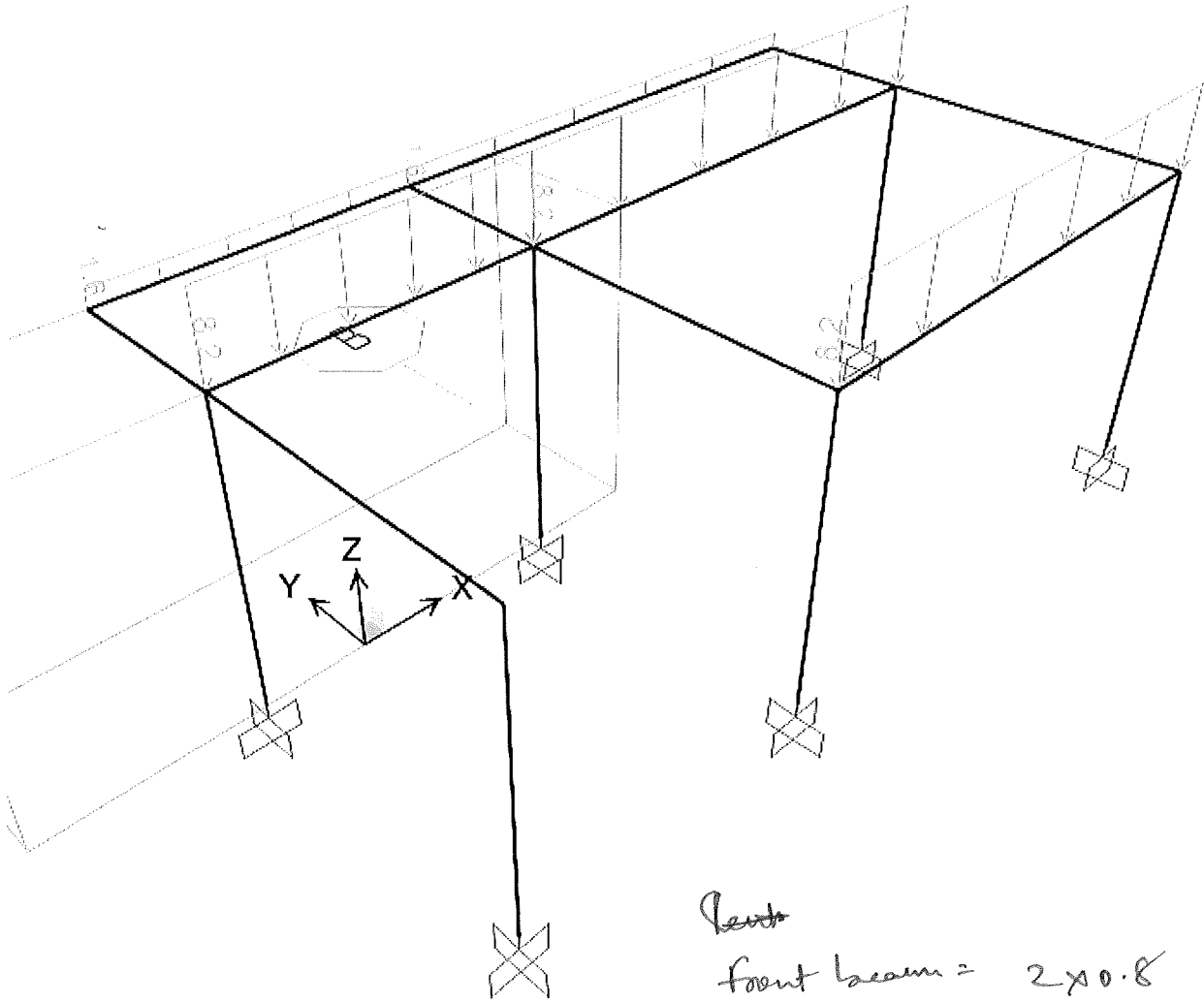
Dead load



front beam = $0.8 \times 3 + 1 \times 0.8$ ← height
 = 3.2 kN/m

Central beam = 1×4.1 ← Tw
 = 4.1 kN/m

Line load:

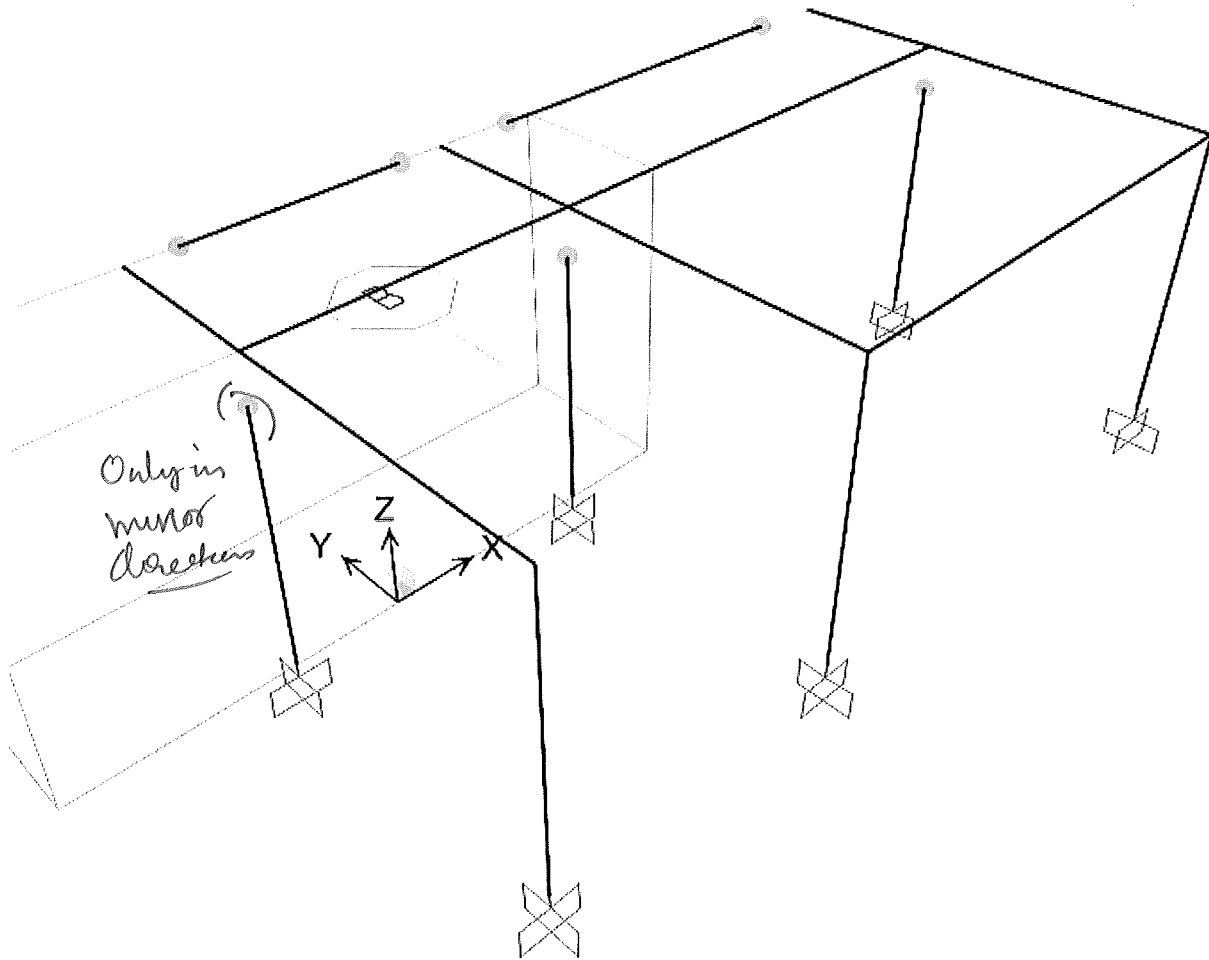


Beams

$$\begin{aligned} \text{front beam} &= 2 \times 0.8 \\ &= 1.6 \text{ m} \end{aligned}$$

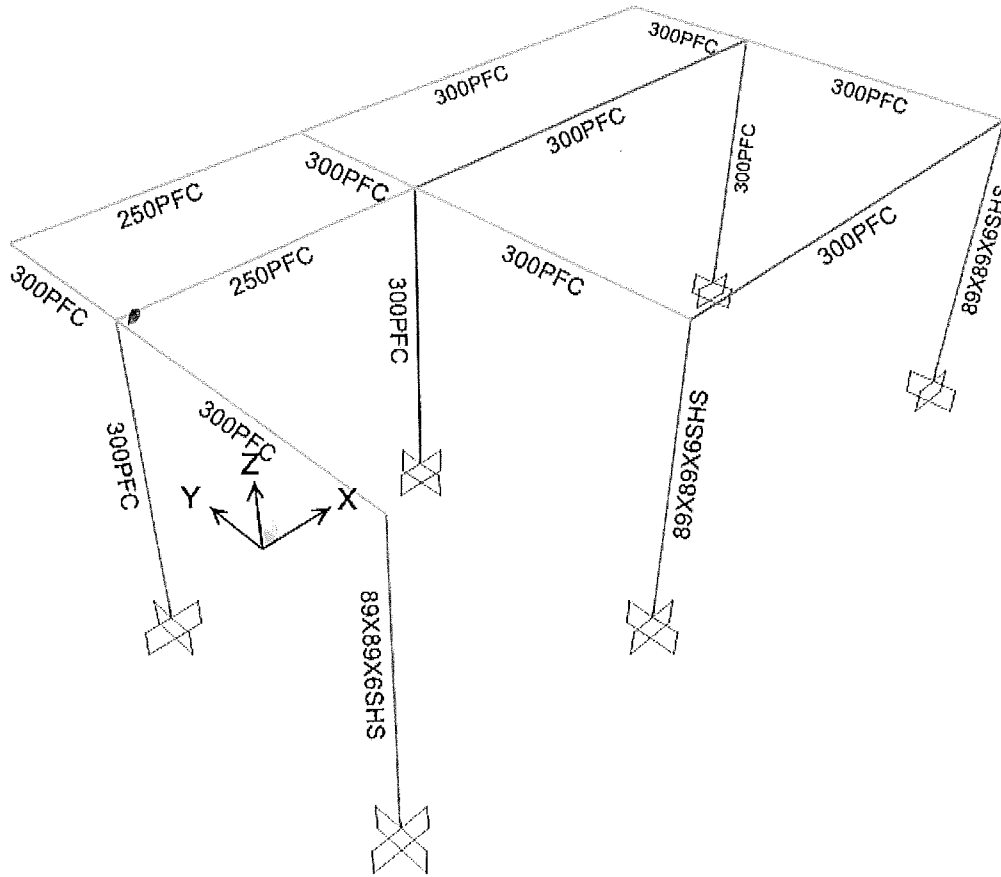
$$\begin{aligned} \text{Central beams} &= 2 \times 4.1 \\ &= 8.2 \text{ m} \end{aligned}$$

^{pin}
Shear/connections / moment-resisting.

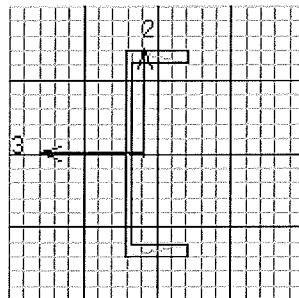


Demand / Capacity ratio

≤ 1 (ok)



Design report of central column



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 2	X Mid: 2.000	Combo: DSTL2	Design Type: Column
Length: 3.000	Y Mid: 0.000	Shape: 300PFC	Frame Type: Sway Frame
Loc : 0.000	Z Mid: 1.500	Class: Compact	Prinpl Rot: 0.000 degrees

PhiB=0.900	PhiC=0.900	PhiTY=0.900	PhiTF=0.900	PhiS=0.900
------------	------------	-------------	-------------	------------

A=0.005	I33=7.240E-05	r33=0.119	Z33=4.827E-04	Av3=0.003
J=2.900E-07	I22=4.040E-06	r22=0.028	Z22=6.433E-05	Av2=0.002
E=199947978.8	fy=344737.894	Ry=1.100	S33=5.640E-04	Iw=5.821E-08
RLLF=1.000	Fu=448159.263		S22=1.170E-04	

22

STRESS CHECK FORCES & MOMENTS (Combo DSTL2)

Location	N*	M33*	M22*	V2*	V3*	T*
0.000	-122.388	-7.847	-0.368	-7.577	-0.123	-0.002

PMM DEMAND/CAPACITY RATIO (6.1b)

D/C Ratio:	0.627 = 0.627	< 0.950	OK
	= N*/(phi*Nc)		

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.290	1.000	32.510
Minor Flexure	1.903	1.000	203.033
Major Braced	0.761	1.000	19.187
Minor Braced	0.860	1.000	91.747
LTB	1.400	1.000	149.372

AXIAL FORCE & BIAXIAL MOMENT DESIGN (6.1b)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	0.761	1.290	1.000	1.000	0.389	0.527
Minor Bending	1.000	0.860	1.903	1.000	1.000	0.600	0.000

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	2.500	0.435

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	8.550	0.500	0.123

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.640E-04	8.528E-05	0.000	0.000	0.005

	M*	Ms	Mr	Mi	Nc
Major Moment	-7.847	194.432	179.423	178.711	1681.836
Minor Moment	-0.368	29.401	27.131	24.272	779.535

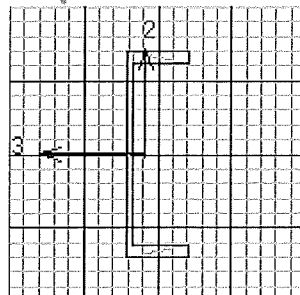
	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	114.116	194.432	160.514	160.514	160.514

	N*	Ns	Nc	Nt	Noz
Axial	-122.388	1761.611	216.849	1761.611	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	7.577	446.780	0.017	OK
Minor Shear	0.123	536.136	0.000	OK

Design report beam 300PF



27

NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
 Units : KN, m, C

Frame : 17 X Mid: 4.500 Combo: DSTL2 Design Type: Beam
 Length: 5.000 Y Mid: -3.000 Shape: 300PFC Frame Type: Sway Frame
 Loc : 2.500 Z Mid: 3.000 Class: Compact Princpl Rot: 0.000 degrees

PhiB=0.900 PhiC=0.900 PhiTY=0.900 PhiTF=0.900 PhiS=0.900

A=0.005 I33=7.240E-05 r33=0.119 Z33=4.827E-04 Av3=0.003
 J=2.900E-07 I22=4.040E-06 r22=0.028 Z22=6.433E-05 Av2=0.002
 E=199947978.8 fy=344737.894 Ry=1.100 S33=5.640E-04 Iw=5.821E-08
 RLLF=1.000 Fu=448159.263 S22=1.170E-04

STRESS CHECK FORCES & MOMENTS (Combo DSTL2)

Location	N*	M33*	M22*	V2*	V3*	T*
2.500	-1.519	51.998	0.020	-0.296	-9.042E-04	-0.002

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio: 0.922 = 0.922 < 0.950 OK
 = M33*/(phi*Mo33)

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	42.006
Minor Flexure	1.000	1.000	177.824
Major Braced	1.000	1.000	42.006
Minor Braced	1.000	1.000	177.824
LTB	1.400	1.000	248.953

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta b	Delta s	Cm Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.942-0.856
Minor Bending	1.000	1.000	1.000	1.000	1.000	0.917-0.792

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	1.188	0.273

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	9.660	0.500	0.156

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.640E-04	8.528E-05	0.000	0.000	0.005

	M*	Ms	Mr	Mi	Nc
Major Moment	51.998	194.432	194.246	194.203	1430.265
Minor Moment	0.020	29.401	29.373	29.220	274.896

Major Moment	Mo,cr	Mb	Mo	Mc	Mt
	63.325	63.046	62.659	62.659	62.659

Axial	N*	Ns	Nc	Nt	Noz
	-1.519	1761.611	274.896	1761.611	0.000

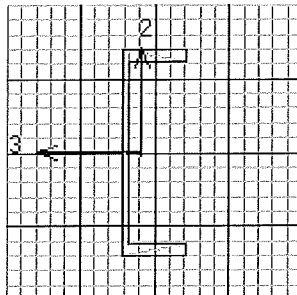
SHEAR CHECK

Major Shear	V*	Vv	Stress Ratio	Status Check
	Force 0.296	Capacity 446.780	0.001	OK

20

Minor Shear 9.042E-04 536.136 1.686E-06 OK

Design report of central beam 300 pfe



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 13 X Mid: 4.500 Combo: DSTL2 Design Type: Beam
Length: 5.000 Y Mid: 1.600 Shape: 300PFC Frame Type: Sway Frame
Loc : 2.500 Z Mid: 3.000 Class: Compact Princpl Rot: 0.000 degrees

PhiB=0.900 PhiC=0.900 PhiTY=0.900 PhiTF=0.900 PhiS=0.900

A=0.005 I33=7.240E-05 r33=0.119 Z33=4.827E-04 Av3=0.003
J=2.900E-07 I22=4.040E-06 r22=0.028 Z22=6.433E-05 Av2=0.002
E=199947978.8 fy=344737.894 Ry=1.100 S33=5.640E-04 Iw=5.821E-08
RLLF=1.000 Fu=448159.263 S22=1.170E-04

STRESS CHECK FORCES & MOMENTS (Combo DSTL2)

Location	N*	M33*	M22*	V2*	V3*	T*
2.500	-0.320	20.975	0.000	0.000	0.000	0.000

PMM DEMAND/CAPACITY RATIO (8.4.4.1)

D/C Ratio: 0.374 = 0.374 < 0.950 OK
= M33*/(phi*Mo33)

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	42.006
Minor Flexure	1.000	1.000	177.824
Major Braced	1.000	1.000	42.006
Minor Braced	1.000	1.000	177.824
LTB	1.400	1.000	248.953

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.1)

Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	1.000	-1.00
Minor Bending	1.000	1.000	1.000	1.001	1.000	1.000	-1.00

LTB Factors	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s
	1.000	1.000	1.400	1.000	1.174	0.273

Axial Factors	Steel Type	Kf	Kt	Alpha_b		
	Hot Rolled	1.000	1.000	9.660	0.500	0.156

Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact

Effective Pro	ZeMajor	ZeMinor	b-be	d-de	Aeff
	5.640E-04	8.528E-05	0.000	0.000	0.005

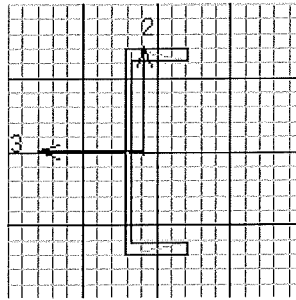


	M*	Ms	Mr	Mi	Nc
Major Moment	20.976	194.432	194.393	194.384	1430.265
Minor Moment	0.000	29.401	29.395	29.363	274.896
	Mo,cr	Mb	Mo	Mc	Mt
Major Moment	63.325	62.319	62.239	62.239	62.239
	N*	Ns	Nc	Nt	Noz
Axial	-0.320	1761.611	274.896	1761.611	0.000

SHEAR CHECK

	V*	Vv	Stress	Status
	Force	Capacity	Ratio	Check
Major Shear	0.000	446.780	0.000	OK
Minor Shear	0.000	536.136	0.000	OK

Design inputs of cross beam 200 PFC



NZS 3404-1997 STEEL SECTION CHECK (Summary for Combo and Station)
Units : KN, m, C

Frame : 20	X Mid: 7.000	Combo: DSTL2	Design Type: Beam	
Length: 3.000	Y Mid: -1.500	Shape: 300PFC	Frame Type: Sway Frame	
Loc : 3.000	Z Mid: 3.000	Class: Compact	Princpl Rot: 0.000 degrees	
PhiB=0.900	PhiC=0.900	PhiTY=0.900	PhiTF=0.900	
PhiS=0.900				
A=0.005	I33=7.240E-05	r33=0.119	Z33=4.827E-04	Av3=0.003
J=2.900E-07	I22=4.040E-06	r22=0.028	Z22=6.433E-05	Av2=0.002
E=199947978.8	Fy=344737.894	Ry=1.100	S33=5.640E-04	Iw=5.821E-08
RLLF=1.000	Fu=448159.263		S22=1.170E-04	

STRESS CHECK FORCES & MOMENTS (Combo DSTL2)

Location	N*	M33*	M22*	V2*	V3*	T*
3.000	0.071	-33.731	-0.122	12.036	0.048	0.072

PMM DEMAND/CAPACITY RATIO (8.4.4.2)

D/C Ratio: $0.237 = 0.237 < 0.950$ OK
 $= M33*/(\phi * Mo33)$

BASIC FACTORS

Buckling Mode	K Factor	L Factor	KL/r
Major Flexure	1.000	1.000	25.204
Minor Flexure	1.000	1.000	106.694
Major Braced	1.000	1.000	25.204
Minor Braced	1.000	1.000	106.694
LTB	1.400	1.000	149.372

AXIAL FORCE & BIAXIAL MOMENT DESIGN (8.4.4.2)

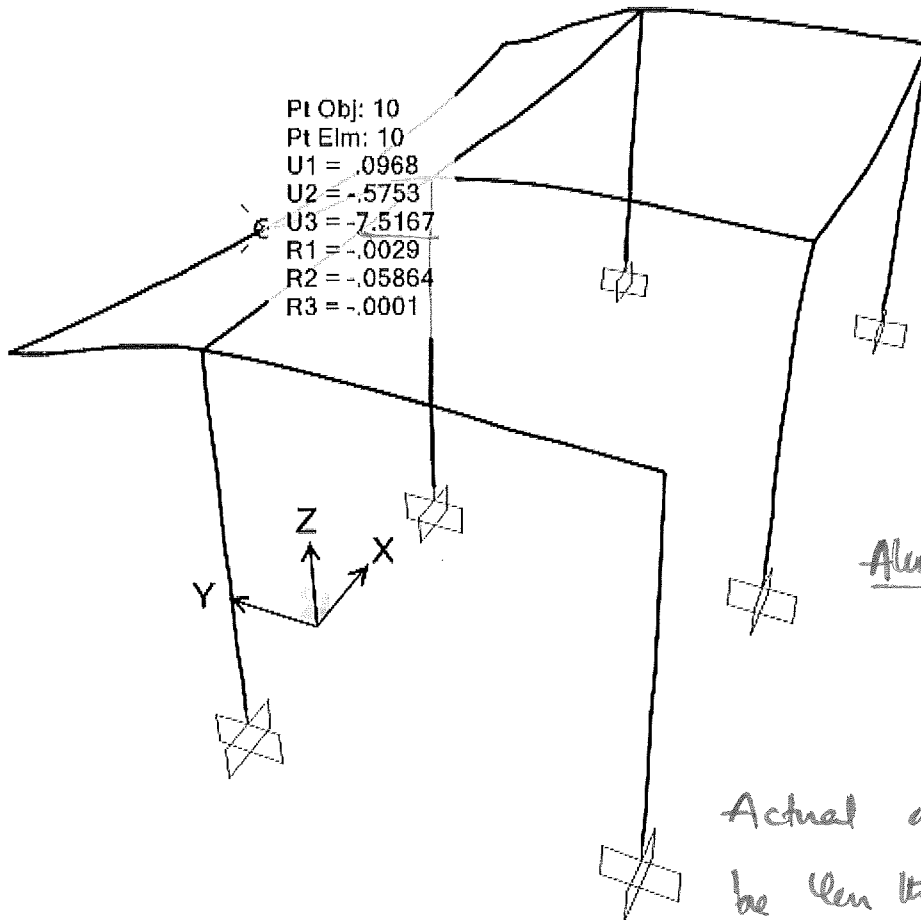
Factor	L	Braced ke	Sway ke	Delta_b	Delta_s	Cm	Betam
Major Bending	1.000	1.000	1.000	1.000	1.000	0.994	0.985
Minor Bending	1.000	1.000	1.000	1.000	1.000	0.527	0.183
	Lltb	Kt	Kl	Kr	Alpha_m	Alpha_s	
LTB Factors	1.000	1.000	1.400	1.000	1.868	0.435	

ub

Axial Factors	Steel Type Hot Rolled	Kf 1.000	Kt 1.000	Alpha_b 14.829	0.500	0.360
Slenderness	Lambda_e	Lambda_ep	Lambda_ey	Lambda_ew	Lambda_e/ey	Compactness
Major/Flange	6.605	9.000	16.000	90.000	0.413	Compact
/Web	35.229	82.000	130.000	180.000	0.271	Compact
Minor/Flange	6.605	9.000	25.000	90.000	0.264	Compact
/Web	35.229	30.000	45.000	180.000	0.783	Non-Compact
Axial/Flange	6.605		16.000		0.413	Compact
/Web	35.229		45.000		0.783	Compact
Effective Pro	ZeMajor 5.640E-04	ZeMinor 8.528E-05	b-be 0.000	d-de 0.000	Aeff 0.005	
Major Moment	M*	Ms	Mr	Mi	Nc	
Minor Moment	-33.731	194.432	194.424	194.432	1619.119	
	-0.122	29.401	29.400	29.401	633.458	
Major Moment	Mo,cr	Mb	Mo	Mc	Mt	
	114.116	158.189	158.196	158.196	158.196	
Axial	N*	Ns	Nc	Nt	Noz	
	0.071	1761.611	633.458	1761.611	0.000	
SHEAR CHECK						
Major Shear	V*	Vv	Stress	Status		
Minor Shear	Force	Capacity	Ratio	Check		
	12.036	446.780	0.027	OK		
	0.048	536.136	8.969E-05	OK		

27

Deflection under dead load

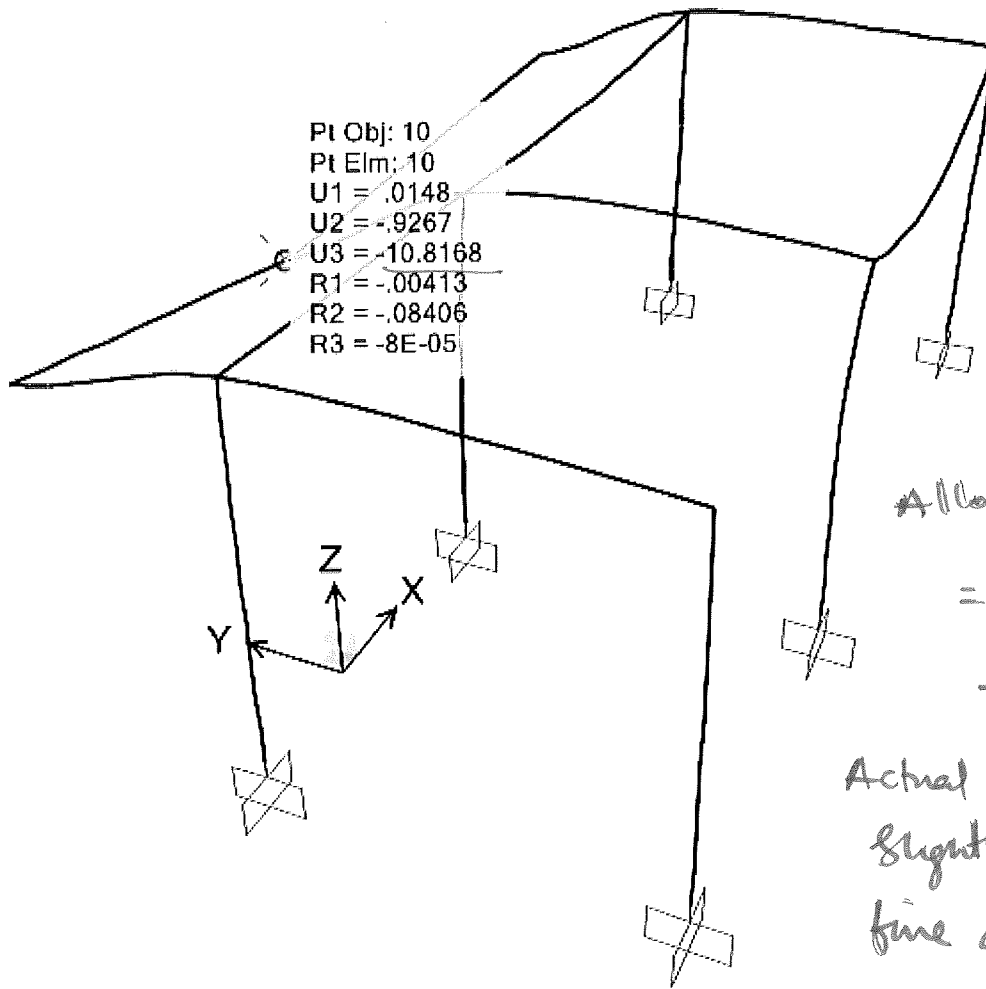


$$\frac{\text{Allowable} = 1600}{200} = 8\text{mm}$$

Actual deflection will be less than 7.5 because

the load of 0.8 kN/m of perimeter because is high γ so if it 0.5 kN/m then deflection comes to 6.68 mm

Deflection DL+LL

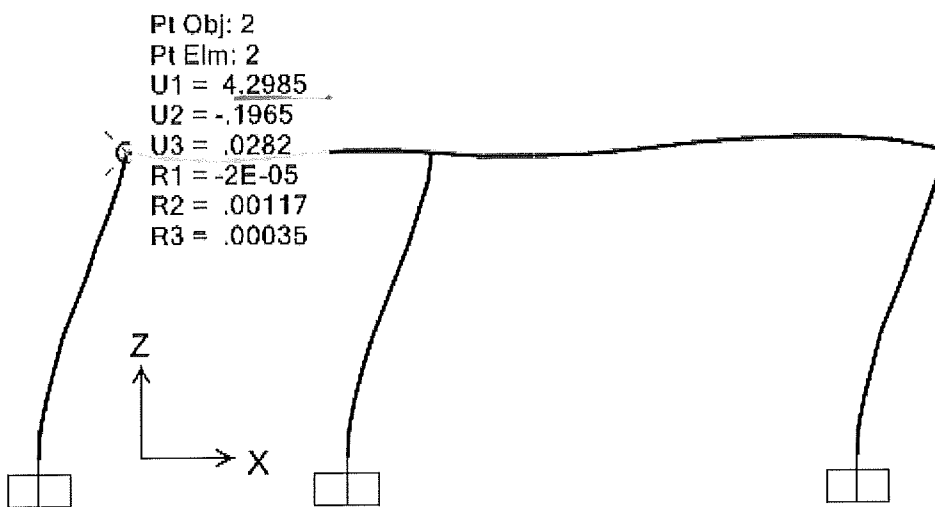


Allowable

$$= \frac{1600}{200} = 8 \text{ mm}$$

Actual deflection is slightly more, that's fine as the loads are over conservative.

Deflection: DL+ES



Allowable

$$\geq \frac{4}{200} \geq 15 \text{ mm}$$

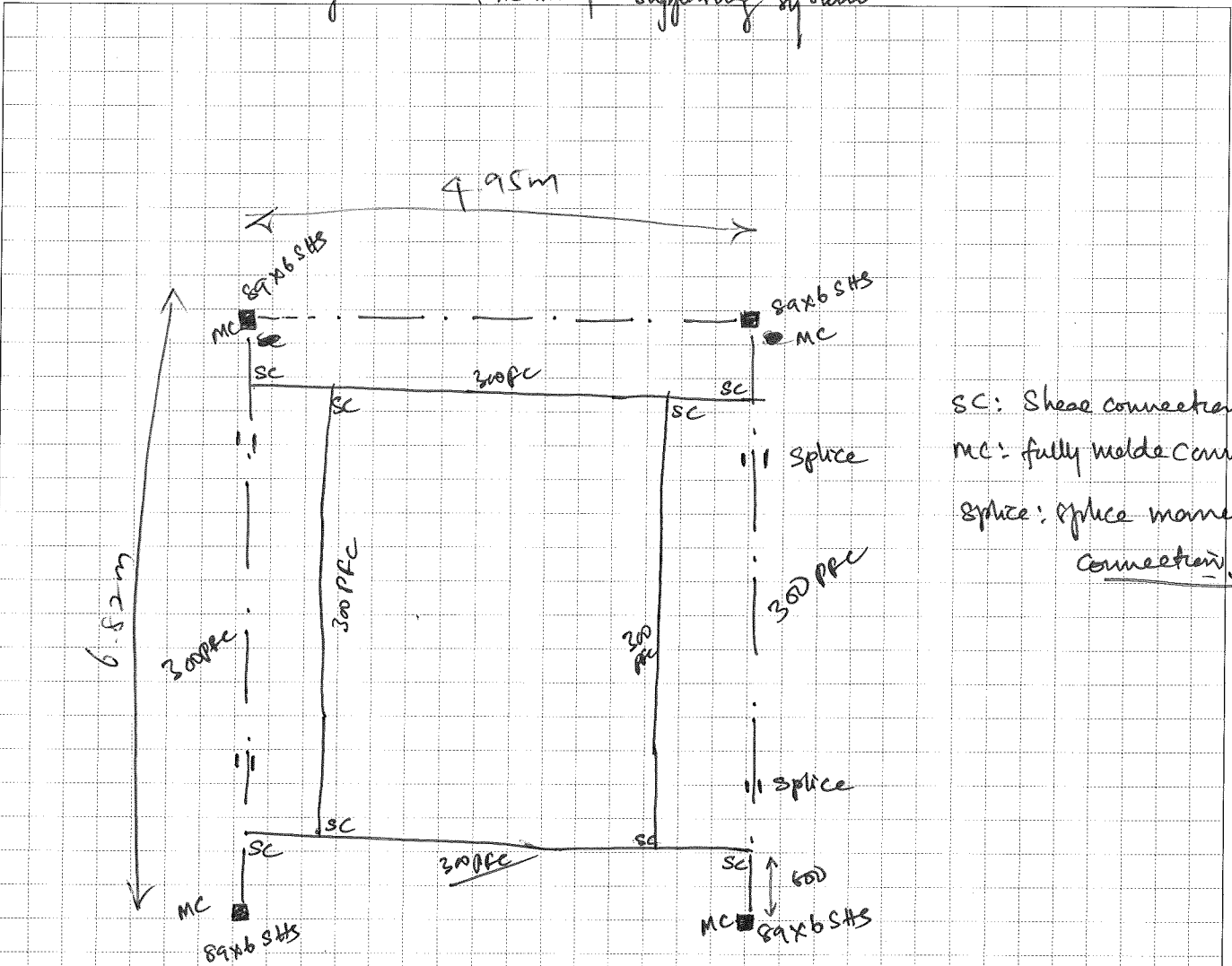
$$4.29 \leq 15 \text{ mm (ok)}$$

PROJECT Lihan st - lounge system - design

JOB NUMBER 17074

SUBJECT Lounge System - Structural Supporting System

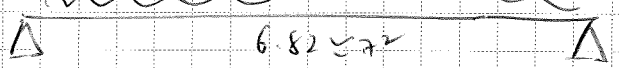
DATE



SC: Shear connection
 MC: fully welded connection
 Splice: splice moment connection

Dead weight of lounge system = $0.25 \text{ kN/m}^2 \rightarrow 250 \text{ kg/m}^2$

$0.61 \text{ kN/m} + 0.6 \text{ kN/m}$



$M_d = 3.78 \text{ kN/m}$

$M_{d1} = 2.48 \text{ kN/m}$

$= 6.23 \text{ kN/m}$

Shear $V = \frac{1 \times 7}{2} \rightarrow \frac{7 \text{ kN}}{2}$

Moment = $1.35 \times 6.26 \text{ kN/m}$

$\rightarrow 10 \text{ kN/m}$

PROJECT

JOB NUMBER

17096

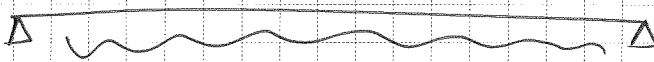
SUBJECT

Load and design details

DATE

18/04/18

Moment demand due to wind load



$$\text{wind uplift} = 0.91 \text{ kN/m}^2 \times 2.5 = 2.3 \text{ kN/m}$$

$$M_w = \frac{2.3 \times 7^2}{8} = 14 \text{ kN-m}$$

$$M_{de} = 8 \text{ kN-m}$$

$$M_d = 14 \times 1.35 = 20 \text{ kN-m}$$

$$Q_d = 10.8 \text{ kN}$$

$$S_x = 236 \times 10^3 \text{ mm}^3$$

$$M_c = 20 \times 526 \times 10^3$$

$$= 10520 \text{ kN-m}$$

(Plastic)

$$\frac{M_d}{M_c} = 0.18 \text{ (Nominal)}$$

$$\frac{M_d}{M_c} \approx 0.13 \text{ (Nominal)} \quad \frac{Q_d}{V_c} \approx 0.6$$

$$\frac{V_d}{V_c} \approx$$

PROJECT

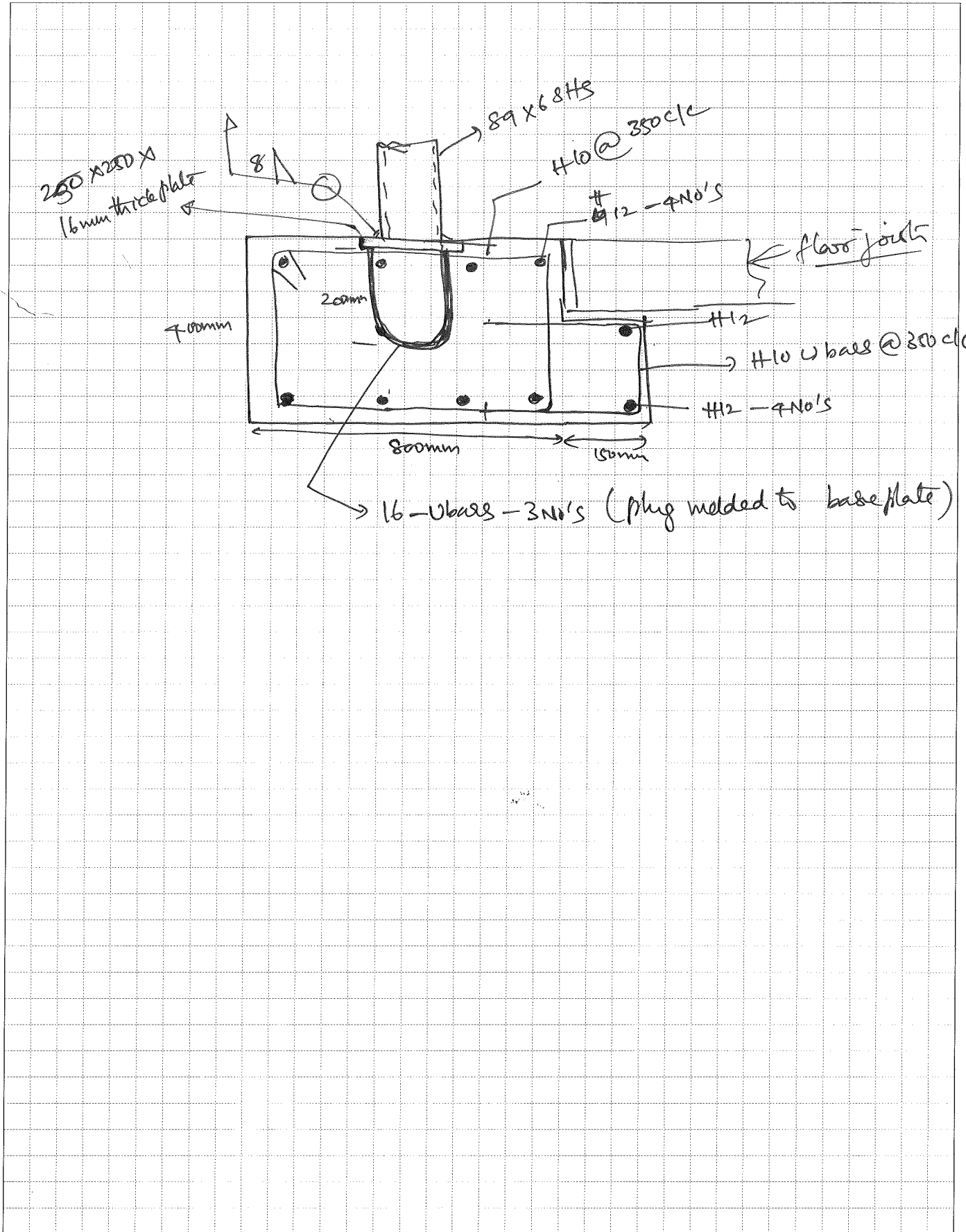
Foundation sketch

JOB NUMBER

17099

SUBJECT

DATE



PROJECT

Kaipoi House

JOB NUMBER

17094

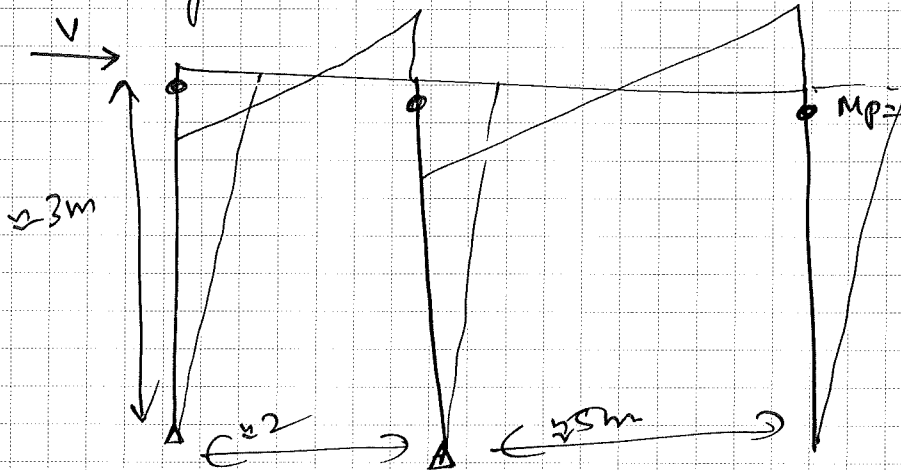
SUBJECT

DATE

16/05/18

Bracing units calculation:

Column sway mechanism:



Capacity of

300PE:

$$M_p = \frac{780 \times 10^3 \times 0.3 \times 0.9}{10^6} = 129.6 \text{ kNm}$$

1 kN = 200 N

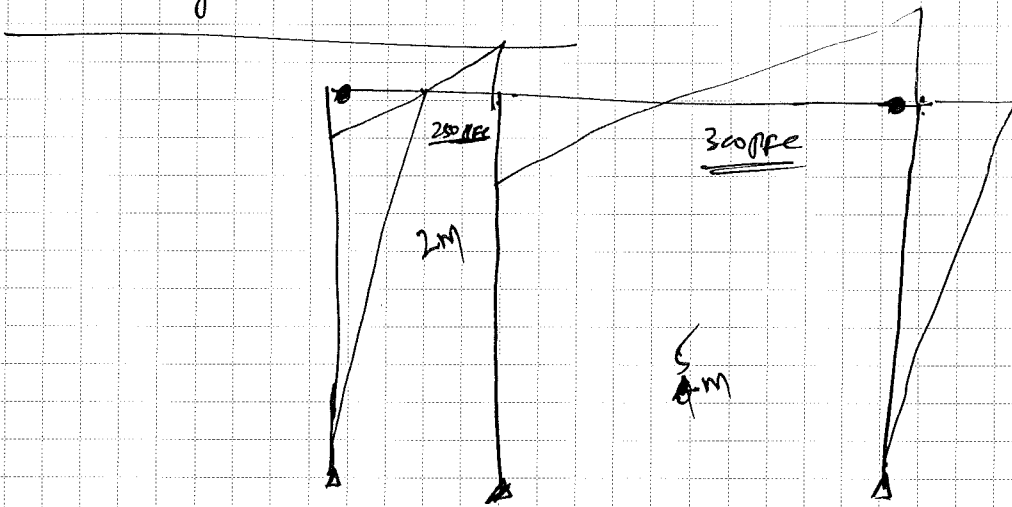
Column sway mechanism:-

$$V \times \theta \times L = \sum M_p \times \theta_p = 3 \times 129.6 \times \theta_p$$

$$V = \frac{3 \times 129.6}{3m} = 129.6 \text{ kN}$$

~~$B_v = 129.6 \times 200 = 25920 \text{ N}$~~

Beam sway mechanism:-



PROJECT

JOB NUMBER

17094

SUBJECT

~~Deck Over~~

DATE

16/05/18

$$V_{\text{TOTAL}} = 113 \left(\frac{3}{2} \right) + 129.6 \left(\frac{3}{5} \right) \underline{2500 \text{ N}}$$

$$= 82.42$$

$$M_p = 420 \times 800 \times 0.9$$

$$= 113 \text{ kNm}$$

$$Q_c \times h = Q_b \times L$$

$$Q_b = Q_c \left(\frac{h}{L} \right)$$

$$V = \underline{82.42 \text{ kN}} \text{ (governs the design)}$$

Using factor of Safety of 2:

$$V = \underline{41.21 \text{ kN}}$$

Structural capacity of steel frame in terms of RB Braering units

$$\text{Braering units} = 41 \times 20$$

$$= \underline{\underline{820 \text{ RBV}}}$$

SECTION 3

Truss Details & Bracing Details

~~(Include Fixings of Gib & Ecoply)~~

- ~~- Design IT Calcs~~
- ~~- Hyspan etc.~~



Demand Calculation Sheet

Job Details

Name: Phoenix Homes
 Street and Number: 17 Lilian Street
 Lot and DP Number: Lot 45 DP 460884
 City/Town/District: Kaiapoi
 Designer: Lana
 Company: W2 Limited
 Date: 29-11-2017

Building Specification

Number of Storeys	2		
Floor Loading	2 kPa		
Foundation Type	Slab		
	Upper	Lower	
Cladding Weight	Medium	Medium	
Roof Weight	Light	Light	
Room in Roof Space	No	No	
Roof Pitch (degrees)	3	3	
Roof Height above Eaves (m)	1.1	3.4	Percentage of Upper Storey Area Supported by Lower Storey
Building Height to Apex (m)	6.7		
Ground to Lower Floor (m)	0.2		
Lower to Upper Floor (m)		2.9	
Average Stud Height (m)	2.5	2.7	
Building Length (m)	12.78	13.35	
Building Width (m)	8.97	8.97	
Building Plan Area (m ²)	112.8	112.5	100

Building Location

Wind Zone = High

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

Earthquake Zone 2

Soil Type C (Shallow)
 Annual Prob. of Exceedance: 1 in 2500 (x 1.8)

Bracing Units required for Wind

	Along	Across
Upper Level	360	426
Lower Level	901	1224

Bracing Units required for Earthquake

	Along & Across
Upper Level	990
Lower Level	2059



Upper Level Along Resistance Sheet

Job Name: Phoenix Homes

Timber Floor Limit of 120 BUs/m Applied

Wind	EQ
Demand	
360	990
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1432 398%	1252 127%
A	1	3.00		2.55	GS1-N	GIB®	195	169		
	2	1.60		2.55	GS1-N	GIB®	104	90		
	3	1.80		2.55	GS1-N	GIB®	117	102		
	External Length = 12.78									
B	1	3.00		2.55	GS1-N	GIB®	195	169		
	2	3.20		2.55	GS1-N	GIB®	208	181		
C	1	1.50		2.55	GS1-N	GIB®	97	85		
	2	3.00		2.55	GS1-N	GIB®	195	169		
D	1	0.40		2.55	GS1-N	GIB®	20	22		
	2	1.80		2.55	GS1-N	GIB®	117	102		
	3	1.90		2.55	GS1-N	GIB®	123	107		
	4	1.00		2.55	GS1-N	GIB®	61	56		
	External Length = 12.78									

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved



Upper Level Across Resistance Sheet

Job Name: Phoenix Homes

Timber Floor Limit of 120 BUs/m Applied

Wind	EQ
Demand	
426	990
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	1148 270%	1035 105%
M	1	1.30		2.55	GS1-N	GIB®	84	73		
	2	1.50		2.55	GS1-N	GIB®	97	85		
	3	1.50		2.55	GS1-N	GIB®	97	85		
	External Length = 8.97									
N	1	0.55		2.55	GS1-N	GIB®	29	30		
	2	0.55		2.55	GS1-N	GIB®	29	30		
	3	3.00		2.55	GS1-N	GIB®	195	169		
	4	1.20		2.55	GS1-N	GIB®	78	68		
External Length = 8.97									331 OK	298 OK
O	1	2.30		2.55	GS1-N	GIB®	149	130		
	2	0.90		2.55	GS1-N	GIB®	53	50		
	3	2.10		2.55	GS1-N	GIB®	136	119		
External Length = 8.97									339 OK	299 OK
P	1	0.69		2.55	GS1-N	GIB®	38	38		
	2	0.69		2.55	GS1-N	GIB®	38	38		
	3	1.00		2.55	GS1-N	GIB®	61	56		
	4	0.58		2.55	GS1-N	GIB®	31	32		
	5	0.58		2.55	GS1-N	GIB®	31	32		
External Length = 8.97									199 OK	196 OK

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 staved



Lower Level Along Resistance Sheet

Job Name: Phoenix Homes

									Wind	EQ
									Demand	
									901	2059
									Achieved	
Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2245	2080
									249%	101%
A	1	4.30		2.7	GS1-N	GIB®	264	229		
	2	0.80		2.7	GS1-N	GIB®	43	42		
	3	1.20		2.7	GS1-N	GIB®	74	64		
	4	1.30		2.7	GS1-N	GIB®	80	69		
	External Length = 7.45									
B	1	4.70		2.7	GS1-N	GIB®	288	251		
	2	0.70		2.7	GS1-N	GIB®	37	37		
	External Length = 5.40									
C	1	0.70		2.7	GS1-N	GIB®	37	37		
	2	3.10		2.7	BL1-H	GIB®	353	287		
	3	3.00		2.7	GS1-N	GIB®	184	160		
	External Length = 6.80									
D	1	0.59		2.7	BLP-H	GIB®	70	75		
	2	2.30		2.7	BLP-H	GIB®	307	307		
	3	0.60		2.7	BLP-H	GIB®	71	76		
	4	0.60		2.7	BLP-H	GIB®	71	76		
	5	0.70		2.7	BLP-H	GIB®	87	91		
	6	2.10		2.7	BLP-H	GIB®	280	280		
	External Length = 13.35									

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 staved



Lower Level Across Resistance Sheet

Job Name: Phoenix Homes

Wind	EQ
Demand	
1224	2059
Achieved	

Line	Element	Length (m)	Angle (degrees)	Stud Ht. (m)	Type	Supplier	Wind (BUs)	EQ (BUs)	2222	2063
M	1	0.40		2.7	GS1-N	GIB®	19	21	182%	100%
	2	0.50		2.7	GS1-N	GIB®	24	26		
	3	0.50		2.7	GS1-N	GIB®	24	26		
	4	7.00		2.7	Steel	Steel	871	871		
	External Length = 8.97									
N	1	1.50		2.7	GS2-N	GIB®	131	115	477 OK	418 OK
	2	2.30		2.7	GS1-N	GIB®	141	123		
	3	2.40		2.7	GS1-N	GIB®	147	128		
	4	1.00		2.7	GS1-N	GIB®	58	53		
	External Length = 8.97									
O	1	1.40		2.7	GS1-N	GIB®	86	75	478 OK	416 OK
	2	1.60		2.7	GS1-N	GIB®	98	85		
	3	4.80		2.7	GS1-N	GIB®	294	256		
	External Length = 8.97									
P	1	3.80		2.7	GS1-N	GIB®	233	203	328 OK	285 OK
	2	1.55		2.7	GS1-N	GIB®	95	83		
	External Length = 7.89									

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 staved



Custom Wall Elements

Supplier	System	Min. Length m	Wind BUs/m	EQ BUs/m
Steel	Steel	1	140	140

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



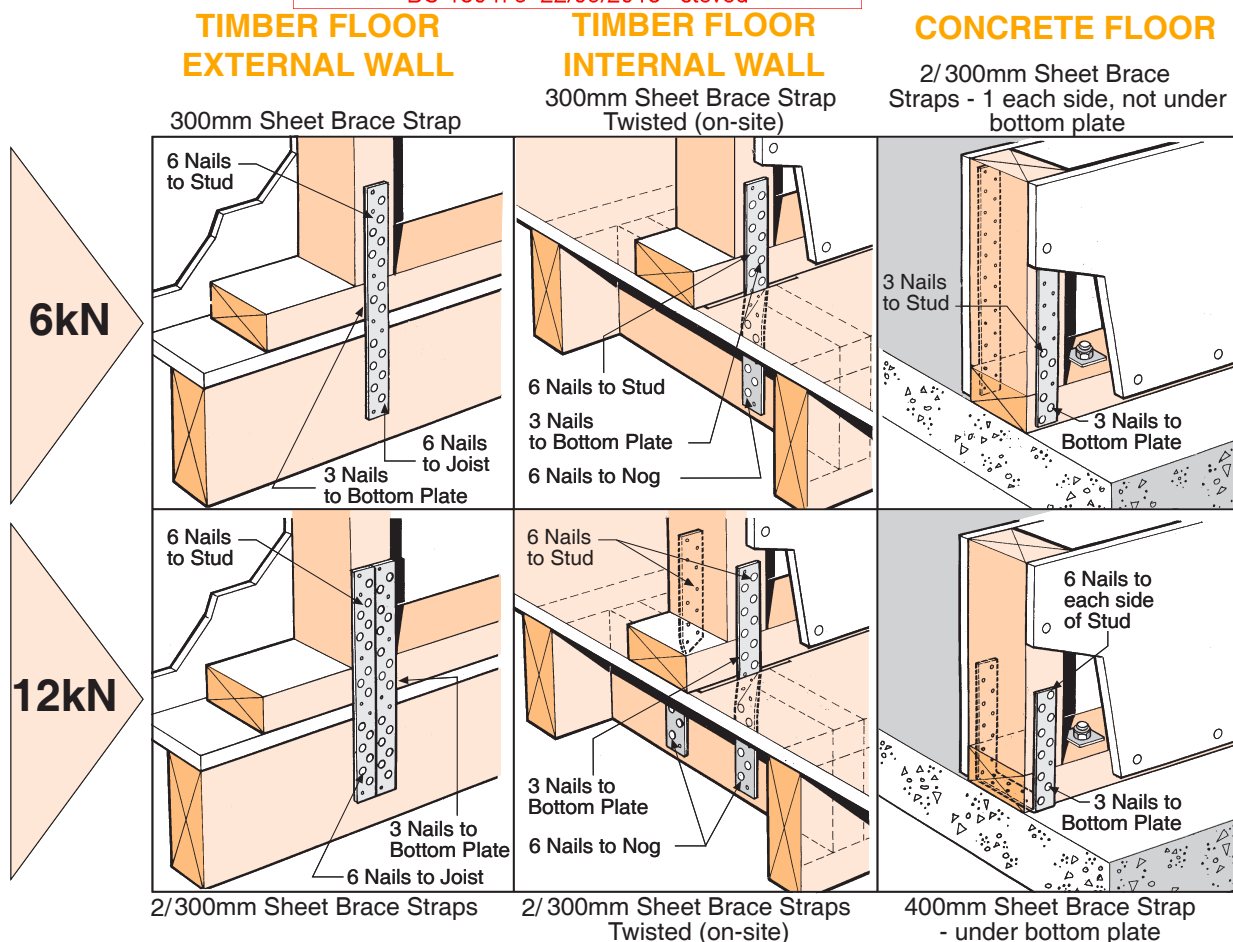
LUMBERLOK®

SHEET BRACE STRAPS

- ★ Complies with Section 8 NZS 3604:2011
- ★ 6kN and 12kN fixings
- ★ 200, 300, 400 and 600mm length
- ★ Quick and easy to apply

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

**USE STAINLESS STEEL
OPTION IN EXTERIOR
SITUATIONS**



LUMBERLOK Sheet Brace Straps are available in 200, 300, 400 and 600mm lengths.

In addition to a bracing wall hold down, this product can be used for a multitude of 6kN fixings situations, as detailed in NZS 3604:2011.

0.91mm x 25mm G300 Z275 Galvanised Steel.

Nail using LUMBERLOK Product Nails 30mm x 3.15 diameter.

Also available in 0.9mm x 25mm Stainless Steel 304-2B.

**Available from leading Builders Supply Merchants
throughout New Zealand**



MiTek New Zealand Limited

AUCKLAND
PO Box 58-014, Botany 2163
Phone: 09-274 7109
Fax: 09-274 7100

CHRISTCHURCH
PO Box 8387, Riccarton 8440
Phone: 03-348 8691
Fax: 03-348 0314

www.mitekznz.co.nz

© Copyright 2017 MiTek Holdings, Inc.
All rights reserved.

MITEK® LUMBERLOK® BOWMAC®

Canterbury Frames & Trusses Ltd
 30 Westland, Rolleston, Ph 03 347 1100,

BC180473

Page 1 of 1

Date: 20-12-2017

Ver 4.3.4

Producer Statement - PS1 - Design

Job Ref: 4688

This producer statement applies to the structural engineering design software "Pryda Build" supplied by Pryda NZ to
 Canterbury Frames & Trusses Ltd

These truss designs are in accordance with sound and widely accepted engineering principles. I believe on reasonable grounds that if constructed in accordance with the design, the trusses will comply with relevant requirements of the New Zealand Building Code, Clause B1 and Verification Method B1/VM1. The durability shall comply with the New Zealand Building Code, Clause B2, for building importance level 2 and a design working life of 50 years.

In addition to the above, this software also complies in part with:

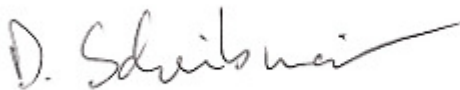
ANSI / TPI 1 - 2002 National Design Standard for metal plate connected wood truss construction.

AS 1649 - 2001 Timber - Methods of test for mechanical fasteners and connectors - Basic working loads and characteristic strengths.

The truss designs require that the supporting structure is stable in its own right, and that the trusses will be braced in accordance with the New Zealand Building Code Standard NZS 3604:2011, and any supplementary details provided, including but not limited to Pryda Installation Guides.

Pryda NZ holds a current policy of Professional Indemnity Insurance with cover no less than NZ\$2 million. The policy includes the engineering design processes used in the software.

On behalf of Pryda NZ (a division of ITW New Zealand)



Daniel Scheibmair
 NZ Engineering Manager
 BE, ME (Hons), CPEng, IntPE, MIPENZ (261677)
Pryda New Zealand

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

Canterbury Frames & Trusses Ltd
 30 Westland, Rolleston, Ph 03 347 1100,

BC180473

Page 1 of 2

Date: 20-12-2017

Ver 4.3.4

Fabricator / Designer Statement

Job Ref: **4688**

This statement may be used by the Building Consent Authority for compliance purposes and is issued by a licensed truss fabricator using the Pryda Build software.

CLIENT Name: *New House*

SITE Details:

Address : *17 Lillian St*
Kaipoi

City:

Post Code:

Nominal Design Criteria:

- | | |
|---|---|
| Design working life: 50 years | Design roof snow load: 440 Pa
(incl. probability factor) |
| Building importance: Residential (Importance Level 2) | Ground snow load: 900 Pa |
| Roofing: Longrun (6.0 kg/sq.m) | Location: Region N4 - Canterbury |
| Ceiling: 13mm Gib-board (8.5 kg/sq.m) | Altitude above sea level: 100 m |
| Top chord purlins: 900 mm | |

- BC restraints: Battens at 1800 mm crs
- Standard truss spacing: 900 mm
- Standard roof pitch: 1.50 deg.
- Ult. design wind speed: 37 m/s (wind classification = Medium)

- Max. eaves height: 3 m
- Max. ridge height: 8 m

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

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

- Int pressure coeff. up: 0.2
- Overhang Condition: Metal fascia

The correctness of the Design Criteria used by the Pryda Build truss design software is the responsibility of the fabricator.

Note : Where relevant, a structural fascia beam is required at all hip and dutch hip corners to support the short creeper/rafter overhangs, as shown in AS4440-2004

Note: This statement must be read in conjunction with the truss layout and detail sheets.

All truss designs and their connections have been designed using Pryda design software. Additional items such as roof/ceiling plane bracing, special notes, supplementary timber, etc., which may be shown on the plan drawings are the responsibility of others.

All trusses have been manufactured in accordance with the fabrication specifications provided by Pryda, and shall be installed, connected and braced in accordance with the recommendations given in - : AS4440:2004 "Installation of nailplated timber roof trusses" and any other supplementary details that may be provided, such as the Pryda Installation Guides.

Timber verification and grading values are in accordance with clause B1 and timber treatment in accordance with clause B2 of the New Zealand Building Code.

I/we confirm that the trusses for this project have been manufactured in accordance with the fabrication specifications provided by Pryda New Zealand.

Name: Miriam Hickson Position: Designer

Signed:  Date: 20-12-2017

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

Canterbury Frames & Trusses Ltd
30 Westland, Rolleston, Ph 03 347 1100,

BC180473

Page 2 of 2

Date: 20-12-2017

Ver 4.3.4

Fabricator / Designer Statement

Job Ref: **4688**

Note 1: All timber framing nails are machine-driven, glue coated, or annular/helical deformed shank. Use specified fixings with Pryda connectors as noted.

Tie-downs to walls/beams:

All trusses need to be fixed at each timber support with 2 / 90x3.15 dia Skew Nail

M1	1	-	1/NPPC8	OTH	90	JD5	-2.05
	5	7350	2/MGL	JD5	45	JD5	-2.06
M2	1	-	1/NPPC8	OTH	90	JD5	-1.19
	4	4995	1/NPPC8	JD5	90	JD5	-2.79
	6	7350	2/MGL	JD5	45	JD5	-0.19
M3	1	-	1/NPPC8	OTH	90	JD5	-1.72
	4	4860	2/MGL	JD5	45	JD5	-1.73
M4	1	-	1/NPPC8	JD5	90	JD4	-2.24
	5	8880	2/MGL	JD5	45	JD4	-2.23

Secondary fixings (hip & gable ends, valleys):

All trusses are to be fixed at each support with the following:

Hip truss to truncated girder	3 face nails, bottom chords
Jack truss to truncated girder	3 skew nails or back face nails, bottom chords
Creeper truss to hip truss	3 face nails, top and bottom chords
Top chord extensions	2 skew nails
Valley trusses	1 skew nail
Outriggers	2 skew nails

All additional connections are as follows:

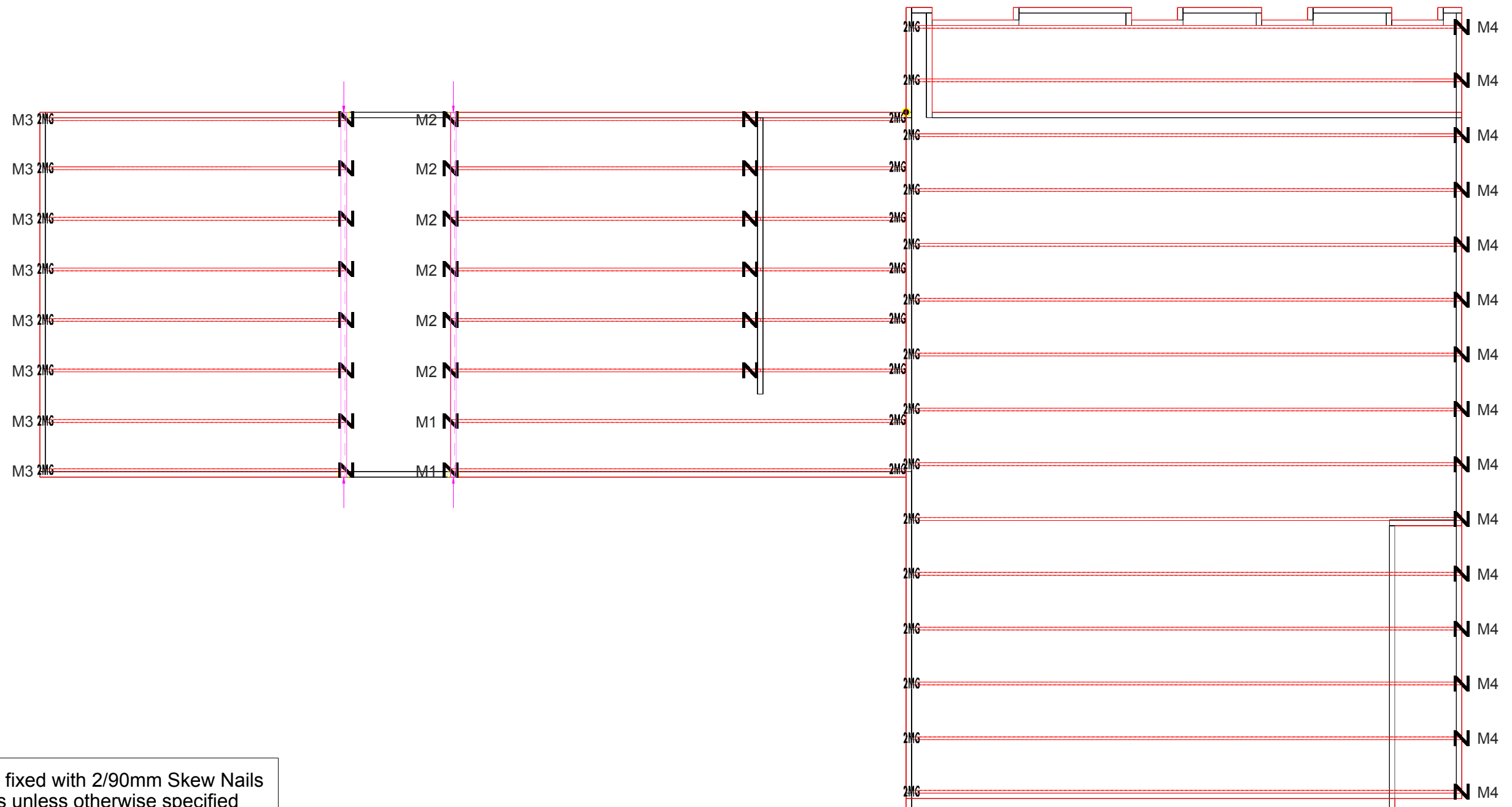
<i>Supporting Truss</i>	<i>Supported Truss</i>	<i>Top Chord</i>	<i>Bottom Chord</i>
-------------------------	------------------------	------------------	---------------------

Fixing Summary:

<i>Connector</i>	<i>Description</i>	<i>Total</i>	<i>Fixing Method (per connector)</i>	
Tiedown			Support	Truss
MGL	Multigrip (long)	62	6/30x3.15d nails	4/30x3.15d nails
NPPC8	Purlin cleat	37	4/12g-11x35 screws	12/30x3.15d nails

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

Check all opening sizes before cladding or ordering windows & doors.



All trusses fixed with 2/90mm Skew Nails & 2/Z-Nails unless otherwise specified

Truss Connections

* All tie-downs use 2/90x3.15 dia Skew Nails unless otherwise noted.

- N** 37 x 1/NPPC8 Purlin cleat
- 2MG** 31 x 2/MGL Multigrip (long)

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

140x45 SG8 Rafters as per Architects Specification



TRUSS LAYOUT

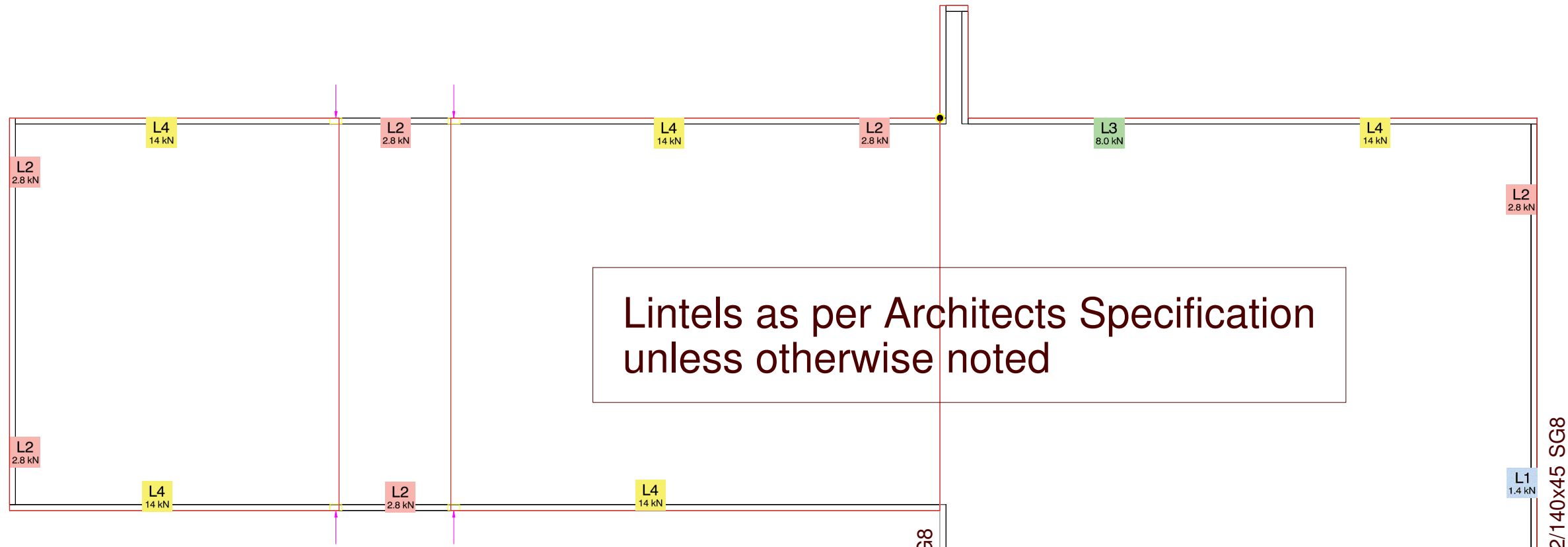
Customer: New House
 Site Address: 17 Lillian St
 Kaiapoi

Job Details:
 Roofing: Longrun
 Pitch: 1.50 Deg.
 Truss Spacing: 900
 Design Wind Velocity: 37.00 m/s (Ult.)
 Detailer: Miriam Hickson

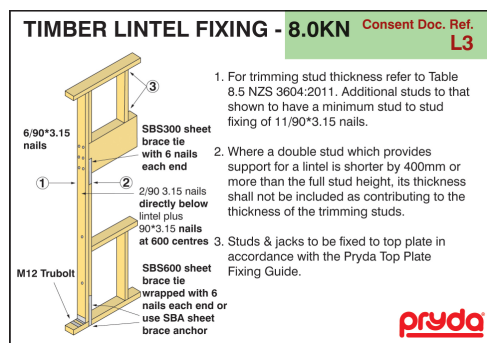
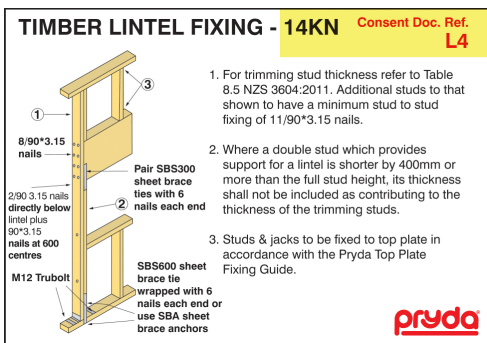
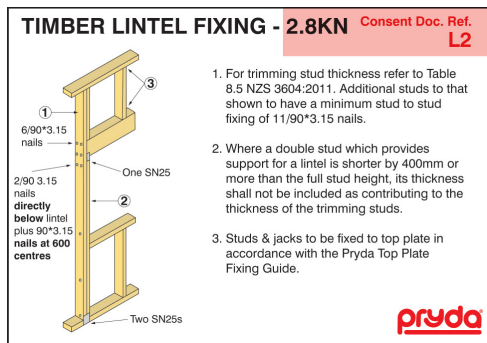
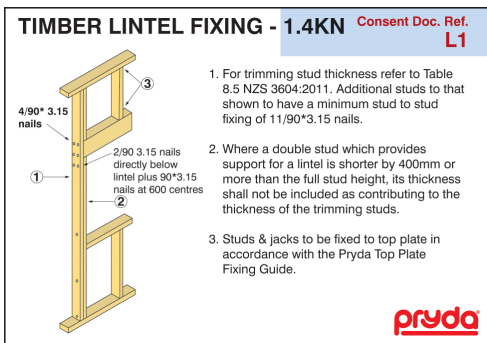
Job Ref: 4688
 Scale: As Shown
 Sheet:



Check all opening sizes before cladding or ordering windows & doors.



Lintels as per Architects Specification unless otherwise noted



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



LINTEL FIXING LAYOUT (LOWER)

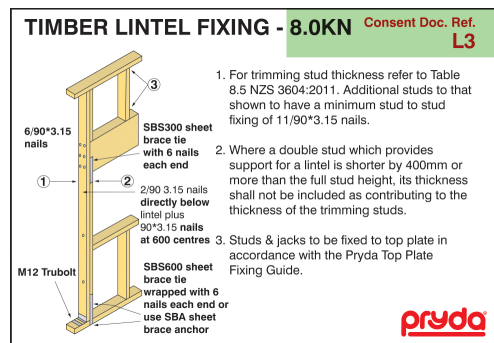
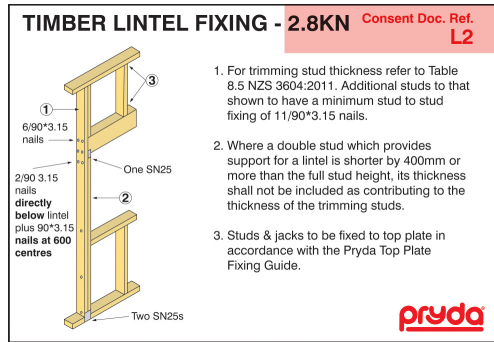
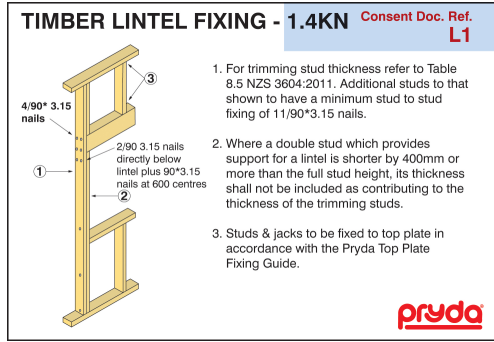
Customer: New House
Site Address: 17 Lillian St
Kaiapoi

Job Details:
Roofing: Longrun
Pitch: 1.50 Deg.
Truss Spacing: 900
Design Wind Velocity: 37.00 m/s (Ult.)
Detailer: Miriam Hickson

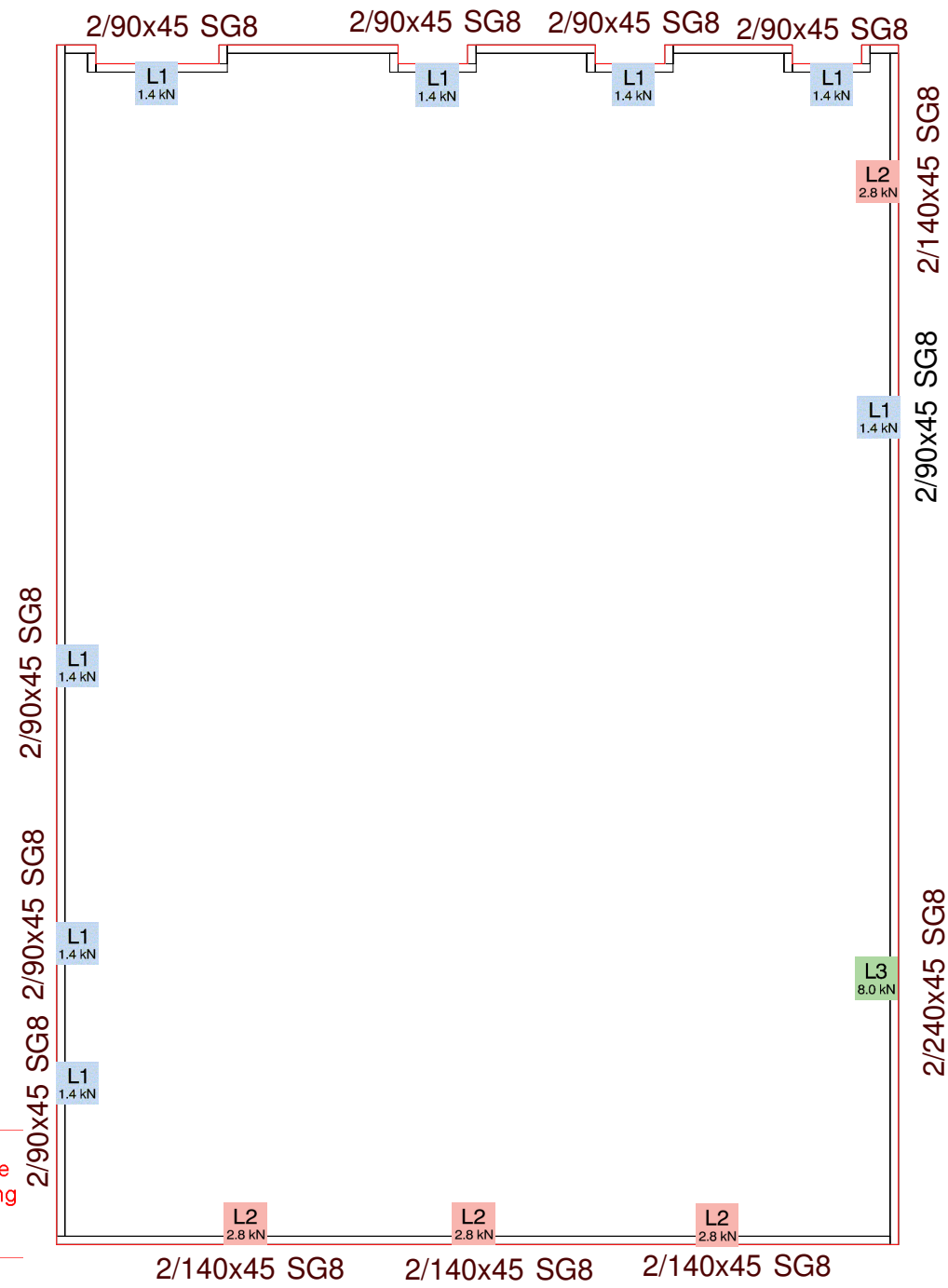
Job Ref: 4688
Scale: As Shown
Sheet:



Check all opening sizes before cladding or ordering windows & doors.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance with the Building Act 2004, clause 49 and the Building Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



LINTEL FIXING LAYOUT (UPPER)

Customer: New House
Site Address: 17 Lillian St
Kaiapoi

Job Details:
Roofing: Longrun
Pitch: 1.50 Deg.
Truss Spacing: 900
Design Wind Velocity: 37.00 m/s (Ult.)
Detailer: Miriam Hickson

Job Ref: 4688
Scale: As Shown
Sheet:



SECTION 4

H1 Calculations

~~Risk Matrix~~

ARCHITECTURE + STRUCTURAL ENGINEERING BUILDING DESIGN

W2

W2 LTD + P O BOX 130 111 + 03 366 0966 + CHRISTCHURCH + NEW ZEALAND

Calculations to satisfy H1 Insulation requirements

Project Location	17 Lilian Street Kaipoi
Zone	3

Schedule method:

Total window/wall area ratio	0.32	Schedule method may be used if less than 0.3
W, S, E window/wall area ratio	0.30	Schedule method may be used if less than 0.3
Skylight area	0.00	Schedule method may be used if less than 1.2 square metres

Calculation method

Total window/wall area ratio	0.32	Calculation method may be used if less than 0.5
Calculated Heat Loss	524.29	

Schedule reference building

	R-val.	Area	HL
Roof	3.30	206.41	62.55
Wall	2.00	205.71	102.85
Floor	1.30	195.67	150.52
Glazing up to 30%	0.26	90.97	349.88
Glazing over 30%	0.34	6.55	19.27
Skylights	0.34	0.00	0.00

Schedule reference Heat Loss	685.07
------------------------------	--------

The calculated heat loss for the proposed building is less than that for the reference building, so with insulation as shown in the cross section drawing supplied, the design is acceptable.

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

SECTION 5

Specifications



ARCHITECTURAL SPECIFICATION

Project **SOVEREIGN LAKES HOUSE**
Address **17 LILIAN STREET, KAIAPOI**
Date **APRIL 2018**

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

TABLE OF CONTENTS

1220 PROJECT	2
2310 FOUNDATIONS	4
3101 CONCRETE WORK - BASIC	6
3155FR FIRTH RIBRAFT® FLOOR SYSTEM	11
3410 STRUCTURAL STEELWORK - BASIC	18
3820 CARPENTRY	21
4161T THERMAKRAFT UNDERLAYS, FOILS & DPC	25
4221HH HERMPAC HORIZONTAL CLADDING SYSTEM	29
4221HV HERMPAC VERTICAL CLADDING SYSTEM	35
4230 WALL CLADDING	40
4282RI RCS INTEGRA LIGHTWEIGHT CONCRETE FACADE SYSTEM	43
4311M METALCRAFT PROFILED ROOFING	49
4383 TIMBER DECKING	54
4422VE VIKING ENVIROCLAD & ENVIROCLAD FBS MEMBRANE	56
4521 ALUMINIUM WINDOWS AND DOORS	61
4610 GLAZING RESIDENTIAL	69
4710P PINK® BATTS® & PINK® BATTS® SILENCER® INSULATION	74
4711E EXPOL UNDERFLOOR INSULATION	78
5113G GIB® PLASTERBOARD LININGS	81
5120 LININGS	87
5431KF KOPINE PARTICLEBOARD FLOORS	89
6211 WALL TILING	92
6221 FLOOR TILING	97
6311 TIMBER STRIP, BLOCK & PLANK FLOORING	103
6511 CARPETING	107
6700 PAINTING GENERAL	110
6711 PAINTING EXTERIOR	115
6721 PAINTING INTERIOR	116
7120 HOT & COLD WATER SYSTEM	117
7212 GAS SYSTEM LPG CYLINDERS	123
7221 GAS APPLIANCES	128
7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS	130
7420 SANITARY SYSTEMS	133
7430 DRAINAGE	135
7555E ESCEA GAS FIRES	138
7701 ELECTRICAL BASIC	142

1220 PROJECT

1 GENERAL

This general section describes the project including:

- A description of the work
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER

Read all general sections together with all other sections.

Description of the work

1.2 SCOPE OF THE WORK

Construction of a new two storey residential home with attached double garage at 17 Lilian St, Kaiapoi

1.3 RESTRICTED BUILDING WORK

This project includes Restricted Building Work.

Site

1.4 SITE

The site consists of: 680m²
as shown on drawing A02 - Site Plan
no.

1.5 LEGAL DESCRIPTION

The site of the works, the street address and the legal description are shown on the drawings.

1.6 EXISTING SERVICES

The following are the network utility services:

Electrical:	To boundary
Telecommunication:	To boundary
Water:	As shown on Site Plan A02
Gas:	N/A
Stormwater:	As shown on Site Plan A02
Foul water:	As shown on Site Plan A02

1.7 SITE FEATURES

This is a flat corner site located in a subdivision, see site plan on A-02 for levels and further detail.

Site environment - Wind

1.8 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN

The design wind pressures are to [NZS 3604](#), Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.

Building wind zone Medium

Site environment - Durability

1.9 EXPOSURE ZONE

The exposure zone is to [NZS 3604](#), Section 4 Durability, 4.2 Exposure zones and [NZBC E2/AS1](#).

The site zone is: C

Site environment - Seismic

1.10 EARTHQUAKE ZONE - NON SPECIFIC DESIGN

The zone is to [NZS 3604](#), Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone 2
is:

Archaeological discovery

1.11 ANTIQUITIES AND ITEMS OF VALUE

Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator.
All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Heritage New Zealand Pouhere Taonga Act 2014. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site may be classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the Heritage New Zealand for authority to proceed.

Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.

NOTE; There is a difference between the site and the buildings, the Act tends to address the site (items found in or on the ground) and has less say over the building and it's contents. Procedures under the Act are complex, costly and time consuming, and there are substantial penalties for non-compliance under the Act. For more information refer to the NZ Historic Place Trust web site www.historic.org.nz.

2310 FOUNDATIONS

1 GENERAL

This section relates to all foundation and piling work, with the exception of in situ concrete work and concrete masonry.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3605	Timber piles and poles for use in buildings
NZS 3603	Timber structures standard

Performance

2 PRODUCTS

2.1 SQUARE TIMBER PILES

Corsican pine or radiata pine, treated H5 CCA (preservative code 01 or 02) to [NZS 3602](#), table 1A, and complying with [NZS 3605](#) for cross-section, length, straightness, strength and branding. All to [NZS 3604](#) for footing and type.

2.2 TIMBER SUB-FLOOR FRAMING

Species, grade, moisture content in service and level of treatment as set out in [NZS 3602](#). Grading to [NZS 3603](#) and treated to [NZS 3602](#), table 1C.

2.3 NAILS

Steel, stainless steel and galvanized steel of pattern to [NZS 3604](#), table 6.6 **Nailing schedule for hand-driven and power-driven nails** and section 4 Durability.

2.4 BOLTS AND SCREWS

Steel, stainless steel and galvanized steel to [NZS 3604](#).

2.5 NAIL PLATES

Stainless steel and galvanized steel toothed or nailed steel plates to the plate manufacturer's design for the particular locations shown on the drawings.

2.6 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

2.7 CONCRETE

For piles and footings, 17.5 MPa prescribed mix concrete to [NZS 3104](#), section 3, and cover to reinforcing to [NZS 3604](#), 4.5.1, generally 50mm, against ground 75mm. Provisions for prescribed mix concrete, and [NZS 3604](#), section 6.4.5, Pile footings.

3 EXECUTION

3.1 FOUNDATIONS GENERALLY

Comply with [NZS 3109](#), 3602 and [NZS 3604](#) 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).

3.2 EXCAVATIONS

Refer to 2210 PREPARATION AND GROUNDWORK.

3.3 INSTALL SQUARE TIMBER PILES

Prepare for, place and secure as detailed on the drawings.

3.4 SUB-FLOOR FRAMING

Frame up off foundation walls and piles, all fabricated, fastened and braced to NZS 3604, section 6, **Foundation and subfloor framing.**

4 SELECTIONS

4.1 PILES

Brand/type: Square timber

4.2 TIMBER SUB-FLOOR FRAMING

Member	Size	Centres	Species / grade	Treatment
Timber piles:	125 x 125mm square or 140mm dia. round, minimum	1200	Pinus Radiata	H5 CCA (preservative code 01 or 02)
Sub-floor framing:	90 x 45	450	Pinus Radiata	H3.2
Bearers:	90 x 90		Pinus Radiata	H3.2

4.3 NAILS

Material < 600mm from ground: Stainless steel

Material > 600mm from ground: Galvanized Steel

4.4 BOLTS AND SCREWS

Material < 600mm from ground: Stainless steel

Material > 600mm from ground: Galvanized Steel

3101 CONCRETE WORK - BASIC

1 GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

1.1 ABBREVIATIONS AND DEFINITIONS

The following definitions apply specifically to this section:

ACRS Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.

ACRS web site - www.steelcertification.com

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/AS1	Structure
NZBC B1/VM1	Structure
NZBC E2/AS3	External moisture
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

Requirements

1.3 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to [AS/NZS 4671](#). Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

2 PRODUCTS

2.1 NORMAL CONCRETE

Normal concrete 17.5 to 50 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to [NZS 3104](#). Provide delivery dockets listing mix and despatch details.

2.2 SITE CONCRETE

Concrete 10 MPa with minimum water for workability, all materials and batching to [NZS 3104](#), table 3.1, Prescribed mixes (P).

2.3 REINFORCEMENT

Bars to [AS/NZS 4671](#). Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to [AS/NZS 4671](#), and 500E mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1.

2.4 MESH FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground mesh to be welded reinforcing mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1, Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m² (1.14kg/m² in each direction).

2.5 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.6 SPACERS AND CHAIRS

Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

2.7 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to [NZS 3604](#), 7.5.4, Damp-proof membrane.

3 EXECUTION

3.1 HANDLE AND STORE

Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.2 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. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 INSTALL DAMP-PROOF MEMBRANE

Apply polythene membrane to prepared basecourse with 150mm laps between sheets. Tape seal laps and penetrations with 50mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.

3.4 CUT AND BEND REINFORCEMENT

Cut and bend bars using proper bending tools to avoid notching and to the requirements of [NZS 3109](#): 3.3 Hooks and bends. Minimum radii of reinforcement bends to [NZS 3109](#), table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.5 ADJUSTMENTS

Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.6 TOLERANCES, BENDING

To [NZS 3109](#), 3.9, Tolerances for reinforcement.

3.7 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 in [NZS 3109](#), 3.6, Spacing of reinforcement.

3.8 LAPPED SPLICES

Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS.

Provide laps only where indicated on the drawings. Tie all lapping bars to each other. Plain bars lapped splices must be hooked.

Wire mesh laps to [NZS 3101](#).1, lap one mesh square plus 50mm minimum (do not count bar extension beyond the outermost wire).

3.9 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229

For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.10 REINFORCEMENT COVER TO NZS 3604 OR NZS 4229

For in-situ concrete, foundations and interior slabs on ground, to [NZS 3604](#) or [NZS 4229](#), the reinforcement and welded mesh cover to be:

Location, cover to	NZS 3604	NZS 4229
Footing, to earth	75mm	75mm
Footing, to DPM	75mm	50mm
Foundation, to edge	75mm	75mm
Slab, to slab top	30mm	30mm
Slab, to slab edge	50mm to 75mm	50mm to 75mm

3.11 CASTING IN

Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.12 CONSTRUCTION JOINTS

Locate and construct as shown on the drawings or in accordance with [NZS 3109](#), 5.6, Type B.

3.13 PRE-PLACEMENT INSPECTION

Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.

3.14 SURFACE FINISHES

To [NZS 3114](#), 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.15 CONCRETE SURFACE TOLERANCES

To [NZS 3114](#), 104, Surface tolerances and [NZS 3114](#), 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

3.16 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.17 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.18 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3. Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.

Allow for free joints maximum 24m centres to NZBC B1/AS1, 3.1.13 **NZS 3604 New clause**.

3.19 SAW CUTS TO NZS 3604 OR NZS 4229

Cut slabs where indicated on the drawings as required to control shrinkage cracking. Form by saw cutting the slab (blade width approximately 5 mm) to a quarter of the depth of the slab after it has hardened (saw cutting shall take place no later than 24 hours after initial set for average ambient temperatures above 20 °C, and 48 hours for average ambient temperatures below 20°C).

3.20 SPACING OF SAW CUTS

Spacing of sawcuts

Floor situation	Maximum spacing of sawcuts both ways
Industrial floor	5m
Architectural, exposed floor, thin finishes, rigid finishes	4m
Carpet on underlay flooring	6m

3.21 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.22 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.

3.23 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

- 12 hours: Sides of beams, walls and columns
- 4 days: Slabs in beam and slab construction (leave props under slab spans over 2 metres)
- 10 days: Props from under slab spans over 2 metres
- 18 days: Beams, soffits and slab spans over 5 metres

3.24 CLEAN OUT

Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

3.25 REMOVE

Remove all unused materials and all concrete and reinforcing debris from the site.

4 SELECTIONS

4.1 REINFORCEMENT LAPS

Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.2 SITE CONCRETE

Site concrete:

10 MPa: Driveways and pathways

4.3 SURFACE FINISHES FLOOR SLABS

Surface finish class to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U3	Floor slab

4.4 SURFACE FINISHES PAVEMENTS AND DRIVEWAYS

Surface finish class to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

Finish class	Location
U2 wood float finish	Driveways and pathways

3155FR FIRTH RIBRAFT® FLOOR SYSTEM

1 GENERAL

This section relates to the supply and installation of **Firth Industries** RibRaft® floor system. It includes:

- a non specific design reinforced concrete waffle raft floor slab-on-ground (RibRaft®) system.
- a RibRaft® floor system incorporating an integrated thermal edging.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following definitions apply specifically to this section:

ACRS Australian Certification Authority for Reinforcing Steels - An independent certification scheme for reinforcing steel and structural steel, by product and manufacturer/processor. Certifies compliance with Australia/New Zealand Standards.
ACRS Web site - www.steelcertification.com

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/VM1	Structure
NZBC B1/AS1	Structure
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
AS/NZS 4671	Steel reinforcing materials

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Firth RibRaft® Floor System Manual*
Firth RibRaft® Technical Manual January 2012
Firth RibRaft® Flooring Solutions (Introductory brochure)
Firth RibRaft® HotEdge® installation manual
CodeMark™ [CMA-CM40015](#) - RibRaft® Floor System

* A copy of this manual must be held on site.

Manufacturer/supplier contact details

Company: **Firth Industries**

Web: www.firth.co.nz

Email: info@firth.co.nz

Telephone: 0800 FIRTH1 (0800 347841)

Further information and/or names of tradespeople who have installed Firth RibRaft® floors are available by phoning Firth Information Service 0800 347841.

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Firth RibRaft® Floor System product or component, or associated Firth products.

1.5 QUALIFICATIONS

Tradespeople to be competent, experienced and familiar with the Firth RibRaft® Floor System materials and techniques specified.

1.6 STEEL REINFORCING COMPLIANCE

Steel reinforcing materials for concrete to [AS/NZS 4671](#). Steel to be manufactured in New Zealand, or by an overseas manufacturer holding a current valid (or equivalent) NZ S Mark or ACRS certificate for that type of steel. Confirm compliance and provide evidence if requested.

1.7 QUALITY RECORDS

Keep accurate records relating to strength and quality of materials used during construction.

Include records of workmanship during construction and photographs of as-built details. Make the information available to the Building Consent Authority inspector on request.

Performance

1.8 COMPLIANCE - RIBRAFT® FLOOR SYSTEM

RibRaft® Floor System meets the requirements of the CodeMark® certificate CodeMark™ [CMA-CM40015](#) when used within the conditions and limitations of its Certificate of Conformity.

Achieves compliance with NZBC as follows:

- [NZBC B1.3.1](#), 3.2, 3.3
- [NZBC B2.3.1](#) (a)
- [NZBC E2.3.3](#)
- [NZBC F2.3.1](#)
- [NZBC H1. 3.1](#) (refer to limitation c)

2 PRODUCTS

Materials

2.1 BLINDING

50mm maximum compacted GAP 7.

2.2 TIMBER FORMWORK

No. 2 framing and dressing or merchantable grade radiata pine boards to [NZS 3631](#).

2.3 DAMP-PROOF MEMBRANE

0.25mm minimum polyethylene to [NZS 3604](#): clause 7.5.4, Damp-proof membrane (DPM). Refer to SELECTIONS.

2.4 POLYSTYRENE PODS

Firth RibRaft® proprietary purpose made polystyrene pods.

2.5 REINFORCEMENT

Bars to [AS/NZS 4671](#). Grade 500E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings.

2.6 INTERNAL CORNER REINFORCEMENT

Minimum 2 x D10 bars Grade 300E to [AS/NZS 4671](#).

2.7 MESH

Welded reinforcing mesh to [AS/NZS 4671](#) as modified by NZS B1/VM1, generally, Class E, minimum to [NZBC B1/AS1](#) - Grade 500E, 2.27kg/m² (1.14kg/m² in each direction). Minimum SE62 500E mesh or the equivalent.

2.8 TYING WIRE

Mild drawn steel wire not less than 1.2mm diameter.

2.9 CONCRETE - RIBRAFT® APPLICATIONS

20 or 25 MPa 100mm slump mix in either 13mm or 19mm nominal aggregate size. Firth Raftmix™ for direct placement and Firth Raftmix™ Pump for pump applications

2.10 NORMAL CONCRETE - NON RIBRAFT® APPLICATIONS

Normal concrete 20 MPa grade, maximum aggregate size 19mm to [NZS 3104](#) for concrete work where Firth Raftmix™ or Firth Raftmix™ Pump are not appropriate

Components

2.11 SPACERS

Firth proprietary spacers. Refer to SELECTIONS for size.

2.12 INTEGRATED THERMAL EDGING PANELS

Firth RibRaft® HotEdge® panels, 25mm thick x 3m long pre-plastered Foamular® extruded foam sheets with ship-lapped joints at each end. Panels provide a minimum of R1.0 insulation to edge beam of RibRaft® floors. Panels are placed inside RibRaft® foundation boxing before Firth RaftMix™ concrete is poured, to form an integral part of the foundation.

RibRaft® HotEdge® components to complete the system are as follows:

- 60mm Tornado galvanized wire screws (steel mechanical connectors, to provide regular fixed anchor points into the edge beam)
- 45mm heavy duty powder coated external corner aluminium extrusion (length to suit the application)
- DanDam Foam Tape.

Refer to SELECTIONS for options.

3 EXECUTION

Conditions

3.1 STORAGE

Take delivery of and accept all materials and accessories dry and undamaged. Store on timber fillets on hard ground protected from weather, contamination and damage in a secure area clear of any building operation.

Handle and store reinforcing steel and accessories without damage or contamination. Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity. Store steel fabric flat.

3.2 HANDLING

Avoid distribution and contact with damaging substances. Do not drag sheets across each other and other materials. Protect edges and surface finishes from damage.

Application - RibRaft® floor system

3.3 SITE CLEARANCE

Clear the slab area of any vegetation and topsoil down to the subgrade level.

3.4 BUILDING PLATFORM

Create a building platform to a level surface approximately 330mm below finished floor level. Cut and/or fill sloping sites. Confirm finished floor level.

3.5 POST-CUT INSPECTION

Inspect and confirm that the soil conditions are as anticipated by the geotechnical investigation and report and conform to the requirements of the Firth RibRaft® manual. Refer to Firth RibRaft® Floor System Manual Section 1 - Design Information, 3.5 Foundation Soils.

3.6 TEMPORARY BUILDING PLATFORM DRAINAGE

Construct suitable drainage to keep excessive ground water off the building platform during and after construction as required.

3.7 HARDFILL

Place hardfill and ensure it is spread and compacted with mechanical compaction.

3.8 UNDERGROUND SERVICES

Ensure underfloor services are installed in the subsoil or hardfill in locations as shown on the drawings and according to Firth RibRaft® floor system requirements. Refer to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.4 Plumbing and Services.

3.9 BLINDING LAYER

Spread GAP 7 blinding layer to a minimum 500mm past the outside edge of the slab, compact to a level layer no greater than 50mm thick and no higher than 305mm below finished floor level.

3.10 FORMWORK

Construct formwork as required, well braced and tied to remain in position, straight and plumb during construction. Ensure formwork will provide for the topping depth, including rebates and the required concrete finish.

3.11 INSTALL DAMP-PROOF MEMBRANE

Apply DPM to the prepared basecourse extending to the outside of all edge beams or fold and staple up the inside of the formwork. Overlap all joints in the DPM sheets a minimum 150mm. Tape laps and penetrations with 50mm wide pressure sensitive plastic tape. Ensure DPM is not damaged during the construction process. Repair all damage to DPM before proceeding with following procedures.

3.12 PLACE POLYSTYRENE PODS

Place polystyrene pods in a regular waffle pattern using the spacers in the specified grid pattern to fit the floor plan. Cut pods on site with a saw or suitable hot wire as required. Cut holes for services and trim around piles as required on site.

3.13 INSTALL SPACERS

Install spacers and locations to the Firth RibRaft® floor system requirements.

Form standard ribs between pods using Firth 100mm spacers. Place the spacers at a minimum of one spacer along each edge of each pod or part pod. The ribs in both directions form a waffle pattern throughout the slab.

Form the edge beam using Firth 300mm spacers. Place the spacers at 1200mm centres maximum along the perimeter of the slab at least and one spacer per pod or part pod.

Form ribs to support loadbearing walls using Firth 300mm spacers. Place the spacers at a minimum of one spacer along the edge of each pod or part pod.

3.14 PLACE REINFORCING STEEL: RIB STEEL

Place rib reinforcing steel in the bottom of the internal ribs and supported in the correct position by the Firth spacers. Lap all steel 720mm minimum, and hook all plain bars. At the junction with the edge beam, each rib steel bar shall sit on top of the edge beam bars and extend to the outermost bar. Allow for 75mm cover to the edge of the beam. Place 1 x HD12 bar in each 100mm wide rib and 2 x HD12 bars in each 300mm wide rib.

3.15 PLACE REINFORCING STEEL: EDGE BEAM STEEL

Place the two edge beam reinforcing bars in the bottom of the edge beam and supported in the correct position by the Firth spacers. Tie one edge beam bar below the mesh at the perimeter of the area covered by the polystyrene pods. Lap all steel 720mm minimum, and hook all plain bars. At corners, the inner bottom bars and the top bars cross each other and extend to 75mm from the outside face of the edge beam. Tie these bars together where they cross. Tying of edge beam steel is only required at corners.

3.16 PLACE REINFORCING STEEL: RE-ENTRANT CORNER STEEL

Place two HD12 bars, 1200mm in length across the corner. Tie to the top of the mesh at re-entrant corners at 200mm centres with 50mm side cover from the internal corner.

Install specified steel to Firth RibRaft® Floor System Manual Section 2 - Installation Information, 3.9 Reinforcing Steel. Ensure specified minimum cover requirements are maintained.

3.17 PLACE REINFORCING MESH AND CHAIRS

Place reinforcing mesh over the pods and support on the mesh chairs spaced at 1200mm centres minimum, with two mesh chairs minimum placed per pod and with one mesh chair minimum per part pod.

3.18 MESH LAPS

For slabs on ground the welded reinforcing mesh to be lapped and tied, such that the outermost wires overlap by the greater of:

- the spacing of the cross wires plus 50mm
- 225mm or
- manufacturer's requirements

Do not count bar extensions beyond the outermost cross wire.

3.19 FORM SLAB AND OPENING REBATES

Form rebates, as detailed on drawings.

Form a minimum 50mm rebate in slab for masonry veneer construction with a width dependent on the veneer width, cavity width and overhang. Waterproof the rebate with a bituminous sealer on both the vertical and horizontal faces.

3.20 TOPPING SLAB DEPTH

85mm minimum plus additional cover as required for infloor heating.

3.21 PRE-PLACEMENT INSPECTION

Arrange for excavations, formwork and reinforcement to be inspected and passed by the Building Consent Authority.

3.22 CONCRETE PLACEMENT AND COMPACTION

Ensure the rib and edge beam canals are clean, free of debris. Pour the floor in a single pour using only Firth Raftmix™ or Firth Raftmix™ Pump concrete and ensuring that the pods remain in position during placing. Pour concrete onto the top of each pod prior to filling the ribs around the pod to help prevent them from floating and lifting.

Use Firth Raftmix™ for placement in the floor directly from the concrete truck chute or Firth Raftmix™ Pump concrete for placement in the floor by concrete pump.

Compact concrete using a suitable poker vibrator for the ribs and ground beams and into all corners of the formwork. Screed as required. Confirm levels with a laser level.

3.23 CONCRETE FINISHING

Float and trowel to provide a U3 finish to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

3.24 CONCRETE CURING

Curing of the concrete slab must take place immediately after finishing the concrete to [NZS 3109](#) by one of the following curing methods:

- ponding or continuous sprinkling of water
- placing a wet covering or plastic membrane over the slab
- the use of liquid membrane curing compounds

3.25 SHRINKAGE CONTROL JOINTS

Cut shrinkage control joints as shown on the plans after hardening to a depth of 25mm within 24 hours in summer or 48 hours in winter.

Where shrinkage control joints have not been shown on the plans, position the shrinkage control joints to coincide with major changes in the floor plan. Agree position of shrinkage control joints with the designer.

Bay dimensions formed by the shrinkage control joints to be limited to a maximum ratio of length to width of 2 to 1 with a maximum dimension of 6 metres. Place the shrinkage control joints over the 100mm wide internal ribs wherever possible. Where a shrinkage control joint runs along the line of a 300mm wide loadbearing rib, locate the cut directly above one edge of the 300mm rib.

3.26 CLEAN OUT SHRINKAGE CONTROL JOINTS

Clean out control joints. If required fill with suitable flexible sealant.

Application - RibRaft® HotEdge® system

3.27 INSTALL RIBRAFT® HOTEDEGE®

Install panels to Firth RibRaft® HotEdge® installation manual and as follows:

- Fix panels temporarily around the perimeter of the Rib Raft® slab, tied against the external boxing, prior to the concrete pour
- Fix 60mm Tornado galvanized wire screws to panel at 300mm or 600mm centres staggered top and bottom to provide secure fixing for RaftMix™
- Bond shiplap joints of end of panels with MS sealant
- Seal panel edges with DanDam 3.5 x 12mm concrete seal foam tape
- Cut, glue and seal internal corners with MS sealant
- Finish external corner with 45mm heavy duty powder coated external corner aluminium extrusion (length to suit the application)
- Pour RibRaft® RaftMix® concrete slab covering the angled top edge HotEdge® anchoring
- Remove formwork

3.28 BOTTOM PLATE ANCHORAGE - TIMBER FRAME

Fix bottom plate with 7-15 kN Uplift-Ramset Ankascrew® AS10150GH to Firth RibRaft® HotEdge® installation manual.

3.29 RIBRAFT® HOTEDEGE® PANELS - FINISHING, EXPOSED SURFACES

Apply 2 coats of acrylic paint to exposed surfaces of panel once wall framing and cladding is in place.

Application - other concrete work

3.30 PLACE CONCRETE

Do not place fresh concrete against the preceding layer after more than 45 minutes, or such lesser time as required by the circumstances, to [NZS 3109](#): clause 7.4, Handling and placing.

3.31 SCREED THE SURFACE

Screed the concrete surface by straight edge or vibrating screed immediately after compaction and to tolerances in [NZS 3109](#): table 5.2, Tolerances for in situ construction.

3.32 CONCRETE FINISHING

Screed and provide a U3 finish to [NZS 3114](#): table 2, Classes of floor, exterior pavement and invert finishes.

Finishing

3.33 STRIKE FORMWORK

Strike formwork after at least 12 hours after the slab has been finished without damaging or overloading structure.

3.34 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with suitable patching mortar, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

Completion

3.35 LEAVE

Leave work to the standard required by following procedures.

3.36 CLEAN UP

Clean up surrounding areas following completion of the concrete placement.

3.37 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.firth.co.nz.

Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 DAMP-PROOF MEMBRANE

Type: As per contractor

4.2 FIRTH RIBRAFT® POD

Brand: Firth

Size: 1100mm x 1100mm x 220mm

4.3 FIRTH SPACERS

Brand: Firth

Size: 100mm and 300mm

RibRaft® HotEdge® system

4.4 FIRTH RIBRAFT® HOTEDEGE®

Brand: Firth RibRaft® HotEdge®

Panel size: 25mm thick x 3000mm long x ~mm wide

Wall type: Timber framed

Finishing

4.5 CONCRETE SURFACE FINISH - FLOORS

Location: Floor slab

Finish class: U3 (interior)

3410 STRUCTURAL STEELWORK - BASIC

1 GENERAL

This section relates to the fabrication, erection and specialist coating of structural steelwork of a general nature.

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC F5/AS1	Construction and demolition hazards
AS/NZS 1252.1	High-strength steel fastener assemblies for structural engineering - Bolts, nuts and washers - Technical requirements
AS/NZS 1554.1	Structural steel welding - Welding of steel structures
AS 1627.4	Metal finishing - Preparation and pretreatment of surfaces - Abrasive blast cleaning
AS 1627.9	Metal finishing - Preparation and pretreatment of surfaces - Pictorial surface preparation standards for painting steel surfaces
AS/NZS 2312:2002	Guide to the protection of iron and steel against atmospheric corrosion by the use of protective coatings
NZS 3404.1:1997	Steel Structures Standard
AS 3828	Guidelines for the erection of building steelwork
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
GANZ:	Galvanizing Association of New Zealand - After-Fabrication Hot Dip Galvanizing. A practical reference for designers, specifiers, engineers, consultants, manufacturers and users
HERA R4-99	Specification for the fabrication, erection and surface treatment of structural steelwork

1.2 QUALIFICATIONS

Welders to be qualified, experienced competent workers, familiar with the materials and the techniques specified.

1.3 SHOP DRAWINGS

Supply 1 set of shop and erection drawings to the owner for review prior to fabrication.

1.4 SHOP DRAWINGS REVIEW

Shop drawings review indicates the design concept has been reviewed without the need for further modification. This does not relieve the contractor of any responsibility for the correctness of the shop drawings, site dimensions, or for ensuring the work is performed in compliance with the drawings and specifications.

1.5 VERIFY DETAILS AND DIMENSIONS

Refer to drawings to ensure all required details and fixings are provided for in the structural steelwork. Verify dimensions against site measurements prior to fabrication.

1.6 TEST WELDING

Non-destructive weld examination with method, extent and standards of acceptance to [AS/NZS 1554.1](#), Section 7 and [NZS 3404.1](#), Appendix D.

2 PRODUCTS

2.1 STRUCTURAL STEEL

Comply with New Zealand, Australian, British or Japanese Standards for steel as required by [NZS 3404.1](#), section 2, including, type, category, and suppression of brittle fracture.

Grade 300, except RHS sections Grade 350, unless noted otherwise on the drawings.

2.2 WELDING

Electrodes to comply with and be selected for the grade of steel being welded as required by [AS/NZS 1554.1](#). Welding wire as required by the wire manufacturer for the materials to be joined and the welding position. Welding flux: dry and used from sealed containers. Material for arc stud welding to comply with [AS/NZS 1554.1](#).

2.3 BOLTS, NUTS AND WASHERS

To [AS/NZS 1252.1](#) and to the requirements of [NZS 3404.1](#), section 2.3 **Fasteners**. Hot-dip galvanize all bolts, nuts and washers forming a permanent part of any structure subject to a protective coating, to [AS/NZS 4680](#).

3 EXECUTION

- 3.1 SURFACE FINISH
Grind off all burrs and sharp arrises.
- 3.2 TOLERANCES
Discard material showing visual defects affecting its structural integrity. Comply with the tolerances laid down for holding down bolts, columns, beams and other members in HERA R4-99 and [NZS 3404.1](#). Comply with [NZS 3404.1](#) for level and alignment of beams and alignment and plumbing of struts.
Structural elements to comply for straightness, length, full contact splices and struts not prepared for full contact with [NZS 3404.1](#).
- 3.3 CUTTING
To [NZS 3404.1](#), and for existing steel HERA R4-99. Hand cut only where machine cutting is not possible.
- 3.4 CONSTRUCT
Construct the steel structure as detailed and to [NZS 3404.1](#), section 14, Fabrication and section 15, Erection.
- 3.5 WELDING
Carry out welding in accordance with [AS/NZS 1554.1](#) and the additional requirements of [NZS 3404.1](#). Equipment to comply with [AS/NZS 1554.1](#), clause 1.8.2.
- 3.6 WELDING NEAR TOUCHING STEELWORK
Shop weld together touching or near-touching steelwork all round with 5mm (one pass) continuous fillet welds unless denoted otherwise on the drawings.
- 3.7 HOLING
Comply with [NZS 3404.1](#) for sizes, alignment, finishing, punching and flame cutting of holes.
- 3.8 BOLTING
Bolting, including high strength bolting to [NZS 3404.1](#). Ensure that at least one clear thread shows above the nut and at least one thread run out is clear beneath the thread after tightening.
- 3.9 THREADS EXCLUDED FROM SHEAR PLANE
Select length of bolts such that the threaded portion does not occur within the shear plane between joined parts.
- 3.10 START ERECTION
Start erection only when the holding down bolts and anchorages have achieved sufficient strength. Carry out the erection of the structural steel to the requirements of AS 3828. Comply with [NZBC F5](#) and [NZS 3404.1](#), section 15, Erection. Provide temporary bracing as required to achieve stability during erection.
- 3.11 BASE PLATES
Enlargement or site cutting of holes not permitted. Bending or displacement of holding down bolts not permitted.
- 3.12 COLUMNS
Plumb columns using sawn steel packs and wedges not larger than necessary for the purpose. The column base must not be raised by more than 25mm. Fill space beneath the base plate with cement-sand grout, containing a non-shrink additive, the grout having a minimum compressive strength of 30MPa at 28 days. Alternately use a dry pack of 1:2 cement with the sand mortar hammered in tight to ensure complete filling of space.
- 3.13 INSPECTION
Inspect all stages of fabrication and construction of the structure to [NZS 3404.1](#), sections 14, Fabrication and 15 Erection.
- 3.14 ENCASED STEELWORK
Clean the steelwork to be encased in concrete to remove all loose mill scale, rust, dirt and other matter affecting bond with concrete. Achieve this by wire brushing and the use of suitable solvents.
- 3.15 BRUSHING AND POWER TOOL CLEANING
Remove oil and grease by the use of solvents. Scrape and power wire brush to a minimum Class 2 finish to AS 1627.9. Clean to bright metal, but avoid producing a polished surface. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.
- 3.16 ABRASIVE BLASTING
Remove oil and grease by the use of solvents. Abrasive blast clean to a Class 2.5 finish to AS 1627.4. Clean to bright metal, but avoid producing a polished surface. Select grit type and equipment such that the cleaned surface profile between peaks and valleys does not exceed one third of the dry film thickness. Check that no burrs or sharp arrises remain which may prevent the full coating thickness being attained.

3.17 PRIMING GENERALLY

Coat steelwork, unless specifically noted otherwise, with the specified priming paint, including patch priming on site after erection.

3.18 UNPAINTED SURFACES

Do not paint:

- faying face of high strength friction grip bolted joints
- areas for site welding, keeping 75mm clear all round
- surfaces being embedded in concrete.

Where steel is only partly encased then extend priming 25mm maximum into the concrete encasement area.

3.19 PATCH PRIMING

Clean areas of damaged priming and areas left clear for site jointing to a standard comparable with that specified for shop cleaning. Wash off chemical deposits from welding fumes. Apply priming coats to the same standard as shop primers, ensuring thorough coating of bolts, nuts and connection areas. Reprime if more than 4 weeks elapse before the final coating system is applied.

4 SELECTIONS**4.1 STEELWORK BEING GALVANIZED**

Outdoor pergola structure

4.2 PRIMER

Brand/type: As per fabricator

4.3 SHOP PRIMING

Dry film build: 75 microns minimum

3820 CARPENTRY

1 GENERAL

This section relates to the supply and erection of timber framing, as a framed structure, or as partitioning. It includes prefabricated timber and engineered wood.

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1604.4	Specification for preservative treatment - Laminated veneer lumber (LVL)
AS/NZS 1604.5	Specification for preservative treatment - Glue laminated timber products
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
AS/NZS 4357.0	Structural laminated veneer lumber - Specification
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice
*A copy of NZS 3604 Timber-framed buildings, must be held on site.	

1.2 QUALIFICATIONS

Workers to be experienced, competent trades people familiar with the materials and techniques specified.

1.3 DIMENSIONS

All timber sizes except for battens are actual minimum dried sizes.

2 PRODUCTS

2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to [NZS 3602](#), [NZBC B2/AS1](#) and treatment to [NZS 3640](#), [NZBC B2/AS1](#). Structural grade (SG) to [NZS 3604](#), [NZS 3622](#) with properties to [NZS 3603](#).

2.2 EXTERIOR CAVITY WALL BATTENS - TIMBER - NON-STRUCTURAL

H3.1 or H3.2 Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Temporary fix battens before being fixed into the framing with the cladding fixings.

To [NZS 3602](#), table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 EXTERIOR CAVITY WALL BATTENS - PROPRIETARY - NON-STRUCTURAL

Extruded polypropylene battens, size approximately 45mm wide x 18mm thickness. Temporary fix battens before being fixed into the framing with the cladding fixings. To the scope limitations of [NZBC E2/AS1](#), and [NZS 3604](#) Building Wind Zones up to, and including "Extra High".

Components

2.4 NAILS

Type to [NZS 3604](#), section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of [NZS 3604](#), sections 6-10.

2.5 BOLTS AND SCREWS

Bolts and screws of engineering and/or coach type complete with washers, to the requirements of [NZS 3604](#), section 4, **Durability**, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10.

2.6 NAIL PLATES

Comply with the requirements of [NZS 3604](#), section 4, **Durability**, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

2.7 CONNECTORS

Comply with the requirements of [NZS 3604](#), section 4, **Durability**, and of the number and form required for each particular junction to [NZS 3604](#), sections 6-10. Connectors and structural brackets to the connector manufacturer's design for particular locations shown on drawings.

2.8 CORROSION RISKS

For interior timber, treated with copper-based timber preservatives (H3.2 or higher), use a minimum of hot-dipped galvanized steel fixings and fasteners.

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

2.9 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3 EXECUTION

3.1 EXECUTION GENERALLY

To [NZS 3604](#) 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).

3.2 SEPARATION

Separate all timber framing timbers from concrete, masonry and brick by:-

- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

3.3 ATTENDANCE

Provide and fix blocks, nogs, openings and other items as required by other trades.

3.4 MOISTURE CONTENT

Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.

Framing at erection: 24% maximum

Framing at enclosure: 20% maximum

Framing at lining: 16% maximum

3.5 SET-OUT

Set out framing in accordance with the requirements of [NZS 3604](#) and as required to support sheet linings and claddings.

3.6 FRAMING FLOORS

Framed and fastened to [NZS 3604](#), section 7, **Floors**.

3.7 FRAMING WALLS

Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to [NZS 3604](#), section 8, **Walls**.

3.8 FRAMING ROOFS

Frame 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](#), section 9, **Posts** and 10, **Roof framing**.

3.9 FRAMING CEILINGS

Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

3.10 INSTALLING WALL UNDERLAYS

Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.11 FIT CAVITY BATTENS

Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to NZS 3604. Fit and fix related flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc.).

3.12 DPC TO LOSP TREATED TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.13 DPC TO TIMBER

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4 SELECTIONS

4.1 FLOOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Mid floor joists:	Radiata pine	SG8	H1.2
Boundary joists:	Radiata pine	SG8	H1.2

4.2 EXTERIOR WALL FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
Parapets:	Radiata pine	SG8	H1.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Radiata pine	SG8	H3.2
Wall battens (not cavity):	Radiata pine	Merch	H1.2
Jamb battens:	Radiata Pine	Merch	H3.1

4.3 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1
Proprietary - non structural:	Cavibat		
Cavity closer:	As per contractor		

4.4 ROOF FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.5 INTERIOR FRAMING - RADIATA PINE

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2

4.6 EXTERIOR EXPOSED TIMBERS

Member	Species	Grade	Treatment
Posts:	Radiata pine	SG8	H3.2 CCA
Joists:	Radiata pine	SG8	H3.2 CCA
Exterior stairs and steps:	Radiata pine	SG8	H3.2 CCA
Pergola:	Radiata pine	SG8	H3.2 CCA
Ground contact members	Radiata pine	SG8	H5 CCA

Note all CCA to be preservative code 01 or 02

4161T THERMAKRAFT UNDERLAYS, FOILS & DPC

1 GENERAL

This section relates to the application of **Thermakraft Ltd**, DPC, DPM, wall underlays, roofing underlays and accessories.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

NZMRM New Zealand Metal Roofing Manufacturers Inc.

The following definitions apply specifically to this section:

Wall underlay the same meaning as defined in [NZBC E2/AS1](#), covering kraft based and synthetic wall underlays, sometimes called, wall wraps, building wraps or building papers.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1-AS7	Protection from fire
NZBC E2/AS1	External moisture
AS 1530.2	Methods for fire tests on building materials, components and structures - Test for flammability of materials
NZS 2295	Pliable, permeable building underlays
AS/NZS 2904	Damp-proof courses and flashings
NZS 3604	Timber-framed buildings
NZS 4214	Methods of determining the total thermal resistance of parts of buildings
AS/NZS 4389	Roof safety mesh
AS/NZS 4534	Zinc and zinc/aluminium-alloy coatings on steel wire
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Thermakraft documents relating to work in this section are:
Thermakraft product manual and technical data sheets.

- [BRANZ Appraisal 329](#) - Supercourse 500™ Damp-Proof Course and Concealed Flashing
- [BRANZ Appraisal 651](#) - Thermakraft Covertex™ 407 Fire Retardant Self-Supporting Roof Underlay
- [BRANZ Appraisal 695](#) - Watergate-Plus 295™ Fire Retardant Wall Underlay
- [BRANZ Appraisal 743](#) - Thermakraft Covertex 405™ Plus Fire Retardant Self-Supporting Roof Underlay
- [BRANZ Appraisal 867](#) - Thermakraft Steelwrap 290™ Fire Retardant Wall Underlay
- [BRANZ Appraisal 878](#) - Thermakraft Aluband™ Window Flashing Tape
- [BRANZ Appraisal 912](#) - Thermakraft 220™ Wall Underlay
- [BRANZ Appraisal 917](#) - Thermakraft Covertex 403™ Plus Fire Retardant Roof Underlay
- [BRANZ Appraisal 918](#) - Thermakraft Covertex 403™ Plus Fire Retardant Wall Underlay
- [BRANZ Appraisal 919](#) - Thermakraft Aluband™ Acrylic Window Flashing Tape
- [BRANZ Appraisal 942](#) - Multi-Fit Penetration Seals
- [BRANZ Appraisal 943](#) - Thermakraft 401™ Roof Underlay
- [BRANZ Appraisal 947](#) - Aluband XTREME Flashing Tape
- [BRANZ Appraisal 962](#) - The Thermakraft One Wrap System
- [BRANZ Appraisal 1000](#) - Thermakraft Thermabar 397 Light Diffusing Reflective Underlay

[Code Mark Certificate 30069](#) - Thermakraft Covertex 403™ Plus Absorbent Breathable Roof Underlay

[Code Mark Certificate 30030](#) - Thermakraft Covertex 405™ Absorbent Breathable Roof Underlay

[Code Mark Certificate 30028](#) - Thermakraft Covertex 407™ Absorbent Breathable Roof Underlay

Manufacturer/supplier contact details

Company: **Thermakraft Ltd**
 Web: www.thermakraft.co.nz
 Email: info@thermakraft.co.nz
 Telephone: 0800 806 595

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against failure of materials and execution. Thermakraft Ltd warrant performance of products if design and installation complies with relevant technical literature, NZBC, and recognised industry Codes of Practice. Copy of Thermakraft™ Product Warranty available on request.

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified materials, or associated products, components or accessories.

1.6 INSTALLATION SKILL LEVELS

Installers to be experienced in the installation of Thermakraft™ products and familiar with Thermakraft™ technical literature and the related documents listed in this design i.e. [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice.

2 PRODUCTS

Roofing underlays

2.1 BITUMINOUS SELF-SUPPORTING ROOFING UNDERLAY

Thermakraft 215™, bituminous self-supporting roofing underlay to [NZS 2295](#).

Accessories

2.2 MULTI-FIT SEALS FOR UNDERLAY PENETRATIONS

Thermakraft™ Multi-Fit seals are a UV resistant EPDM material which forms a weathertight air seal for pipes and penetrations with a high strength acrylic adhesive suitable for use on all underlay systems. Available for use with pipes 15-110mm and cables 7-22mm both are pre-punched ensuring a tight accurate fit. No special tools required for installation.

2.3 GUTTER AND UNDER FLASHINGS

Thermakraft 215™, bituminous breather type underlay to [NZS 2295](#) cut to width for use under valley, apron flashing and internal gutters.

Soffit liner cut to width from Thermakraft 215™ bituminous breather type underlay. Refer to SELECTIONS.

2.4 TAPE

Thermakraft™ tapes to compliment the underlay. Pressure sensitive aluminium foil tapes for joining foil insulation and vapour barriers. These include:

- Thermakraft™ White General Purpose Underlay Tape
- Thermakraft™ Foil Tape 150
- Thermakraft™ Window Sealing Tapes, used to repair damaged bituminous underlays

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

Design application and installation of Thermakraft Building products to [NZBC E2/AS1](#), BRANZ Appraisals, Thermakraft Technical Literature and Industry Codes of Practice.

3.2 STORAGE

Store building underlays and accessory materials, under conditions that ensure no deterioration or damage. Store rolls in an upright position on a smooth floor and protected from sunlight, UV radiation and moisture.

3.3 INSPECTION

Before starting work, check that the building construction phase will allow work of the required standard. Carry out remedial work identified before laying underlay.

Application - roofing underlay

3.4 ROOF UNDERLAY

Lay vertically over purlins on wire netting with a 150mm side lap. Fix securely to purlins with galvanized fixings. Lay underlay to avoid excessive dishing between purlins. When used vertically, limit individual runs to 10 metres for bituminous underlays. Do not lay vertically on roof pitches under 10° without support.

Horizontally lay across the rafter/trusses starting at the gutter line with succeeding sheets in true alignment and lapping 150mm. Scribe around and fit neatly to all penetrations and avoid prolonged exposure by installing the roof immediately.

3.5 GUTTER AND UNDER FLASHINGS

Lay Thermakraft 215™ bituminous breather type underlay cut to width by manufacturer for use as an underlay to valley, apron flashings, and internal gutters. Lap under flashings with adjoining underlays. Fix Thermakraft 215™ bituminous breather type underlay soffit liner from top plate down 150mm past ribbon plate.

Completion

3.6 CLEAN UP

Clean up as the work proceeds.

3.7 LEAVE

Leave work to the standard required by following procedures.

3.8 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.thermakraft.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Roofing Underlays

4.1 THERMAKRAFT BITUMINOUS ROOFING UNDERLAYS

Location: Roof
Type: Thermakraft 215™ bituminous self-supporting roofing underlay
Jointing tape: Thermakraft™ white GP tape 60mm

Gutter and Under Flashing

4.2 GUTTER AND UNDER FLASHINGS

Location: As per architectural drawings
Type:
Jointing tape: Thermakraft™ window sill tape 75mm Aluband™ Xtreme™

4221HH HERMPAC HORIZONTAL CLADDING SYSTEM

1 GENERAL

This section relates to the supply and fixing of Hermpac Horizontal cladding:

- Bevel back & Rebated Bevel Back weatherboards
- Rusticated weatherboards
- Splaycut & Multi-Splay weatherboards
- Cavity batten systems
- Fascia
- Mouldings
- Proprietary flashing systems

1.1 RELATED WORK

Refer to painting sections for finishes to weatherboard cladding.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring
BRANZ BU 582	Structurally fix cavity battens

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

[Hermpac Construction Drawings:](#)

Hermpac Bevelback & Rebated Bevelback Cavity System Installation Specification
 Hermpac Bevelback & Rebated Bevelback Direct Fix System Installation Specification
 Hermpac Rusticated & Splaycut Cavity System Installation Specification
 Hermpac Rusticated & Splaycut Direct Fix System Installation Specification

[Hermpac Standard and Custom Profiles](#)

[Hermpac Profiles Chart - Volume 4](#)

[Hermpac Grade descriptions](#)

[Hermpac Nail fixings](#)

[Hermpac Legal and / or Sustainable Certification](#)

[Hermpac Product Technical Statement](#)

[Machinecoat - Flood Coat Inundation versus Spray Application](#)

[Maintenance of selected Wood Oil / Oil Based Stain finishes](#)

[Hermpac Product Technical Statement](#)

[BRANZ Appraisal 524 - Cavity Batten System](#)

[BRANZ Appraisal 658 - Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System](#)

[BRANZ Appraisal 663 - Hermpac Bevelback and Rebated Bevelback Weatherboard Cavity System](#)

[CodeMark Certificate of Conformity for Hermpac Rusticated, Splaycut and Multi-Splay](#)

[Weatherboard Cavity System Certificate Number GM-CM30037-RevG](#)

[CodeMark Certificate of Conformity for Hermpac Bevelback & Rebated Bevelback Weatherboard](#)

[Cavity System Certificate Number GM-CM30038-RevG](#)

[Manufacturer/supplier contact details](#)

Company: **Hermpac Ltd**

Contacts:

Kyle Deans - 021 771 857, kyle.deans@hermpac.co.nz

Carmen Hansen - 027 809 4588, carmen@hermpac.co.nz

Web: www.hermpac.co.nz

Email: technical@hermpac.co.nz

information@hermpac.co.nz

Telephone: 09 421 9840 Auckland

04 586 9674 Wellington

03 341 2163 Christchurch

Performance

1.4 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by [NZS 3604](#).

1.5 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To [NZBC B2/AS1 Durability](#) and [NZBC E2/AS1 External moisture](#).

1.6 SAMPLES AND PROFILE DRAWINGS

Hard Profiles, Technical Profile Drawings, Timber Species samples and/or Colour Chips for Machinecoat (NZ) applied finish options are available by request; contact technical@hermpac.co.nz or telephone 09 421 9840.

2 PRODUCTS

Materials

2.1 WESTERN RED CEDAR

Hermpac Canadian Coastal Western Red Cedar (*Thuja plicata*) harvested from the sustainable managed forests of British Columbia, Canada. Hermpac Western Red Cedar is supplied from forest sources, certified legal and sustainable under one or more independent third party verified certification systems (PEFC, CSA, SFI or FSC).

2.2 HORIZONTAL WEATHERBOARDS

Weatherboards to Hermpac profiles, Lap and Rebate details to BRANZ BU 411 and general design to the [NZS 3617](#), species and grading to [NZS 3602](#), table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in lengths relative to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position.

Acceptable Solution is limited to the following types of weatherboards and their derivatives:

- Horizontal Standard Bevel Back and Hermpac Custom Profiles
- Horizontal Rebated Bevel Back and Hermpac Custom Profiles
- Horizontal Rusticated and Hermpac Custom Profiles
- Horizontal Splay Cut, Multi-Splay and Hermpac Custom Profiles

A selection of the above profiles are also available in Western Red Cedar Finger-Joint (CEDARONE) Pre-primed and undercoated, sanded and/or de-nibbed between coats.

2.3 COVER BOARDS, MOULDINGS AND SCRIBERS

To Hermpac profiles as detailed, with species and grading to [NZS 3602](#), but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.4 FASCIA BOARDS

To Hermpac profiles, with species and grading to [NZS 3602](#), but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.5 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

2.6 CAVIBAT EXTERIOR CAVITY WALL BATTENS - NON STRUCTURALLY FIXED

Cavibat extruded fluted polypropylene cavity batten system. Refer to [BRANZ Appraisal 524](#).

Components

2.7 NAILS, SILICON BRONZE

Hermpac Crown, Rose or Flat Head, Annular Grooved Silicon bronze fixings to [NZBC E2/AS1 Table 24](#). Refer to Hermpac construction details for fixing details and to SELECTIONS for fixing sizes.

2.8 NAILS, STAINLESS STEEL

Hermpac Crown, Rose or Flat Head, Annular Grooved Grade 316 Stainless steel fixings to [NZBC E2/AS1 Table 24](#). Refer to Hermpac construction details for fixing details and to SELECTIONS for fixing sizes.

2.9 JOLT HEAD NAILS, STAINLESS STEEL

Hermpac Jolt Head, Annular Grooved Grade 316 Stainless Steel fixings to [NZBC E2/AS1 Table 24](#). Refer to [Hermpac construction drawings](#) for fixing details and to SELECTIONS for fixing sizes.

2.10 CLINCH NAILS, STAINLESS STEEL

Hermpac Proprietary 40 x 2.0mm and 50 x 2.0mm Clinch Nail, Annular Grooved Grade 316 Stainless steel.

2.11 FLASHINGS

To [NZBC E2/AS1](#), 4.0 Flashings. Material, grade and colour as detailed and scheduled and to [NZBC E2/AS1](#); Table 21: Compatibility of materials in contact and Table 22: Compatibility of materials subject to run-off. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

2.12 SOAKERS, STAINLESS STEEL / COLORSTEEL ZINCALUME / ALUMINIUM

To [NZBC E2/AS1](#), 4.0 Flashings. Machine folded stainless steel/zinc coated steel sheet to profile of weatherboard and mitred corner joints. To [NZBC E2/AS1](#); Table 21: Compatibility of materials in contact and Table 22: Compatibility of materials subject to run-off. Ensure that materials used for soakers are compatible with adjacent materials and fixings, cladding materials and fixings.

2.13 SOAKERS, COPPER

To NZBC E2/AS1, 4.0 Flashings. Machine folded half-hard copper sheet to profile of weatherboard and mitred corner joints. To NZBC E2/AS1; Table 21: Compatibility of materials in contact and table 22: Compatibility of materials subject to run-off. Ensure that materials used for Soakers are compatible with adjacent materials and fixings and cladding materials and fixings.

Finishes

2.14

FACTORY PRE-FINISHING - MACHINECOAT (NZ) - PENETRATING WOOD OIL / OIL BASED STAIN

Flood Coat Inundation: Factory application of selected oil based stain finishes by flood inundation and enhanced penetration of timber surface by roller pressure and fibre saturation.

Refer to: www.hermpac.co.nz/our-products/coatings/555/coatings/

Wood X: Penetrating wood oil - exclusive Machinecoat (NZ) factory formulation, standard and custom colour range.
Resene: Machinecoat (NZ) Waterborne Woodsman oil stain - exclusive pigment and fungicide enriched factory formulation.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution to NZBC E2/AS1: 3.0 Weathertightness risk factors, and 9.0 Wall claddings, 9.1.8 Drained cavities and 9.4 Timber weatherboards.

3.2 STORAGE

Take delivery of Hermpac timber products, dry, unmarked and undamaged from freight and handling (Grade characteristics excluded). Stack Hermpac weatherboards flat and true, clear of the ground by a minimum of 150mm and supported on dry, clean timber bearers at maximum 900mm centres. Keep weatherboards dry at all times, either by storing within an enclosed building, or when stored externally place an additional secondary cover on the plastic wrapping. Care must be taken to avoid damage to weatherboard edges and surfaces.

3.3 SUBSTRATE

Before starting fixing ensure that the substrate conforms with NZS 3604, section 2, table 2.1, Timber framing tolerances and the requirements of NZS 3604, section 6, Foundation and subfloor framing and NZBC E2/AS1, 9.4 Timber weatherboards governing support for timber board cladding.

Application - horizontal cladding over cavity battens

3.4 CAVIBAT DRAINED CAVITY - NON STRUCTURALLY FIXED

Install Cavibat 18mm drained cavity. Wall framing studs lined with Cavibat battens vertically and horizontally. The Cavibat battens are temporarily fixed over the wall underlay using galvanized nails and then firmly fixed by the cladding fixings which will penetrate the wall framing studs.

3.5 CAVITY CLOSER / VERMIN PROOFING

Refer to Hermpac Cavity System Installation Specification. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Use cavity spacers where fixing is required between cavity battens.

3.6 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

Application - fixing

3.7 FIXING - OIL STAIN FINISH

Install level, true to line and face, to [NZBC E2/AS1: 9.4](#) Timber weatherboards. Double coat all cut ends before fixing. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Finish the heads of Hermpac Crown, Rose and Flat head nails flush onto and not into the board surface. Do not over drive the nail head and crush the timber surface beneath and surrounding the nail.

3.8 FIXING BEVEL BACK & REBATED BEVEL BACK WEATHERBOARDS

Install level, true to line and face, to [NZBC E2/AS1: 9.4](#) Timber weatherboards. Single nail weatherboards to every fixing point, just clear of the adjacent lapped board. Nails to be driven in with a slightly upward slope. Line nails vertically across the boards. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Refer to Hermpac website for accurate weatherboard fixing information.

Using a Hermpac 40 or 50 x 2.0mm specialty clinch nail, restrain the top edge of the Bevel Back by driving the clinch nail positioned hard up against the edge but not into the Bevel Back weatherboard. Drive the clinch nail into the frame so that the clinch head settles flush into the weatherboard's surface, prior to the next row of boards being fixed above (studs at maximum 600mm centres). The clinch nail head must not sit proud of the timber surface nor prevent the correct separation of each adjacent row of boards.

3.9 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to [NZBC E2/AS1](#).

3.10 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

Completion

3.11 REPLACE

Replace all damaged or marked elements.

3.12 LEAVE

Leave work to the standard required for following procedures.

3.13 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

4.1 HERMPAC WEATHERBOARDS - HORIZONTAL RANDOM WIDTH & DEPTH

Location:	Refer to the Elevations
Species:	HERMPAC Western Red Cedar
Grade:	HERMPAC Premium Clears No.1 (PC1)
Profile:	SH5
Cover dimensions:	Random
Thickness:	Random
Surface finish:	Band Sawn Face (BSF)
Moisture content:	≤18% at fixing
Fixing system:	Over drained cavity
External corner:	CP2327

4.2 WEATHERBOARD FASTENINGS - SILICON BRONZE NAILS

Nails:	Crown Head
Type:	Silicon Bronze
Size:	Refer to manufacturers instructions

4.3 CAVIBAT EXTERIOR CAVITY WALL BATTENS - NON STRUCTURAL

Product:	Cavibat non-structural cavity batten
Material:	Extruded fluted polypropylene
Size:	40mm wide x 18mm thick

4.4 SIGMA CAVITY CLOSER/VERMIN-PROOFING

Brand/type: Sigma cavity closure
 Material: Aluminium

4.5 HERMPAC INTERNAL AND EXTERNAL CORNER BACK FLASHINGS

Material: Aluminium
 Size: Refer to details

4.6 FACTORY FINISH COAT - WOOD OIL / OIL STAIN - FLOOD COAT INUNDATION

Brand: Machinecoat (NZ) Ltd
 Product: Wood-X penetrating wood oil
 Coating process: Machinecoat (NZ) Ltd. Flood Coat Inundation
 Colour: Benmore
 Factory coats: One
 On-site coats: One

4221HV HERMPAC VERTICAL CLADDING SYSTEM

1 GENERAL

This section relates to the supply and fixing of **Hermpac** Vertical cladding:

- Vertical shiplap weatherboards
- Board and Batten
- Fascia
- Mouldings
- Proprietary flashing systems
- Vertical Shiplap 'Vertiline' cavity batten systems

1.1 RELATED WORK

Refer to painting sections for finishes to weatherboard cladding.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards, fascia boards and flooring

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Hermpac Ltd documents relating to this part of the work:

[Hermpac Construction drawings](#)
[Hermpac Vertical Shiplap Vertiline installation specification](#)
[Hermpac Vertical Shiplap direct fix installation specification](#)
[Hermpac Board and Batten installation specifications](#)
[Hermpac Standard and custom profiles](#)
[Hermpac Profiles chart - Volume 4](#)
[Hermpac Grade descriptions](#)
[Hermpac Nail fixings](#)
[Hermpac Legal and / or Sustainable Certification](#)
[Hermpac Product Technical Statement](#)
[Machinecoat - Flood Coat Inundation versus Spray Application](#)
 Maintenance of selected wood oil/oil based stain finishes

[BRANZ Appraisal 650](#) - Hermpac Vertiline Vertical Shiplap Weatherboard Cavity System

[BRANZ Appraisal 828](#) - Hermpac Board and Batten Cavity System

[BRANZ Appraisal 524](#) - Cavibat Cavity Battens

CodeMark Certificate of Conformity for Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Certificate Number [GM-CM30036-RevG](#)

Manufacturer/supplier contact details:

Company: Hermpac Ltd

Contacts:

Kyle Deans - 021 771 857, kyle.deans@hermpac.co.nz
 Carmen Hansen - 027 809 4588, carmen@hermpac.co.nz

Web: www.hermpac.co.nz

Email: technical@hermpac.co.nz
information@hermpac.co.nz

Telephone: 09 421 9840 Auckland
 04 586 9674 Wellington
 03 341 2163 Christchurch

Performance

1.4 FIXINGS, WIND

Design and use the fixings appropriate for the wind zone (R) and topographical classification (T) of this site and building height; as required by [NZS 3604](#).

1.5 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed cladding system, including all penetrations. To [NZBC B2](#) Durability and [NZBC E2/AS1](#) External moisture.

1.6 SAMPLES AND PROFILE DRAWINGS

Hard Profiles, Technical Profile Drawings, Timber Species samples and/or Colour Chips for Machinecoat (NZ) applied finish options are available by request at technical@hermpac.co.nz, or via telephone or fax.

2 PRODUCTS

Materials

2.1 WESTERN RED CEDAR

Hermpac Canadian Coastal Western Red Cedar (*Thuja plicata*) harvested from the sustainable managed forests of British Columbia, Canada. Hermpac Western Red Cedar is supplied from forest sources, certified legal and sustainable under one or more independent third party verified certification systems (PEFC, CSA, SFI or FSC).

Refer to website for Hermpac's policy on sustainability and for links to suppliers websites and forest management goals and policies.

2.2 VERTICAL SHIPLAP / VERTICAL BOARD AND BATTEN

Weatherboards to Hermpac profiles, Lap and Rebate details to BRANZ BU 411 and general design to the [NZS 3617](#), species and grading to [NZS 3602](#), table 2, reference 2A.1, Requirements for wood-based building components to achieve a 15-year durability performance. Weatherboards in lengths relevant to profile selection and application, with all unsound and open split knots excluded by cross cut removal prior to fixing into position.

Acceptable Solution is limited to the following types of weatherboards and their derivatives:

- Vertical Shiplap and Hermpac Custom Profiles
- Vertical Board and Batten and Hermpac Custom Profiles

A selection of the above profiles are also available in Western Red Cedar Finger-Joint (CEDARONE) Pre-primed and undercoated, sanded and/or de-nibbed between coats.

2.3 COVER BOARDS, SMART CORNERS, MOULDINGS AND SCRIBERS

To Hermpac profiles as detailed, with species and grading to [NZS 3602](#), but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.4 FASCIA BOARDS

To Hermpac profiles, with species and grading to [NZS 3602](#), but with all unsound and open split knots excluded by cross cut removal prior to fixing into position. To [NZS 3602](#), table 2, reference 2A.3, Requirements for wood-based building components to achieve a 15-year durability performance.

2.5 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

2.6 CAVIBAT EXTERIOR CAVITY WALL BATTENS - NON STRUCTURALLY FIXED

Cavibat extruded fluted polypropylene cavity batten system. Refer to [BRANZ Appraisal 524](#).

2.7 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Aluminium, PVC or stainless steel cavity closure strip, punched with 3mm-5mm holes or slots to provide a minimum ventilation opening area of 1000mm² per lineal metre of wall. Length and width to suit cavity. To [NZBC E2/AS1](#): clause 9.1.8.3 and figure 66.

Components

- 2.8 NAILS, SILICON BRONZE
Hermpac Crown, Rose or Flat Head, Annular Grooved Silicon Bronze fixings to NZBC E2/AS1 Table 24, flush fixed to face of weatherboard. Refer to [Hermpac construction drawings](#) for fixing details and to SELECTIONS for fixing sizes.
- 2.9 NAILS, STAINLESS STEEL
Hermpac Crown, Rose or Flat Head, Annular Grooved Grade 316 Stainless Steel fixings to NZBC E2/AS1 Table 24. Refer to [Hermpac construction drawings](#) for fixing details and to SELECTIONS for fixing sizes.
- 2.10 CLINCH NAILS, STAINLESS STEEL
Hermpac proprietary 40mm x 2.0mm and 50mm x 2.0mm Clinch Nail, Annular Grooved Grade 316 Stainless Steel.
- 2.11 FLASHINGS
To NZBC E2/AS1, 4.0 **Flashings**. Material, grade and colour as detailed and scheduled and to NZBC E2/AS1; Table 21: Compatibility of materials in contact and table 22: Compatibility of materials subject to run-off. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

Finishes

- 2.12
FACTORY PRE-FINISHING - MACHINECOAT (NZ) - PENETRATING WOOD OIL / OIL BASED STAIN
Flood Coat Inundation: Factory application of selected oil based stain finishes by flood inundation and enhanced penetration of timber surface by roller pressure and fibre saturation. Refer to: www.hermpac.co.nz/our-products/coatings/555/coatings/
- Wood X: Penetrating wood oil - exclusive Machinecoat (NZ) factory formulation, standard and custom colour range.
- Resene: Machinecoat (NZ) Waterborne Woodsman oil stain - exclusive pigment and fungicide enriched factory formulation.
- Site applications to manufacturers specifications. All Hermpac weatherboards and mouldings must be coated all six sides prior to installation.

3 EXECUTION

Conditions

- 3.1 GENERALLY
Execution to NZBC E2/AS1: 3.0 Weathertightness risk factors, and 9.0 Wall claddings, 9.1.8 Drained cavities and 9.4 Timber weatherboards.
- 3.2 STORAGE
Take delivery of Hermpac timber products, dry, unmarked and undamaged from freight and handling (Grade characteristics excluded). Stack Hermpac weatherboards flat and true, clear of the ground by a minimum of 150mm and supported on dry, clean timber bearers at maximum 900mm centres. Keep weatherboards dry at all times, either by storing within an enclosed building, or when stored externally place an additional secondary cover on the plastic wrapping. Care must be taken to avoid damage to weatherboard edges and surfaces.
- 3.3 SUBSTRATE
Before starting fixing ensure that the substrate conforms to NZS 3604, section 2, table 2.1 Timber framing tolerances, and the requirements of NZS 3604, section 6, **Foundation and subfloor framing**, and NZBC E2/AS1, 9.4 **Timber weatherboards**, governing support for timber board cladding.

Application - vertical cladding over cavity battens

- 3.4 CAVIBAT DRAINED CAVITY / NON STRUCTURALLY FIXED
Install Cavibat 18mm drained cavity. Wall framing studs lined with Cavibat battens vertically and horizontally. The Cavibat battens are temporarily fixed over the wall underlay using galvanized nails and then firmly fixed by the cladding fixings which will penetrate the wall framing studs.

3.5 CAVITY CLOSER / VERMIN PROOFING

Refer to Hermpac Cavity System Installation Specification. Seal the top of the cavity and install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Use cavity spacers where fixing is required between cavity battens.

3.6 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.7 SET-OUT

Using laser or mechanical devices set-out the overlap boards to ensure dimension to exposed face in line of weather is constant and that boards remain vertical. Use a string line to set out all nailing that will be visible in the finished work. Align all nailing accurately in straight lines. Use the appropriate Hermpac proprietary weatherboard set-out tools to establish correct angle of nail and consistent, accurate placement relative to visible edge of board.

Application - fixing

3.8 FIXING - OIL STAIN FINISH

Install level, true to line and face, to [NZBC E2/AS1: 9.4 Timber weatherboards](#). Double coat all cut ends before fixing. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Finish the heads of Hermpac Crown, Rose and Flat head nails flush onto and not into the board surface. Do not over drive the nail head and crush the timber surface beneath and surrounding the nail.

3.9 FIXING VERTICAL SHIPLAP WEATHERBOARDS

Install level, true to line and face, to [NZBC E2/AS1: 9.4 Timber weatherboards](#). Single nail weatherboards to every fixing point, just clear of the adjacent lapped board. Nails to be driven in with a slightly upward slope. Line nails horizontally across the boards. Pilot drill all fixings slightly smaller than gauge of fixing to ensure a snug fit and to minimise risk of moisture entry. Refer to Hermpac website for accurate weatherboard fixing information.

Using a Hermpac 40 or 50 x 2.0mm specialty clinch nail, prior to the next row of Vertical Shiplap boards being fixed alongside (nogs or dwangs at maximum 480mm centres) and at a position hard up against but not into the hidden lap board edge at every fixing point, restrain the hidden lap tongue by driving the clinch nail into the frame so that the clinch head settles flush into the weatherboard's surface. The clinch nail head must not sit proud of the timber surface nor prevent the correct separation of each adjacent row of boards.

Refer to Hermpac website for external and internal corner construction details.

3.10 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to [NZBC E2/AS1](#).

3.11 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

Completion

3.12 REPLACE

Replace all damaged or marked elements.

3.13 LEAVE

Leave work to the standard required for following procedures.

3.14 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 HERMPAC - VERTICAL SHIPLAP

Location: Refer to Elevations
 Species: HERMPAC Western Red Cedar
 Grade: HERMPAC Premium Clears No.1 (PC1)
 Profile: HP56
 Fixing system: Over drained cavity
 Surface finish: Band Sawn Face (BSF)
 Moisture content: ≤18 % at fixing
 External corners: Butted

4.2 WEATHERBOARD FASTENINGS - SILICON BRONZE NAILS

Nails: Crown Head
 Type: Silicon Bronze
 Size: Refer to installation instructions

4.3 CAVIBAT EXTERIOR CAVITY WALL BATTENS - NON STRUCTURAL

Product: Cavibat non-structural cavity batten
 Material: extruded fluted polypropylene
 Size: 40mm x 18mm

4.4 SIGMA CAVITY CLOSER/VERMIN-PROOFING

Brand/type: Sigma cavity closure
 Material: Aluminium

4.5 HERMPAC INTERNAL AND EXTERNAL CORNER BACK FLASHINGS

Material: Aluminium
 Size: As per details

4.6 FACTORY FINISH COAT - WOOD OIL / OIL STAIN - FLOOD COAT INUNDATION

Brand: Machinecoat (NZ) Ltd
 Product: Wood-X penetrating wood oil
 Coating process: Machinecoat (NZ) Ltd. Flood Coat Inundation
 Colour: Benmore
 Factory coats: One
 On site coats: One

4230 WALL CLADDING

1 GENERAL

This section relates to the supply and installation of exterior cladding, including:

- associated flashings
- timber fascias
- timber barges
- timber trims
- timber beads
- timber facings

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1491	Finger jointed structural timber
AS/NZS 2269.0	Plywood - Structural - Specification
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3617	Profiles of weatherboards fascia boards and flooring
NZS 3631	New Zealand timber grading rules
BRANZ BU 601	Sealants for cladding joints

Performance

1.2 PERFORMANCE

Accept responsibility for the weathertight performance of the completed cladding system, including all penetrations.

2 PRODUCTS

2.1 WALL UNDERLAYS

For flexible wall underlays, rigid wall underlays and rigid air barriers, refer to the appropriate separate section(s).

2.2 EXTERIOR CAVITY WALL BATTENS

Radiata pine battens, minimum 20mm thickness, width and height to match timber framing studs. Treatment to [NZBC B2/AS1](#) and [NZS 3602](#), table 1, reference 1D.10, Requirements for wood-based building components to achieve a 50-year durability performance.

2.3 EXTERIOR CAVITY CLOSER/VERMIN-PROOFING

Perforated uPVC, aluminium or stainless steel trays with upstands. Upstand one side 10mm and the other 75mm. Length and width to suit cavity.

2.4 FIBRE CEMENT SHEET CLADDING

Cellulose cement autoclaved sheets to NZS/AS 2908.2.

2.5 FIBRE-CEMENT SOFFIT LINING

Cellulose cement autoclaved sheets to [AS/NZS 2908.2](#).

2.6 PVC JOINTERS

To suit sheet thickness.

2.7 NAILS, SCREWS AND FASTENINGS

Metal, size and pattern, to cladding manufacturer's requirements and complying with the relevant aspects of [NZS 3604](#), section 4, Durability.

2.8 FLASHINGS

To [NZBC E2/AS1, 4.0 Flashings](#). Material, grade and colour as detailed and scheduled. Ensure that materials used for flashings are compatible with the window frame materials and fixings and cladding materials and fixings.

3 EXECUTION

3.1 MOISTURE CONTENT

Maximum allowable moisture content to [NZS 3602](#) for:
Equilibrium moisture content (EMC)

- Framing: 20% at closing in
- Weatherboards: 14% at time of fixing
- Exterior joinery and trim: 14%

3.2 EXECUTION METHODS AND PRACTICES

To [NZS 3604](#) 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).

3.3 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay/rigid air barrier to openings finished and dressed off with flashing tape ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).

3.4 INSTALL DRAINED CAVITY

20mm Minimum thickness drained cavity to [NZBC E2/AS1: 9.0 Wall claddings](#), where required. Fix vertical cavity battens to wall framing studs. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Do not use horizontal cavity battens. Use cavity spacers where fixing is required between cavity battens.

3.5 FIXINGS TO TIMBER CLADDINGS

Punched for puttying

3.6 INSTALL FIBRE CEMENT SHEET CLADDING

Install to detail and to the cladding manufacturer's requirements and to [NZBC E2/AS1: 9.7 Fibre cement sheet](#). Refer to the cladding manufacturer's literature for fixing details and [NZS 3604](#) for fixings durability requirements for specific provisions.

3.7 INSTALL FIBRE CEMENT SOFFITS WITH JOINTERS AND CAPPING MOULDS

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 and [NZS 3604](#) for fixings durability requirements for specific provisions.

3.8 INSTALL FLUSH JOINTED FIBRE CEMENT SOFFIT SHEETS

Cut sheets dry, and scribe fit to fully support all edges and joints. Fit expansion joints to limit finished areas to 9 metre x 6 metres maximum, confirm with the sheet manufacturer's requirements. Flush joints with bedding compound reinforcing tape and finishing compound to flush width of 150mm. Refer to the sheet manufacturer's requirements and details.

3.9 INSTALL EXTERIOR TIMBER FINISHINGS

Install timber fascias, barge boards, facings, beads, trim and enclosures level, true to line and face, with all end grain sealed and joints mitred.

3.10 INSTALL FLASHINGS

Install flashings, covers and soakers as detailed on the drawings and to [NZBC E2/AS1](#).

3.11 USE OF SEALANTS

Selection and use of sealants to follow BRANZ BU 601: Sealants for cladding joints.

3.12 COMPLETE

Ensure the work is complete with all flashings, finishings and trim properly installed so the cladding system is completely weathertight.

3.13 REPLACE

Replace damaged or marked elements. Remove unused materials from the site.

4 SELECTIONS

4.1 CAVITY BATTENS

Timber species: Pine
 Timber grade: SG8
 Treatment: H3.1 (non-structural)

4.2 CAVITY CLOSER/VERMIN-PROOFING

Brand/type: As per contractor
 Material: uPVC

4.3 FIBRE CEMENT SHEET CLADDING

Location: Refer to Elevation
 Brand/type: Eterpan
 Thickness: 10mm
 Edge detail: Expressed joint & butt joint, refer to Elevations

4.4 FIBRE-CEMENT SOFFIT LINING

Brand/type: As per contractor
 Thickness: 4.5mm
 Finish: Paint

4282RI RCS INTEGRA LIGHTWEIGHT CONCRETE FACADE SYSTEM

1 GENERAL

This section relates to the supply and fixing of **Resene Construction Systems** Integra Lightweight Concrete Facade System, cavity based exterior wall cladding system based on Integra AAC light weight concrete panels fixed over a drained cavity to timber framing and with an applied textured surface finish.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

PPCS	Proprietary Plaster Cladding Standard
MPNZA	Master Painters New Zealand Association
LRV	Light Reflectance Value

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
MPNZA	Health and Safety Programme
Health and Safety at Work Act 2015	

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

- Resene Construction Systems Technical Manual
- Resene Construction Systems Trade Spec™
- Resene Construction Systems Project Guide
- Resene Total Colour System

[BRANZ Appraisal 681](#) - Integra Light Weight Facade System

Materials and execution to Resene Construction Systems specification except where varied by this specification and supported by architectural detailing.

Manufacturer/supplier contact details

Company:	Resene Construction Systems
Web:	www.reseneconstruction.co.nz
Email:	help@reseneconstruction.co.nz
Telephone:	0800 50 70 40

Contact details for Resene literature is 0800 RESENE (0800 737 363) or web site www.resene.co.nz.

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:
15 years: For materials by Resene Construction Systems

- Provide this warranty on the Resene Construction Systems standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:
5 years: For execution/workmanship - by Registered Plasterer

- Provide this warranty on the Resene Construction Systems standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Use only PPCS (Proprietary Plaster Cladding Standard) registered applicators licensed to apply the Resene Construction Systems exterior render systems.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Resene Construction Systems exterior render system.

1.8 INFORMATION FOR OPERATION AND MAINTENANCE

Provide Resene Construction Systems Maintenance Guide on or before practical completion of the contract for issuing to the building owner. Resene Construction Systems Maintenance Guide to be provided on request. Provide ongoing maintenance instructions to meet the performance requirements of [NZBC B2/AS1](#).

1.9 HEALTH AND SAFETY

Refer to the requirements of the [Health and Safety at Work Act 2015](#) and WorkSafe NZ: [Guidelines for the provision of facilities and general safety in the construction industry](#).

If the elimination or isolation of potential hazards and risks is not possible then minimise hazards and risks in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and risks, and put into place procedures for dealing with emergencies. Obtain from Resene Construction System the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.10 PRODUCER STATEMENT

Provide the producer statement compiled by the licensed applicator in the form as required by the Building Consent Authority.

Performance

1.11 PERFORMANCE

Accept responsibility for the structural and weather-tight performance of the cladding installation.

1.12 FIXINGS, WIND

Design the installation to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

1.13 INSPECTIONS

Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives of Resene Construction Systems to inspect the work in progress and to take samples of their products from site if requested refer to Resene Construction Systems Project Guide.

2 PRODUCTS

Materials

- 2.1 RESENE CONSTRUCTION SYSTEMS RENDER PREP
Waterborne acrylic polymer dispersion.
- 2.2 INTEGRA AAC 50MM PANEL
50mm thick fibre reinforced aerated concrete, 2200mm x 600mm panel.
- 2.3 ROCKCOTE MULTISTOP BEDDING COMPOUND
Polymer modified cement-based dry plaster mix.
- 2.4 ROCKCOTE PM100 QUICK RENDER
Polymer modified cement-based dry plaster mix.
- 2.5 RESENE LIMELOCK
Waterborne acrylic polymer dispersion.
- 2.6 ACRYLIC TEXTURE
100% acrylic, high-build texture coating.
- 2.7 RESENE X-200
Resene X-200 waterproof membrane, colour selection from Resene Total Colour System.
- 2.8 REINFORCING MESH
Resene Construction Systems alkali-resistant fibreglass woven mesh and sticky mesh.

Components

- 2.9 FLASHINGS AND ACCESSORIES
Resene Construction Systems proprietary profiles made from rigid uPVC for head, sill, jamb, starter strips (vermin proofing); expansion and control joints; jamb sill and head jamb soakers; corner and base exterior applications to suit the cavity width.

Components - 20mm cavity

- 2.10 RESENE CONSTRUCTION SYSTEMS CAVITY BATTENS
Type: 40mm x 20mm RCS Graphex peel and stick battens
- 2.11 CLADDING FIXINGS, TIMBER FRAME -50mm ACC PANEL
Minimum 100mm x 14 g countersunk screws for 20mm cavity. Fixings to be galvanized or zinc plated steel to AS 3566 class 3.
- 2.12 EXTERIOR CAVITY BASE VENTED STARTER TRACK
Rigid uPVC Resene Construction Systems ventilated starter track for 20mm cavity.

Accessories

- 2.13 SEALANT
BRANZ appraised modified silicon (MS) sealant.
- 2.14 PRIMING STEEL
Resene Galvo-Prime, a brush applied waterborne galvanised iron primer or Zinc rich spray pack primer / solvent borne an exterior solvent borne spray application.

3 EXECUTION

Conditions

- 3.1 DELIVERY
Keep plaster products dry in transit. Take delivery of plaster products dry and undamaged. Reject all damaged materials.

3.2 STORAGE

Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Do not store PVC corner beads in direct sunlight.

3.3 SUBSTRATE

Do not begin the application until required openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparation are complete. Do not commence plastering until substrate is of the required standard. All defects in substrate must be rectified prior to application of plaster coatings commencing.

3.4 PANEL APPLICATION CONDITIONS

Carry out panel fixing to Resene Construction Systems specification under conditions which will not adversely affect the finished work. Temperature must be above 5°C, cover work to protect it from cooler temperatures, refer to Resene Construction Systems specification.

3.5 PROTECT

Before installation of Integra AAC panels and subsequent application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

3.6 PLASTERING CONDITIONS

Carry out plastering to Resene Construction Systems specification under conditions which will not adversely affect the finished work.

3.7 FLASHING AND DETAILING

Comply with the Resene Construction Systems penetration flashing guidelines. Carry out to the required standard of execution to ensure water does not penetrate.

3.8 ALIGNMENT OF FRAMING

To the standard required by the Resene Construction Systems, plumb, level and in true alignment.

3.9 CONFIRM LAYOUT

Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

Application

3.10 CAVITY BATTENS

Apply peel and stick cavity battens full length to studs, to achieve the required thickness drained cavity to [NZBC E2/AS1: 9.0 Wall claddings](#). The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens must be no longer than 100mm. Use cavity spacers where fixing is required between cavity battens. Fix additional battens to internal and external corners and around openings to Resene Construction Systems standard details.

3.11 PENETRATIONS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:

- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- where electrical cables pass through cladding, ensure that there is no direct contact with the Integra panel, conduit required to be installed by electrician.

3.12 PENETRATION FLASHINGS

Fix in place required uPVC trims, profiles flashings and control joints. Service penetrations such as piping and light fittings to be sealed by specific trade.

3.13 INTEGRA AAC PANELS

Horizontally screw fix in a stretcher bond pattern to the battens to Resene Construction Systems requirements. Fixings to be a minimum of 50mm from the edge of the panel. Bond all horizontal and vertical joints with MultiStop bedding compound. Panels can cantilever beyond a stud to a maximum of 305mm.

3.14 SEAL COAT INTEGRA PANEL

Seal Integra Panel with one coat of Resene Construction Systems RenderPrep.

3.15 PRIMING STEEL

Use either Resene Galvo-Prime or Zinc rich spray pack primer to make sure that all exposed steel has been spot primed.

3.16 PANEL PATCHING

Apply Rockcote MultiStop as a substrate patching to Resene Construction Systems requirements. MultiStop Bedding to bug/blow holes greater than 10mm but less than 40mm diameter. MultiStop Finishing to bug/blow holes less than 10mm.

3.17 MOVEMENT CONTROL JOINTS

Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and / or where shown on the drawings and to Resene Construction Systems requirements. Reinforcing mesh is not continuous across control joints. Exposed control joints to be reflected through final coatings from substrate. Confirm locations in writing to the owner before work commences.

3.18 FIT FLASHINGS AND ACCESSORIES

Check and ensure head flashings have been installed. Fit flashings to jambs and sill on recessed joinery using Resene Construction Systems proprietary flashings. Reinforce bottom edges of Integra panels with uPVC channel extrusions to Resene Construction Systems technical and installation manual.

Resene Construction Systems - Integra Lightweight Concrete Facade System

3.19 BASE AND MESH COAT

Apply Rockcote PM100 Quick Render base plaster coat 5mm thickness maximum. Embed fibreglass reinforcing mesh into the wet plaster. Overlap each successive length by 100mm minimum. Apply sticky mesh around all external corners and into all window reveals. Apply diagonal reinforcement strips at all corners of windows, doors and other exterior openings.

3.20 LEVELLING COAT

Apply by trowel or pump second coat of Rockcote PM 100 Quick Render 1-2mm thickness. Trowel flat and leave to touch dry before floating off with a large plastic float and water, to remove any imperfections and leave a level surface.

Application - acrylic selection

3.21 SEAL COAT ACRYLIC TEXTURE FINISH

For texture finish seal the base coats with one coat of Resene Limelock within 14 days of applying the second base coat.

3.22 ACRYLIC TEXTURED FINISH COAT

Apply Texture coat 1mm thickness minimum to achieve the specified finish and colour (optional) to Resene Construction Systems requirements.

3.23 PROTECTIVE FINISH COAT

Apply two coats of Resene X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.

3.24 FINISHING

Refer to SELECTIONS for system texture and colour.

Completion

3.25 CLEANING

Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

3.26 FINAL INSPECTION

A final inspection by Resene Construction Systems applicator and project assessor of the entire finished cladding to take place immediately after completion of the wall cladding work and any defects or subsequent damage made good immediately.

4 SELECTIONS

For further details on selections go to www.reseneconstruction.co.nz. Substitutions are not permitted to the following, unless stated otherwise.

Performance

Materials

4.1 RESENE CONSTRUCTION SYSTEMS CAVITY 50mm PANEL

Location: Refer to Elevations
Type: 50mm Integra ACC Panel

4.2 RESENE CONSTRUCTION SYSTEMS 20MM CAVITY BATTENS

Type: 40mm x 20mm polystyrene battens

4.3 RESENE CONSTRUCTION SYSTEMS UPVC VENTILATED STARTER TRACK

Type: Resene Construction Systems uPVC ventilated starter track

4.4 RESENE CONSTRUCTION SYSTEMS INTEGRA AAC PANEL FIXINGS

Type/finish (class): 14g x 100mm Class 3 screw for 50mm AAC panel on 20mm cavity

4.5 RESENE CONSTRUCTION SYSTEMS INTEGRA LIGHTWEIGHT CONCRETE FACADE SYSTEM - ACRYLIC FINISH

Panel bonding: Rockcote MultiStop Bedding compound
 Panel patching: Rockcote MultiStop Bedding
 Panel sealing: RCS RenderPrep
 Base (1st) coat: Rockcote PM100 Quick Render; plus fibreglass mesh
 Second coat: Rockcote PM100 Quick Render
 Sealer coat: Resene Limelock
 Texture coat: Acrylic Texture
 Texture finish: TBC
 Texture colour: TBC
 Paint coat: Resene X-200
 Paint colour: TBC

4311M METALCRAFT PROFILED ROOFING

1 GENERAL

This section relates to the supply and fixing of **Metalcraft Roofing** profiled roofing complete with accessories.

It includes:

- Trough section roofing profiles
- Asymmetrical rib roofing profiles
- Corrugated roofing profile
- Translucent roofing

1.1 ABBREVIATIONS AND DEFINITIONS

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
MS	Modified silicone
LBP	Licensed Building Practitioner

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC G12/AS1	Water supplies
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 3566	Self-drilling screws for the building and construction industries
NZS 3604	Timber-framed buildings
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmosphere - Classification determination and estimation
NZMRM CoP	NZ metal roof and wall cladding Code of Practice (CoP)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Metalcraft Roofing Metdek400 product literature
 Metalcraft Roofing Metdek500 product literature
 Metalcraft Roofing Metdek855 product literature
 Metalcraft Roofing Metrib750 product literature
 Metalcraft Roofing Metrib760 product literature
 Metalcraft Roofing MC700 product literature
 Metalcraft Roofing MC770 product literature
 Metalcraft Roofing MC760 product literature
 Metalcraft Roofing T-Rib product literature
 Metalcraft Roofing MC1000 product literature
 Metalcraft Roofing Metcom7 product literature
 Metalcraft Roofing Metcom930 product literature
 Metalcraft Roofing Kahu® product literature
 Metalcraft Roofing Corrugate product literature
 Metalcraft Roofing Alsynite Topglass® product literature

Manufacturer/supplier contact details

Company: **Metalcraft Roofing**
 Web: www.metalcraftgroup.co.nz
 Email: frances.charles@unitedindustries.co.nz
 Telephone: 09 274 0408

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

18 years for failure of coating adhesion

18 years for weatherproofing by material penetration

For Warranty requirements in excess of this contact Metalcraft Roofing.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

5years for workmanship

- Provide this warranty on the material manufacturers standard warranty form.
- Commence the warranty from the date of practical completion of the contract works.

Include a copy of the Metalcraft Roofing maintenance requirements with the warranty. Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.7 QUALIFICATIONS

Roof Installers shall be experienced, competent roofers familiar with Metalcraft products. And for Restricted Building Work shall also be, an LBP or supervised by an LBP.

Carry out work with experienced, competent installers familiar with the products being used and preferably with appropriate qualifications such as the National Certificate in Metal Roofing and Cladding.

Performance - wind

1.8 WIND - NON SPECIFIC DESIGN

Building wind zone:

~ / ~kPa ULS (refer to [NZS 3604](#), table 5.4)

Refer to Metalcraft for "Wind Load Span Design Graphs" for load parameters.

1.9 FIXINGS, WIND

Design and use the fixings/fixing pattern appropriate for the wind design parameters and [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice. Refer to Metalcraft profiled roofing product literature for profile details. Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

Performance - General

1.10 PERFORMANCE

Install roofing materials in accordance with the [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice, and Metalcraft profiled roofing product literature, to form a weather-tight performance for the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

1.11 DRINKING WATER

Roofing for collecting potable water to [NZBC G12/AS1](#).

1.12 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile or cladding to the primary structure.

2 PRODUCTS

Materials

2.1 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL

Formability steel sheet, G550 for roll forming or G300 for flashings, coated to AS 1397.

Fixings

2.2 FASTENERS GENERALLY

Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with E2/AS1 and/or the NZ Metal Roof and Wall Cladding - Code of Practice and Metalcraft profiled roofing product literature. For fixing patterns refer to Metalcraft product literature for roofing profile.

2.3 FIXING SCREWS

To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metalcraft and with a Class 4 or 5 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm. Screw fasteners to be head stamped identifying the manufacturer and class. Refer to SELECTIONS.

2.4 RIVETS

Sealed aluminium, minimum diameter 4.0mm. Refer to Metalcraft for requirements..

2.5 FLASHINGS GENERALLY

To [NZBC E2/AS1, 4.0, Flashings](#).

Formable grade 0.55 BMT for galvanized, aluminium/zinc, aluminium/zinc/magnesium - coated and pre-painted steel and 0.90 BMT for aluminium (or 0.7mm for small aluminium flashings) to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

Components

2.6 FLASHINGS TO VERGE, RIDGE AND HIP

To [NZBC E2/AS1, 4.0, Flashings](#).

Supplied by the roofing manufacturer to match or to suit the roofing.

2.7 BOOT FLASHINGS

Generally to E2/AS1, 8.4.17 **Roof penetrations** (note; E2/AS1, Figure.54 **Soaker flashing for pipe penetration**, has an error, use as guide only).

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

Accessories

2.8 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.9 UNDERLAY AND REFLECTIVE FOIL

Refer to 4161 UNDERLAYS, FOIL AND DPC.

2.10 SEALANT

Neutral curing silicone or polymer sealant as required by Metalcraft and used as directed.

2.11 CLOSURE STRIPS

Polyurethane profiled closed cell foam strips to fit the sheet profile.

Brand: Ecofoam

Profile: To suit selected cladding profile

3 EXECUTION

Conditions

3.1 INSPECTION

Inspect the roof framing and supporting structure to ensure that it is complete and fully braced ready for roofing and free from any misalignments or protrusions that could damage the roofing.

3.2 FRAMING TIMBER MOISTURE

When continuous metal cladding etc. Runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

3.3 STORAGE

Upon delivery visually inspect sheets for damage and accept packs of undamaged roofing. Reject all damaged material. Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air circulation and drying between sheets.

3.4 HANDLING

Do not drag sheets across each other or other materials. Avoid distortion and contact with damaging substances, including cement. Long lengths of roofing should be lifted onto the roof using an approved load spreading beam. Protect edges and surface finishes from damage, keep under cover and remove as the product is being installed. Use soft, flat sole shoes when fixing and for all other work on the roof. Walk along the purlin line whenever possible.

3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use lead sheet or copper in contact with or allow water run-off onto galvanized or aluminium/zinc coated steel.

Application

3.6 FIX INSULATION

Refer to thermal insulation sections.

3.7 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread and string lines along purlin centres to keep fastenings in line.

3.8 END LAPS

End laps are not recommended, except where specifically detailed.

3.9 THERMAL MOVEMENT

Fix for Thermal Movement to Metalcraft requirements for thermal movement.

3.10 FIXING GENERALLY

Install and fix in accordance with the [NZMRM CoP](#) recommendations, and to Metalcraft required fixing patterns and details for each area of the building roofing. Use only screws as required by Metalcraft. Paint colour matched fixings and accessories before installation.

3.11 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking Zinalume® and Colorsteel®. Cut by shear only, using nibblers or hand snips. Remove all cutting and drilling debris from the roof.

3.12 STOP ENDS AND DOWNTURNS

Form stop-ends at the upper end of sheets. Form downturns at the gutter line where the roof pitch is less than 8 degrees. Form using the required tools.

3.13 INSTALL FLASHINGS

Flash roof to parapets, walls and penetrations to detail. Flashings to be installed on timber framing with moisture content of less than 20%. Where no detail is provided flash to [NZMRM CoP](#) NZ metal roof and wall cladding Code of Practice recommendations and Metalcraft and [NZBC E2/AS1](#) requirements. Cut accurately and fix using sealant and rivets to detail and to Metalcraft requirements to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

3.14 USE OF SEALANTS

Select and use sealants only as recommended by Metalcraft. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

3.15 FLASHING PENETRATIONS

Flash all penetrations through the roof. Fit pipe flashings with a proprietary collar flashing, with other penetrations flashed as detailed and to provide a weathertight installation. Ensure that flashings are set to avoid any ponding of water.

Completion

3.16 REPLACE

Replace damaged or marked elements. Do not attempt to repair coatings by applying colour match paint to pre-finished surfaces.

3.17 LEAVE

Leave this work complete with all necessary flashings, undercloaks, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

3.18 REMOVE

Remove all trade rubbish, swarf and unused materials from the roof and surrounds daily during the work. Sweep down at the end of each day, and clean out spouting, gutters and rainwater pipes on completion of the roof. Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.metalcraftgroup.co.nz. Substitutions are not permitted to the following, unless stated otherwise.

Coating system

4.1 COATING SYSTEM - EXPOSURE ZONE B-C (CAT 1-3)

Project Exposure Zone B-C to [NZS 3604](#), C 1-3 to ISO 9223.
 Base material: Zinalume on Steel
 Coating system: Colorsteel Endura
 Paint colour: Basalt Base

Roofing - asymmetrical rib profile

4.2 METALCRAFT - T-RIB ASYMMETRICAL RIB PROFILE ROOFING

Location: Refer to Roof plan
 Manufacturer: Metalcraft Roofing
 Profile: T-Rib
 Dimensions: Sheet width 810mm, cover 760mm, rib height 29mm, and roll formed to any length
 Roof pitch: 3
 BMT/material: 0.4
 Purlin material: Timber
 Fixings: Class 4 12G x 65mm

Accessories

4.3 FLASHINGS - GENERALLY

BMT/material: 0.55
 Coating system: To match roofing
 Paint colour: To match roofing

4383 TIMBER DECKING

1 GENERAL

This section relates to the fabrication and installation of exterior timber

- spaced boarding to decks
- steps and landings

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D1/AS1	Access routes
AS 4586	Slip resistance classification of new pedestrian surface materials
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
BRANZ BU 497	Stair construction

2 PRODUCTS

Materials

2.1 SOLID TIMBER COMPONENTS

Selection to [NZS 3602](#).

2.2 HARDWOOD SPACED BOARDING FOR EXTERIOR DECKS

Plantation-grown hardwood. Dressed four sides and with arrises, or specifically profiled decking. Provide a timber sample for review prior to laying.

3 EXECUTION

Conditions

3.1 GENERALLY

Execution 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).

Check site dimensions. Carry out machining within the practices recommended for the particular timber, wood product or pre-finished wood product being used. Machine drill and cut holes and recesses and form joints to the componentry manufacturer's recommendations. Work to be accurate, square and true to line and face.

Application

3.2 LAYING TIMBER SPACED BOARDING - EXTERIOR DECKS

Confirm whether the grooved side of the boards is face up or face down. Avoid excessively short or long lengths. Drill for all fixings. Stagger end joints. Space narrow boards (<100mm) a minimum of 2mm apart in general conditions, or minimum 3mm to 4mm apart if wide boards (>100mm) or narrow boards that are likely to swell after fixing, or 5mm apart for wide boards that are likely to swell. Leave a 12mm minimum gap between the exterior wall and the adjacent decking board.

3.3 SCREW FIXING

Pre-drill for all fixings, where the screws allow, use a proprietary deck pre-drilling and countersinking tool.

Use decking screws and power drive into the deck surface to just slightly below the board surface (approx. 0.5mm). Take care to not overdrive the screw as this may result in the screw heads or the boards being damaged. Refer to SELECTIONS.

3.4 CORROSION RISKS

For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel or silicon bronze, fixings and connectors, if decking or framing timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

Completion

3.5 LEAVE

Leave work to the standard required by following procedures.

3.6 REMOVE

Remove all debris, unused materials and elements from the site.

4 SELECTIONS

4.1 EXTERIOR DECKING - HARDWOOD SPACED BOARDING

Species: Qwila
 Size: 140mm x 20mm
 Grooved face: Down

4.2 SCREW FIXING

Screw type: Stainless Steel decking screw ~
 Screw size: 65 x 10g ~

4422VE VIKING ENVIROCLAD & ENVIROCLAD FBS MEMBRANE

1 GENERAL

This section relates to **Viking Enviroclad** membrane and **Viking Enviroclad FBS** (fleece backed) membrane system:

It includes **Enviroclad** applied as a single layer membrane and **Enviroclad FBS** incorporating a polyester fibre fleece-backing;

- suitable for industrial, commercial and residential roofing and decking applications

1.1 RELATED WORK

Refer to 7411M METALCRAFT ROOFINGRAINWATER SPOUTING SYSTEMS for rainwater disposal.

1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section

TPO	Thermoplastic polyolefin
FBS	Fleece-back system

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
AS/NZS 2269.0	Plywood - Structural - Specifications

1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Viking Waterproofing Membrane Systems manual
 Viking Enviroclad Plywood Substrate Checklist
 Viking Concrete Substrate Checklist
 Viking Enviroclad Standard Details
 Viking Enviroclad Applicator Manual
[BRANZ Appraisal 656](#) - Enviroclad Roofing Membrane
[CodeMark Certificate Number 30058](#) Rev B - Viking Enviroclad Roofing and Deck Membrane System

Copies of the above literature are available from Viking Roofspec

Web: www.vikingroofspec.co.nz
 Email: info@vikingroofspec.co.nz
 Telephone: 0800 729 799
 Facsimile: 0800 729 788

Warranties

1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years: For Viking **Enviroclad** Membrane
 20 years: For Viking **Enviroclad FBS** Membrane

- Provide this warranty on the Viking Roofing standard form.
- Commence the warranty from the date of completion of fixing.

Refer to the section 1237 WARRANTIES for additional requirements.

1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

- 5 years: For **Enviroclad** membrane when installed by Viking approved applicator
- 5 years: For **Enviroclad FBS** membrane when installed by Viking approved applicator

- Provide this warranty in the Viking Enviroclad Membrane Product Warranty on standard form.
- Commence the warranty from the date of completion of fixing.

Refer to the section 1237 WARRANTIES for additional requirements.

1.7 WARRANTY - VIKING FULL SYSTEM WARRANTY ON APPLICATION

Provide a Viking Full System Warranty for materials and installation:

- 20 years: For Viking **Enviroclad** Membrane
- 20 years: For Viking **Enviroclad FBS** Membrane

- Register with Viking Roofspec prior to installation.
- Approved Applicator must hold d current Stage 3 Viking Roofspec Licence.
- Provide this warranty on the Viking Full System Warranty job completion form.
- Commence the warranty from the date of completion of fixing.

Refer to the section 1237 WARRANTIES for additional requirements.

Requirements

1.8 QUALIFICATIONS

Installation of the membrane to be carried out by Viking Approved Applicators. Installation of substrates must be completed by suitably qualified persons in accordance with instructions given in Manufacturers Technical Literature and [BRANZ Appraisal 656](#) - **Enviroclad** Roofing Membrane.

1.9 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Viking membrane waterproofing materials, or associated products, components or accessories.

Performance

1.10 TEST

Flood test horizontal applications with a minimum 50mm depth of water for 24 hours. Make good any lack of watertightness when the surface is completely dry.

1.11 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. All penetrations to comply with Viking Roofspec recommendations and standard details.

2 PRODUCTS

Materials

2.1 ENVIROCLAD WATERPROOFING MEMBRANE

Polyester reinforced thermoplastic polyolefin (TPO) membrane. Refer to SELECTIONS for size and colour options.

Components

2.2 ADHESIVE - ENVIROCLAD ONLY

Enviroclad Bonding Adhesive - proprietary solvent based contact adhesive.

2.3 ENVIROCLAD CUT EDGE SEALANT (CLEAR)

Proprietary sealant for sealing cut edges.

- 2.4 WATER CUT-OFF MASTIC
Mastic Sealant for use at compression terminations, drains and beneath metal edging.
- 2.5 ENVIROCLAD UNIVERSAL SEALANT
UV stable sealant for use in exposed terminations (e.g. chase sealing).
- 2.6 ENVIROCLAD WEATHERED MEMBRANE CLEANER
Proprietary membrane cleaner.
- 2.7 ENVIROCLAD OUTSIDE AND INSIDE CORNERS
Proprietary unreinforced moulded TPO flashings to be welded as internal and external corners.
- 2.8 ENVIROCLAD UNREINFORCED MEMBRANE
Proprietary unreinforced TPO membrane. 300mm x 15.2m.
- 2.9 ENVIROCLAD T-JOINT COVERS
Proprietary unreinforced TPO disks.
- 2.10 ENVIROCLAD PIPE FLASHINGS
Proprietary unreinforced moulded TPO flashings for sealing pipe penetrations.
- 2.11 ENVIROCLAD POURABLE POCKETS
Proprietary unreinforced moulded TPO surrounds for encasing pipe penetrations.
- 2.12 ENVIROCLAD THERMOPLASTIC POURABLE SEALER
Proprietary thermoplastic pourable sealer for filling of pourable pocket.
- 2.13 SPLICE WIPES
Proprietary wipes for cleaning and drying membrane prior to welding.

Accessories

- 2.14 VENTS
Aluminium vent or TPO vent.
- 2.15 ENVIROCLAD WALKWAY ROLLS
Proprietary non-slip TPO walkway mat. 792mm x15m. (Apply and weld in 3m sections)
- 2.16 ENVIROCLAD SCUPPER OUTLETS
TPO scuppers. 100mm x 100mm or 100mm x 65mm outlets.
- 2.17 LEAF AND GRAVEL GRATES
Viking Gravel/Leaf Grates.
- 2.18 CLAMP RING ROOF DRAINS OR OVERFLOWS
80mm, 100mm or 150mm clamp sealed drains and overflows.

3 EXECUTION

Conditions

- 3.1 GENERALLY
All work and materials to comply with current Viking Enviroclad technical literature and standard details.
- 3.2 STORAGE
Take delivery of **Enviroclad** membrane in rolls undamaged and include for site handling facilities where required. Store rolls horizontally only. Provide dry storage for all products. Stack off the ground on a level surface and with accessories.
- 3.3 WEATHER
Lay **Enviroclad** membrane in fair weather, with ambient air temperature no less than 7°C.

3.4 EQUIPMENT

Equipment to be used:

- Suitable welding equipment
- Magnetic heat sink poles
- Hand roller
- Dual caulking Gun

Application - preparation

3.5 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, grooves, ducts, provision of battens and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. The substrate to be smooth, clean, dry and stable.

3.6 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate, including sumps, outlets and projections, will ensure work of the required standard. . Ensure the fall complies with [NZBC E2/AS1 8.5.6](#), **Roof and deck drainage**, including correct fall to rainwater outlets to avoid ponding.

3.7 PLYWOOD SUBSTRATE

Install to requirements of current Viking Roofspec Enviroclad Plywood Substrate Checklist. Plywood to be;

- a minimum of 17mm thick and complying with [AS/NZS 2269.0](#)
- minimum CD structural grade with the sanded C side upwards
- H3.2 treated (CCA) and kiln dried.

Lay plywood with staggered joints (brick bond) with all edges of the sheets fully supported. Do not use tongue and groove plywood.

Leave a 3mm gap between all sheets. Fix with 10 gauge x 50mm stainless steel countersunk screws. Fix at 50mm from the corners, 150mm centres on edges and 200mm centres on intermediate supports. No timber corner fillets are to be used. Chamfer all external edges with a minimum radius of 5mm where the membrane is to be wrapped over.

Provide falls to a minimum of those stated in [NZBC E2/AS1, 8.5.1](#), - 1:30 for roofs, 1:40 for decks and 1:100 for gutters.

Plywood and the timber substructure to have a maximum moisture content of 18% when the membrane is adhered.

Application - laying

3.8 GENERAL

Install to current application standards as detailed in Viking Roofspec Technical literature and Viking **Enviroclad** Applicators Manual.

3.9 PLYWOOD SUBSTRATE PREPARATION

Plywood to be clean and dry before application of the waterproofing membrane.

3.10 POSITION AND RELAX

Membrane to be unrolled onto the prepared substrate and allowed to relax for at least 20 minutes prior to installation. Position membrane over acceptable substrate and fold membrane back to expose half of the underside.

3.11 APPLY ADHESIVE - ENVIROCLAD

Apply **Enviroclad** Bonding Adhesive, to the exposed underside of the membrane and to the corresponding substrate, using a plastic core medium nap paint roller at a coverage rate of 2m² per litre (includes coverage on both membrane and substrate).

3.12 INSTALL MEMBRANE SHEETS - ENVIROCLAD

Allow adhesive to flash off until tacky. Lay the glued Enviroclad membrane onto the glued substrate. Brush down the bonded section of Enviroclad membrane immediately with a soft bristle broom. Fold back the unglued half of the sheet and repeat procedure.

3.13 LAP JOINTS

Install adjoining **Enviroclad** membrane sheets in the same manner, overlapping edges to provide a minimum 40mm hot air weld.

- 3.14 **HOT AIR WELD**
Clean all weld areas with Weathered Membrane Cleaner. Then weld the adjoining **Enviroclad** membrane sheets (minimum width of weld is 40mm).
- 3.15 **MEMBRANE CLEANER**
Ensure that all membrane, including accessories, to be welded is cleaned using Weathered Membrane Cleaner. Wipe the surface where the **Enviroclad** membrane cleaner has been applied with a clean, dry HP Splice Wipe to remove residue prior to welding.
- 3.16 **INSPECT**
Inspect and test joints all welds using a seam probe. Seal all cut reinforced membrane edges using Cut Edge Sealer, or roll the membrane edge using the correct welding technique. Flood test with a minimum 50mm depth of water for 24 hours.
- 3.17 **PENETRATIONS AND JUNCTIONS**
Form and finish upstands, downturns, penetrations, outlets and vents to conform to current Viking Roofspec Standard Details. Confirm installation of all required flashings and terminations, to leave membrane watertight upon project completion.
- 3.18 **VENTING – ROOF/DECK CAVITIES**
Provide adequate ventilation to **NZBC E2/AS1, 8.5.2, General**. If applying roof mounted proprietary vents, install a minimum one Viking roof vent for the first 40m² of flat roof area and one vent per 90m² thereafter. Check that the cavity is cross ventilated to allow air movement across the entire cavity.

Finishing

- 3.19 **FOOT TRAFFIC**
Keep foot traffic to a minimum after laying the membrane. Lay protection as required for foot traffic or later works.
- 3.20 **ACCESS BOARDS**
Provide access boards for later operations and remove when no longer needed.
- 3.21 **ACCEPTANCE**
Inspect the completed work. Protect and maintain roofing until completion of the contract works.
- 3.22 **SUBSEQUENT WORK**
Make good any damage and repair to Viking Roofspec specifications.

Completion

- 3.23 **CLEAN UP**
Clean up as the work proceeds.
- 3.24 **LEAVE**
Leave work to the standard required by following procedures.
- 3.25 **REMOVE**
Remove debris, unused materials and elements from the site.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 **VIKING ENVIROCLAD MEMBRANE**

Location:	Roof to living area
Substrate:	17mm H3.2 C/D Plywood
Brand/type:	Viking Enviroclad
Thickness:	1.52 mm
Size:	3.0 or 3.6 metres wide x 30.4 metres long
Colour:	Slate Grey
Finish:	smooth
Accessories:	Viking Scupper

4521 ALUMINIUM WINDOWS AND DOORS

1 GENERAL

This section relates to the manufacture, supply, and installation of:

- aluminium windows
- aluminium doors and frames
- hardware and furniture
- overhead glazing
- flashings

1.1 RELATED WORK

Refer to glazing sections for glass types

1.2 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of New Zealand
PQAS	Powder Coating Quality Assurance System

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC H1/VM1	Energy efficiency
NZBC H1/AS1	Energy efficiency
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
WANZ Installation Guide:	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 6.
WANZ PQAS	Powder Coating Quality Assurance System
WANZ SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005).
BRANZ BU 337	Protecting Window Glass from Surface Damage
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.
US Federal Specification	
TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 years: For fabrication

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

1.7 COMPLIANCE

Windows and doors to be manufactured and installed to [NZBC E2/AS1](#).

1.8 SHOP DRAWINGS

Shop drawings to show the general arrangement of the aluminium joining including, but not be limited to:

Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including: -

- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Interaction between claddings and linings
- Flashing details
- Sealants and air seals
- Non standard fixing details including bracketing

And where required the following:

- Design calculations
- Producer Statement in the form PS1 Producer Statement Design
- Rebate sizes
- Dimensions of all typical elements and of any special sizes and shapes
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of windows and doors
- Sealant types and full size sections of all sealants and backing rods
- Provision for thermal movement
- Provision for seismic movement and movement under wind loads
- Sequence of installation
- Glazing specification and details

Where requested provide the following additional information

- Information of Professional Indemnity Insurance held by the person providing the shop drawings

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Complete shop drawing review before commencing fabrication.

1.9 CERTIFICATION

Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of [NZS 4211](#).

Performance

1.10 PERFORMANCE - WINDOWS AND DOORS

To [NZS 4211](#), including:

- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

1.11 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS

The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window manufacturer.

Performance - Wind (design by contractor)

1.12 WIND - NON SPECIFIC DESIGN

Design the installation to the wind zone parameters of [NZS 3604](#), table 5.4.

Refer to SELECTIONS for wind zone.

Finishes

1.13 CERTIFY COATINGS - POWDER COATING

Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided. The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2 PRODUCTS

Materials

2.1 WINDOWS

Refer to SELECTIONS for type and finish.

2.2 DOORS

Refer to SELECTIONS for type and finish.

2.3 ALUMINIUM EXTRUSIONS

Alloy designation to comply with [AS/NZS 1866](#). Branded and extruded for anodising or powder coating.

2.4 ALUMINIUM SHEET AND STRIP

Complying with [AS/NZS 1734](#) of suitable thickness. Rolled for anodising or powder coating.
Alloy designation: 5251 - H16 or 5005 - H16

2.5 STAINLESS STEEL SHEET AND STRIP

Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.6 GLASS

Refer to the glazing section for glass types and installation.

2.7 REVEALS - TIMBER PAINTED

Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

2.8 FLASHINGS GENERALLY

To [NZBC E2/AS1](#), 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components - for cavity systems

2.9 STANDARD CAVITY CLOSER

A perforated device constructed from either aluminium or PVC to close the cavity above the window or door unit, between the cladding and head flashing, to provide ventilation in accordance with [NZBC E2/AS1](#) to the spaces above the window or door.

2.10 WANZ SUPPORT BAR

Extruded aluminium support bar with built in drainage and ventilation to [NZBC E2/AS1](#), to provide continuous support to the window unit. Size to suit cladding type.

Components

2.11 GLAZING GASKETS

Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

2.12 HARDWARE AND FURNITURE

Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

2.13 SAFETY STAYS

Stainless steel non releasable restrictors to limit window opening to [NZBC F4/AS1](#), Table 2, Acceptable opening sizes for barriers.

Sealants

2.14 STRUCTURAL SEALANT

Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a $\pm 40\%$ movement factor complying with US Federal Specification TT S 001543A.

2.15 WEATHERING/INSTALLATION SEALANT

Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT S 0011534A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus ($\pm 25\%$ movement) to US Federal Specification TT S 00230C.

2.16 FOAM TAPE

Foam tape to [NZBC E2/AS1](#), 9.1.10.7 **Closed cell foam tape**.

Finishes

2.17 POWDER COATED ALUMINIUM - EXTRA DURABLE

Polyester powder organic coating in accordance with [WANZ PQAS](#) and AS 3715.

2.18 POWDER COATED ALUMINIUM - HIGH DUTY

Polyester powder coating in accordance with [WANZ PQAS](#) and AAMA 2604.

2.19 POWDER COATED ALUMINIUM - SUPER DUTY

PVF² fluoropolymer powder coating in accordance with AAMA 2605 and [WANZ PQAS](#).

3 EXECUTION

Conditions - generally

3.1 DO NOT DELIVER

Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.

3.2 UNLOAD WINDOW JOINERY

Unload, handle and store elements in accordance with the window manufacturer's requirements.

3.3 AVOID DISTORTION

Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE

Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

3.5 PROPRIETARY ELEMENTS

Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS

Retain protective coverings and coatings to BRANZ BU 337 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

3.7 ADDITIONAL PROTECTION

Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS

Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

3.9 INSTALLATION FIXING

To NZBC E2/AS1, 9.1.10.8, **Attachments for windows and doors**. Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings. Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION

Fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

3.11 TIMBER / PVC REVEALS

Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces.

3.12 HARDWARE GENERALLY

Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

3.13 SAFETY STAYS

Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.

Installation - windows and doors

3.14 CORROSION PROTECTION

Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

3.15 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS

Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:

- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1:9.1.5 **Wall underlays to wall openings**.
- Full height 20mm jamb battens to NZBC E2/AS1 figure 72A (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

3.16 INSTALLATION

Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

3.17 INSTALLATION CAVITY CONSTRUCTION

Install to Wanz Installation Guide details and drawings including Wanz sill support bars. For thresholds with support bars fixed through membranes, pre-fill support bar screw holes with silicone sealant to NZBC E2/AS1, figure 62(d).

3.18 INSTALL FLASHINGS

Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm minimum plus any jamb scriber width at each end.

3.19 COMPLETE AIR SEAL

To NZBC E2/AS1:9.1.6 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE

Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 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. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

3.22 PREPARE JOINTS

Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

3.23 BACK UP

When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

3.24 SEALANT FINISH

Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer. Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.

Completion - cleaning

3.25 REMOVE TRADE DEBRIS

Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.

3.26 TRADE CLEAN

Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

Completion

3.27 PROTECTIVE COVERINGS

Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades.

3.28 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. Masking tape must not be used for this purpose.

3.29 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM
In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted only to minor surface scratching. Otherwise replace all damaged material.

3.30 REMOVE
At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

3.31 REPLACE
Replace damaged, cracked or marked elements.

4 SELECTIONS

Performance

4.1 THERMAL PERFORMANCE
R-value: R0.26 (as determined from [NZBC H1/VM1](#) or [H1/AS1](#))

Performance - Wind (design by contractor)

4.2 WIND - NON SPECIFIC DESIGN
Building wind zone High (refer to [NZS 3604](#), table 5.4)

Window and door system

4.3 ALUMINIUM WINDOWS
Manufacturer: As per contractor
Type/location: Refer to Framing Plan and Elevations

4.4 ALUMINIUM DOORS
Manufacturer: As per contractor
Type/location: Refer to framing plan and Elevations

4.5 TIMBER REVEALS
Timber species: Radiata Pine
Grade/treatment: H3.1 / H3.1
Thickness: 25mm
Reveals: Grooved
Finish: Paint

Finishes

4.6 FLUOROPOLYMER POWDER COATING FINISH
Type: PVF2 fluoropolymer powder coating
System integrity: Minimum 20 years
Thickness: Average of 80 microns with a minimum of 50 microns
Colour: Kinetic Platypus

4.7 FLASHINGS
Material/type: Aluminium
Pattern: Formed to suit details provided

4.8 WEATHERING SEALANT
Brand/type: 1-part polyurethane moisture curing, elastic joint sealant
Colour: As per contractor

4610 GLAZING RESIDENTIAL

1 GENERAL

This section relates to the supply and fixing of glass products for external and internal joinery in residential type buildings and includes:

- windows and doors
- frameless shower and bath screens
- splashbacks, wall linings
- balustrade systems, pool fences
- mirrors and mirror frames

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

PVB	Polyvinyl Butyral
CIP	Cast in place

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC F4/AS1	Safety from falling
NZBC F9/AS1	Means of restricting access to residential pools
NZBC H1/AS1	Energy Efficiency
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 3604	Timber-framed buildings
NZS 4211	Specification for performance of windows
NZS 4218	Thermal insulation - Housing and Small Buildings
NZS 4223.1	Glazing in buildings - Glass selection and glazing
NZS 4223.Supp1	Glazing in buildings - Supplement 1 to NZS 4223.1:2008 and NZS 4223.4:2008
NZS 4223.2	Glazing in buildings - Insulating glass units
NZS 4223.3	Glazing in buildings - Human impact safety requirements
NZS 4223.4	Glazing in buildings - Wind, dead, snow and live action
AS/NZS 2208	Safety glazing materials in buildings
AS/NZS 4666	Insulating glass units
BRANZ BU 337	Protecting window glass from damage

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Warrant glass under normal environmental and use conditions against failure of materials.

10 years:	for insulating glass units
10 years:	for laminated glass
10 years:	for toughened glass

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

Performance

1.4 ENERGY EFFICIENCY

Provide glazing to meet the energy requirements of NZS 4218 and NZBC H1/AS1 for housing small buildings.

Refer to SELECTIONS and schedules for location and type of glazing.

2 PRODUCTS

Materials

2.1 CLEAR FLOAT GLASS

Clear ordinary annealed transparent float glass for general window glazing. Thickness to [NZS 4223.1](#) and [NZS 4223](#). Supp 1.

2.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Translucent, annealed, rolled glass with a decorative pattern on one surface.

2.3 LAMINATED GLASS

Grade A Safety Glass to [AS/NZS 2208](#) with PVB or CIP resin interlayer.

2.4 TOUGHENED GLASS

Grade A Safety Glass to [AS/NZS 2208](#).

Heat soaked toughened glass to [NZS 4223.1](#), Appendix E required for critical areas. Refer to SELECTIONS.

2.5 INSULATING GLASS UNITS (IGU'S)

To [AS/NZS 4666](#), [NZS 4223.2](#) and the IGU Manufacturers Association (IGUMA) requirements. Marking to [NZS 4223.2](#) as modified by [NZBC B2/AS1](#), 3.5.

Materials, screens

2.6 GLASS SCREENS SHOWER & BATH

Proprietary shower / bath screens, formed to shape before toughening, complete with matching hardware.

Components, aluminium and uPVC glazing

2.7 GLAZING TAPE AND GASKETS

Single/double sided pressure sensitive self-adhesive low/medium/high density foam tapes/butyl tapes selected to suit the glazing detail to window manufacturers' requirements.

2.8 SETTING BLOCKS

Santoprene/Neoprene, 80-90 Shore A hardness, set at quarter points or to detail, to support the weight of glass panes.

3 EXECUTION

Conditions

3.1 GENERAL REQUIREMENTS

To [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#). All external glazing to be wind and watertight on completion.

3.2 DELIVERY

Keep glass dry and clean during delivery and bring on to site when ready to glaze directly into place. Comply also with the storage requirements set out in BRANZ BU 337.

3.3 GLASS CONDITION

All glass to have undamaged edges and surfaces.

3.4 GLASS THICKNESS

If not specifically stated in the glazing schedule determine the minimum thickness of glass for each sheet as required by [NZS 4223.1](#), [NZS 4223.3](#), [NZS 4223.4](#) and [NZS 4223](#). Supp 1. For windows tested to [NZS 4211](#), ensure glass meets the requirements of the window testing.

Determine the final glass thickness based on whether wind loading or human impact considerations govern.

3.5 REBATE DIMENSIONS

Provide rebates for glazing to the widths and depths necessary for each situation including minimum glass edge cover to [NZS 4223.1](#), Section 4 Glazing.

3.6 JOINTING, PUTTY AND SEALING MATERIAL COMPATIBILITY

Ensure jointing, putty and sealing materials are compatible with glass substrates. Confirm compatibility with laminated glass, IGUs and coatings.

Conditions - human impact safety requirements

3.7 SAFETY GLAZING, GENERAL REQUIREMENTS

Glazing of doors, side panels, low level and window seat glazing, bathrooms, stairwell landings and similar locations, to [NZS 4223.3](#) for thickness and maximum areas of safety glass.

3.8 SAFETY GLAZING MATERIAL

Use only safety glazing materials defined in [NZS 4223.3](#), that also comply with the relevant requirements of [AS/NZS 2208](#). Ensure material is permanently marked and if cut by the distributor or installer mark each piece to [NZS 4223.3](#), 2.8 Identification.

3.9 CONTAINMENT

Edge cover to comply with [NZS 4223.1](#), Section 4 Glazing, table 5. Otherwise to [NZS 4223.3](#), 2.3 Edge cover.

Assembly

3.10 WORKING OF GLASS

All working of glass as required in [NZS 4223.1](#).

3.11 EDGE WORK AND BEVELLING

Edgework other than a clean cut. Refer to SELECTIONS/drawings for type.

3.12 SURFACE TREATMENT

Refer to SELECTIONS/drawings for finish.

3.13 SURFACE CUTTING

Refer to SELECTIONS/drawings for finish.

3.14 INSTALL SAFETY GLASS

To [NZS 4223.3](#).

Application - timber glazing

3.15 PREPARE REBATES

Ensure all rebates and grooves are clean, dry and unobstructed at time of priming, sealing and glazing.

3.16 PREPARE TIMBER SURROUNDS

Ensure that all rebates have been primed with a primer suitable for this purpose and applied to the requirements of the painting section/s.

3.17 PREPARE TIMBER BEADS

Before fixing ensure that timber beads are sealed and painted to match the timber surround.

3.18 LOCATE BLOCKS

Centralise the glass in the rebate opening using setting, location and spacer blocks as required in [NZS 4223.1](#), Section 4 Glazing, to prevent movement of glass in the rebate and cushion the effect of wind loading on the sealing system.

3.19 INSTALL PUTTY FRONTING

Back putty to give a bedding of not less than 1mm to 2mm between the glass and the back of the rebate when the glass has been pressed back. Strip off squeezed out putty at a positive angle. Fix glass to wooden surrounds with diamond points or sprigs at maximum 460mm centres. Fix glass to metal surrounds with spring clips or pins provided by the sash manufacturers. Apply putty to the face to form a triangular fillet stopping 1-2 mm below sight line. Finish putty smooth and true to line and face and with a light brushing.

Leave all windows and doors closed until putty has set sufficiently to prevent glass displacement.

Prime putty fronting once surface has skinned - normally within 10 - 15 days of completion of glazing, but this can be reduced with special XHP putty.

3.20 BEAD GLAZING, PREFORMED STRIPS

Apply the preformed tape to the rebate upstand with securely formed (or sealed) butt joints at corners. Place setting blocks, offer the glass and press back against the tape centralised in the opening and apply the second tape. Press the beads against and compressing the tapes and fix true to line and face sufficiently rigid to prevent flexing or movement. Trim off excess strip.

If a capping bead is required clean and paint the timber surface and when dry apply sealant capping between bead and glass and tool to a smooth camber.

3.21 INSTALLING INSULATING GLASS UNITS

Refer to the glazing manufacturer's requirements and before glazing ensure that the materials forming the opening are strong enough to accept the weight, the rebates are the correct size and prepared to receive the units to [AS/NZS 4666](#). Fit setting and location blocks and bead glaze units using a compatible sealant to NZS 4666 section 3 Glazing, and to the glazing manufacturer's requirements.

Application aluminium

3.22 INSTALL GLASS TO ALUMINIUM FRAMES

Install glass to NZS4223.1.

- Bead glaze to Section 4 Glazing.
- Channel glaze to Section 4 Glazing, and Section 5 for Framed, Unframed, Partly Framed Glass Assemblies.

Application miscellaneous

3.23 INSTALL GLASS SHOWER & BATH SCREENS

Install shower and bath screens and doors to manufacturer's requirements.

Finishing

3.24 SAFETY

Indicate the presence of transparent glass for the remainder of the construction period, with whiting, tape or signs compatible with the glass type.

Completion

3.25 TRADE CLEAN

Clean off or remove safety indicators at completion of the building.

3.26 REPLACE

Replace damaged, cracked or marked glass.

3.27 LEAVE

Leave work to the standard required by following procedures.

3.28 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Performance - wind

- 4.1 WIND ZONE - NON-SPECIFIC DESIGN
Building wind zone: M (as determined from NZS 3604, NZS 4223.4)

Glass by type

- 4.2 TEXTURED, PATTERNED OR OBSCURE GLASS

Location: Refer to Elevation
 Brand/pattern: As per contractor
 Pattern: As per contractor
 Thickness: As per contractor

- 4.3 TOUGHENED GLASS

Location: Refer to Elevations
 Brand/type: As per contractor
 Thickness: As per contractor

Bath and shower screens and doors

- 4.4 FRAMELESS GLASS SHOWER SCREENS AND DOORS

Location: Bathroom and Ensuite
 Brand/type: Safety Glass
 Thickness: 10 mm
 Hardware: As per contractor
 Accessories: As per contractor

4710P PINK® BATTS® & PINK® BATTS® SILENCER® INSULATION

1 GENERAL

This section relates to Tasman Insulation **Pink® Batts®** insulation materials installed into residential buildings.

It includes:

Thermal:

- **Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Skillion Roof Insulation**
- **Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®)**
- **Pink® Batts® Masonry Wall Insulation**
- **Pink® Batts® 140mm Wall Insulation**
- **Pink® Batts® Steel Wall Insulation**
- **Pink® Batts® Narrow Wall Insulation**
- **Pink® Batts® SnugFloor® Underfloor Insulation**

Acoustic:

- **Pink® Batts® Silencer®**
- **Pink® Batts® Silencer® Midfloor**

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1-AS6	Protection from fire
NZBC H1/AS1	Energy efficiency
NZS/AS 1530.1	Methods for fire tests on building materials, components and structures - Combustibility test for materials
AS/NZS 3000	Electrical installations
NZS 4218	Thermal insulation - Housing and small buildings
NZS 4220	Code of practice for energy conservation in non-residential buildings
NZS 4243.1	Energy Efficiency - Large buildings - Building thermal envelope
NZS 4246	Energy efficiency - Installing bulk thermal insulation in residential buildings
AS/NZS 60598.2.2:2001	Luminaires- Particular Requirements - Recessed luminaires
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents related to this section are:

Tasman Insulation New Zealand: Product Data Sheets and Installation Instructions

[BRANZ Appraisal 238](#) - Pink® Batts® Insulation

[BRANZ Appraisal 632](#) - Pink® Batts® SnugFloor® Underfloor Insulation

[BRANZ Appraisal 767](#) - Pink® Batts® Skillion Roof Insulation

Manufacturer/supplier contact details

Company: **Tasman Insulation New Zealand**

Web: www.pinkbatts.co.nz

Telephone: 0800 746 522

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

Lifetime Warranty	For Pink® Batts® insulation products
-------------------	---

- Commence the warranty from the date of practical completion of the contract works.
- Provide this Warranty on the **Pink® Batts® Lifetime Warranty Certificate** form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS, PINK® BATTS®

Installers to be **PinkFit® - Preferred Pink® Batts® installers**. A list of approved installers can be obtained from the web, by telephone or from the local building supplies merchant.

Web: www.pinkbatts.co.nz

Telephone: Freephone 0800 746 534

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Tasman Insulation **Pink® Batts®** insulation or associated products, components or accessories.

Performance - combustibility

1.6 FIRE PREVENTION

Pink® Batts® insulation materials are considered a non-combustible material to NZS/AS 1530.1 and need not be separated from heat sources such as fire places, heating appliances, flues and chimneys to **NZBC C/AS1** to **C/AS6**, except if used in conjunction with, or attached to other heat sensitive materials.

2 PRODUCTS

Materials - thermal

2.1 PINK® BATTS® CEILING INSULATION

Pink® Batts® Ceiling Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.

NOTE: When insulation abutting or covering recessed downlights is intended to be in contact with IC, CA 80, CA 135 luminaries the insulation must withstand a 30s Needle Flame test to **AS/NZS 60695.11.5**. **Pink® Batts®** insulation meets this requirement.

2.2 PINK® BATTS® WALL INSULATION

Pink® Batts® Wall Insulation (Pink® Batts® Classic and Pink® Batts® Ultra®) is a light weight flexible bio-soluble glass wool manufactured from up to 80% recycled glass, bonded with a thermosetting resin to form rectangular slabs. Refer to SELECTIONS for R values and thickness options.

Components

2.3 FASTENERS

Insul anchors complete with retaining washer.

2.4 TAPES

Proprietary plastic tape stapled across framing to retain insulation in unlined wall and ceiling locations.

2.5 ADHESIVE TAPE

Pressure sensitive adhesive tape.

3 EXECUTION

3.1 STORAGE

Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, compression, puncturing and damage to edges of materials. Do not use damaged or wet insulation materials.

3.2 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.3 INSPECTION

Before starting installation of blankets and slabs, check that the location and framing are free from moisture, that the cavities are not interconnected and that mesh, wall underlays and vapour barriers are in place.

Application - general

3.4 INSTALL INSULATION - GENERAL

Lay, install, fit and fix to [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to [NZS 4218](#) and [NZS 4246](#). Install in large buildings to [NZS 4243.1](#) and [NZS 4220](#). Allow insulation to re-loft/relax prior to installation. Do not cover vents. Confirm with fireplace manufacturer for clearances; **Pink® Batts®** insulation need not be separated except if used in conjunction with, or attached to other heat sensitive materials. Lift up electrical wires, lighting transformers/controllers and lay the insulation underneath.

3.5 RECESSED LIGHT FITTINGS - CLEARANCE

Non-residential applications;

The clearance between insulation and recessed downlights

- 100mm gap to [AS/NZS 3000](#), figure 4.9.
- Provide larger clearances where required by the light manufacturer.

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger clearance where required by the light manufacturer.
- In a retrofit situation where recessed downlights are unclassified or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

Application, thermal insulation

3.6 INSTALL PINK® BATTS® CEILING INSULATION

Ensure that the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Ceiling Insulation** beneath electrical wiring and plumbing. Install to the outer edge of the top plate. Maintain a 25mm gap clearance between the **Pink® Batts®** insulation and roof underlay. Refer to [NZS 4246](#) for installation guidelines and **Pink® Batts®** installation instructions for detailed information.

3.7 INSTALL PINK® BATTS® WALL INSULATION

Ensure the product is installed dry; if wet replace before installation. If cutting is required, cut oversize by 5-10mm to ensure a friction fit. Fill gaps around windows and doors with off-cuts. Insulate around vents (not over them) to allow unhindered ventilation.

Fit **Pink® Batts® Wall Insulation** behind electrical wiring and plumbing. Ensure there are no gaps, folds or undesirable compression at edges.

Refer to [NZS 4246](#) for installation guidelines and **Pink® Batts®** installation instructions for detailed information.

Completion

3.8 CLEAN UP

Clean up as the work proceeds, so no spare offcuts or any other matter or item remain behind claddings or linings.

3.9 LEAVE

Leave work to the standard required by following procedures.

3.10 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.pinkbatts.co.nz.
Substitutions are not permitted to the following, unless stated otherwise.

Thermal insulation

4.1 PINK® BATTS® CLASSIC CEILING INSULATION

Location: All roof
Brand: **Pink® Batts® Classic Ceiling**
R-value: R3.2
Thickness: 170mm

4.2 PINK® BATTS® CLASSIC WALL INSULATION

Location: Exterior walls and walls between house and garage
Brand: **Pink® Batts® Classic Wall**
R-value: R2.4
Thickness: 90mm

4711E EXPOL UNDERFLOOR INSULATION

1 GENERAL

This section relates to **Expol** expanded polystyrene (EPS) panels fitted as underfloor thermal insulation to:

- timber framed floors

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC H1/AS1	Energy efficiency
AS/NZS 3000	Electrical installations
AS 1366.3	Rigid cellular plastic sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 4218	Thermal Insulation - Housing and small buildings
NZS 4243.1	Energy efficiency - Large buildings - Building thermal envelope
AS/NZS 4859.1	Materials for the thermal insulation of buildings - General criteria and technical provisions

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Expol UnderFloor Insulation brochure
 Expol Technical Product Guide
[BRANZ Appraisal 256](#) - EXPOL UnderFloor Insulation

Copies of the above literature are available from:

Web: www.expol.co.nz
 Email: sales@expol.co.nz
 Telephone: 09 634 3449 / 0800 863373
 Facsimile: 09 634 0756

Requirements

1.3 QUALIFICATIONS

Work to be carried out by trades people experienced, competent and familiar with the materials and techniques specified.

Performance

1.4 EXPOL INSULATION

Expol will contribute to meeting the requirements of [NZBC H1/AS1](#): Energy efficiency, 2.0 Building thermal envelope. Install to [NZS 4218](#) for small building envelope, to [NZS 4243.1](#) for large buildings and to the Expol technical requirements.

1.5 DURABILITY

Expol EPS insulation to comply with [NZBC B2/AS1](#) Table 1, Durability requirements of nominated building elements.

50 years For Expol UnderFloor thermal insulation panels

Refer to the Manufacturer's literature for additional requirements.

2 PRODUCTS

Materials

2.1 EXPOL UNDERFLOOR INSULATION - TIMBER FLOOR R1.4

Expol UnderFloor, flame retardant polystyrene panels (EPS) to AS 1366.3, and to [NZS 4859.1](#). Panels are 60mm thick.

Components

2.2 WIRE GUARD - TIMBER FLOORS

Expol Wire Guard, a paper strip used to separate exposed electrical cables from Expol UnderFloor insulation.

2.3 FIXINGS - TIMBER FLOORS

Expol non corrosive nylon fixings with a stainless steel nail to secure panels.

3 EXECUTION

Conditions

3.1 DELIVERY

Keep materials dry in transit. Take delivery of materials in an undamaged in condition. Reject all damaged materials.

3.2 STORAGE

Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and damage to edges of sheet materials. Do not use damaged sheets.

3.3 HANDLING

Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.4 PROTECT

Do not subject the polystyrene to prolonged saturation or exposure to sunlight. Do not allow the polystyrene come into contact with solvents.

Installation

3.5 SECURE PANELS NEW FLOORS

Nail two fixings at opposite corners per panel, flush with the top of the joist to ensure the panel sits just below the underside of the floor.

3.6 FIT PANELS

Friction fit Expol UnderFloor panels between floor joists, with one face touching the underside of the floor. Select the correct panel width for the correct joist space. Ensure width of panel is oversize to create a snug fit. Trim edges of panel when oversize by cutting one or more of the concertina edges. Ensure separation from electric cabling. Install to Expol Technical literature and to [BRANZ Appraisal 256](#) - Expol UnderFloor Insulation.

3.7 ELECTRICAL CABLES

Separate all electrical cables from Expol UnderFloor insulation using Expol Wire Guard, applied to the joist area to separate the cables from polystyrene. Take extreme caution when working around electrical cables.

CAUTION: Electrical cables and equipment partially or completely surrounded with bulk thermal insulation may overheat and fail. For cables installed prior to 1989 ensure all insulation is fitted leaving the cables exposed. When fitting around recessed downlights / uprights or other electrical appliances, leave a 150mm clearance around the appliance and comply with [AS/NZS 3000](#).

3.8 PIPES AND PLUMBING

Cut the panel and notch around difficult areas to accommodate obstacles. A polyurethane foam material may be used to seal off more difficult areas. Ensure all air gaps are sealed around the outside perimeter to retain maximum insulation.

Completion

3.9 CLEANING

Remove debris, unused materials and elements from the site. Clean soiled or marked work. Replace damaged, cracked or marked elements. Leave the whole of this work to the standard required by following the execution procedures.

3.10 PROTECT

Protect new work from damage.

4 SELECTIONS

4.1 EXPOL UNDERFLOOR INSULATION - TIMBER FLOORS

Location:	Refer to sections & Midfloor Plan
Brand:	Expol UnderFloor
Layers:	2
Size:	TBC
kPa:	70
R value:	R2.8

5113G GIB® PLASTERBOARD LININGS

1 GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:

- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems
- GIBFix® Framing systems

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

AWCINZ Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2-AS6	Protection from fire
NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600	Cold-formed steel structures
ISO 5660.1	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 1: Heat release rate (cone calorimeter method)
ISO 5660.2	Reaction-to-fire tests - Heat release, smoke production and mass loss rate - Part 2: Smoke production rate (dynamic measurement)
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH	Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- GIB® Site Guide (Dec 2014)
- GIB® Noise Control Systems (March 2006)
- GIB® Fire Rated Systems (Oct 2012)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB Superline® (June 2013)
- GIB® Ezybrace® Systems (2016)
- GIB Ezybrace® Bracing Software (2016)
- GIB Ezybrace® Systems (June 2011), with amendments (Dec 2014)
- GIB Ezybrace® for Steel Frame Housing (NASH) Software (2011)
- GIBFix® Framing System (2016)
- GIB® Rondo® Metal Ceiling Batten Systems
- GIB-Cove®
- GIB® Goldline™ Platinum Tape-on Trims (Jan 2006)
- GIB® UltraFlex® high impact corner mould (Sept 2004)
- GIB® Tough Systems (Nov 2014)

[BRANZ Appraisal 294](#) (2011) - GIB Ezybrace® Systems

[BRANZ Appraisal 427](#) (2007) - GIB Aqualine® Wet Area Systems

[BRANZ Appraisal 928](#) (2016) - GIB Ezybrace® Systems 2016

GreenTag Certification [WWLCG001-001-A-2015](#) - GreenTag™ GreenRate/Level B for:

- GIB® Standard (10mm & 13mm)
- GIB Fyreline®(10mm, 13mm, 16mm &19mm)
- GIB Braceline® (10mm & 13mm)
- GIB® Noiseline® (10mm & 13mm)
- GIB Toughline® (13mm)
- GIB Wideline® (10mm & 13mm)

Copies of the above literature are available at

Company: Winstone Wallboards

Web: www.gib.co.nz

Telephone: 0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS

GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:

- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.6 INSPECTIONS AND ACCEPTANCE

Allow for inspection of the finished plasterboard surface:

- before applying sealer and
- before applying finish coatings or decorative papers,

so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

1.7 BRACING REQUIREMENTS

Braced wall systems to [NZS 3604](#) when tested to BRANZ Technical Paper P21, using:

- GIB Ezybrace® Systems (2016) and/or GIB Ezybrace® Bracing Software (2016)
- GIB Ezybrace® Systems (2011)
- GIB Ezybrace® for Steel Frame Housing (NASH) Software 2011 (to NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria)

Refer to drawings for location and type.

2 PRODUCTS

Materials

2.1 GIB® PLASTERBOARD

Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to [AS/NZS 2588](#). Refer to SELECTIONS for location, type, thickness and finish.

GIB® Standard plasterboard

GIB Wideline® plasterboard

GIB Ultraline® high quality surface plasterboard

GIB Fyreline® fire resistant plasterboard

GIB Braceline® & GIB® Noiseline® dual purpose wall bracing & noise control plasterboard

GIB Aqualine® wet area plasterboard

GIB Toughline®

GIB Superline®

Components

2.2 SCREWS

GIB® Grabber® drywall type screws as follows:

Grabber® type	Used for fixing:
High Thread	GIB Ezybrace® or Standard systems to timber
Self Tapping	Standard systems to light gauge steel or timber
Dual Thread Screws	GIBFix®, GIB Ezybrace®, or Standard systems, to light gauge steel or timber
Wafer Head Needle Tip	Light gauge metal to timber not directly under plasterboard
Pancake Head Drill Tip	Light gauge metal to light gauge metal directly under plasterboard

Refer to GIB® requirements for appropriate details.

2.3 NAILS

GIB® Nails (gold passivated).

Size: 30mm, 40mm

2.4 TAPE ON TRIMS AND EDGES

GIB® Goldline™ tape-on trims

GIB® UltraFlex® high impact corner mould

GIB® Levelline® Tape on Trim

2.5 METAL ANGLE TRIMS

GIB® galvanized steel slim angle trims.

2.6 CONTROL JOINTS

GIB® Rondo® P35 control joints.

GIB® Goldline™ tape-on trims

GIB® plastic smooth control joints.

GIB® plastic W-profile control joints.

Accessories

2.7 ADHESIVE

Timber frame and/or steel frame:

GIBFix® One ultra low VOC water based wallboard adhesive

GIBFix® All-Bond solvent based wallboard adhesive

2.8 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®, GIB Trade Finish® Multi
Cove:	GIB-Cove® Bond

2.9 JOINTING TAPE
GIB® paper jointing tape.

2.10 GAP FILLER
GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3 EXECUTION

Conditions

3.1 STORAGE

Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (Dec 2014).

3.2 LEVELS OF PLASTERBOARD FINISH

Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in [AS/NZS 2589](#).

3.3 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE

Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to [AS/NZS 2589](#).

3.4 SUBSTRATE

Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (Dec 2014).

3.5 TIMBER FRAME MOISTURE CONTENT

Maximum allowable moisture content to [AS/NZS 2589](#) for timber framing at lining: 18% or less for plasterboard linings. Refer to [NZBC E2/AS1](#) and GIB® Site Guide (Dec 2014).

3.6 PROTECTION

Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide (Dec 2014).

Application

3.7 LINING WALLS AND CEILINGS GENERALLY

Form to GIB® Site Guide (Dec 2014). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.8 BOARD ORIENTATION

Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.9 FORM WET AREA SYSTEMS

Form to GIB Aqualine® Wet Area Systems requirements.

3.10 FORM BRACING SYSTEMS

Form bracing systems to:

- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (2011)

3.11 FORM CONTROL JOINTS

Form control joints to GIB® Site Guide (Dec 2014) requirements.

3.12 INSTALL TAPE-ON TRIMS

Install to GIB® Goldline™ Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.13 FINISHING GENERALLY

To GIB® Site Guide (Dec 2014) and [AS/NZS 2589](#).

Completion

3.14 REPLACE

Replace damaged sheets or elements.

3.15 CLEAN DOWN

Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean.

3.16 REMOVE

Remove debris, unused materials and elements from the site.

3.17 LEAVE

Leave work to the standard required by following procedures.

4 SELECTIONS

Plasterboard

4.1 GIB® STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All interior walls excluding bracing & wet areas	GIB® Standard plasterboard	10mm	Level 4

4.2 GIB® WATER RESISTANT SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Bathroom, Ensuits, Laundry	GIB Aqualine® plasterboard	10mm	Level 4

4.3 GIB® STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
All celings excluding wet areas	GIB® Standard plasterboard	13mm	Level 4

4.4 GIB® WATER RESISTANT SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
Bathroom, Ensuits & Laundry	GIB Aqualine® plasterboard	13mm	Level 4

4.5 GIB® BRACING SYSTEMS

Refer to:

- GIB Ezybrace® Systems (2016)
- GIB Ezybrace® Systems (2011)

For bracing element location refer to drawn documentation.

Accessories

- 4.6 GIB® TAPE ON EDGE OR CORNER TRIMS
Brand/type: Selected by contractor
- 4.7 GIB® EDGE PROFILES
Brand/type: TBC with client if required

5120 LININGS

1 GENERAL

This section relates to the supply and installation of internal wall and ceiling linings, and all associated accessories and trim except for plasterboard.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS/NZS 1859.2	Reconstituted wood-based panels - Specifications - Dry processed fibreboard
AS/NZS 1859.4	Reconstituted wood-based panels - Specifications - Wet-processed fibreboard
AS/NZS 1860.1	Particleboard flooring - Specifications
AS/NZS 2269.0	Plywood - Structural - Specification
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
AS/NZS 2908.2	Cellulose-cement products - Flat sheets
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings
NZS 3610	Profiles of mouldings and joinery
New Zealand Fibrous Plaster Association:	Code of recommended practice for the application and fixing of fibrous plaster
BRANZ BU 519	Fasteners selection

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Manufacturer/supplier contact details

Company: PBS Distributors
 Email: www.pbs.co.nz
 Telephone: 0800 2255 727

Requirements

2 PRODUCTS

Sundry linings and finishings

2.1 FIBRE CEMENT SHEET

Cellulose cement autoclaved sheets to [AS/NZS 2908.2](#).

2.2 PRE-FINISHED FIBRE CEMENT SHEET

Cellulose cement autoclaved sheets to [AS/NZS 2908.2](#), with factory applied water resistant coating.

2.3 NAILS

Zinc-plated steel, stainless steel and galvanized steel of pattern to suit location and to BRANZ BU 519 Fasteners selection.

2.4 SCREWS FOR POWER SCREW GUN DRIVING

Timber framing: 3.5mm x 30mm with self embedding head
 Steel framing: 3.5mm x 30mm with self embedding head

2.5 TIMBER INTERIOR FINISHING TRIM

Selection to [NZS 3602](#). Profile as detailed, or if not shown, to [NZS 3610](#).

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material.

3.2 SUBSTRATE

To [NZS 3604](#), 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. Starting work implies acceptance the substrate will allow work of the required standard.

3.3 MOISTURE CONTENT

Maximum allowable moisture content in accordance with [NZS 3602](#) for:

Framing at lining: 20% for timber-based linings

Framing at lining: 16% for fibrous plaster linings

3.4 PROTECT

Protect surfaces, cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage.

3.5 TIMING OF WORK

Ensure building is weatherproof before lining work commences.

3.6 CONFIRM LEVELS OF FINISH

Before commencing work, confirm the surface finish assessment procedures necessary to ensure the specified levels of finish will be obtained.

Sundry items

3.7 PROPRIETARY ACCESS HATCH

Install and fix to the hatch manufacturer's requirements.

3.8 CEILING ACCESS

Trim out ceiling to form 600mm x 500mm square clear opening. Fit finished 40mm x 12mm timber facings to perimeter, set to support a lift-out panel of the ceiling material.

3.9 TRIM

Scribe and fit reveal linings to exterior timber joinery, architraves to interior joinery, skirtings to walls and timber bead cornices as detailed and shown.

3.10 CLEAN

Clean adjoining surfaces and fittings of spots, marks, dust and droppings.

4 SELECTIONS

Sundry linings and finishings

4.1 FIBRE CEMENT SHEET

Brand/type: Eterpan Refined

Thickness: 9mm

5431KF KOPINE PARTICLEBOARD FLOORS

1 GENERAL

This section relates to the supply and fixing of **Kopine®** high density particleboard as flooring. It includes:

- **Kopine®** UltraLock 12
- **Kopine®** Tongue & Groove 12
- **Kopine®** is a registered trademark of the **New Zealand Panels Group Limited**

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[AS/NZS 1860.1](#) Particleboard flooring - Specifications
[NZS 3604](#) Timber-framed buildings

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Kopine® - 'Performance Under Pressure'
Product Warranty
Material Safety Data Sheet
Technical Data Sheet
Installation Guide & Technical Specification

CodeMark AQ-220917-CMNZ - Kopine Flooring Systems - Ultralock 12 - Tongue & Groove 12

Manufacturer/supplier contact details

Company: Kopine - a business unit of New Zealand Panels Group
Web: www.kopine.co.nz
Email: sales@kopine.co.nz
Telephone: 0800 866 678

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

50 years **Kopine®** Ultralock and Tongue & Groove flooring

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of Practical Completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Compliance information

1.4 INFORMATION REQUIRED FOR CODE COMPLIANCE

Where the floor forms part of a structural bracing system, install in accordance with [NZS 3604](#), 7.3 Structural Floor Diaphragms and provide the following compliance documentation:

- Installer's approval certificate from the manufacturer / importer / distributor
- Manufacturer / importer / distributor product warranty
- Installer / applicator workmanship warranty
- Producer Statement - (PS3) Construction from the applicator / installer
- Producer Statement - (PS4) Construction Review from a suitably qualified person
- Other information required by the BCA in the Building Consent Approval documents.

2 PRODUCTS

- 2.1 **KOPINE® ULTRALOCK 12 HIGH DENSITY PARTICLEBOARD FLOORING**
Manufactured from sustainably grown NZ plantation pine to AS/NZS 1860.1, the fully glued joints on long edges of adjacent panels significantly reduce any potential for edge peaking. In most cases nogs/dwangs are not required. 20mm thick panels are 2400mm x 1200mm or 3600mm x 1200mm
- 2.2 **SCREWS**
Sure-fast type countersunk 50mm x 8 gauge, minimum length 50mm, minimum Class 3 or stainless steel
- 2.3 **ADHESIVE**
Gorilla Grip Express - single-component polyurethane based construction adhesive or elastomeric construction adhesive.
Always Supplied with Kopine® flooring order, and must be used to meet CodeMark requirements.

3 EXECUTION

Conditions

- 3.1 **DELIVERY, STORAGE AND HANDLING**
Take delivery of packets of particle board, all from the same batch for clear finish floors and store flat stacked on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle particle board in accordance with Kopine® requirements. Reject and replace goods that are damaged or will not provide the required finish.
- 3.2 **WORK GENERALLY**
To be carried out to CodeMark AQ-220917-CMNZ and the relevant Kopine® Installation Guide & Technical Specification.
- 3.3 **LAYING PATTERN**
Ensure subfloor framing suits the required laying pattern.
- 3.4 **SUBSTRATE**
Do not commence work until the substrate is plumb and level, in true alignment and to Kopine® requirements.
- 3.5 **SUPPORT EDGES AND JOINTS**
Fully support edges and joints on square edges of sheets. T&G edged sheet joints are not fully supported unless shown otherwise.
- 3.6 **EXPOSURE TO WEATHER**
Kopine® flooring must not be exposed to weather for more than 12 weeks.

Application

- 3.7 **ADHESIVE FASTENING**
Use adhesive fastening to joists in conjunction with mechanical fixing, using the adhesive supplied by Kopine®. Apply adhesive to all floor joists, square edge butt joints and grooved edge butt joints, in accordance with the adhesive manufacturer's requirements.
- 3.8 **SCREW FIXING**
Fix screws at 150mm centres along short side of the sheets and around the perimeter of the entire floor, and at 200mm centres along intermediate joists. Fixings must be a minimum of 10mm from the UltraLock 12 panel edge. With tongue and groove flooring, fix screws 15mm from the edge to avoid tongue damage. Pre-drill sheets for screw fixing. Overdriven screws must be removed and set in a new position.
- 3.9 **EXPANSION JOINTS - LARGER FLOORS**
Lay particleboard flooring to allow for a 20mm expansion gap at maximum 10m centres for large floor areas to Kopine® requirements. Locate under internal walls where possible.

Installation

3.10 LAYING FLOORING - ULTRALOCK 12 GROOVED EDGE

Install particleboard flooring to Kopine® requirements. Programme work for minimal exposure to weather.

- Lay sheets across the joists in a staggered pattern from the centre of large areas, with continuous edge support at building perimeter. Sheets to span at least 3 joists. Lay sheet brand name down.
- Leave 10mm expansion clearance where partitions or walls interrupt and an 8mm minimum clearance between panel edges and fixed objects including columns and bottom plates. Fix sheets using construction adhesive in conjunction with mechanical fixing.
- Apply adhesive in a continuous 5mm bead to all floor joists and nogs.
- Apply a generous glue bead to short edge of sheet. Repeat application for the groove on the long edge of the sheet.
- Fix sheets with nails or screws to Kopine® requirements. Clean off excess adhesive.
- Finish all fixings flush with surface at time of fixing. Tighten fixings; punch nails and tighten screws just prior to sanding. Close butt edges of sheets. Do not cramp sheets.

Do not allow water to pond on the floor surface. Clean surface of flooring daily to remove sawdust and shavings, when exposed to the weather.

3.11 FINISHING

Refer to Kopine® requirements regarding timing of nail punching and general sanding procedures. Lightly sand for floor coverings and 3-cut sand for clear finish. Hand sand into corners.

Completion

3.12 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.13 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

4 SELECTIONS

For further details on selections go to www.kopine.co.nz. Substitutions are not permitted to the following Kopine® materials and/or associated components, unless stated otherwise.

4.1 PARTICLEBOARD FLOORING - KOPINE® ULTRALOCK 12

Manufacturer/supplier: New Zealand Panel Group
 Brand/grade: Kopine® Ultralock 12
 Thickness: 20mm
 Edge detail: Square edge with groove
 Fixing type/finish: screw and adhesive / Class 3 or better
 Floor finish: Overlaid

4.2 CONSTRUCTION METHOD

Method: Platform method

Components

4.3 ADHESIVE, MULTIPURPOSE

Brand/type: Holdfast Gorilla Grip Express, polyurethane construction adhesive (supplied with Kopine® flooring order)

4.4 SCREWS

Type/size/material: 10g x 50mm stainless steel

Note: screw fixing is unacceptable for diaphragm floors to [NZS 3604](#).

6211 WALL TILING

1 GENERAL

This section relates to the supply and installation of ceramic wall tiles.
It includes:

- cement render walls
- concrete masonry walls
- timber substrate walls

1.1 RELATED WORK

Refer to 6221 FLOOR TILING for floor tiling.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BRANZ	Good practice guide - Tiling

Requirements

1.3 QUALIFICATIONS

Tilers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.5 ADHESIVES COMPATIBILITY

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

2 PRODUCTS

Materials

2.1 WALL TILES

Refer to SELECTIONS for product selection.

Accessories

2.2 SHEET WATERPROOFING MEMBRANE

Proprietary sheet waterproofing system.

2.3 SAND AND CEMENT GROUT

1 part Portland cement to 2-3 parts fine sand mixed to a paste consistency with a minimum of clean water.

2.4 GROUT

Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.

2.5 TILE ADHESIVE

To AS ISO 13007.1.

2.6 MOVEMENT JOINT SEALANT

To BRANZ Good practice guide: Tiling, section 5.0.

- Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
- Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.

Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

3 EXECUTION**3.1 DELIVERY, STORAGE AND HANDLING**

Take delivery of materials and goods and store on site and protect from damage.
Protect finished surfaces, edges and corners from damage.
Move/handle goods in accordance with manufacturer's requirements.
Reject and replace goods that are damaged or will not provide the required finish.

3.2 CHECK TILES

Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.

3.3 CONFIRM LAYOUT

Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.

3.4 SETTING OUT

Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.

Conditions**3.5 SERVICES AND ACCESSORIES**

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.6 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.7 LIGHTING

Light the tile work as closely and clearly as possible to that of the finished lighting, to ensure that differences in plane surface are highlighted during installation.

Application - preparing new surfaces**3.8 NEW SHEET LININGS**

Remove contaminants that may affect bonding or adhesion. Surface to finish clean and dry with a texture to give a complete key to the tile manufacturer's requirements and with a maximum variation in the background plane of 4mm in 2 metres.

Application - waterproof membranes**3.9 INSTALL WATERPROOFING MEMBRANE**

Install waterproofing membrane between the tile adhesive and the substrate. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide - Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install waterproof membranes as follows:

-

Unenclosed shower cubicle

- To 1800mm above floor and 300mm above shower rose.
- To at least 1500mm from shower rose.
- To the floor within 1500mm of the shower rose.

Bath with a shower over and no shower screen

- To 1500mm from the shower rose and top edge.
- To 1800mm above base of bath.
- To the floor within 1500mm of the shower rose.

Bath with shower over and a screen for the shower

- To 1800mm height around sides of bath.

Bath

- To 150mm minimum around the sides and along walls horizontally 150mm minimum.

Splashback to a vanity

- To 300mm minimum up wall behind the vanity.
- To the floor level at least twice the width of the vanity and 500mm min beyond it at each end.

3.10 SHEET WATERPROOFING MEMBRANE

Install to manufacturers requirements and to BRANZ Good practice guide - Tiling, 7.0 Waterproofing interior wet areas.

Application - tile installation

3.11 TILE FIXING GENERALLY

To AS 3958.1. Apply adhesive, prepare and fix tiles by the method required by the adhesive manufacturer and tap them firmly into place.

3.12 FITTING TILES

Ensure cut edges are smooth and installed without jagged or flaked edges. Do not install single tiles in more than one piece. Maintain the heights of wall tile work in full courses to the nearest dimension. Within allowed tolerances, ensure corners of tiles are flush and level with corners of adjacent tiles. Keep joint lines, including mitres, straight and of an even width. Fully bed trim units, moulded or shaped pieces and other accessories with an appropriate bedding material. Fix accessories level, plumb and true to the designated projection at detailed locations and heights.

3.13 MOVEMENT JOINTS

Provide movement joints with a minimum width of 4mm, carried through tile and bedding and where substantial movement is anticipated, through the rigid sheet to the structure. Install joints over expansion joints, at junctions between different backgrounds, abutting other materials, at storey heights horizontally and 3 to 4 metres vertically, at internal corners and at junctions with floors and columns. Ensure joints are clean, formed, filled and with sealant inserted to the sealant manufacturer's requirements.

3.14 TILE FINISH AND JOINTS

Ensure finished surfaces are flat and true to a tolerance of ± 4 mm in 2 metres from the required plane. Clean surplus bedding material from joint spaces and tile surface. Ensure joint widths are consistent throughout the installation with 1.5mm width for dust-pressed tiles and 6mm for extruded tiles, measured at the tile face. Ensure joint alignment is consistent throughout the installation and to a tolerance of ± 4 mm in 2 metres from the detailed joint alignment.

3.15 THIN BED FIXING

Apply adhesive to a maximum 3mm bed thickness with a minimum of voids.

Notched trowel method

- For internal dry applications, spread adhesive to a uniform thickness and "rib" it with a notched trowel to the adhesive manufacturer's requirements. Press tiles and beat into place to obtain adequate coverage by adhesive on the back of each tile.

Floating method

- Apply adhesive to a uniform thickness. Apply tiles with a twisting or sliding action and tap back firmly into the floated bedding.

Buttering

- With a trowel butter adhesive evenly over the whole of the back of the tile, slightly thicker than the final required adhesive thickness. Press and tap firmly into position leaving no voids. Do not use "spot-fixing".

Occasionally remove a tile as fixing proceeds to check the maintenance of adequate contact with the adhesive.

3.16 THICK BED FIXING

Apply thick-bed cement based adhesive to an average 6mm bed thickness as a floated bed and to the tile manufacturer's requirements. Prepare and fix tiles by the method required by the tile manufacturer and beat and tap them firmly into place.

Grouting

3.17 APPLY GROUTING

Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to the depth of the cushion and flush with surface to cushion edge and square edge tiles. Remove surplus grout with a damp cloth and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

3.18 APPLY PROPRIETARY GROUTING

Remove spacers. Prepare joints, mix and apply grout and finish off to the tile manufacturer's requirements, uniform in colour, smooth and without voids, pinholes or low spots.

Cleaning

3.19 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.20 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.21 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 CERAMIC WALL TILES

Location: Bathroom and Ensuites
Manufacturer: TBC with client

Components

4.2 WALL TILE WATERPROOF MEMBRANE

Location: As per plans
Manufacturer: Ardex WPM 001

6221 FLOOR TILING

1 GENERAL

This section relates to the supply and installation of ceramic floor tiles. It includes:

- concrete substrates
- timber substrate floors
- timber floor overlays

1.1 RELATED WORK

Refer to 6211 WALL TILING for wall tiling.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D1/AS1	Access routes
NZBC E3/AS1	Internal moisture
AS 3740	Waterproofing of wet areas within residential buildings
AS 3958.1	Ceramic tiles - Guide to the installation of ceramic tiles
AS 4586	Slip resistance classification of new pedestrian surface materials
NZS 4121	Design for access and mobility - Buildings and associated facilities
AS ISO 13007.1	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for adhesives
AS ISO 13007.3	Ceramic tiles - Grouts and adhesives: Terms, definitions and specifications for grouts
BRANZ	Good practice guide: Tiling

Requirements

1.3 QUALIFICATIONS

Tilers to be experienced, competent trades people familiar with the materials and techniques specified.

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.5 DEFLECTION CRITERIA FOR SUSPENDED FLOORS

Check that the floor is rigid enough for the tiling. Deflection of suspended floors should not exceed 1/360th of the span under dead load and live load.

1.6 ADHESIVES COMPATIBILITY

Adhesives selected for use on proprietary substrates or waterproof membranes to have documented compatibility approval from the respective manufacturers.

1.7 PROVIDE SPARE TILES

Provide spare tiles. Refer to SELECTIONS for type and quantity.

Performance

1.8 SLIP RESISTANCE – SURFACES EXEMPT FROM TESTING

Slip resistance for walking surfaces comply with NZBC D1/AS1, Table 2.

2 PRODUCTS

Materials

2.1 FLOOR TILES

Refer to SELECTIONS for product selection.

2.2 REINFORCING MESH

Galvanized 500mm x 500mm x 2.5mm steel mesh for screeds and bedding as necessary.

2.3 SEPARATING LAYER

Single layer heavy gauge polyethylene film.

2.4 BUILDING UNDERLAY

Breather type bitumen saturated kraft paper.

- 2.5 FIBRE CEMENT FLOOR OVERLAY
6mm or 9mm thick sheet of Portland cement, sand, fine cellulose fibre and water, with a smooth finish.

Components

- 2.6 EXPANSION JOINT, METAL AND RUBBER
Clear anodised aluminium/brass with metal anchor to set into in-situ concrete, cement screed/bed and complete with rubber infill.
- 2.7 EXPANSION JOINT, METAL AND COMPOUND
Aluminium/brass angles with high density foam rubber insert and jointing compound.
- 2.8 EXPANSION JOINT, PLASTIC
Rigid stabilised PVC sides with flexible central section.

Accessories

- 2.9 SCREED
Mix of 3:1 Portland cement, coarse washed sand gauged with liquid polymer additive to the tile manufacturer's stated requirements.
- 2.10 CEMENT MORTAR
Sand and cement bedding coat with liquid polymer additive, to the tile manufacturer's stated requirements.
- 2.11 SHEET WATERPROOFING MEMBRANE
Proprietary sheet waterproofing system.
- 2.12 TILE ADHESIVE
To AS ISO 13007.1.
- 2.13 SAND AND CEMENT GROUT
1 part Portland cement to 2-3 parts fine, washed sand, mixed to a paste consistency with a minimum of clean, potable water.
- 2.14 PROPRIETARY GROUT
Cement based, compressible and to suit particular location/use. To AS ISO 13007.3.
- 2.15 MOVEMENT JOINT SEALANT
To BRANZ Good practice guide: Tiling, section 5.0.
 - Neutral cured sealant for areas where waterproof membranes are used or where used against aluminium.
 - Acid cured sealant except for areas where waterproof membranes are used or where used against aluminium.
Note: Check compatibility of membrane and sealant, use bond breaking tape to separate them if required.

3 EXECUTION

- 3.1 DELIVERY, STORAGE AND HANDLING
Take delivery of materials and goods and store on site and protect from damage. Protect finished surfaces, edges and corners from damage. Move/handle goods in accordance with manufacturer's requirements. Reject and replace goods that are damaged or will not provide the required finish
- 3.2 CHECK TILES
Check tiles to ensure that they are as specified, from the same batch, of a consistent colour and pattern and sufficient to complete the work. Reject tiles that vary widely in colour or pattern. Reject tiles that are damaged.
- 3.3 CONFIRM LAYOUT
Before commencing work confirm the proposed layout of tiles and expansion joints and other visual considerations of the finished work.
- 3.4 SETTING OUT
Before commencing the setting out confirm the number and location of cut tiles. Minimise in number with no cut tiles less than half size and only at the perimeter of the work.
- 3.5 GENERALLY
Prepare surface and complete tiling work in accordance with AS 3958.1, as modified by BRANZ Good practice guide: Tiling.

Conditions

3.6 SERVICES AND ACCESSORIES

Ensure that all services and accessories are in place and located to suit the tile layout, and that the substrate, background and adjoining surfaces (with the preparation called for in this section) are of the quality necessary to allow tiling of the required standard.

3.7 DO NOT START

Do not start laying tiles until concrete floors are cured, moisture content of floors is such that shrinkage is complete, thermal movement has been accommodated and the levels and surface finish will achieve tile laying of the required standard.

3.8 SUBSTRATE TEMPERATURE

Do not carry out tiling where the substrate temperature is below 5°C or above 40°C.

3.9 MOISTURE CONTENT

Ensure the floor is dry and if in doubt check for moisture content by hygrometer. Do not proceed with tiling work until readings for the whole area show 75% relative humidity or less.

3.10 SCREEDS

Form screeds with a deviation from plane of not more than 5mm over 3 metres.

3.11 FALLS

Form screeds in areas where water is used in significant amounts with a deviation from plane of not more than 5mm over 3 metres. Unless otherwise specified form screeds with the following falls: Unless stated otherwise provide minimum fall gradients to BRANZ Good Practice Guide - Tiling, clause 6.5 Falls in floors.

1 : 40 minimum	For tiled decks which also acts as a roof
1 : 60 minimum	For paving over ground
1 : 50 minimum	For unenclosed shower bases (to NZBC E3/AS1 , 3.3.5)
1 : 60 minimum	For enclosed shower bases
1 : 50 minimum	For shower bases for people with disabilities (to NZS 4121 , 10.5.11.3 (b).)
1 : 60 minimum	For commercial kitchens or similar

Movement joints**3.12 MOVEMENT JOINTS**

Provide movement joints with a minimum width of 4mm, carried through tile and bedding and where substantial movement is anticipated, through the rigid sheet to the structure. Install joints over expansion joints, at junctions between different backgrounds, abutting other materials, at internal corners and at junctions with floors and columns. Ensure joints are clean, formed, filled and with sealant inserted to the sealant manufacturer's requirements.

3.13 METAL EXPANSION JOINT

Accurately locate and fix joints in situ, with the bedding, or on top of the bedding, to finish flush with the installed tile and to the tile manufacturer's requirements. Fit and fix rubber/rubber compound inserts to finish flush. Fit expansion joints at regular intervals over the floor area at intervals not exceeding 4 metres, at changes in floor plane and where the floor plane is interrupted.

Waterproofing

3.14 INSTALL WATERPROOFING MEMBRANE - INTERIOR WET AREAS

Install waterproofing membrane to manufacturers requirements and to BRANZ Good tiling practice, 7.0 Waterproofing interior wet areas. Reinforce all junctions of the waterproofing membrane to BRANZ Good practice guide: Tiling; 7.0 Waterproofing interior wet areas. Unless otherwise specified or shown on the drawings, install waterproof membranes as follows:

Unenclosed shower cubicle

- To 1800mm above floor and 300mm above shower rose.
- To at least 1500mm from shower rose.
- To the floor within 1500mm of the shower rose.

Bath with a shower over and no shower screen

- To 1500mm from the shower rose and top edge.
- To 1800mm above base of bath.
- To the floor within 1500mm of the shower rose.

Bath with shower over and a screen for the shower

- To 1800mm height around sides of bath.

Bath

- To 150mm minimum around the sides and along walls horizontally 150mm minimum.

Splashback to a vanity

- To 300mm minimum up wall behind the vanity.
- To the floor level at least twice the width of the vanity and 500mm min beyond it at each end.

Application - tile installation

3.15 BONDED CEMENT MORTAR

Apply proprietary cement slurry bond coat over the whole of the floor to the tile manufacturer's requirements. Thoroughly mix and place the 40mm thick mortar bed over the bond coat and firmly tamp, screed and compact to the required level. Apply proprietary cement slurry bond coat to the wet mortar bed and set tiles while still tacky, firmly beating into the bedding and aligning the 3mm tile joints at the same time.

3.16 MODIFIED CEMENT BASED ADHESIVE

Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.17 MODIFIED CEMENT BASED ADHESIVE AND WATERPROOF MEMBRANE

Apply appropriate waterproof membrane to manufacturer's requirements. Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.18 PLASTER SCREED AND SEPARATING LAYER

Lay polyethylene sheet/building underlay to a smooth surface, joints lapped 100mm minimum. Place galvanized steel mesh over with spacers to centralise it in the mortar bed. Thoroughly mix and place the proprietary screed mix to the manufacturer's requirements and compact to the required level. Ensure drying times are observed before installation of tiles by thin/thick set method.

Application - interior tile installation on timber floors

3.19 FIBRE CEMENT OVERLAY AND MODIFIED CEMENT BASED ADHESIVE

Align movement joints with overlay joints. Apply and float thick or thin bed of modified cement based adhesive to bed thickness to the adhesive manufacturer's requirements. Rib surface with a notched trowel, press tiles and place with required grout joints and to obtain adequate coverage by adhesive on the back of each tile to AS 3958.1.

3.20 EXPANSION JOINT, COMPOUND

Provide expansion joints; at 4 metre intervals, at the perimeter of floors, at changes of level and around structural features. Carefully clean out the joint, insert the backing rod and fill with compound placed by gun. After the correct interval, finish the surface off flush to the compound manufacturer's requirements.

Grouting

3.21 APPLY GROUTING

Remove spacers. Apply grouting mix to as large an area as can be worked before setting commences. Work with a grouting tool back and forth until joints are completely filled with no adhesive showing. Avoid damage to the surface of tiles, using masking tape where necessary. Finish to depth of cushion and flush with surface to cushion edge and square-edge tiles. Remove surplus grout with a damp sponge and tool the joints to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

3.22 APPLY PROPRIETARY GROUTING

Remove spacers. Prepare joints, mix and apply grout and finish off to the grout manufacturer's requirements, to finish the grout uniform in colour, smooth and without voids, pinholes or low spots.

Cleaning

3.23 CLEAN TILES

Upon completion of setting and grouting, thoroughly sponge and wash the tiles to leave them completely clean and without blemish. Finally polish glazed tiles with a clean dry cloth.

Completion

3.24 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.25 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked tiles. Replace damaged or marked tiles where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures. Ensure tiles are not disturbed by foot traffic for at least 24 hours after laying and after grouting.

3.26 PROTECTION

Provide the following temporary protection of the finished work:
Provide protection to tiles by laying sheet material such as insulating board for the period between completion of laying and completion of the contract works.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 CERAMIC TILES

Location: Bathroom, WC, Laundry & Ensuites
Manufacturer: TBC with client

Components

4.2 SHEET WATERPROOFING MEMBRANE

Location: Wet areas
Brand/type: Ardex

6311 TIMBER STRIP, BLOCK & PLANK FLOORING

1 GENERAL

This section relates to the supply, laying and finishing of timber flooring as an overlay, including underlays over the existing substrate.

It includes:

- laminated timber
- solid timber

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS2-AS7	Protection from fire
NZBC C/VM2	Protection from fire
NZBC D1/AS1	Access routes
AS 4586	Slip resistance classification of new pedestrian surface materials
AS/NZS 1859.4	Reconstituted wood-based panels - Specifications - Wet-processed fibreboard
AS/NZS 2269.0	Plywood - Structural - Specifications
AS/NZS 1860.1	Particleboard flooring - Specifications
BRANZ BU 330	Thin flooring materials - 2 Preparation and laying

1.2 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Manufacturer/supplier contact details

Company: Floorscape

Web: www.floorscape.co.nz

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

20 years: For product

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Floor layers to be experienced, competent trades people, familiar with the materials and the techniques specified.

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

Performance

1.6 SLIP RESISTANCE – SURFACES EXEMPT FROM TESTING

Slip resistance for walking surfaces comply with [NZBC D1/AS1](#), Table 2.

1.7 TESTING MOISTURE CONTENT

Sample and test the substrate to BRANZ BU 330 to ensure that moisture content is within the limits specified. Provide a written record.

2 PRODUCTS

Materials

- 2.1 FOAM UNDERLAY
2mm Thick, closed cell foam underlay to provide a moisture membrane.
- 2.2 TIMBER STRIP, BLOCK AND PLANK FLOORING
Refer to SELECTIONS for product selection.
- 2.3 TIMBER TRIM
Skirting, edge strip, reducer strip and nosing as detailed and to match overlay flooring.

Accessories

- 2.4 FOAM UNDERLAY TAPE
Moisture resistant tape, 48mm wide.
- 2.5 CONCRETE SEALER
Two part water based epoxy coating.
- 2.6 EXPANSION STRIPS
Coloured silicone flexible expansion sealant.
- 2.7 EXPANSION COVERS
Selected expansion covers as supplied.
- 2.8 ADHESIVE, FLOATING
PVA or aliphatic resin, as recommended by the overlay flooring supplier.

Finishes

- 2.9 SEALER
Two coats of penetrating oil sealer to the flooring supplier's requirements.
- 2.10 POLYURETHANE
Resin-based, moisture-curing polyurethane to the flooring supplier's requirements.

3 EXECUTION

Conditions

- 3.1 STORAGE AND HANDLING
Accept packs of timber and accessories undamaged and dry. Store on level, dry surfaces in non-traffic, non-work areas that are enclosed and dry. Avoid damage to timber.
- 3.2 CHECK TIMBER
Check that the timber supplied is as specified, of a consistent colour and grain and sufficient to complete the work. Reject timber that varies widely in colour or grain. Reject timber that is damaged. Check the moisture content of the timber to ensure it is at the required level for the installation environment.

Check laminated strip and plank flooring to ensure it has been supplied at the moisture content recommended by the suppliers for the proposed location. Do not remove planks from packs until just prior to installation.
- 3.3 DO NOT START
Do not start laying before the building is enclosed, doors are hung and lockable, wet work complete, full lighting available and in the case of air-conditioned buildings the air-conditioning operating for 6 weeks.
- 3.4 INSPECT THE SUBSTRATE
Inspect the substrate to ensure it provides a suitable finish. Do not start laying if the substrate will not allow work of the required standard.

3.5 STARTING WORK

Starting work means the floor layer accepts the substrate as allowing work of the required standard.

3.6 CARRY OUT THE WORK

Carry out the work to conform with this specification and in accordance with the timber floor supplier's technical requirements.

3.7 LAYOUT

Before beginning the installation, confirm the proposed layout of the timber, grain direction, any other visual considerations of the finished work and specified expansion requirements relating to the specified product. Minimise in number with no cut planks less than half width and only at the perimeter of the work.

3.8 SURFACE TOLERANCES, FLOATING

Substrate to have no deviations greater than 5mm over a 3 metre straightedge in any given direction and no abrupt variations greater than 2mm over 250mm.

Application - surface preparation - new

3.9 PREPARATION NEW CONCRETE

Clear substrate of debris, then vacuum to remove dust. Refer to allowable surface tolerances.

Check for moisture content by hygrometer to BRANZ BU 330. Do not commence installation until the hygrometer readings show 60-70%. Apply concrete sealer if required before commencing flooring installation.

Application - installation

3.10 LAYING, FLOATING

Install 2mm foam underlay to the total floor area, in long, continuous runs, allowing to cove up walls by 50mm. Tape joints using moisture resistant tape, to create an impervious membrane. Install the timber floor strictly in accordance with the flooring supplier's stated requirements. Ensure the required expansion gap is left at perimeters and around fixed obstacles.

3.11 EXPANSION GAPS, PERIMETERS

Calculate expansion gaps strictly to manufacturer's requirements, to suit the environment, size of the installation and product type.

3.12 EXPANSION STRIPS

Apply coloured silicone flexible expansion sealant supplied by the flooring manufacturer to match the dimensions of the expansion gap flush with the finished flooring. Apply to flooring manufacturer's directions.

3.13 EXPANSION COVERS

Cover expansion joints using matching expansion joint covers supplied by flooring manufacturer.

Finishing

3.14 SURFACE FINISHING, UNFINISHED FLOORS

Allow the adhesive to cure fully and then finish the timber surface with five fine sandings.

3.15 WAX COATING, UNFINISHED FLOORS

Apply two coatings of timber sealer and then a spirit based wax polish to the flooring supplier's requirements.

3.16 POLYURETHANE COATING, UNFINISHED FLOORS

Apply four coats of resin-based, moisture-curing polyurethane to the coating manufacturer's and flooring supplier's requirements. Physically protect the surface from damage or contamination before and after coating.

3.17 CLEAN TIMBER FLOORING

Leave timber flooring surfaces free of adhesive, dirt and debris. Vacuum off, damp mop with a low-foam neutral detergent and allow to dry.

Completion

3.18 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.19 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 TIMBER LAMINATED PLANK FLOORING

Location:	Refer to floor plans
Brand:	Floorscape
Species:	Oak
Pattern:	Matterhorn
Size:	182mm x 19mm
Thickness:	14mm

6511 CARPETING

1 GENERAL

This section relates to the supply and installation of carpet laid conventionally (stretched), direct stuck or double bonded (double direct stuck).

It includes:

- carpet underlay
- woven sheet carpet

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

- | | |
|--------------------------------|---|
| NZBC C/AS2-AS7 | Protection from fire |
| AS/NZS 2455.1 | Textile floor coverings - Installation practice - General |

Warranties

1.2 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

1 year: For materials

- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

1 year: For execution

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS

Carpet layers to be experienced, competent trades people familiar with the materials and the techniques specified, and with [AS/NZS 2455.1](#).

1.5 MOISTURE CONTENT OF CONCRETE SLAB

Concrete slab is to be cured and dried to a relative humidity of not exceeding 75% or until the moisture content does not exceed 5.5%, in accordance with [AS/NZS 2455.1](#), refer to section 6192 FLOORING SUBSTRATE PREPARATION.

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any of the specified systems, components and associated products listed in this section.

1.8 RESERVE MATERIAL

Supply reserve carpet, all suitably packaged for delivery and storage. Refer to SELECTIONS.

2 PRODUCTS

Materials

2.1 UNDERLAY

To [AS/NZS 2455.1](#) Soft underlay and underlays manufacturer's requirements. Refer to SELECTIONS for product selection.

2.2 CARPET

To [AS/NZS 2455.1](#) Textile floor coverings. Refer to SELECTIONS for product selection.

Components

2.3 BINDER BARS

Anodised aluminium section with fluted face.

2.4 DIVIDER STRIPS

Hardwood strips 20mm x 15mm or as specified. Refer to SELECTIONS for type and size.

2.5 EDGE GRIPPER

To [AS/NZS 2270](#).

Timber/plywood with steel grippers to carpet manufacturer's requirements, constructed of sufficient pins and nails so as to withstand a minimum stretching force of 6580N over a 1220 mm length.

Accessories

2.6 TAPE

To carpet manufacturer's requirements.

3 EXECUTION

Conditions

3.1 DELIVERY

Take delivery of materials and goods and store on site and protect from damage. Accept rolls of carpet and accessories undamaged and dry.

3.2 HANDLE AND STORE

Handle carpet on flat dollies using carpet cradles, with probes on fork- lifts and without sharp bending or folding. Store carpet in flat bins with a maximum height of three rows. Keep dry. Protect from damage.

3.3 INSPECTION

Before starting work inspect the substrate to ensure that it will allow work of the required standard, and that all fittings and fixtures around which the carpet is to be scribed are in place.

3.4 PROTECTION

Protect adjoining work surfaces and finishes during the carpet installation.

3.5 TAPE

Tape for binding and seaming using type and width required by the carpet manufacturer to suit the specified carpet and the standard of performance required.

3.6 LAYOUT

Plan the general layout so that:

- seams run lengthways
- traffic runs along the seam
- light from windows is not across the seam
- pile faces away from the light source.

3.7 TEMPERATURE

Acclimatise carpet to a room temperature above 15°C through the whole of the installation.

3.8 FLOOR PREPARATION

Refer to 6192 FLOORING SUBSTRATE PREPARATION. Prepare floor and check conditions required for laying to AS/NZS 2455.1, section 2.

Application - substrate preparation

3.9 PREPARING NEW CONCRETE FLOOR

To be level, smooth, clean, cured and dry. Remove loose material and dust. Refer to 6192 FLOORING SUBSTRATE PREPARATION.

3.10 PREPARING NEW WOOD PRODUCT FLOOR

To be level, sanded smooth and dry with loose material and dust removed. Check for moisture content and do not commence laying until readings for the whole area show a moisture content of:
 8 - 12% for air conditioned buildings
 10 - 14% for intermittently heated buildings
 12 - 16% for unheated buildings
 Refer to 6192 FLOORING SUBSTRATE PREPARATION.

Application - carpet laying

3.11 INSTALLATION, UNDERLAY

Installation to underlay manufacturer's requirements. Lay at right angles to the carpet direction.

3.12 INSTALLATION, CONVENTIONAL SYSTEM

Tape carpet joints, fix grippers to floor and install underlay and carpet to AS/NZS 2455.1, section 3. Stretch carpet tight in both width and length evenly without bowing, square with walls.

3.13 FIXING TRIMS

Fix binder bars, carpet to carpet bars, and trims to all junctions with other materials and to carpet edges, to the carpet manufacturer's requirements. Ensure that junctions with other materials are neatly formed, with bars and trim securely fastened to the substrate, 20mm from each end and at a maximum of 100mm centres.

Completion

3.14 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused and temporary materials and elements from the site.

3.15 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Leave work to the standard required for following procedures.

3.16 SPECIAL PROTECTION

Poli-film PF38

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 UNDERLAY

Location	Brand	Type/thickness/weight
Under carpet, refer to floor plans		10mm

4.2 CARPET

Location	Brand/type/weight/code	Installation method
Refer to plans	TBC with client	Stretch & grip

4.3 BINDER BARS

Brand: As per installer
 Colour: TBC with client

6700 PAINTING GENERAL

1 GENERAL

This section relates to the general matters related to painting work

1.1 RELATED WORK

Refer to 6711 PAINTING EXTERIOR for exterior paint systems.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

1.2 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

APAS	Australian Paint Approval Scheme
MPNZA	Master Painters New Zealand Association Inc.
VOC	Volatile organic compound

Documents

1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC C/AS1-AS7	Protection from fire
AS/NZS 2311	Guide to the painting of buildings
AS/NZS 2312.1	Guide to the protection of structural steel against exterior atmospheric corrosion by the use of protective coatings - Paint Coatings
AS/NZS ISO 9001	Quality management systems - requirements
WorkSafe NZ	Guidelines for the provision of facilities and general safety in the construction industry
WorkSafe NZ	Guidelines for the management of lead-based paint
MPNZA	Specification manual
MPNZA	Health and Safety Programme
	Health and Safety at Work Act 2015

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified manufacturer's system, or associated components and products.

1.5 QUALIFICATIONS

Painters to be a member of MPNZA and experienced competent workers, familiar with the materials and the techniques specified.

1.6 HEALTH AND SAFETY

Refer to the requirements of the [Health and Safety at Work Act 2015](#) and WorkSafe NZ: [Guidelines for the provision of facilities and general safety in the construction industry](#). If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Health and Safety Programme. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put in place procedures for dealing with emergencies.

Refer to WorkSafe NZ: [Guidelines for the management of lead-based paint](#) for the required procedures and precautions when:

- treating/removing lead-based paint
- burning off paint
- sanding off paint
- using solvent based paint removers.

1.7 MATERIAL SAFETY DATA SHEET

Obtain from each paint manufacturer the material safety sheet for each product used. Keep sheets on site and comply with the required safety procedures.

Warranties

1.8 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

Refer to the general section 1237WA WARRANTY AGREEMENT for the required format and details of when completed warranty must be submitted.

Performance

1.9 MANUFACTURER'S INSPECTION

Allow the paint manufacturers to inspect the work in progress and to take samples of their products from site if requested.

1.10 INSPECTION OF WORK

Inspection of the whole of the work at each of the stages scheduled may be made. Agree a programme that will facilitate such inspection, including notification when each part and stage of the work is ready for inspection.

2 PRODUCTS

Materials

2.1 PAINT TYPES

Use the manufacturer's complete system and only the products specified.

2.2 MATERIALS GENERALLY

Use only the Manufacturer's products which are guaranteed for their consistency and performance under [AS/NZS ISO 9001](#) and APAS approval, prepared, mixed and applied as directed in the Manufacturer's specification sheets, specification manuals and product data sheets.

2.3 THINNERS AND ADDITIVES

Only use thinners or additives within the stated limits for the particular situations specified.

Accessories

2.4 FILLERS

For recommendations on; fillers, stopping, paint strippers, cleaning agents, etching solutions, mould inhibitors, rust inhibitors, knotting and other commodities used for the surface preparation, refer to the manufacturer of the specified coating.

3 EXECUTION

Conditions

3.1 EXECUTION

To conform to manufacturer's requirements and those methods, practices and techniques contained in [AS/NZS 2311](#), the MPNZA Specification manual, and WorkSafe NZ: [Guidelines for the provision of facilities and general safety in the construction industry](#).

3.2 PREPARE

Prepare surfaces to the coating manufacturer's requirements.

3.3 COATED SURFACES

Ensure that substrate surfaces are able to achieve the specified finish.

3.4 PRE-PRIMED SURFACES

Sand down any breakdown or damage of the primer to a sound surface and immediately re-prime.

3.5 BRUSH DOWN

Brush down surfaces immediately before application, to remove dust, dirt and loose material.

3.6 COMPATIBILITY

Check that materials are as required by the paint manufacturers for the particular surface and conditions of exposure, and that they are compatible with each other. Use paint from the same manufacturer for each paint system. If not compatible, obtain instructions before proceeding.

3.7 TREATED SURFACES

Where surfaces have been treated with preservatives or fire retardants, check with the treatment manufacturer that coating materials are compatible with the treatment and do not inhibit its performance. If they are not compatible, obtain instructions before proceeding.

3.8 BACK PAINTING

Co-ordinate with cladding and/or lining installer as to who will do the work and timing.

Exterior

For exterior cladding and trim that require on site finishing, paint the back and exposed bottom edges at the base of the cladding (generally, bottom plate overhang and horizontal flashings) to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed.

Refer to appropriate exterior paint sections SELECTION clauses for claddings to be back painted.

Interior

For lining and trim that require on site finishing and/or back painting (usually wet areas), paint the back and exposed bottom edges at the base of the lining, to the manufacturer's requirements, but at least to 150mm up from base. Coating to match front finish, generally apply 2 coats or 1 coat if pre-primed, or if no front finish seal to manufacturer's requirements.

Refer to appropriate interior paint sections SELECTION clauses for linings to be back painted.

3.9 ANCILLARY SURFACES

The coatings listed in schedules and elsewhere are of necessity simplified. Coat ancillary exposed surfaces to match similar or adjacent materials or areas, except where a fair-faced natural finish is required or items are completely prefinished. In cases of doubt obtain instructions before proceeding.

3.10 HARDWARE

Do not paint hinges or hardware that cannot be removed. If items can be removed, carefully remove hardware, fixtures and fittings before commencing work. Set aside where they cannot be damaged or misplaced and replace on completion.

3.11 PROTECTION

Use dropsheets, coverings and masking necessary to protect adjoining fixtures, fittings and spaces from paint drops, spots, spray and damage.

Preparation - gypsum plaster

3.12 PREPARING GYPSUM PLASTER

Fill and sand small crevices and cracks. Surface moisture content not to exceed 12% at time of coating.

Preparation - painted surfaces generally

3.13 SURFACE PREPARATION

Refer to the Manufacturer's specification sheets and product data sheets. Carry out the preparatory work required by them for each of the substrates.

For interior surfaces such as paper faced plasterboard use the Manufacturer's recommended finishing compound as an aid to achieving a Level 5 finish.

3.14 MOULD

Sterilise surface mould by washing or sponging the whole surface with a one part sodium hypochlorite household bleach to three parts clean water solution. Allow bleach to act for 30 minutes and wash off with clean water. Wash cloths and sponges regularly in clean water.

Reapplication may be necessary. Treat with anti-mould solution to the treatment manufacturer's requirements.

3.15 GAP FILLING

Fill cracks, holes, indented and damaged surfaces with putty, plaster filler, wood filler, or plastic wood, as appropriate and in accordance with the paint manufacturer's requirements. Allow to dry or set before sanding back level with the surface. Prime coat or seal the timber before using putty. Wet cement or gypsum base plasters before applying filler. Use only Portland cement base types, or water-insoluble organic-based gap fillers in exterior or wet areas.

Application - before applying final coatings

3.16 OFF-SITE WORK

Carry out off-site preparation and coating under cover, in a suitable environment and with adequate lighting. Store items both before and after coating in a clean, dry area, protected from the weather and mechanical damage, properly stacked and spaced to permit air circulation and to prevent sticking of surfaces.

3.17 PRIMING JOINERY

Before priming preservative treated timber ensure that any cut surfaces have been retreated. Liberally coat end grain, allow to soak in and then recoat. Ensure LOSP treated joinery has dried sufficiently to lose odour.

3.18 CONCEALED JOINERY SURFACES

Apply off-site coatings to all surfaces including those which will be concealed when incorporated into the building.

3.19 CONCEALED METAL SURFACES

Apply primer to suit the coating system to all metal surfaces which will be concealed when incorporated into the building.

3.20 DOORS

Prime or seal and paint all six faces of doors before hanging.

3.21 BEAD GLAZING

Before glazing apply the first two coats, or the primer and one undercoat, to rebates of stained, varnished or painted joinery and beads.

3.22 PUTTY GLAZING

Follow putty manufacturers recommendations for application, drying, and painting. Ensure that the putty is fully protected by the coating system as soon as it is sufficiently hard.

Application - generally

3.23 PAINTING GENERALLY

Comply with the paint manufacturer's requirements and any additional requirements in this specification.

3.24 MIXING

Thoroughly mix paints. Lift any settled pigment and ensure the paint is homogenous.

3.25 ENVIRONMENT

Paint exterior surfaces only in favourable weather conditions:

- warm dry days without frost or heavy dews
- avoid painting in direct sunlight any surfaces that absorb heat excessively
- as far as possible apply paint in the temperature range 15°C to 25°C
- do not paint if temperatures fall outside the range of 10°C and 35°C unless paints with the necessary temperature tolerance have been specified
- do not apply solvent borne paint if moisture is present on the surface

3.26 SEQUENCE OF OPERATIONS

Painting work to generally follow the following sequences:

- back painting and pre-installation painting, then post-installation exposed-face painting
- complete surface preparation before commencing painting
- apply paint in the specified sequence using the specified paint
- allow full drying time between coats to the paint manufacturer's requirements
- do not expose primers, undercoats and intermediate coats beyond manufacturers stated instructions before applying the next coat
- finish broad areas before painting trim
- ensure batch numbers of tins are matched for whole areas
- internally, paint ceilings before walls and walls before joinery, trim and other items

3.27 PAINT APPLICATIONS

Select brush, roller, or pad and apply paint to the requirements of the paint manufacturer and to obtain a smooth even coating of correct thickness, uniform gloss and colour.

3.28 DRYING TIME

Before handling or applying the next coat of paint, give each coat the full drying time as required by the paint manufacturer. Ensure that surfaces are dry and that condensation does not occur before the paint reaches surface-dry condition.

3.29 LIGHTLY SAND

Lightly sand primers, sealers, undercoats and intermediate coats to remove dust pick-up, protruding fibres and coarse particles. Remove dust immediately before applying the next coat.

3.30 DEFECTIVE WORK

Correct defective work immediately and re-coat as required, following precisely the paint system specified.

3.31 EACH COAT

Each coat of paint and the completed paint system to have the following qualities and properties:

- uniform finish, colour, texture, sheen and hiding power
- the specified number of coats applied
- no blemishes such as runs, sags, crinkling, fat edges, entrained paint skins, hairs, dust, bare or starved patches, cracks, brush marks, ladder marks and blistering
- proper covering of corners, crannies, thin edges, cracks, end grain and other difficult places of application

Completion

3.32 CLEAN

Clean adjoining surfaces, glass and fittings of any paint contamination. Clean off glass indicators at completion of the building works. Clean glass inside and out to a shining finish.

3.33 CLEAN EQUIPMENT

Use the Manufacturer's environmental wash system for the cleaning of water-based paint and plasters from brushes, rollers, plastering or spray equipment to separate the solids from the water component for safe disposal.

3.34 LEAVE

Leave the whole of this work uniform in gloss and colour, of correct thickness, free from painting defects, clean and unmarked and to the standard required by following procedures.

3.35 REMOVE

Remove dropsheets, coverings and masking to leave surrounding surfaces and areas clean, tidy and undamaged. Remove debris, unused materials and elements from the site.

3.36 REPLACE HARDWARE

Replace hardware without damage to it or the adjoining surface. Leave properly fitted and in working order.

4 SELECTIONS

4.1 SELECTIONS

Refer to 6711 PAINTING EXTERIOR and 6721 PAINTING INTERIOR for selections.

6711 PAINTING EXTERIOR

1 GENERAL

This section relates to the preparation of exterior unpainted and pre-painted surfaces, and the application of exterior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6721 PAINTING INTERIOR for interior paint systems.

Documents

1.2 MANUFACTURER'S DOCUMENTS

Copies of the above literature are available from the Dulux website
Web: www.dulux.co.nz

Warranties

1.3 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

Paint systems

4.1 CONCRETE / BLOCKWORK / FIBRE CEMENT / CEMENT PLASTER

Brand: Dulux
Coating type: As per manufacturer recommendati~~on~~s based on substrate

6721 PAINTING INTERIOR

1 GENERAL

This section relates to the preparation of interior unpainted and pre-painted surfaces, and the application of interior:

- decorative paint coatings
- protective paint coatings
- sealers
- stains
- clear finishes

Related work

1.1 RELATED SECTIONS

Refer to 6700 PAINTING GENERAL for general painting matters.
Refer to 6711 PAINTING EXTERIOR for exterior paint systems.

Documents

1.2 MANUFACTURER'S DOCUMENTS

Copies of the above literature are available from
Web: www.dulux.co.nz

Warranties

1.3 WARRANTY

Warrant this work under normal environmental and use conditions against failure.
2 years: Warranty period

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

2 PRODUCTS

2.1 PRODUCTS

Refer to 6700 PAINTING GENERAL for product clauses.

3 EXECUTION

3.1 EXECUTION

Refer to 6700 PAINTING GENERAL for execution clauses.

4 SELECTIONS

Paint systems

4.1 PLASTERBOARD

Brand: Dulux
Coating type: Satin

4.2 PLASTERBOARD - WET AREA

Brand: Dulux
Coating type: Satin

7120 HOT & COLD WATER SYSTEM

1 GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

1.1 RELATED WORK

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures and tapware selections.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC C/AS1-AS7	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1	Energy Efficiency
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 3500.5	Plumbing and drainage - Housing installations
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS/NZS 5601.1	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.
Gas (Safety and Measurement) Regulations 2010	
Plumbers, Gasfitters and Drainlayers Act 2006	
NZ Backflow Testing Standard:	NZ Backflow Testing Standard 2011 , Field testing of backflow prevention devices and verification of air gaps

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

Copies of the above literature are available from

Web: www.petercocks.co.nz

Requirements

1.4 QUALIFICATIONS

Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

1.5 INFORMATION FOR OPERATION AND MAINTENANCE

Provide the following general operation and maintenance information as electronic PDF format documents:

Provide this information prior to practical completion.

Warranties

1.6 WARRANTY

Provide warranty for:

2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Performance

1.7 TESTING - TO NZBC G12/AS1

Test to [NZBC G12/AS1](#), 7.5, **Watertightness**, for hot and cold water.

- Test to a pressure of 1500 kpa for period not less than 15 minutes.

Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed. Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

2 PRODUCTS

2.1 PVC-U PIPE

Complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#) Durability, Table 1 and [NZBC G12/AS1](#), Table 1.

2.2 POLYBUTYLENE PIPE

Polybutylene tubing to [AS/NZS 2642.1](#), [AS/NZS 2642.2](#) and [AS/NZS 2642.3](#) complete with fittings and accessories brand-matched with durability to [NZBC B2/AS1](#) Durability, table 1 and [NZBC G12/AS1](#), table 1.

2.3 POLYETHYLENE PIPE

To [AS/NZS 4130](#) Series 1 complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to [NZBC B2/AS1](#), table 1 and [NZBC G12/AS1](#), table 1.

2.4 WATER METER

To the requirements of the network utility operator.

2.5 VALVES

Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to [NZBC G12/AS1](#).

2.6 BACKFLOW PREVENTION DEVICES

Provide backflow prevention devices to [AS/NZS 2845.1](#) where it is possible for water or contaminants to backflow into the potable water supply. Refer to [NZBC G12/AS1](#) 3.4 Backflow protection, and [NZBC G12/AS1](#), table 2, Selection of Backflow Protection.

2.7 TEMPERING VALVE

Tempering valve to [NZS 4617](#) to [NZBC G12/AS1](#).

Materials - Hot water heating appliances

2.8 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

To [NZS 4305](#), ceramic-coated steel thermal storage cylinder, insulated and complete with required fittings.

Components

2.9 PROTECTIVE TAPE

Plasticised PVC tape system with primer, mastic fixing and outer coating.

3 EXECUTION**3.1 EXECUTION GENERALLY**

Generally carry out the whole of this work and tests to [NZBC G12/VM1](#) or [NZBC G12/AS1](#).

3.2 HANDLE AND STORE

Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES

Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Flow rates to each outlet to be no less than those given in [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in [NZBC G12/AS1](#), table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE

Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing**3.10 JOINTING PVC-U PIPE**

Solvent welded joints using spigots and sockets, flanged joints and seal ring compression joints to [NZBC G12/AS1](#).

3.11 JOINTING POLYBUTYLENE PIPE

Aluminium clamped, seal ring compression or push fit "O" ring seal jointing to pipe system manufacturer's requirements.

3.12 JOINTING POLYETHYLENE PIPE

Seal ring compression joints and electrofusion to [NZBC G12/AS1](#).

Application - Pipework installation**3.13 WATER SUPPLY CONNECTION**

Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to [NZBC G12/AS1](#).

3.14 POTABLE WATER SUPPLY PIPEWORK INSTALLATION

From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to [NZBC G12/VM1](#) or [NZBC G12/AS1](#), table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings.

Conceal pipework and pressure test before the wall linings are fixed.

3.15 HOT WATER PIPEWORK

Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/VM1 or NZBC G12/AS1, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and G12/VM1 or G12/AS1.

3.16 EQUIPOTENTIAL BONDING

Earth metallic water supply pipe and metallic sanitary fixtures to NZBC G12/AS1, 9.0.

3.17 IN-LINE FILTER

Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

3.18 HOT WATER CYLINDER INSTALLATION GENERALLY

Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation. Valve-vented systems to NZS 4607.

3.19 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES

Non-gas (electric, wet-back, solar etc) water heating appliances to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation.

3.20 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 G12/AS1: 6.11. Valve-vented systems to NZS 4607.

3.21 INSTALL HOT WATER CYLINDER OVERFLOW TRAY

Install drained overflow tray to hot water cylinder to NZBC G12/AS1.

3.22 INSTALL TEMPERING VALVE

Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.23 PENETRATIONS

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

Installation - Valves

3.24 INSTALLING BELOW GROUND ISOLATING VALVE

Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.25 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED

Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

3.26 INSTALLING BACKFLOW PREVENTION DEVICE

Provide and install backflow prevention device as near as practicable to the potential source of contamination, and in an accessible position for maintenance and testing to AS 2845.3 or NZ Backflow Testing Standard.

Completion

3.27 LABEL

Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.28 CLEAN IN-LINE FILTER

Clean all in-line filters on completion of works.

3.29 REPLACE

Replace damaged or marked elements.

3.30 LEAVE

Leave work to the standard required by following procedures.

3.31 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Water main

4.1 POLYETHYLENE WATER MAIN

Size: 25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

4.2 PVC-U PIPE

Manufacturer: As per contractor

Brand: As per contractor

4.3 POLYBUTYLENE PIPE

Manufacturer: As per contractor

Brand: As per contractor

Hot water systems

4.4 ELECTRIC HOT WATER CYLINDER, MAINS PRESSURE

Brand: Baxi

Model size: 300 L SDB Mains Pressure

Valves and accessories

4.5 MAIN ISOLATING VALVE

Location: As per plans

Brand/type: As per manufacturers specifications

4.6 FLOOR/ZONE ISOLATING VALVES

Location: As per contractor

Brand/type: As per manufacturers specifications

4.7 TEMPERING VALVE

Location: As per contractor

Brand/type: As per manufacturers specifications

4.8 BACKFLOW PREVENTION DEVICE

Location: As per contractor

Brand/type: As per manufacturers specifications

7212 GAS SYSTEM LPG CYLINDERS

1 GENERAL

This section relates to Installation and maintenance of a 45kg LPG twin cylinder system and associated piping systems.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

WorkSafe:	WorkSafe New Zealand.
HSNO:	Hazardous Substances and New Organisms Act 1996.
LPGA	LPG Association of New Zealand Inc.

The following definitions apply specifically to this section:

Condensate:	The liquid that separates from the gas downstream of any regulator due to the reduction in temperature resulting from pressure reduction.
Condensate trap:	(also known as a drip leg or tailpipe) a device installed in a gas line to trap the condensate liquid
Enclosure:	A compartment, an enclosed area or a partitioned-off space primarily used for the installing of a gas cylinder meter, or gas pressure regulator.
LAB number:	Number allocated by WorkSafe when a cylinder is approved.
POL fitting:	(Prest-O-Lite) The common name given for a standard union with left hand thread, used for connection to a 45 Kg cylinder.
Pigtail:	A short length of flexible tube or copper pipe completed with end couplings. Use for connecting the cylinder to the manifold or the changeover valve.
Twin cylinder installation:	A cylinder installation where two cylinders are connected separately to the system. Each cylinder is connected to a change over valve that can be operated manually or automatically, to change over the cylinder which is supplying LPG to the installation. Connection may be made using flexible rubber or copper pigtails, or pipe fittings.

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC G10/AS1	Piped services
NZBC G11/AS1	Gas as an energy source
AS/NZS 1596	The storage and handling of LPG.
AS/NZS 4129	Fittings for polyethylene pipes for pressure applications
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
AS 4176	Polyethylene/aluminium and cross linked polyethylene/aluminium macrocomposite pipe systems for pressure applications
AS/NZS 5601.1	Gas Installations - general installations
LPGA CoP No.2	Installation and maintenance of twin 45kg cylinder systems

Electricity (Safety) Regulations 2010
 Gas (Safety and Measurement) Regulations 2010
 Plumbers, Gasfitters and Drainlayers Act 2006

Warranties

1.3 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years: For the complete gas system

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010 and Electricity (Safety) Regulations 2010.

1.5 QUALIFICATIONS

Work to be carried out by gasfitters experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

1.6 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS

Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.7 DESIGN

Design the piping system to [AS/NZS 5601.1](#), with pipe sizes to give a minimum pressure at any appliance inlet, to [AS/NZS 5601.1](#), Table 5.1, of 2.75 kPa for LPG. Include pressure regulators if required.

1.8 LOCATION OF CYLINDERS

Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#). Ensure location allows good accessibility for cylinder replacement to [AS/NZS 5601.1](#). Coordinate with electrical installations to ensure clearances are maintained.

Compliance information

1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation: -
Manufacturer's, importers or distributors warranty

- Installer / applicator's warranty
- Gasfitting Certificate of Compliance - from the installer

1.10 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.11 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.12 GAS APPLIANCE COMPLIANCE

Supplier to provide Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 PIPEWORK GENERAL

Pipework requirements to [AS/NZS 5601.1](#), particularly [AS/NZS 5601.1](#), Section 4, **Means of compliance - materials fittings and components**.

2.2 COPPER PIPE

Complete with fittings to [AS/NZS 5601.1](#). Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**.

2.3 MACROCOMPOSITE PIPE

Polyethylene/aluminium/cross linked polyethylene combination (PE/AL/PE, PE-X/AL/PE-X or PE-X/AL/PE) macrocomposite pipe systems for pressure applications to AS 4176. Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. Used for general pipework, can also be used in ground beneath a building.

2.4 POLYETHYLENE PIPE

Polyethylene pipes to [AS/NZS 4130](#) Series two, or [AS/NZS 4130](#) Series three. Fittings to [AS/NZS 4129](#). Range of use to [AS/NZS 5601.1](#), table 4.1 **Consumer Piping Materials**. For use in ground but not beneath a building.

2.5 ISOLATING VALVES

Manual shut-off valves to [AS/NZS 5601.1](#).

2.6 CYLINDERS

Full 45kg cylinders to be supplied by the LPG supply company.

Components

2.7 AUTOMATIC CHANGEOVER REGULATOR

To the requirements of [AS/NZS 5601.1](#).

Automatic changeover regulator including a gas pressure regulator and non-return valve on each pigtail connection. The valve must comply with the requirements of [HSNO](#) and WorkSafe.

Changeover valves may be comprised of a first and second stage regulator system in a single body, or as a combination of separate component items.

Changeover valves complete with all components necessary for the operation of the bottle gas system including: -

- Flexible Pigtails
- Regulators
- Condensate trap
- Over pressure shut off
- All required valves

Protect from weather.

Accessories

2.8 ANCHORS AND CHAINS

To the requirements of [LPGA COP No.2](#).

All cylinders larger than 25 litres capacity shall be securely held in place by galvanized chains and brackets. The brackets shall be fastened to a wall or similar robust anchorage. The cylinder's fastenings must be capable of withstanding a steady applied load equal to four times the weight of the filled cylinder.

3 EXECUTION

Conditions

3.1 GENERALLY

Carry out the whole of this work to the requirements of [NZBC G10/AS1](#), [NZBC G11/AS1](#) and [AS/NZS 5601.1](#).

3.2 BURIED PIPES

Pipes to be bedded in a trench, backfilled, marker taped and separated from other services, to [AS/NZS 5601.1](#), 5.4 **Installation of consumer piping underground.**

Application

3.3 INSTALL PIPING

Run the system, completely concealed, in the most suitable type of pipe for each part of the installation, bent, supported, jointed and complete with all fittings to [AS/NZS 5601.1](#). Confirm the type of pipe and its location. Label pipework to distinguish it from other services to [AS/NZS 5601.1](#), 5.1.12 **Identification of pipework.**

3.4 PRESSURE TEST

Pressure test the system for leakage to [AS/NZS 5601.1](#) before pipework is concealed by linings.

3.5 LOCATION OF CYLINDERS

Cylinders and associated equipment to be installed external to buildings, except where [AS/NZS 1596](#) permits. Location and clearances to [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

Installation of cylinders

3.6 GENERAL

Cylinders shall be installed upright with the valve uppermost to ensure the inlet to the safety valve remains in the vapour space clear of the liquid content of the cylinder.

- Clearances around cylinders shall comply with CLEARANCES AROUND CYLINDER clause.
- Where two or more exchange cylinders are installed, a manual or automatic changeover valve shall be fitted immediately upstream of the regulator. This valve may be an integral part of an automatic changeover regulator.

3.7 SUPPORT

Cylinders shall not be supported by other cylinders.

Cylinders shall be installed on supporting bases that are firm, level, of non-combustible material, and with a finished surface that prevents ponding of water and at least 50mm above the surrounding surface. Soil is not considered an acceptable supporting base.

All cylinders to be securely held in place by galvanized chains and anchor brackets. The brackets shall be fastened to a wall or similar robust anchorage. Fixings shall be galvanised or stainless steel.

3.8 CYLINDER CONNECTION

Cylinders should be connected directly to the changeover valve assembly by flexible pigtails.

An excess flow valve, to prevent cylinder venting if hose fails, shall be fitted immediately upstream of the piping or hose assembly. This excess flow valve may be an integral part of the POL fitting.

Pigtails connecting cylinders to changeover valves or manifolds should not exceed 1 metre in length.

A non-return valve must be fitted in the supply between each cylinder and the changeover valve, or in a manifold system, between each cylinder and its manifold connection, to prevent flow across the changeover system to [AS/NZS 5601.1](#).

3.9 CYLINDERS IN AN ENCLOSURE OR RECESS

To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

3.10 CYLINDERS UNDER BUILDINGS

To [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations.**

3.11 CLEARANCES AROUND CYLINDER

Cylinders should be installed with clearances complying with the [AS/NZS 5601.1](#), Appendix J, **LP Gas cylinder locations**, figure J3 **Minimum clearance to ignition sources**, and figure J4 **Minimum clearance to a drain or opening into a building**, and at least 1 metre from any readily ignitable material. Readily ignitable materials include paper, dry grass or oily substances.

3.12 CYLINDER SAFETY VALVE DISCHARGE

The discharge point of the cylinder safety valve shall be directed away from any other cylinder, piping, building, drain, approach path to cylinders and any opening into or under a building.

3.13 TEST POINTS

A pressure test point should be installed immediately downstream of each second stage regulator. Such test point may be an integral part of the regulator.

Completion

3.14 ROUTINE CLEANING

Carry out routine trade cleaning of this part of the work including periodic removal all debris, unused materials and elements from the site.

3.15 DEFECTIVE OR DAMAGED WORK

Repair damaged or marked elements. Replace damaged or marked elements where repair is not possible or will not be acceptable. Adjust operation of equipment and moving parts not working correctly. Leave work to the standard required for following procedures.

Commissioning

3.16 FINAL INSPECTION AND TESTING

Check cylinders are working and ensure all connected appliances are operating correctly. Carry out final inspections and testing, pressure test the system for leakage to [AS/NZS 5601.1](#). Leave system shut off at the cylinders until practical completion.

3.17 HANDOVER

Provide a copy of the system operating and maintenance instructions.

Completion

3.18 REPLACE

Replace damaged, cracked or marked elements.

3.19 LEAVE

Leave appliances clean and in full working order to the standard required by following procedures.

3.20 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

Materials

4.1 LPG CYLINDER SYSTEM

Location:	Refer to plans
LPG supplier:	Rockgas
Cylinder Number/size:	2 x 45kg
Changeover valve supply:	Gas fitter - automatic change over
Cylinder restraint:	Anchors and chain

7221 GAS APPLIANCES

1 GENERAL

This section relates to the supply and installation of gas-powered appliances using low pressure gas.

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZBC C/AS1-AS7](#) Protection from fire
[NZBC G4/AS1](#) Ventilation
[NZBC G10/AS1](#) Piped services
[NZBC G11/AS1](#) Gas as an energy source
[NZBC G12/AS1](#) Water supplies
[AS/NZS 5601.1](#) Gas Installations - general installations
[Electricity \(Safety\) Regulations 2010](#) (Reprint as at 4 April 2016)
[Gas \(Safety and Measurement\) Regulations 2010](#)
[Plumbers, Gasfitters and Drainlayers Act 2006](#)

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

Copies of the above literature are available from
Web: www.rinnai.co.nz

Requirements

1.3 COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010 and the network utility operator's/gas suppliers requirements. Give notices for inspections and carry out tests as required.

1.4 QUALIFICATIONS

Gasfitters to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

Performance

1.5 FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

1.6 GAS CERTIFICATE OF COMPLIANCE

Provide a Gasfitting Certificate of Compliance as required by Clause 46 and 47 of the Gas (Safety and Measurement) Regulations 2010 and when required provide a copy to the energy supplier.

1.7 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.8 APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 GAS APPLIANCES
Refer to SELECTIONS for product selection.

2.2 GAS TYPE
All appliance to be specifically suited to the gas type supply, refer to SELECTIONS.

3 EXECUTION

Conditions

3.1 GENERALLY
Carry out the whole of this work to the requirements of [NZBC G10/AS1](#), [NZBC G11/AS1](#) and [AS/NZS 5601.1](#).

Application

3.2 INSTALL GAS APPLIANCES
Fit and connect gas appliances to [AS/NZS 5601.1](#), complete with isolation valves as required to the appliance manufacturer's requirements.

3.3 SEISMIC RESTRAINTS - GAS APPLIANCES
Where gas appliances require seismic restraints, restrain to manufacturer's requirements, [AS/NZS 5601.1](#) and [NZBC C/AS1-AS7](#), 7.2 Gas-burning Appliances.

3.4 CONNECT UP GAS HOT WATER HEATERS
Connect gas hot water heaters supplied and fitted under Hot and Cold Water system section or by gas fitter, to [NZBC G10/AS1](#), [G11/AS1](#), [G12/AS1](#) and to [AS/NZS 5601.1](#) and the water heater manufacturer's requirements.

Completion

3.5 REPLACE
Replace damaged, cracked or marked elements.

3.6 LEAVE
Leave appliances clean and in full working order and leave work to the standard required by following procedures.

3.7 REMOVE
Remove debris, unused materials and elements from the site.

4 SELECTIONS

4.1 GAS TYPE
Gas type: LPG

4.2 GAS APPLIANCES

Appliance	Make and code	Supplied by
Cooker top:	TBC	Kitchen Things
Fireplace:	Escea	TBC

7411M METALCRAFT ROOFING RAINWATER SPOUTING SYSTEMS

1 GENERAL

This section relates to **Metalcraft Roofing** rainwater disposal systems including gutters fascias and downpipes.

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
NZMRM	New Zealand Metal Roofing Manufacturers Inc
Gutter	In this section includes spouting

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E1/AS1	Surface water
AS 1273	Unplasticised PVC (uPVC) downpipe and fittings for rainwater
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:
Are available on the website or by contacting Metalcraft Roofing.

For technical assistance contact **Metalcraft Roofing**

Web: www.metalcraftroofing.co.nz

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Warrant this work under normal environmental and use conditions against:

10 years:	Failure of coating adhesion (manufacturer's standard warranty)
10 years:	Weatherproofing failure caused by material penetration as a result of corrosion (manufacturer's standard warranty)
3 years:	Weatherproofing failure caused by substandard workmanship

From: Date of completion of installation

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.5 NO SUBSTITUTIONS

Substitutions are not permitted to any specified system, or associated components and products.

1.6 QUALIFICATIONS

Installers to be experienced competent gutter installers, familiar with the **MetalcraftRoofing** materials and the techniques specified.

1.7 INFORMATION FOR OPERATION AND MAINTENANCE

Provide one copy of all relevant **Metalcraft Roofing** maintenance information on completion of the roofing work.

Performance

1.8 TEST

Test the completed rainwater disposal system with water to ensure gutters are laid to correct falls, that both spouting and downpipes are unobstructed and that no ponding occurs in gutters. Comply with E1/AS1.

2 PRODUCTS

Materials

2.1 GUTTERS

Complete with matching brackets with fixing screws to suit the gutter / fascia. Refer to SELECTIONS for type.

Components

2.2 DROPPERS

Steel or plastic droppers, sized to fit inside the downpipe.

2.3 DOMES

Wire mesh in round form with legs to clip inside the outlet opening to the downpipe.

3 EXECUTION

Conditions

3.1 HANDLE AND STORE

Handle and store downpipes, spouting and accessories to avoid damage. Store on site under cover, on a clean level area, stacked to eliminate movement and away from work in progress. Avoid exposure to sunlight if strippable film is still on the product.

3.2 SUBSTRATE

Check that fascia, barges or cladding are level and true to line and face and will allow work of the required standard without distortion to the product alignment. Do not proceed until they are up to standard.

3.3 THERMAL MOVEMENT

Make adequate provision in the fixing and jointing of the spouting for thermal movement in the length of the spouting. Provide an expansion joint in spouting over 12 metres in length for steel gutter.

3.4 CORROSION

Separate metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

Check compatibility of metals used for rainwater goods, against the materials being used for roofing and flashings.

Application - metal

3.5 INSTALL METAL GUTTER AND FASCIA

Establish minimum falls necessary (minimum 1:500) to outlets to prevent ponding and screw fix brackets true-to-line at 900mm centres maximum. In areas where snow fall is possible and or high wind areas, the centres should be reduced to 600mm. Lap spouting joints in direction of flow, a minimum of 40mm to seal between and over the top of joint and seal with silicone sealant and fix with rivets. Ensure the joint is fixed over its full girth. Cut out neatly for and fit the pre-formed downpipe dropper and rivet and seal around the joint. All installation to **Metalcraft Roofing** details and **NZMRM CoP** NZ metal roof and wall cladding Code of Practice recommendations.

3.6 INSTALL OVERFLOWS

Install as close as practical to downpipe locations, at a height allowing water to discharge to the outside and not into the building.

Completion

- 3.7 **REPLACE**
Replace damaged or marked elements.
- 3.8 **LEAVE**
Leave the whole of this work discharging completely and freely into the stormwater system and free of all debris. Leave work to the standard required by following procedures.
- 3.9 **REMOVE**
Remove debris, unused materials and elements from the site.

4 SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 **METALCRAFT METALLINE GUTTER / FASCIA SYSTEM**

Profile: Fascia 155
 Size: 155
 Base material: Steel
 BMT: 0.55mm
 Coating system: Endura
 Colour: BasaltBase

4.2 **METALCRAFT ROOFING GUTTER SYSTEMS**

Profile: Box 125
 Base material: steel
 BMT: 0.55mm
 Coating system: Endura
 Colour: BasaltBase

4.3 **METALCRAFT COLOURSTEEL DOWNPIPES**

Profile: Round
 Size: 80mm
 Coating system: Endura
 Colour: BasaltBase

4.4 **DOMES**

Metal: Extractor vent dome

7420 SANITARY SYSTEMS

1 GENERAL

This section relates to above ground gravity flow sanitary systems;

- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 RELATED SECTIONS

Refer to 7151 SANITARY FIXTURES, TAPWARE & ACCESSORIES for sanitary fixtures tapware and accessories.

Refer to 7430 DRAINAGE for underground drains.

1.2 DOCUMENTS

Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
NZBC G13/AS3	Plumbing and drainage
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
Plumbers, Gasfitters and Drainlayers Act 2006	

1.3 QUALIFICATIONS

Carry out all work under the direct supervision of a certifying plumber under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

2 PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

PVC-U pipe to [AS/NZS 1260](#) complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS

Chrome plate on copper pipes and associated copper and brass fittings.
White polybutylene or PVC, including all associated fittings.

3 EXECUTION

3.1 EXECUTION GENERALLY - NZBC G13/AS1

Carry out this work and complete all tests to [NZBC G1/AS1](#): 2.0, 3.0 and [NZBC G13/AS1](#).

3.2 ELECTROLYTIC ACTION

Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 INSTALL TRAPS, WASTE AND VENT PIPES - NZBC G13/AS1

Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to [NZBC G13/AS1](#) and [AS/NZS 2032](#). Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.4 PENETRATIONS

At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.5 TEST

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

3.6 CLEAN UP

Remove labels and clean fittings. Remove unused materials from the site.

4 SELECTIONS

4.1 PVC-U WASTE, DISCHARGE AND VENT PIPES

Brand/type: As per contractor

4.2 EXPOSED PIPES AND TRAPS

Brand/type: As per contractor

7430 DRAINAGE

1 GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and groundwater drainage.

1.1 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC G13/AS2	Foul Water
NZBC G13/AS3	Plumbing and Drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications
Plumbers, Gasfitters and Drainlayers Act 2006	

1.2 AS BUILT DOCUMENTS

Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS

Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

2 PRODUCTS

2.1 CONCRETE

17.5 MPa prescribed mix to [NZS 3104](#).

2.2 REINFORCEMENT

Plain round and/or deformed steel bars, Grade 300 to [AS/NZS 4671](#).

2.3 PVC-U PIPES

PVC-U pipes bends, junctions, fittings and joints to [AS/NZS 1254](#) and [AS/NZS 1260](#). Underground PVC-U pipe to be Classified as follows:

Classification	Use
SN4 - SN6	Domestic & light load areas
SN8 - SN10	Commercial & Industrial medium load areas
SN16	Public roads & high load areas

2.4 GULLY TRAPS - NZBC G13/AS2

To [NZBC G13/AS2](#): 3.3 Gully traps, complete with grating.

- 2.5 SURFACE WATER SUMP GRATINGS
Cast iron frame with lift-up grating.
- 2.6 STRIP DRAIN CHANNEL
Proprietary, modular, variable invert, PVC or precast concrete drainage channel sections and drainage sump, embedded in site concrete and fitted with selected metal gratings.

- 2.7 INSPECTION COVERS
Cast iron frame with screw-down cover.

- 2.8 TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1
- | | |
|--------------------------|---|
| Bedding: | Clean granular non-cohesive material with a maximum particle size of 20 mm. |
| Bedding & surround: | Clean granular non-cohesive material with a maximum particle size of 20 mm. |
| Compacted selected fill: | Any Fine grain soil or granular material which is free from topsoil and rubbish and has a maximum particle size of 20 mm. |
| Ordinary fill: | Excavated material. |
| Concrete: | 75 mm thick concrete pad. |

3 EXECUTION

- 3.1 EXCAVATE
Excavate for drains to a firm even base with correct gradients set in straight runs. Trenches running parallel, below and close to foundations of buildings to [NZS 3604](#) or [NZS 4229](#) to be separated to:
- [NZBC E1/AS1](#), 3.9.7, **Proximity of Trench to Building**, for stormwater and subsoil drains.
 - [NZBC G13/AS2](#), 5.6, **Proximity of Trench to Building**, for foul water drains.
- 3.2 MANUFACTURER'S REQUIREMENTS
All drainage installations to the pipe and fitting manufacturer's requirements.
- 3.3 DRAINAGE GENERALLY - NZBC G13/AS2 & NZBC E1/AS1
Carry out drainage work and tests to [NZBC G13/AS2](#) (foul water), [NZBC E1/AS1](#) (stormwater). Lay uPVC pipe systems to relevant sections of [AS/NZS 2032](#), NZS 2566.1 and [AS/NZS 2566.2](#). Lay polyethylene pipes and fittings to relevant sections of [AS/NZS 2033](#) and NZS 2566.1.
- 3.4 LAY FOUL WATER DRAINS
Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.
- 3.5 INSTALL GULLY TRAPS
Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.
- 3.6 LAY STORMWATER DRAINS
Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the 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.
- 3.7 INSTALL STRIP DRAIN CHANNEL
Excavate trench and form site concrete base to fall. Set interlocking channel sections, sumps and accessories in place, all in accordance with the channel manufacturer's requirements. Check falls and install gratings and covers.
- 3.8 INSTALL SURFACE WATER SUMP
To [NZBC E1/AS1](#), complete with ceramic half-siphon pipe and cast iron frame with a lift out grating.
- 3.9 INSTALL STORMWATER INSPECTION CHAMBERS
Construct as detailed on a poured concrete footing to [NZBC E1/AS1](#), 3.7, **Access for maintenance**. Provide all necessary haunching to channels. Fit a cast iron cover and frame.

- 3.10 **INSTALL FOUL WATER INSPECTION CHAMBERS - NZBC G13/AS2**
Construct as detailed on a poured concrete footing to **NZBC G13/AS2, 5.7 Access points**. Provide all necessary haunching to channels. Fit a cast iron cover and frame.
- 3.11 **CONCRETE ENCASEMENT**
Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.
- 3.12 **FIELD TEST**
Field test drains for watertightness (PVC-U to **AS/NZS 2032** or AS/NZS 2566. 2 Appendix N) to the satisfaction of the territorial authority inspector.
- 3.13 **PLACING & COMPACTING TRENCH BACKFILLING MATERIAL**
Granular bedding and selected fill shall be placed in layers no greater than 100 mm loose thickness and compacted. Base bedding (beneath the pipe) shall be placed and compacted before pipes are laid.

Up to 300mm above the pipe, compaction shall be by tamping by hand using a rod with a pad foot (having an area of 75 ± 25 mm by 75 ± 25 mm) over the entire surface of each layer to produce a compact layer without obvious voids, without disturbing the drains.

More than 300 mm above the pipe, compaction shall be by at least four passes of a mechanical tamping foot compactor (whacker type) with a minimum weight of 75 kg.

4 SELECTIONS

- 4.1 **PVC-U PIPES**
Brand/type: As per contractor
- 4.2 **TRENCH BACKFILLING MATERIAL - NZBC G13/AS2 & NZBC E1/AS1**
Location: Refer to detail
Type: Refer to detail

7555E ESCEA GAS FIRES

1 GENERAL

This section relates to the supply and installation of **Escea** gas fires, flues and controls.

1.1 RELATED WORK

Refer to 7211 GAS SYSTEM UTILITY NETWORK for piped gas supply.
Refer to 7212 GAS SYSTEM LPG CYLINDERS for cylinder gas supply.

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZBC G10/AS1](#) Piped services
[AS/NZS 1596](#) Storage and handling of Liquefied Petroleum Gas
[Electricity \(Safety\) Regulations 2010](#) (Reprint as at 4 April 2016)
[Gas \(Safety and Measurement\) Regulations 2010](#)
[Plumbers, Gasfitters and Drainlayers Act 2006](#)

1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

- **Escea** product catalogue
- User manual for DX1000, DX1500, DS1400, DL850, DL1100, DF700, DF960, DFS730, ST900, EF5000
- Flueing information, including Vertical Flexi (Direct Vent), Vertical Rigid (Direct Vent), Horizontal Rigid (Direct Vent), Horizontal/Vertical (Powered Direct Vent).
- Builders and Architects information for DX1000, DX1500, DS1400, DL850, DL1100, DF700, DF960, DFS730, ST900, EF5000
- Drawings for architects
- Clearances to electrical equipment (TV's)

Manufacturer/supplier contact details

Company: **Escea Ltd**
Web: www.escea.com/nz
Telephone: 0800 173 000

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

5 year Firebox For parts
Warranty:

- Provide the warranty in the manufacturer's standard form
- Commence the warranty from date of purchase

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

2 years Total For labour
Warranty:

- Provide this warranty on the installer/applicator standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS

Gasfitter to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying gasfitter under the [Plumbers, Gasfitters and Drainlayers Act 2006](#).

1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **Escea** products, or associated products, components or accessories.

1.8 COMPLY

Comply with the Gas (Safety and Measurement) Regulations 2010, Electricity (Safety) Regulations 2010 and the network utility operator's requirements. Give notices for inspections and carry out tests as required.

1.9 INFORMATION FOR OPERATION AND MAINTENANCE

Supply the **Escea** Gas Fire User Guide to the owner at the completion of the testing of the gas fire.

Performance

1.10 FINAL INSPECTION AND TEST

Submit the work for inspection and test and prove to the satisfaction of the network utility operator that the installation complies with all Acts and Regulations and has been tested for leakage and proved to be sound.

Testing should be at the time of completion. Confirm this timing before carrying out any tests. Test and demonstrate the system according to manufacturer's specification and to appropriate gas Standard.

1.11 GAS CERTIFICATE OF COMPLIANCE

Provide a Certificate of Compliance (CoC) as required by the Gas (Safety and Measurement) Regulations 2010 to the owner, and when required provide a copy to the energy supplier before connection.

1.12 GAS SAFETY CERTIFICATION

Provide a Gas Safety Certificate (GSC) as required by the Gas (Safety and Measurement) Regulations 2010 and provide a copy to the owner and when required the BCA. To be provided at completion of the work, prior to Practical Completion.

1.13 APPLIANCE COMPLIANCE

Supplier to provide a Supplier Declaration of Compliance (SDoC) in accordance with the requirements of the Gas (Safety and Measurement) Regulations 2010.

2 PRODUCTS

Materials

2.1 EF5000 OUTDOOR GAS FIRE

Escea EF5000 flame effect open fronted gas fire designed for outdoor use only. Manufactured from stainless steel and requires no flue. Ignited by touch pad electronic control. To be permanently installed into a wall cavity or optional kitset wall enclosure. Refer to SELECTIONS for fuel effect and other options.

Components

2.2 OUTDOOR KITSET ENCLOSURE FOR EF5000

Ready to build free standing enclosure for the **Escea EF5000** only. Supplied to suit tile, plaster or light rock veneer finishes.

3 EXECUTION

Conditions

3.1 GENERALLY

Carry out the whole of this work to the requirements of **NZBC G10/AS1** and the appropriate Standards for gas installation.

Application

3.2 INSTALL GAS APPLIANCES

Fit and connect gas appliances complete with flues as required to **Escea** installation requirements. Refer also to section 7221 GAS APPLIANCES for installation.

3.3 HANDLE AND STORE

Handle and store units, cylinders, pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress. Store according to manufacturer's instructions.

3.4 CONCEAL

Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION

Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT

Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE

Gas fitter to check and confirm adequate pipe size, incoming mains and meter on site as a part of the installation. Pipe sizing calculation to appropriate gas Standard.

Installation

3.8 INSTALL EF5000 OUTDOOR GAS FIRE

Install **Escea EF5000** outdoor gas fire complete with the necessary fittings to **Escea** requirements. Gas pipe to be capable of 60Mj/hr with all other appliances running, and fitted with an isolating shut off valve in an accessible location to **Escea** details and requirements.

Completion

3.9 REPLACE

Replace damaged or marked elements.

3.10 LEAVE

Leave work to the standard required by following procedures.

3.11 REMOVE

Remove debris, unused materials and elements from the site.

4 SELECTIONS

For further details on selections go to www.escea.com/nz. Substitutions are not permitted to the following, unless stated otherwise.

Materials

4.1 ESCEA EF5000 OUTDOOR GAS FIRE

Location:	Outdoor Living
Manufacturer:	Escea
Model:	EF5000
Fuel effect:	TBC with client
Fascia colour:	Volcanic Black
Power supply:	Batteries
Gas type:	LPG

Components

- 4.2 KITSET WALL UNIT FOR EF5000
 - Location: Outdoor Living
 - Manufacturer: **Escea**
 - Model: **EF5000 Kitset Wall Unit**
 - Cladding: Vertical Cedar

- 4.3 KITSET STEEL SKELETON ENCLOSURE FOR EF5000
 - Location: Outdoor Living
 - Manufacturer: **Escea**
 - Model: **Kitset Enclosure**

7701 ELECTRICAL BASIC

1 GENERAL

This section relates to the wiring for domestic and small scale commercial installations, including:

- power
- lighting
- electrical automation
- security system
- complete with componentry
- electrically-powered fittings
- fire rated sealers, liners and accessories

1.1 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

CFL	compact fluorescent lamp
ELV	extra low voltage
GLS	general lighting service
IP	international (ingress) protection classification
LCD	liquid crystal display
LED	light emitting diode
MCB	miniature circuit breaker
NUO	Network Utility Operator
PCB	printed circuit board
PIR	passive infrared
RCBO	residual current-operated circuit breaker with over current protection
RCCB	residual current-operated circuit breakers
RCD	residual current device
SIA	security integration architecture
TPS	tough plastic sheathed
TCF	Telecommunications Carriers' Forum

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC F6/AS1	Visibility in escape routes
NZBC F7/AS1	Warning systems
NZBC G4/AS1	Ventilation
NZBC G9/AS1	Electricity
AS/NZS 1125	Conductors in insulated electric cables and flexible cord
AS/NZS 1768	Lightning protection
AS/NZS 2201.1	Intruder alarm systems - Client's premises - Design, installation, commissioning and maintenance
AS 2293.1	Emergency escape lighting and exit signs for buildings - System design, installation and operation
AS 2293.3	Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs
AS/NZS 3000	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3008.1.2	Electrical installations - Selection of cables - Cables for alternating voltages up to and including 0.6/1 kV - Typical New Zealand installation conditions
AS/NZS 3100:2009	Approval and test specification-general requirements for electrical equipment
AS/NZS 3112	Approval and test specification - Plugs and socket-outlets
AS/NZS 3113	Approval and test specification - Ceiling roses
AS/NZS 3190	Approval and test specification - Residual current devices (current-operated earth-leakage devices)
AS/NZS 3350.1	Safety of household and similar electrical appliances - General requirements
AS/NZS 3439.3	Low-voltage switchgear and controlgear assemblies - Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards
AS 3786	Smoke alarms
NZS 4514	Interconnected smoke alarms for houses
AS/NZS 5000.2	Electric cables - Polymeric insulated - for working voltages up to and including 450/750v
AS/NZS 60598.2.2:2001	Luminaires - Particular requirements - Recessed luminaires
IEC 61643	Components for low voltage surge protection devices
Electricity (Safety) Regulations 2010 (Reprint as at 4 April 2016)	
TCF Premises Wiring Code of Practice 2011	

Warranties

1.3 WARRANTY

Warrant the complete electrical installation under normal environmental and use conditions against failure of materials and execution.

1 year: Warranty period

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

Requirements

1.4 COMPLY

Comply with the Electricity (Safety) Regulations 2010, [AS/NZS 3000](#), [AS/NZS 3008.1.2](#) and [TCF Premises Wiring Code 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.

1.5 QUALIFICATIONS

Carry out work under the supervision of an electrical licensed supervisor.

1.6 ELECTRICAL CERTIFICATE OF COMPLIANCE

Supply a certificate of compliance (CoC) to the owner, and if required the NUO, as required by the Electricity (Safety) Regulations (2010), prior to connection.

- Arrange for the NUO to inspect before the meter installation, listed work inspection, polarity check and supply becoming live.
- Arrange for an inspector to inspect as required by regulation 70.

1.7 ELECTRICAL SAFETY CERTIFICATE

Provide an Electrical Safety Certificate (ESC), as required by the Electrical (Safety) Regulations 2010, to the owner and when required the BCA. To be provided no later than 20 working days after connection and prior to Practical Completion.

2 PRODUCTS

2.1 MAINS SUPPLY, SINGLE PHASE

Tough plastic sheathed neutral screened cable to AS/NZS 4961 and [AS/NZS 3008.1.2](#), with a minimum rating of 60 amps per phase. Include pilot cable where required by network utility company.

2.2 CABLES

Tough plastic sheathed copper conductors to [AS/NZS 5000.2](#), stranded above 1.0mm², and to [AS/NZS 3008.1.2](#). Minimum sizes as below. Increase sizes if the method of installation, thermal insulation, cable length or load will reduce the cable rating below that of the MCB rating, or produce an excessive voltage drop.

- | | |
|--------------------|---|
| Lighting circuits: | Domestic: 1.5mm ² on 10 amp MCBs |
| Lighting circuits: | Commercial: 1.5mm ² on 16 amp MCBs |
| Power circuits: | 2.5mm ² on 16 amp MCBs for domestic and unenclosed or unfilled cavity construction |
| | 2.5mm ² on 16 amp MCBs for domestic insulated construction, or filled cavity |
| | 2.5mm ² on 20 amp MCBs for unenclosed or unfilled cavity construction |
| | 2.5mm ² on 16 amp MCBs for insulated construction, or filled cavity, or lengths over 30 metres |

Hot water cylinder circuits: Single phase: 2.5mm² on 20 amp MCBs

Range/oven/hob circuits: Single phase: 6mm² on 32 amp MCBs

Heat resistant cable for final connections to all heated appliances, and high temperature cable in ambient conditions that may be above 35°C.

2.3 METER BOX

Proprietary manufactured, zinc plated powder coated metal case, or ABS plastic, with glazed panel door, weatherproof where mounted outdoors, and complete with meter mounting, main switch and fuse.

2.4 DISTRIBUTION BOARD

Flush surface mount boards manufactured to [AS/NZS 3439.3](#) and installed in accordance with [AS/NZS 3000](#). Manufactured from engineering grade resin with a glow wire rating of 850°C, complete with neutral and earth busbars, and insulated comb phase bar. Distribution boards to have 20% spare capacity for future additions and alterations.

2.5 CIRCUIT PROTECTION

General requirements including main switch 63A or 100A. Residual current protection 30mA, ensure RCCBs' meet Type A and comply with [AS/NZS 3190](#). MCBs to 4.5kA or 6kA rated.

2.6 WALL BOXES

Standard grid size or equivalent to be manufactured from plastic or metal, with 2 or more gang size to be metal with steel inserts for accessory securing screws. Screw fixed.

2.7 SWITCH UNITS

Single pole switches to be 16 amp minimum rated, double pole or intermediate to be 16 amp minimum rated. All switches to be 230 volt a.c. polycarbonate flushplate units. Refer to drawings/schedules for number of switches per unit, dimmer units, neon (indicator or toggle) units and 2 way units.

- 2.8 HOT WATER SYSTEM SWITCH
One way 20 amp switch complete with cable clamp for flexible PVC conduit to element enclosure.
- 2.9 SWITCHED SOCKET UNITS
10 amp, 230 volt flat 3 pin socket outlets fitted with safety shutters and manufactured to [AS/NZS 3100](#), [AS/NZS 3112](#) and [AS/NZS 3113](#), single or multi gang as detailed.
- 2.10 SURGE PROTECTION
Protection for the homes appliances with IEC 61643 Class II surge protection devices fitted to the switchboard. For variable electronic equipment fit IEC 61643 Class III surge protection to switched socket outlets.
- 2.11 CEILING ROSES
White plastic mounting base with screwed cover, manufactured to [AS/NZS 3113](#). Terminal type. Cylindrical section TPS for suspended fittings.
- 2.12 BATTEN HOLDERS
Standard white plastic bayonet cap, with cap angled where wall mounted. Brass liners.
- 2.13 LIGHT FITTINGS
Fluorescent and High Intensity Discharge fittings with low loss control gear and power factor corrected to 0.95 minimum. Control gear suitable for dimming if this is required. All fittings complete with lamps; Incandescent GLS lamps pearl, coiled-coil 230v rated, bayonet cap; Fluorescent triphosphor 2700K; CFL; halogen ELV 12v dichroic reflector with cover glass unless detailed otherwise; integral/non-integral LEDs, reflectors, lenses, heatsinks and drivers - 3,000K to 4,000K, CRI >80, L70.
- 2.14 RESIDENTIAL RECESSED LIGHT FITTINGS
Residential recessed luminaires to [AS/NZS 60598.2.2](#), types IC-F, IC, CA-80 or CA-135 only.
- 2.15 SPACE HEATERS
Fixed wired room heaters radiant or convector, and compliant with [AS/NZS 3350.1](#). Flush or surface mount, fitted with safety cut-outs.
- 2.16 EXHAUST FANS
Ceiling, wall or duct mounted exhaust fans for ventilation to [NZBC G4/AS1](#), and compliant with [AS/NZS 3350.1](#).
- 2.17 HEATED TOWEL RAILS
Fixed wired heated towel warmers, double insulated, IPX4 splash-proof, compliant with [AS/NZS 3350.1](#), scratch resistant powdercoated or chrome finish.
- 2.18 OUTDOOR SWITCHES & SOCKETS
Using materials with superior UV protection, impact strength, and addition chemical resistance when compared with interior polycarbonate fittings. Weather protected, switches to IP56 minimum, and sockets to IP53 minimum. Sockets fitted with safety shutters behind socket pins, and all products able to be padlocked off or on.
- 3 EXECUTION**
- 3.1 MAIN SUPPLY
Lay underground mains to the NUO requirements. Excavate trench, install cable and marker tape and backfill.
- 3.2 METER BOX
Fit to meter box manufacturer's and Electricity Retailer's requirements. Recess into external wall in sheltered area and flash to weatherproof to [NZBC E2/AS1](#) fig 69. Arrange for meter installation and connection.
- 3.3 DISTRIBUTION BOARD
Fit to [AS/NZS 3000](#) and board manufacturer's requirements. Recess into wall or surface mount and ensure fire containment properties of the enclosure are maintained.
- 3.4 CIRCUIT PROTECTION
Install MCBs at distribution board to [AS/NZS3000](#) to protect each final sub circuit.

3.5 EARTH BONDS

Bond together and to earth all plumbing fittings not adequately isolated, to [AS/NZS 3000](#), the Electricity (Safety) Regulations 2010 and the fitting manufacturer's requirements.

3.6 MAIN EARTH

Provide a plastic toby box to contain and protect the earth electrode. Fix the connecting earth wiring closely and securely against wall surfaces.

3.7 EARTH LEAKAGE PROTECTION

Install RCD protection to [AS/NZS 3000](#).

3.8 RCD - DOMESTIC INSTALLATIONS

Install 30mA RCD protection at the switchboard for all final sub circuits to control outlets and lighting except for fixed or stationary cooking equipment, to [AS/NZS 3000](#).

3.9 RCD - SPECIFIC INSTALLATIONS

Install 30mA RCDs at the distribution board.

Install fixed wired RCD protected outlets (SRCD) in the following areas:

- Wet areas: bathrooms, laundries, kitchens.
- Near pools and water features.
- Where intended for use with cleaning equipment.
- Hand-held tools subject to movement in use, i.e. work-shops, garages.

3.10 SET-OUT

The position of outlets and equipment shown on drawings is indicative of requirements. Confirm documents and site conditions are not in conflict with other services or features. Resolve conflicts and discrepancies before proceeding with work affected. Confirm on site the exact location, disposition and mounting heights of all outlets, fittings, equipment, penetrations, and use of exposed wiring. Fix outlet items level, plumb and in line.

3.11 CABLING

Install wiring systems to [AS/NZS 3000](#). 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. Install cable in conduits where required to pass through concrete or underground. In walls run cabling horizontally and vertically in straight lines. In ceilings either run cabling along ceiling framing or attached to catenary wires. Clip cabling to ceiling framing/catenary wires.

3.12 CABLING CIRCUITS

Install all circuits with the appropriately rated cable and circuit protection. Install with a maximum of 8 light switch units or 4 double or single switched socket units on any circuit. Minimum 2 lighting circuits per floor. Separate circuits for all electric heating appliances. Kitchen sockets to be on at least two different circuits.

3.13 WALL BOXES

Mount flush in cavity construction size to fit products selected. Fix vertically mounted wall boxes to studs. Screw fix horizontally mounted switched socket outlet wall boxes to solid blocking or nogs. Fix switch panel wall boxes to solid blocking.

3.14 SWITCH AND SOCKET UNITS

Fit all single and double switch units, all sockets to the following heights (to the centre of the unit) unless shown otherwise on the drawings.

Switch Units: 1000mm above finished floor

Socket Units: 150mm above work benches
400mm above finished floor

Mount light switches and switch socket outlets vertically and socket units horizontally. Label all switch units that control electrical equipment or special lighting circuits by colour filled engraving on the switch. Use proprietary engraved switch mechanisms where applicable.

3.15 ISOLATING SWITCHES

Locate isolating switches in positions as confirmed by the owner, when not specifically shown on the drawings.

3.16 LIGHT FITTINGS

Install light fittings in locations and at heights specified and confirmed by the owner, in accordance with the fitting manufacturer's requirements.

3.17 EXTRA LOW VOLTAGE LIGHTING

Use electronic, transformers (halogen) or drivers (LED) for ELV lamps, one transformer/driver per lamp. Locate to manufacturer's requirements and as close as practicable to the lamp. Ensure transformers/drivers and rear of light fittings are adequately ventilated and appropriately clear of any building elements, to [AS/NZS 3000](#).

3.18 RECESSED LIGHT FITTINGS - CLEARANCE TO INSULATION

Non-residential applications;

The clearance between insulation and recessed downlights;

- Leave 100mm gap to [AS/NZS 3000](#), figure 4.9
- Provide larger gaps where required by the downlight manufacturer

Residential applications;

- Ensure new recessed downlights are one of the new classes classified in [AS/NZS 60598.2.2](#); CA 80, CA 135, IC and IC - F.
- Classification type CA 80, CA 135, to [AS/NZS 60598.2.2](#); insulation can abut the sides (wrapping around the sides)
- Classification type IC and IC - F, to [AS/NZS 60598.2.2](#); insulation can abut and cover over the top of the downlight
- Provide larger gaps where required by the light manufacturer
- In a retrofit situation where the insulation is non-approved or unknown, ensure 100mm clearance from the insulation to [AS/NZS 3000](#), figure 4.9.

3.19 ELECTRIC HOT WATER SYSTEM

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. Hot water cylinders, thermostats and 3000 watt element supplied and fitted under the hot and cold water system section.

3.20 SPACE HEATERS

Install to the heater manufacturer's requirements, and to [AS/NZS 3000](#). Fit neatly and without damage to surrounding finishes. Ensure control switches and thermostats are fitted to appliance, or otherwise connect to a control switch located adjacent to the heater and a remote thermostat.

3.21 SURGE PROTECTION

Install surge protection devices to manufacturer's requirements and in accordance with [AS/NZS 3000](#) and [AS/NZS 1768](#). When fitting IEC 61643 Class II protection at the switchboard, protect the device by a dedicated MCB.

3.22 ELECTRIC POWERED FITTINGS AND EQUIPMENT

Install and wire fittings and equipment to individual fittings and equipment manufacturer's requirements. Refer to the drawings for required layouts and locations for equipment. Refer to SELECTIONS for schedules of fittings.

3.23 BATHROOM ELECTRICAL FIXTURES

Install all electrical fixtures. Connect the following bathroom and toilet electrical items:

- Heated towel rails: Install to manufacturer's requirements and installed in accordance with [AS/NZS 3000](#) and the [NZBC G9/AS1](#)
- Mirror demisters: Locate centrally above the wash hand basin(s). Connect wiring to room lighting unless specified otherwise.
- Exhaust fans: Install exhaust fans to manufacturer requirements. Installed in accordance with [AS/NZS 3000](#) and [NZBC G4/AS1](#).

3.24 OUTDOOR/EXTERIOR SERVICES

Install all wiring systems in accordance with [AS/NZS 3000](#) and in accordance with the manufacturer's recommendations:

Provide circuits and connections for exterior installations, including ELV 12/24 Volt path lighting and electronic irrigation systems. Refer to drawings for connection points. Where underground, ensure appropriate protection, such as thickness of sheathing, conduit, depth of cabling, and proximity to other services.

Use the appropriate rated fittings for power control and power supply. Weather protected switches to IP56, and sockets to IP53 as a minimum. Install to manufacturer's specifications using recommended fittings and sealants to maintain the products integrity.

Earth leakage protection to be provided for in areas where there is increased risk to human safety in the form of either RCDs at the distribution board, or socket outlet. RCDs are recommended for visible awareness of protection.

3.25 LABELLING

Include label under each controller, switch and circuit breaker on distribution boards. Include a warning notice if light dimmers are used in the installation. List the rating of each circuit.

Completion

3.26 COMPLETION

Leave installation operating correctly, with equipment clean and operational.

4 SELECTIONS

Materials

4.1 SELECTIONS - FITTINGS AND HARDWARE

Confirm selections of all outlet fittings and hardware with the owner in writing before ordering.

4.2 METER BOX

Location: Refer to elevations and plans
Brand / type: As per contractor

4.3 DISTRIBUTION BOARD

Location: Refer to plans
Brand / type: As per contractor

Outlets - fittings

4.4 INTERIOR OUTLETS

Item	Brand / type
Switch / socket outlets:	Coordinate with client for locations
Coverplate colour:	As per client
Switch module colour:	As per client

Item	Brand / type
Light dimmers:	As per client

4.5 EXTERIOR SWITCHES AND SOCKETS

Item	Brand / type
Weatherproof socket outlets:	Coordinate with client

4.6 MISCELLANEOUS ELECTRICAL ITEMS

Item	Brand / type
Extractor fan:	Weiss Extractor FV130

4.7 SPACE HEATERS

Location: Refer to plans
Brand / type: TBC

4.8 HEATED TOWEL RAILS

Location	Brand / type
As per plans	TBC with client

4.9 BATHROOM FANS AND HEATERS

Location	Brand / type
Bathroom / ensuite-Heating:	TBC with client
Bathroom / ensuite-Extract:	Weiss Extractor FV130

4.10 ELECTRICAL APPLIANCES

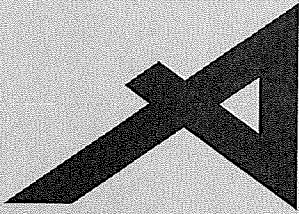
Item	Brand / type
Wall oven:	Gaggenau BOP25101 & BSP250100
Cooker top/hob:	Gaggenau CV280110
Range hood:	TBC

SECTION 6

Technical Information

(Manufacturer's Information)

- ~~- Septic Tank & Effluent Design incl. fencing~~
- ~~- ECan Approval Documents~~
- Gas Fire
- ~~- Heating Unit~~
- ~~- Solar Panels~~
- Central Heating Systems
- ~~- A4 Details/Acceptable Solution Extract~~
- ~~- Well/Water Test~~



BRANZ Appraised
Appraisal No.256 [2014]

BRANZ Appraisals
Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 256 (2014)**

This Appraisal replaces Appraisal
No. 256 (2009).

**EXPOL UNDERFLOOR
INSULATION**

Expol Limited
PO Box 13 560
Onehunga
Auckland

Tel: 09 634 3449
Fax: 09 634 0756
Web: www.expol.co.nz

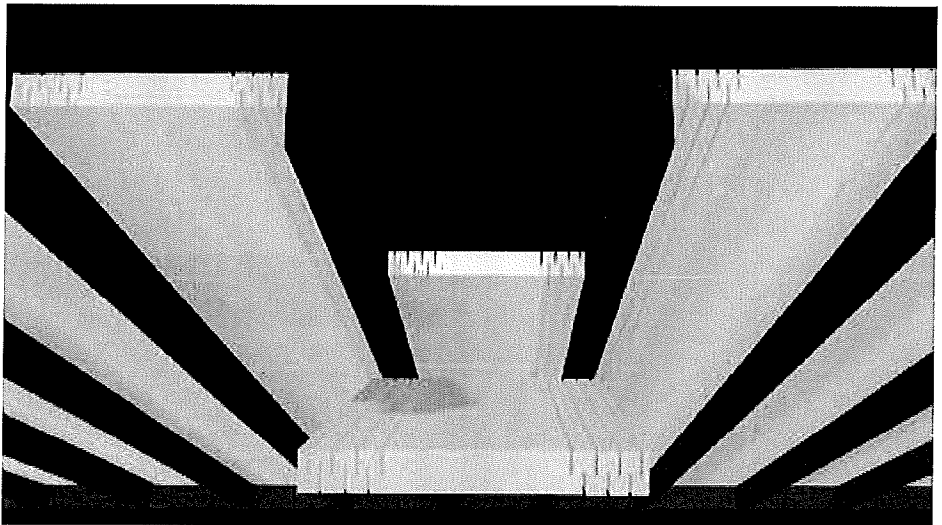


BRANZ
BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz



Product

1.1 EXPOL Underfloor Insulation is an Expanded Polystyrene (EPS) foam board for use as thermal insulation for timber frame floors. The insulation is pre-cut to fit a range of flooring joist spacings.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

Scope

2.1 EXPOL Underfloor Insulation has been appraised as a thermal insulation material for timber framed floors in new or existing domestic and commercial buildings.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, EXPOL Underfloor Insulation, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1(a) not less than 50 years, and B2.3.1(b) 15 years. EXPOL Underfloor Insulation will meet these requirements. See Paragraphs 8.1 and 8.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. EXPOL Underfloor Insulation meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a) and H1.3.2 E. EXPOL Underfloor Insulation will contribute to meeting these requirements. See Paragraph 13.1.

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. EXPOL Underfloor Insulation thermal resistance (R-value) has been determined by testing to AS/NZS 4859.1 which is an acceptable method.

Technical Specification

Description

- 4.1 EXPOL Underfloor Insulation is Expanded Polystyrene (EPS) foam boards with pre-cut concertina cuts to both edges. EXPOL Underfloor Insulation is available as set out in Table 1.
- 4.2 EXPOL Underfloor Insulation is white in colour and is supplied in colour coded packaging to identify the different widths with labelling in compliance with AS/NZS 4859.1.
- 4.3 EXPOL Underfloor Insulation is manufactured from flame retardant bead to meet the manufacturing requirements of AS 1366.3.
- 4.4 Nylon brackets and stainless steel nails are available as an optional method of fixings.

Table 1: EXPOL Underfloor Insulation product range.

R-value	Nominal Thickness (mm)	Width (mm)	Length (mm)	Pieces per Bag
R1.4	60	360	1200	12
R1.4	60	410	1200	11
R1.4	60	470	1200	10
R1.4	60	560	1200	9

Handling and Storage

- 5.1 On site, EXPOL Underfloor Insulation must be stored under cover and out of sunlight.
- 5.2 EXPOL Underfloor Insulation is able to get wet during the installation process, but it is recommended that the product is dry before installation against the underfloor or before flooring is fitted.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for EXPOL Underfloor Insulation. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 EXPOL Underfloor Insulation is intended for use as thermal insulation to floors, compression fitted between floor joists with the option of being clipped in place with a bracket. The panels are supplied in widths to suit most installations.
- 7.2 EXPOL Underfloor insulation has an R-value of 1.4 m²C/W. It can be used to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. For construction R-values, refer to BRANZ House Insulation Guide.
- 7.3 The building envelope must be constructed to ensure the insulation remains dry throughout the life of the building.
- 7.4 EXPOL Underfloor Insulation, when installed following the Technical Literature, is suitable for use in exposed underfloors without a lining. Clips should be used in wind exposed situations.

Electrical Cables

- 7.5 PVC cables must be prevented from direct contact with EXPOL Underfloor Insulation. Refer to Paragraph 15.6.

Durability

Serviceable Life

- 8.1 Where the building is maintained so that provisions of the NZBC E2 and E3 Clauses are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance, EXPOL Underfloor Insulation can expect to have a serviceable life of at least 50 years.
- 8.2 Expol nylon brackets must be used to achieve a 50 year serviceable life.
- 8.3 Nylon support brackets are required to support EXPOL Underfloor Insulation for underfloors that are subjected to wind exposure.

Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of the dampness repaired. The insulation must be dry and the floor framing must be clean, dry and free from all contaminants and mould before refitting the insulation.
- 9.2 Regular inspections must be completed to insure that installation integrity is maintained and any dislodged panels are reinstalled.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to EXPOL Underfloor Insulation from heat sources such as fire places, heating appliances, flues, chimneys and recessed luminaires (except classed IC - F). Refer to Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1.

Control of Internal Fire and Smoke Spread

- 11.1 Where the ceiling of an occupied space forms the underside of the thermal envelope, EXPOL Underfloor Insulation must be enclosed by an internal lining depending on the Risk Group. Refer to the relevant NZBC Acceptable Solutions C/AS1 - C/AS6 for specific internal surface finish and sub floor space requirements.

Internal Moisture

- 12.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.

Energy Efficiency

- 13.1 EXPOL Underfloor Insulation will contribute to meeting the requirements of NZBC Clause H1 Performance H1.3.1(a) and H1.3.2 E through compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraph 7.2.

Installation Information

Installation Skill Level Requirements

14.1 Installation of EXPOL Underfloor Insulation must be completed by an installer with an understanding of insulation installation.

General

15.1 It is important to achieve a tight friction fit between the edge of the board and the joist. This is achieved by the compression of the pre-cut concertina cuts to the edges of the boards.

15.2 All gaps must be filled and a tight fit made at butt joints. Small gaps can be sealed with extra material, or a urethane foam.

15.4 EXPOL nylon brackets must be used, in line with the Technical Literature, to achieve a 50 year serviceable life.

15.5 EXPOL Underfloor Insulation must be separated from all sources of heat.

15.6 PVC cables must be prevented from direct contact with any EXPOL Underfloor Insulation. A physical separation must be provided by running cables around the insulation boards, or by wrapping the cables with separating material supplied by Expol Limited.

Inspections

16.7 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of EXPOL Underfloor Insulation installations.

Health and Safety

16.1 NZS 4246 gives guidance for health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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

Tests

17.1 BRANZ has carried out thermal resistance testing of EXPOL Underfloor Insulation in accordance with ASTM C518 as part of the material test evaluation to AS/NZS 4859.1.

Other Investigations

18.1 An assessment of the durability of EXPOL Underfloor Insulation has been made by BRANZ technical experts.

18.2 The Technical Literature including Installation Instruction have been reviewed by BRANZ and found to be satisfactory.

18.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation and to examine completed installations.

Quality

19.1 The manufacture of EXPOL Underfloor Insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes were obtained and found to be satisfactory.

19.2 Expol Limited is responsible for the quality of the product supplied.

19.3 Quality of installation of the product on site is the responsibility of the installer.

19.4 Maintenance of the building is the responsibility of the building owner.

Sources of Information

- AS 1366.3: 1992 Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- NZS 4218: 2004 Energy efficiency - Small building envelope.
- NZS 4218: 2009 Thermal Insulation - Housing and small buildings.
- NZS 4243: 2007 Energy efficiency - Large buildings.
- NZS 4246: 2006 Energy efficiency - Installing insulation in residential buildings
- NZS 4214: 2006 Methods of determining the total thermal resistance of buildings.
- Compliance Document for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition October 2007 (including Amendment 2, October 2011).
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The New Zealand Building Regulations 1992.



BRANZ

In the opinion of BRANZ, EXPOL Underfloor Insulation is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Expol Limited, and is valid until further notice, subject to the Conditions of Appraisal.

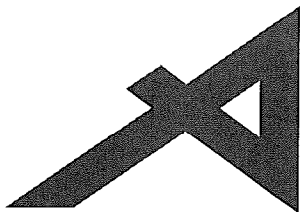
Conditions of Appraisal

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. Expol 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 Expol 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 Expol Limited or any third party.

For BRANZ

C Percy
Chief Executive

Date of issue: 17 December 2014



BRANZ Appraised
Appraisal No. 238 [2012]

**PINK® BATTS®
INSULATION**

Appraisal No. 238 [2012]

This Appraisal replaces BRANZ
Appraisal No. 238 [2008].

Amended 28 July 2016



BRANZ Appraisals

Technical Assessments of
products for building and
construction.

Product

1.1 Pink® Batts® insulation is a range of resin bonded fibrous glasswool thermal insulating material for use in walls, ceilings and roofs of buildings. Pink® Batts® insulation is pre-cut to suit a range of framing spacings.

Scope

2.1 Pink® Batts® insulation has been appraised as a thermal insulating material for framed or part-framed walls, ceilings and roofs of domestic and commercial buildings.



**Tasman Insulation New
Zealand Ltd**

PO Box 12 069

Penrose

Auckland

Tel: 09 579 2139

Fax: 09 571 3482

Freephone: 0800 746 522

Web: www.pinkbatts.co.nz

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Pink® Batts® insulation, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years and B2.3.1 (b) 15 years. Pink® Batts® insulation will meet these requirements. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Pink® Batts® insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Pink® Batts® insulation meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a] and H1.3.2 E. Pink® Batts® insulation will contribute to meeting these requirements. See Paragraphs 14.1 and 14.2.

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. Pink® Batts® insulation thermal resistance (R-value) has been determined by AS/NZS 4859.1 which is an acceptable method.



BRANZ

1222 Moonshine Rd,

RD1, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

Tel: 04 237 1170

branz.co.nz

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications **APPROVED** in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved





BRANZ Appraisal
Appraisal No. 238 [2012]
01 May 2012

PINK® BATTS® INSULATION

Technical Specification

- 4.1 Pink® Batts® insulation is a resin bonded fibrous glasswool insulation manufactured from recycled and/or virgin glass and cured urea extended phenolic resin.
- 4.2 Pink® Batts® insulation is manufactured in a range of sizes to suit framing centres and cavity depths. Building Insulation Blanket (BIB) is supplied in rolls for commercial applications. Pink® Batts® insulation is available as set out in Table 1.

Table 1: Pink® Batts® insulation product table.

R-value	Nominal Thickness (mm)	Width (mm)	Length (mm)	Nett Area (m ²)	Density (kg/m ³)
Ceiling Insulation					
1.8	95	432	1220	13.7	8.3
2.2	115	432	1220	12.6	8.2
2.6	140	432	1220	10.5	7.7
3.2	170	432	1220	8.4	8.4
3.2	170	432	1220	8.4	7.1
3.6 [†]	180	432	1220	7.4	7.5
3.6	180	432	1220	7.4	8.8
4.0 [†]	195	432	1220	6.3	8.1
4.6 [†]	215	432	1220	5.3	9.0
5.0 [†]	220	432	1220	4.2	10.0
6.0 [†]	235	432	1220	3.7	13.0
6.3 [†]	250	432	1220	3.2	12.3
7.0 [†]	260	432	1220	2.6	15.8
Wall Insulation					
1.8	90	580	1140	17.2	9.0
2.2	90	580	1140	13.9	12.0
2.4	90	580	1140	10.6	15.5
2.4	90	580	1140	10.6	17.4
2.6 [†]	90	580	1140	9.9	20.0
2.8 [†]	90	580	1140	6.6	28.6
3.2 [†]	140	580	1140	9.9	10.7
3.6 [†]	140	580	1140	7.3	14.0
4.0 [†]	140	580	1140	5.3	20.5
Building Insulation Blanket					
1.8	75	1200	8000	19.2	12.0
Masonry Wall Insulation					
1.0	40	580	1220	21.2	14.0
Narrow Wall Insulation					
2.2	90	380	1140	9.5	12.0
2.6 [†]	90	380	1140	7.8	20.0
Steel Wall Insulation					
2.2	90	610	1220	15.6	12.0
2.6 [†]	90	610	1220	9.7	20.0



BRANZ Appraisal
Appraisal No. 238 [2012]
01 May 2012

PINK® BATTS® INSULATION

Table 1: Pink® Batts® insulation product table cont.

R-value	Nominal Thickness [mm]	Width [mm]	Length [mm]	Nett Area [m ²]	Density [kg/m ³]
Pink® Batts® Retrofit Ceiling Insulation					
2.9	150	432	1220	9.5	7.7
3.3	175	432	1220	8.8	7.1

¹ Pink® Batts® Insulation products that have the Environmental Choice license.

- 4.3 Pink® Batts® insulation is pink in colour and is baled in pink polythene bags with labelling in compliance with AS/NZS 4859.1.
- 4.4 Pink® Batts® Retrofit Ceiling Insulation is pink in colour and is baled in teal polythene bags with labelling in compliance with AS/NZS 4859.1.
- 4.5 Accessories used with Pink® Batts® insulation, which are supplied by the insulation installer, are wire netting, plastic strapping and fixings.

Handling and Storage

- 5.1 Pink® Batts® insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the bales. The bales must be stored in an orientation that avoids excessive compression of the product.
- 5.2 In general, insulation products are sensitive to the length of time they are stored in compression packaging. Product that does not recover to its nominal thickness may not achieve the stated R-value.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Pink® Batts® insulation. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Pink® Batts® insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Pink® Batts® insulation can be used to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Greater construction R-values can be achieved where specific design is used. For construction R-values refer to the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.
- 7.2 Pink® Batts® insulation is designed to be friction-fitted between wall, ceiling or roof framing. It can also be laid directly on a ceiling lining, over ceiling battens or joists/truss chords. In other horizontal situations, it must be adequately supported by galvanised wire netting or some other suitable durable material.
- 7.3 Where the insulation is installed in exterior walls, the nominal thickness of the insulation material must be selected to provide a snug close fit which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.
- 7.4 Building Insulation Blanket is designed specifically for commercial roof and commercial wall applications. In residential applications, installation must be completed in line with NZS 4246.
- 7.5 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.



BRANZ Appraisal
Appraisal No. 238 [2012]
01 May 2012

PINK® BATTES® INSULATION

- 7.6 To prevent moisture transfer and to provide roof ventilation, a separation of 25 mm minimum is required between the insulation and any rigid substrate or flexible roof underlay. Selecting specifically designed skillion roof insulation products with a controlled nominal thickness can assist with this requirement.
- 7.7 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.8 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246. See Paragraphs 10.1 - 10.3.

Durability

Serviceable Life

- 8.1 Where the building is maintained so that provisions of NZBC Clauses E2 and E3 are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance [e.g. moisture], Pink® Batts® insulation can expect to have a serviceable life of at least 50 years.

Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of dampness repaired. Cavities must be clean and dry before fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

Prevention of Fire Occurring

- 10.1 Pink® Batts® Insulation is considered a non-combustible material and need not to be separated from heat sources such as fire places, heating appliances, flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1.

Downlights

- 10.2 Recessed luminaires shall be of type and be installed in accordance with NZBC Acceptable Solution C/AS1 to C/AS6, Section 7.4.
- 10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires in existing buildings.

Control of Internal Fire and Smoke Spread

- 11.1 Pink® Batts® Insulation has been classified non-combustible when tested to AS 1530.1 and can therefore be assigned a Group Number of 1-S. Unless foamed plastics building materials are also used as part of the wall or ceiling construction, there are no internal surface finish requirements in Risk Group SH in accordance with NZBC Acceptable Solution C/AS1. When used in an occupied space, Pink® Batts® Insulation does not need to be enclosed in any Risk Group. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6 for the specific internal surface requirements for walls or ceilings in other Risk Groups.

External Moisture

- 12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.
- 12.2 The moisture content of the construction materials at the time of installing and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2 (a), or a lower moisture content if required by the lining manufacturer.

Internal Moisture

- 13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.



BRANZ Appraisal
Appraisal No. 238 [2012]
01 May 2012

PINK® BATTS® INSULATION

13.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2 E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

14.1 Pink® Batts® insulation will contribute to meeting the requirements of NZBC Clause H1, Performance H1.3.1 [a] and H1.3.2 E by compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraphs 7.1 - 7.8.

14.2 Pink® Batts® insulation R-values have been determined by BRANZ testing to AS/NZS 4859.1 and are given in Table 1.

Installation Information

Installation Skill Level Requirements

15.1 Installation of Pink® Batts® Insulation must be completed by an installer with an understanding of Insulation installation.

General

16.1 Installation of Pink® Batts® insulation must be in accordance with the Technical Literature and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.

16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.

16.3 Pink® Batts® insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.

16.4 Pink® Batts® insulation is supplied in segment and blanket form [see Table 1] to suit framing layouts. The product is able to be cut to suit wall cavities and when fitted between roof or ceiling framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced. In wall cavities the insulation must be neatly friction-fitted between framing members to prevent sagging. In ceiling or roofs, the insulation may be fitted between framing members or fitted over framing members and butted tightly. The insulation must extend to the external wall top plate. The insulation must not be folded or compressed. A close even fit provides the most efficient thermal performance. Whenever possible, the insulation should be fitted beneath wiring or plumbing.

16.5 The clearance requirements for heating appliances and downlights must be followed. Refer also to NZS 4246.

Inspections

16.6 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Pink® Batts® insulation installations.

Health and Safety

17.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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

Tests

18.1 BRANZ has carried out thermal resistance testing of Pink® Batts® insulation in accordance with AS/NZS 4859.1.

18.2 Tests have been carried out in accordance with AS 1530.1. Pink® Batts® insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.



BRANZ Appraisal
 Appraisal No. 238 [2012]
 01 May 2012

PINK® BATTS® INSULATION

Other Investigations

- 19.1 An assessment of the durability of Pink® Batts® insulation has been made by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature including installation instructions have been reviewed by BRANZ and found to be satisfactory.
- 19.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality

- 20.1 The manufacture of Pink® Batts® insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.
- 20.2 The range of Pink® Batts® products have been assessed for their environmental impact by the New Zealand Ecolabelling Trust and comply with the requirements of the Environmental Choice Specification, Licence No. 2504017 – Thermal (resistive type) Building Insulants. The products that have the Environmental Choice license are noted in Table 1.
- 20.3 Tasman Insulation New Zealand Ltd is responsible for the quality of the product supplied.
- 20.4 Quality of installation of the product on site is the responsibility of the installer.
- 20.5 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.

Sources of Information

- AS 1530.1: 1994 Combustibility test for materials.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- NZS 4246: 2006 Energy efficiency – Installing insulation in residential buildings.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- Compliance Document for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition, October 2007 [including Amendment 2, October 2011].
- Ministry of Business, Innovation and Employment record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 09 September 2015.

This Appraisal has been amended to update the Appraisal text, Product Range as set out in Table 1 and to update clause changes as required by the introduction of NZBC Fire Clauses C1 to C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 2, dated 04 February 2016.

This Appraisal has been amended to update the Appraisal Holders contact details.

Amendment No. 3, dated 24 March 2016.

This Appraisal has been amended to update the Product Range in Table 1.

Amendment No. 4, dated 28 July 2016.

This Appraisal has been amended to update the Product Range in Table 1 and to add Pink® Batts® Retrofit Ceiling Insulation into the Appraisal. The Appraisal has also been amended to update the Paragraph in Control of Internal Fire and Smoke Spread.



BRANZ Appraisal
Appraisal No. 238 [2012]
01 May 2012

PINK® BATTES® INSULATION



In the opinion of BRANZ, Pink® Batts® Insulation is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Tasman Insulation New Zealand Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

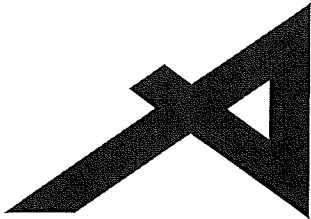
Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. Tasman Insulation New Zealand Ltd:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by Tasman Insulation New Zealand Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Tasman Insulation New Zealand Ltd or any third party.

For BRANZ

A handwritten signature in black ink, appearing to read 'Pieter Burghout', written over a horizontal line.

Pieter Burghout
Chief Executive
Date of Issue:
01 May 2012



BRANZ Appraised

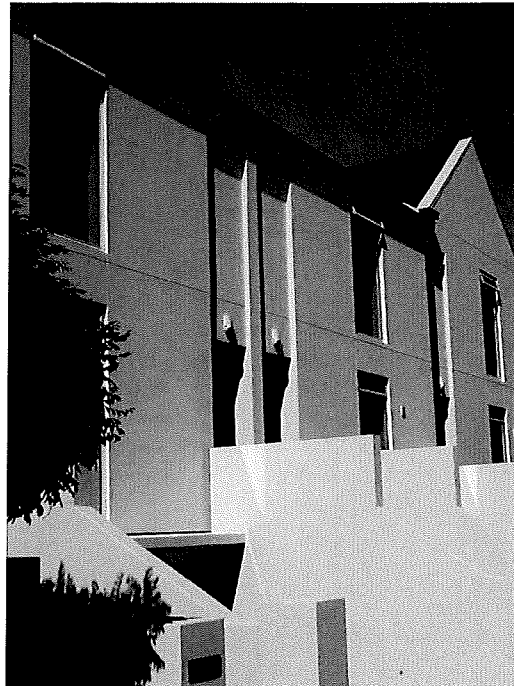
Appraisal No. 681 [2010]

INTEGRA LIGHT WEIGHT CONCRETE FACADE SYSTEM

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

Appraisal No. 681 [2010]

Amended 06 March 2018



BRANZ Appraisals

Technical Assessments of products
for building and construction.

Resene Construction Systems

Rockcote Resene Limited

PO Box 39108
Harewood
Christchurch

Tel: 03 338 6328

Web: www.reseneconstruction.co.nz



BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 The Integra Light Weight Concrete Facade System is a pressure moderated cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- 1.2 The system consists of autoclaved aerated concrete (AAC) panels (Integra panels) fixed over high density polystyrene or timber battens to form a 20 or 40 mm cavity. The coating system consists of a minimum 5 mm thickness of fibreglass mesh reinforced polymer-modified plasters and high-build, tintable finishing plasters. The plaster is finished with a tintable protective finishing coat. The plaster can be applied to give different texture appearances.
- 1.3 The system incorporates EdgeSeal joinery flashings. It also incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 or 40 mm drained cavity.

Scope

- 2.1 The Integra Light Weight Concrete Facade System has been appraised as an external wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC; and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
 - situated in NZS 3604 Wind Zones up to, and including Extra High.
- 2.2 The Integra Light Weight Concrete Facade System has also been appraised for weathertightness and structural wind loading when used as an external wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- 2.3 The Integra Light Weight Concrete Facade System must only be installed on vertical surfaces (except for tops of parapets, sills and balustrades, which must have a minimum 10° slope and be waterproofed in accordance with the Technical Literature).
- 2.4 The system is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. *[Note: The Appraisal of the Integra Light Weight Concrete Facade System relies on the joinery meeting the requirements of NZS 421.1 for the relevant Wind Zone or design wind pressure.]*



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

- 2.5 Installation of components and accessories supplied by Rockcote Resene Limited and its approved applicators must be carried out only by Rockcote Resene Limited approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, the Integra Light Weight Concrete Facade System 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 Integra Light Weight Concrete Facade System meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 10.1 - 10.4.

Clause B2 DURABILITY: Performance B2.3.1 (b), 15 years, B2.3.1 (c), 5 years, and B2.3.2. The Integra Light Weight Concrete Facade System meets these requirements. See Paragraphs 11.1 and 11.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Integra Light Weight Concrete Facade System meets this requirement. See Paragraphs 15.1 - 15.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Integra Light Weight Concrete Facade System meets this requirement and will not present a health hazard to people.

- 3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

- 4.1 System components and accessories supplied by Rockcote Resene Limited are as follows:

Cavity Battens

- Cavity battens are manufactured from high density [Class H] expanded polystyrene [EPS] with an approximate density of 28 kg/m³. The battens are 40 mm wide by 22 or 40 mm thick and are supplied in 1200 mm lengths.

Integra Panels

- Integra panels are 50 mm thick, manufactured from autoclaved aerated concrete with an approximate density of 31 kg/m². Integra panels are supplied 2.2 m long x 600 mm wide.

Bedding Compound

- Rockcote MultiStop FRP Bedding Compound is a polymer-modified, Portland cement-based thin section jointing plaster supplied in 15 kg bags and mixed on site with clean drinking water. It is applied with a broad knife to the joints of the Integra Panels.

Base Plaster

- Rockcote PM100 Quick Render is a dry mix, cement-based, polymer-modified plaster supplied in 20 kg bags and mixed on site with clean water. It is used as a base coat for bonding and bedding the fibreglass mesh and is trowel-applied to an approximate thickness of 4-5 mm.
- Resene Construction Systems RMaxx is a high-yielding, cement-free dispersion based basecoat plaster supplied in 20 kg pails. It is applied as the base coat in a minimum 1.5 mm layer followed by the embedment of fibreglass mesh reinforcement in the outer surface. An additional 1.0-1.5 mm is applied to fully encase the mesh.

Primer

- Rockcote Render Prime is a water-borne acrylic, polymer dispersion, tintable coating supplied in 15 litre pails. It is brush or roller-applied as a primer between the Rockcote PM100 Quick Render base coat and Rockcote acrylic textures.
- Resene Limelock is a water-borne acrylic, polymer dispersion, tintable coating supplied in 10 litre pails. It is brush or roller applied as a primer between the mineral textures and the finishing system.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Mineral Texture Coating

- Rockcote Mineral Textures are dry mix, cement-based, polymer-modified plasters, supplied in 20 kg bags and mixed on site with clean water. They are trowel or spray applied to an approximate thickness of 1.0 – 3.0 mm.

Acrylic Texture Coating

- Rockcote acrylic texture coatings are ready mixed, tintable, mineral-filled, polymer-based, elastomeric high-build coating with in pail and dry film preservatives, supplied in 10 litre pails. They are spray or trowel applied to an approximate thickness of 0.5 – 2.0 mm. The selected Rockcote texture colour must have a minimum light reflectance value [LRV] of 25%.

uPVC Primer, Plaster Modifier and Finishes

- Multistop bedding compound – used as a uPVC primer when mixed with diluted Acrylbond resin or water.
- Acrylbond is a water-based co-polymer resin supplied in 4 and 15 litre pails used as a plaster modifier.
- Rockcote Premium Armour is a water-borne 100% acrylic-based protective finish for use over Rockcote Textures. It is supplied in 4 and 15 litre pails and is brush or roller applied. The protective finish coat must have a minimum LRV of 25%.
- Resene X200 is an acrylic waterproofing membrane for use as a protective finish over Rockcote Textures. It is supplied in 4 and 10 litre pails and is brush, roller or spray applied. The protective finish coat must have a minimum LRV of 25%.

Accessories

- Reinforcing mesh – an alkali-resistant fibreglass with a nominal mesh size of approximately 5.0 x 4.0 mm and an approximate weight of 160 g/m² or a nominal mesh size of approximately 8.0 x 9.0 mm and an approximate weight of 170 g/m².
- Sticky Mesh – alkali-resistant fibreglass, 150 mm wide corner pieces.
- uPVC components – starter strip flashing, standard corner flashing, vertical control joint, horizontal control joint, EdgeSeal sill, jamb and head flashings, and 50 mm ventilated starter strip.
- 3M All Weather Flashing Tape 8067 – flexible flashing tape with a proprietary backing and an acrylic pressure sensitive adhesive to seal the EdgeSeal head flashing to the building underlay. The tape is available 76 mm wide in rolls 22.8 m long.

4.2 Accessories used with the system which are supplied by the Rockcote Resene Limited approved applicator are:

- Timber Cavity Battens - nominal 50 mm wide x 25 mm thick (minimum finished size of 45 mm wide x 18 mm thick), or 40 x 40 mm dressed timber treated to Hazard Class H3.1.
- Cavity batten fixings – 30 or 40 x 2.5 mm hot-dip galvanised steel flat head nails (for 22 mm thick battens), or 60 x 2.8 mm hot-dip galvanised steel flat head nails (for 40 mm thick battens) for timber frame, or construction adhesive for temporary fixing to building underlay over timber or steel frame.
- uPVC component fixings – 30 x 2.5 mm hot-dip galvanised steel flat head nails to timber frame and AS 3566 Corrosion Class 3, 20 mm screws to steel frame.
- Integra fixings [timber frame] – AS 3566 Corrosion Class 4 hot-dip galvanised wood screws with a head diameter of 14 mm and a shank diameter of 5.1 mm in NZS 3604 defined Exposure Zones B, C and D. Refer to Table 1 for fixing length requirements.

Table 1: Integra panel fixing lengths (timber frame)

Integra Panel and Cavity Batten Thickness	Screw Size
50 mm panel plus 20 mm EPS cavity batten	100 mm or greater
50 mm panel plus 20 mm timber cavity batten	100 mm or greater
50 mm panel plus 40 mm EPS cavity batten	125 mm or greater
50 mm panel plus 40 mm timber cavity batten	125 mm or greater



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

- Integra fixings [steel frame] – AS 3566 Corrosion Class 4 hot-dip galvanised self-drilling screws with a head diameter of 14 mm and a shank diameter of 5.1 mm in NZS 3604 defined Exposure Zones B, C and D. Refer to Table 2 for fixing length requirements.

Table 2: Integra panel fixing lengths [steel frame]

Integra Panel and Cavity Batten Thickness	Screw Size
50 mm panel plus 20 mm EPS cavity batten	80 mm or greater
50 mm panel plus 20 mm timber cavity batten	80 mm or greater
50 mm panel plus 40 mm EPS cavity batten	100 mm or greater
50 mm panel plus 40 mm timber cavity batten	100 mm or greater

- **Waterproof membrane tapes** – tapes covered by a valid BRANZ Appraisal for use as waterproof membranes over the tops of plastered parapets, balustrades, fixing blocks and the like.
 - **Flexible sealant** – sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- 4.3 Accessories used with the system which are supplied by the building contractor are:
- **Flexible wall underlay** – building paper complying with NZBC Acceptable Solution E2/AS1, Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as wall underlays.
 - **Flexible building underlay support** – polypropylene strap, 75 mm galvanised mesh, galvanised wire, or additional vertical battens for securing the flexible building underlay in place and preventing bulging of the bulk insulation into the drainage cavity. *[Note: mesh and wire galvanising must comply with AS/NZS 4534.]*
 - **Rigid wall underlay** – Plywood or fibre cement sheet complying with NZBC Acceptable Solution E2/AS1, Table 23, or rigid sheathing covered by a valid BRANZ Appraisal for use as rigid air barrier systems.
 - **Flexible sill and jamb tapes** – flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1 Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.
 - **Joinery head flashings** – as supplied by the joinery manufacturer or contractor.
 - **Window and door trim cavity air seal** – air seals complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal for use around window, door and other wall penetration openings.

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Rockcote Resene Limited or the approved applicators, whether on or off site, are under the control of Rockcote Resene Limited approved applicators. Dry storage must be provided on site for the Integra panels, fibreglass mesh and bags of plaster. EPS battens, uPVC flashings and profiles must be protected from direct sunlight and physical damage, and should be stored flat and under cover. Liquid components must be stored in frost-free conditions.
- 5.2 Handling and storage of all materials supplied by the building contractor, whether on or off site, are under the control of the building contractor. Materials must be handled and stored in accordance with the relevant manufacturer’s instructions.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Integra Light Weight Concrete Facade 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. The Integra Light Weight Concrete Facade System listing on the BRANZ website excludes specific details. These details have not been assessed by BRANZ and are outside the scope of the Appraisal.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Design Information

Framing

Timber Treatment

- 7.1 Timber wall framing behind the Integra Light Weight Concrete Facade System must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

- 7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1.170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1200 mm centres.
- 7.3 For specifically designed timber framed buildings situated in Wind Zones above NZS 3604 defined Extra High, there must be a minimum timber framing size of 90 x 45 mm, and a minimum timber grade of MSG8.
- 7.4 Timber framing must have a maximum moisture content of 24% at the time of the cladding application. *[Note: If Integra panels are fixed to framing with a moisture content of greater than 24% problems may occur at a later date due to excessive timber shrinkage.]*

Steel Framing

- 7.5 Steel framing must be to a specific design meeting the requirements of the NZBC.
- 7.6 The minimum framing specification is 'C' section studs and nogs with an overall section size of 75 mm web and 32 mm flange. Steel thickness must be a minimum 0.75 mm.
- 7.7 In all cases studs must be at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1200 mm centres.

Integra Setout

- 7.8 Integra panels are installed horizontally. Vertical panel edges may be jointed on-stud or off-stud and vertical panel joints must be staggered for each row. Integra panels must be supported at fixing locations with vertical cavity battens or cavity spacers 100 mm long maximum in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.2 (f). At the base of the wall, the Integra panels must hang 50 mm below the supporting framing.

General

- 8.1 When the Integra Light Weight Concrete Facade System is used for specifically designed buildings up to design differential 2.5 kPa ULS wind pressure, only the weathertightness aspects of the cladding and maximum framing centres and Integra panel fixing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.
- 8.2 Punchings in the starter strip provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 (b).
- 8.3 The ground clearance to finished floor levels as set out in NZS 3604 must be adhered to at all times. At ground level, paved surfaces, such as footpaths, must be kept clear of the bottom edge of the cladding system by a minimum of 100 mm, and unpaved surfaces by 175 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Table 18. *[Note: A detail showing Integra panel carried within 35 mm of a drain is included in the Technical Literature. This detail is outside the scope of this Appraisal and approval for its use is by specific design.]*
- 8.4 At balcony, deck or roof/wall junctions, the bottom edge of the Integra Light Weight Concrete Facade System must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

- 8.5 All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the fixing lengths must be increased by a minimum of the thickness of the underlay.
- 8.6 Where penetrations through the Integra Light Weight Concrete Facade System are wider than the cavity batten spacing, allowance must be made for airflow between adjacent cavities. A minimum 10 mm gap must be left between the bottom of the vertical cavity batten and the flashing to the opening.
- 8.7 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. The Technical Literature provides some guidance. Details not included within the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Electrical Cables

- 8.8 PVC sheathed electrical cables must be prevented from direct contact with EPS cavity battens. When cables must penetrate the EPS for exterior electrical connections, the cable must be directly supported by passing through an electrical conduit. There is no separation requirement for PVC sheathed electrical cables passing through Integra panels.

Control Joints

- 9.1 Control joints where Integra panels are used must be constructed in accordance with the Technical Literature and be provided as follows:
- Horizontal control joints - at maximum 6.0 m centres.
 - Vertical control joints - at maximum 8.0 m centres; aligned with any control joint in the structural framing, or where the system abuts different cladding types.

(Note: Horizontal and vertical control joints must be located over structural supports. The Technical Literature provides some guidance for the design of vertical control joints where the system abuts different cladding types. Details not included within the Technical Literature are outside the scope of this Appraisal and are the responsibility of the designer - see Paragraph 8.7.)

Inter-storey Junctions

- 9.2 Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 (b).

Structure

Mass

- 10.1 The mass of the Integra Light Weight Concrete Facade System is approximately 34.5 kg/m², therefore it is considered a medium wall cladding in terms of NZS 3604.

Impact Resistance

- 10.2 The system has adequate resistance to impact loads likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Wind Zones

- 10.3 The Integra Light Weight Concrete Facade System is suitable for use in all Wind Zones of NZS 3604, up to, and including Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to design differential 2.5 kPa ULS wind pressure when the buildings are specifically designed.

Integra Fixing

- 10.4 Integra panels where a 20 mm deep cavity is used must be fixed through the cavity battens and cavity spacers to the wall framing with two screws per stud. The screws must be positioned 50 mm minimum (100 mm maximum) from the panel edge. Integra panels where a 40 mm deep cavity is used must be fixed through the cavity battens and cavity spacers to the wall framing with three screws per stud. The top and bottom screws must be positioned 50 mm minimum (100 mm maximum) from the panel edge, with the middle screw positioned near the centre of the panel. The fixing heads must finish flush with or slightly below the surface of the panel. Where studs are at 600 mm centres, one fixing is required into the bottom plate at mid-dwang length.

Durability

- 11.1 The Integra Light Weight Concrete Facade System meets the performance requirements of NZBC Clause B2.3.1 [b], 15 years for the cladding system and plaster finish, and the performance requirements of NZBC Clause B2.3.1 [c], 5 years for the exterior paint system.

Serviceable Life

- 11.2 The Integra Light Weight Concrete Facade System is expected to have a serviceable life of at least 30 years provided the system is maintained in accordance with this Appraisal, and the Integra panels, fixings and plaster are continuously protected by a weathertight coating and remain dry in service.
- 11.3 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of Integra panels in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

- 12.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.
- 12.2 Regular cleaning (at least annually) of the paint coating is required to remove grime, dirt and organic growth and to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent. Paint systems must be recoated at approximately 5-8 yearly intervals in accordance with the paint manufacturer's instructions.
- 12.3 Annual inspections must be made to ensure that all aspects of the cladding system, including the coating system, plasters, flashings and any sealed joints remain in a weatherproof condition. Any cracks, damaged areas or areas showing signs of deterioration which could allow water ingress, must be repaired immediately. The Integra Light Weight Concrete Facade System must be repaired in accordance with the instructions of Rockcote Resene Limited.
- 12.4 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the system. *{Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of the Integra Light Weight Concrete Facade System.}*



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Control of External Fire Spread

- 13.1 The Integra Light Weight Concrete Façade System using Rockcote PM100 Quick Render with a mineral texture coating and Rockcote Premium Armour protective finishing coat has a peak heat release rate of less than 100 kw/m² and a total heat released of less than 25 MJ/m² in accordance with NZBC Acceptable Solution C/AS1, Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at any distance to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.
- 13.2 The Integra Light Weight Concrete Façade System using Rockcote PM100 Quick Render with a mineral texture coating and Resene X200 protective finishing coat has a peak heat release rate of less than 150 kw/m² and a total heat released of less than 50 MJ/m² in accordance with NZBC Acceptable Solution C/AS1, Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at a distance of ≥ 1.0 m to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.
- 13.3 The Integra Light Weight Concrete Façade System using Rockcote PM100 Quick Render with an acrylic texture coating and Resene X200 protective finishing coat has a peak heat release rate of less than 150 kw/m² and a total heat released of less than 50 MJ/m² in accordance with NZBC Acceptable Solution C/AS1, Table 5.1. The system is suitable for use on buildings with a SH Risk Group classification, at a distance of ≥ 1.0 m to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.
- 13.4 The Integra Light Weight Concrete Façade System using any other Resene Construction Systems base plaster, texture or surface finish does not have a peak heat release or total heat released rating. The system is suitable for use on buildings with a SH Risk Group classification, a building height of ≤ 10 m high and a distance of ≥ 1.0 m to the relevant boundary. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 5.8.1 for the specific exterior surface finishes requirements for other building Risk Groups.

Prevention of Fire Occurring

- 14.1 Rockcote Integra panels need not be separated from fireplaces, heating appliances, flues and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, the heat sensitive material must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 to C/AS6, Paragraph 7.5.9 for the protection of combustible materials.

External Moisture

- 15.1 The Integra Light Weight Concrete Facade System, when installed in accordance with this Appraisal and the Technical Literature, prevents the penetration of moisture that could cause undue dampness or damage to building elements.
- 15.2 The cavity must be sealed off from the roof and sub-floor space to meet the performance requirements of Clause E2.3.5.
- 15.3 The Integra Light Weight Concrete Facade System allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet the performance requirements of Clause E2.3.6.
- 15.4 The details given in the Technical Literature for weather sealing are based on the design principle of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.
- 15.5 The use of the Integra Light Weight Concrete Facade System where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for junctions, penetrations, etc to remain weather resistant.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Internal Moisture

- 16.1 The Integra Light Weight Concrete Facade System alone does not meet NZBC Acceptable Solution E3/AS1, Paragraph 1.1.1 [a]. Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

- 16.2 The Integra Light Weight Concrete Facade System is not a barrier to the passage of water vapour, and when correctly installed will not create or increase the risk of moisture damage resulting from condensation. Refer to Paragraph 16.3 for specific requirements for steel framed buildings.
- 16.3 When the Integra Light Weight Concrete Facade System is installed over a steel frame, an expanded polystyrene thermal break must be installed over each steel member to provide a thermal break in accordance with the requirements of NZBC Acceptable Solution E3/AS1, Paragraph 1.1.4 [d]. The wall underlay, cavity battens and the rest of the Integra Light Weight Concrete Facade System are then installed over top of the thermal break in accordance with the Technical Literature and this Appraisal. Where thermal breaks are used, the fixing length must be increased by a minimum of the thickness of the thermal break.

Installation Information

Installation Skill Level Requirements

- 17.1 Installation and finishing of components and accessories supplied by Rockcote Resene Limited and the approved applicators must be completed by trained applicators, approved by Rockcote Resene Limited.
- 17.2 Installation of the accessories supplied by the building contractor must be completed by tradespersons with an understanding of cavity construction, in accordance with instructions given within the Integra Light Weight Concrete Facade System Technical Literature and this Appraisal.

System Installation

Wall Underlay and Flexible Sill and Jamb Tape Installation

- 18.1 The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Integra Light Weight Concrete Facade System. Flexible wall underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.
- 18.2 Where studs are at greater than 450 mm centres and a flexible wall underlay is being used, a building underlay support must be installed over the underlay at maximum 300 mm centres horizontally.

Aluminium Joinery Installation

- 18.3 Aluminium joinery must be installed by the building contractor in accordance with the Technical Literature. A 7.5 - 10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place. The joinery must be spaced 22 - 23 mm off of the face of the wall underlay to allow the Integra Light Weight Concrete Facade System flashings to be installed.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

The Integra Light Weight Concrete Facade System

- 18.4 The system must be installed in accordance with the Technical Literature by Rockcote Resene Limited approved applicators.
- 18.5 The Integra Light Weight Concrete Facade System plaster system must only be applied when the air and substrate temperature is within the range of +5°C to +30°C.

Inspections

- 18.6 The Technical Literature must be referred to during the inspection of Integra Light Weight Concrete Facade System installations.

Finishing

- 18.7 The paint manufacturers' instructions must be followed at all times for application of the paint finish. The plaster must be cured for a minimum of 2-3 days and must be dry before commencing painting.

Health and Safety

- 19.1 Cutting of Integra panels must be carried out in well ventilated areas, and a dust mask and eye protection must be worn.
- 19.2 When power tools are used for cutting, grinding or forming holes, health and safety measures must be observed because of the amount of dust generated.
- 19.3 Safe use and handling procedures for the components that make up the Integra Light Weight Concrete Facade System are provided in the relevant manufacturer's Technical Literature.

Basis of Appraisal

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

Tests

- 20.1 The following testing has been undertaken by BRANZ:
- BRANZ expert opinion on NZBC E2 code compliance for the Integra Light Weight Concrete Facade System was based on evaluation of all details within the scope and as stated within this Appraisal and testing of the Rockcote EPS Cavity Plus Render System to E2/VM1 (as contained within NZBC Clause E2, Amendment 4). The testing assessed the performance of the foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, vertical and horizontal control joints, internal and external corners and balustrade to wall junction with a plastered cap. The Integra Light Weight Concrete Facade System follows the same flashing and weathertightness design principles as the Rockcote EPS Cavity Plus Render System. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of Acceptable Solution E2/AS1 for drained cavity claddings.
 - Wind face load and fastener pull through testing for the Integra Light Weight Concrete Facade System. BRANZ determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber and steel framed walls.
 - In-plane shear testing of the Integra Light Weight Concrete Facade System to determine the system's ability to resist its self-weight.
 - A racking test was completed to examine the performance of the Integra Light Weight Concrete Facade System when the system was subjected to both serviceability level and ultimate level seismic racking deflections, taken to be ±8 mm and ±36 mm respectively. The plaster system did not crack or show signs of damage for the entire test program.
 - Durability testing of the Integra panels to verify the durability of the system. The testing included compressive strength, length change during moisture movement, corrosion protection of steel reinforcement and mineralogy by x-ray diffraction crystallography.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Other Investigations

- 21.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 21.2 Site visits of Integra Light Weight Concrete Facade System installations have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 21.3 The Technical Literature for the Integra Light Weight Concrete Facade System has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of the plasters has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 22.2 The quality management system of the primer, acrylic textures and Resene X200 paint manufacturer, Resene Paints Ltd, has been assessed and registered as meeting the requirements of ISO 9001: 2008.
- 22.3 The manufacture of the Integra panels has been examined by an agent of BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 22.4 The quality of materials, components and accessories supplied by Rockcote Resene Limited is the responsibility of Rockcote Resene Limited.
- 22.5 Quality on site is the responsibility of the Rockcote Resene Limited approved applicators.
- 22.6 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, building wraps, flashing tapes and air seals in accordance with the instructions of Rockcote Resene Limited.
- 22.7 Building owners are responsible for the maintenance of the Integra Light Weight Concrete Facade System installations in accordance with the instructions of Rockcote Resene Limited.

Sources of Information

- AS 3566 - 2002 Self-drilling screws for the building and construction industries.
- AS 3730 Guide to the properties of paints for buildings.
- AS/NZS 1170: 2002 Structural design actions.
- NZS 3602: 2003 Timber and wood-based products for use in building.
- NZS 3603: 1993 Timber Structures Standard.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 7, 01 January 2017).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM

Amendments

Amendment No. 1, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.

Amendment No. 2, dated 14 August 2013.

This Appraisal has been amended to change the system name, include the EdgeSeal window flashings and 40 mm thick cavity battens, and to update clause changes as required by the introduction of the new NZBC Fire Clauses C1 – C6 Protection from Fire and A3 Building Importance Levels.

Amendment No. 3, dated 24 December 2015.

This Appraisal has been amended to update the system name, to reduce the minimum LRV of the finishing system from 40% to 25% and to update the panel fixing requirements.

Amendment No. 4, dated 11 March 2016.

This Appraisal has been amended to increase the maximum dwang spacing from 800 mm to 1200 mm centres.

Amendment No. 5, dated 12 December 2017.

This Appraisal has been amended to add Resene Construction Systems RMaxx and update the Appraisal Holders details.

Amendment No. 6, dated 06 March 2018.

This Appraisal has been amended to update the Control of External Fire Spread section.



BRANZ Appraisal
Appraisal No. 681 [2010]
07 May 2010

INTEGRA LIGHT WEIGHT
CONCRETE FACADE SYSTEM



In the opinion of BRANZ, the Integra Light Weight Concrete Facade System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Rockcote Resene Limited, and is valid until further notice, subject to the Conditions of Appraisal.

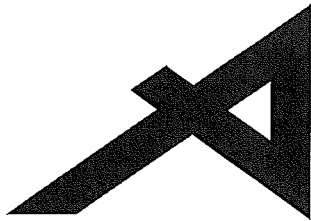
Conditions of Appraisal

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. Rockcote Resene 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 Rockcote Resene 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 Rockcote Resene Limited or any third party.

For BRANZ

A handwritten signature in black ink, appearing to read 'Pieter Burghout'.

Pieter Burghout
Chief Executive
Date of Issue:
07 May 2010



BRANZ Appraised
Appraisal No. 656 [2015]

**VIKING ENVIROCLAD
ROOFING AND DECK
MEMBRANE**

Appraisal No. 656 [2015]

This Appraisal replaces Appraisal No. 656 [2009].

Amended 14 November 2017



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

- 1.1 Viking Enviroclad is a single ply, polyester fabric reinforced, thermoplastic polyolefin (TPO) waterproofing sheet membrane for flat or pitched roofs and decks. It can be applied as a fully bonded or mechanically fixed system.

Scope

- 2.1 Viking Enviroclad has been appraised as a roof and deck waterproofing membrane on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan areas when subject to specific design; and,
 - with building structures designed and constructed to meet the requirements of the NZBC; and,
 - with substrates of plywood or concrete slab; and,
 - with minimum falls for roofs of 1:30 and decks of 1:40; and,
 - with decks that have a maximum area of 40 m²; and,
 - situated in NZS 3604 Wind Zones, up to, and including Extra High.
- 2.2 Viking Enviroclad has also been appraised for use as a roof and deck waterproofing membrane on specifically designed buildings within the following scope:
 - subject to specific structural and weathertightness design; and,
 - with substrates of plywood or concrete slab; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.7 kPa and,
 - with the weathertightness design of junctions for each specific structure being the responsibility of the building designer.
- 2.3 Roofs and decks waterproofed with Viking Enviroclad must be designed and constructed in accordance with the following limitations:
 - nominally flat or pitched roofs and decks constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
 - with no steps within the deck level, no integral roof gardens and no downpipe direct discharge to the decks; and,
 - with the deck membrane continually protected from physical damage by pedestal protection system.
- 2.4 The design and construction of the substrate and movement and control joints is specific to each building, and therefore is the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.



Viking Roofspec

A division of Viking Group Ltd

P O Box 14 541

Panmure

Auckland

Freephone: 0800 729 799

Freefax: 0800 729 788

Email: info@vikingroofspec.co.nz

Web: www.vikingroofspec.co.nz



BRANZ

BRANZ

1222 Moonshine Rd,

RD1, Porirua 5381

Private Bag 50 908

Porirua 5240,

New Zealand

Tel: 04 237 1170

branz.co.nz





BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

2.5 The membrane must be installed by Viking Roofspec Licensed and Trained Installers.

Building Regulations

New Zealand Building Code [NZBC]

3.1 In the opinion of BRANZ, Viking Enviroclad, 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. Viking Enviroclad meets these requirements for loads arising from wind [i.e. B1.3.3 (h).] See Paragraphs 8.1 - 8.3

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Viking Enviroclad meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1, E2.3.2 and E2.3.6. Roofs incorporating Viking Enviroclad meet these requirements. See Paragraphs 13.1 - 13.8.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Viking Enviroclad meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Materials used with the Viking Roofing and Deck Membrane supplied by Viking Roofspec are as follows:

- Viking Enviroclad - a light grey 1.14, 1.5 or 2.0 mm polyester fabric reinforced, multilayer, synthetic roof waterproofing sheet based on thermoplastic polyolefin (TPO). It is supplied in rolls 3.0 m wide x 30.4 m long and 3.66 m wide x 30.4 m long.
- Viking Enviroclad with APEEL™ Protective Film - as per Viking Enviroclad but with a removable protective film to protect the Enviroclad during construction. Note: APEEL™ Protective film is to be removed within 90 days of installation.
- HP-X Fasteners - #15 wire diameter, mini drill point, buttress style thread fasteners for the mechanically fixed Viking Enviroclad.
- Piranha Plates [washers] - Galvalume coated plates [washers] with twelve barbs (in two rows of six). They are 60 mm diameter, 0.9 mm thick with upturned edges.
- Rhino Bond System
 - Induction welding tool.
 - 80 mm round specially coated plates.
 - Magnetic heat sink poles.
- Heat Weldable Walkway - Heat weldable walkway pad with a rough upper surface for traction. It is available in 3 mm thick rolls 750 mm wide x 15 m.
- Sure-Weld Bonding Adhesive - a high strength, solvent based contact adhesive that is used to bond Viking Enviroclad to various porous or non porous substrates. It is supplied as a yellow liquid in 5 US Gallon pails.
- Pipe Seal - an injection moulded, pre-formed flashing for pipes from 25 to 650 mm diameter. They are approximately 200 mm in height with a stepped configuration with a large base diameter to cover plates used for attaching the membrane.
- Coated Metal - a galvanised metal sheet covered with unreinforced Enviroclad membrane. It is used for edge flashing details and is supplied as a sheet 3.1 m long x 1.2 m wide, and then cut to size.
- Universal Corners - Weldable pre-formed internal and external corners for detailing.
- CCW-102 Sealant - a one part, moisture curing, elastomeric polyurethane sealant. It is used to fill the sealant pockets to waterproof around penetrations. It is supplied as a white paste in cartridges of 10.3 Fl oz each.
- Sealant Pockets - pre-fabricated polymer pockets used for placing around penetrations prior to filling with CCW 102 sealant to ensure weathertight detailing.



BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

- **Cut Edge Sealant** - a free flowing polymeric sealant designed to seal cut edges of Viking Enviroclad and therefore seal in any loose reinforcing strands at the cut edge. It is supplied as high solids, gun consistency material or medium solids, free flowing material. It is either white, grey or tan coloured in 8 oz bottles or 1.1 oz tubes.

Handling and Storage

- 5.1 Handling and storage of all materials whether on or off site is under the control of the Viking Roofspec Licensed and Trained Installers. Dry storage must be provided for all products and the rolls of membrane must be lying down on pallets.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Viking Enviroclad Roof and Deck Membrane. 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 Viking Enviroclad membrane can be installed using three different fixing methods, one fully bonded, the other two mechanical. The standard method is fully bonded with heat welded seams. The first mechanical method uses HP-X Fasteners and Piranha Plates fixed through the membrane and then covered by the membrane laps. The second mechanical method, Rhino Bond System, induction welds the membrane to pre-installed washers beneath the membrane.
- 7.2 Viking Enviroclad is for use on roofs, decks, balconies, gutters and parapets where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.3 Viking Enviroclad can be adversely affected by contact with bituminous materials or polystyrene insulation. Viking Roofspec should be contacted for advice in either of these situations.
- 7.4 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".
- 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 that all sheet edges are fully supported.
- 7.6 Roofs where regular foot traffic is envisaged i.e. maintenance of lift equipment, a heat weldable walkway should be used to ensure the membrane is protected. Viking Enviroclad is designed for limited, irregular pedestrian access only.
- 7.7 Decks must always be protected by a pedestal protection system.
- 7.8 Refer to Viking Roofspec for deck foot traffic protection system specifications.

Structure

- 8.1 Viking Enviroclad installed using any of the three installation methods is suitable for use in areas subject to a maximum design differential Ultimate Limit State wind pressure of 2.7 kPa, subject to the limitations of the substrate.



BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

Substrates

Plywood

- 9.1 Plywood must be treated to H3 [CCA treated]. LOSP treated plywood must not be used. Plywood must comply with NZBC Acceptable Solution E2/AS1, Paragraph 8.5.3 and 8.5.5. Where specific design is required [i.e. the building is outside the scope of NZS 3604 and NZBC Acceptable Solution E2/AS1], the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings.

Concrete

- 9.2 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

Existing Construction

- 9.3 A thorough inspection of the plywood or concrete substrate must be made to ensure it is in a fit condition and does not contain any materials or contaminants that will adversely affect the performance of the membrane.
- 9.4 Repairs must be undertaken, where applicable, to ensure the substrate is sound, the joints are sealed, and the flashings are sound. Plywood substrates must be checked for screw fixings, and if necessary refixed as for new plywood.

Durability

Serviceable Life

- 10.1 Viking Enviroclad installation when subjected to normal conditions of environment and with proper maintenance can expect to have a serviceable life of at least 15 years.

Maintenance

- 11.1 Maintenance requirements of the membrane are provided by Viking Roofspec.
- 11.2 In the event of damage to the membrane, the membrane must be repaired by removing the damaged portion and applying a patch as for new work.
- 11.3 Drainage outlets must be maintained to operate effectively.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to Viking Enviroclad from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 13.1 Roofs and decks must be designed and constructed to shed precipitated moisture. They must also be designed and constructed to shed melted snow in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 for buildings within the scope limitations of Paragraph 2.1 is given by the Technical Literature which aligns with details in NZBC Acceptable Solution E2/AS1.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, Viking Enviroclad will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membrane is impervious to water and will give a weathertight roof or deck
- 13.3 The minimum fall for roofs is 1 in 30, for decks 1 in 40 and for gutters 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.
- [Note: Where possible a gutter fall of 1 in 60 is preferred.]*
- 13.4 Viking Enviroclad is impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with NZBC Clause E2.3.6.



BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

- 13.5 Roof falls must be built into the substrate and not created with mortar screeds over the membrane.
- 13.6 Allowance for deflection and settlement of the substrate must be made in the design of the roof to ensure falls are maintained and no ponding of water can occur.
- 13.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the roof or deck does not drain to an external gutter or spouting.
- 13.8 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.
- 13.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design. Weathertightness details that are developed by the designer are outside of the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

Installation Information

Installation Skill Level Requirement

- 14.1 Installation of the membrane must be completed by trained installers, approved by Viking Roofspec.
- 14.2 Installation of substrates must be completed by tradespersons with an understanding of roof and deck construction, in accordance with instructions given within the Viking Roofspec Technical Literature and this Appraisal.

Preparation of Substrates

- 15.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.
- 15.2 Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 515. The relative humidity of the concrete must be 75% or less before membrane application.
- 15.3 The moisture content of a timber substructure must be a maximum of 20% and plywood sheet must be dry at time of membrane application. This will generally require plywood sheets to be covered until just before the membrane is laid, to prevent rain wetting.

Membrane Installation

- 16.1 The installation of this membrane system is very complex and limited to trained applicators only. The Viking Enviroclad Applicators Manual should be referred to in all instances for the correct procedures.

Inspections

- 17.1 Critical areas of inspection for waterproofing systems 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 Technical Literature instructions.

Health and Safety

- 18.1 Safe use and handling procedures for the membrane system is provided in the Technical Literature. The product must be used in conjunction with the relevant Materials Safety Data Sheet.



BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

Basis of Appraisal

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

Tests

- 19.1 Testing has been carried out on the membrane by various organisations for shear/joint strength, adhesion, peel resistance, resistance to ageing, resistance to impact, resistance to frost, resistance to freeze/thaw, resistance to UV, elongation, tensile strength, seam strength, breaking strength, low temperature resistance, static puncture resistance, dynamic puncture resistance and artificial weathering followed by tensile strength, elongation, low temperature flexibility retention, and mechanical fastening. Results and test methods have been reviewed by BRANZ and found to be satisfactory.
- 19.2 Wind face load and fastener pull through testing was completed for the Viking Enviroclad mechanically fastened systems incorporating Piranha Plates and the Rhino Bond System. BRANZ Determined design wind suction pressures, and by comparing these pressures with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for plywood and concrete substrates

Other Investigations

- 20.1 A durability opinion has been provided by BRANZ technical experts.
- 20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 The manufacture of Viking Enviroclad has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certification covering quality aspects associated with this product.
- 21.2 The quality of supply of the product to the market is the responsibility of Viking Roofspec.
- 21.3 Quality on site is the responsibility of the Viking Roofspec Licensed and Trained Installers.
- 21.4 Designers are responsible for the building and substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Viking Roofspec and this Appraisal.
- 21.5 The Building owners are responsible for the maintenance of the Viking Enviroclad Roof and Deck Membrane in accordance with Viking Roofer's instructions.

Sources of Information

- AS/NZS 2269: 2012 Plywood - Structural.
- AS/NZS 1170: 2002 Structural Design action - general principles.
- BRANZ Good Practice Guide - Membrane Roofing, reprint October 2015.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 [Amendment 7, 01 January 2017].
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraised
Appraisal No. 656 [2015]

BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE

Amendments

Amendment No.1, dated 28 January 2016.

This appraisal has been amended to update the roll sizes of the Viking Enviroclad Membrane.

Amendment No.2, dated 14 November 2017.

This appraisal has been amended to add Viking Enviroclad with APEEL™ Protective Film.



BRANZ Appraisal
Appraisal No. 656 [2015]
20 February 2015

VIKING ENVIROCLAD ROOFING
AND DECK MEMBRANE



In the opinion of BRANZ, Viking Enviroclad Roofing And Deck Membrane is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Viking Roofspec, 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. Viking Roofspec:
 - 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 Viking Roofspec.
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 Viking Roofspec or any third party.

For BRANZ

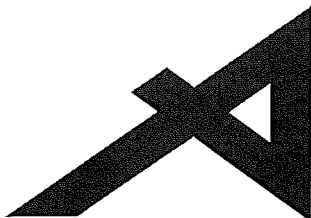
A handwritten signature in black ink, appearing to read 'Chelydra Percy'.

Chelydra Percy

Chief Executive

Date of Issue:

20 February 2015



BRANZ Appraised
Appraisal No. 548 [2013]

TEKTON® BUILDING WRAP

Appraisal No. 548 [2013]

This Appraisal replaces BRANZ Appraisal No. 548 [2007], issued 27 July 2007.
Amended 17 December 2013.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

- 1.1 Tekton® Building Wrap is a synthetic breather-type flexible wall underlay and air barrier for use under direct and non-direct fixed wall cladding on timber and steel framed buildings. The product is manufactured of a coated spun-bonded polypropylene.

Scope

- 2.1 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on timber framed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - with absorbent wall claddings directly fixed to framing; and,
 - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1; and,
 - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.2 Tekton® Building Wrap has been appraised for use as a flexible wall underlay on steel framed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
 - with masonry veneer subject to specific design; and,
 - situated in NZS 3604 Wind Zones up to, and including Very High.
- 2.3 Tekton® Building Wrap has been appraised for use as a flexible wall underlay over rigid wall underlays on timber and steel framed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - with absorbent and non-absorbent wall claddings installed over an 18 mm minimum drained cavity; and,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
 - situated in NZS 3604 Wind Zones up to and including Extra High.
- 2.4 Tekton® Building Wrap has also been appraised for use on buildings subject to specific weathertightness design. Building designers are responsible for the building design and for the incorporation of Tekton® Building Wrap into their design in accordance with the declared properties and the instructions of Marshall Innovations Limited.



Marshall Innovations Limited

PO Box 9411
Greerton
Tauranga
Tel: 07 543 0948
Fax: 07 541 1029
Web: www.mwnz.com



BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz





BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, Tekton® Building Wrap, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet, or contribute to meeting the following provisions of the NZBC:
- Clause B2 DURABILITY:** Performance B2.3.1 (a), not less than 50 years, B2.3.1 (b), 15 years and B2.3.2. Tekton® Building Wrap meets these requirements. See Paragraphs 9.1 and 9.2.
- Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the cladding system, Tekton® Building Wrap will contribute to meeting this requirement. See Paragraphs 12.1 – 12.3.
- Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Tekton® Building Wrap meets this requirement and will not present a health hazard to people.
- 3.2 This is an Appraisal of an **Alternative Solution** in terms of the New Zealand Building Code compliance.

Technical Specification

- 4.1 Tekton® Building Wrap is a 100 g/m² light grey sheet polypropylene membrane material approximately 0.6 mm thick.
- 4.2 The product is supplied in rolls 1.370 m x 74 m and 2.743 m x 37 m. The product is printed with the Tekton® logo repeated along the length of the roll. The rolls are wrapped with an instruction sticker.

Accessories

- 4.3 Accessories used with Tekton® Building Wrap which are supplied by the installer are:
- Fixings – staples, clouts, screws or proprietary wrap fixings, or other temporary fixings to attach the wall wrap to the framing.
 - Wall underlay support – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall wrap in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Handling and Storage

- 5.1 Handling and storage of the product, whether on or off site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Tekton® Building Wrap. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

Timber and Steel Framing

- 7.1 Studs must be provided at maximum 600 mm centres. Dwargs must be fitted flush between the studs at maximum 1200 mm centres.

General

- 7.2 Tekton® Building Wrap is intended for use as an alternative to conventional building papers which are fixed over timber and steel framed walls in order to limit the entry of wind into building cavities, and to act as a secondary barrier to wind-driven rain.



BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP

- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed in. Hence, the building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.
- 7.4 Tekton® Building Wrap must not be exposed to the weather or ultra violet light for a total of more than 60 days before being covered by the wall cladding.
- 7.5 Tekton® Building Wrap is suitable for use under wall claddings as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23, except that it must not be used with non-absorbent wall claddings such as vinyl or metal based sidings or weatherboards in direct fixed installations. Tekton® is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings. Refer to Table 1.
- 7.6 Tekton® Building Wrap is also suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 (c). Refer to Table 1.

Table 1: NZBC E2/AS1 Table 23 Requirements

NZBC E2/AS1 Table 23 Wall Wrap Properties	Property Performance Requirement	Actual Property Performance
Absorbency	≥ 100 g/m ²	Classified as non-absorbent [see paragraph 7.4]
Vapour Resistance	≤ 7 MN s/g	Pass
Water Resistance	≥ 20 mm	Pass
pH of Extract	≥ 5.5 and ≤ 8	9.78 [Note 1]
Shrinkage	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear: Machine direction = 228 N Cross direction = 186 N Tensile strength: Machine direction = 4.4 kN/m Cross direction = 3.9 kN/m
Air Barrier	Air resistance: ≥ 0.1 MN s/m ³	Pass

Note 1: Further testing of Tekton® Building Wrap was completed to determine the effect of the high pH level on the wall underlay and materials it is likely to come into contact with during its serviceable life. The testing confirmed that the high pH had no adverse effects on the wall underlay performance, or the performance of other materials.

- 7.7 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.



BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP

Stucco Plaster

- 7.8 Tekton® Building Wrap is suitable for use as a non-rigid backing material for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.1. The wall underlay must be supported with 75 mm galvanised mesh or plastic tape or wire at 150 mm centres run across the cavity battens to limit deflection to a maximum of 5 mm in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.5.2.
- 7.9 Tekton® Building Wrap may also be used as a slip layer over rigid backings for stucco plaster in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.3.3 (b).

Structure

- 8.1 Tekton® Building Wrap is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a flexible building underlay, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay for rigid building underlays.

Durability

- 9.1 Tekton® Building Wrap meets code compliance with NZBC Clause B2.3.1 (a), not less than 50 years for building wraps used where the cladding durability requirement or expected serviceable life is not less than 50 years, and code compliance with NZBC Clause B2.3.1 (b), 15 years for building wraps used where the cladding durability requirement is 15 years.

Serviceable Life

- 9.2 Provided it is not exposed to the weather or ultra-violet light for a total of more than 60 days, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, Tekton® Building Wrap is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

- 10.1 Tekton® Building Wrap has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, Paragraph 4.1.7.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Tekton® Building Wrap from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 12.1 Tekton® Building Wrap must be used behind claddings that meet the requirements of the NZBC, e.g. such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Tekton® Building Wrap, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding systems compliance with NZBC Clause E2.
- 12.3 When used as an air barrier, particular care must be taken to ensure an air tight barrier is achieved, and weather sealing at all openings and penetrations through the cladding meets the requirements of the NZBC.



BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP

Installation Information

Installation Skill Level Requirements

- 13.1 Installation must always be carried out in accordance with the Technical Literature and this Appraisal, by competent tradespersons with an understanding of wall wrap installation.

Wrap Installation

- 14.1 Tekton® Building Wrap must be fixed to all framing members at maximum 300 mm centres with hot-dip galvanised, large-head clouts 20 mm long, zinc plated 6-8 mm staples, self-drilling screws, or proprietary wrap fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 Tekton® Building Wrap must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 75 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the membrane. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess wall underlay may be cut off flush with the internal face of the wall frame.
- 14.4 Tekton® Building Wrap can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created by wide roll widths.
- 14.6 Any damaged areas of Tekton® Building Wrap, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

Inspections

- 14.7 The Technical Literature must be referred to during the inspection of Tekton® Building Wrap installations.

Basis of Appraisal

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

Tests

- 15.1 The following tests have been carried out on Tekton® Building Wrap by Scion: Folding strength of paper in accordance with AS/NZS 1301.423; edge tear resistance and tensile strength in accordance with AS/NZS 4200.1 and air resistance in accordance with BS 6538-3.
- 15.2 The following tests have been carried out on Tekton® Building Wrap by BRANZ: Absorbency in accordance with AS/NZS 4201.6, Vapour transmission in accordance with ASTM E 96B, Shrinkage in accordance with AS/NZS 4201.3, Water barrier in accordance with AS/NZS 4201.4 and pH of extract in accordance with AS/NZS 1301.421. A range of these tests were completed before and after Tekton® Building Wrap was exposed to ultra-violet light.
- 15.3 The Flammability Index of Tekton® Building Wrap has been evaluated in accordance with AS 1530.2.

Other Investigations

- 16.1 A durability opinion was given by BRANZ technical experts.
- 16.2 Site inspections were carried out by BRANZ to assess methods used for the installation of Tekton® Building Wrap, and to examine completed installations.
- 16.3 The marketer's Technical Literature, including installation instructions, have been examined by BRANZ and found to be satisfactory.



BRANZ Appraised
Appraisal No. 548 [2013]

BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP

Quality

- 17.1 The manufacture of Tekton® Building Wrap has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of product certification by ICC-ES and CCMC covering quality aspects associated with the product.
- 17.2 The quality of supply to the market is the responsibility of Marshall Innovations Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the wall wrap into their design in accordance with the instructions of Marshall Innovations Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Marshall Innovations Limited.

Sources of Information

- AS 1530.2 – 1993 Test for flammability of materials.
- AS/NZS 1301.421s: 1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1: 1994 Pliable building membranes and underlays – materials.
- AS/NZS 4201.1: 1994 Pliable building membranes and underlays – Methods of test – Resistance to dry delamination.
- AS/NZS 4201.2: 1994 Pliable building membranes and underlays – Methods of test – Resistance to wet delamination.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4: 1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6: 1994 Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- BS 6538.3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- 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].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.

Amendment

Amendment No. 1, dated 17 December 2013.

This Appraisal has been amended to fix an editorial error.



BRANZ Appraisal
Appraisal No. 548 [2013]
16 December 2013

TEKTON® BUILDING WRAP



In the opinion of BRANZ, Tekton® Building Wrap is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Marshall Innovations Limited, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

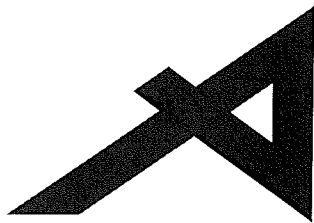
1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the technical literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. Marshall Innovations Limited:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by Marshall Innovations Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Marshall Innovations Limited or any third party.

For BRANZ

A handwritten signature in black ink, appearing to read 'Cheydra Percy'.

Cheydra Percy
Chief Executive

Date of Issue:
16 December 2013

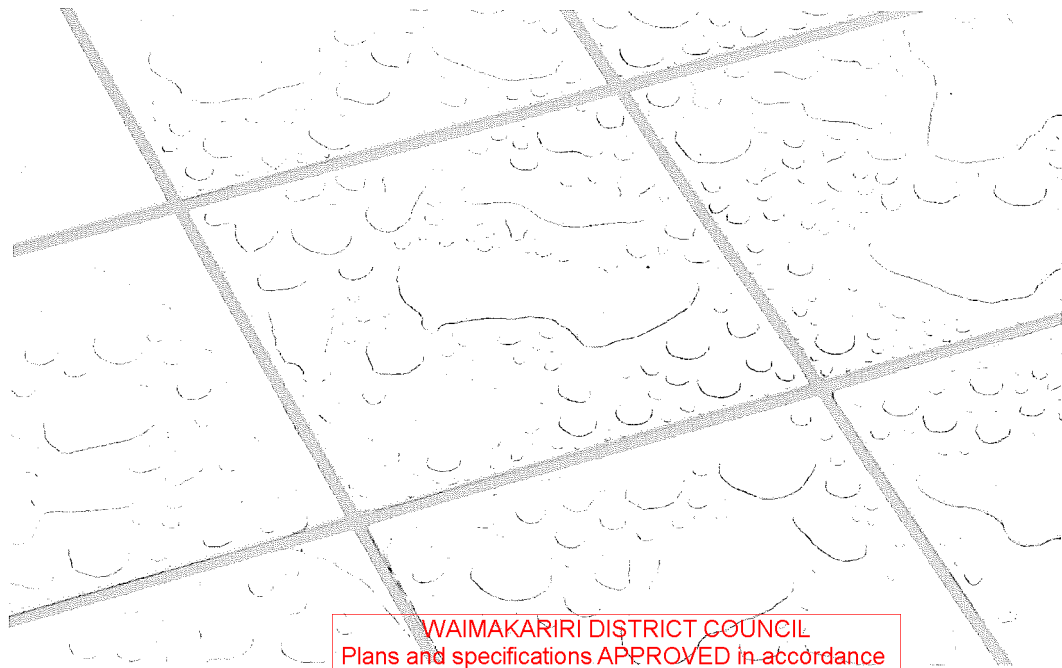


BRANZ Appraised
Appraisal No. 472 [2017]

**ARDEX UNDERTILE
INTERNAL LIQUID
WATERPROOFING
MEMBRANES**

Appraisal No. 472 [2017]

This Appraisal replaces BRANZ
Appraisal No. 472 [2011]



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

BRANZ Appraisals

Technical Assessments of
products for building and
construction.

Product

1.1 ARDEX Undertile Liquid Membranes are premixed and two-part liquid-applied waterproofing membranes for use under ceramic or stone tile finishes in internal wet areas.

Scope

- 2.1 ARDEX Undertile Liquid Membranes have been appraised for use as waterproofing membranes for the internal wet areas of buildings, within the following scope:
 - on floor substrates of concrete, flooring grade particleboard, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
 - when protected from physical damage by ceramic or stone tile finishes; and,
 - where floors are designed and constructed such that deflections do not exceed 1/360th of the span.
- 2.2 The use of ARDEX Undertile Liquid Membranes on concrete slabs where hydrostatic or vapour pressure is present from below is outside the scope of this Appraisal.
- 2.3 Movement and control joints in the substrate must be carried through the membrane and tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and is therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.4 The ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.5 The membranes must be installed by trained installers, approved by ARDEX New Zealand Limited.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, ARDEX Undertile Liquid Membranes, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:
 - Clause B2 DURABILITY:** Performance B2.3.1 [b] 15 years and B2.3.2. ARDEX Undertile Liquid Membranes meet these requirements. See Paragraph 9.1.
 - Clause E3 INTERNAL MOISTURE:** Performance E3.3.6. Internal wet area floors and walls incorporating ARDEX Undertile Liquid Membranes meet this requirement. See Paragraphs 11.1-11.6.
 - Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. ARDEX Undertile Liquid Membranes meet this requirement and will not present a health hazard to people.



**ARDEX New Zealand
Limited**
15 Alfred Street
Onehunga
Auckland
Tel: 09 636 0005
Web: www.ardex.co.nz



BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz





BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Technical Specification

- 4.1 Materials supplied by ARDEX New Zealand Limited are as follows:
- ARDEX WPM 001 is a one part, polymer-based, ready-to-use, liquid-applied membrane containing micro-fibres. It is supplied as a light blue thixotropic paste 20 kg (approximately 15 litres) pails.
 - ARDEX WPM 002 is a fast drying, two part, flexible, cementitious-based, liquid applied membrane containing micro-fibres. It is supplied as ARDEX WPM 002 Part A Liquid in 20 kg pails and ARDEX WPM 002 Part B Powder in 10 kg multi-wall bags. When dry, the membrane is light grey in colour.
 - ARDEX WPM 155 Rapid is a one part, water-based polyurethane-acrylic, ready-to-use, liquid applied, rapid setting membrane. It is supplied as blue/grey colour in 4 and 15 litre pails.
 - ARDEX STB Tape is an uncured butyl tape with a fleece layer that is used in the ARDEX WPM 155 Rapid under tile waterproofing system.
 - ARDEX Multiprime is a water-based primer used to seal substrates and enhance the adhesion of the membranes. It is supplied as a red coloured liquid in 1, 4 and 20 litre 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 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.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the ARDEX Undertile Liquid 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 ARDEX Undertile Liquid 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 ARDEX WPM 002 and ARDEX WPM 155 Rapid are designed to be used where a quicker curing time is required, such as in cool or humid conditions.
- 7.3 The membrane 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 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%.



BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Substrates

Plywood

- 8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with the sanded C face upwards and treated to H3 (CCA treated). LOSP treated plywood must not be used.
- 8.2 The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10 g x 50 mm stainless steel countersunk head screws at 150 mm centres along the sheet edges and 200 mm centres through the body of the sheets.

Fibre Cement Compressed Sheet/ Fibre Cement Sheet Tile Underlay

- 8.3 Fibre cement compressed sheet and tile underlay must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area membrane substrate. Installation must be carried out in accordance with the instructions of the manufacturer.

Particleboard

- 8.4 Particleboard must be specified for the end use in accordance with NZS 3602.

Concrete and Concrete Masonry

- 8.5 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101, concrete slab-on-ground to NZS 3604 or NZS 4229, and concrete masonry to NZS 4229 and NZS 4230.

Wet Area Wall Linings

- 8.6 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588 and be suitable for use in internal wet areas.
- 8.7 Fibre cement sheet must be suitable for use in wet areas and comply with AS/NZS 2908.2.
- 8.8 Installation of plasterboard or fibre cement wall linings must be carried out in accordance with the instructions of the manufacturer.

Durability

Serviceable Life

- 9.1 ARDEX Undertile Liquid 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 serviceable life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membrane 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, grout and sealant.
- 10.2 In the event of damage to the membrane, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.
- 10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean.



BRANZ Appraised
Appraisal No. 472 [2017]

BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Internal Moisture

- 11.1 ARDEX Undertile Liquid Membranes are impervious to water, and when appropriately designed and installed will prevent water from penetrating behind linings or entering concealed spaces.
- 11.2 Surfaces must be finished with ceramic or stone tiles. A means of compliance with NZBC Clause E3.3.3 and E3.3.4 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b), 3.1.2 (b) and 3.3.1 (b).
- 11.3 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes and drainage flanges must be provided and the floor must fall to the outlet.
- 11.4 ARDEX Undertile Liquid Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of compliance for overflow is given in NZBC Acceptable Solution E3/AS1, Section 2.
- 11.5 The waterproofing membranes 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 the flooring and wall lining manufacturers.
- 11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must overlap the membrane a minimum of 30 mm.

Installation Information

Installation Skill Level Requirement

- 12.1 Installation of the membranes must be completed by trained installers, approved by ARDEX New Zealand Limited.
- 12.2 Installation of substrates must be completed by, or under the supervision of, licensed Building Practitioners with the relevant Licence Class, in accordance with instructions given within the ARDEX New Zealand Limited Technical Literature and this Appraisal.

Preparation of Substrates

- 13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be 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 concrete substrates must be 75% or less before membrane application. The concrete can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 585.
- 13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have reinforcements installed as set out in the Technical Literature.
- 13.4 Substrates must be primed with ARDEX Primer and allowed to dry fully before the membrane is installed.



BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Membrane Installation

- 14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.
- 14.2 ARDEX WPM 002 liquid and dry components must be mixed and left to stand for 5 minutes before re-mixing, then applying. ARDEX WPM 001 and ARDEX WPM 155 Rapid 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 1.0 - 1.5 mm. Subsequent coats must be applied at an opposite direction to the previous coat.
- 14.4 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. ARDEX STB Tape must be used with ARDEX WPM 155 to take advantage of the rapid/fast drying features.
- 14.6 Clean up may be undertaken with water.

Tiling

- 15.1 The membrane must be fully cured before tiling. The cured membrane must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.
- 15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide - Tiling. The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or ARDEX New Zealand Limited.

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 supplier'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 membrane are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.



BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Basis of Appraisal

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

Tests

- 18.1 The following testing of ARDEX WPM 001 and ARDEX WPM 002 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 ARDEX WPM 001 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 ARDEX WPM 001 and ARDEX WPM 002 has been undertaken by BRANZ for low temperature flexibility and peel adhesion after heat/humidity aging.
- 18.4 The following testing of ARDEX WPM 155 Rapid was undertaken by various organisations:
 - Durability testing to AS/NZS 4858 Appendix A including effect of heat aging, bleach, detergent and water on tensile strength and elongation.
 - Cyclic movement resistance requirements of AS/NZS 4858:2004 Appendix B.
 - Water Vapour Transmission using both wet and dry cup methods from ASTM E96.
 - Water transmission behaviour following the procedures of AS/NZS 4858 Appendix C.
- 18.5 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 ARDEX Undertile Liquid Membranes by BRANZ technical experts.
- 19.2 Site inspections have been carried out by BRANZ to examine the practicability of installation.
- 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 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing systems and substrate.
- 20.5 Quality on site is the responsibility of the trained installers, approved by ARDEX New Zealand Ltd.
- 20.6 Building owners are responsible for the maintenance of the ceramic or stone tiles in accordance with the instructions of ARDEX New Zealand Ltd.



BRANZ Appraised
Appraisal No. 472 [2017]

BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES

Sources of Information

- AS 3740 – 2010 Waterproofing of wet areas within residential buildings.
- AS 3958.1: 2007 Ceramic Tiles – Guide to the installation of ceramic tiles.
- AS/NZS 1170: 2002 Structural design actions
- AS/NZS 2908.2: 2000 Cellulose-cement products – flat sheet.
- AS/NZS 4858 – 2004 Wet area membranes.
- AS/NZS 2269: 2012 Plywood – Structural.
- Good Practice Guide – Tiling, BRANZ, April 2015.
- NZS 3101: 2006 Concrete Structures Standard.
- NZS 3602: 2003 Timber and wood-based products for use in buildings.
- NZS 3604: 2011 Timber framed buildings.
- NZS 4229: 2013 Concrete masonry buildings not requiring specific engineering design.
- NZS 4230: 2004 Code of practice for the design of masonry structures.
- Ministry of Business, Innovation and Employment Record of amendments – Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



BRANZ Appraisal
Appraisal No. 472 [2017]
17 January 2018

ARDEX UNDERTILE INTERNAL
LIQUID WATERPROOFING
MEMBRANES



In the opinion of BRANZ, ARDEX Undertile Internal Liquid Waterproofing 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 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. ARDEX New Zealand Limited:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by ARDEX New Zealand Limited.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to ARDEX New Zealand Limited or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
17 January 2018

16/04/2018

To: Emma Edgar
W2 Architects

From: Viking Roofspec
Technical support
Viking Roofspec Ltd

**Reference: Viking Roofspec Product Warranty for Viking Enviroclad at minimal falls
17 Lilian Street, Kaiapoi.**

Dear Emma.

It is always Viking Roofspecs first recommendation and advice wherever possible to meet or exceed the minimum falls outlined within E2/AS1, 8.5.1 Limitations.

However there are sometimes rare cases, such as repairs and maintenance of an existing building, where these falls cannot be achieved without a re-build of a majority of the affected construction and other areas adjacent to it.

Viking Roofspec will supply a Product Warranty for Viking Enviroclad at falls below the NZBC minimum requirements only after careful *consideration of a particular project. This warranty is for the durability of the waterproofing membrane only, not for design, construction, substrate or installation.

Viking Roofspec notes that the Falls on this roof / deck are 1.5°.

Please note that neither this letter nor a Viking Roofspec product warranty accepts liability for the construction nor proves compliance to minimum falls set out for membrane waterproofing in E2/AS1, 8.5.1 Limitations. If a project is required to have a building consent the acceptance or not of the overall design and construction is as always with the Building Consent Authority.

*In these cases every consideration must be made to...

1. Consult with Viking Roofspec Ltd, Product Warranty provider
2. Consult with the Approved Applicator, provider of the membrane installation warranty
3. Wherever practical improve upon the existing falls as much as can be achieved
4. Minimise the risk of ponding water
5. Create falls to spouting, external of the building envelope
6. Ensure all design / construction and waterproofing details are considered to
 - a. Minimise laps, penetrations and watershed obstructions to the external spouting,
 - b. Minimum upstand heights under claddings should be increased from 150mm to 200mm.

Sincerely

Chris Knowles
Viking Roofspec Ltd
Email: chris.knowles@vikingroofspec.co.nz
Web: www.vikingroofspec.co.nz

Mobile: 027 230 8796



MAKE COMFORT A WAY OF LIFE

IN THIS DOCUMENT

This document outlines the specification of the system. What you need to discuss with your builder and considerations to ensure the system meets your expectations.

- Proposed Specification
- Your Responsibilities
- Variations
- Don't just take our word for it! Here's what our customers have to say!
- Considerations Affecting Your Heating System
- Payment
- Acceptance of Proposal AND APPLICATION FOR CREDIT AND SECURITY
- TERMS OF TRADE

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



52 Pilkington Way,
Wigram, Christchurch
PO Box 31-274,
Christchurch 8444,
New Zealand
P: 03 357 1233
E: info@centralheating.co.nz
www.centralheating.co.nz

Leon Liang,
Phoenix Homes Ltd,
Kaiapoi,
Christchurch.

12 December 2017

Dear Leon/Ellen,

HEATING DESIGN SOLUTION: Phoenix Homes- 17 Lillian St – Kaiapoi. Version 2.

Thank you for your time to discuss your requirements for heating your client's home and the opportunity to present this proposal. The system we propose has been designed with their specific requirements in mind. From our discussions we identified that the key factors are to install a central heating system for whole house comfort and the option for domestic hot water.

Our proposal is to install underfloor heating throughout the ground floor slab. This will be heated using an Air to Water Heat Pump. We see this as the most effective way of heating your home to fit with your requirements and provide the comfort levels desired.

SYSTEM VALUE

To fully install your central heating system as specified below is **\$14,040.00** plus GST
This includes items 1-2.

This document provides further details of our proposal and the options we have discussed. We have also included our terms and conditions for you to review.

This quotation includes:

Our electrician will run all electrical cable and connect all aspects of the heat pump and thermostat, provided the cable run from the heat pump to the distribution board is no more than 15m of cable. The excess will be charged on a time and materials basis. Your electrician will need to provide a circuit at the switch board and a space for a breaker and a kW hour meter and complete the electrical connection of the element in the hot water cylinder.

This quote is valid for 30 days from the date of issue.

To move forward to the next stage, we will contact you to talk through the installation process in more detail, including the timing of installation, our terms and conditions, deposit requirements, etc. If you have any queries, please don't hesitate to contact me.

Kind Regards,

A handwritten signature in black ink that reads "Rob Noster".

Rob Noster

Legend - Walls

All exterior timber framed walls to be 90x45 H1.2 SG8 timber framing, studs @ 600 c/c, dwangs @ 600 c/c, unless noted otherwise.
All interior timber framed walls to be 90x45 & 140x45 H1.2 SG8 timber framing, studs @ 600 c/c, dwangs @ 800 c/c, unless noted otherwise.

Top Plate Fixing: Top plate to be fixed to studs @ 600 max c/c with 2-90 x 3.15 end nails + 2 wire dogs or 4.7kN alternative fixing unless noted otherwise.

Bottom Plate Fixing: M12 cranked bolt bottom plate anchor's @ 1200 max crs with 50x50x3 flat washer unless noted otherwise.

General Notes

Contractor to install all new plumbing fixtures and appliances to manufacturers specifications.

Contractor to furnish and install all hardware unless noted otherwise.

Wet area lining to wall and ceiling to be 10mm GIB Aqualine Wet Area Lining minimum, with 9mm Villaboard Lining behind tiled showers.

Floor finishes for wet area rooms to be slip resistant in accordance with NZBC D1/AS1 Table 2 and also to be in accordance with NZBC E3 - Internal Moisture.

In wall 20mm plywood blocking at all sink, wall sconce and accessory locations. Contractor to provide all blocking as required for proper installation of item.

All entries and exits to be in accordance with NZBC D1/AS1.

Smoke alarms shall be installed to comply with Section 3 F7/AS1. All smoke alarms must have test & hush button functions.


Kitchen bench top to comply with NZBC G3/AS1.

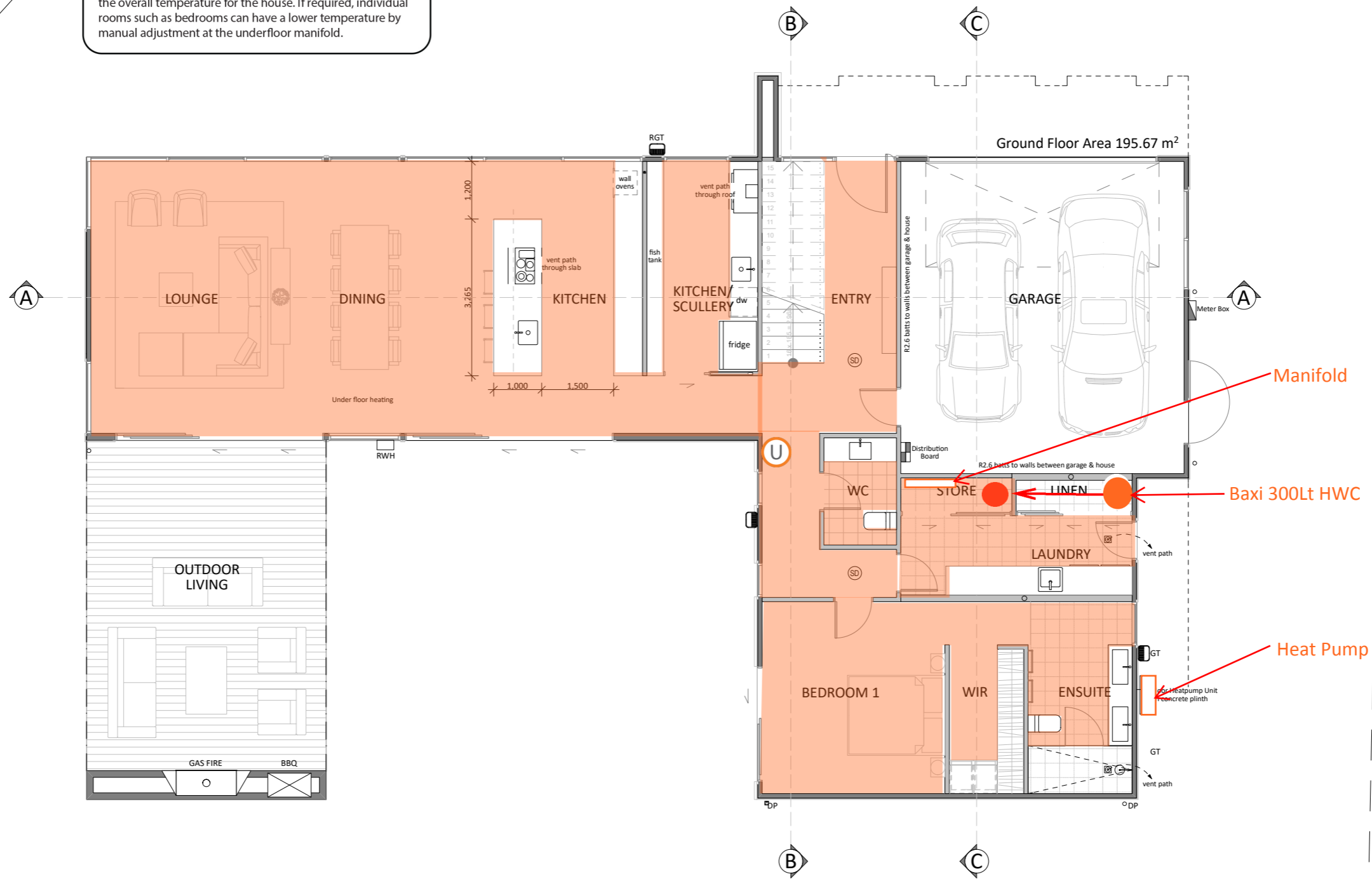
Interior & exterior glazing to comply with NZS4223.

Refer to door and window schedules for lintel sizes


 Title: **Suggested Equipment Locations**
 Date: **12/12/2017** Issue:

This equipment layout is indicative and the final design may deviate due to site conditions.

The extent of the heated area is shown in colour on this plan. The  indicates the floor and air sensing thermostat that sets the overall temperature for the house. If required, individual rooms such as bedrooms can have a lower temperature by manual adjustment at the underfloor manifold.



W2 LIMITED
96 Disraeli Street, Christchurch
phone 03 366 0966
web www.w2.nz

ALL RIGHTS RESERVED
This drawing & all graphic & written material contained herein constitutes the original & unpublished work of W2 Ltd. & may not be copied, distributed, or used in whole or part without expressed written permission.
© W2 2015

GENERAL NOTE
All contractors MUST verify all dimensions on site before starting work or ordering materials. Any contractor shall immediately report any anomalies found to W2 Ltd.
DO NOT SCALE - All Dimensions in mm unless otherwise stated.

REVISION HISTORY

Rev:	Date:	Issue:
A	??/??/2014	Initial Issue

- CONCEPT
- SCHEMATIC
- PRELIMINARY
- CONSENT
- TENDER
- CONSTRUCTION
- AS BUILT

Date: 2017-12-11

GROUND FLOOR PLAN

Scale: 1:100@A3 Sheet No: Rev:

DESIGNED: MW
DRAWN: MH

A04 A

GROUND FLOOR PLAN
1:100

PROPOSED SPECIFICATION

1. HEAT SOURCE

- A Thermaflow HPTF10, or equivalent or better, Air to Water Heat Pump, situated behind the Ensuite.
- The heat pumps water temperature will be controlled by an on board controller for underfloor heating water temperature.



Air to Water Heat Pump

2. UNDERFLOOR

- A room thermostat will be located in the Entry area and a temperature probe will be located in the floor slab for control of the overall house temperature. If required, individual rooms such as bedrooms can have a lower temperature by manual adjustment at the manifold.
 - The underfloor manifold for the ground floor will be situated in the store cupboard in the Laundry.
 - 16mm German Multitubo underfloor pipe leading from the manifold will be laid and secured on the reinforcing mesh during construction for the ground floor.
 - All pipework is pneumatically pressure tested before the slab is poured and left pressurized during the construction period.
- Please note: To keep costs to a minimum, this quotation is based on the most economic method of installation, which is running feed pipes under the slab and tying the underfloor pipe loops to the reinforcing mesh. This requires the concrete slab to have no saw cuts and we recommend the use of crack inducers from CANZAC, LESA or CRACKMATE. Should your builder insist on saw cuts, or other changes to the installation, there may be additional design and installation costs for your underfloor system.



*Underfloor Heating Pipes attached to reinforcing mesh.
Walls marked out in day-glow paint on polystyrene*



Underfloor Heating Manifold



Digital Thermostat

3. DOMESTIC HOT WATER OPTION

There is also the possibility of adding a domestic hot water system. A 300 litre Twin Coil high pressure stainless steel cylinder with a controls package can be located in the Linen cupboard and connected to the heat pump system. The heat pump will do the bulk of the work raising the cylinder temperature to nearly 50°C. The electric element will then top it up to the required 60°C. They also have a facility for ring main plumbing.

To include this option please add **\$4,000.00** plus GST to the price of your heating system.

Please note:

- The cylinder installation and domestic plumbing would be completed by your plumber and electrical connection of the element in the hot water cylinder by the site electrician.
- The cylinder has an install foot print of 800mm (w) x 600mm (d) and has a height clearance of 2300mm

4. DESIGN FEES

Time spent by our engineers in getting the proposal to this stage. The design fees have been waived.

Total Design Time Taken (2 hrs @ \$150/hr)	\$300.00
Waiver of Design Fee	-\$300.00

YOUR RESPONSIBILITIES

The following will be yours, and your builder's responsibility:

- Marking out of house and boundaries.
- Accurately marking out the rooms and fixed joinery on the polystyrene prior to us laying the underfloor heating pipe. This is required to ensure pipes are correctly positioned for best results.
- A level concrete pad (1100mm x 750mm x 100mm) for the heat pump in a garden area to enable the condensate to soak away or with Aco type strip drainage around it if in a paved area.
- Access and trenching for running pipes & conduits through foundations and tailings, to be provided where required.
- Access to be provided for pipe routes within the house in the event of steel or concrete beams.
- The site electrician will need to supply a circuit for our heat pump and space for a kW meter and breaker at the switchboard and complete the electrical connection of the element in the hot water cylinder.
- Your plumber to install the cylinder and complete the domestic plumbing, including installation of a water tap next to the heat source. Requirements will be sent to you on request.
- To provide a water supply at the heat source location.
- To provide power on site for all stages of our installation.
- A copy of final plans to be given to us prior to installation. Please advise us of any changes to the plans.

Please make sure your builder and any sub trades are aware of the requirements listed above.

VARIATIONS

- Any variations to this quote must be agreed by Central Heating New Zealand Ltd and confirmed in writing. This includes any changes to equipment positions once they have been piped.
- Extra charges will occur for variations.
- Specific stage site visits have been allowed for in this quote which is sufficient to complete the installation, provided that work is not held up or hindered by other contractors. Should visits be wasted or extra visits required, these will be invoiced in addition to the amount stated in the quote.

DON'T JUST TAKE OUR WORD FOR IT! HERE'S WHAT OUR CUSTOMERS HAVE TO SAY!**Grant and Dorothy Mossman-Catchpole**

New Home with Underfloor Heating in Living areas, halls and bathrooms with Air to Water heat pump

...."amazing comfort from the underfloor heating. Best value part of the house for making a cosy home"...

Elizabeth Stewart

Retro-fitted radiators put into an existing central heating system

"...The heating has made a HUGE difference to us. Henry, who is 4 months old had a persistent cough and this has diminished hugely (to my amazement), and Sera, who is 3 years old, has not needed any Ventolin since the system was commissioned.

Everything was so professional. What a relief. From pricing, to planning, to (I imagine) the guys installing things having a planning meeting before the installation occurred. I am REALLY impressed with the service and incredibly grateful for it...."

Daryl and Jill Biggar

New home with a geothermal heat pump, underfloor and domestic hot water heating

"We had a GSHP with underfloor heating/hot water installed in 2009 and we are pleased we made this decision. We always come home to a cosy, warm house with a nice even temperature throughout - 24/7. No need to fight over who should fetch the wood from outside during the wet, cold days and nights. The freezing mornings are not a problem as we wake up to a comfortably heated bedroom and the bathroom floor is always warm. It has proved to be very cost efficient to operate and very simple to control. The service and expertise provided by Central Heating NZ was exceptional and we would not hesitate to use them again with future builds".

Mark & Trish Pringle

New home with a diesel boiler and radiator system

"...Best company to deal with in the whole building process! Nice to deal with, efficient, excellent knowledge, fantastic service, on top of things the whole way, good follow up! ..."

CONSIDERATIONS AFFECTING YOUR HEATING SYSTEM

IMPORTANT INFORMATION FOR HOMEOWNERS AND SPECIFIERS DURING THE DESIGN PHASE OF THE PROJECT

We design our systems to cope in the normal range of weather for your region and based on the information to hand at the time, but sometimes changes occur during the building process that affect the performance of the heating system. This can happen when alterations to the building elements are made either after we have designed the heating system or after the installation of the system. Also, unforeseen behaviour, such as thermal bridging, can occur during the building process, which affects the performance of the heating system.

GETTING THE MOST OUT OF YOUR SYSTEM

The design of the heating system is based on an international standard depending on geographical location. For New Zealand, we use the Institute of Refrigeration Heating & Air Conditioning Engineers of New Zealand (IRHACE) External Design Conditions & Data for your area (www.irhace.org.nz/uploads/design_temps.pdf). Under these conditions, the system is designed to achieve at least 21°C in the living areas and 17°C in bedrooms and hallways. However, if any of the design criteria are compromised, supplementary heating may be required at times.

- **Running the System:** To give good living temperatures with reasonable running costs, in slab underfloor heating requires constant running. The slab is a large mass which is easier to keep warm than to reheat each day. At the start of each season, the floor will take approximately 8 hours to heat up to its ideal temperature and consume more energy than when the floor is maintained at that temperature. Because of this, we suggest leaving the system operating throughout the winter as opposed to switching it on and off.
- **Insulation:** Insulation under the floor slab is required to limit downward heat loss. We advocate the installation of at least 50mm of high density polystyrene under the slab during construction for the underfloor heated areas.
- **Thermal Bridging:** Thermal bridging is when heat is transferred through conduction to areas surrounding the slab. To help mitigate issues such as thermal bridging, we suggest insulating the perimeter of the foundation and isolating the heated slab from patios and paths with thermal breaks. This helps keep the heat in the home by reducing heat loss.
- **Increased Load:** Two storey houses that only have the ground floor heated and houses that have large areas of glazing, a high ratio of external wall to floor area (e.g. complicated shapes) or rooms that have more than two external walls will require more heat than other homes.
- **Floor Coverings:** The underfloor heating system works by radiating heat from the concrete slab into the room. It's important to consider heat emission when choosing a floor covering as they can significantly reduce the emission of heat into the rooms. Floor coverings such as thick or high specification underlays are primarily designed to insulate and should be avoided. Underfloor heating works well with all floor coverings but should be as close to the recommended industry standard of maximum R 0.15 resistance as possible. E.g. a 5mm underlay has an R value of 0.137. We suggest no more than 7mm standard underlay or purpose designed underlay such as Duralay Heatflow should be used.
- **Curtains and Window Coverings:** The use of curtains is advised for efficiency and maximum comfort as it is always colder near windows (even if they are the highest quality double glazing). This is especially true if the other factors listed above are compromised.
NB: Privacy roller blinds provide little thermal insulation value.

PAYMENT

Our terms of payment are a 20% deposit to be paid on acceptance of the quotation, followed by progress payments as work is executed and materials delivered to site. These payments are due on the 20th Month following of receipt of the invoice. The balance must be paid on the day of commissioning; this means when the system becomes operational. Please see the terms and conditions attached.

- If retentions are to be withheld we reserve the right to charge additional finance costs as required.
- You may require a design producer statement for building consent. We are happy to produce this for a fee of \$500 including GST. This does not hold the price of any quote but will be deducted from the deposit at time of acceptance.
- Special order product is invoiced to you on placing the order with our suppliers.

ACCEPTANCE OF PROPOSAL AND APPLICATION FOR CREDIT AND SECURITY

Acceptance

- The Customer accepts this proposal by signing this agreement and returning it to Central Heating New Zealand Limited (CHNZ) with the deposit.
- Should CHNZ not receive such a signed copy, but the Client continues to instruct CHNZ once installation has started, then the Client will be taken to have accepted the terms and conditions of the quote.

Quote Ref 5601587-3699 Total: \$14,040.00 plus GST

Option for Baxi 300Lt HWC Total: \$18,040.00 plus GST

Particulars of Customer

If Individual:	
Full Name (including middle names): _____	Date of birth: _____
Address: _____	
Telephone: _____	Email address: _____
If not Individual:	
Type of Organisation:	<input type="checkbox"/> Trust <input type="checkbox"/> Partnership <input type="checkbox"/> Company <input type="checkbox"/> Other
Name of organisation (if applicable): _____	
Company registration number (if applicable): _____	
Trading name (if applicable): _____	
Address of organisation: Postal: _____	
	Physical: _____
Person acting on behalf of organisation (full name): _____	
Contact Address of person acting: _____	
Telephone: _____	Facsimile: _____
E-mail address: _____	Mobile: _____

Information

The Customer authorises Central Heating New Zealand Limited (CHNZ) to make all necessary enquiries and receive and collect information concerning the Customer's credit rating and its identity from any person or organisation, including any credit providers, credit reporters, debt collection agencies government agencies and the Customer's employer and accountant for the purposes of credit approval, establishing credit limits and administering the Customer's account, including considering any future requests to increase the Customer's credit limit. The Customer agrees that CHNZ may produce this authority to such parties for these purposes as proof of the Customer's authorisation for any such person or company to provide CHNZ with such information as it may require in the course of administering and enforcing CHNZ's "Terms of Trade" attached (the *Terms*). The Customer acknowledges and agrees that information obtained about the Customer may be provided to CHNZ's related companies and organisations which provide services to CHNZ including, without limitation, external debt collection agencies and/or credit reporting and other agencies required from time to time to be involved in the administration of the Customer's account or enforcement of the Terms. Such information may be held and used by those persons and organisations, and they may disclose that information to authorised users of any reporting services that they may provide.

The Customer can access personal information CHNZ holds about it by contacting CHNZ in writing. If the information held is inaccurate, incomplete or not up to date the Customer may request CHNZ to correct the information. CHNZ's address is 52 Pilkington Way, Wigram, Christchurch 8042.

Terms of Trade

The Customer agrees to purchase goods and/or services from CHNZ on the terms set out in the Terms, and acknowledges: receipt of the Terms; that further copies are available on request; and that all goods and/or services sold or provided by CHNZ to (or for the account of) the Customer (whether in the past or in the future) are sold pursuant to the Terms (including a Security Interest in favour of CHNZ).

Acknowledgement

The person signing this application form declares that he/she is the duly authorised agent(s) of his/her co-partners/co-directors/trustees/employer and with their authority and on their behalf he/she has signed this declaration and bound them to the Terms, and that the information provided in this application form is true and correct.

I/We accept the above Quotation and Terms of Trade. I/We would like to enter into a contract for the works to commence.

Signature: _____

Position: _____

Full Name: _____

Date: _____

SIGNED ON BEHALF OF CENTRAL HEATING NEW ZEALAND:

Signature: _____

Position: _____

Full Name: _____

Date: _____

TERMS OF TRADE

all payments due under any Proposal shall become immediately due and payable to us and we may without prejudice to any other remedies available to us, terminate any Proposal.

1 Terms of contract

By requesting us (Central Heating New Zealand Limited) to supply Goods or Services to you, by written contract or otherwise, you acknowledge and agree (or you are deemed to acknowledge and agree) that:

- (a) you have assented or agreed to these, our standard form terms of trade (these Terms) forming part of each contract notwithstanding anything that may be stated to the contrary in your enquiries or your order;
- (b) these Terms and any other contract entered into between you and us will create or creates in favour of us, a Security Interest in the Goods which are the subject of the contract; and
- (c) except as expressly agreed between you and us in writing:
 - (i) any other document entered into between you and us must be interpreted consistently with these Terms; and
 - (ii) to the extent that there is any inconsistency between these Terms and any other document, the terms of these Terms shall prevail.

2 Price

- 2.1 The price for Goods and Services will be as quoted to you in writing, whether under any Proposal or otherwise.
- 2.2 We may withdraw any quotation before it is accepted, and in any event any quotation will lapse, without notice, 60 days after it is given, unless a deposit has been paid.
- 2.3 Upon payment of a deposit for a quote which has not been withdrawn, the price given in any such quote shall be held for six months from the date of the quote, at which time it will lapse without notice.
- 2.4 Unless agreed otherwise, GST will be payable by you as an additional amount on all prices and charges.
- 2.5 This entire clause 2 is subject to any variations in accordance with clause 3.

3 Variations

- 3.1 Any alteration to a Proposal will be a variation. A variation requested by you must be agreed by us in writing.
- 3.2 A variation includes, without limitation, changes to equipment positions once they have been installed, any necessary alteration to any aspect of a Proposal due to inaccurate information supplied by you (such necessity to be determined in our sole discretion) and delays which are out of our control.
- 3.3 In the event that it is impossible for us to commence or continue and Work at a date and time agreed between you and us due to the state of the premises (e.g. non completion of foundation work), this will be a delay constituting a variation and we may charge you for any labour, time and other incidental costs arising from the variation.
- 3.4 A material fluctuation in our costs shall be a variation subject to expiry of the period specified in clause 2.3 above.
- 3.5 You will be liable for the original contract price and all additional costs incurred as a result of a variation, including the alteration of plans themselves and any losses incurred by us as a result of a variation. The price of any variation will not necessarily be charged on the same basis as any work already ordered.

4 Invoicing and Payment

- 4.1 Invoices may be rendered monthly and/or when Goods are delivered to the site or work pursuant to a Work Order is executed, as progress payments. Invoices are due in full without the deduction or withholding of retentions on the 20th Month Following of receipt. A final invoice shall be issued for any balance owing at Completion.
- 4.2 Any deposit required by us is due by the date specified by us, or, if no date is provided, on acceptance of these Terms. Any such deposit is non-refundable.
- 4.3 If full payment of any invoice is not made on the due date then without prejudice to any other remedies available to us:
 - (a) we may cancel or withhold supply of further Goods or Services;
 - (b) interest on monies overdue shall be charged on a daily basis and be calculated by adding 5% per annum to the overdraft rate payable by us to our bankers at the time of and during such default, and interest shall continue to accrue both before and after judgement; and
 - (c) you shall be responsible for all costs incurred by us in recovering such monies.
- 4.4 If:
 - (a) you are in breach of any of these Terms; or
 - (b) you become insolvent, bankrupt, convene a meeting with your creditors or propose or enter into an arrangement with creditors, or make an assignment for the benefit of your creditors; or
 - (c) a receiver, manager, liquidator (provisional or otherwise) or similar person is appointed with respect to you or any of your assets,

- 4.5 We may from time to time vary your credit limit with us at our sole discretion in relation to further purchases of Goods or Services. If any acquisition would be in excess of your credit limit, we reserve the right to require, prior to delivery of the Goods or provision of the Services, payment in cash of the amount by which the cost exceeds your credit limit.
- 4.6 Your obligation under these Terms shall be to pay the full amount owing under these Terms free of all deductions and retentions.

5 Ownership

Ownership in the Goods shall not pass upon delivery, but shall remain with us until full payment for all monies owing by you to us has been made. Until all monies have been paid, the following shall apply:

- (a) You hold the Goods supplied as fiduciary for us and will deal with them as agent for and on behalf of us (but will not hold yourself out as our agent to any third parties).
- (b) If any of the Goods are installed in or affixed to and become an accession to other Goods, the Security Interest continues in the accession in accordance with the PPSA. If the Goods become affixed to land then, provided that the Goods can be separated from the land to which they are affixed, they remain our property and we may uplift and retake possession of the Goods if you fail to meet your obligations under these Terms.
- (c) If the Goods subsequently become part of some other product or mass:
 - (i) nothing in these Terms shall be construed as limiting the application of Sections 82 to 86 (inclusive) of the PPSA; and
 - (ii) we authorise you to sell the Goods as part of the mass provided that the proceeds of such sale are held in a separate account on trust for us, with our beneficial interest extending to the amount of all monies still owing by you to us, and such interest shall remain until all such monies have been paid. This authority may be revoked by us for any reason upon us giving you notice in writing.
- (d) In the event that you are in default of your obligations under these Terms you irrevocably give us and our agents the right to enter your property, or any property that you have rights of access to, at any time without notice, to uplift and remove any of the Goods supplied and resell them. At any time we may enter the property and retrieve any equipment and tools located at the property that are owned or leased by us. We shall not be liable for costs, damages or expenses or any other loss suffered by you or any third party as a result of such actions and you agree to indemnify us (and our agents) against any costs (including legal costs) or liability we suffer as a result of such actions.
- (e) In the event that the Goods are resold by us pursuant to clause 5(d), you will remain liable for any shortfall between the proceeds of such sale and any monies owed by you to us.

6 Timing and Risk

- 6.1 While we shall endeavour to meet any timeframes specified in any Proposal or any other agreement with regards to timing, time shall in no case be of the essence with respect to the performance of any Work. Any such timeframes are agreed in good faith and are not to be treated as a condition of any Proposal and subsequent payment. We shall not be responsible and you shall not be entitled to cancel for any delay.
- 6.2 Risk in respect of the Goods sold shall pass to you upon delivery, or at the time you pay for the Goods, whichever is the earlier. It is your responsibility to insure the Goods.
- 6.3 If ownership has passed to you at the time we deliver the Goods, delivery is a contract for carriage "at owner's risk" under the Carriage of Goods Act 1979. This means that we will pay no compensation if the goods are lost or damaged other than through our fault.

7 Access and Compliance with Acts and Regulations

- 7.1 Where you grant access to us over your property for the purposes of carrying out any Work, you shall ensure:
 - (a) convenient access for the delivery and provision of the Goods and Services. If access is not convenient we may make a further charge to you that we consider reasonable in the circumstances to cover the additional costs that arise due to such inconvenience;
 - (b) compliance with all legislation and regulations in relation to the property, including ensuring the property is in a safe state for us to undertake any necessary work.
- 7.2 If we have any concerns regarding the safety of our employees, in relation to the access and use of your property, we shall be entitled to halt all work on your property, until such time as our safety concerns have been resolved. In that case you shall be responsible for payment of work undertaken by us to that point and we shall not be liable to you on any basis arising from us having halted work.

7.3 We are not responsible for, and you agree to assume all liability and indemnify us for any residual damage to any property which arises from instructions issued by you requiring the alteration of work already done in accordance with any Proposal.

7.4 You are responsible for defining all relevant property boundaries and for obtaining and providing us with a copy of any consents or permits required in relation to any Work, prior to us commencing such Work.

7.5 Upon commencement of any Work you shall ensure, at no cost to us, adequate safe storage facilities are provided for protection against theft and damage of the Goods or any equipment or other items belonging to us.

8 PPSA

8.1 Without limiting anything else in these Terms, you acknowledge that:

- (a) these Terms create in favour of us, a Security Interest in all present and after acquired Goods supplied by us to you (or for your account) to secure the payment by you to us of the amount owing; and
- (b) these Terms will apply notwithstanding anything, express or implied, to the contrary contained in any purchase order or in any enquiry by you; and
- (c) the Security Interest shall continue until we give you a final release.

8.2 You undertake to:

- (a) promptly do all things, sign any further documents and/or provide any information which we may require to enable us to perfect and maintain the perfection of our Security Interest (including by registration of a financing statement); and
- (b) give us not less than 14 days prior written notice of any proposed change in your name and/or any other change in your details (including, but not limited to, changes in your address, facsimile number, trading name or business practice).

8.3 Under the PPSA you are entitled to receive certain information in relation to financing statements registered against you as a debtor and certain attempts to deal with the collateral of any security agreement. In relation to such rights, you agree:

- (a) to waive your right to receive a verification statement under section 148 of the PPSA in respect of any financing statement or financing change statement relating to the Security Interest;
- (b) that nothing in sections 114(1)(a) and 133 of the PPSA shall apply to these Terms;
- (c) to waive your rights as a debtor under sections 116, 120(2), 121, 125, 126, 127, 129 and 131 of the PPSA to the extent that these rights may be waived under section 107(2) of the PPSA.

In addition, you agree that the Security Interest has the same priority in relation to all amounts forming part of the amount owing, including future advances.

9 Warranties

9.1 Where the manufacturer of the Goods has provided a manufacturer's warranty (*Manufacturer's Warranty*), this warranty shall be extended to you. In order to be entitled to this warranty, you must have used the Goods in accordance with the warranty and notified us of the claim within 7 days of the reason for the claim first coming to your attention.

9.2 Except to the extent of a Manufacturer's Warranty, and any other written warranties given by us to you, all warranties and representations including those expressed or implied by law, in respect of Goods sold or services supplied are excluded to the extent permitted by law.

10 Damage and Defects

10.1 You shall, within 7 days of Completion (time being of the essence), inspect the Work and notify us if you believe there to be any defect, damage or failure to comply with the Proposal or any agreed variation. You shall then give us a reasonable period of time for inspection of any issue identified. If you fail to comply with any of the requirements in this clause 10, the Work shall be deemed to be free of any damage or defects.

11 Liability

11.1 We shall not be liable:

- (a) where your instructions were contrary to our advice and where the Goods and Services match your instructions but are not fit and suitable for the purpose for which you require them;
- (b) where you have altered or modified the Goods, mis-applied the Goods, not followed our instructions in respect to the Goods or have subjected them to any unusual or non-recommended use, servicing or handling;
- (c) for defects in any designs prepared by any third party;
- (d) for claims arising wholly or partly by any factors beyond our control, including, without limitation, any loss resulting from a delay in production or supply of the Goods or services. Such factors include, but are not limited to, acts of nature, war, riot, power failure, industrial action, and defaults of any ancillary parties that we rely on in relation to the Goods and Services;
- (e) for any indirect or consequential loss of any kind;
- (f) for any goods supplied by you and which we use in relation to the Services ; or
- (g) where the terms of any written warranty have not been complied with, or any manufacturer's handbook provided to you has not been complied with.

11.2 Our total liability under any warranty for defective Services or defective or damaged Goods is limited at our option to either:

- (a) remedying the defective Services;
- (b) replacing or repairing the defective or damaged Goods; or
- (c) refunding the price of the defective Services or defective or damaged Goods.

Where we elect to repair or remedy as provided above, we will use reasonable endeavours to do so as soon as practical, but will not be liable for any delay in completing the repairs.

11.3 Subject to the other provisions under this clause 11 our total liability to you arising out of any claim for loss or damages, however arising, shall not exceed the value of the Goods or Services which are the subject of the claim.

11.4 You agree to indemnify us against all claims and loss of any kind whatsoever, however caused, and whether arising as a result of your negligence or otherwise, brought by any person in connection with any matter, act, omission or error by you or your agents or employees.

12 Guarantee

12.1 As part of this contract, we may require that you arrange for a guarantor to give a personal guarantee. Should we so require, we will not commence any Work until the guarantor has signed the guarantee in the form provided by us and any costs of executing such guarantee shall be borne by you.

13 Cancellation by you

13.1 You may not cancel any order for Goods or Services or part of it without our written consent. If you do so, in addition to any other rights we may have, we may retain any deposit paid.

14 Waiver

14.1 Waiver of any of these Terms by us will only be effective if given in writing by an authorised person. If we waive any of these Terms the waiver shall apply to and operate only in the particular transaction, dealing or matter in respect of which it was given, and will not affect our rights under these Terms at any future time.

15 Severability

15.1 Each clause in these Terms is severable and if any clause is held to be illegal or unenforceable then the remaining clauses will remain in full force and effect.

16 Consumer Guarantees Act (CGA)

16.1 Where you are acquiring Goods and/or Services in trade the CGA shall not apply. If the CGA applies, these terms and conditions shall be read subject to your rights under the CGA.

17 Construction Contracts Act 2002 (CCA)

17.1 To the extent that the Goods and/or services purchased under these Terms create a construction contract for the purposes of the CCA, then the CCA and this clause 17 apply.

17.2 Without limiting any other rights we have you acknowledge and agree that we:

- (a) are entitled to progress payments in accordance with sections 16 and 17 of the CCA and you will make payment on the due date for payment as defined in section 18 of the CCA;
- (b) retain the right to claim for payment under the CCA by submitting a payment claim as defined in the CCA. You must serve any payment schedule on us within 7 days of the date of the relevant payment claim; and
- (c) retain the right to suspend work under section 72 of the CCA.

18 Governing Law

18.1 These Terms are governed by New Zealand law.

19 Definitions

"Completion" means when all services pursuant to a Work Order have been completed.

"GST" means goods and services tax pursuant to the GST Act as amended or replaced).

"GST Act" means the Goods and Services Tax Act 1985 (as amended or replaced).

"Goods" means all goods supplied by us to you from time to time, and (unless the context requires otherwise) includes all proceeds of such Goods and any product or mass which the Goods subsequently become part of.

"PPSA" means the Personal Property Securities Act 1999 (as amended or replaced).

"Proposal" means any document recording your instructions for the supply of Goods and/or the delivery of Services pursuant to which we commence any work and includes any final quote for such instructions, however given.

"Security Interest" means the security interest provided for by these Terms.

"Services" means all services provided by us to you from time to time, including the delivery and installation of the Goods and all services incidental to such delivery and installation.

"Work" means all work directly or indirectly related to a Proposal.

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System



Page 1 of 6



Product Description

- The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- The system consists of vertically fixed shiplap weatherboards, ventilated cavity battens, flashings and accessories.
- The Hermpac VertiLine Vertical Shiplap Weatherboards are manufactured from Western Red Cedar. Selected Weatherboards are also manufactured from Dura-Larch and Ashin-Dura. Cedar and Dura-Larch weatherboards are supplied either raw, with one coat of machine applied premium penetrating exterior grade oil stain to Hermpac specifications or, with a machine applied primer coat and one machine applied undercoat of exterior grade paint to Hermpac specifications. Ashin-Dura weatherboards are treated to H3.1 and are only available with a machine applied primer coat and one machine applied coat of exterior grade paint to Hermpac specifications.
- The system incorporates a primary and secondary means of weather resistance (first and second line of defense) against water penetration by separating the cladding from the external wall frame with a minimal 18 mm drained cavity.
- Only HP50 to HP60 (vertical shiplap standard profiles), CP777, CP857, CP862, CP1096, CP1219, CP1470, CP1637, CP1721, CP1739 to CP1743, CP1973, CP2071 to CP2073, CP2095, CP2257, CP2258, CP2498, CP2579, CP2948 to CP2950, CP3057, CP3058, CP3144, CP3164, CP3284 and CP3287 are covered by this certificate.

Product purpose and use

- The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has been assessed as an external vertically fixed wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable System E2/AS1, Third Edition including amendment 7 (01/01/2017), Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Third Edition including amendment 7 (01/01/2017), Table 2; and,
 - situated in NZS 3604:2011 Wind Zones up to, and including Extra High.
- The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System has also been assessed for weathertightness and structural wind loading when used as an external vertically fixed wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Third Edition including amendment 7 (01/01/2017), Paragraph 1.1 with regards to building height and floor plan area; and,
 - constructed with timber framing subject to specific engineering design; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System must only be installed vertically on vertical, flat surfaces.
- The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System is assessed for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The assessment of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System relies on the joinery meeting the requirements of NZS 4211:2008 including Amendment 1 for the relevant Wind Zone or wind pressure.)

CodeMark Certification Body		31/3/2017	08/01/2018	31/3/2020	GM-CM30036-RevG
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222 www.Global-Mark.com.au	Herve Michoux Managing Director	Date of issue	Last update	Date of next re-certification	Certificate Number

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. This certificate is issued by Global-Mark Pty Limited, an independent certification body accredited by the product certification accreditation body (JAS-ANZ) appointed by the Chief Executive of the Ministry of Business Innovation and Employment under the Building Act 2004. The Ministry of Business Innovation and Employment does not in any way warrant, guarantee, or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry of Business Innovation and Employment disclaims, to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate. This Certificate may only be reproduced in its entirety. It is advised to check that this Certificate of Conformity is currently valid and not withdrawn, suspended or superseded by a later issue by referring to the Ministry of Business Innovation and Employment website, <http://www.mbie.govt.nz/> New Zealand Building Code (NZBC) references the Building Code in force at the time of issuing the product certificate. Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

JAS-ANZ



global-mark



Page 2 of 6

Certificate holder

Hermpac Pacific Limited.

110 Foundry Road, Silverdale 0932, New Zealand. Tel: 09 426 5475, Fax: 09 426 7638, www.hermpac.co.nz

Compliance with the New Zealand Building Code (NZBC):

The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System if designed, used, installed and maintained in accordance with the scope of this Certificate, the statements and conditions of the supporting BRANZ appraisal No. 650 (2014) Amended 13 October 2017 and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specifications, June 2017 will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4(b), (c), (d) and (e) for the relevant physical conditions of B1.3.3. (a), (h), (j) and (q). The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets the requirements

Clause B2 DURABILITY: Performance B2.3.1(b) 15 years and B2.3.2(a). The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets these requirements.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System meets this requirement and will not present a health hazard to people.

Subject to the following conditions and limitations:

1. Subject to regular inspection for soil movement, earthquake or other structural impact or user damage.
2. Maintaining the validity of BRANZ Appraisal No. 650 (2014) Amended 13 October 2017 Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System.
3. Proprietary stain systems and proprietary paint systems have not been evaluated, and are therefore outside the scope of this certification.

Design Conditions:

1. Product specification and incorporation of the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System into the building design shall be carried out by a designer / architect / engineer or a building professional who:
 - a. Is qualified to design the buildings covered under the 'Scope' of use of this product.
 - b. Has ready access to the technical specifications including installation details and standards referenced in both the BRANZ appraisal No. 650 (2014) Amended 13 October 2017 and this certificate.

Product Installation Conditions:

1. Installation shall be carried out by a Licensed Building Practitioner (LBP), or tradespersons with experience in shiplap weatherboard external wall cladding installation who are supervised by a LBP.
2. Installation shall be undertaken in accordance with all relevant technical information related to the selected installation method, including information contained within the BRANZ appraisal No. 650 (2014) Amended 13 October 2017 and the Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System Installation Specifications, June 2017, including
 - a. the following installation details :

- HC SHIP 000 Drawing Index 16/10/2017
- HC SHIP 001 Drawing Index 16/10/2017
- HC SHIP 002 Isometric View 16/10/2017
- HC SHIP 100 Vertical Shiplap Weatherboard System Profiles 16/10/2017
- HC SHIP 101 Trim and Moulding Profiles 16/10/2017
- HC SHIP 102 Moulds & Weatherboard System Profiles 16/10/2017
- HC SHIP 200 Window Head Detail, Aluminium Joinery 16/10/2017
- HC SHIP 201 Window Sill Detail, Aluminium Joinery 16/10/2017
- HC SHIP 202 Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC SHIP 202A Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC SHIP 210 Door Head Detail Aluminium Joinery 16/10/2017
- HC SHIP 211 Door Sill Detail, Aluminium Joinery 16/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

JAS-ANZ



global-mark

Page 3 of 6



HC SHIP 212 Door Jamb Detail, Aluminium Joinery 16/10/2017
 HC SHIP 212A Door Jamb Detail, Aluminium Joinery 16/10/2017
 HC SHIP 300 Internal Corner HP41 16/10/2017
 HC SHIP 301 Internal Corner Edge to Edge 16/10/2017
 HC SHIP 302 Enclosed Deck Balustrade to Wall Junction 16/10/2017
 HC SHIP 303 Internal Corner - HP352, HP399 - HP1852 16/10/2017
 HC SHIP 303A Internal Corner - HP352, HP399 - HP1852 16/10/2017
 HC SHIP 304 Internal Corner - HP350, HP399 - HP1850 16/10/2017
 HC SHIP 304A Internal Corner - HP350, HP399 - HP1850 16/10/2017
 HC SHIP 305 Internal Corner - HP351, HP399 - HP1851 16/10/2017
 HC SHIP 305A Internal Corner - HP351, HP399 - HP1851 16/10/2017
 HC SHIP 306 Internal Corner - HP370 16/10/2017
 HC SHIP 307 Internal Corner - HP41 & HP399 16/10/2017
 HC SHIP 308 Internal Corner - HP370, HP399 - HP1853 16/10/2017
 HC SHIP 309 Internal Corner - HP110 & HP399 16/10/2017
 HC SHIP 310 Internal Corner - HP110 16/10/2017
 HC SHIP 311 Internal Corner - HP360 16/10/2017
 HC SHIP 400 External Corner Boxed 16/10/2017
 HC SHIP 401 External Corner HP40 16/10/2017
 HC SHIP 402 External Corner HP42 16/10/2017
 HC SHIP 403 External Corner 16/10/2017
 HC SHIP 404 External Corner - HP321 16/10/2017
 HC SHIP 405 External Corner - HP310, HP399 - HP1802 16/10/2017
 HC SHIP 405A External Corner - HP310, HP399 - HP1802 16/10/2017
 HC SHIP 406 External Corner - HP301, HP399 - HP1854 16/10/2017
 HC SHIP 406A External Corner - HP301, HP399 - HP1854 16/10/2017
 HC SHIP 407 External Corner - HP42, HP399 - HP1803 16/10/2017
 HC SHIP 407A External Corner - HP42, HP399 - HP1803 16/10/2017
 HC SHIP 408 External Corner - HP300, HP399 - HP1801 16/10/2017
 HC SHIP 408A External Corner - HP300, HP399 - HP1801 16/10/2017
 HC SHIP 410 General Detail Cavity Fix, Stain Finish 16/10/2017
 HC SHIP 411 General Detail Cavity Fix, Paint Finish 16/10/2017
 HC SHIP 412 Drained Inter-Storey Joint 16/10/2017
 HC SHIP 413 Scarf Join Stain Finish 16/10/2017
 HC SHIP 500 Base of Wall, Concrete 16/10/2017
 HC SHIP 501 Base of Wall, Timber 16/10/2017
 HC SHIP 502 Cavity at Enclosed Deck 16/10/2017
 HC SHIP 600 Roof/Wall Junction 16/10/2017
 HC SHIP 601 Soffit Detail, Overhang 16/10/2017
 HC SHIP 602 Eaves Detail, No Overhang 16/10/2017
 HC SHIP 700 Parapet Detail 16/10/2017
 HC SHIP 800 Meter Box Detail 16/10/2017
 HC SHIP 801 Pipe Penetration Detail 16/10/2017
 HC SHIP 802 Pipe Penetration Plan Detail 16/10/2017

HC SHIP40 000 Drawing Index 18/10/2017
 HC SHIP40 001 Drawing Index 18/10/2017
 HC SHIP40 002 Isometric View 18/10/2017
 HC SHIP40 100 Vertical SHIP40lap Weatherboard System Profiles 18/10/2017
 HC SHIP40 101 Trim and Moulding Profiles 18/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

Page 4 of 6



global-mark



- HC SHIP40 102 Moulds & Weatherboard System Profiles 18/10/2017
- HC SHIP40 103 Vertibat Batten Profiles 18/10/2017
- HC SHIP40 104 Vertibat Batten Profiles – Structural Fixing 18/10/2017
- HC SHIP40 200 Window Head Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 201 Window Sill Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 202 Window Jamb Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 202A Window Jamb Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 210 Door Head Detail Aluminium Joinery 18/10/2017
- HC SHIP40 211 Door Sill Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 212 Door Jamb Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 212A Door Jamb Detail, Aluminium Joinery 18/10/2017
- HC SHIP40 300 Internal Corner HP41 18/10/2017
- HC SHIP40 301 Internal Corner Edge to Edge 18/10/2017
- HC SHIP40 302 Enclosed Deck Balustrade to Wall Junction 18/10/2017
- HC SHIP40 303 Internal Corner - HP352, HP399 - HP1852 18/10/2017
- HC SHIP40 303A Internal Corner - HP352, HP399 - HP1852 18/10/2017
- HC SHIP40 304 Internal Corner - HP350, HP399 - HP1850 18/10/2017
- HC SHIP40 304A Internal Corner - HP350, HP399 - HP1850 18/10/2017
- HC SHIP40 305 Internal Corner - HP351, HP399 - HP1851 18/10/2017
- HC SHIP40 305A Internal Corner - HP351, HP399 - HP1851 18/10/2017
- HC SHIP40 306 Internal Corner - HP370 18/10/2017
- HC SHIP40 307 Internal Corner - HP41 & HP399 18/10/2017
- HC SHIP40 308 Internal Corner - HP370, HP399 - HP1853 18/10/2017
- HC SHIP40 309 Internal Corner - HP110 & HP399 18/10/2017
- HC SHIP40 310 Internal Corner - HP110 18/10/2017
- HC SHIP40 311 Internal Corner - HP360 18/10/2017
- HC SHIP40 400 External Corner Boxed 18/10/2017
- HC SHIP40 401 External Corner HP40 18/10/2017
- HC SHIP40 402 External Corner HP42 18/10/2017
- HC SHIP40 403 External Corner 18/10/2017
- HC SHIP40 404 External Corner - HP321 18/10/2017
- HC SHIP40 405 External Corner - HP310, HP399 - HP1802 18/10/2017
- HC SHIP40 405A External Corner - HP310, HP399 - HP1802 18/10/2017
- HC SHIP40 406 External Corner - HP301, HP399 - HP1854 18/10/2017
- HC SHIP40 406A External Corner - HP301, HP399 - HP1854 18/10/2017
- HC SHIP40 407 External Corner - HP42, HP399 - HP1803 18/10/2017
- HC SHIP40 407A External Corner - HP42, HP399 - HP1803 18/10/2017
- HC SHIP40 408 External Corner - HP300, HP399 - HP1801 18/10/2017
- HC SHIP40 408A External Corner - HP300, HP399 - HP1801 18/10/2017
- HC SHIP40 410 General Detail Cavity Fix, Stain Finish 2015 18/10/2017
- HC SHIP40 411 Structural Cavity Fix, Paint Finish 2015 18/10/2017
- HC SHIP40 411A General Detail Cavity Fix, Paint Finish 18/10/2017
- HC SHIP40 412 Drained Inter-Storey Joint 18/10/2017
- HC SHIP40 413 Scarf Join Stain Finish 18/10/2017
- HC SHIP40 500 Base of Wall, Concrete 18/10/2017
- HC SHIP40 501 Base of Wall, Timber 18/10/2017
- HC SHIP40 502 Cavity at Enclosed Deck 18/10/2017
- HC SHIP40 600 Roof/Wall Junction 18/10/2017
- HC SHIP40 601 Soffit Detail, Overhang 18/10/2017
- HC SHIP40 602 Eaves Detail, No Overhang 18/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

JAS-ANZ



global-mark

Page 5 of 6



- HC SHIP40 700 Parapet Detail 18/10/2017
- HC SHIP40 800 Meter Box Detail 18/10/2017
- HC SHIP40 801 Pipe Penetration Detail 18/10/2017
- HC SHIP40 802 Pipe Penetration Plan Detail 18/10/2017

- VC RWD 000 Drawing Index 16/10/2017
- VC RWD 001 Drawing Index 16/10/2017
- VC RWD 002 Isometric View 16/10/2017
- VC RWD 100 Vertical Shiplap Weatherboard System Profiles 16/10/2017
- VC RWD 101 Trim and Moulding Profiles 16/10/2017
- VC RWD 102 Moulds & Weatherboard System Profiles 16/10/2017
- VC RWD 200 Window Head Detail, Aluminium Joinery 16/10/2017
- VC RWD 201 Window Sill Detail, Aluminium Joinery 16/10/2017
- VC RWD 201A Window Sill Detail, Aluminium Joinery 16/10/2017
- VC RWD 202 Window Jamb Detail, Aluminium Joinery 16/10/2017
- VC RWD 202A Window Jamb Detail, Aluminium Joinery 16/10/2017
- VC RWD 210 Door Head Detail Aluminium Joinery 16/10/2017
- VC RWD 211 Door Sill Detail, Aluminium Joinery 16/10/2017
- VC RWD 211A Door Sill Detail, Aluminium Joinery 16/10/2017
- VC RWD 212 Door Jamb Detail, Aluminium Joinery 16/10/2017
- VC RWD 212A Door Jamb Detail, Aluminium Joinery 16/10/2017
- VC RWD 301 Internal Corner Edge to Edge 16/10/2017
- VC RWD 302 Enclosed Deck Balustrade to Wall Junction 16/10/2017
- VC RWD 303 Internal Corner - HP352, HP399 - HP1852 16/10/2017
- VC RWD 303A Internal Corner - HP352, HP399 - HP1852 16/10/2017
- VC RWD 304 Internal Corner - HP350, HP399 - HP1850 16/10/2017
- VC RWD 304A Internal Corner - HP350, HP399 - HP1850 16/10/2017
- VC RWD 305 Internal Corner - HP351, HP399 - HP1851 16/10/2017
- VC RWD 305A Internal Corner - HP351, HP399 - HP1851 16/10/2017
- VC RWD 307 Internal Corner - HP41 & HP399 16/10/2017
- VC RWD 310 Internal Corner - HP110 16/10/2017
- VC RWD 311 Internal Corner - HP360 16/10/2017
- VC RWD 401 External Corner HP40 16/10/2017
- VC RWD 402 External Corner HP42 16/10/2017
- VC RWD 403 External Corner 16/10/2017
- VC RWD 404 External Corner - HP321 16/10/2017
- VC RWD 405 External Corner - HP310, HP399 - HP1802 16/10/2017
- VC RWD 405A External Corner - HP310, HP399 - HP1802 16/10/2017
- VC RWD 406 External Corner - HP301, HP399 - HP1854 16/10/2017
- VC RWD 406A External Corner - HP301, HP399 - HP1854 16/10/2017
- VC RWD 407 External Corner - HP42, HP399 - HP1803 16/10/2017
- VC RWD 407A External Corner - HP42, HP399 - HP1803 16/10/2017
- VC RWD 408 External Corner - HP300, HP399 - HP1801 16/10/2017
- VC RWD 408A External Corner - HP300, HP399 - HP1801 16/10/2017
- VC RWD 410 General Detail Cavity Fix, Stain Finish 16/10/2017
- VC RWD 500 Base of Wall, Concrete 16/10/2017
- VC RWD 501 Base of Wall, Timber 16/10/2017
- VC RWD 502 Cavity at Enclosed Deck 16/10/2017
- VC RWD 600 Roof/Wall Junction 16/10/2017
- VC RWD 602 Eaves Detail, No Overhang 16/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System

JAS-ANZ



global-mark



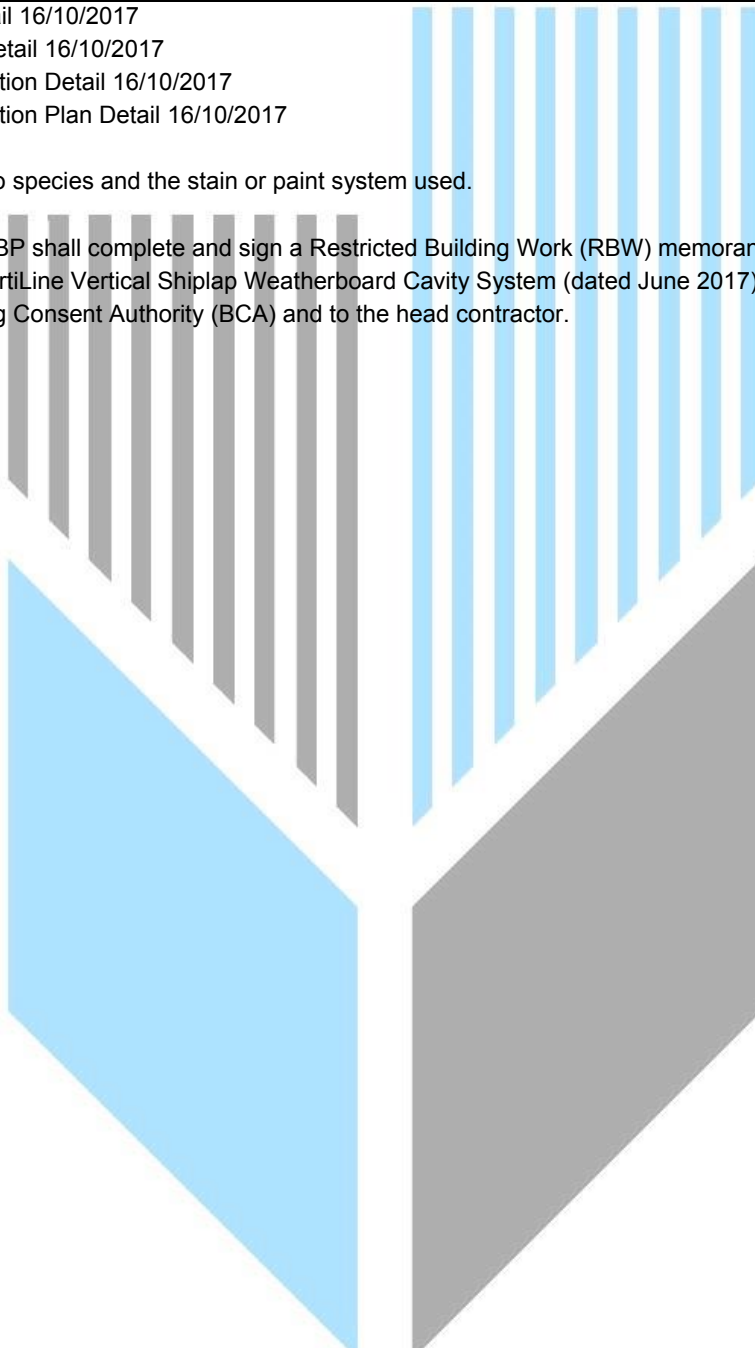
Page 6 of 6

- VC RWD 700 Parapet Detail 16/10/2017
- VC RWD 800 Meter Box Detail 16/10/2017
- VC RWD 801 Pipe Penetration Detail 16/10/2017
- VC RWD 802 Pipe Penetration Plan Detail 16/10/2017

b. The finish requirements applicable to species and the stain or paint system used.

3. Upon completion of the installation, the LBP shall complete and sign a Restricted Building Work (RBW) memorandum and the Quality Assurance Checklist Hermpac VertiLine Vertical Shiplap Weatherboard Cavity System (dated June 2017). The RBW document is to be provided to the Building Consent Authority (BCA) and to the head contractor.

End of document



CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System



Page 1 of 5

Product Description

- The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.
- The system consists of horizontally fixed rusticated, Splaycut and Multi-Splay Weatherboards installed over battens to form the cavity, flashings and accessories
- The Hermpac Rusticated, Splaycut and Multi-Splay weatherboards are manufactured from Western Red Cedar. Selected Weatherboards are also manufactured from Dura-Larch and Ashin-Dura. Cedar and Dura-Larch weatherboards are supplied either raw, with one coat of machine applied premium penetrating exterior grade oil stain to Hermpac specifications or, with a machine applied primer coat and one machine applied undercoat of exterior grade paint to Hermpac specifications. Ashin-Dura weatherboards are treated to H3.1 and are only available with a machine applied primer coat and one machine applied coat of exterior grade paint to Hermpac specifications. The system incorporates a primary and secondary means of weather resistance (first and second line of defense) against water penetration by separating the cladding from the external wall frame with a minimal 18 mm drained cavity.
- Only Hermpac rusticated, Splaycut and Multi-Splay Weatherboard profiles HP51, HP52, HP65, HP65MS, HP66, HP66MS, HP67 and HP68 and HP53, HP54, HP57, CP549, CP550, CP656, CP665, CP835 to CP847, CP849, CP853, CP943, CP1307, CP1328, CP1736 to CP1738, CP1763 to CP1765, CP1836, CP1890, CP1891, CP2078, CP2257, CP2258, CP2404, CP2488, CP2495, CP2614, CP2677, CP2719, CP2760, CP2952, CP2958, CP3121, CP3132, CP3170 to CP3172, CP3161 and CP3168 are covered by this certificate.

Product purpose and use

- The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System has been assessed as an external horizontally fixed wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable System E2/AS1, Third Edition including amendment 7 (01/01/2017), Paragraph 1.1; and,
 - constructed with timber framing complying with the NZBC and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Third Edition including amendment 7 (01/01/2017), Table 2; and,
 - situated in NZS 3604:2011 Wind Zones up to, and including Extra High.
- The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System has also been assessed for weathertightness and structural wind loading when used as an external horizontally fixed wall cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Third Edition including amendment 7 (01/01/2017), Paragraph 1.1; with regards to building height and floor plan area; and,
 - constructed with timber framing subject to specific engineering design; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.
- The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System must only be installed horizontally on vertical,

CodeMark Certification Body		31/3/2017	08/01/2018	31/3/2020	GM-CM30037-RevG
Global-Mark Pty Ltd, Suite 4.07, 32 Delhi Road, North Ryde NSW 2113, Australia Tel: +61 (0)2 9886 0222	Herve Michoux Managing Director	Date of issue	Last update	Date of next re-certification	Certificate Number

The purpose of construction site audits is to confirm the practicability of installing the product; and to confirm the appropriateness and accuracy of installation instructions. In issuing this certificate, Global-Mark has relied on the independent expert and/or laboratory advise or reports. This certificate is issued by Global-Mark Pty Limited, an independent certification body accredited by the product certification accreditation body (JAS-ANZ) appointed by the Chief Executive of the Ministry of Business Innovation and Employment under the Building Act 2004. The Ministry of Business Innovation and Employment does not in any way warrant, guarantee, or represent that the building method or product the subject of this certificate conforms with the New Zealand Building Code, nor accept any liability arising out of the use of the building method or product. The Ministry of Business Innovation and Employment disclaims, to the extent permitted by law, all liability (including negligence) for claims of losses, expenses, damages, and costs arising as a result of the use of the building method(s) or product(s) referred to in this certificate. This Certificate may only be reproduced in its entirety. It is advised to check that this Certificate of Conformity is currently valid and not withdrawn, suspended or superseded by a later issue by referring to the Ministry of Business Innovation and Employment website, <http://www.mbie.govt.nz/> New Zealand Building Code (NZBC) references the Building Code in force at the time of issuing the product certificate. Certificate holder will notify Global-Mark Pty Ltd in accordance with Regulation 15 of the Building (Product Certification) Regulations 2008

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System



Page 2 of 5

flat, surfaces.

4. The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System is assessed for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The assessment of the Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System relies on the joinery meeting the requirements of NZS 4211:2008 including Amendment 1 for the relevant Wind Zone or wind pressure.)

Certificate holder

Herman Pacific Limited.

110 Foundry Road, Silverdale 0932, New Zealand. Tel: 09 426 5475, Fax: 09 426 7638, www.hermpac.co.nz

Compliance with the New Zealand Building Code (NZBC):

The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System if designed, used, installed and maintained in accordance with the scope of this Certificate, the statements and conditions of the supporting BRANZ Appraisal No. 658 (2014) Amended 1 October 2017, the Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System Installation Specification, June 2017 will meet the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2, B1.3.4 (b), (c), (d) and (e) for the relevant physical conditions of B1.3.3 (a), (h), (j) and (q). The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System meets the requirements.

Clause B2 DURABILITY: Performance B2.3.1(b) 15 years and B2.3.2(a). The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System meets these requirements.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System meets this requirement.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System meets this requirement and will not present a health hazard to people.

Subject to the following conditions and limitations:

1. Subject to regular inspection for soil movement, earthquake or other structural impact or user damage.
2. Maintaining the validity of BRANZ Appraisal No. 658 (2014) Amended 13 October 2017 Hermpac Rusticated, Splaycut and Multi-splay Weatherboard Cavity System.
3. Proprietary stain systems and proprietary paint systems have not been evaluated, and are therefore outside the scope of this certification.

Design Conditions:

1. Product specification and incorporation of the Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System into the building design shall be carried out by a designer / architect / engineer or a building professional who:
 - a. Is qualified to design the buildings covered under the 'Scope' of use of this product.
 - b. Has ready access to the technical specifications including installation details and standards referenced in both the BRANZ appraisal No. 658 (2014) Amended 13 October 2017 and this certificate.

Product Installation Conditions:

1. Installation shall be carried out by a Licensed Building Practitioner (LBP), or tradespersons with experience in Rusticated, Splaycut and Multi-Splay Weatherboard external wall cladding installation who are supervised by a LBP.
2. Installation shall be undertaken in accordance with all relevant technical information related to the selected installation method, including information contained within the BRANZ appraisal No. 658 (2014) Amended 13 October 2017, the Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System Installation Specification, June 2017, including
 - a. The following installation details:
 - HC RUST 000 Drawing Index 16/10/2017
 - HC RUST 001 Drawing Index 16/10/2017
 - HC RUST 002 Isometric Views 16/10/2017
 - HC RUST 100 Rusticated Weatherboard System Profiles 16/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System



JAS-ANZ



global-mark

Page 3 of 5

- HC RUST 101 Trim and Moulding Profiles 16/10/2017
- HC RUST 200 Window Head Detail, Aluminium Joinery 16/10/2017
- HC RUST 201 Window Sill Detail, Aluminium Joinery 16/10/2017
- HC RUST 202 Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC RUST 202A Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC RUST 210 Door Head Detail Aluminium Joinery 16/10/2017
- HC RUST 211 Door Sill Detail, Aluminium Joinery 16/10/2017
- HC RUST 212 Door Jamb Detail, Aluminium Joinery 16/10/2017
- HC RUST 212A Door Jamb Detail, Aluminium Joinery 16/10/2017
- HC RUST 300 Internal Corner HP41 16/10/2017
- HC RUST 302 Enclosed Deck Balustrade to Wall Junction 16/10/2017
- HC RUST 307 Internal Corner HP370 16/10/2017
- HC RUST 310 Internal Corner HP360 16/10/2017
- HC RUST 400 External Corner Boxed 16/10/2017
- HC RUST 401 External Corner HP40 16/10/2017
- HC RUST 402 External Corner HP42 16/10/2017
- HC RUST 403 External Corner HP202 & HP201 16/10/2017
- HC RUST 404 External Corner HP310 16/10/2017
- HC RUST 405 External Corner HP321 16/10/2017
- HC RUST 410 General Detail Cavity Fix, Stain Finish 16/10/2017
- HC RUST 411 General Detail Cavity Fix, Paint Finish 16/10/2017
- HC RUST 412 Drained Inter-Storey Joint 16/10/2017
- HC RUST 413 Scarf Join Stain Finish 16/10/2017
- HC RUST 500 Base of Wall, Concrete 16/10/2017
- HC RUST 501 Base of Wall, Timber 16/10/2017
- HC RUST 502 Cavity at Enclosed Deck 16/10/2017
- HC RUST 600 Roof/Wall Junction 16/10/2017
- HC RUST 601 Soffit Detail, Overhang 16/10/2017
- HC RUST 602 Eaves Detail, No Overhang 16/10/2017
- HC RUST 700 Parapet Detail 16/10/2017
- HC RUST 800 Meter Box Detail 16/10/2017
- HC RUST 801 Pipe Penetration Detail 16/10/2017
- HC RUST 802 Pipe Penetration Plan Detail 16/10/2017

- HC RWD 000 Drawing Index 16/10/2017
- HC RWD 002 Isometric Views 16/10/2017
- HC RWD 100 Rusticated Weatherboard System Profiles 16/10/2017
- HC RWD 101 Trim and Moulding Profiles 16/10/2017
- HC RWD 200 Window Head Detail, Aluminium Joinery 16/10/2017
- HC RWD 201 Window Sill Detail, Aluminium Joinery 16/10/2017
- HC RWD 201A Window Sill Detail, Aluminium Joinery 16/10/2017
- HC RWD 202 Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC RWD 202A Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC RWD 210 Door Head Detail Aluminium Joinery 16/10/2017
- HC RWD 211 Door Sill Detail, Aluminium Joinery 16/10/2017
- HC RWD 212 Door Jamb Detail, Aluminium Joinery 16/10/2017
- HC RWD 212A Door Jamb Detail, Aluminium Joinery 16/10/2017
- HC RWD 300 Internal Corner HP41 16/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System



JAS-ANZ



global-mark

Page 4 of 5

- HC RWD 300 Internal Corner Butt 16/10/2017
- HC RWD 302 Enclosed Deck Balustrade to Wall Junction 16/10/2017
- HC RWD 402 External Corner HP42 16/10/2017
- HC RWD 410 General Detail Cavity Fix, Stain Finish 16/10/2017
- HC RWD 413 Scarf Join Stain Finish 16/10/2017
- HC RWD 500 Base of Wall, Concrete 16/10/2017
- HC RWD 501 Base of Wall, Timber 16/10/2017
- HC RWD 502 Cavity at Enclosed Deck 16/10/2017
- HC RWD 600 Roof/Wall Junction 16/10/2017
- HC RWD 601 Soffit Detail, Overhang 16/10/2017
- HC RWD 601A Soffit Detail, Overhang 16/10/2017
- HC RWD 602 Eaves Detail, No Overhang 16/10/2017
- HC RWD 602A Eaves Detail, No Overhang 16/10/2017
- HC RUST 700 Parapet Detail 16/10/2017
- HC RUST 800 Meter Box Detail 16/10/2017
- HC RUST 801 Pipe Penetration Detail 16/10/2017
- HC RUST 802 Pipe Penetration Plan Detail 16/10/2017

- HC SPLAY 000 Drawing Index 16/10/2017
- HC SPLAY 100 Splaycut Weatherboard System Profiles 16/10/2017
- HC SPLAY 101 Splaycut Trim and Moulding Profiles 16/10/2017
- HC SPLAY 200 Window Head Detail, Aluminium Joinery 16/10/2017
- HC SPLAY 201 Window Sill Detail, Aluminium Joinery 16/10/2017
- HC SPLAY 202 Window Jamb Detail, Aluminium Joinery 16/10/2017
- HC SPLAY 210 Door Head Detail Aluminium Joinery 16/10/2017
- HC SPLAY 211 Door Sill Detail, Aluminium Joinery 16/10/2017
- HC SPLAY 212 Door Jamb Detail, Aluminium Joinery 16/10/2017
- HC SPLAY 300 Internal Corner HP10 16/10/2017
- HC SPLAY 301 Internal Corner Scribed 16/10/2017
- HC SPLAY 302 Internal Corner Boxed 16/10/2017
- HC SPLAY 303 Enclosed Deck Balustrade to Wall Junction 16/10/2017
- HC SPLAY 400 External Corner Boxed 16/10/2017
- HC SPLAY 401 External Corner Soaker 16/10/2017
- HC SPLAY 410 General Detail Cavity Fix, Stain Finish 16/10/2017
- HC SPLAY 410A General Detail Cavity Fix, Multi-Splay Stain Finish 16/10/2017
- HC SPLAY 411 General Detail Cavity Fix, Paint Finish 16/10/2017
- HC SPLAY 411A General Detail Cavity Fix, Multi-Splay Paint Finish 16/10/2017
- HC SPLAY 412 Drained Inter-Storey Joint 16/10/2017
- HC SPLAY 413 Scarf Join, Stain Finish 16/10/2017
- HC SPLAY 500 Base of Wall, Concrete 16/10/2017
- HC SPLAY 501 Base of Wall, Timber 16/10/2017
- HC SPLAY 502 Cavity at Enclosed Deck 16/10/2017
- HC SPLAY 600 Roof/Wall Junction 16/10/2017
- HC SPLAY 601 Soffit Detail, Overhang 16/10/2017
- HC SPLAY 602 Eaves Detail, No Overhang 16/10/2017
- HC SPLAY 700 Parapet Detail 16/10/2017
- HC SPLAY 800 Meter Box Detail 16/10/2017
- HC SPLAY 801 Pipe Penetration Detail 16/10/2017

CERTIFICATE OF CONFORMITY

This product Certificate is issued under Section 269 of the Building Act 2004 for:

Hermpac Rusticated, Splaycut and Multi-Splay Weatherboard Cavity System



JAS-ANZ



global-mark

Page 5 of 5

HC SPLAY 802 Pipe Penetration Plan Detail 16/10/2017

b. The finish requirements applicable to species and the stain or paint system used.

3. Upon completion of the installation, the LBP shall complete and sign a Restricted Building Work (RBW) memorandum and the Quality Assurance Checklist Hermpac Rusticated, Multi-Splay & Splaycut Weatherboard Cavity System (dated June 2017). The RBW document is to be provided to the Building Consent Authority (BCA) and to the head contractor.

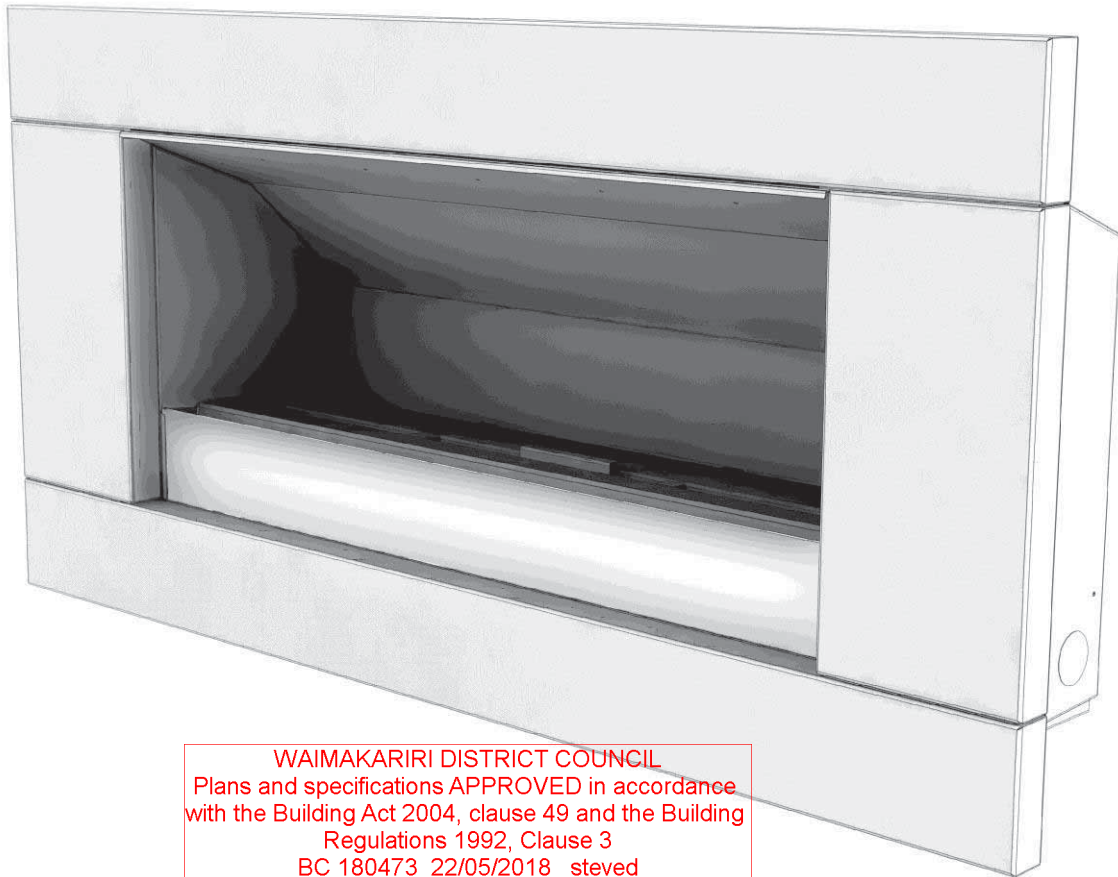
End of document

escea.

Installation Manual

EF5000 – AUS & NZ

This manual is **ONLY** for fires with a serial No. from 81000 onwards.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

Important:

The appliance shall be installed in accordance with;

- Local gas fitting regulations
- Municipal building codes
- AS/NZS 5601.1:2013, *Gas installations*
- Any other relevant statutory regulations.
- TO BE INSTALLED ONLY BY AN AUTHORIZED PERSON
- THIS APPLIANCE MUST NOT BE INSTALLED OR USED INDOORS
- INSTRUCTIONS MUST BE LEFT WITH THE CONSUMER AND THE CONSUMER TO RETEAIN THEM FOR FUTURE REFERENCE.

Manufactured by: Escea Ltd, PO Box 5277 Dunedin NZ, Ph: +64 3 4788220, email: info@escea.com
For contact details of your local Escea distributor or dealer please visit www.escea.com

Warning:

Children and adults should be alerted to the hazards of high surface temperatures, burns and clothing ignition.

Young Children should be carefully supervised when they are in the area of the appliance.

Clothing or other flammable materials should not be hung from the appliance, or placed on or near the appliance.

Any guard or other protective device removed for servicing the appliance must be replaced prior to operating the appliance.

Installation of appliances fitted to fixed gas supply systems and repair of all appliances must be carried out by a qualified service person.

A qualified service person should inspect and service this product at least annually.

Cleaning may be required in order to keep the control compartment, burners, and circulating air passageways clean.

The 240/24volt plug pack MUST be installed inside and out of the weather. It MUST be kept dry and protected from rain and water ingress.

This Gas Fire is for outdoor use only.

Contents:	Chapter:
Product description _____	1.0
Power supply _____	2.0
Creating the cavity _____	3.0
Wall cladding around the fire _____	4.0
Minimum install height off the ground _____	5.0
Types of installation _____	6.0
Corner Installations _____	7.0
Laying gas pipe _____	8.0
Fixing the fire into the cavity _____	9.0
Connecting gas pipe _____	10.0
Connecting the power supply and touch panel _____	11.0
Testing of touch panel and spark ignition _____	12.0
Checking operating pressure _____	13.0
Assembly of stone cartridge _____	14.0
Fitting the fascia _____	15.0
Placement of ceramic pebbles _____	16.0
Operating Instructions _____	17.0
Maintenance and cleaning _____	18.0
Electrical Schematic _____	19.0
Gas Conversion _____	20.0

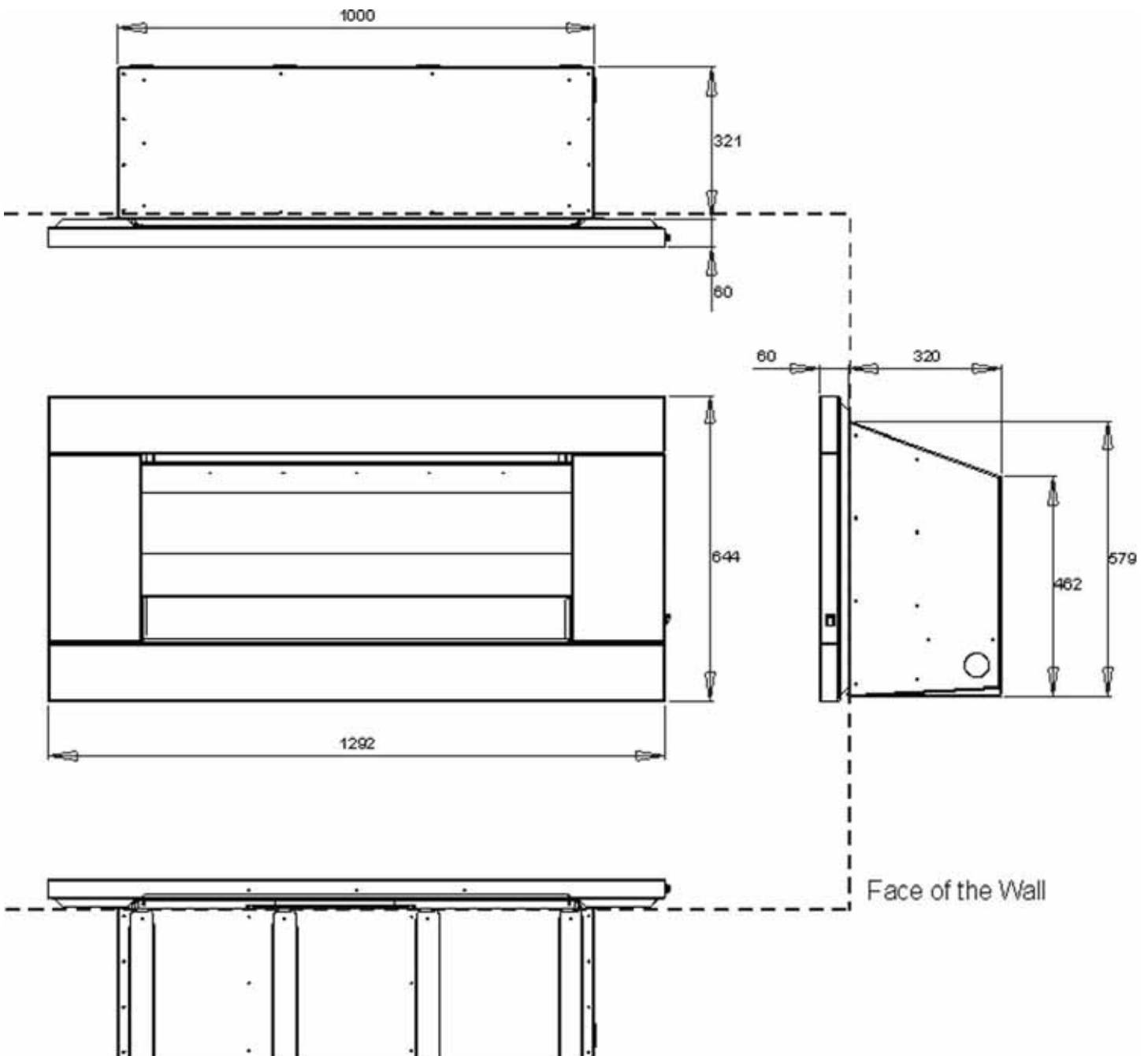
1.0 Product Description:

The escea EF5000 flame effect gas fire is designed for outdoor use only. This appliance requires no flue and must be permanently installed into a cavity. It may be installed into a timber cavity.

The fire is controlled by the user from a switch that is situated on the lower right hand side of the stainless steel fascia.

The Data Label, containing all technical information such as manufacture date, serial number, gas type, jet size, etc, can be found in the lower right hand side of the fire, below the firebox, to access this, the fascia must be removed.

1.1 Product dimensions: (mm)



2.0 Power Supply:

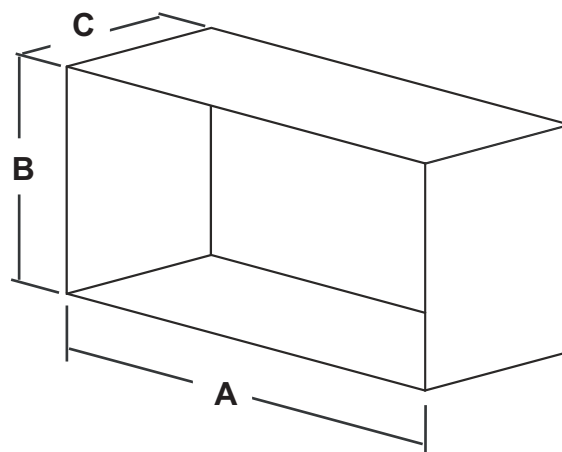
This appliance requires a constant external 24V AC 1A power supply to mains electricity. A transformer is supplied with the fire.

3.0 Creating the Cavity:

The dimensioned drawing below shows the size of opening that must be created to install the unit.

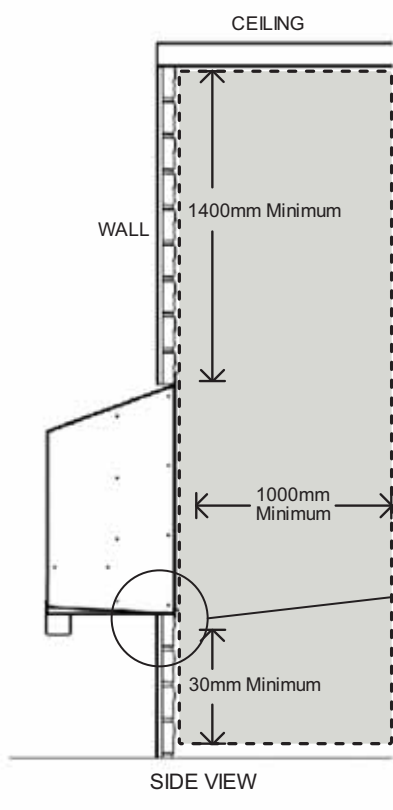
3.1 Cavity Dimensions:

Minimum Cavity Dimensions		
A	B	C
1010 mm	585 mm	330 mm



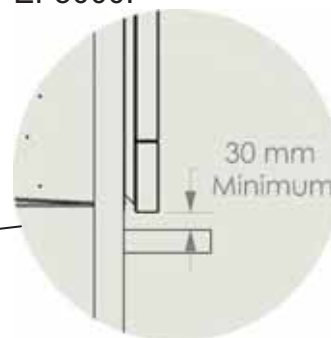
3.2 Where possible, it is recommended that the cavity is made slightly larger than the above dimensions to give the installer the maximum amount of space to work in.

3.3 Clearances to combustibles:



Minimum clearance distance between a combustible ceiling and the fascia must be no less than 1400mm.

Warning: Under no circumstances should any object such as people, pets, furniture, etc. be closer than 1 metre in front of the escea EF5000.



Warning: Do not install a TV above this fire under any circumstances.

4.0 Wall cladding around fire:

- 4.1 The temperature of the wall directly above the heater does get hot and hence may discolour paint finishes.
- 4.2 Some dark coloured exhaust stains may also become visible directly above the fire due to exhaust. In most cases this can be cleaned off with water and a brush.

5.0 Minimum install height:

The fire has ventilation gaps behind the fascia at the top and bottom. These must not be blocked, so ensure there is a gap of at least 30mm between the bottom of the fascia and anything below.

6.0 Types of Installation:

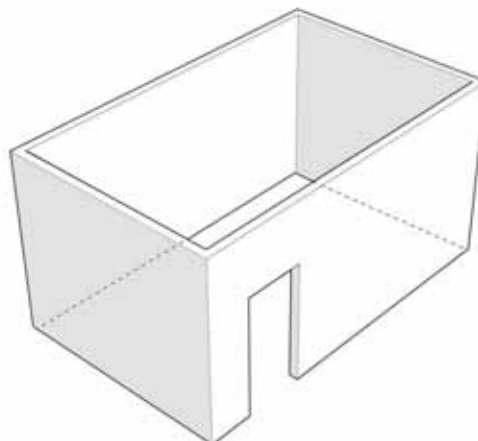
This appliance shall only be used in an above ground open-air situation with natural ventilation, without stagnant areas, where gas leakage and products of combustion are rapidly dispersed by wind and natural convection.

Certain materials or items, when placed under or near the appliance, will be subjected to radiant heat and could become damaged.

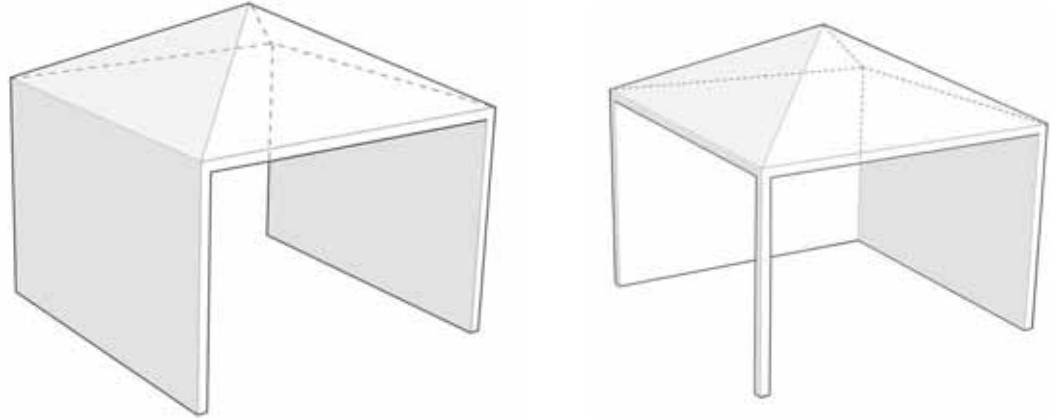
The following installation diagrams are escea recommendations only and may or may not comply with your local council standards. Please check with your local council for actual building standards.

Typically an outdoor space is not enclosed but, any enclosure in which the appliance is used should comply with one of the following:

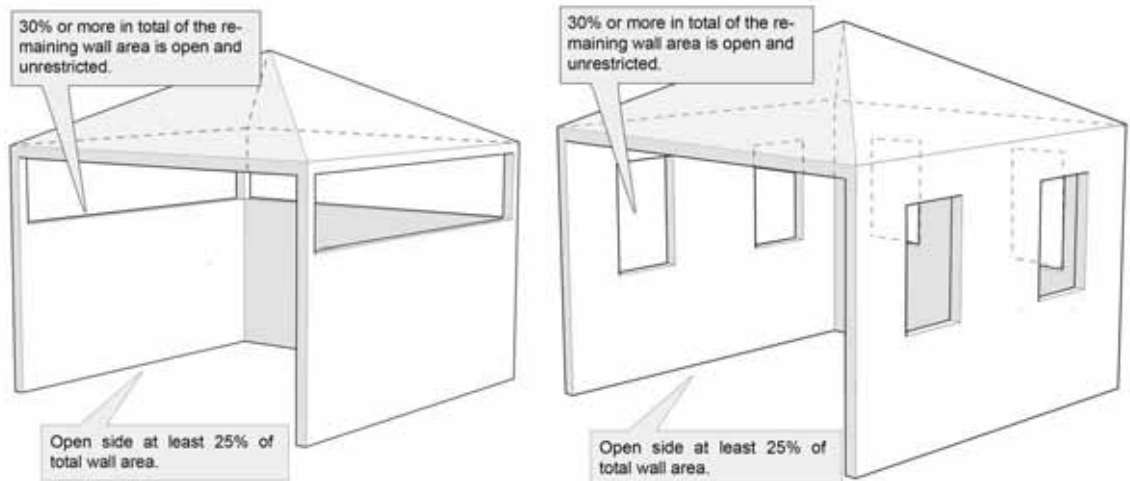
- An enclosure with walls on all sides, but at least one permanent opening at ground level and no overhead cover.



- Within a partial enclosure that includes an overhead cover and no more than two walls.



- Within a partial enclosure that includes an overhead cover and more than two walls, the following should apply:
 - At least 25% of the total wall area is completely open, and
 - At least 30% of the remaining wall area is open and unrestricted

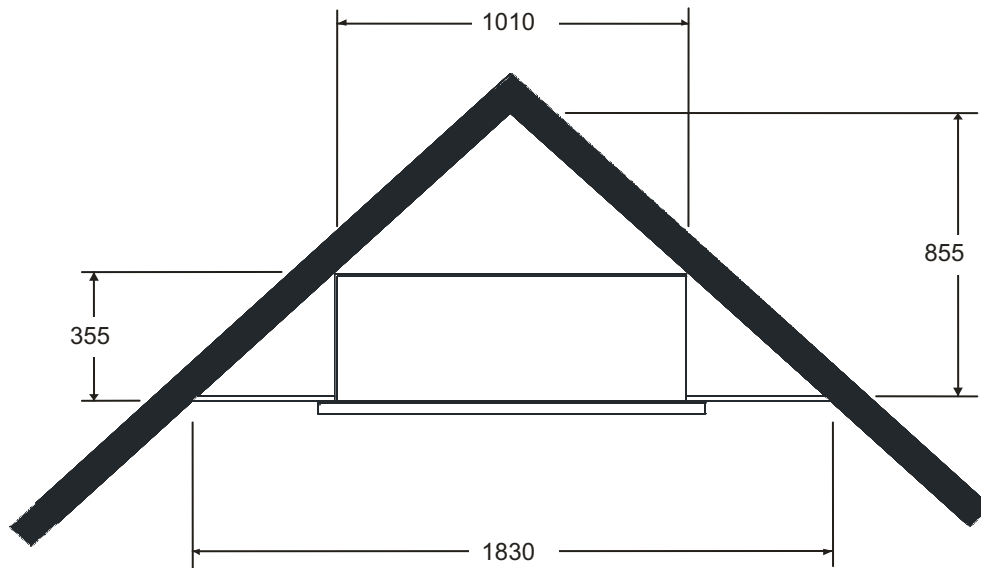


Rectangular areas have been used in the above diagrams; the same principles apply to any other shaped area.

In the case of balconies, at least 20% of the total wall area should be and remain open and unrestricted.

7.0 Corner Installations:

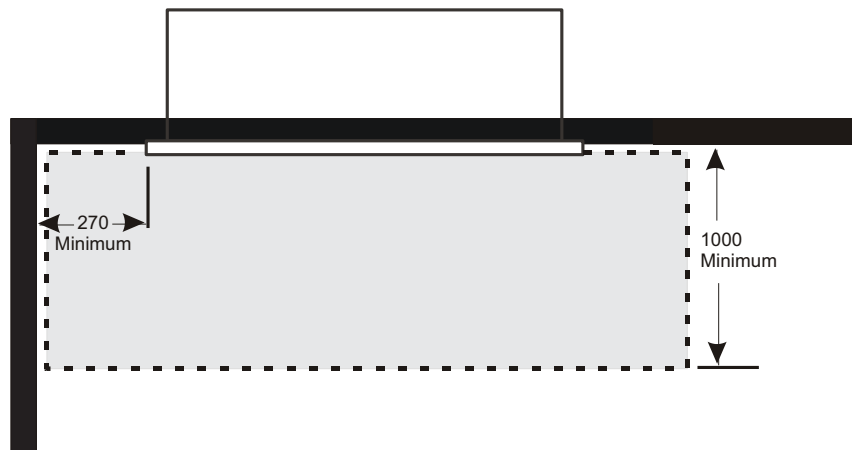
If a cavity is to be created in a corner, the following drawings give the minimum sized interior wall dimensions possible.



Note:

Allowances need to be made for cladding the internal of the cavity.

Dimensions of the cavity in this diagram represent the internal size only.



Minimum clearance distance between adjacent wall and fascia needs to be no less than 270mm.

8.0 Laying Gas Pipe:

Gas pipe should be sized as per the requirements of AS5601/AG601-2000. The pipe sizing must be sufficient to deliver the following volume of gas to the heater with all other gas appliances in the home running at the same time;

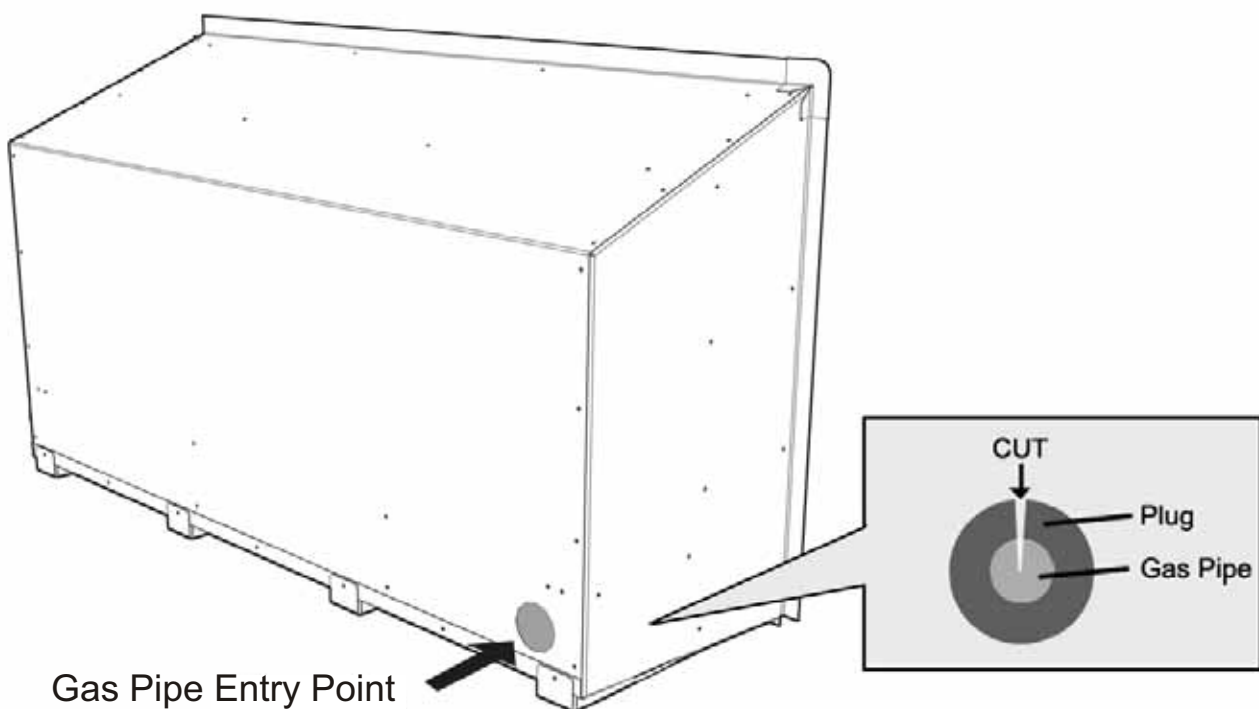
EF5000 Natural Gas = 49 Mj/hr

EF5000 Propane = 40 Mj/hr

EF5000 ULPG = 40 Mj/hr

It is highly recommended to install an easily accessible isolating shut off valve (ball valve) along the gas line to the EF500 unit which should be easily accessible to the user.

- 8.1 This fire has been supplied with a 1/2" pipe connected through a short 45° flare nut inlet connection to make the gas supply easy and safe. Solid pipe should be run to the inside lower left hand side of the fire. Insert the supplied rubber plug and cut it as shown below to allow the gas pipe and the electrical cable to pass through, keeping the plug as air-tight as possible.

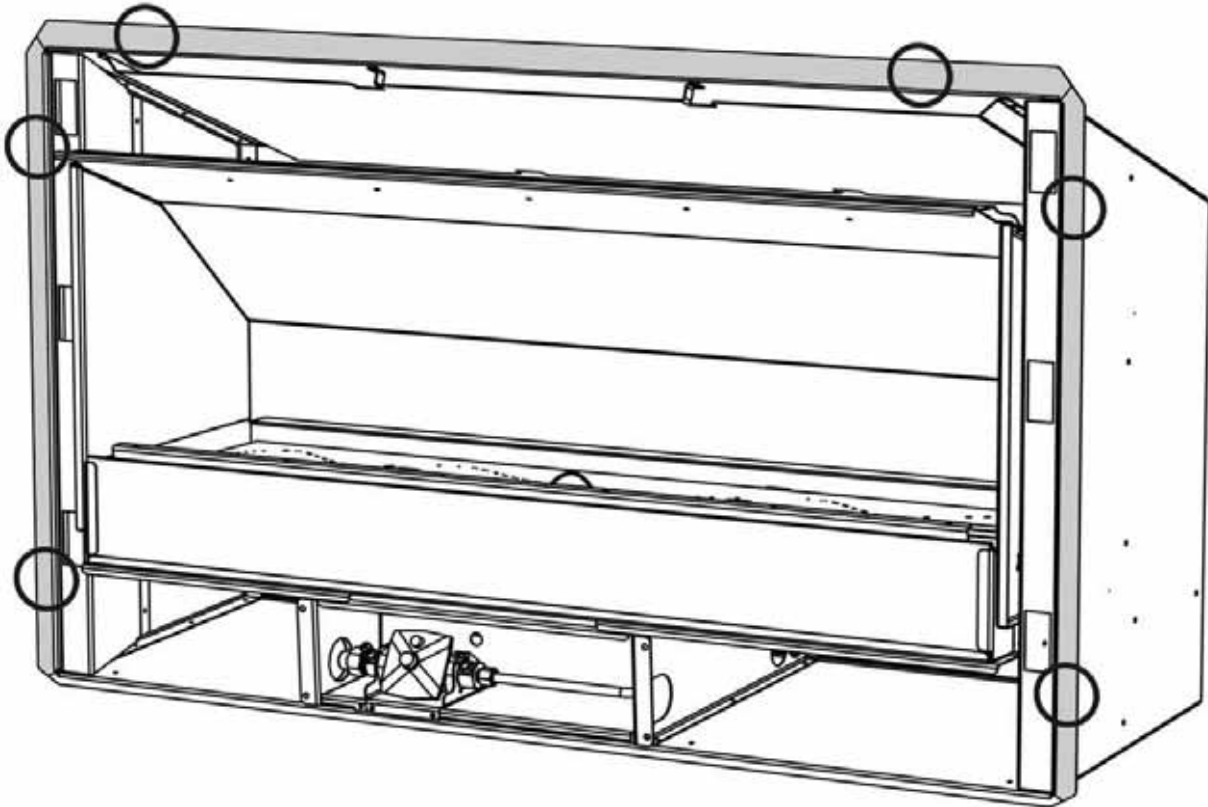


- 8.2 Any flexible pipe should be attached to the copper supply pipe and joint tested to ensure gas tightness, an isolating valve is recommended for this purpose.
- 8.3 Before each use of the appliance the hose assembly connecting the appliance to the gas supply must be inspected. If there is evidence of excessive abrasion or wear, or if the hose is damaged, then the hose assembly must be replaced before the appliance is operated.
- 8.4 The gas hose should be properly located away from pathways or areas where the hose may be subject to accidental damage.

9.0 Fixing the fire into the cavity:

To fix the fire to the cavity, first drill 4 to 6 (5mm diameter) holes in the *outer flange* (as shaded grey in the picture below) in locations which will give you the most support from the cavity framework behind and evenly spaced around the flange. Using the supplied Stainless Steel screws, fasten the fire to the cavity through these drilled holes.

Suggested location for screws of mounting:



Ensure that the fire is securely located and free from movement.

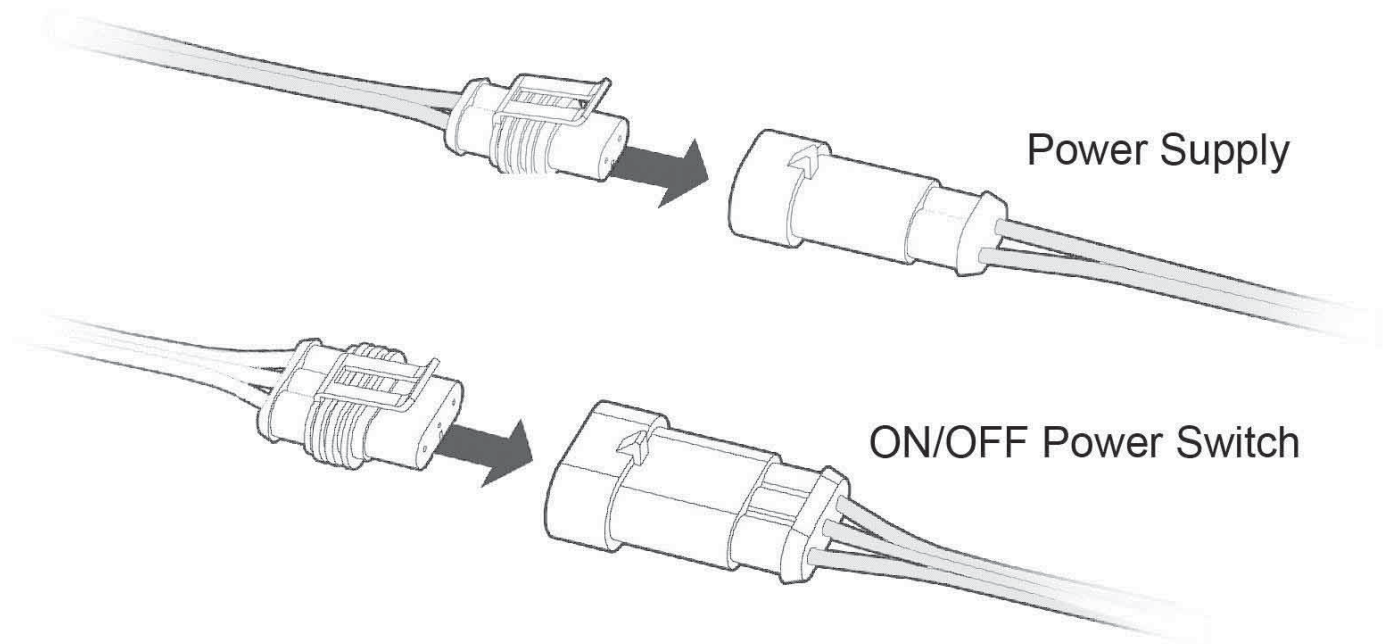
10.0 Connecting the Gas Pipe:

When the fire unit has been pushed into position and secured the flexible hose can be connected to the inlet side of the appliance regulator at the front center of the fire. The hose and pipe assembly should have been tested prior to this as per section 8.2

- 10.1 No matter which connection the installer chooses, the regulator that is supplied in the fire **MUST NOT BE REMOVED**. Removal of the regulator, or replacing it with one not intended for use with an Escea EF5000, will void the limited appliance warranty.
- 10.2 The EF5000 must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of ½ psi (3.5 kPa).

11.0 Connecting the power supply and power switch:

- 11.1 The Power Supply socket is located in the centerline of the fire, below the firebox, facing the right hand side behind the ignition tray. Push the 2 pin plug together until they 'click'.
- 11.2 The ON/OFF Power Switch socket plugs into the 3 pin plug lead situated at the front RH side of the fire. Push them together until they 'click'.



12.0 Testing of the power switch and spark ignition:

*IMPORTANT: Before the operating pressure can be checked and the fascia fitted,
The power switch and spark ignition must be tested.*

- 12.1 This can be done with the gas supply either turned on or off.
With the power supply and power switch connected, Lean the fascia Right end up beside the fire and run through the steps for igniting the pilot (refer to section 17.0 for instructions).

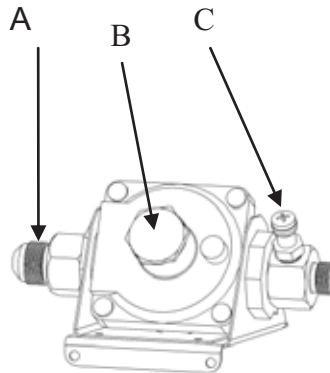
13.0 Checking Operating Pressure:

NOTE: Check ensure that the correct jets, for the gas being used, are installed – see Chapter 20.

This check is done at the regulator located at the lower front of the appliance.

- 13.1 This must be done before fascia has been fitted.
- 13.2 Pressure test point available for operating pressure (as shown below).
- 13.3 The operating pressure has been factory set. Please check that the operating pressure is exactly as listed below and if not, adjust screw in centre of regulator until pressure is correct. If unable to do this, reassess the inlet gas pressure / pipes.
- 13.4 Replace operating test point screw and leak-test the test point.
- 13.5 Test for overall soundness using an appropriate method.

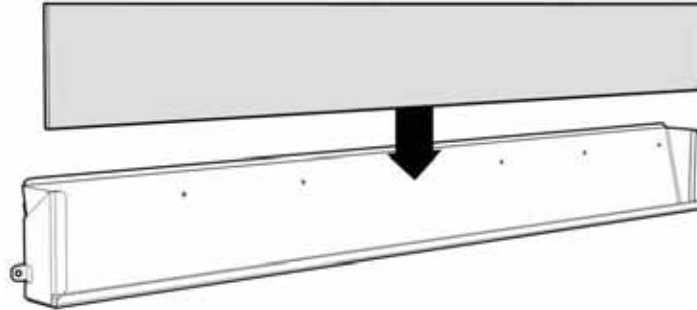
- A = Inlet gas connection
- B = Pressure adjustment screw
- C = Operating pressure test point



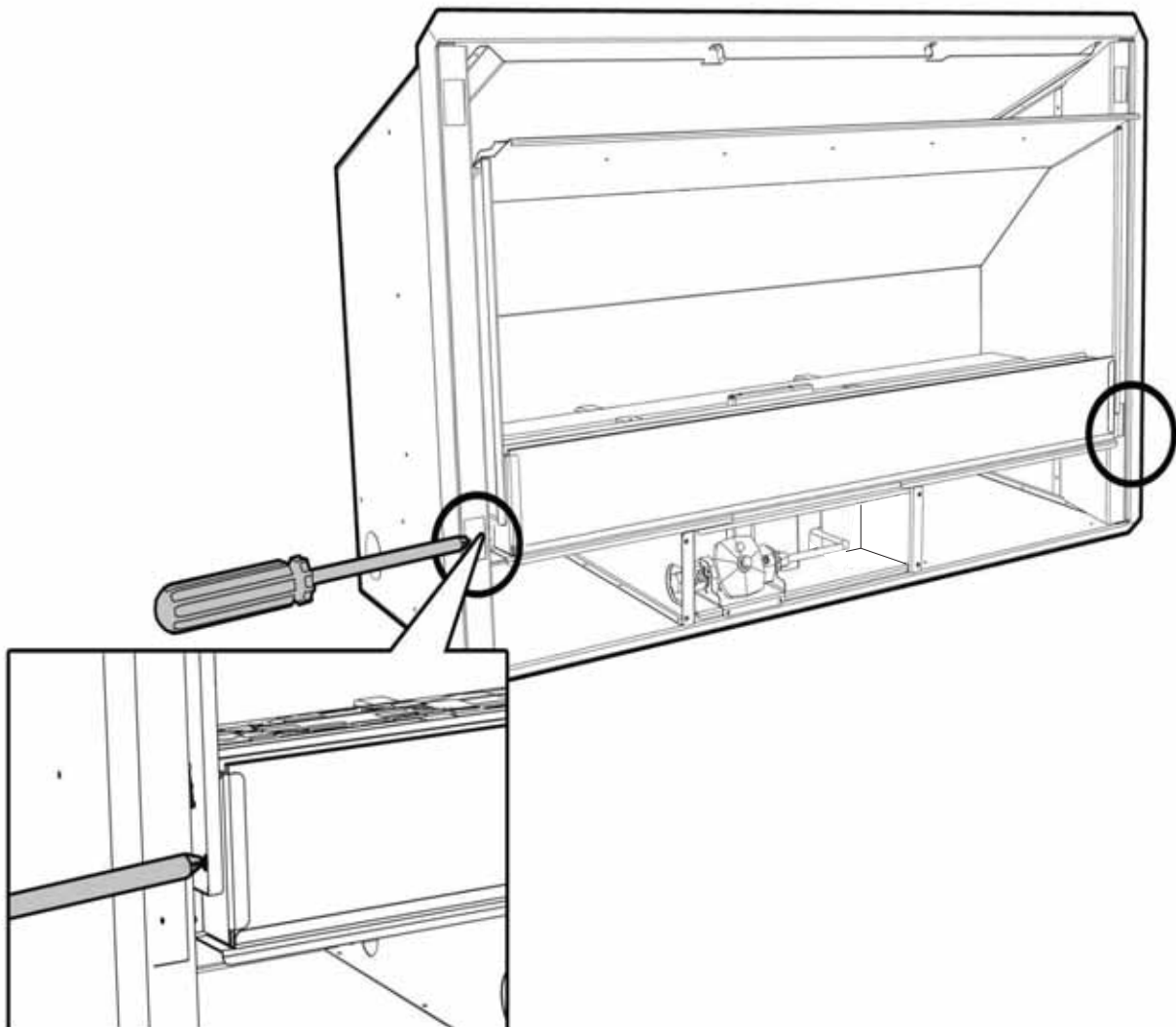
EF5000 Pressure table			
	Propane	Natural Gas	ULPG
Minimum Inlet pressure	2.5 kPa	1.0 kPa	2.5 kPa
Maximum Inlet pressure	5.0 kPa	5.0 kPa	5.0 kPa
Operating Pressure	2.0 kPa	1.0 kPa	2.2 kPa

14.0 Assembly of stone cartridge:

The glass which fits inside in the stone Cartridge has been packaged to protect it during transit, and can be found inside the firebox. Insert the glass strip into the stone cartridge as shown to the right, between the two metal flanges and push it all the way to the bottom. A bag of pebbles (River Stones) are also supplied, use these to fill the stone cartridge.



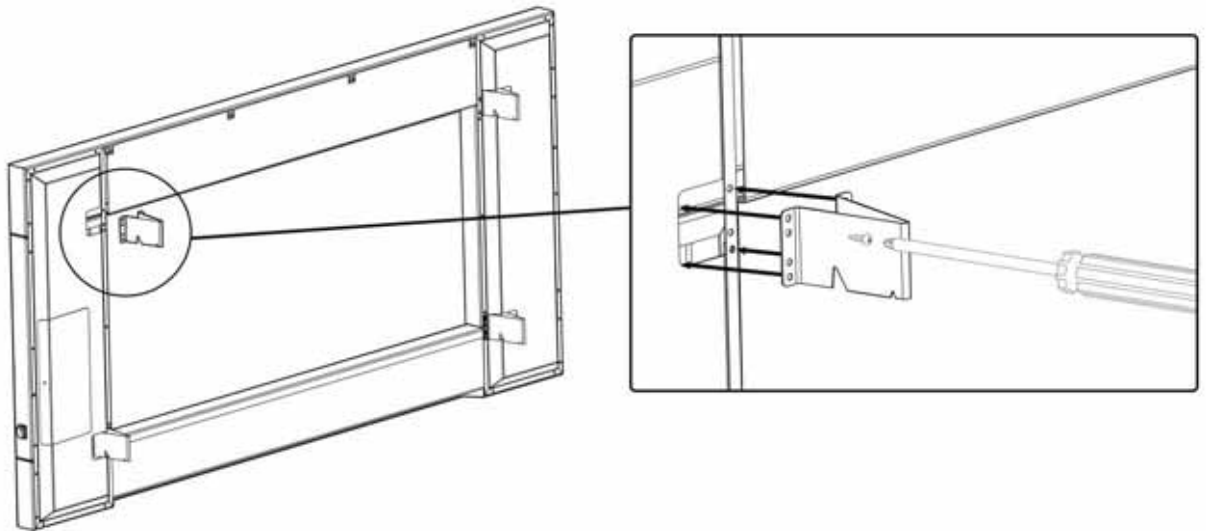
- 14.1 With the glass in position, fix the stone cartridge to the fire by using the two supplied screws in the location shown below. Do this before the fascia is fitted.



15.0 Fitting the Fascia:

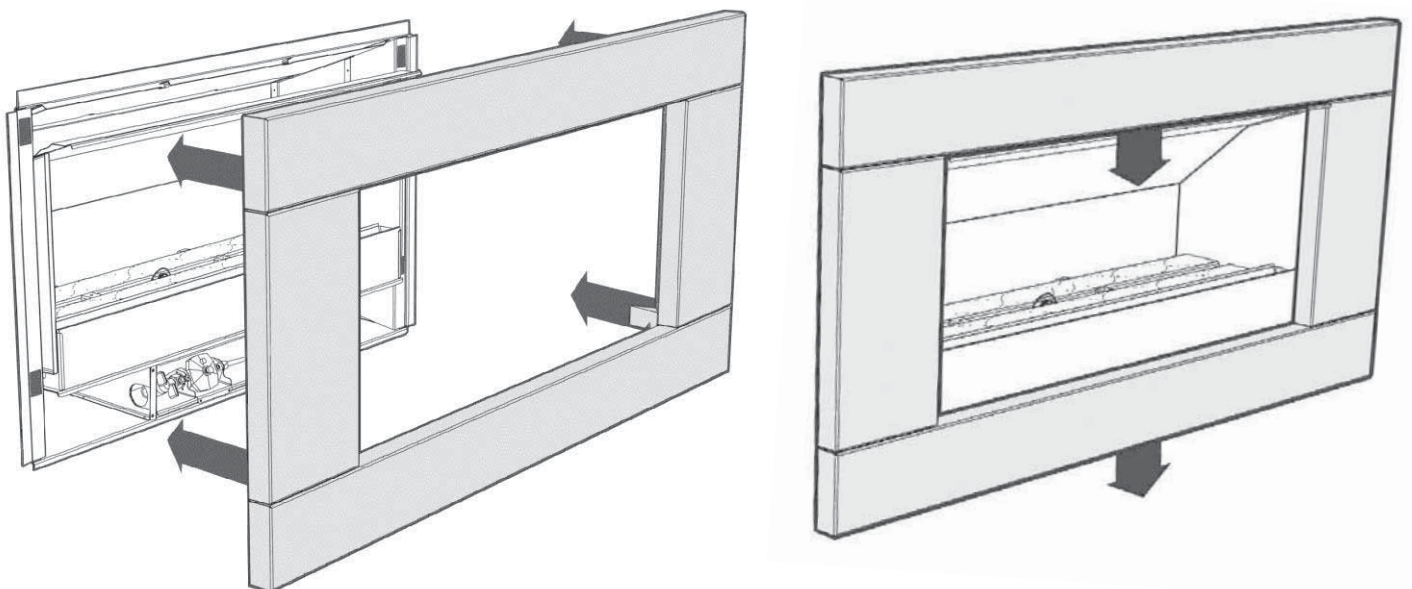
Before fitting the fascia, the hooks must be attached using the screws supplied. Ensure the wires connecting the fascia to the fire are securely connected, as per section 11.0.

The EF5000 fascia is attached to the combustion box by four 'hooks' on the corners of the fascia.



Line up the hooks with the receptacles on the Outdoor Fire pictured below, and push the fascia into position. The first slot in the hook can be used to hang the fascia in the receptacles in order to ease the attachment.

- 15.1 When you have pushed the fascia in as far as it will go, briefly push down on the fascia to secure the fascia into position.



16.0 Placement of ceramic stones:

EF5000 fuel beds should be evenly spread out with a maximum one layer of media. Do not heap or mound the fuel bed media and attempt to get an even spread across the top of the burners.

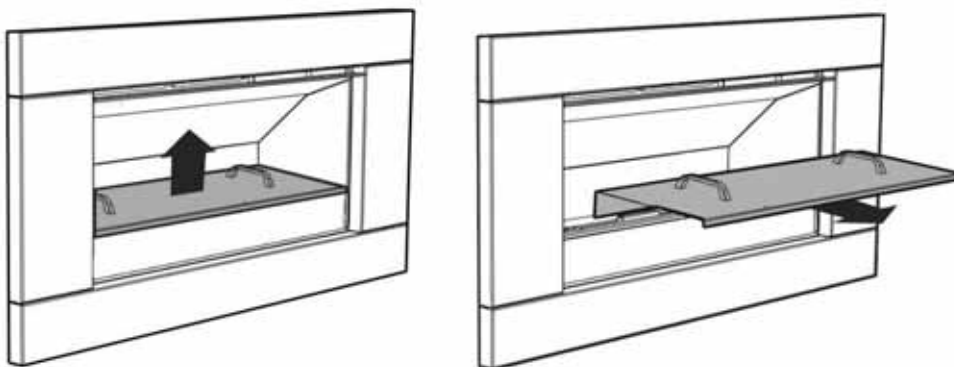


Ceramic stones

River stones

UNDER NO CIRCUMSTANCES SHOULD THE SUPPLIED SMALL STONE PEBBLES (RIVER STONES) BE PLACED ON THE BURNERS. THEY ARE FOR USE INSIDE THE STONE CARTRIDGE ONLY

- 16.1 If desired, an optional Weather Cover can be purchased from your Escea retailer, which protects the fuelbed and burners. This should be replaced when while the fire is not in use.
- 16.2 To fit the weather cover ensure fire is off and cooled, and place the front edge on the glass at the front of the fire, the rear flange of the Weather Cover will rest on the burner supports behind the rear burner. To remove, lift the Weather Cover upwards and then towards yourself.

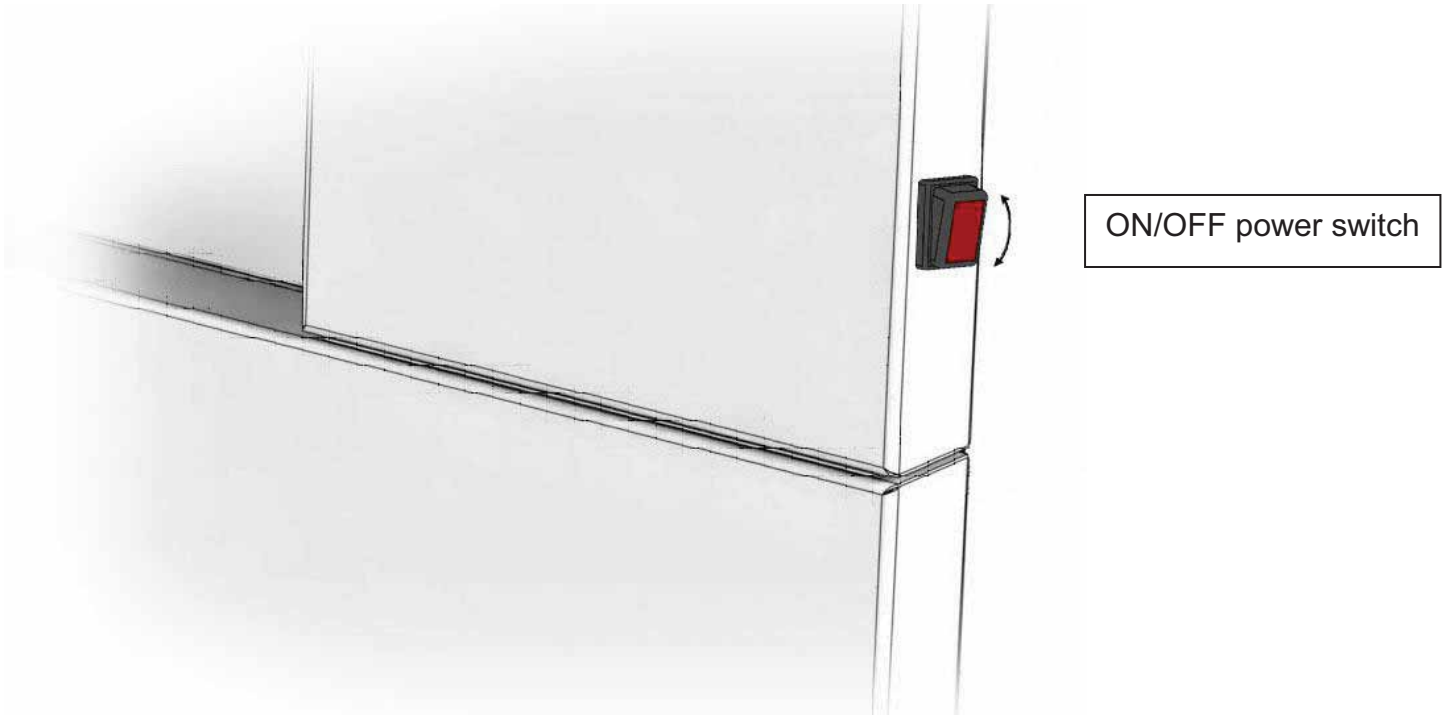


- 16.3 The fire **MUST NOT** be operated while the cover is fitted.
- 16.4 The cover **MUST NOT** be fitted while the fire is hot. A cooling period of 30 minutes must be observed before fitting.
- 16.5 Objects such as wood, coal, fire logs or any other solid fuels shall not be burned in the gas fireplace.
Under no circumstances should any part of your body enter the gas fireplace during the start-up or whilst the fire is running.

17.0 Operating Instructions:

The EF5000 is operated by the switch located on the right hand side outer edge of the fascia. The basic operations possible are ON/OFF.

Before operating the fire, ensure the power transformer is plugged into the mains wall socket & turned on, and the supply is turned on.



17.1 Igniting the pilot flame

To turn the fire on push the ON/OFF rocker switch to the on position. The ignition unit will start sparking and the pilot and burners will ignite almost immediately.

In the event of no gas, the ignition unit will attempt to try to light up to 3 times before shutting down.

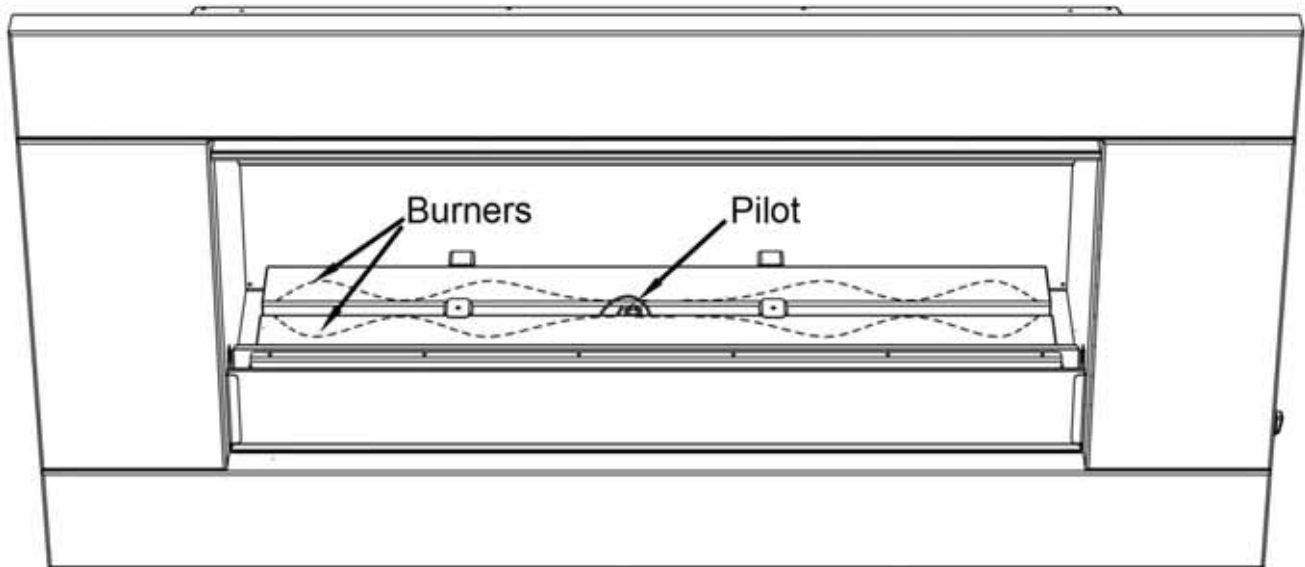


17.2 Turning off the fire

To turn the fire off, simply flick the ON/OFF rocker switch to the off position. This will shut down the gas flow to the pilot flame and both burners.

Please ensure the gas supply is also turned off, and as an extra safety please turn off the main power supply at the house.

17.3 Pilot Flame and Burner Positioning



18.0 Maintenance and Cleaning

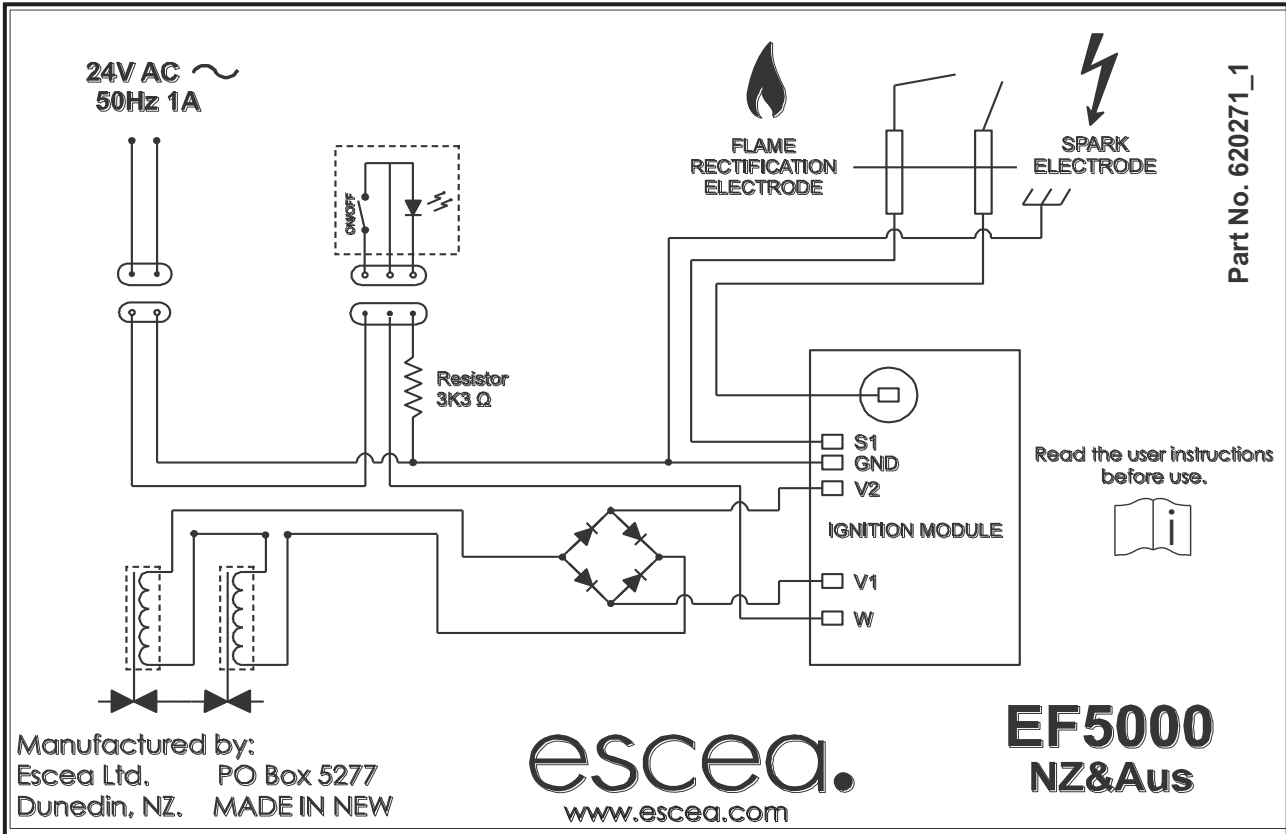
The unit must be cold before starting any form of maintenance or cleaning. To remove the glass and stones in the front stone tray simply reverse the steps in section 15.0. The glass can be cleaned using standard window cleaner and the quartz stones can be washed using soapy water

- 18.1 If the stainless steel fascia or weather cover requires cleaning the following products are recommended; 3M Stainless steel cleaner or methylated spirits.

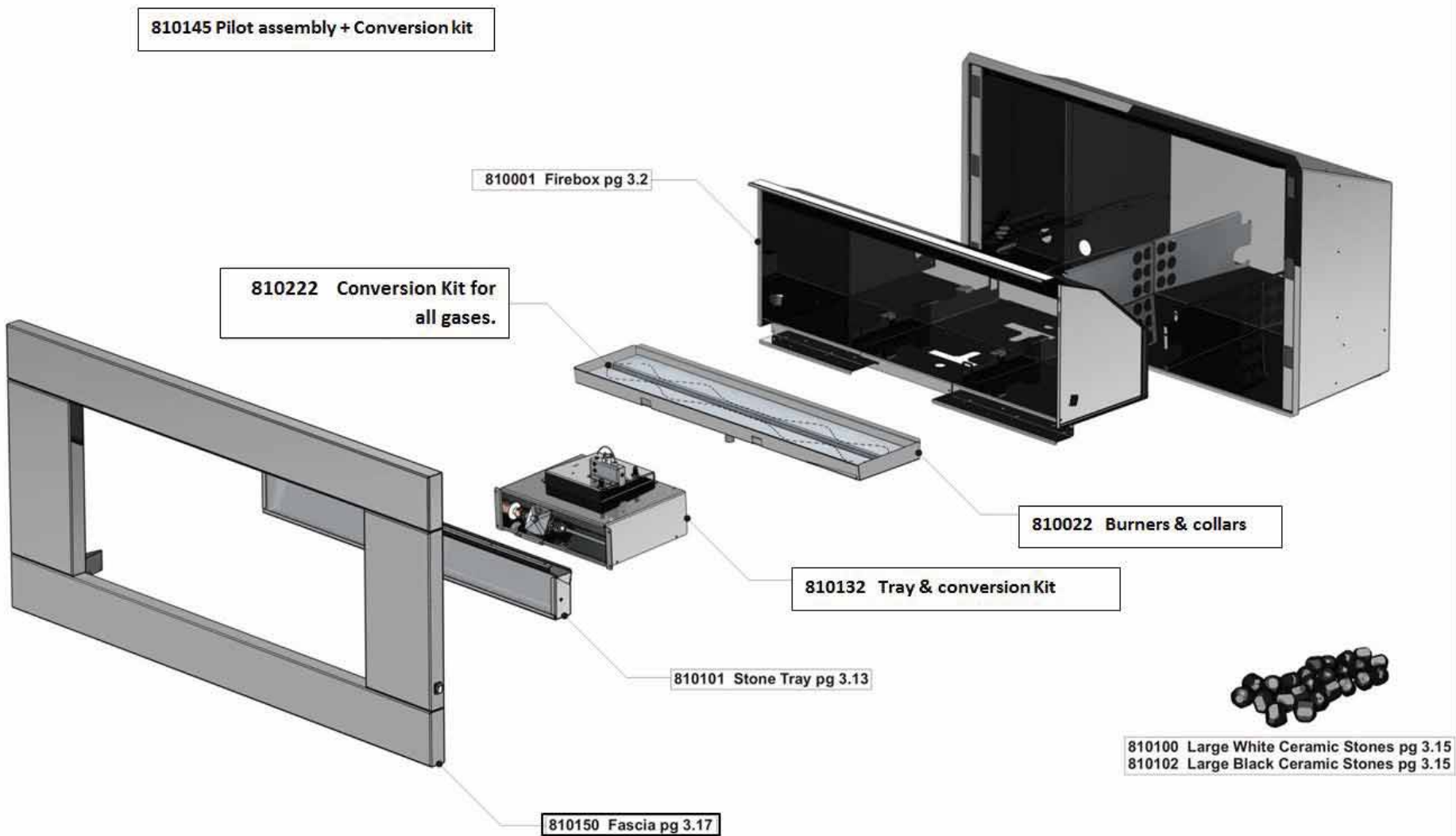
Periodically the pilot and burners should be checked visually for carbon and soot build-up, consistent flame and clean burning.

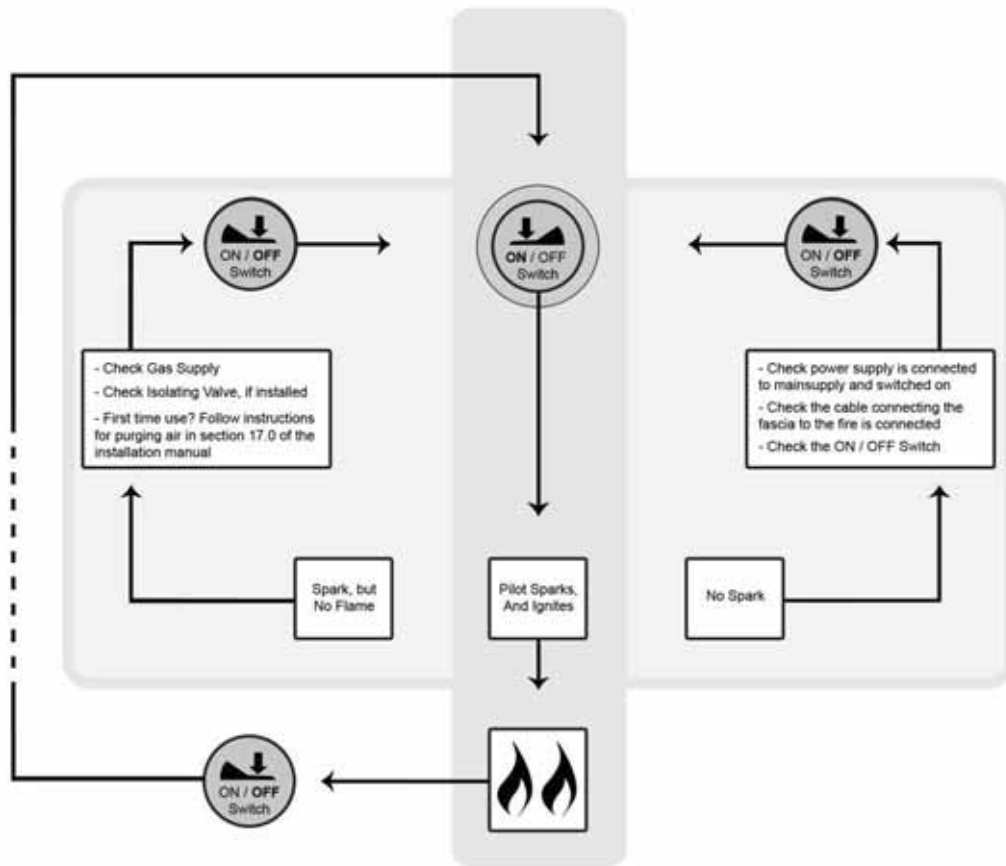
- 18.2 Cleaning of the burners and ceramic stones can be carried out using a brush and a dry cloth and should be done at least annually. This will remove carbon or soot build-up.

19.0 Electrical Schematic



EF5000 Exploded View





	Propane	ULPG	Natural Gas
Min. Inlet Pressure	2.5 kPa	2.5 kPa	1.00 kPa
Max Inlet Pressure	5.0 kPa	5.0 kPa	5.00 kPa
Manifold Pressure	2.0 kPa	2.2 kPa	1.00 kPa
Front Burner Jet Size	Ø1.3	Ø1.25	Ø4.0
Rear Burner Jet size	Ø1.3	Ø1.25	Ø4.0
Front Burner Aeration Hole	11mm x 2 off per burner	11mm x 2 off per burner	Ø5mm x 2 holes Collar must be fitted - 1 off per burner
Rear Burner Aeration Hole	11mm x 2 off per burner	11mm x 2 off per burner	Ø5mm x 2 holes Collar must be fitted - 1 off per burner
Mj/hour	40	40	49

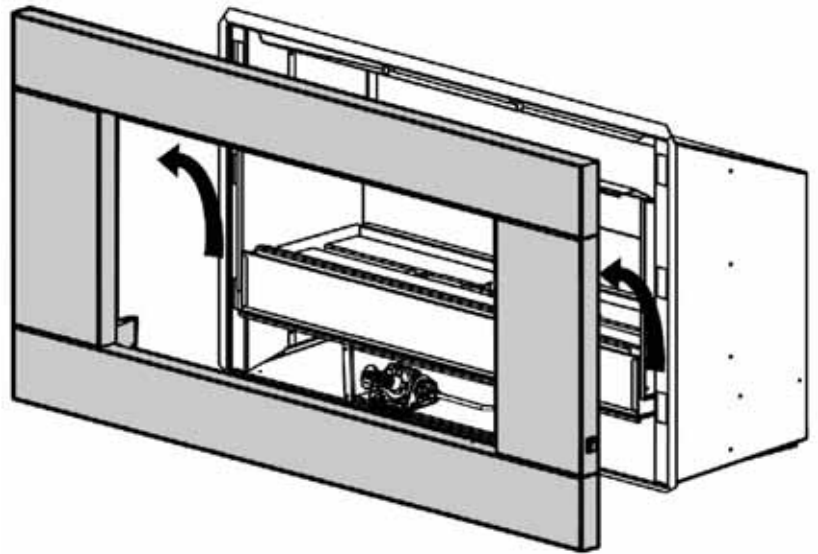
For any inquires, please contact your local Escea distributor or dealer www.escea.com

20.0 Gas conversion

Warning: Before starting the gas conversion, ensure that the fireplace is cool.

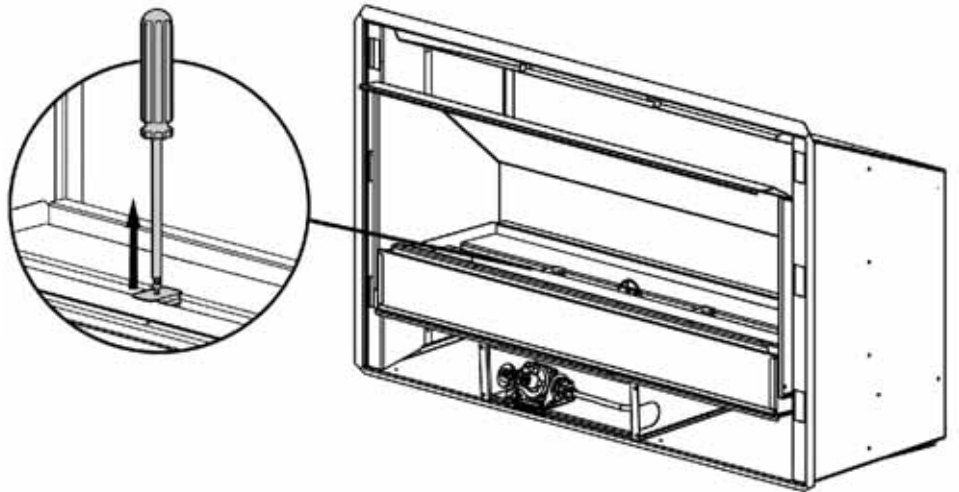
Step One:

Lift the fascia and hang it in the second slot, now you can unplug the fascia lead and remove the Fascia from the EF5000 firebox by lifting up and outwards. This will give you access to remove the Burners and Stone tray.



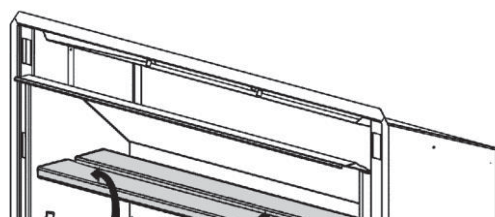
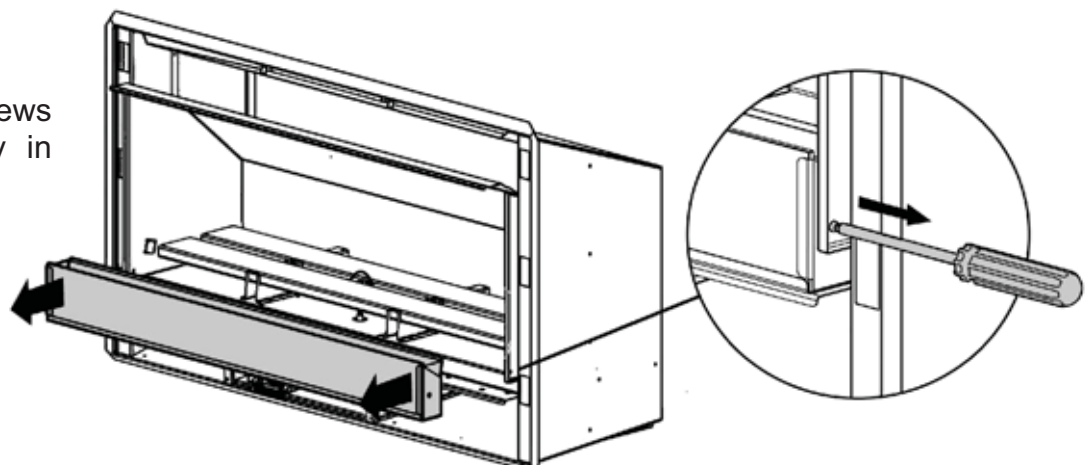
Step Two:

Remove all of the coals and the two screws holding the burner clamps in place, remove the clamps.



Step Three:

Remove the two screws holding the Stone tray in place and lift it out.



Step Four:

Lift out both burners, this will give you access to the jets (spuds).

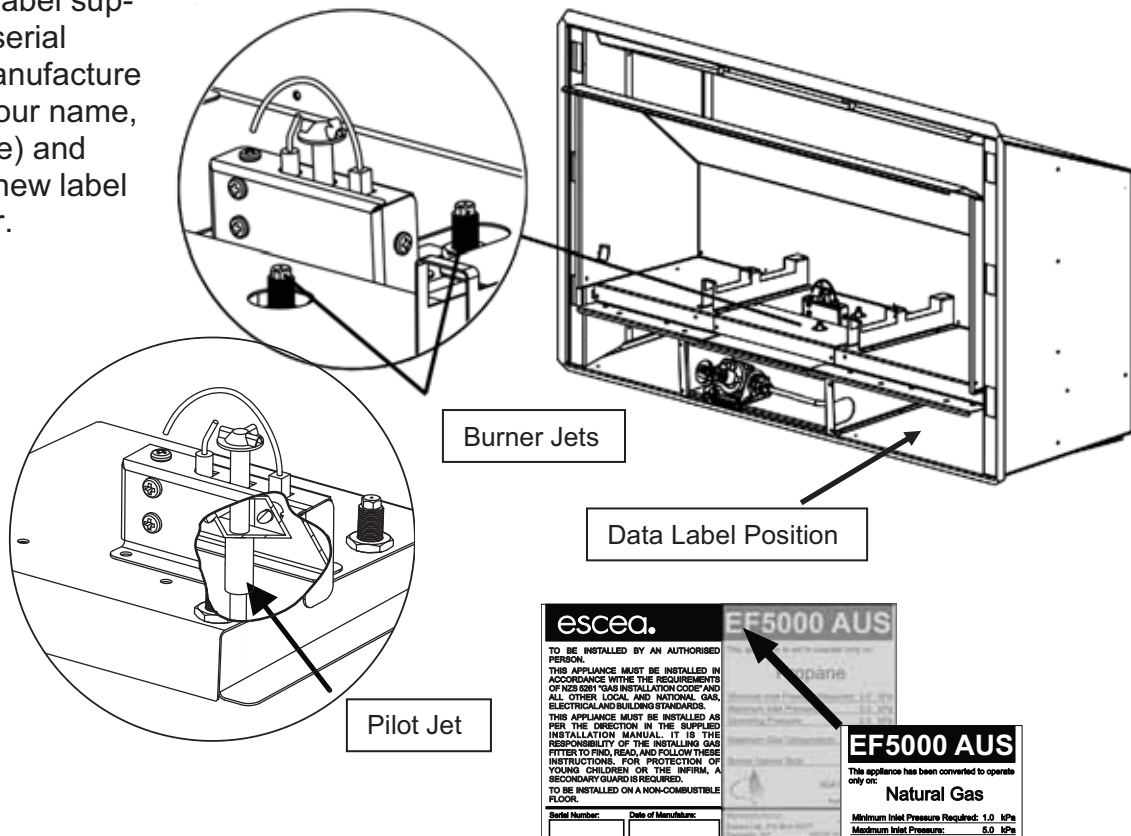
Step Five:

Change the two jets with the conversion jets supplied in kitset. Cover the existing gas type label with the new gas type label supplied in kitset. Ensure serial number and date of manufacture are still visible. Write your name, company (if appropriate) and date of conversion on new label with permanent marker.

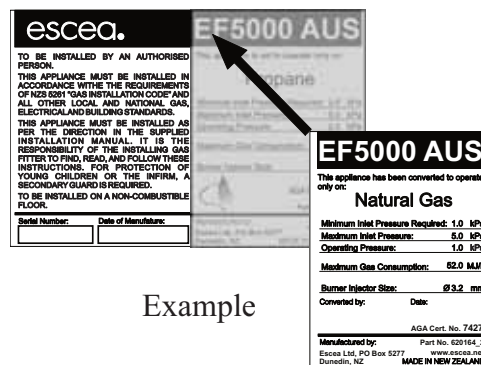
Step Six:

Replace the pilot jet with the correct one supplied in the kit (See the table below).

Note: You will have to remove the cover from behind the pilot assembly, it may be helpful to remove the control tray



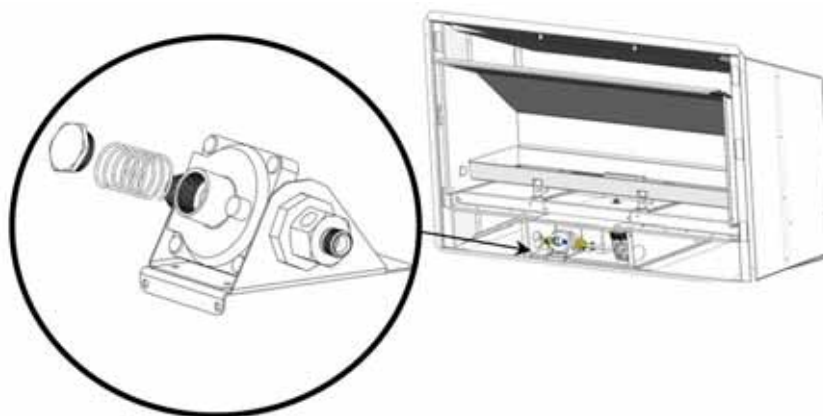
Gas	NG	Propane	ULPG
Pilot Jet	Ø0.45	Ø0.30	Ø0.30
Front Jet	Ø4.0	Ø1.3	Ø1.25
Rear Jet	Ø4.0	Ø1.3	Ø1.25



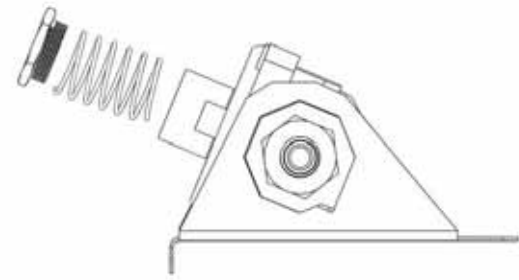
Example

Step Seven:

Take the regulator spring out of the regulator by unscrewing the pressure adjustment knob completely. Swap regulator spring with the new spring that is supplied in conversion kitset. Replace adjustment screw and reset gas pressure as per the settings below.

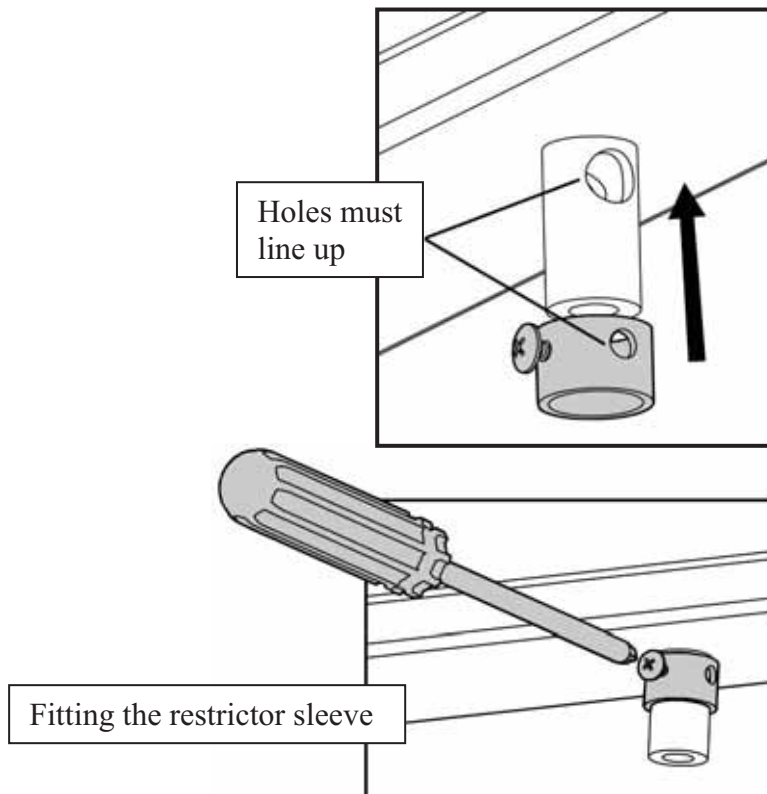


	Natural Gas	Propane	ULPG
kPa	1.0	2.0	2.2



Step Eight:

For Propane/ULPG to Natural gas conversion you will need to fit the natural gas restrictor collars. These slide over the burner tube on the underside of the burners, and must be screwed into place so that the porting holes line up.



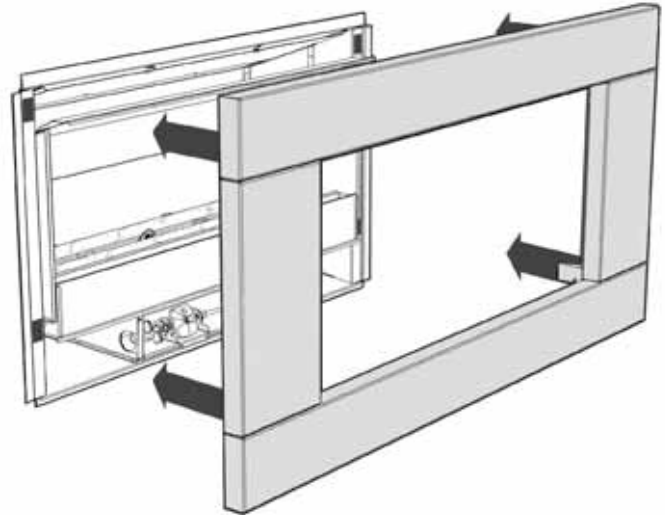
Note: For Natural gas to Propane/ULPG conversion remove the restrictor collars from the burners.

Step Nine:

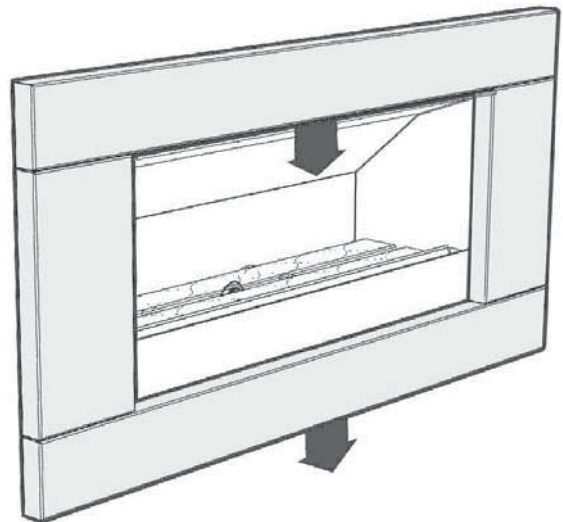
- a) Insert the burners and fix them into place with the burner clamps.
- b) Replace the stone tray and fix it back onto the firebox.
- c) Replace the coals, ensuring you have only one even layer.
Do not heap or mound the coals.

Step Ten:

Re-attach the fascia power supply lead. Push them together until they 'click'. Line up the hooks with the receptacles on the Firebox, take advantage of the first slot in the hook where you can rest the fascia before you push the fascia into position.

**Step Eleven:**

When you have pushed the fascia in as far as it will go, briefly push down on the fascia to secure the fascia into position.



Once the fire has been re-assembled, test the fire to ensure it is running correctly.

escea.

GAS FIRE USER GUIDE Australia and New Zealand



EF5000

www.escea.com

630114_4 Userguide Aus & NZ

Any service work carried out on this appliance must only be done by a recognised escea technician or authorised personnel.

The data plate for this appliance, containing technical information and specifications, can be found to the right of the control tray, near the base of the fire. To access this, the fascia must be removed.

DO NOT PLACE ARTICLES ON OR AGAINST THIS APPLIANCE.

DO NOT USE OR STORE FLAMMABLE MATERIALS NEAR THIS APPLIANCE.

DO NOT SPRAY AEROSOLS IN THE VICINITY OF THIS APPLIANCE WHILST IT IS IN OPERATION.

IT IS NOT RECOMMENDED TO OPERATE THE FIRE WITH THE FASCIA PANELS REMOVED.

THIS APPLIANCE IS NOT INTENDED FOR USE BY YOUNG CHILDREN OR INFIRM PERSONS UNLESS THEY HAVE BEEN ADEQUATELY SUPERVISED BY A RESPONSIBLE PERSON TO ENSURE THAT THEY CAN USE THE APPLIANCE SAFELY.

YOUNG CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.

THE APPLIANCE MUST BE INSPECTED BEFORE USE AND AT LEAST ANNUALLY BY AN AUTHORISED TECHNICIAN.

THIS APPLIANCE MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS.

escea. NZ LTD
17 Carnforth st, Green Island
Dunedin, New Zealand
E-mail: info@escea.co.nz
Web: www.escea.com
Phone: 64 3 478 8220

Distributed in Western Australia by
Air Group
28 Division Street
Welshpool, Perth, Western Australia
web: www.airgroup.com.au
Phone: +61 8 93502200

Distributed in Australia by
Glen Dimplex
1/21 Lionel Road
Waverley, Melbourne
web: www.glendimplex.com.au
Phone: +61 3 87873500

Contents

Basic Operation _____	1 - 4
Removing the Fascia _____	5
Cleaning and Maintenance _____	6

Basic Operation

The EF5000 is operated by the switch located on the right hand side outer edge of the fascia. The basic operations possible are ON/OFF.

Before operating the fire, ensure the power transformer is plugged into the mains wall socket & turned on, and the supply is turned on.



Ignition:

To turn the fire on push the ON/OFF rocker switch to the on position. The ignition unit will start sparking and the pilot and burners will ignite almost immediately.

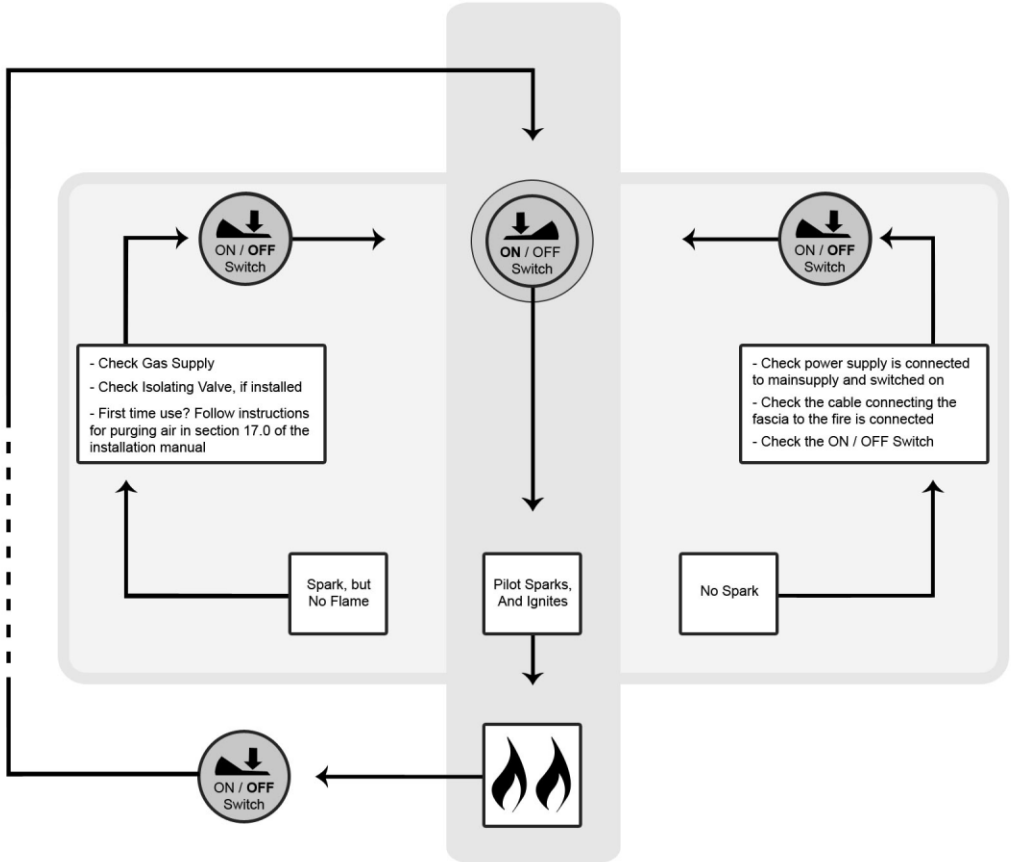
In the event of no gas, the ignition unit will attempt to try to light up to 3 times before shutting down.

Turning off the fire:

To turn the fire off, simply flick the ON/OFF rocker switch to the off position. This will shut down the gas flow to the pilot flame and both burners.

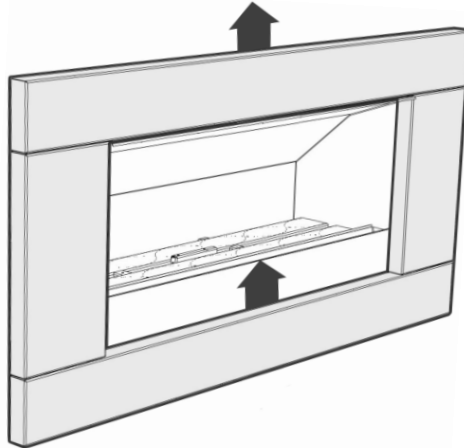
Please ensure the gas supply is also turned off, and as an extra safety please turn off the main power supply at the house.

Basic Operation

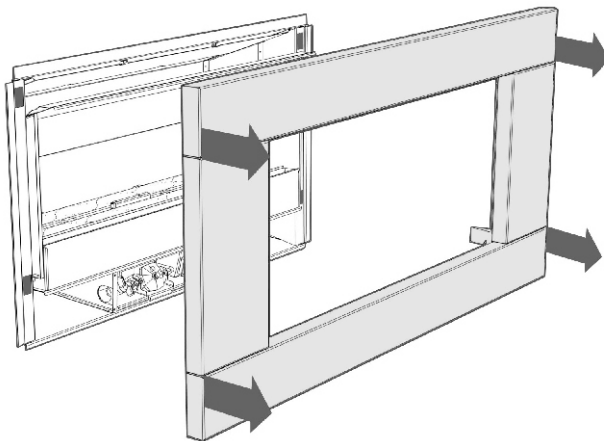


Removing the Fascia

The EF5000 Stainless Steel fascia is attached to the fire by four 'hooks' on the corners of the fascia. If you need to remove the fascia, first give the fascia a brief lift upwards as shown.



Now slide the fascia towards you until it falls into the additional slot, unplug the electrical cord. Now you can rest the Fascia on the ground.



Reverse these steps to re-fit the Fascia, ensuring the two connections are correctly plugged in by testing the fire.

Cleaning your EF5000

Note: Always ensure the fireplace is cold before starting any cleaning or maintenance.

To clean the glass and stones in the front stone tray, first remove the stones from inside the tray and the glass will then be free to slide upwards.

The glass can be cleaned using standard window cleaner. The quartz stones can be washed using soapy water

To clean the weather cover warm soapy water should be used.

Cleaning of the ceramic stones and burners can be carried out using a brush and a dry cloth

Fascia:

The Fascia is the visible surround of your Escea Gas Fireplace and must be treated carefully to prevent unsightly marks from tarnishing the visual quality of the product. Some marking over time is inevitable however, so the following directions will assist you in getting the maximum enjoyment from your Escea Gas Fireplace.

Never ever rub the fascia.

The outside of an Escea Fascia must only be cleaned with a soft microfibre cloth. If heavier cleaning is required for the likes of grease or stubborn fingerprint removal we recommend the use of Steel Kleen brand Ezi Wipes. These wipes have been tested by Escea technicians and produce very satisfying results, when used correctly. Instructions

Cleaning your EF5000

For Stainless Steel Fascias:

1. Ensure that the Gas Fireplace is off, and that the fascia is cold.
2. Using the gloves provided with your fascia, remove the towelette from the sachet and wipe the fascia with even, straight strokes.
3. Make sure your strokes follow the direction of the grain or brush finish. Wiping across the grain can leave small scratches.
4. The wipe will leave a very fine film over the fascia, ensure this film is distributed evenly.
5. If the film is applied too heavily and is quite visible, you can remove the excess by gently wiping dry with a microfibre cloth. Ensure your strokes still follow the direction of the grain or brush finish.
6. Ensure that no film is applied to the glass of your Escea Gas Fireplace. If applied accidentally, wipe off with an absorbent microfibre cloth.

For Powder Coated Fascias:

1. Ensure that the Gas Fireplace is off, and that the fascia is cold to the touch.
2. Using the gloves provided with your fascia, remove the towelette from the sachet and wipe the fascia with even, straight strokes.
3. Because the wipe leaves a protective film over the fascia, the entire fascia will need to be wiped to avoid seeing a difference in surface texture. Ensure this film is distributed evenly.
4. If the film is applied too heavily and is quite visible, you can remove the excess by gently wiping dry with a microfibre cloth.
5. Ensure that no film is applied to the glass of your Escea Gas Fireplace. If applied accidentally, wipe off with an absorbent microfibre cloth.



Western Red Cedar

Thuja plicata / species information

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 steved

Native to Western North America, Western Red Cedar is steeped in a rich history - highly valued for its durability, stability and overall beauty. Certainly it has earned the rightful title of Hermpac's flagship specie.

Since the 1950s, it has also been lauded as one of the most appealing species for adding value and cutting-edge design to prestigious homes throughout New Zealand.

The merit points for Western Red Cedar are extensive, including a natural resistance to decay, light in weight, and its overall ease to work with. It is little wonder this fantastic specie is the preferred choice for a diverse range of interior and exterior applications.



Premium timbers that don't cost the earth

Auckland
 110 Foundry Rd, Silverdale.
 PO Box 35-209, Browns Bay,
 Auckland 0753
 p. 09 421 9840 f. 09 426 7638

Wellington
 160 Gracefield Rd, Seaview.
 PO Box 38-123, Wellington Mail Centre,
 Lower Hutt 5045
 p. 04 586 9674 f. 04 586 9675

Christchurch
 27 Nga Mahi Road, Sockburn.
 PO Box 8822, Riccarton,
 Christchurch 8440
 p. 03 341 2163 f. 03 341 2173



Products / Western Red Cedar

Thuja plicata / species information

Weatherboards

With fantastic durability and stability, coupled with a proven track record of reliability in the New Zealand building industry, Hermpac's Western Red Cedar has quickly ranked amongst the top as a cladding solution. Our large range of profiles and pre-coated colour options will also ensure your house or project has that true 'stand out' result. You can purchase Western Red Cedar from Hermpac with confidence - all our weatherboard systems are BRANZ appraised and CodeMark certified (an annual process of rigorous, independent testing of both our facility and installed systems).

Soffit Lining and Panelling

Along with the benefits stated above, Cedar also has natural warmth appeal. This aesthetic transfers easily from external to internal applications. With a range of traditional TG&V profiles, to the more contemporary square negative details, Hermpac's Cedar panelling and sarking will create that sought after good-looking transitional flow from the outside in, and vice versa. Add further impact with our range of pre-coated quality stains and oils in your favoured colour choice.

Posts and Beams

Western Red Cedar's stability makes it a very popular choice for pergolas and gazebos (provided structural support is not a requirement). Add to the fact the specie is highly durable, and the result is both a pergola with a 'wow' factor, plus years of sheltered entertaining.

Battens and Screens

Whether making a strong design statement, or simply just requiring a practical solution to hide a less appealing feature around your home, we have a range of Cedar screens and battens in many sizes and lengths. Cedar's stability also gives you confidence that your screen will look great for years to come.

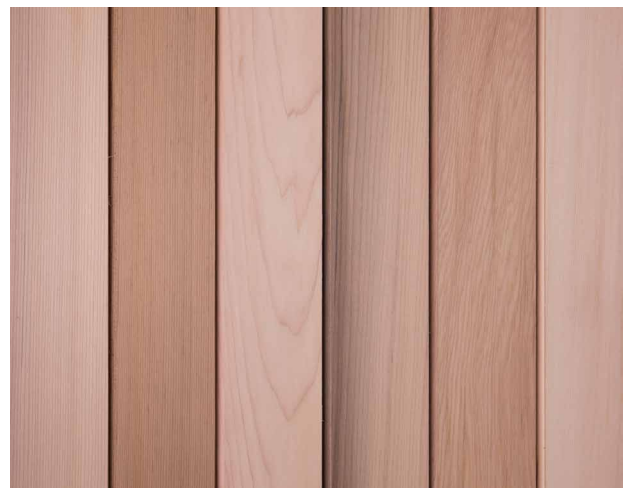
Technical Information

Hermpac Common Name	Western Red Cedar
Scientific Name	<i>Thuja plicata</i>
Common Names	British Columbia Cedar, Red Cedar
Regions Of Distribution	British Columbia, Canada
Heartwood Colour	Pale brown to dark brown / red
Sapwood Colour	White to yellow
Grades	PC1, PC2, PremSelect, CedarOne, CedarLine, CedarFit, Appearance, Reman
Sizes	sizes up to 500 x 250mm
Lengths	up to 6.1m longer lengths available on request
Visual Grain	Medium, distinct, variable
Natural Durability	Class 2/3* durable
Radial Shrinkage (Green To 12% Mc)	2%
Tangential Shrinkage (Green To 12% Mc)	4%

Mechanical Properties

	Green	Dry (12% Mc)
Modulus of Rupture ^(MPa)	38	57
Janka ^(kN)		1.5
Max Crushing Strength ^(MPa)	17	30
Static Bending Strength ^(MPa)	21	34
Shearing Strength ^(MPa)		6
Modulus of Elasticity ^(GPa)	7	8
Specific Gravity ^(kg/m³)	300	330
Weight ^(kg/m³)	428	384

Sample



Disclaimer: All information provided in this brochure, our website and related documentation are provided on a best endeavors accuracy basis only and without any representation or warranties, expressed or implied and none of the information provided in this brochure constitutes or is meant to constitute advice of any kind. You should always consult and rely on advice of your own professionals.

* Durability classes are based on Australian Standards AS5604-2005 and all the relevant information in the standard. The heartwood of an individual piece of timber may vary from the species nominated classification.



Hermpac

Rusticated, Splaycut & Multi-Splay Weatherboard **Cavity System**

Installation Specifications

Contents

1.0	General Information	2
2.0	Design Information	2
3.0	Installation Information	4
4.0	Maintenance	5
5.0	Health & Safety	5

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



Premium timbers that don't cost the earth

Auckland
110 Foundry Rd, Silverdale.
PO Box 35-209, Browns Bay,
Auckland 0753
p. 09 421 9840 f. 09 426 7638

Wellington
160 Gracefield Rd, Seaview.
PO Box 38-123, Wellington Mail Centre,
Lower Hutt 5045
p. 04 586 9674 f. 04 586 9675

Christchurch
27 Nga Mahi Road, Sockburn.
PO Box 8822, Riccarton,
Christchurch 8440
p. 03 341 2163 f. 03 341 2173

Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System

Installation Specifications

1.0 General Information

1.1 Introduction

The Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

The cladding system consists of horizontally fixed Hermpac Rusticated, Splaycut & Multi-Splay weatherboards installed over cavity battens, flashings and accessories and is finished with a premium penetrating oil stain or paint finish to Herman Pacific Limited specifications.

The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with an 18-20 mm drained cavity.

1.2 BRANZ Appraisal

The Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System has been appraised by BRANZ. Refer to Appraisal No. 658 (2014).

1.3 CODEMARK Certification

The Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System has the Codemark Certificate of Conformity. Refer Certificate No. GM-CM30037.

1.4 Hermpac Rusticated, Splaycut & Multi-Splay Weatherboards

Hermpac Rusticated, Splaycut & Multi-Splay weatherboards are manufactured from Canadian Coastal Western Red Cedar. Selected rusticated weatherboards are manufactured from DuraLarch (oil/stain or paint finish) or Ashin-Dura (paint finish only).

The Rusticated and Splaycut weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411. The weatherboards are minimum 18.5mm thick and are available in a range of widths and face profiles, supplied as a random length supply. Selected lengths are outside the general specification and are available by special contract.

Note: Multi-Splay weatherboards fall outside the scope of NZS 3617 and BRANZ Bulletin 411.

1.5 Cavity Battens

The Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System uses either treated timber cavity battens or Cavibat polypropylene cavity battens to separate the weatherboards from the wall frame and form the cavity. Cavibat cavity battens can be installed vertically over the wall framing to provide support for the weatherboards at fixing points, e.g. at window openings. Refer to www.cavibat.co.nz and BRANZ Appraisal No. 524 (2012) for full specifications.

1.6 Accessories

Accessories supplied by Herman Pacific Limited for use with the Hermpac Rusticated, Splaycut & Multi-Splay Cavity System include:

- Hermpac external corner mouldings – HP40 (40 x 40mm) and HP42 (42 x 42mm) and the Hermpac ‘Smart Corner’ series, profiled external corner moulds.
- Hermpac internal corner moulds – HP41 (18.5 x 18.5mm) and the Hermpac ‘Smart Corner’ series.
- Hermpac cover battens – HP201 (69 x 18mm) and HP202 (90 x 18mm).
- Hermpac eaves moulding – HP32 (40 x 27mm), HP33 (26 x 15mm) and HP7 (30 x 18mm) bevelled profile.
- Hermpac cover batten fixings – 50 x 2.8 mm silicon bronze, Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails for stain finish or Grade 316 stainless steel annular grooved

Jolt Head nails for paint finish.

- Hermpac Rustic plugs – HP44 (40 x 9.25 mm) and HP43 (25 x 9.25mm) profiled to suit the weatherboard profile. The plugs are supplied in 10 m bundles.
- Hermpac scribes – HP11 – HP18, with bevelled or radiused edges (cut to suit as required).
- Hermpac scribe fixings – length to suit scribe size (minimum 50 x 2.8mm) stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails for stain finish or Jolt Head nails for paint finish.
- Hermpac flat and corner soakers – 90° soakers available in copper, stainless steel or etch primed aluminium.
- Hermpac soaker fixings – 19 x 1.6mm silicon bronze or stainless steel Rose Head or Flat head nails.
- Nail fixings for weatherboards – selection options:
 - For oil/stain finish – silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails. Nail shank must be minimum 3.25mm diameter and the length must allow 30mm minimum penetration of the wall frame.
 - For CedarOne or paint finish – grade 316 stainless steel annular grooved Hermpac Jolt Head nails. The nail shank must be minimum 3.25mm diameter and the length must allow 35mm minimum penetration of the wall frame.
- Hermpac clinch nails – Grade 316 stainless steel annular grooved nails with an off-set flat head.
- Hermpac flat and corner soakers – 90° soakers available in copper, stainless steel, powder coated Zinalume or etch primed aluminium.
- Hermpac soaker fixings – 19 x 1.6mm silicon bronze or stainless steel Rose Head or Flat Head nails.
- Hermpac aluminium flashings – widths to suit specified corners – 2.4m or 3.0m lengths.
- Hermpac J Mould Flashing – for window jambs – 20mm or 29.5mm, 2.4m or 3.0m lengths.
- Hermpac aluminium Cavity Closure – 20mm or 40mm, 2.4m or 3.0m lengths.

1.7 Handling and Storage

Hermpac Rusticated and Splaycut weatherboards must be stacked flat and true, clear of the ground by a minimum of 150mm and supported on dry and clean timber bearers at maximum 900 mm centres.

The weatherboards must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces.

2.0 Design Information

2.1 Design Responsibility

The Specifier for the project must ensure that the details in this literature are suitable 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.

2.2 Scope

This specification covers the use of the Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System as an external horizontally fixed wall cladding system for buildings within the following scope:

Stain finished weatherboards with crown/rose/flat head nails. Paint finished DuraLarch and Ashin-Dura weatherboards fixed with annular grooved jolt/crown/rose/flat head nails. Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat

Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System

Installation Specifications

head nails:

- the scope limitations of NZBC Acceptable System E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including 'Extra High'.

Any stain or paint finished weatherboards if fixed with annular grooved flat/crown/rose head nails only for weathertightness and structural wind loading for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

CedarOne or other paint finished Western Red Cedar weatherboards if fixed with annular grooved jolt head nails:

- the scope limitations of NZBC Acceptable System E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Medium when studs are at maximum 600mm centres, and NZS 3604 Wind Zones up to, and including Very High when studs are at maximum 400mm centres.

For applications which are outside the scope of this literature and details which are not in this literature the specifier must ensure that the design meets the relevant performance requirements of the NZBC.

Hempac recommends that professional design advice is sought in these circumstances.

2.3 Building Regulations

The Hempac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System if designed, used and installed in accordance with the statements and conditions of this literature and the supporting BRANZ Appraisal, will meet the following provisions of the New Zealand Building Code:

- Clause B1 Structure
- Clause B2 Durability
- Clause E2 External Moisture
- Clause F2 Hazardous Building Materials

2.4 Ground Clearances

The finished floor level must have a minimum clearance to paved or unprotected ground as required by NZS 3604:2011.

Hempac 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.

The bottom edge of the Hempac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System must finish a minimum of 100mm above paved surfaces or 175mm above unprotected ground.

At deck or low pitch roof/wall junctions, the bottom edge of the Hempac weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.

2.5 Structure & Framing

Timber wall framing behind the Hempac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System must be treated as required by NZBC Acceptable Solution B2/AS1.

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 design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Use of timber framing must be in accordance with framing manufacturer's specifications.

In all cases studs must be at maximum 600mm centres, with nogs/dwangs fitted flush between the studs at maximum 800mm centres.

Note: For CedarOne or painted cedar weatherboards fixed with annular grooved Grade 316 stainless steel Jolt Head nails, studs must be at a maximum 600mm centres for NZS 3604 Wind Zones up to, and including Medium, and 400mm centres maximum for NZS 3604 Wind Zones High and Very High.

2.6 Framing 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 3604:2011.

2.7 Cavity Closure Strip

The Hempac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System must incorporate a cavity closure strip to close off the bottom of the cavity and provide resistance against the penetration of vermin. The cavity closure strip must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.

The cavity closure strip must be manufactured from PVC, aluminium or stainless steel, and be punched with 3-5mm holes or slots which provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall.

2.8 Wall Underlay

The Hempac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System must be installed over wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or wall underlays covered by a valid BRANZ Appraisal.

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High, and rigid underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure.

Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.

2.9 Inter-storey Junctions

Inter-storey drained joints must be constructed in accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

2.10 Hempac Rusticated, Splaycut & Multi-Splay Weatherboards

Hempac Rusticated, Splaycut & Multi-Splay weatherboards shall be fixed with an approximate 2mm vertical expansion

Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System

Installation Specifications

gap at the overlap between boards. Hermpac Rusticated and Splaycut profiles are all manufactured in accordance with BRANZ Bulletin 411 (Refer to E2/AS1 page 121, paragraph 9.4.1.1) and have a 27mm rebate for a 25mm lap.

Note: Multi-Splay weatherboards fall outside the scope of NZS 3617 and BRANZ Bulletin 411.

The weatherboards shall be pre-coated with the selected coating (prior to site delivery and installation) by Hermpac associate Machinecoat (NZ) Ltd, by the flood coat inundation method or in-line spray coat system (subject to coating type selected).

Pre-finished Rusticated, Splaycut & Multi-Splay weatherboards shall be over-coated and maintained in accordance with the coating manufacturer's specification. All cut ends and/or uncoated surfaces shall be double coated during installation to protect against the penetration of moisture, post installation.

The weatherboards shall be fixed through the cavity battens to the studs at maximum 600mm centres using Hermpac weatherboard fixings (refer to Section 1.5 of this specification).

External corners shall be weatherproofed by the use of corrosion resistant corner flashings and corner facings, e.g. Hermpac proprietary profiles HP40, HP42, the Hermpac 'Smart Corner' series, or cover battens HP201 and HP202 with Hermpac rustic plugs or scribes.

Internal corners shall be weatherproofed by the use of corrosion resistant internal corner flashings along with internal mouldings, e.g. Hermpac profile HP41 or the Hermpac 'Smart Corner' series.

3.0 Installation Information

3.1 System Installation

This section of the literature should be read in conjunction with the installation details.

The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints.

Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions.

Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected. All penetrations through the wall underlay must be sealed and joints sealed or lapped 150mm.

The selected cavity closure strip must be installed so a minimum 15mm drip edge to the bottom of the weatherboards is maintained at all times.

Cavity battens must be installed over the wall underlay to the wall framing at a maximum of 600mm centres where the studs are at 600mm centres, or at 400mm centres when studs are at 400mm centres. Cavibat cavity battens must be fixed in place with 40 x 2.8mm hot-dip galvanised flat head nails or galvanised or stainless steel finishing brads at 400mm centres. Refer to www.cavibat.co.nz and BRANZ Appraisal Number 524 (2012) for further information. Timber cavity battens must be fixed in place with 40 x 2.8mm hot-dip galvanised flat-head nails at maximum 800mm centres.

Where the studs are at greater than 450mm centres, a

wall underlay support, e.g. polypropylene strap, 75mm galvanised mesh, galvanised wire, or additional vertical battens must be installed over the wall underlay between the cavity battens at maximum 300mm centres to prevent the wall underlay from bulging into the drainage cavity.

3.1.1 Aluminium Joinery Installation

Aluminium joinery and associated head flashings must be installed in accordance with the window manufacturer's instructions. A 7.5-10mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6 after the joinery has been secured in place.

3.1.2 Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Installation

Hermpac Rusticated, Splaycut & Multi-Splay weatherboards must not be wet prior to installation. Prior to installation, the back, face and edges of the Hermpac Rusticated, Splaycut & Multi-Splay weatherboards must be sealed with an exterior grade oil-based penetrating oil stain or paint. During installation, cut ends and edges and all fresh cuts or exposed timber must be double sealed with an exterior grade oil-based penetrating oil stain or paint.

Before the weatherboards are installed, the corner detail must be prepared to suit the selected option, e.g. external box corner/corner moulding etc. The necessary flashings must be installed before commencing weatherboard fixing and the cavity closure must be installed continuously around the bottom of the cavity.

Immediately prior to installing the weatherboards over the internal and external corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

The first course of weatherboards must be full length, and commence from an external corner. The first weatherboard must be installed level to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50mm.

Hermpac Rusticated and Splaycut weatherboards must be overlapped a minimum of 25mm with an expansion gap of 2mm at the overlap. Multi-Splay weatherboards must be overlapped a minimum of 30mm with an expansion gap of 2mm at the overlap.

For best practice use the Hermpac clinch nail to restrain the top of the weatherboard lap at every cavity batten. NB: Clinch nails are a proprietary component of all Hermpac cladding systems. For best performance we recommend their use on all installations. The use of clinch nails is mandatory for installations in 'Extra High' wind zones and above.

Hermpac Rusticated, Splaycut & Multi-Splay weatherboards must be pre-drilled on a slight up-slope, with a hole slightly smaller than that of the nail, to reduce the risk of moisture entry. Fix each weatherboard with one nail per board at every cavity batten.

The fixing must be located 30-35mm above the bottom of the weatherboard (for Rusticated and Splaycut - ref: HC-RUST-410 and HC-SPLAY-410) and 35-40mm above the bottom of the weatherboard (for Multi-Splay - ref: HC-SPLAY410A), be located no closer than 32mm (where practical) from the end of the board, and must finish flush onto the surface of the weatherboard, not into or below the surface.

Fix weatherboards in full lengths where possible. Where joints are required, scarf the weatherboard at 30° over a cavity batten and fix as per drawn detail 'HC-RUST-413' or 'HC-SPLAY-413'.

For oil/stain finished weatherboards:

Weatherboard fixing must be carried out using silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails.

Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System

Installation Specifications

The nail shank must be minimum 3.25mm diameter. The length must achieve 30mm minimum penetration of the wall frame.

For CedarOne and paint finished weatherboards:

Weatherboard fixing must be carried out using Grade 316 Stainless Steel annular grooved Jolt Head nails. The nail shank must be minimum 3.25mm diameter. The length must achieve 35mm minimum penetration of the wall frame.

Punch nails 2mm below the weatherboard surface, prime nail holes and fill prior to sanding and finishing.

3.1.3 Boxed Corners, Cover Battens and Mouldings

External and internal corners must be finished in accordance with the installation detailing.

Most Hermpac 'Smart Corners' mouldings can be fixed by applying a continuous bead of sealant to the inside surfaces of the moulding or the faces of the flashing to which the moulding is to be bonded. Excess coating should be wiped off areas of the moulding intended to contact the adhesive.

Wherever possible, the moulding should be bonded to the flashing prior to installation. If this is not possible, the moulding shall be temporarily held in place while the sealant cures.

A continuous bead of sealant should also be applied at the join between the moulding and the end-grain cross section of any butted weatherboard and direct to flashing along the line of weatherboard nail fixing (if the weatherboard fixing will pierce the flashing).

Sealant options for Wood-X, Traditional Oil Stains or Resene Waterborne Oil Stains include Bostik Seal N Flex FC or Sikaflex AT Façade (NB: for other stains please check with the manufacturer to determine the most suitable sealant).

Further or sole mechanical support of the Moulding-Flashing interface can be achieved in some cases with a pre-drilled and suitably placed Hermpac nail. The requirement for a continuous bead of sealant as detailed above still applies.

3.1.4 Finishing

At least two coats of an exterior grade quality oil-based penetrating stain must be used over the front face of the Hermpac Rusticated, Splaycut & Multi-Splay weatherboards to protect the weatherboards and give the desired finish colour to the exterior walls. The stain must be recommended for use as a wall cladding stain by the manufacturer and must be brush or Machinecoat NZ Ltd applied. Hermpac recommends the use of oil based stains manufactured by Wood-X and Resene.

Follow the stain manufacturer's instructions at all times for application of the stain finish.

For paint finish the paint must be recommended for use as a wall cladding paint by the manufacturer and must be brush or Machinecoat NZ Ltd applied.

To ensure a top quality paint finish:

1. Any sharp edges should be removed to provide a radius to aid in uniform paint film coverage.
2. Use a premium alkyd oil or acrylic based primer to envelope prime all cut ends and bare timber surfaces twice.
3. Punch nail holes and prime promptly after punching.
4. Fill holes with a suitable filler and allow to dry.

5. When filler is fully dry and cured, sand area smooth.
6. Apply one coat of an alkyd oil or acrylic based primer to sanded area and allow to fully dry before sanding lightly.
7. Ensure surface is clean and free from any chalking, dirt, dust, mould or other contaminants prior to painting top coats.
8. Apply two coats of premium high quality 100% exterior grade acrylic to surface allowing adequate time for drying between coats.

Timber is a natural product and for best results use a colour with a LRV of 40-45 or above. Please consult with us for a specific recommendation minimum for your chosen timber.

Follow the paint manufacturer's instructions at all times for application of the paint finish.

Refer to Section 4.0 for maintenance requirements.

4.0 Maintenance

Building owners are responsible for the maintenance of the Hermpac Rusticated, Splaycut & Multi-Splay Weatherboard Cavity System.

Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Sealant, coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

Regular cleaning (at least annually) of the surface finish with water and a mild detergent is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the cladding.

Recoating of the stain finish will be necessary throughout the life of the cladding system. Re-staining must be carried out every 2-3 years in accordance with the stain manufacturer's instructions. Re-staining will be required more frequently on exposed northern and western facing walls. When re-staining, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the stain.

Recoating of the paint finish will be necessary throughout the life of the cladding system. Re-coating must be carried out every 7-10 years in accordance with the paint manufacturer's instructions. When re-coating, care must be taken to ensure bottom edges are well covered and penetrated with the paint.

5.0 Health & Safety

Cutting of Hermpac Rusticated, Splaycut & Multi-Splay weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.



For further information please contact us
technical@hermpac.co.nz

Auckland
09 421 9840

Wellington
04 586 9674

Christchurch
03 341 2163



Hermpac

VertiLine Vertical Shiplap Weatherboard **Cavity System**

Installation Specifications

Contents

1.0	General Information	2
2.0	Design Information	2
3.0	Installation Information	3
4.0	Maintenance	5
5.0	Health & Safety	5



Premium timbers that don't cost the earth

Auckland
110 Foundry Rd, Silverdale.
PO Box 35-209, Browns Bay,
Auckland 0753
p. 09 421 9840 f. 09 426 7638

Wellington
160 Gracefield Rd, Seaview.
PO Box 38-123, Wellington Mail Centre,
Lower Hutt 5045
p. 04 586 9674 f. 04 586 9675

Christchurch
27 Nga Mahi Road, Sockburn.
PO Box 8822, Riccarton,
Christchurch 8440
p. 03 341 2163 f. 03 341 2173

VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

1.0 General Information

1.1 Introduction

The VertiLine Vertical Shiplap Cavity System is a cavity-based external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

The cladding system consists of vertically fixed Hermpac shiplap timber weatherboards installed over ventilated battens, flashings and accessories and is finished with a premium penetrating oil stain or paint finish to Hermpac specifications.

The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall frame with an 18-45mm minimum drained cavity.

1.2 BRANZ Appraisal

The VertiLine Vertical Shiplap Cavity System has been appraised by BRANZ. Refer to Appraisal No. 650 (2014).

1.3 CODEMARK Certification

The VertiLine Vertical Shiplap Cavity System has the Codemark Certificate of Conformity. Refer Certificate No. GM-CM30036.

1.4 Hermpac Vertical Shiplap Weatherboards

Hermpac vertical shiplap weatherboards are manufactured from Canadian Coastal Western Red Cedar. Selected vertical shiplap weatherboards are manufactured from DuraLarch (oil/stain or paint finish) and Ashin-Dura (paint finish only).

The weatherboard lap and rebate profiles are in accordance with NZS 3617 and BRANZ Bulletin 411. The weatherboards are minimum 18.5mm thick and are available in a range of widths and face profiles. They are supplied as a random length supply. Select lengths are outside of the general specification and are available by special contract.

1.5 Cavity Battens

The VertiLine Vertical Shiplap Cavity System uses 20, 40 or 45mm thick Vertibat timber cavity battens, or 18mm Cavibat polypropylene cavity battens to separate the weatherboards from the wall frame and form the cavity.

The 20, 40 and 45mm Vertibat batten and 18mm Cavibat batten are installed horizontally over nogs/dwangs to provide support for the weatherboards at fixings points. The 40 and 45mm thick Vertibat batten can be structurally fixed, installed horizontally across the studs where the weatherboards are then fixed into the batten only.

Vertibat cavity battens are 45 x 20mm (V1), 45 x 40mm (V3), 45 x 45mm (V5), 70 x 20mm (V2), 70 x 40mm (V4), 70 x 45mm (V6) thick Radiata pine treated to minimum Hazard Class H3.1. The top and bottom edges are bevelled with a slope. The front and back face of the batten is grooved with 20mm wide x 5mm deep rebates at 95mm centres. The grooves are offset on each face.

Refer to www.cavibat.co.nz and BRANZ Appraisal No. 524 (2012) for full specifications for the Cavibat cavity battens.

1.6 Accessories

Accessories supplied by Hermpac for use with the VertiLine Vertical Shiplap Cavity System include:

- Hermpac external corner mouldings – HP40 (40 x 40mm) and HP42 (42 x 42mm) and the Hermpac 'Smart Corner' series, profiled external corner moulds.
- Hermpac internal corner mould – HP41 (18.5 x 18.5mm), through to HP110 (39 x 39mm) profiles and the Hermpac 'Smart Corner' series.
- Hermpac cover battens – HP201 (69 x 18mm) and HP202 (90 x 18mm).
- Hermpac cover batten fixings – 50 x 2.8mm silicon bronze, Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails for

stain finish or Grade 316 stainless steel annular grooved Jolt Head nails for paint finish.

- Hermpac eaves moulding – HP32 (40 x 27mm), HP33 (26 x 15mm) and HP7 (30 x 18mm) bevelled profile.
- Screw fixings for 40-45mm thick Vertibat cavity batten fixed to studs only – 12 gauge x 65-75mm long Grade 304 stainless steel screws. Minimum 25mm penetration to frame required.
- Nail fixings for weatherboards - selection options:
- For oil/stain finish for 18-20mm Cavibat or Vertibat battens fixed to nogs/dwangs) – silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails. Nail shank minimum 3.25mm diameter and length to allow 30mm minimum penetration of the wall frame.
- For CedarOne or paint finish for 18-20mm Cavibat or Vertibat battens fixed to nogs/dwangs – Grade 316 stainless steel annular grooved Hermpac Jolt Head nails. Nail shank must be minimum 3.25mm diameter and the length to allow 35mm minimum penetration of the wall frame.
- For oil/stain finish for 40-45mm Vertibat battens fixed to nogs/dwangs only – silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails. Nail shank must be minimum 3.25mm diameter and the length to allow 30mm minimum penetration of the wall frame
- For CedarOne or paint finish for 40-45mm Vertibat battens fixed to nogs/dwangs only – Grade 316 stainless steel annular grooved Hermpac Jolt Head nails. Nail shank must be minimum 3.25mm diameter and the length must allow 35mm minimum penetration of the wall frame
- For oil/stain for structurally fixed 40-45mm Vertibat battens fixed to studs only – ref: HC-SHIP40-410A – silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails. Nail shank must be minimum 2.8mm diameter and the length must allow 30mm minimum penetration of the Vertibat V3-V6 cavity batten.
- For CedarOne or paint for structurally fixed 40 or 45mm Vertibat battens fixed to studs only – ref: HC-SHIP40-411A – Grade 316 stainless steel annular grooved Hermpac Jolt Head nails. Nail shank must be minimum 3.25mm diameter and the length must allow 35mm minimum penetration of the Vertibat V3-V6 cavity batten.
- Hermpac clinch nails – Grade 316 stainless steel annular grooved nails with an off-set flat head.
- Hermpac aluminium flashings – widths to suit specified corners – 2.4m or 3.0m lengths.
- Hermpac J Mould Flashing – for window jambs – 20mm or 29.5mm, 2.4m or 3.0m lengths.
- Hermpac aluminium Cavity Closure – 20mm or 40mm, 2.4m or 3.0m lengths.

1.7 Handling and Storage

Hermpac vertical shiplap weatherboards must be stacked flat and true, clear of the ground by a minimum of 150mm and supported on dry and clean timber bearers at maximum 900mm centres.

The weatherboards must be kept dry at all times either by storing within an enclosed building or when stored externally an additional secondary cover to the plastic wrapping is required. Care must be taken to avoid damage to edges, ends and the weatherboard surfaces.

2.0 Design Information

2.1 Design Responsibility

The Specifier for the project must ensure that the details in this literature are suitable for the intended application and

VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

that additional detailing is provided for specific design or any areas that fall outside the scope and specifications of this literature.

2.2 Scope

The use of the VertiLine Vertical Shiplap Cavity System as an external vertically fixed wall cladding system for buildings within the following scope:

Stain finished weatherboards with crown/rose/flat head nails. Paint finished DuraLarch and Ashin-Dura weatherboards fixed with annular grooved jolt/crown/rose/flat head nails. Paint finished Western Red Cedar weatherboards fixed with annular grooved crown/rose/flat head nails:

- the scope limitations of NZBC Acceptable System E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including 'Extra High'.

Any stain or paint finished weatherboards if fixed with annular grooved flat/crown/rose head nails, only for weathertightness and structural wind loading for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
- constructed with timber framing complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

CedarOne or other paint finished Western Red Cedar weatherboards if fixed with annular grooved jolt head nails:

- the scope limitations of NZBC Acceptable System E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including Medium when nogs/dwangs or structural Vertibat cavity battens are at maximum 480 mm centres, and NZS 3604 Wind Zones up to, and including Very High when nogs/dwangs or structural Vertibat cavity battens are at maximum 400 mm centres.

For applications which are outside the scope of this literature and details which are not in this literature the specifier must ensure that the design meets the relevant performance requirements of the NZBC.

Hermpac recommends that professional design advice is sought in these circumstances.

2.3 Building Regulations

The VertiLine Vertical Shiplap Cavity System if designed, used and installed in accordance with the statements and conditions of this literature and the supporting BRANZ Appraisal, will meet the following provisions of the New Zealand Building Code:

- Clause B1 Structure
- Clause B2 Durability
- Clause E2 External Moisture
- Clause F2 Hazardous Building Materials

2.4 Ground Clearances

The finished floor level must have a minimum clearance to paved or unprotected ground as required by NZS 3604:2011.

Hermpac 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.

The bottom edge of the VertiLine Vertical Shiplap Cavity System must finish a minimum of 100mm above paved surfaces or 175mm above unprotected ground.

At deck or low pitch roof/wall junctions, the bottom edge of the Hermpac weatherboards must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.

2.5 Structure & Framing

Timber wall framing behind the VertiLine Vertical Shiplap Cavity System must be treated as required by NZBC Acceptable Solution B2/AS1.

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 design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. Use of timber framing must be in accordance with framing manufacturer's specifications.

In all cases studs must be at maximum 600mm centres. Where Vertibat or Cavibat cavity battens are fixed to nogs/dwangs, the nogs/dwangs must be fitted flush between the studs at maximum 480mm centres. Where 40 or 45mm thick Vertibat cavity battens are fixed to studs only, nogs/dwangs must be fitted flush between the studs at maximum 800mm centres.

Note: For CedarOne or painted cedar weatherboards fixed with annular grooved Grade 316 stainless steel Jolt Head nails, nogs/dwangs or structurally fixed Vertibat cavity battens must be at a maximum 480mm centres for NZS 3604 Wind Zones up to, and including Medium and at a maximum 400mm centres for NZS 3604 Wind Zones High and Very High.

2.6 Framing 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 3604:2011.

2.7 Cavity Closure Strip

The VertiLine Vertical Shiplap Cavity System must incorporate a cavity closure strip to close off the bottom of the cavity and provide resistance against the penetration of vermin. The cavity closure strip must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3. The cavity closure strip must be manufactured from uPVC, aluminium or stainless steel, and be punched with 3-5mm holes or slots which provide a minimum ventilation opening area of 1000mm² per lineal metre of wall.

2.8 Wall Underlay

The VertiLine Vertical Shiplap Cavity System must be installed over wall underlay complying with NZBC Acceptable Solution E2/AS1, Table 23, or wall underlays covered by a valid BRANZ Appraisal.

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including 'Very High', and rigid underlays for buildings in the 'Extra High' wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure.

Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the weatherboard fixing lengths must be increased by a minimum of the thickness of the underlay.

2.9 Inter-storey Junctions

Inter-storey drained joints must be constructed in

VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

accordance with the Technical Literature. Inter-storey drained joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4(b).

2.10 Hermpac Vertical Shiplap Weatherboards

Hermpac vertical shiplap weatherboards shall be fixed with an approximate 2mm vertical expansion gap at the overlap between boards. Hermpac vertical shiplap profiles are all manufactured in accordance with BRANZ Bulletin 411 (Refer to E2/AS1 page 121, Paragraph 9.4.1.1) and have a 27mm rebate for a 25mm lap.

The weatherboards shall be pre-coated with the selected coating (prior to site delivery and installation) by Hermpac associate Machinecoat (NZ) Ltd, by the flood coat inundation method or in-line spray coat system (subject to coating type selected).

Pre-finished vertical shiplap weatherboards shall be over-coated and maintained in accordance with the coating manufacturer's specification. All cut ends and/or uncoated surfaces shall be double coated during installation to protect against the penetration of moisture, post installation.

The weatherboards shall be fixed to nogs/dwangs (or structurally fixed to 40-45mm Vertibat cavity battens) at 400-480mm maximum centres using Hermpac shiplap weatherboard fixings (refer to Section 1.5 of this specification).

External corners shall be weatherproofed by the use of corrosion resistant corner flashings and corner facings, e.g. Hermpac proprietary profiles HP40, HP42 the Hermpac 'Smart Corner' series or cover battens HP201 and HP202.

Internal corners shall be weatherproofed by the use of corrosion resistant internal corner flashings along with internal mouldings, e.g. Hermpac profiles HP41 and HP110 or the Hermpac 'Smart Corner' series.

3.0 Installation Information

3.1 System Installation

This section of the literature should be read in conjunction with the installation details.

The selected wall underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the VertiLine Vertical Shiplap Cavity System.

Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints.

Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

The selected cavity closure strip must be installed so a minimum 15mm drip edge to the bottom of the weatherboards is maintained at all times.

There are several options available for the installation of cavity battens as outlined below.

Vertibat Cavity Battens to Nogs/Dwangs

Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (nogs/dwangs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The

cavity battens must be fixed in place with 40 x 2.5mm flat head hot-dipped galvanised nails or 50 x 2.8mm hot-dipped galvanised gun nails (for 20mm thick battens), or 60 x 2.8mm flat head hot-dipped galvanised nails or 60 x 2.8mm hot-dipped galvanised gun nails (for 40 or 45mm thick battens) to temporarily fix the battens in place prior to installation of the cladding.

Cavibat Cavity Battens to Nogs/Dwangs

The Cavibat cavity battens must be installed horizontally over the building underlay to the wall framing (nogs/dwangs) at 400-480mm maximum centres. The cavity battens must be fixed in place with 40 x 2.5mm hot-dip galvanised flat head nails or galvanised or stainless steel finishing brads at 400mm centres. Refer to BRANZ Appraisal Number 524 (2012) for further information.

40 or 45mm thick structurally fixed Vertibat Cavity Battens to Studs

40 or 45mm thick Vertibat cavity battens must be installed horizontally over the building underlay to the wall framing (studs) at 400-480mm maximum centres. The battens must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with one 12 gauge x 65mm long (for V3 or V4) or 12 gauge x 75mm long (for V5 or V6) Grade 304 stainless steel screw at each stud crossing (maximum 600mm centres). A 25mm minimum penetration of the framing is required.

3.1.1 Aluminium Joinery Installation

Aluminium joinery and associated head flashings must be installed in accordance with the window manufacturer's instructions. A 7.5-10mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6 after the joinery has been secured in place.

3.1.2 Hermpac Vertical Shiplap Weatherboard Installation

Hermpac vertical shiplap weatherboards must not be wet prior to installation. Prior to installation, the back face and edges of the Hermpac shiplap weatherboards must be sealed with an exterior grade oil-based penetrating oil stain or paint. During installation, cut ends and edges and all fresh cuts or exposed timber must be double sealed with an exterior grade oil-based penetrating oil stain or paint.

Hermpac shiplap weatherboards must be installed starting at the corner of the wall section being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50mm. The weatherboards should be installed with the lap facing away from the prevailing winds.

Immediately prior to installing the weatherboards over the internal and external corner flashings, a continuous bead of sealant must be applied to the face of the flashing along the fixing line.

Hermpac shiplap weatherboards must be overlapped a minimum of 25mm with an expansion gap of 2mm at the overlap. The top of the weatherboard lap should be restrained using the Hermpac clinch nail at every cavity batten.

NB: Clinch nails are a proprietary component of all Hermpac cladding systems. We recommend their use on all installations for best performance. Use of clinch nails is mandatory for installations in 'Extra High' wind zones and above.

Hermpac shiplap weatherboards must be pre-drilled on a slight up-slope, with a hole slightly smaller than that of the nail. Fix each weatherboard with one nail per board at every cavity batten.

The fixing must be located 30-35mm in from the weatherboard lap, be located no closer than 32mm (where practical) from the end of the board, and must finish flush onto the surface of the weatherboard, not into or below

VertiLine Vertical Shiplap Weatherboard Cavity System

Installation Specifications

the surface.

Fix weatherboards in full lengths where possible. Where joints are required, scarf the weatherboard at 30° over a cavity batten and fix as per detail 'HC-SHIP-413' or 'HC-SHIP40-413'.

For oil/stain finished weatherboards:

Weatherboard fixing must be carried out using silicon bronze or Grade 316 stainless steel annular grooved Hermpac Crown Head, Rose Head or Flat Head nails.

- For 18mm Cavibat or 20, 40 or 45mm Vertibat fixed to nogs/dwangs, the nail shank must be minimum 3.25mm diameter and the length must allow minimum 30mm penetration of the wall frame.
- For structurally fixed 40-45mm Vertibat battens fixed to studs only, the nail shank must be minimum 2.8mm diameter and the length must allow minimum 30mm penetration of the batten.

For CedarOne and paint finished weatherboards:

Weatherboard fixing must be carried out using Grade 316 stainless steel annular grooved Hermpac Jolt Head nails.

Punch nails 2mm below the weatherboard surface, prime nail holes and fill prior to sanding and finishing.

- For 18mm Cavibat or 20, 40 or 45mm Vertibat fixed to nogs/dwangs, the nail shank must be minimum 3.25mm diameter and the length must allow minimum 35mm penetration of the wall frame.
- For structurally fixed 40-45mm Vertibat battens fixed to studs only, the nail shank must be minimum 3.25mm diameter and the length must allow minimum 35mm penetration of the batten.

3.1.3 Boxed Corners, Cover Battens and Mouldings

External and internal corners must be finished in accordance with the installation detailing.

Most Hermpac 'Smart Corners' mouldings can be fixed by applying a continuous bead of sealant to the inside surfaces of the moulding or the faces of the flashing to which the moulding is to be bonded. Excess coating should be wiped off areas of the moulding intended to contact the adhesive.

Wherever possible, the moulding should be bonded to the flashing prior to installation. If this is not possible, the moulding shall be temporarily held in place while the sealant cures.

A continuous bead of sealant should also be applied at the joint between the moulding and the end-grain cross section of any butted weatherboard and direct to flashing along the line of weatherboard nail fixing (if the weatherboard fixing will pierce the flashing).

Sealant options for Wood-X, Traditional Oil Stains or Resene Waterborne Oil Stains include Bostik Seal N Flex FC or Sikaflex AT Façade (NB: for other stains please check with the manufacturer to determine the most suitable sealant).

Further or sole mechanical support of the Moulding-Flashing interface can be achieved in some cases with a pre-drilled and suitably placed Hermpac nail. The requirement for a continuous bead of sealant as detailed above still applies.

3.1.4 Finishing

At least two coats of an exterior grade quality oil-based penetrating stain must be used over the front face of the Hermpac shiplap weatherboards to protect the weatherboards and give the desired finish colour to the exterior walls. The stain must be recommended for use as a wall cladding stain by the manufacturer and must be brush or Machinecoat NZ Ltd applied. Hermpac recommends the use

of oil based stains manufactured by Wood-X and Resene.

Follow the stain manufacturer's instructions at all times for application of the stain finish.

For paint finish the paint must be recommended for use as a wall cladding paint by the manufacturer and must be brush or Machinecoat NZ Ltd applied.

To ensure a top quality paint finish:

1. Any sharp edges should be removed to provide a radius to aid in uniform paint film coverage.
2. Use a premium alkyd oil or acrylic based primer to envelope prime all cut ends and bare timber surfaces twice.
3. Punch nail holes and prime promptly after punching.
4. Fill holes with a suitable filler and allow to dry.
5. When filler is fully dry and cured, sand area smooth.
6. Apply one coat of an alkyd oil or acrylic based primer to sanded area and allow to fully dry before sanding lightly.
7. Ensure surface is clean and free from any chalking, dirt, dust, mould or other contaminants prior to painting top coats.
8. Apply two coats of premium high quality 100% exterior grade acrylic to surface allowing adequate time for drying between coats.

Timber is a natural product and for best results use a colour with a LRV of 40-45 or above. Please consult with us for a specific recommendation minimum for your chosen timber.

Follow the paint manufacturer's instructions at all times for application of the paint finish.

Refer to Section 4.0 for maintenance requirements.

4.0 Maintenance

Building owners are responsible for the maintenance of the VertiLine Vertical Shiplap Cavity System. Annual inspections must be made to ensure that all aspects of the cladding system, including flashings remain in a weatherproof condition. Any damaged areas or areas showing signs of deterioration which would allow water ingress, must be repaired immediately. Sealant, coatings, flashings or the weatherboards must be repaired in accordance with the relevant manufacturer's instructions.

Regular cleaning (at least annually) of the surface finish with water and a mild detergent is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the cladding.

Recoating of the stain finish will be necessary throughout the life of the cladding system. Re-staining must be carried out every 2-3 years in accordance with the stain manufacturer's instructions. Re-staining will be required more frequently on exposed northern and western facing walls. When re-staining, care must be taken to ensure bottom edges and shiplap edges are well covered and penetrated with the stain.

Recoating of the paint finish will be necessary throughout the life of the cladding system. Re-coating must be carried out every 7-10 years in accordance with the paint manufacturer's instructions. When re-coating, care must be taken to ensure bottom edges are well covered and penetrated with the paint.

5.0 Health & Safety

Cutting of Hermpac shiplap weatherboards must be carried out in well ventilated areas and dust masks, eye and hearing protection must be worn.



For further information please contact us
technical@hermpac.co.nz

Auckland
09 421 9840

Wellington
04 586 9674

Christchurch
03 341 2163



T-RIB

METALCRAFT ROOFING T-RIB

T-RIB EXPLAINED

The T-Rib Roofing and External Wall Cladding system comprises:

- A long run steel sheet with an asymmetrical trapezoidal profile
- Associated design and installation information

Metalcraft fabricates the T-Rib sheets from steel manufactured by New Zealand Steel. This steel is supplied with different protective coatings which are designed to withstand conditions in specific New Zealand Corrosion Zones. Refer to NZ Steel's Environmental Categories Brochure at www.nzsteel.co.nz/technical-resources for details.

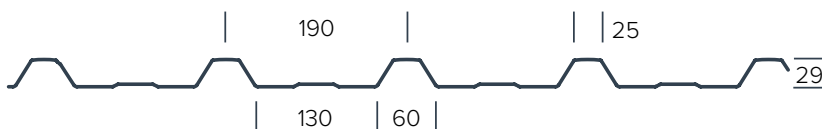
T-Rib is available in the following NZ Steel branded products:

- COLORSTEEL® Endura®
- Galvsteel®
- COLORSTEEL® Maxx®
- Zinalume®

In the following sizes:

- **Thicknesses:** 0.4mm and 0.55mm
- **Width:** Cover = 760mm Sheet = 810mm

And with the following profile dimensions:



PURPOSE

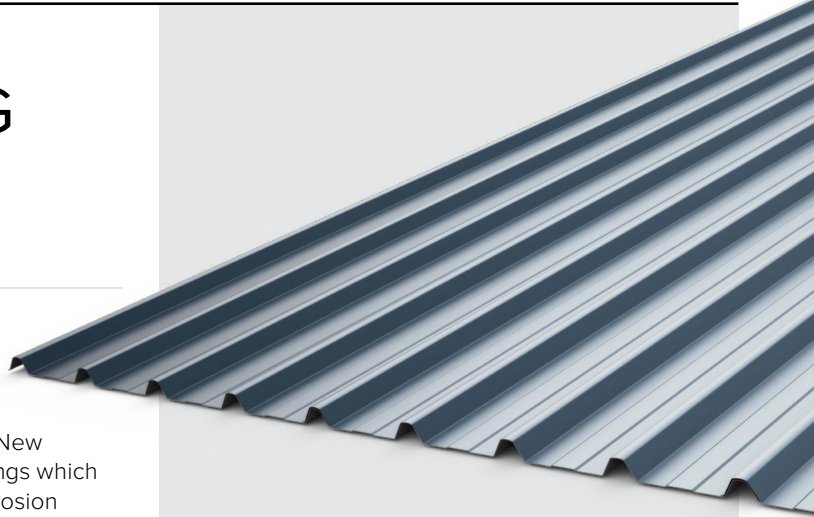
Metalcraft Roofing supply the T-Rib System as a horizontal and vertical wall external cladding and on roofs with a minimum pitch of 3°.

SCOPE OF USE

Metalcraft Roofing supply the T-Rib Roofing and External Wall Cladding system for use on commercial and residential buildings within the following scope:

LOCATION:

- In wind zones:
 - Up to and including Extra High as defined by NZS-3604:2011.
 - Subject to specific engineering, if the engineer has satisfied themselves that the product, pitch and fixings will meet the conditions.
- In all climate zones as defined by NZS-3604:2011, subject to the limitations set out below (see limitations overleaf).
- On buildings located within 1m of the relevant boundary, in respect of fire spread only.



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

SIGN OFF

SIGNED:

Frances Charles

Frances Charles
National Sales & Marketing Manager

DATE: 9 FEBRUARY 2018

VERSION: 1.0

FURTHER INFORMATION

For further product assistance please contact:

www.metalcraftgroup.co.nz

Phone: 0276 031096

Copyright © 2017, The Building Business Limited. All rights reserved.

Uncontrolled in printed format

To find your nearest Metalcraft Roofing branch visit: www.metalcraftgroup.co.nz





T-RIB

BUILDING:

- On new buildings that have been designed and constructed to comply with the NZ Building Code (NZBC) using timber or steel framing.
- On existing buildings using timber and steel framing where the designer and installer have satisfied themselves that the building is suitable for the intended building work.
- In conjunction with a vapour permeable building wrap that has a permeability of 36g/m²/day of a vapour resistance of no more than 500MNs/g.
- In conjunction with a potable water collection system.

LIMITATIONS

LOCATION:

- T-Rib may be used as a roof cladding system in exposure zones B, C & D. For use in "Microclimatic considerations," (as defined in Sec 4.2.4) refer to Metalcraft Roofing.
- T-Rib may be used as a wall cladding system in exposure zones B & C. Where T-Rib is to be used as a wall cladding in exposure Zone D, then only COLORSTEEL® Endura® or COLORSTEEL® Maxx® may be used.

BUILDING:

- Where T-Rib is used in an insulated building in conjunction with steel framing, a thermal break is required.
- Contact with other materials must be in accordance with Table 21 (E2/AS1), or compatible with the The New Zealand Metal Roofing Manufacturers Association Inc (NZMRM) Code Of Practice.
- Building height and design wind speed is limited by the T-Rib design load span tables (refer to: www.metalcraftgroup.co.nz).
- Where it is used as a roof cladding system, T-Rib sheet lengths of ≤ 40m must be installed on a roof with a minimum pitch of 3°. T-Rib sheet lengths of > 40m but less than ≤ 60m must be installed on a roof with a minimum pitch of 4°.
- T-Rib can be used in conjunction with a potable water collection system.
- When used as a wall cladding, T-Rib must be installed in conjunction with a drained cavity.

USEFUL LINKS

- For technical information, drawings and specification refer to: www.metalcraftgroup.co.nz
- For information to ensure correct fasteners are being used refer to: www.metalcraftgroup.co.nz
- For information on care and maintenance refer to: www.metalcraftgroup.co.nz
- For information on the Metalcraft Roofing warranty refer to: www.metalcraftgroup.co.nz

Copyright © 2017, The Building Business Limited (TBB). All rights reserved. This pass™ has been prepared by TBB in accordance with MBIE PTS guidelines. TBB ISO 9001 pending.

Uncontrolled in printed format

To find your nearest Metalcraft Roofing branch visit: www.metalcraftgroup.co.nz

COMPLIANCE WITH NZ BUILDING CODE

If designed, installed and maintained in accordance with all Metalcraft Roofing requirements, the T-Rib Roofing and External Cladding system will comply with or contribute to compliance with the following provisions of the NZBC:

NZBC Clause	Evidence of compliance
B1 Structure B1.3.1, B1.3.2 B1.3.3 (a), (b), (c), (d), (g), (h) & (i) - Building element, installation of a building element	AS1397:2011 (claim by NZ Steel) cited in E2/AS1. Load span tables AS/NZS1170:2002.
B2 Durability B2.3.1 (b) - Minimum 15 yrs	Coated in accordance with AS/NZS 2728:2013. (NZ Steel claim) cited in E2/AS1.
C3 Fire Affecting Areas Beyond the Source C3.4 (a), C3.5, C3.6, C3.7 (a), C3.8 & C3.9	ISO5660 BRANZ (FH 6102-TT, dated 3/1/2017) (Material Group 1-S). Steel non-combustible (per comment section 5.8 C/AS2-C/AS7.
E2 External Moisture E2.3.1, E2.3.2, E2.3.7 (a-c)	E2/AS1 NZ MRM Code of Practice (V2.2).
F2 Hazardous Building Materials F2.3.1	Refer to BRANZ statement (G12.3.1). NZ Steel claim coated to AS/NZS2728.
G12 Water Supply G12.3.1	BRANZ statement that metal roof suitable refer: http://www.level.org.nz/water/water-supply/mains-or-rainwater/harvesting-rainwater/ NZ Steel claim tested to AS/NZS40202.

OTHER CERTIFICATIONS

As the manufacturer of the steel from which T-Rib is fabricated, NZ Steel provides assurance that the steel:

- Has been manufactured in accordance with AS 1397-2001.
- Is coated in accordance with AS/NZS 2728:2013, or galvanized in accordance with AS/NZS 2312.2:2014.



NATURE'S OAK

NATURE'S OAK - WOOD FLOORING INSTALLATION INSTRUCTIONS

Thank you for purchasing this Nature's Oak Wood Flooring. Please read these instructions carefully prior to installation. We strongly recommend that these instructions are read in full prior to beginning your installation.

IN GENERAL

Nature's Oak Wood Flooring is a floating timber floor meaning that the edges of each board are joined to each other using the glueless Uniclic joining system, and are not fixed to the sub-floor. Nature's Oak Wood Flooring floats over an approved 2mm foam underlay and can be installed over any sound, dry and level surface. An expansion gap is left to the entire perimeter of the floor to allow for initial and seasonal expansion. The boards are generally installed along the length of the room with the ends of boards laid with a natural random stagger.

A successful installation will rely heavily on strict adherence to these instructions. The two most common causes of failure are uneven subfloors, and inadequate expansion to the perimeter of the floor. An uneven subfloor may lead to movement of the flooring underfoot and within the joining system, resulting in excessive noise, which often sound like "crackling" or "creaking".

TOOLS NEEDED

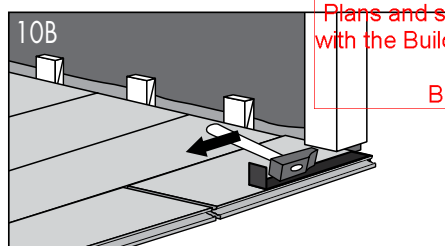
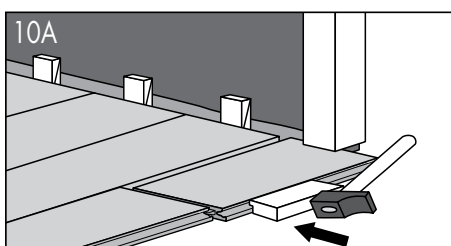
An installation Kit containing expansion wedges, a pulling iron and a tapping block. You will also require a jigsaw, pencil, hammer, tape measure, sharp "Stanley" type knife and small hand tools associated with wood working. Along with your Nature's Oak Wood Flooring you'll need a quality underlay, and enough trims to complete your floor. Trims are available in a range of shapes, profiles and colours from your local retailer.

PREPARATION

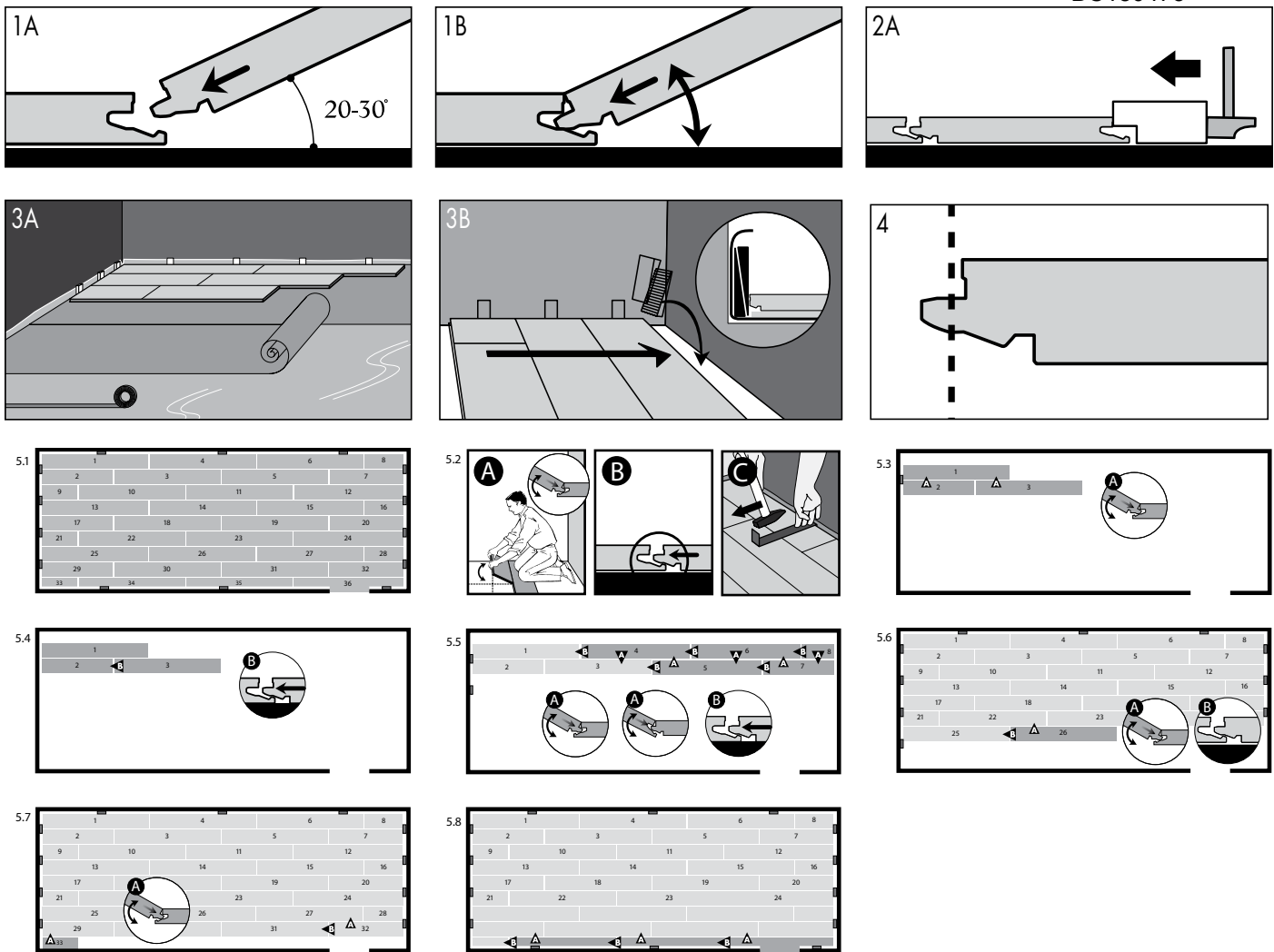
The first thing that you need is to ensure that the subfloor or surface that the engineered wood floor is being installed over is level. Using a 1 metre straight edge, the subfloor level should not exceed +/- 3mm over 1 lineal metre in any direction. Remember, uneven floors may lead to movement and noise, so it is necessary to assess the levelness and get it right. Timber floors can be sanded level and concrete floors or existing floor coverings can usually be levelled using a self-levelling compound. Nature's Oak Wood Flooring cannot be installed over carpet or carpet underlay but can be installed over well bonded vinyl, cork, ceramic tiles if sufficiently level.

Nature's Oak Wood Flooring must always be installed over a continuous damp proof membrane. This continuous damp proof membrane can be provided by 200uM builders plastic, overlapped 300mm at the joins and taped with a vapour tight tape or by the use of Combi-lay underlay. Combi-lay underlays are manufactured with a plastic damp proof membrane on one side and are conveniently fitted with a 100mm overlap and peel and stick tape. Combi-lay is rolled out along the starting wall with the plastic down, peel & stick side to the wall. Additional rows are rolled out with tape down over the extended clear overlap. The wax tape can then be peeled away forming the continuous damp proof. Cut ends must be taped with a water proof tape.

In the instance of knowingly or logically wet subfloors, or heated subfloors, always use 200uM builders plastic sheeting, overlapping joints by 300mm, taping joints with waterproof tape and turning up at walls or vertical fixtures. Door frames and architraves should be undercut prior to commencing installation using a scrap of flooring and a long, flexible hand saw(Fig 10). Undercut saws may be available from your local retailer and are specifically designed for this purpose.



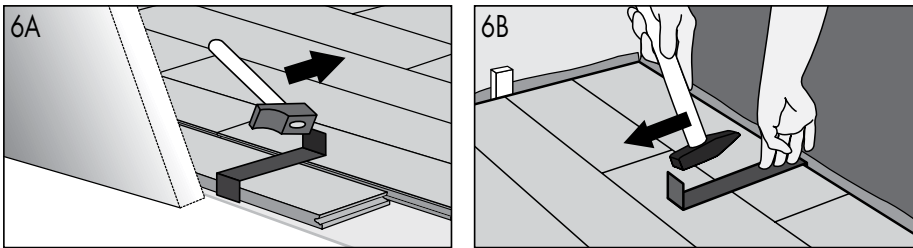
WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



Work out the trims to be installed as some trims are easier to install prior to the flooring. This will be dependant on the direction of the trim to the flooring and the type of trim to be installed.

INSTALLING THE FIRST THREE ROWS

Select a starting wall that is long and visible, the first three rows will be installed parallel to this wall. Install the first row of plastic and/or underlay as required then install the first row, tongue (male) to the wall to assess the straightness of the starting wall. If the starting wall is undulating or uneven, square this row off to the other side of the room using a tape measure and scribe the first row of boards to cater for the undulations while accommodating a uniform 10-14mm expansion gap. If scribing is not required, remove the tongue along these starting boards (Fig 4). In terms of the required expansion gap, a minimum of 10mm is required in lower relative humidity environments like Melbourne or Hobart. A 14mm gap is required in areas of higher relative humidity like Queensland or Darwin. Remember that Nature's Oak Wood Flooring may expand up to 4mm per LM in the width, as such the wider the floor, and the higher the humidity, the larger the perimeter gap should be. Now we will assemble the first 2 rows in a staggered formation as per diagram 5.5. This will provide a foundation for additional rows, it can be assembled away from the wall, then slid into position with minimum 10mm spacers installed along the wall and at the ends. The off-cut from the first 2 rows can now be used to start the 3rd row, providing it is longer than 300mm. If not, a new board will need to be cut to begin the 3rd row. Now install the 1st board of the 3rd row by rotating the long join into position (Fig 1) and install the 10-15mm spacer at the start of this row. Continue installing the floor left to right using the off cut from row 3 to begin row 4. (Note: Remember to ensure that you stagger end joins by greater than 300mm.) Any small gaps in the first three rows can be filled using a caulking compound in an appropriate colour.



THE BODY AND THE FINAL ROW

Continue installing the floor left to right. The final row will need to be trimmed to fit using a jigsaw and brought into place using the pulling iron (Fig 6). Remember to allow 10-14mm for your expansion gap at all walls and vertical surfaces. This gap will be covered last of all.

FINISHING OFF

Where skirting boards have been left in place, it is now time to fit scotia moulding to the perimeter of the floor to cover the expansion gap. Scotia is to be pinned to the skirting only so as not to inhibit the free movement of the floor. If skirting boards have been removed or are yet to be fitted, they will usually cover the expansion gap well. Install any End, Connector or Adapter profiles that have not been fitted during the installation process. These trims must hold the floor in place and provide for full and free expansion of the flooring. They should be anchored with adhesive and mechanically. Finally, any gaps at the floor perimeter that could not be covered with skirting or profiles, can be filled with a caulking compound in a matching. Any gaps between boards can also be filled at this time. Your engineered wood floor can now be cleaned and enjoyed.

SPECIAL NOTES

- 10mm is the minimum perimeter expansion gap for all applications. Larger floors or floors that will be exposed to higher levels of relative humidity will need larger expansion gaps. Some multi-room or very large installations will need expansion joints installed throughout the floor. In most cases, multi-room installations will need to be separated at doorways using connector trims, a range of which are available from your local retailer. Your retailer will be able to advise you in this regard.
- Nature's Oak Wood Flooring floor can be direct stuck to a prepared subfloor. We recommend the use of Bostik Ultraset adhesive used as instructed, along with their recommended ancillary products.
- When installing Nature's Oak Wood Flooring on stairs, glue both tread and riser using a recommended polyurethane or construction adhesive. No underlay should be used on tread or riser. Special stair nosing trims are also available for this application.
- It is the installer's responsibility to check each board for faults or defects, in appropriate finished lighting conditions, prior to installation. Labour costs or any other costs associated with the replacement of boards after they have been installed will not be accepted by Floorscape Ltd. or its agents.
- Nature's Oak Wood Flooring is not designed to be exposed to extremes of humidity or temperature. It is important to note that floors exposed to such conditions may fail. Sensible protection of the flooring from such extremes, particularly in unoccupied homes, must be afforded. Measures can include curtains, awning, blinds, window tinting, and early commissioning and/or regular use of air conditioning or humidity control devices. Protection of the flooring from any radiant heat source should also be provided, eg: around combustion heaters and other heaters, as these generate extreme low humidity. Nature's Oak Wood Flooring should not be installed until these measures are in place, and should not be installed more than 2 weeks prior to occupation of the home. It is important to understand that any warranty, expressed or implied, may be voided if the floor is exposed to extreme conditions.
- It is the homeowner's responsibility to provide a moderate indoor environment in order to prevent cracking and distortion of the flooring, even when unoccupied.

MAINTENANCE

Like all timber floors Nature's Oak Wood Flooring will mark and scratch. However, it can be re-coated or re-sanded as required, just like traditional wood flooring in order to maintain your floor;

- Sweep or vacuum (bristles down) your floor regularly to remove stones and abrasive grit or dirt.
- Install dirt trapping mats at external entrances.
- Apply felt floor protectors to the underside of all moving furniture to reduce marking or scratching.
- Damp clean using a barely moist mop. For best results, add one capful of Timber Cleaner to your water and towel off any excess moisture immediately after damp mopping.

Full maintenance instructions can be obtained from your local retailer.

Again, thank you for your purchase.

INSTALLATION GUIDE

AND TECHNICAL
SPECIFICATIONS



WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved

**TONGUE &
GROOVE** 12
KOPINE

**ULTRA
LOCK** 12
KOPINE



kopine.co.nz



**ULTRA
LOCKTM₁₂**
KOPINE

**TONGUE &
GROOVETM₁₂**
KOPINE

KOPINE FLOORING SYSTEMS INCLUDE BOTH ULTRALOCK₁₂ AND TONGUE & GROOVE₁₂ HIGH-DENSITY PARTICLEBOARD FLOORING.

- › Codemark compliant
- › 12 week exposure time
- › Meets AS/NZS1860 Standard
- › Adhesive provided at no extra cost
- › Easy to install - no nogs or dwangs required
- › Moisture-resistant joints
- › 2-hour walk on time
- › Environmental Choice NZ
- › Low formaldehyde emission (E1)
- › 20mm thick
- › Two panel sizes – 2400 x 1200mm and 3600 x 1200mm
- › Made right here in New Zealand at Kopu near Thames.
- › Using sustainable NZ grown Radiata pine

WHAT'S IN THIS GUIDE

- 1. How to install Ultralock12**
- 2. How to install Tongue & Groove12**
- 3. Technical Specifications**

1

HOW TO INSTALL ULTRALOCK₁₂

Kopine Ultralock™12 is a high-density particleboard flooring that uses a patented system to bond the panel edges together for a seamless finish. You don't need nogs or dwangs and the Gorilla Grip glue (provided at no extra cost when you buy the board) provides an effective moisture seal and an excellent strong joint when set.



WHAT YOU NEED BEFORE YOU START

- › Holdfast Gorilla Grip – supplied when you buy the panels and the only one tested with our board for Codemark compliance.
- › No. 8 gauge x 50mm countersunk screws (recommended).

OR

- › A minimum of 65mm x 2.8mm hot-dipped galvanised annular grooved flooring nails if you've got a nail gun and know how to use it.

OR

- › A minimum of 60 x 2.8mm hot-dipped galvanised jolt head nails or 60 x 3.15mm hot-dipped galvanised csk annular grooved flooring nails (if you're old school and using a hammer).

STEP 1

JOIST SPACING

- › Joist spacing should be no more than 600 mm centres. The closer the joists the more rigid the floor.
- › Before you lay your first panel, put some nails into the joist to hold it in place.
- › Irrespective of the size of the floor allow for an 8mm expansion gap between the panel edges and any fixed elements i.e. masonry walls, bottom plates etc.



STEP 2 GLUE THE JOISTS

Before you put down your first panel, apply a continuous bead of glue to the top of the joists it's going to sit across, and then all subsequent joists as you lay further sheets.



STEP 3 LAYING THE FIRST SHEET

- › Make sure the panel edges are square, and free from dirt and grease.
- › Take a straight, square line from one corner of the floor and lay the first panel down this line, across the glued joists.
- › Screw the first panel down.
- › Nails or screws should be spaced at 150mm centres along the short edge of the panels and around the perimeter edge of the entire floor, and at 200mm centres along intermediate joists.
- › Nails or screws must be a minimum of 10mm from the edge.
- › Completely fix panels when you lay them down – corner fixing only is not good practice and not enough to hold the panels while the glue cures.

Using screws? Use a lower torque setting to reduce the risk of overdriving and tearing the threads loose in the timber. Overdriven screws must be removed and set in a new position. Screw fixing gives the tightest result of all the methods.

Using a nail gun? A depth adjuster attachment should be used on the nail gun and adjusted to ensure that the nails do not penetrate more than 2 mm below the surface of the panel. Do not rely on the nails to pull panels down tight on the joists – panels must be in contact with the joist before the nail is fired.

Using a hammer? Drive nails at a slight angle (alternating) and parallel to the sheet edge for improved lateral holding. Nail vertically at corners. Nails should be hammered flush when laying, then punched below the surface just before sanding.



STEP 4

GLUEING THE PANELS

Note: Gorilla Grip adhesive works best in conditions above 10C. Do not use below 5C. It's the ONLY adhesive tested and recommended for use with Kopine flooring to achieve Codemark compliance.

- › Apply the glue bead to all edges of the first panel in a continuous run of at least 5mm diameter – more is better!
- › The glue should squeeze out of the top of the joint when you push the panels together.
- › Lay panels in a staggered, brick-like pattern with panels at right angles to the joists, making sure you glue all edges and the joists underneath – this will help stop the squeaking and peaking.
- › Gorilla Grip cures fast so don't mess about. Fix the panels within 15 minutes of the glue being applied.
- › If you move the panels apart after 15 minutes, you'll need to put some fresh glue on before you rejoin them.



GLUE GENEROUSLY ALONG EDGE



EXCESS GLUE MEANS IT'S RIGHT



JOB DONE!

STEP 5

AVOID THE PANELS FOR TWO HOURS

- › Clean any excess glue off the joints with a scraper.
- › Don't walk on the joints for a minimum of two hours after you've glued – especially if joists are at 600mm centres or in cold conditions.
- › If you have to walk over it, lay planks across or walk across the joists only.

2

HOW TO INSTALL TONGUE & GROOVE₁₂

Kopine Tongue & Groove₁₂ is a high-density particleboard flooring that uses black plastic tongues with a grooved edge to provide a super tough joint. You don't need nogs or dwangs and the glue (provided when you buy the board at no extra cost) provides an effective moisture seal to minimise joint peaking.



WHAT YOU NEED BEFORE YOU START

- › Holdfast Gorilla Grip –the only one tested with our board for Codemark compliance.
- › No. 8 gauge x 50mm countersunk screws (recommended).
- › A rubber mallet.

OR

- › A minimum of 65mm x 2.8mm hot-dipped galvanised annular grooved flooring nails if you're using a nail gun.

OR

- › A minimum of 60 x 2.8mm hot-dipped galvanised jolt head nails or 60 x 3.15mm hot-dipped galvanised csk annuler grooved flooring nails (if you're old school and using a hammer).

STEP 1

JOIST SPACING

- › Joist spacing should be no more than 600 mm centres. The closer the joists the more rigid the floor.
- › Before you lay your first panel, put some nails into the joist to hold it in place.
- › Irrespective of the size of the floor allow for an 8mm expansion gap between the panel edges and any fixed elements i.e. masonry walls, bottom plates etc.





STEP 2 GLUE THE JOISTS

Before you put down your first panel, apply a continuous bead of glue to the top of the joists it's going to sit across, and then all subsequent joists as you lay further sheets.

STEP 3 LAYING THE FIRST SHEET

- › Make sure the panel edges are square, and free from dirt and grease.
- › Take a straight, square line from one corner of the floor and lay the first panel down this line, across the glued joists.
- › Screw the first panel down, ensuring screws (or nails) are a minimum of 15mm from the edge to avoid the plastic tongue.
- › Nails or screws should be spaced at 150mm centres along the short edge of the panels and around the perimeter edge of the entire floor, and at 200mm centres along intermediate joists.
- › Completely fix panels when you lay them down – corner fixing only is not good practice and not enough to hold the panels while the glue cures.

Using screws? Use a lower torque setting to reduce the risk of overdriving and tearing the threads loose in the timber. Overdriven screws must be removed and set in a new position. Screw fixing gives the tightest result of all the methods.

Using a nail gun? A depth adjuster attachment should be used on the nail gun and adjusted to ensure that the nails do not penetrate more than 2 mm below the surface of the panel. Do not rely on the nails to pull panels down tight on the joists – panels must be in contact with the joist before the nail is fired.

Using a hammer? Drive nails at a slight angle (alternating) and parallel to the panel edge for improved lateral holding. Nail vertically at corners. Nails should be hammered flush when laying then punched below the surface just before sanding.





STEP 4

GLUEING THE PANELS

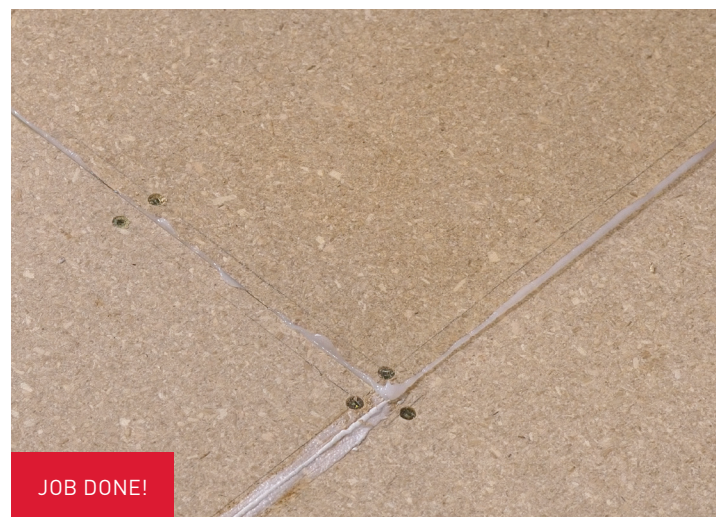
Note: Gorilla Grip adhesive works best in conditions above 10C. Do not use below 5C. It's the ONLY adhesive tested and recommended for use with Kopine flooring to achieve Codemark compliance.

- › Apply the glue bead to all edges of the first panel (including the top and bottom of the tongue) in a continuous run of at least 5mm diameter – more is better!
- › The glue should squeeze out of the top of the joint when you push the panels together. You'll need to use the rubber mallet to join the panels tightly.
- › Lay panels in a staggered, brick-like pattern with panels at right angles to the joists, making sure you glue all edges and the joists underneath – this will help stop the squeaking and peaking.
- › Gorilla Grip cures fast so don't mess about. Fix the panels within 15 minutes of the glue being applied.
- › If you move the panels apart after 15 minutes, you'll need to put some fresh glue on before you rejoin them.

STEP 5

AVOID THE PANELS FOR TWO HOURS

- › Clean any excess glue off the joints with a scraper.
- › Don't walk on the joints for a minimum of two hours after you've glued – especially if joists are at 600mm centres or in cold conditions.
- › If you have to walk over it, lay planks across or walk across the joists only.



3

TECHNICAL SPECS

Ultralock™12 and Tongue & Groove12 are high-density particleboard flooring systems made here in New Zealand by Kopine. Strong and fast to install, with water-resistant joints, both flooring systems are quiet, cost-effective and will stand the test of time.

The specifications here cover both systems – where differences occur they are clearly identified.

Both flooring products have been tested to AS/NZ 1860 and have Codemark Certification and Environmental Choice NZ certification.



Kopine Ultralock™12 system uses a patented system to glue the grooved panel edges together in a continuous flooring membrane. The adhesive, which is supplied at no extra cost when you buy the board, eliminates the need for nogs or dwangs, saving time and money.

The glue also provides an effective moisture seal at the joints, significantly reducing the chance of edge peaking that requires additional sanding.



Kopine Tongue & Groove12 is a traditional method of jointing but uses a glue bond in addition to the black PVC tongue to produce a strong joint which significantly reduces edge peaking compared to glueless systems.

PRODUCT DESCRIPTION

Kopine Ultralock™12 and Kopine Tongue & Groove12 flooring systems are reconstituted wood panels manufactured by bonding radiata pine wood particles with a melamine urea formaldehyde resin using a combination of heat and pressure.



PROPERTIES OF KOPINE FLOORING SYSTEMS

Dimensions

Size (mm)	2400 x 1200	3600 x 1200
Nominal Thickness(mm)	20 mm	20 mm
Sheets per pack	50	20
Sheet weight (kg)	41	61

Tolerances

Board squareness	Length of sheet diagonals does not differ more than 1.5 mm
Thickness	+/- 0.4 mm
Length and width	+/- 1.5 mm
Sheet edges	2.0 mm max. deviation from line

Physical properties of Kopine particleboard

Density	> 670 kg/m ³
Internal bond ¹	> 500 kPa
Modulus of rupture ¹	> 17 MPa
Modulus of elasticity ¹	> 2650 MPa
Moisture content (at dispatch)	5 – 13 %
Surface water absorption ¹	< 210 g/m ²
Thickness swell (24 hour soak) ¹	< 14 %
Extractable formaldehyde	E1: ≤1.5 mg/L when tested in accordance with AS/NZS 4266.16.
Surface	Upper surface is sanded, underside is sanded
Thermal insulation	R = 0.13 m ² C/W

¹ Physical properties based on lower 5th percentile values in relation to particleboard flooring panels when tested internally (based on the procedures stated in AS/ NZS 4266).

BUILDING MATERIALS FOR USE WITH KOPINE® FLOORING SYSTEMS

Holdfast Gorilla Grip Express Adhesive

Holdfast Gorilla Grip is a fast curing, one component, polyurethane-based adhesive with high bond strength. It bonds deeply into the panel fibres, even on damp surfaces. Holdfast Gorilla Grip cures to a transparent glue line and gives added protection against moisture penetration into the joint significantly decreasing the risk of edge swell or peaking. The glue is temperature resistant to 100°C.

For more information contact Holdfast on 0800 701 080.

Construction adhesives are supplied in 310 ml cartridges and will fit any standard glue gun. Cartridges are included at no extra cost as part of the Kopine Ultralock™12 and Tongue & Groove12 flooring systems.

Sustainability

Kopine Ultralock™12 and Tongue & Groove12 are made from radiata pine shavings and chips. New Zealand plantations are managed in compliance with the New Zealand Forest Accord.

Kopine Flooring Systems have Environmental Choice NZ accreditation under the Floor Coverings category.

Joists

The choice of joists will play a part in determining the performance of the flooring system. Moisture content of the joists must be less than 18%. It is highly recommended that joists be either Machine Stress graded, high temperature kiln dried timber such as laser frame, OR where longer spans and higher performance is required, use LVL (laminated veneer lumber) joists.

The benefits are a stiffer, more level floor than one laid with conventional wet, visual graded joists. This will result in reduced vibration, transmitting less sound above and below the floor.

Note: Kopine Flooring systems provides maximum performance using the specified components only when used in accordance with the installation instructions at the front of this brochure. Substitute components have not been tested and may not perform to the same standard and are not recommended.

DESIGN CONSIDERATIONS

Design 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.

Ground clearance

A minimum clearance of 550 mm must be provided between the underside of the flooring and the surface of the ground. Refer NZS 3604:2011. Inspection access is also required.

Heavy loadings

For concentrated loads over 180 kg or uniformly distributed loads over 200 kg/m², a structural engineer should be consulted. Joints must be supported by nogs/dwangs beneath heavy loads.

Floor frame spacings

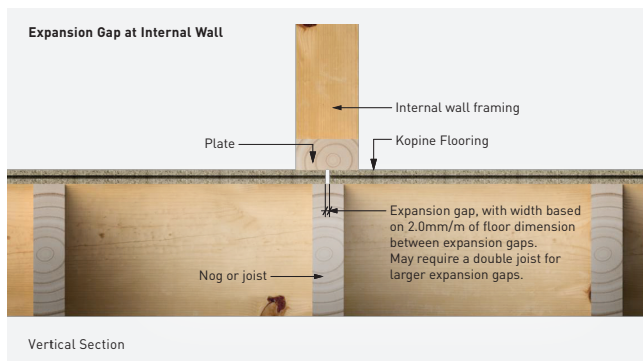
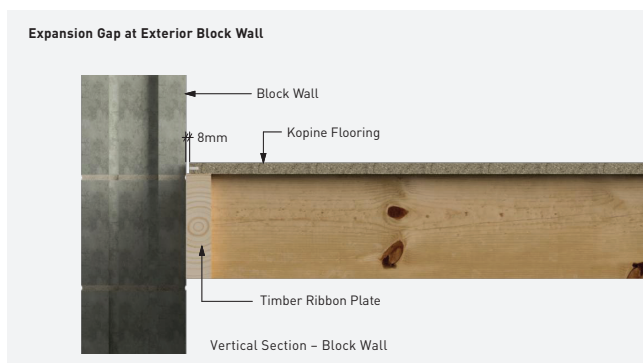
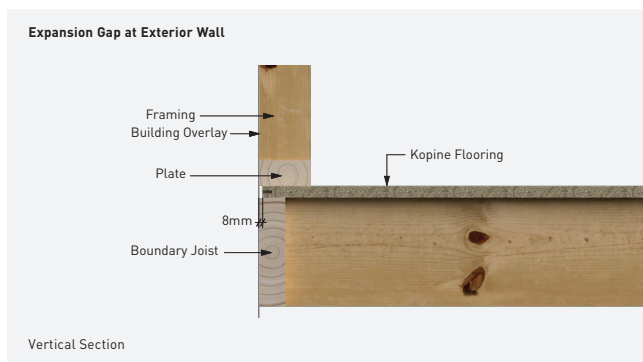
Kopine Ultralock™ particleboard flooring is suitable for residential flooring applications with a maximum frame spacing of 600 mm for a maximum 1.8 kN live load. Live loads above 2.0 kPa / 1.8 kN are required to be specifically designed using Kopine flooring properties outlined earlier in this technical section.

For greater strength and stiffness consider a frame spacing of 400 mm centres or 450 mm centres where 3600 x 1200 mm sheets are used.

Expansion gaps

Regardless of the size of the floor, an 8 mm expansion gap must be provided between the panel edges and any fixed elements e.g. masonry walls, bottom plates etc. This is important to allow for any linear expansion and applies whether pre or post laying.

Where the effects of expansion in the flooring may be critical with respect to achieving the desired floor or wall finishes, then it is recommended that expansion joints be incorporated into the design. Allow expansion of 2.0 mm/m of floor dimension utilising the details given under 'Large Floor Areas' section.



Large floor areas

As with all wood products, particleboard floors will expand and contract with changes in moisture content of the panels. For large floor areas, provision must be made for expansion of the panels in addition to the perimeter gaps. It is recommended that expansion joints should be designed into the floor at a minimum of 20 mm per 10 metre of floor at a maximum of 10 metre spacing's or smaller gaps with closer spacing to give an equivalent space.

Where floors are laid in wet conditions, consideration should be given to decreasing the distance between expansion joints.

Exposure to weather

- ▶ Kopine flooring systems may be exposed to weather for up to three months. For best results keep exposure to a minimum.
- ▶ Pre laying - make sure the building is closed in within three months, preferably sooner. Post lay if there is a risk of over-exposure.
- ▶ Clear surface water from the floor quickly - do not allow to pond.
- ▶ To allow moisture to evaporate freely, do not apply sealer's, tape or other impervious sheet material to pre laid floor while it is exposed.
- ▶ Kopine flooring panels are designed to be laid across joists and glued together at the edges. This continuous glue bond eliminates the need for further edge support such as timber noggings. All end joints (short edges) must be made over a joist and glued.

Floor diaphragms

Kopine Ultralock™12 and Kopine Tongue & Groove12 are suitable for use as a floor diaphragm within the scope of NZS 3604.

Ventilation

Cross-flow ventilation must comply with NZS 3604 6.14 Prevention of Dampness. Ventilation openings must be evenly distributed around the entire perimeter – in the foundation and/or substructure walling.

A ground cover vapour barrier must be installed in sub-floor areas where:

- ▶ The ground will be permanently or seasonally damp.
- ▶ The airflow is obstructed by party walls, internal foundation walls or attached terraces.
- ▶ Points on the ground are greater than 7.5 metres from a ventilation opening.

Refer to NZS 3604 – 6.14.3.

Underside coating

The underside of Kopine flooring panels facing the ground must not be coated with any form of sealant and only perforated foil or other approved product is to be used as insulation.

This allows the sheet to breathe.

Insulating with foil

Under floor insulation must meet the requirements of clause H1 of the New Zealand Building Code. If foil is used and you intend glue fixing to the joists, the foil will need to be cut to allow daubs of glue to be applied.

Surfacing for wet areas

In water-serviced areas such as laundries, bathrooms, toilets and showers the floor must be covered with a moisture-impervious membrane, coved at the walls, extending under toilet pans. Vinyl tiles, carpet or clear coatings must not be used in these areas. Refer Acceptable Solution E3/AS1. 2.12

Spread of fire

Kopine Flooring Systems can be used where the NZ Building Code requires no specific fire protection criteria.

Heat and fire safety

The floor must be protected from heat sources such as free-standing heaters, space heaters, hot air ducts and pipes containing hot water or steam. Floor temperature must not be allowed to exceed 35°C for prolonged periods.

NZ Building Code C1.3.2 specifies how the floor must be separated from fireplaces, flues, chimneys and fuel burning appliances. Consult appliance manufacturers to determine minimum clearances which will ensure the floor does not exceed 50°C for short periods or 35°C for longer.

Floor Heating Systems

› Over Floor Heating Systems

Over floor heating e.g. under carpet or tiles, may be used with Kopine Flooring Systems, provided the floor surface temperature does not exceed 35°C.

Care must be taken to ensure that the floor temperature is normally maintained at or less than the recommended long-term maximum of 35°C. In these applications, care must be taken to ensure that flooring is laid over dry framing and is well protected from the weather until the building is closed in. Laying of the flooring after close in is recommended. Any failure of the heating system is the responsibility of the floor heating system manufacturer.

› Under Floor Heating Systems

Under NO CIRCUMSTANCES should any floor heating system be attached to the underside of Kopine flooring panels or be attached or placed between joists or any cavities of the floor framing.

Insects – fungus

The risk of damage from insects such as borer or termites is very low. For best results ensure the moisture content does not exceed 18% for prolonged periods and install in accordance with the ventilation requirements of NZS 3604.

Structure

Kopine® Flooring Systems are manufactured to AS/NZS 1860 and as such comply with B1 of the NZ Building Code. The long-term performance of the floor depends almost entirely on the dryness and flatness of the subfloor and the standard of fixing.

Durability

When used in accordance with the instructions and recommendations in this guide and in accordance with NZS 3602, Kopine Ultralock™12 and Kopine Tongue & Groove12 flooring will meet the durability performance requirements of NZ Building Code. Both flooring systems carry Codemark accreditation, meeting the requirement for 50 years durability under the code and this includes the supplied adhesive.

HEALTH & SAFETY

Kopine Flooring Systems should be handled as per the Particleboard Material Safety Data Sheet (MSDS) downloadable from www.kopine.co.nz

Storage and work areas should be well ventilated and dust cleared regularly by vacuum or wet sweeping methods.

If skin irritation occurs, wear long-sleeved shirts, trousers and comfortable work gloves.

For respiratory protection, wear dust masks which comply with AS/NZS 1715 and AS/NZS 1716, EN 143:2000 and EN 149:2001, ANSI 288 or national equivalent.

For eye protection wear safety glasses which comply with AS/NZS 1337.

Holdfast Gorilla Grip Adhesive: Observe normal industrial hygiene measures and for further information refer to the MSDS sheet available from Holdfast Manufacturing, 0800 701 080.

STORAGE & HANDLING

Kopine® Ultralock™12 & Tongue & Groove12 Flooring:

- › May be exposed to weathering for up to 12 weeks during the construction process. It must not be exposed for longer periods and should be protected from extreme weather during construction.
- › Must not be installed over timber supports with moisture content over 18%.
- › Is not suitable for use as a substrate for roofing or decking membranes.
- › Interior surfaces must be sealed with polyurethane or covered with carpet or sheet vinyl prior to occupation of the building.

Before Installation

- › Protect the panels from weather and keep dry before laying. Store the pack clear of the ground on level bearers.
- › A breather-type cover must be supported clear of the panel surface allowing air to circulate freely around the pack.

Handling

- › Use gloves when handling product to avoid splinters.

After Installation

- › Kopine flooring may be exposed to weather for up to 12 weeks. For best results keep exposure to a minimum.
- › Clear surface water from the floor quickly – do not allow it to pond. Remove the bottom plate from doorways to make clearing easier.
- › To allow moisture to evaporate freely, do not apply sealers, tape or other impervious sheet materials to a pre-laid floor while it is exposed.

Dimensional changes of up to 0.2% in panel length and width may occur in response to humidity changes.

Adhesive fastening where foil is used

In ground floor applications where foil insulation is used, apply adhesive to the floor joists through 25 mm square cut outs in the foil at 300 mm centres. Cut outs can be made by taping two builder's knives together and making two cuts along and across the top of the joist, through the foil.

For upper floors that do not require foil or similar insulation, apply a 10 mm bead of Holdfast Gorilla Grip to the joists, covering the whole length of the joist. Fasten sheets fully within 15 minutes of applying the adhesive to ensure a tight bond to the joists. Refer to manufacturer's instructions for more detail.

FINISHING

CLEAR FINISHING PREPARATION

If clear finishing is planned, to avoid colour variation do not mix batches of sheets. To prevent stains, avoid prolonged contact with sawdust piles, stacked timber, steel scaffolding, cement, strapping or nails especially if rusting is likely. Avoid spills of tea, coffee, paint or cement. Keep the period of exposure short.

Kopine flooring panels must be sealed with polyurethane or covered with carpet or sheet vinyl before the building is occupied. Lightly sand with 40-80 grit paper before laying floor coverings or clear finishing.

Do not over-sand. Excessive sanding can reduce structural strength and lead to colour variation, visible when the floor is clear finished.

Clear finishing

- › Punch nails then carefully sand the entire floor.
- › Remove dust from the floor and skirtings with a broom and vacuum cleaner.
- › Apply the first polyurethane coat, following manufacturer's instructions.
- › Fill nail holes with a filler such as DAP wood dough.
- › Apply further coats, lightly sanding between each coat.
- › Follow manufacturer's instructions to complete.

Glue-fixed floor coverings

Refer to floor covering manufacturer's specific requirements.

Maintenance

Regular underfloor inspections must be made. Any sign of moisture or mould on the floors or lower parts of walls must be investigated and corrective action taken. Plumbing leaks, moisture migration or leakage from external sources must be rectified. Moisture concentration in wall cavities must be repaired and recurrence prevented.

Keep vents in the perimeter foundation walls clear of vegetation and other obstructions to allow proper subfloor ventilation at all times. Keep subfloor vapour barriers and insulation foil in a serviceable and effective condition.

Floor coverings and coatings must protect the whole floor surface. In water-serviced areas the moisture-impervious floor covering or coating must be maintained so water cannot reach the particleboard.

Floor wastes must be kept unobstructed and drain to the outside of the building.

After flooding

Dry the floor quickly. Lift carpets and slit insulation foil drapes so all water drains.

FURTHER INFORMATION

Please refer to the appropriate Technical Data Sheets or MSDS which are downloadable from the Kopine website at www.kopine.co.nz

Kopine® is a registered trade mark of Kopine Ltd, a business unit of New Zealand Panels Group.

This guide contains important information on the installation and maintenance of the Kopine Ultralock™ & Tongue & Groove flooring systems. The information contained in this guide is current as at September 2017 and replaces all previous publications relating to the Kopine Ultralock™ and Tongue & Groove flooring systems. Kopine reserves the right to revise this brochure without any notice.

Kopine has used its reasonable endeavours to ensure the accuracy and reliability of the information contained in this brochure, 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. When specifying or installing Kopine Flooring Systems visit www.kopine.co.nz or call **0800 866 678** to ensure you have the current specification material.



INSTALLATION INSTRUCTIONS

Roof

PINK® BATTS® CEILING INSULATION

Installation Instructions

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018, stayed

Correct installation with no compression, gaps or folds is critical to ensure Pink® Batts® ceiling insulation performance is not compromised.

Safety:

Each installation is unique so prior to installation check for all hazards that may cause injury:

- Carry out any required repair work before starting installation
- Ensure there's adequate lighting to identify any hazards
- Treat all electrical cables as live, being 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

- Do not stand on ceiling or ceiling battens

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.

We recommend PinkFit® professional installers. PinkFit® are a nationwide network of professional installers who guarantee that their completed installation will meet the requirements of NZS 4246:2016.

Call **0800 746 534** for your local PinkFit® installer

Roof

PINK® BATTS® CEILING INSULATION

Installation:

Any slight irritation to exposed skin caused by the fibres in glass wool, or through their inhalation, is harmless and temporary.

However for your comfort while installing, it's recommended you wear:

- Loose fitting work clothes which cover the arms and legs
- Covered shoes
- Dust mask
- Safety glasses

For safety while installing, it's recommended you use:

- Cut resistant gloves (if knife is used)
- Kneepads (for retrofitting)

For an efficient installation, the following tools are recommended:

- Stable working platform (for new build)
- Kneeling board or planks (for retrofitting)
- Knife
- Tape measure
- Install rod for tight spaces
- Head torch (for retrofitting)

For retrofitting, take into consideration:

- Using planks laid across joists to walk and work on
- Leveling and refitting any existing insulation if required with correct clearances
- Removing any damp insulation
- Starting installation at the point furthest away from the ceiling access hole

To ensure Pink® Batts® ceiling insulation performance isn't compromised, confirm the correct product and R-value is used in ceiling applications.

- Ensure the product is installed dry
- Friction fit product between framing, ensuring there are NO gaps, folds or compression of the product to achieve optimal performance
- If cutting is required, cut oversize by 5-10mm to ensure a good friction fit
- Ensure that Pink® Batts® ceiling segments are firmly butted against each other
- For retrofitting, install over timber 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 Pink® Batts® insulation beneath electrical wiring and plumbing work. Minimise tucks
- Install to the outer edge of the top plate covering at least 50% of it while ensuring minimal overflow to the eaves
- Maintain a 25mm gap clearance between the Pink® Batts® insulation and any roofing material. If required, to maintain 25mm clearance, trim insulation or use a thinner product around the perimeter
- Insulate access hole cover and secure in place with strapping or glue
- Remove excess material



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 e.g. on truss/rafter above ceiling access hole and hot water cupboard.



Note: Pink® Batts® ceiling insulation shall not be installed in a roof space where foil has been installed as a roof underlay.

Refer to NZS 4246:2016 for full details.

Roof

PINK® BATTS® CEILING INSULATION

Clearances

Follow the clearances specified by the manufacturer; if they are not known then:

Recessed Luminaire

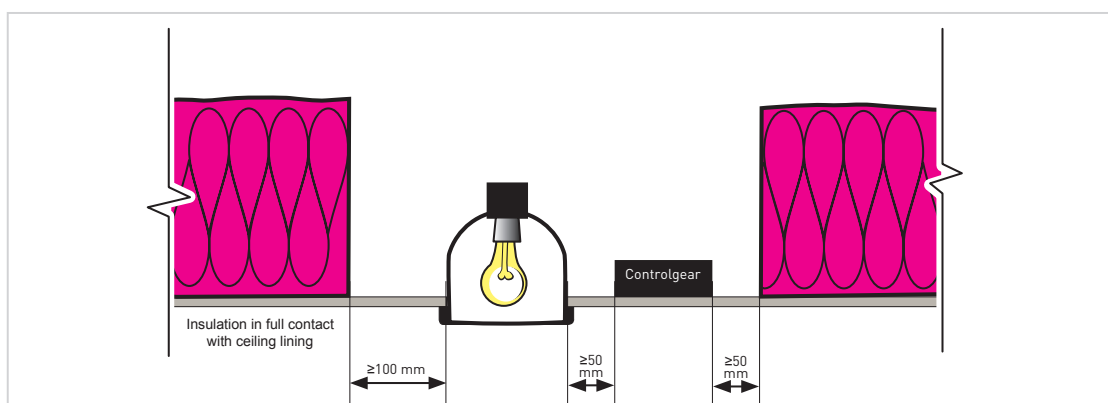
- CA rated recessed luminaires - Nil, however do not install insulation on top of the recessed luminaire
- IC rated recessed luminaires - Nil, insulation can be installed over the top of the recessed luminaire
- Unmarked - Minimum 100mm

Surface Mounted Luminaire - Minimum clearance 200mm; however it does not apply if the insulation is permanently shielded.

Controlgear

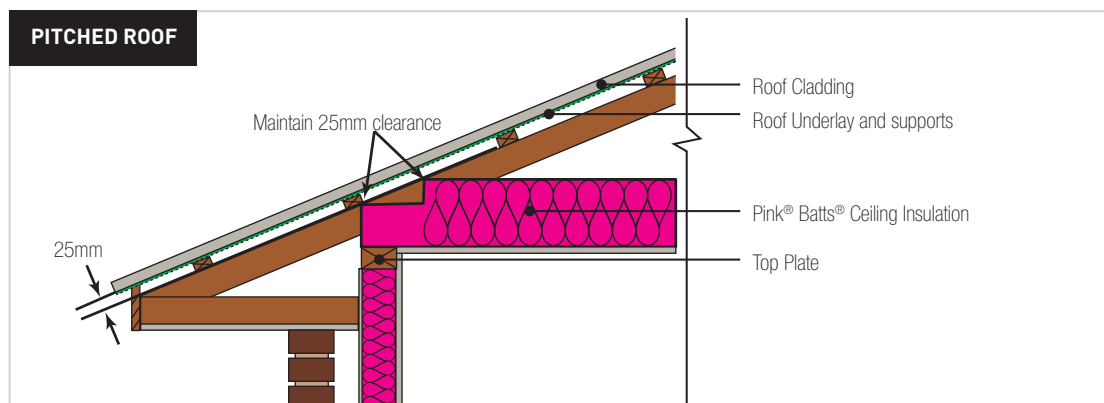
- If possible place it on top of the insulation and leave a minimum clearance of 50mm between controlgear and luminaire
- If not possible to place it on top of the insulation and leave 50mm from the insulation to the controlgear

Controlgear **shall not** sink into the insulation.



Unmarked luminaire and controlgear not placed on top of Pink® Batts® ceiling products.

- Built in appliances - Minimum 50mm
- Enclosures containing electrical equipment
- Fan/heat/light unit - Minimum 100mm
- Ventilation systems - Minimum 50mm
- Unducted mechanical fan units - Minimum 200mm
- Unducted passive vents that remain functional - Minimum 200mm
- Metal chimney and flues - Minimum 75mm
- Brick chimney - Minimum 50mm
- Roof underlay - Minimum 25mm



Note: Pink® Batts® ceiling insulation can be installed from below when the ceiling is to be lined or replaced

***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.



Always.

Product Guide

	LIFETIME WARRANTY#	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	GREENGUARD CERTIFICATION	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS* (mm)	NOMINAL TOTAL AREA PER PACK (m ²)	APPROX COVER-AGE PER PACK** (m ²)
Pink® Batts® Classic R1.8 Ceiling	✓	✓		✓	7110118	1220 X 432	95	13.7	14.4
Pink® Batts® Classic R2.2 Ceiling	✓	✓		✓	7110122	1220 X 432	115	12.6	13.3
Pink® Batts® Classic R2.6 Ceiling	✓	✓		✓	7110126	1220 X 432	140	10.5	11.1
Pink® Batts® Classic R3.2 Ceiling	✓	✓		✓	7110132	1220 X 432	170	8.4	8.8
Pink® Batts® Classic R3.6 Ceiling†	✓	✓	✓†	✓	7110136	1220 X 432	180	7.4	7.7
Pink® Batts® Ultra® R4.0 Ceiling	✓	✓	✓	✓	7110140	1220 X 432	195	6.3	6.6
Pink® Batts® Ultra® R5.0 Ceiling	✓	✓	✓	✓	7110150	1220 X 432	220	4.2	4.4
Pink® Batts® Ultra® R6.0 Ceiling	✓	✓	✓	✓	7110160	1220 X 432	235	3.7	3.9
Pink® Batts® Ultra® R6.3 Ceiling	✓	✓	✓	✓	7110163	1220 X 432	250	3.2	3.3
Pink® Batts® Ultra® R7.0 Ceiling	✓	✓	✓	✓	7110170	1220 X 432	260	2.6	2.8

ROOF - Retrofit Insulation

Pink® Batts® Retrofit R2.9 Ceiling	✓	✓		✓	7110129	1220 X 432	150	9.5	10.0
Pink® Batts® Retrofit R3.3 Ceiling	✓	✓		✓	7110133	1220 X 432	175	2.8	8.8

* Designers should allow for an additional 10% increase in loft for restricted cavities e.g skillion roofs

** Coverage relates to standard structure and actual coverage may vary.

† This product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made products only.

For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz

Storage and Maintenance

Pink® Batts® insulation should be protected from damage and weather. Store under cover in clean dry conditions. The installed product should remain dry at all times. If the product has become wet or damp, the source of the dampness (e.g. leak in roof) should be repaired immediately and any wet or damp insulation should be removed and replaced with new product of an equivalent R-value.

Disposal of bags

Recyclable LLDPE bags are used for packaging of Pink® Batts® insulation. These bags are categorised as Rec 4 and can be placed in a recyclable refuse collection bin. For further details download the relevant product data sheet from pinkbatts.co.nz

Accreditations/Appraisals/Certifications



‡ R3.6 ceiling product is manufactured in both New Zealand and Australia. Environmental Choice New Zealand applies to New Zealand made products only.
 # For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz



DISTRIBUTED BY
 Tasman Insulation New Zealand Ltd
 9-15 Holloway Place, Penrose, Auckland,
 New Zealand

This document supersedes all previous versions and may have been superseded; is a guide only and the purchaser should ascertain the suitability of this product for the end-use situation intended and when used in conjunction with other products; and is provided without prejudice to Tasman Insulation New Zealand Ltd (Tasman) standard terms of sale. Tasman retains the right to change specifications without prior notice. Refer to www.pinkbatts.co.nz or consult Tasman for further information. Do not use this product for any application not detailed in this document. All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. The liability of Tasman and its employees and agents for any errors or omissions in this document or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. The colour PINK and Pink® are registered trademarks of Owens Corning used under license by Tasman Insulation. Batts® is the registered trade mark of Tasman Insulation.



Always.



PRODUCT DATA SHEET

Wall | PINK® BATTS® WALL INSULATION

Application

Pink® Batts® wall insulation is a lightweight flexible glass wool insulation product designed to:

- Thermally insulate timber and steel framed walls
- Fit easily into standard wall constructions, or be easily cut to fit in non-standard constructions
- Meet the requirements of the New Zealand Building Code (NZBC) for different designs and environments

Features and Benefits

- High R-values – R-values up to R4.0 to assist in keeping homes above 18°C as per the World Health Organization's recommendation for a healthy and comfortable home
- Easy to install – lightweight, flexible and simple design makes the installation fast and easy
- Internationally certified for Indoor Air Quality – gives assurance that products meet strict chemical emissions limits
- Non-combustible – will not easily burn in the event of a fire
- Made from over 80% recycled glass making sustainable use of waste
- Made in New Zealand - designed for New Zealand building conditions and reduces emissions associated with the importing of overseas manufactured product

pink batts®

Always.

Wall

PINK® BATTS® WALL INSULATION

Environment

Pink® Batts® insulation is a sustainable and energy efficient product.

- Manufactured using over 80% recycled glass, making sustainable use of waste
- Energy used during the manufacture of Pink® Batts® products is offset by the energy saved by a home fully insulated with Pink® Batts® products within 3-15 months¹
- Manufactured in Auckland, minimising shipping distances compared to imported products

Green Star NZ Credits

Green Star is a comprehensive environmental rating system for buildings; materials with certain attributes can receive points that contribute to the overall score of a rated home.

New Zealand Green Building Council (NZGBC) does not test or certify products; they rely on the work done by third party certification bodies and eco labels like Environmental Choice. Further information is available at nzgbc.org.nz.

Environmental Choice

Higher R-value Pink® Batts® Wall insulation products have Environmental Choice New Zealand Accreditation (refer to the product specifications)



Licence No 2504017.
Thermal Building Insulants

Independently assessed for:

- **Waste Minimisation:** Recycled content, and recycling of process waste
- **Energy Management:** Effective energy management policies and procedures
- **Manufacturing Process:** Not manufactured using blowing agents with a Global Warming Potential (GWP) or Ozone Depleting Potential (ODP)
- **Product Characteristics:** Durability and performance

While only the higher R-value products are eligible for Environmental Choice, all Pink® Batts® thermal insulation products are manufactured in the same environmentally considerate way.

¹ [Beca Carter Hollings & Ferner Ltd, Energy Economics of Fibreglass Insulation, 2005]

Health and Safety

Product Safety

Pink® Batts® insulation is a non-hazardous, safe product.

- IARC (International Agency for Research on Cancer) classifies glass wool formulation used to manufacture Pink® Batts® products as Group 3: 'Not classifiable as to its carcinogenicity to humans'. This is the same classification as caffeine, tea, hair colouring, chlorinated drinking water, saccharin
- Pink® Batts® insulation is bio-soluble. In the unlikely event any fibres are inhaled into the lungs they will dissolve in the body fluids and be cleared from the body



Indoor Air Quality

- Pink® Batts® insulation is certified under the GREENGUARD Certification Program. Being certified for indoor air quality gives an assurance that products meet strict chemical emissions limits (including minimal levels of VOCs and formaldehyde), to help create healthier indoor environments



General Health

- Pink® Batts® insulation will assist in meeting the World Health Organization recommendation for houses to be maintained at a minimum temperature of 18°C to provide a healthy and comfortable home
- A Wellington School of Medicine study found insulated houses resulted in families with fewer sick days and the economic benefit was double the initial cost of the insulation²

² Howden-Chapman, P. et al. "Effect of insulating existing houses on health inequality: cluster randomised study in the community" British Medical Journal, 2007, p334:460

Technical Data

Properties	Result		Test/Method/Standard	Test Results
Combustibility	Non-Combustible	✓	AS/NZS 1530.1:1994	Group Number 1S
Early Fire Hazards		✓	AS/NZS 1530.3:1993 - Ignitability (Range 0-20) - Spread of Flame Index (Range 0-10) - Heat Evolved Index (Range 0-10) - Smoke Developed Index (Range 0-10)	= 0 = 0 = 0 = 0-1
R-value	Various*	✓	AS/NZS 4859.1:2002	
Corrosion	Non-Corrosive	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Moisture Absorption	Non-Hygroscopic	N/A	AS/NZS 4859.1:2002-Glass wool exempt	
Vermin Resistance	No Food Source	✓	AS/NZS 4859.1:2002-Glass wool exempt	

*Stated thicknesses are values at which stated R-values are achieved and are likely to be minimum levels. See table on page 5.

Wall

PINK® BATTS® WALL INSULATION

New Zealand Building Code (NZBC) and Limitations

Pink® Batts® wall insulation when used, installed and maintained in accordance with the requirements outlined in this datasheet, will meet or contribute to meeting the following provisions of the NZBC:

NZBC Clause B2: Durability

Meets the requirement NZBC B2.3.1 a) 50 years and NZBC B2.3.1 b) 15 years

NZBC Clause E3: Internal Moisture

Contributes to meeting these requirements

NZBC Clause F2: Hazardous Building Materials

Meets this requirement and will not present a health hazard to people

NZBC Clause H1: Energy Efficiency

Contributes to meeting this requirement

Limitations

To meet the provisions of the NZBC as outlined in this datasheet, Pink® Batts® wall insulation **MUST** be:

- Installed and maintained in a dry protected environment
- Installed in a building where the provisions of NZBC E2 and E3 are met
- Installed to the requirements of NZS 4246:2016: Energy Efficiency-Installing bulk thermal Insulation in Residential Buildings
- Pink® Batts® wall insulation should **NOT** be crushed or folded

Acoustic Properties

Pink® Batts® insulation will assist with noise control, however penetrations in walls will transmit sound readily. Superior noise control can be achieved by using Pink® Batts® insulation products in conjunction with good acoustic design.

Wall

PINK® BATTS® WALL INSULATION

Specification Notes

State the following:

Product required: Pink® Batts® wall insulation and required R-value

Product Specifications

	LIFETIME WARRANTY*	BRANZ APPRAISED	ENVIRONMENTAL CHOICE	GREENGUARD CERTIFICATION	CODE	SIZE (mm)	NOMINAL STABILISED THICKNESS (mm)	NOMINAL TOTAL AREA PER PACK (m ²)	APPROX COVERAGE PER PACK* (m ²)
Pink® Batts® Classic R1.8 Wall	✓	✓		✓	7127118	1140 x 560	90	16.6	19.6
Pink® Batts® Classic R2.2 Wall	✓	✓		✓	7127122	1140 x 560	90	13.4	15.8
Pink® Batts® Classic R2.4 Wall	✓	✓		✓	7127124	1140 x 560	90	10.2	12.1
Pink® Batts® Ultra® R2.6 Wall	✓	✓	✓	✓	7127126	1140 x 560	90	9.6	11.3
Pink® Batts® Ultra® R2.8 Wall	✓	✓	✓	✓	7127128	1140 x 560	90	6.4	7.5
Pink® Batts® Masonry R1.0	✓	✓		✓	7160110	1220 x 580	40	21.2	-
Pink® Batts® Masonry R1.2				✓	7160134	1220 x 580	50	17.0	-
Pink® Batts® Ultra® R3.2 140mm Wall	✓	✓	✓	✓	7127132	1140 x 560	140	9.6	11.3
Pink® Batts® Ultra® R3.2 140mm Narrow Wall	✓	✓	✓	✓	7160245	1140 x 360	140	7.0	8.6
Pink® Batts® Ultra® R3.6 140mm Wall	✓	✓	✓	✓	7127136	1140 x 560	140	7.0	8.3
Pink® Batts® Ultra® R4.0 140mm Wall	✓	✓	✓	✓	7127140	1140 x 560	140	5.1	6.0
Pink® Batts® Ultra® R4.0 140mm Narrow Wall	✓	✓	✓	✓	7160246	1140 x 360	140	4.1	5.0
Pink® Batts® Steel R2.2 Wall	✓	✓		✓	7160214	1220 x 610	90	15.6	15.6
Pink® Batts® Ultra® Steel R2.6 Wall	✓	✓	✓	✓	7160215	1220 x 610	90	9.7	9.7
Pink® Batts® R2.2 Narrow Wall	✓	✓		✓	7160243	1140 x 360	90	9.0	11.2
Pink® Batts® Ultra® R2.6 Narrow Wall	✓	✓	✓	✓	7160244	1140 x 360	90	7.4	9.2
Pink® Batts® Ultra® R2.8 Narrow Wall	✓	✓	✓	✓	7160247	1140 x 360	90	4.5	5.6

* Coverage relates to standard structures (ie with framing allowance) therefore actual coverage may vary
For full details of the Pink® Batts® Lifetime Warranty visit pinkbatts.co.nz/lifetime-warranty

Accreditations/Appraisals/Certifications



DISTRIBUTED BY
Tasman Insulation New Zealand Ltd
9-15 Holloway Place, Penrose, Auckland,
New Zealand

This document supersedes all previous versions and may have been superseded; is a guide only and the purchaser should ascertain the suitability of this product for the end-use situation intended and when used in conjunction with other products; and is provided without prejudice to Tasman Insulation New Zealand Ltd (Tasman) standard terms of sale. Tasman retains the right to change specifications without prior notice. Refer to www.pinkbatts.co.nz or consult Tasman for further information. Do not use this product for any application not detailed in this document. All claims about this product are subject to any variation caused by normal manufacturing process and tolerances. The liability of Tasman and its employees and agents for any errors or omissions in this document or otherwise in relation to the product is limited to the fullest extent permitted by law. Except where the consumer acquires the goods for the purposes of a business, any rights a consumer may have under the Consumer Guarantees Act are not affected. The colour PINK and Pink® are registered trademarks of Owens Corning used under license by Tasman Insulation. Batts® is the registered trade mark of Tasman Insulation.



Always.



Thermakraft™

THERMAKRAFT 215

THERMAKRAFT 215

Thermakraft 215 self-supporting roof and wall underlay is an absorbent, breathable underlay specifically designed for use in Domestic and Commercial buildings. Suitable as a roof and wall underlay with all cladding types, where Fire Retardancy is NOT required.

- ✓ Versatile building Underlay, designed for use in residential and commercial roof and wall applications.
- ✓ Reduces wind entry into wall and roof cavities, improving thermal efficiency of bulk insulation. Can be used as a vapour control layer, and improve thermal performance if installed and taped on the warm side of bulk insulation.
- ✓ High water resistance provides for temporary weather protection prior to installation of cladding, and acts as a secondary layer of water protection during its serviceable life.
- ✓ Highly water vapour permeable, allowing excess water vapour that may otherwise condense in the wall structure to escape.
- ✓ Lap line printed.



Self-Supporting

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC180473 28/05/2018 steved



High Water Barrier



Breathable



Absorbent



ROOF AND WALL UNDERLAY

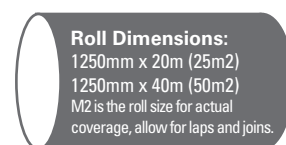
TECHNICAL SPECIFICATIONS

NZBC E2/AS1 ROOF UNDERLAY REQUIREMENTS		
NZBC E2/AS1 TABLE 23 ROOF UNDERLAY PROPERTIES	PROPERTY PERFORMANCE REQUIREMENTS	PROPERTY PERFORMANCE
Absorbency	≥ 150gsm	Pass
Vapour Resistance	≤ 7 MN.s/g	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	≤ 0.5%	Pass
Water Resistance	≥ 100mm	Pass
NZS2295:2206 CLASSIFICATION		
Flammability Index		Non Fire Retardant
Wind Zone	R2	Up to Very High
NZS2295:2006	R2	Self Support

NOTE:
 For wall cavity systems, NZBC Acceptable Solution E2/AS1 Paragraph 9.1.5.5 requires where stud spacing's are greater than 450mm centres, an intermediate means of restraining the building underlay and insulation from bulging into the drained cavity shall be installed. An acceptable means of achieving this is by fixing with Thermakraft Stud Strap horizontally at 300mm centres.

Thermakraft 215 complies with the requirements of NZBC E2/AS1 Table 23. Is suitable for use in the following:

- With absorbent wall claddings directly fixed to timber and steel framing; and,
- With non-absorbent wall claddings directly fixed to timber and steel framing; and,
- With absorbent and non-absorbent wall claddings installed over an 18mm minimum drained cavity; and,
- With masonry veneer in accordance with NZS 3604; and,
- Situated in NZS3604 Building Wind Zones up to, and including 'Very High' (wall); and,
- As a ROOF underlay Self-supporting when run horizontally at pitches 3° and greater. When run vertically at pitches >3° and <10° degrees, 215 must be supported. Support recommended at very low pitches; and,
- As a roof underlay suitable for use with all Roofing materials; and
- Is suitable as an air barrier in unlined wall spaces.



DURABILITY

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 providing:

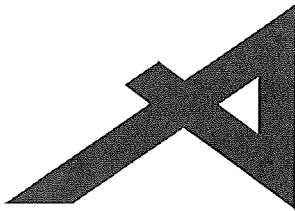
- Installed in accordance to the Application and Installation Guidelines.
- Run length no greater than 10 meters.
- Is not left exposed for more than (7 days) roof.
- Is not left exposed for more than (28 days) wall.
- Not recommended for use on LOSP treated timber, if used the timber must be free of solvent.
- Installed by or under guidance of Licensed Building Practitioners.
- Installed in accordance with the Roofing Code of Practice.



Customer Services
 0800 806 595

11 Turin Place, East Tamaki, Auckland, NZ
 P.O Box 58-112, Botany, Auckland 2163
 Phone 0800 806 595 or +64 9 273 3727
 Fax +64 9 273 3726
 Email info@thermakraft.co.nz
www.thermakraft.co.nz

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

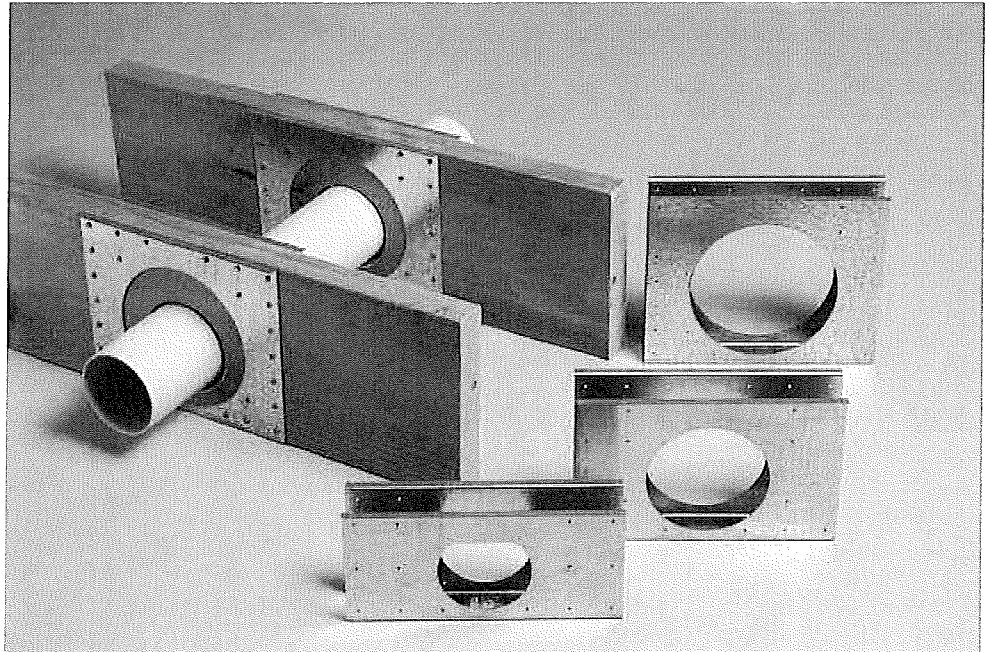


BRANZ Appraised
Appraisal No. 570 [2014]

THRU-BRACKETS FOR TIMBER FRAMING

Appraisal No. 570 [2014]

This Appraisal replaces Appraisal
No. 570 [2007]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Brace-It Ltd

PO Box 558
Whangaparaoa
Auckland, 0943
Tel: 09 424 0916
Fax: 09 424 0475
web: www.brace-it.com
email: info@brace-it.com



BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
branz.co.nz



Product

- 1.1 THRU-brackets are a range of formed galvanised steel brackets for reinforcing Radiata Pine solid timber and LVL floor joists [THRU-JOIST], studs [THRU-STUD] and top plates [THRU-TOP PLATE] to allow holes to be made for services.

Scope

- 2.1 THRU-brackets have been appraised for use as reinforcement to timber floor joists, studs and top plates at holes made for services. They are for use in non-specific design situations where floor joists, studs and top plates are specified up to and including SG10 and LVL10 within NZS 3604, or Radiata Pine up to and including Stress Grade F8 within AS 1684.2.
- 2.2 THRU-TOP PLATE brackets have been appraised for use in Extra High wind zones in New Zealand and up to and including non-cyclonic N3 wind classifications in Australia.
- 2.3 THRU-brackets are for use in internal, dry, protected environments.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, THRU-brackets, 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. THRU-brackets meet the requirements for loads arising from self-weight, imposed gravity loads arising from use, snow, wind and creep [i.e. B1.3.3 (a), (b) (g), (h) and (q)]. See Paragraphs 8.1 - 8.11.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. THRU-brackets meets this requirements. See Paragraph 9.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. THRU-brackets 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.

WAIMAKARIRI DISTRICT COUNCIL
 Plans and specifications APPROVED in accordance
 with the Building Act 2004, clause 49 and the Building
 Regulations 1992, Clause 3
 BC 180473 22/05/2018 staved



BRANZ Appraisal
Appraisal No. 570 [2014]
26 November 2014

THRU-BRACKETS FOR TIMBER
FRAMING

National Construction Code Series (NCC 2014) Building Code of Australia (BCA)

4.1 In the opinion of BRANZ, THRU-brackets, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the Building Code of Australia:

BCA Volume 2 - Class 1 and Class 10 Buildings

Part 2.1 Structural Provisions: Performance Requirement P2.1. THRU-brackets meet this requirement. See Paragraphs 8.1 - 8.1.1.

4.2 This is an Appraisal of an **Alternative Solution** in terms of Building Code of Australia compliance.

Technical Specification

5.1 A range of THRU-brackets are available as set out in Table 1.

Table 1: THRU-brackets range

	Depth [mm]	Length [mm]	Width [mm]	Drilling circle diameter [mm]	Max hole diameter [mm]
THRU-JOIST (Single)					
TJ140	140	300	45	90	68
TJ190	190	300	45	137	121
TJ240	240	300	45	187	121
TJ290	290	400	45	187	121
THRU-JOIST (double)					
TJD140	140	300	90	90	68
TJD190	190	360	90	137	121
TJD240	240	400	90	187	121
TJD290	290	400	90	187	121
THRU-STUD					
TS90	90	200	45	59	59
THRU-TOP PLATE					
TTP	90	350	-	59	59
TTPE	90	350		30 x 190*	30 x 190*

* Slot dimension 30 mm wide x 190 mm long

5.2 The brackets are manufactured from zinc-coated G250 coil steel with a base metal thickness of 1.15 mm through to 2.0 mm depending on the bracket size. The coating class is Z275. The steel is punched and folded to form the brackets. Each bracket has a central drilling circle and nail holes for a specific nailing pattern.

5.3 Nails are 30 x 3.15 mm (35 x 3.15 mm for Australia) hot-dip galvanised which are supplied by the installer.

5.4 12 g x 35 mm galvanised screws are provided for use on the THRU-TOP PLATE bracket.

Handling and Storage

6.1 THRU-brackets must be kept dry and under cover until used.

Technical Literature

7.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for THRU-brackets. 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.



BRANZ Appraisal
Appraisal No. 570 [2014]
26 November 2014

THRU-BRACKETS FOR TIMBER
FRAMING

Design Information

General

- 8.1 Floor and wall framing is to be designed and constructed in accordance with NZS 3604 or AS 1684.2.
- 8.2 THRU-brackets are for use in non-specific design situations with New Zealand timber grades up to and including SG10 and LVL10 or Australian Radiata Pine Stress Grades up to and including F8.
- 8.3 THRU-brackets provide a means of reinforcing joists, studs and top plates around service holes such that the strength and stiffness performance of the timber is not affected.
- 8.4 THRU-brackets are required to match the framing timber they are designed for:
 - THRU-JOIST brackets must match the joist depth, i.e. TJ140 = 140 x 45 mm joist.
 - THRU-STUD brackets are designed for use on 90 x 45 mm studs.
- 8.5 The TJ140 THRU-JOIST bracket has a 100 mm diameter drilling circle for holes up to a 68 mm diameter, the TJ190 THRU-JOIST bracket has a 135 mm diameter drilling circle and the TJ240 and TJ290 brackets have 185 mm diameter drilling circle for holes up to a 121 mm diameter. The THRU-STUD brackets and THRU-TOP PLATE brackets have a maximum hole diameter of 59 mm. Holes can be placed in any position within the drilling circle. To obtain falls for plumbing discharge, pipe holes can be drilled at varying heights within drilling circles on adjacent joists. The THRU-STUD bracket can be located at varying heights to achieve falls.
- 8.6 THRU-JOIST brackets can be installed in any location along the length of a joist. Where multiple brackets are required, they must be installed at a minimum spacing of 1500 mm between centres.
- 8.7 THRU-JOIST brackets will not significantly change the stiffness performance of the original floor joists. This may be important where floors have been designed to have a deflection limit of L/360, for example, in a wet area or under a tiled floor finish.
- 8.8 THRU-STUD brackets can be installed anywhere along the length of the stud. Where multiple brackets are required:
 - Brackets must be installed at a minimum spacing of 1500 mm between centres; or,
 - In the bottom quarter of the stud, two brackets can be installed at minimum 300 mm centres. In these situations the number of brackets are limited to two brackets per stud.
- 8.9 THRU-TOP PLATE brackets, when used in NZS 3604 Extra High wind zones, must have an additional dwang installed directly to the underside of the top plate.
- 8.10 THRU-TOP PLATE brackets have been appraised for use in non-cyclonic wind zones up to and including N3 in Australia.
- 8.11 THRU-TOP PLATE brackets are designed to be limited to one bracket per stud bay.

Durability

Serviceable Life

- 9.1 THRU-brackets 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.

Maintenance

- 10.1 THRU-brackets will not normally require maintenance. However, if damage occurs to the floor or wall structure, then repairs or replacement must be carried out to ensure the integrity of the floor or wall.

Spread of Fire

- 11.1 The use of THRU-brackets with fire rated (New Zealand FRR, Australia FRL) suspended floor constructions or walls has not been assessed and is outside the scope of this Appraisal.



BRANZ Appraisal
Appraisal No. 570 [2014]
26 November 2014

THRU-BRACKETS FOR TIMBER
FRAMING

Installation Information

Installation Skill Level Requirement

12.1 Installation of THRU-brackets can be carried out by any competent contractor.

General

- 13.1 THRU-brackets must be installed in accordance with the information contained within the Technical Literature. The location of holes should take account of any required falls for plumbing discharge pipes.
- 13.2 THRU-brackets are located and installed firmly against the joists, stud or top plate. The brackets are then nailed or screwed to the framing. Every hole in the bracket must be fixed off prior to the holes being drilled. Holes up to 68 mm in diameter can be drilled in the TJ140 THRU-JOIST brackets drilling circle. Holes up to 121 mm diameter can be drilled in the other THRU-JOIST brackets drilling circles. The THRU-STUD and THRU-TOP PLATE brackets drilling circle can be drilled with a 59 mm maximum diameter hole.
- 13.3 THRU-JOIST brackets are normally installed from under the joist. However, if access to the joist is only available from above, the THRU-JOIST bracket may be seated over the top of the joist. This may be necessary in situations where the floor has been removed and the ceiling below is still in place, for example. Performance of the bracket, and the resulting strength of the joist, will not be affected by doing so.

Inspections

- 13.4 The critical areas of inspection are that the brackets sit tightly to the timber joist, stud or top plate and that all holes are nailed or screwed with the correct fixing.
- 13.5 THRU-brackets that are covered by this Appraisal are easily identified by the Appraisal number and logo being pressed into the spine of the bracket.

Basis of Appraisal

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

Tests

- 14.1 BRANZ has carried out flexural and shear tests on timber joists incorporating THRU-brackets. Compression and tension testing has been carried out on studs incorporating the THRU-STUD brackets.

Other Investigations

- 15.1 Structural and durability assessments have been provided by BRANZ technical experts.
- 15.2 Site visits to assess installation methods, the practicability of installation and to examine completed installations, have been made by BRANZ.
- 15.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 16.1 The manufacture of THRU-brackets 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.
- 16.2 The quality of THRU-brackets supplied is the responsibility of Brace-It Ltd.
- 16.3 The installer is responsible for the quality of the installation.
- 16.4 Building owners are responsible for the maintenance of the building.



BRANZ Appraisal
Appraisal No. 570 [2014]
26 November 2014

THRU-BRACKETS FOR TIMBER
FRAMING

Sources of Information

- AS 1397: 2011 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium.
- AS 1684.2: 2010 Residential timber-framed construction - Non cyclonic areas.
- AS/NZS 1365: 1996 Tolerances for flat-rolled steel products
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3604: 2011 Timber-framed buildings.
- National Construction Code Series, Building Code of Australia 2014 - Australian Building Codes Board.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



BRANZ Appraisal
Appraisal No. 570 [2014]
26 November 2014

THRU-BRACKETS FOR TIMBER
FRAMING



In the opinion of BRANZ, Thru-Brackets for Timber Framing is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Brace-It 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. Brace-It Ltd:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions.
 - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by Brace-It Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to Brace-It Ltd or any third party.

For BRANZ

A handwritten signature in black ink, appearing to read 'Chelydra Percy'.

Chelydra Percy

Chief Executive

Date of Issue:

26 November 2014

Technical Data Sheet

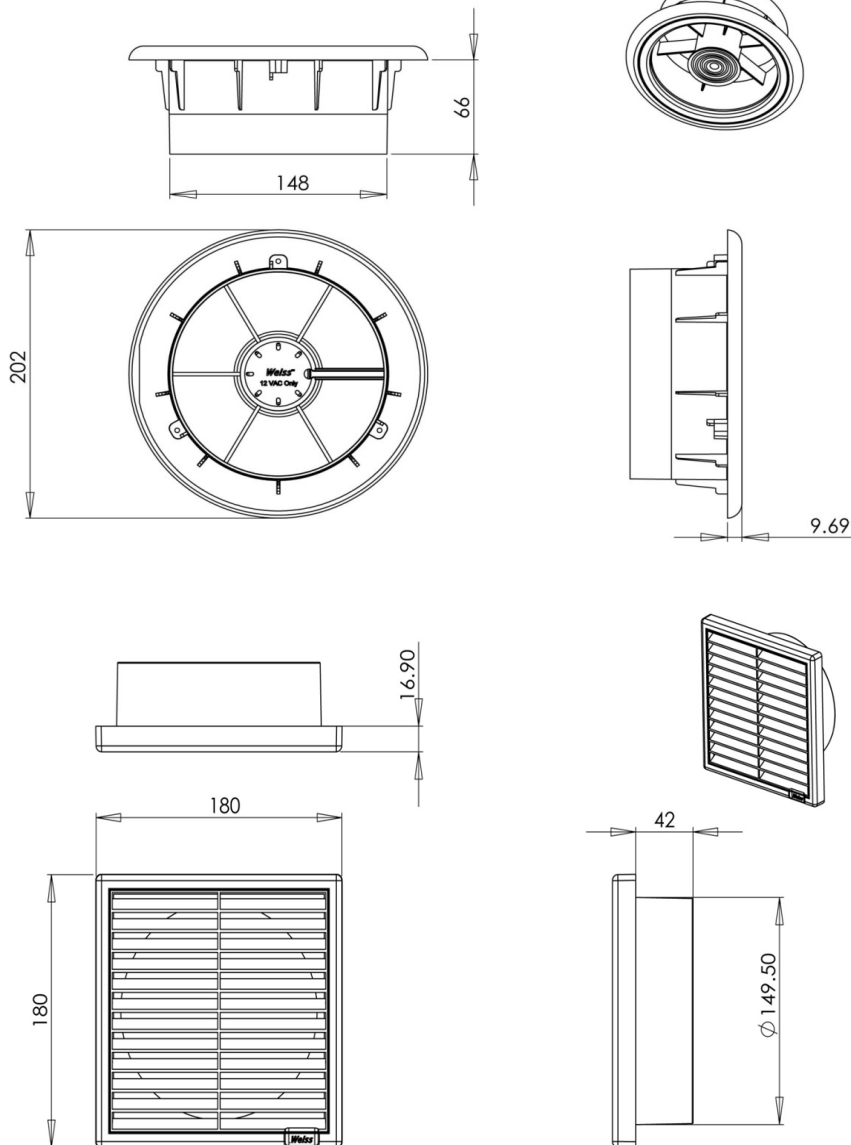
FV130

Shower Fan Unit

150mm ducting

Dimensions

Cut-out size for inlet fascia	170mm
Cut out size for outlet vent	155mm



Specifications

Weight	2kg
Colour of front fascia	White
Housing material	ABS

Approval

AS/NZS 3350.2.80:1998 Amdts 1-3 "Electrical Fan"

Features

- Easy to install
- 6 metres of 150mm ducting supplied
- Unique 'no fuss' all in one unit
- Allows moisture to be removed to the outside of your home
- All parts are included
- 3 year extended warranty

Technical Data Sheet

Product Use

The FV130 is used for the extraction of mist and steam

Typical applications:

- Bathrooms
- Toilets
- Laundries

Environmental Conditions

Operation	to IEC 721-3-3
Climatic conditions	class 3K5
Temperature	0...+50°C
Humidity	<95% r.h.

Standards

Test standards	AS/NZS 3350.2.80: 1998 Amdts 1-3 "Electrical Fan"
Test Report no	SD3190
EMC Compliance	This is a Level One product with an C frame motor that has a very low risk of causing EMC Interference

General

Free Air Fan Performance	362m ³ / hr 100.6L/sec
Installed decibel rating	45DB

Ordering

When ordering please give name and type,	
Reference	FV130
Barcode	942000490093-8

Technical Data

Power Supply	230 VAC
Power consumption	max. 0.4 Amps
Supply Line fusing	max. 10A
For solid wires	2 x 1.5mm ²
Motor	230-240VAC 50Hz 0.4 Amp
Motor insulation class	B1
Total motor wattage	40 Watts
Motor protection	Thermally protected
Total product wattage	40 watts

ARDEX WPM 001

Superflex Bathroom & Balcony Premixed - 1 Part Undertile Waterproofing Membrane

WAIMAKARIRI DISTRICT COUNCIL
Plans and specifications APPROVED in accordance
with the Building Act 2004, clause 49 and the Building
Regulations 1992, Clause 3
BC 180473 22/05/2018 steved



PRODUCT DESCRIPTION

Ardex WPM 001 (Superflex Bathroom & Balcony Premixed 1 Part) is a tough, ready to use waterproofing membrane specifically designed for use under tiles. Ardex WPM 001 has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. Ardex WPM 001 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification once cured.

Ardex WPM 001 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. Ardex WPM 001 is one of the fastest drying one part acrylic membranes on the market – normally ready to tile in 48 hours @ 23°C.

Ardex WPM 001 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

- Fast drying Ardex WPM 001 can be tiled over in 48 hours in non critical areas*
- Liquid reinforced: Excellent strength, eliminates need for reinforcing mat
- Flexible: Accommodates normal building movement class 3 membrane as per AS/NZ 4858: 2004 Wet Area Membranes
- Advanced acrylic: Will not re-emulsify once cured
- Designed for tiling - Fully compatible with Ardex tile adhesive systems
- Water based, safe to use, low odour & easy cleaning
- CSIRO Appraisal #91 for undertile waterproofing in shower recesses
- Conforms to the requirements of AS/NZ 4858: 2004 Wet Area Membranes. (Ref: CSIRO Report 3779)

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance Levels

Commercial and residential

Location

Internal wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls & floors

Substrates

Concrete

Cured for min. 28 days or sealed when set with one coat of Ardex WPM 300 (HydrEpoxy 300) at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. External wet concrete should be allowed to dry thoroughly or sealed with one coat of Ardex WPM 300 as above.

Renders and screeds

Cured for min. 7 days or sealed when set with one coat of Ardex WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of Ardex WPM 300 as above.

Fibre cement

Suitable for wet area grade fibre cement.

Plasterboard

Wet area grade only.

Plywood

Structural plywood (PAA branded), marine grade or other wet area grade only.

Strandsarking

Strandsarking sheets are 3.60m x 800mm x 16.3mm. Strandsarking sheets shall be laid with staggered joints. (brick bond) The edges of all sheets shall be supported with dwangs or framing. The maximum allowable spacing for supporting roof framing is 400mm.

When a roof has a pitch below 2 degrees it is recommended to use Strandfloor H3.1.

Strandsarking sheets may be butt jointed with an Ardex release tape used over the join.

Fixings.

Shall be 50mm x 4.8mm diameter stainless steel screws fixed at 150mm centres.

If fixings are bought into 100mm centres on the intermediate supports this will allow use in wind zones very high and extra high without any further treatment. Fixings must be positioned no closer than 10mm from the sheet edges.

TABLE 1

	Thickness per Coat		Total Dry Film Thickness (2 coats)	Theoretical Coverage		Per Unit
	Dry Film	Wet Film		Per coat	For 2 coats	
FLOORS	0.5mm	1.0mm	1.0mm	15m ²	7.5m ²	20kg(15L) unit
WALLS	0.25mm	0.5mm	0.5mm	30m ²	15m ²	20kg(15L) unit

Particleboard

Wet area grade, internal use only (special preparation is required – contact Ardex).

Permanent

In conditions of permanent immersion,

Immersion

It is recommended that Ardex WPM 002 (Superflex Two Part) is used. Must be covered with tiles for full immersion.

Contact Ardex for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

ARDEX WPM 001 (Superflex Premixed)

The waterproofing membrane shall be Ardex WPM 001: a one part acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Single component: 20kg (approx 15 litres) or 6.5kg (approx 5 litres).

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

COVERAGE

Two coats are recommended for an effective waterproof membrane.

Coverage will vary depending on the porosity of the surface.

One 20kg (15 litre) unit will cover approximately 7.5-15m² (based on two coats) depending on area requirements between wall and floor surfaces to be treated. Refer Table I.

DRYING TIMES

Recoat time

1-2 hours at (23°C/50% RH) between first and second coats. Alternatively, if a polyester mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry. Ardex WPM 001 is totally dry in 48 hours at 23°C/50% RH, but can take up to 72 hours at 10°C/50% RH in corners or for thick films.

Fully cured

The shower should not be used until the membrane has reached its full strength. Ardex WPM 001 membrane is fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with Ardex WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of Ardex WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the Ardex WPM 001.

For substrates or situations other than those listed contact Ardex.

SAFETY DATA

Ardex WPM 001 is non-hazardous and non dangerous. It may produce discomfort of the eyes, respiratory tract and skin. Do not breathe gas/fumes/vapour/spray. Avoid contact with skin. Wear eye/face protection. In case of contact with eyes, rinse with plenty of water and seek medical advice.

ARDEX WPM 001

Superflex Bathroom & Balcony Premixed - 1 Part Undertile Waterproofing Membrane

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

QUALITY PRODUCT

Ardex WPM 001 is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001.

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with Ardex instructions and in applications for which they are intended.

APPLICATION

Apply Ardex WPM 001 by brush or roller. A medium nap (12-15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat, application must consist of laying the product onto the surface and light finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25-40 micrometers wet film thickness while Ardex WPM 001 needs to be applied at between 0.5 and 1.0 mm per coat depending on product and application (Refer Table 1).

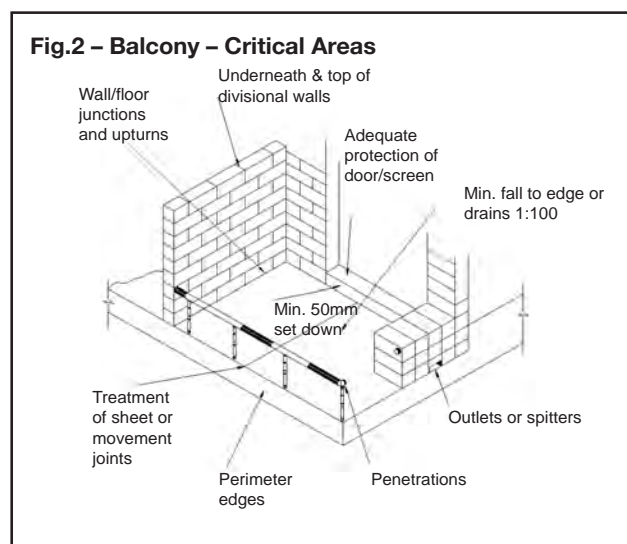
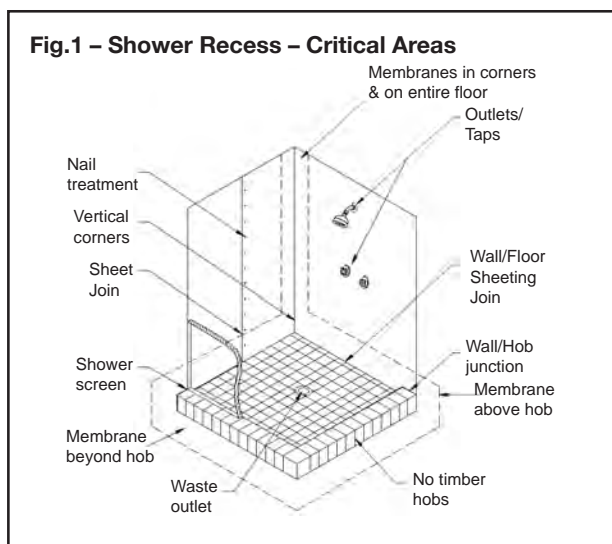
Critical Areas:

INTERNAL WET AREAS

1. Construction should be in accordance with Australian 3740 - 2004 Waterproofing of wet areas

within residential buildings.

2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall & floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber).
5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2mtr)) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cure silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls. Spreading the sealant to 6mm on either side of the joint.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS3740 & the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.



12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 150mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Apply the membrane 1800mm up the walls or to the height of the shower rose within the shower recess.
14. Install the shower screen to inside edge of the hob.

BALCONIES AND DECKS

1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure a min set down (step down) of 50mm to the finished floor level (ie. top of tiles).
3. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/ sliding door.
4. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
5. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
6. Apply the membrane up the step down and as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
7. Where possible, apply the membrane prior to building divisional walls, or other items such as planter boxes.
8. Apply the membrane to the entire balcony floor and at least 50mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
9. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
10. Apply the membrane down over the front edge of the balcony onto the drip rail.
11. Carefully seal any gaps around balcony penetrations prior to applying the membrane.
12. Apply the membrane down into outlets and drains, ensuring excess material is removed.
13. Ensure all weep holes are above the membrane application area.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm

in 2mtr (wet areas) or 1:100 externally, must be achieved prior to tiling.

- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.
- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of Ardex WPM 265 (Sheltercoat/ Superflex Water Based Primer) by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to completely dry prior to the application of the Ardex WPM 001 membrane. This will take around 20-30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

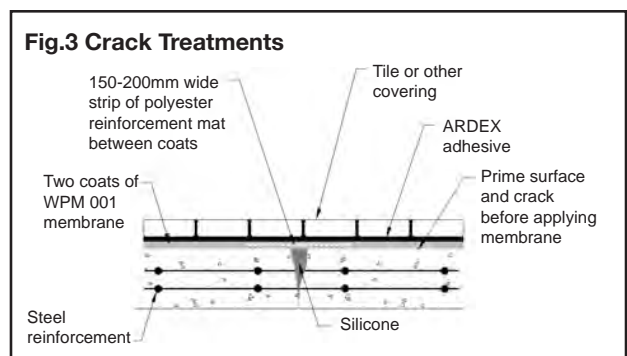
Crack preparation

Cracks <2mm:

Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with Ardex WPM 265 and allow to dry before applying two coats of Ardex WPM 001 membrane in a band at least 200mm wide equidistantly across the crack, along the length of the crack.

Cracks 2-6mm:

(Refer Fig. 3) Prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of Ardex WPM 001 equidistantly across the crack



ARDEX WPM 001

Superflex Bathroom & Balcony Premixed - 1 Part Undertile Waterproofing Membrane

along the entire length of the crack. Place a 190mm wide band of Ardex “Deckweb” polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth preferably using a fluted roller, and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

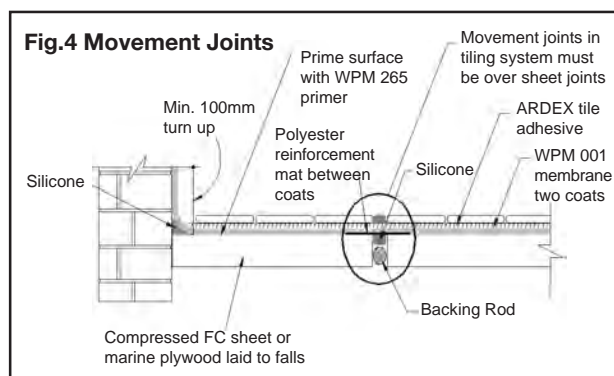
Contact your local Ardex representative.

Movement/construction joints

Movement joints (<6mm)

Use same procedure as in crack preparation.

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of Ardex WPM 001 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex “Deckweb” polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the mat and



remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of Ardex Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)

Corners & coving areas

After priming with Ardex WPM 265 and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates in coving areas and corners. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor

and allow to touch dry.

Apply a first coat of Ardex WPM 001 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be minimum of 1.0mm). Alternatively, if a polyester reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with Ardex WPM 265 and allowing to dry, apply a generous bead (12mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 6mm up the wall and 6mm over the floor and allow to touch dry. Place a 190mm wide band of Ardex “Deckweb” polyester woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The Ardex WPM 001 should be applied to at least 100 mm up the wall surfaces as per the recommendations for the application of Ardex WPM 001 to floors.

Walls

Two coats of Ardex WPM 001 are required to achieve a minimum total dry film thickness of 0.5mm.

After priming with Ardex WPM 265 and allowing to dry, apply two coats of Ardex WPM 001 (to achieve a minimum dry film thickness of 0.5mm) in two opposite directions. Wall sheet joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

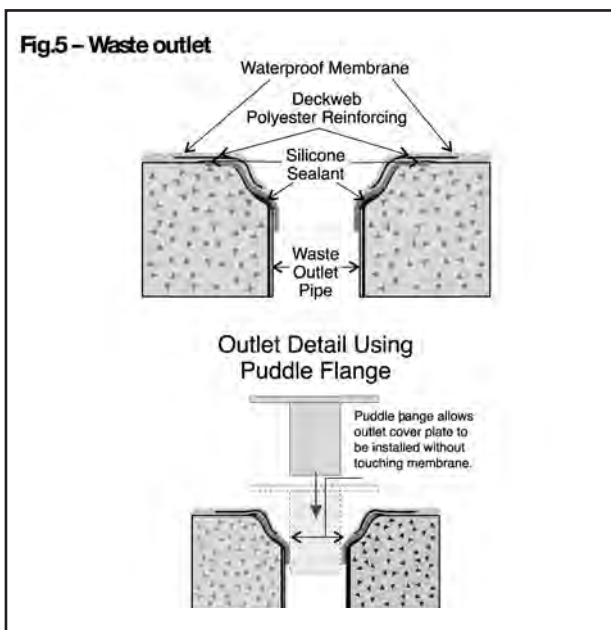
Two coats of Ardex WPM 001 are required to achieve a minimum total dry film thickness of 1.0mm. The flooring recommendations should be extended at least 150 mm up all perimeter walls.

Prime the surface with Ardex WPM 265 and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1-2 hours at 23°C, 50%RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone treatment. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

Waste Outlet

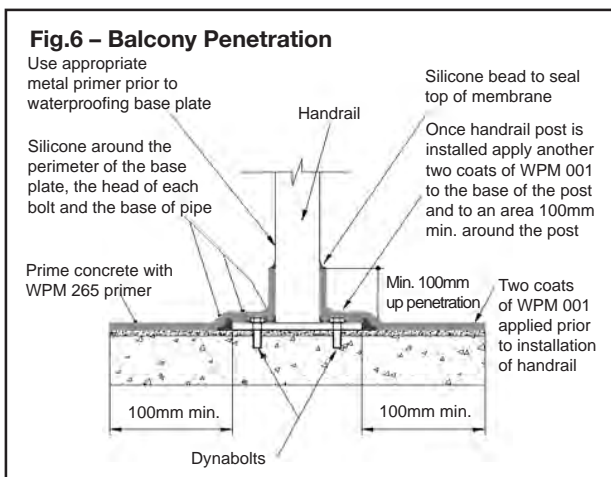
Prime the surface with Ardex WPM 265 and allow to dry. Surfaces of the outlet flange must be primed with an appropriate primer.



Apply Ardex WPM 001 over the adjacent floor surface extending down into the waste outlet flange overlapping the edge of flange by at least 30mm. Place Ardex "Deckweb" polyester woven mat reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig. 5)

Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.



Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 10mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of Ardex WPM 001 on the substrate and the flanged metal. Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.0mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.

Tiling systems

It is advisable to conduct a flood test of the shower once the membrane has cured (normally after 72 hours), and before the tiling commences. A broad range of Ardex tile adhesives can be used over Ardex membranes. Contact Ardex or your nearest Ardex stockist for advice on the most suitable system.

TECHNICAL DATA

**Ardex WPM 001 (Superflex Premixed)
Characteristics of liquid**

Form & Colour	Blue viscous paste
Type	Single part
Specific Gravity	Approx. 1.34kg/litre
pH of Liquid	8.5
Viscosity of Liquid (RVT Brookfield, spindle 7 speed 10)	52,000cps
Non Volatile Matter (volume) AS1321.10	50.3%±1
Tensile Strength 7 days dry AS1145	1.04 MPa
Full Cure	1.92 MPa
Elongation at Break 7 days dry AS1145	780%

Conforms to requirements of class 3 membrane of AS/NZ 4858: 2004 Wet Area Membranes.

NOTE: Most of the tests have been carried out in the Ardex laboratory under standard conditions (23±2°C, 50±5% R.H)

ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane



PRODUCT DESCRIPTION

Ardex WPM 002 (Superflex Bathroom & Balcony 2 Part) is a tough, fast drying two component waterproofing membrane specifically designed for use under tiles. The product has been uniquely formulated with synthetic microfibres to increase its strength and eliminate the need for a separate reinforcement mat. Ardex WPM 002 is based on the most advanced acrylic polymer technology, and is totally resistant to re-emulsification.

Ardex WPM 002 is flexible, safe to use, low in odour, and is fully compatible with polymer modified tile adhesives. Ardex WPM 002 is one of the fastest drying acrylic membranes on the market – normally ready to tile in 16-24 hours @ 23°C.

Ardex WPM 002 meets the Green Building Council of Australia Green Star IEQ-13 requirements for Architectural Sealant when tested in accordance with SCAQMD Method 304-91 Determination of Volatile Organic Compounds (VOC) in Various Materials as referenced by South Coast Air Quality Management Division (SCAQMD) Rule 1168.

FEATURES/BENEFITS

Fast drying Ardex WPM 002 can be tiled over in 16-24 hours, or 4 hours @ 23°C/50% RH in non critical areas*.

Features benefits

- Liquid reinforced: Excellent strength, eliminates need for reinforcing mat.
- Flexible: Accommodates normal building movement.
- Advanced acrylic: Will not re-emulsify.
- Designed for tiling: Fully compatible with ABA/Ardex tile systems adhesives.
- Water based, safe to use, low odour and easy cleaning for undertile waterproofing in shower recesses by independent testing authority.
- Excellent exterior.
- Conforms to the requirements of AS/NZ 4858:2004 Wet Area Membranes (Ref: CSIRO Report 3879)

*Critical areas include areas where the membrane is applied at greater than 0.5mm or over impermeable substances such as over bond breakers or incorporating other reinforcement. Longer drying times are necessary in these areas.

APPLICATION RANGE

Performance levels

Commercial and residential.

Location

Internal and external wet areas, balconies, decks, and other areas that will be tiled or otherwise protected from regular foot traffic.

Surfaces

Walls and floors.

Substrates

Concrete

Cured for min. 28 days or sealed when set with one coat Ardex WPM 300 (HydrEpoxy 300) at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet concrete should be allowed to dry thoroughly or sealed with one coat of Ardex WPM 300 as above.

Renders and Screeds

Cured for min. 7 days or sealed when set with one coat Ardex WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight. Wet render should be allowed to dry thoroughly or sealed with one coat of Ardex WPM 300 as above.

Fibre cement

Wet area grade only.

Plasterboard

Wet area grade only.

Plywood

Structural plywood (PAA branded) or marine grade or other wet area grade only. Not recommended for external use (refer Ardex).

Strandsarking

Strandsarking sheets are 3.60m x 800mm x 16.3mm. Strandsarking sheets shall be laid with staggered joints. (brick bond) The edges of all sheets shall be supported with dwangs or framing. The maximum allowable spacing for supporting roof framing is 400mm.

When a roof has a pitch below 2 degrees it is recommended to use Strandfloor H3.1.

Strandsarking sheets may be butt jointed with an Ardex release tape used over the joint.

Fixings.

Shall be 50mm x 4.8mm diameter stainless steel screws fixed at 150mm centres.

If fixings are bought into 100mm centres on the intermediate supports this will allow use in wind zones very high and extra high without any further treatment. Fixings must be positioned no closer than 10mm from the sheet edges.

TABLE 1

	Thickness per coat		Total dry film thickness (2 coats)	Theoretical coverage		Per unit
	Dry film	Wet film		Per coat	For 2 coats	
FLOORS	0.6mm	0.9mm	1.2mm	32m ²	16m ²	40kg kit
WALLS	0.4mm	0.6mm	0.8mm	48m ²	24m ²	40kg kit

Particleboard

Wet area grade, internal use only (special preparation is required – contact Ardex). Not recommended for external use (refer Ardex).

Permanent Immersion

In conditions of permanent immersion, it is recommended that WPM 002 must be covered with tiles for full immersion applications.

Contact Ardex for use over existing membranes, covering materials, and any other substrates not listed.

SPECIFICATION CLAUSE

Ardex WPM 002 (Superflex Two Part)

The waterproofing membrane shall be Ardex WPM 002, a two component cementitious acrylic modified fibre reinforced membrane formulated to provide a tough, long lasting water barrier under tiling systems.

PACKAGING

Two component: 20kg (approx 20 litres) liquid pail/ 2 x 10kg bags powder.

SHELF LIFE

12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within 3 months.

COVERAGE

Two coats are recommended for an effective waterproof membrane. Coverage will vary depending on the porosity of the surface.

One 40kg kit will cover approximately 16-24m (based on two coats) depending on area requirements between wall and floor surfaces to be treated.

DRYING TIMES

Curing time will vary depending on temperature and humidity.

Recoat time

1-2 hours (23°C/50% RH) between first and second coats. Alternatively, if a polyester mat is used between coats then the second coat can be applied whilst the first coat is still wet.

Dry through

The slowest drying areas are those where the membrane has been applied over a silicone bond breaker, eg. wall and floor junctions. The membrane cannot be tiled over until these critical areas are completely dry.

Ardex WPM 002 membrane is totally dry in 16 hours at 23°C/50% RH but can take up to 24 hours at 10°C / 50% RH in corners or for thick films.

In areas where bond breakers or additional reinforcement are not used, Ardex WPM 002 can be tiled over after 4 hours at 23°C / 50% RH.

Fully cured

The shower should not be used until the membrane has reached its full strength. Normally Ardex WPM 002 membranes are fully cured after 3 days at 23°C, or after 5 days at 10°C.

Drying times will vary depending on humidity, surface temperature and surface porosity.

Do not apply on substrates where the surface temperature is below 10°C or above 35°C.

CLEANING

Wash hands, brushes, rollers, etc, with water while the membrane is still fresh. Remove cured material with mineral turpentine.

SAFETY PRECAUTIONS

Do not use the product in the following situations:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with Ardex WPM 300.
- Where the substrate is wet – wet surfaces can be sealed with one coat of Ardex WPM 300 at a coverage rate of 3.0 square metres per litre and allowed to cure overnight.
- Where rain is imminent.
- Where the membrane will be left exposed and subjected to regular foot traffic.
- On glazed, glass or other totally impervious surfaces (eg. areas pre-treated with water repellants).
- Where the surface temperature is below 10°C or greater than 35°C.
- All floor areas must have adequate falls either built into the substrate or achieved with a sand/cement screed prior to application of the Ardex WPM 002.

For substrates or situations other than those listed contact Ardex.

SAFETY DATA

Ardex WPM 002 Part A is non-hazardous. It may produce discomfort of the eyes, respiratory tract and skin. It should not be swallowed or inhaled. Avoid contact with skin and wear eye/face protection. In case of contact with eyes, rinse with plenty of water and contact a doctor or Poisons Information Centre.

ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane

Ardex WPM 002 Part B contains cement and is therefore hazardous. It may cause burns and serious damage to eyes. Do not breathe dust and avoid contact with eyes. Wear dust masks, goggles and gloves when handling. Keep container locked up and in a well ventilated place.

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

APPLICATION

Apply Ardex WPM 002 by brush or roller. A medium nap (12–15mm pile) paint roller is recommended. New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

To achieve the required dry film thickness per coat application must consist of laying the product onto the surface and light finish the surface. Do not try to apply in the same manner as a building paint. A conventional building paint is normally applied at 25–40 micrometers wet film thickness while Ardex WPM 002 needs to be applied at between 0.6 and 0.9 mm per coat depending on product and application (Refer Table 1).

Critical areas:

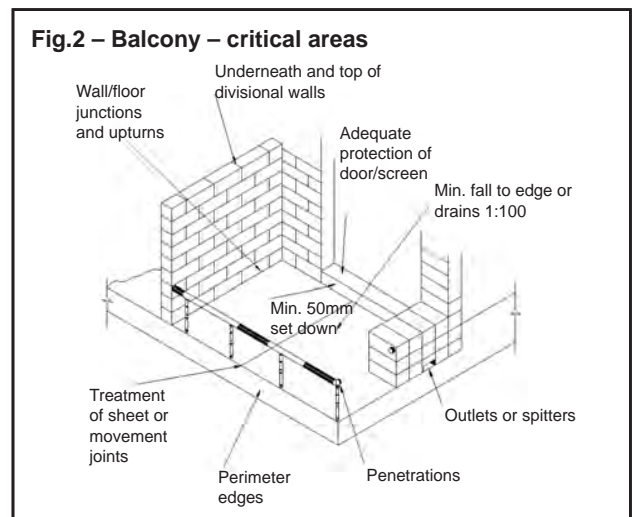
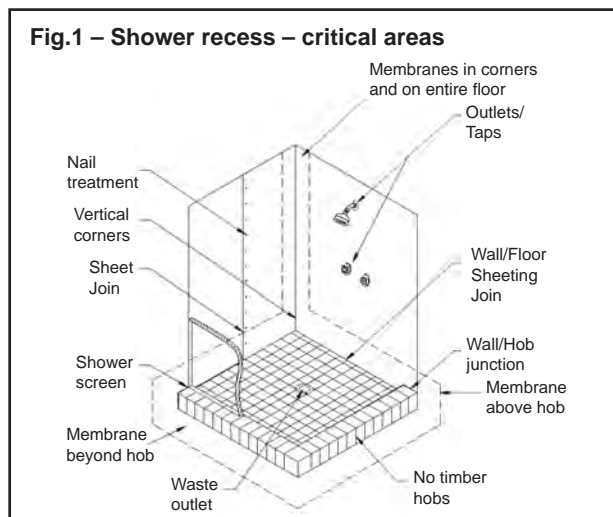
INTERNAL WET AREAS

1. Construction should be in accordance with Australian 3740 - 2004 Waterproofing of wet areas within residential buildings.
2. All render and tile bed requirements should be completed before application of the membrane and tiles or other floor coverings should be direct bonded to the membrane.
3. Ensure wall and floor sheets are installed as per sheet manufacturer's recommendations.
4. Ensure suitable brick/concrete hobs are used (do not use timber), and that the top of the hob does

not slope outwards.

5. Ensure that falls to the waste are min 1:60 (ie. approx. 30mm in 2m) before waterproofing. Ensure outlet pipes are fixed securely and that the waste or drainage flanges are recessed into the floor.
6. Avoid sheet joints in shower recess floor. Ensure that sheets are securely fixed to the wall at the bottom edge, and sheet joints are sealed with a neutral cured silicone sealant spread approximately 6mm on either side of the joint.
7. Treat nail and screw holes with neutral cure silicone sealant.
8. Seal the perimeters of taps, shower outlets and waste outlets with neutral cure silicone sealant.
9. Apply a bead of neutral cure silicone sealant to all horizontal and vertical corners, and spread to 6mm on either side of joint.
10. Apply a bead of neutral cure silicone sealant to the junction of the hob or angle and walls, and spread to 6mm on either side of joint.
11. Waste outlets shall incorporate a puddle flange or similar in accordance with AS3740 and the top surface shall be set flush with the surface to which the membrane is to be applied. A bead of neutral cure silicone shall be applied across the intersection of the puddle flange and the screed/floor.
12. Apply the membrane to the entire shower recess floor and down into waste or drainage flange. Apply the membrane over the hob and at least 150mm beyond the outside edge of the hob (ideally to entire wet area floor).
13. Apply the membrane 1800mm up the walls or to the height of the shower rose within the shower recess.
14. Install the shower screen to inside edge of the hob.

BALCONIES AND DECKS



1. Ensure that the deck is constructed with falls to edge/drains of min 1:100 (ie. 20mm in 2m) or else achieve the fall with a sand/cement screed.
2. Ensure a min set down (step down) of 50mm to the finished floor level (ie. top of tiles).
3. Ensure suitable flashing is installed, ideally prior to the installation of the balcony screen/sliding door.
4. Treat any sheet joints with a neutral cure silicone prior to waterproofing.
5. Prepare and seal all wall/floor junctions with a bead of neutral cure silicone.
6. Apply the membrane up the step down and as far up underneath the screen door flashing as possible (ideally waterproof prior to installing door).
7. Where possible, apply the membrane prior to building divisional walls.
8. Apply the membrane to the entire balcony floor and at least 50mm up the wall above the top surface of the finished tiles and finished below the wall drainage vents.
9. Apply the membrane to the top of the parapets and divisional walls, or else install suitable metal capping.
10. Apply the membrane down over the front edge of the balcony onto the drip rail.
11. Carefully seal any gaps around balcony penetrations prior to applying the membrane.
12. Apply the membrane down into outlets and drains, ensuring excess material is removed.
13. Ensure all weep holes are above the membrane application area.

APPLICATION NOTES

Surface preparation

- Ensure all surfaces are structurally sound and totally dry. The pores of concrete surfaces should be open (absorbent surface). All sheet substrates must be securely fixed in accordance with the manufacturers instructions.
- Falls to outlets of at least 1:60 or approx. 30mm in 2m (wet areas) or 1:100 externally, must be achieved prior to tiling.
- The surface to be coated should be free from dust, oil, paint, curing compounds and any other contaminating materials.
- Damaged concrete should be repaired (leveled) and surface defects including all cracks and sharp protrusions should be treated prior to the application of the membrane.
- Remove laitance on concrete or screeds by mechanical means.

- Highly dense (>40MPa) or steel trowelled concrete should be roughened by suitable mechanical means (shot blasting, grinding, etc).

Priming

The primer is a critical part of the waterproofing system. Apply one coat of Ardex WPM 265 (Sheltercoat/ Superflex Water Based Primer) by brush or roller to all areas to be waterproofed including the floor waste. Allow the primer to be completely dry prior to the application of the Ardex WPM 002 membrane. This will take around 20-30 minutes depending upon weather conditions and porosity of the substrate. Coverage is approximately 6m² per litre. Plastic (eg. PVC) pipes should be primed with a solvent based plumbers pink primer. Prime metal surfaces with a suitable metal primer such as epoxy polyamide primer.

GENERAL APPLICATION

Crack preparation

Cracks <2mm:

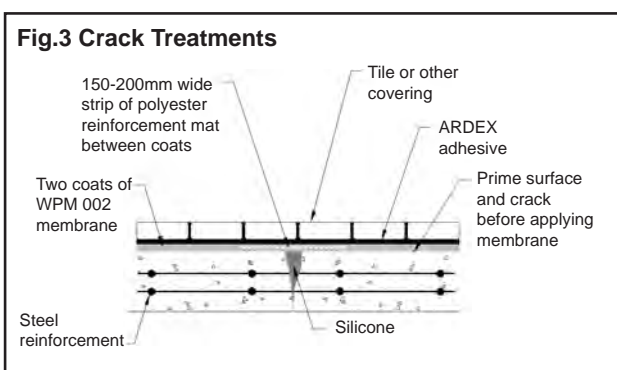
Clean and remove any loose particles in the crack. Prime the crack and adjacent area carefully with Ardex WPM 265 and allow to dry before applying two coats of Ardex WPM 002 membrane, in a band at least 200mm wide equidistantly across the crack, along the length of the crack.

Cracks 2-6mm:

(Refer Fig. 3) prepare and prime the crack as above. Apply a bead of neutral cure silicone into the crack and extend it 6mm either side. Apply a 300mm wide band of Ardex WPM 002 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex “Deckweb” polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Cracks >6mm:

Contact your local Ardex representative.



ARDEX WPM 002

Superflex Bathroom & Balcony - 2 Part 2 Part Undertile Waterproofing Membrane

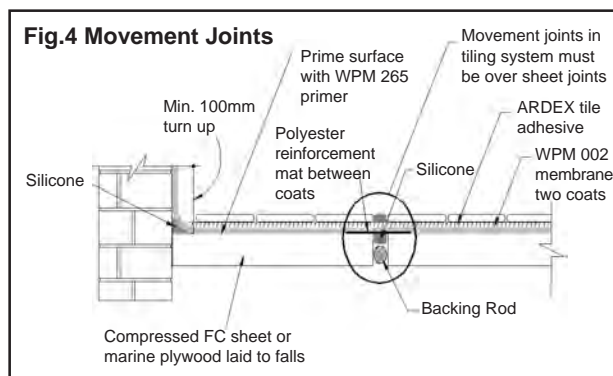
Movement/construction joints

Movement joints (<6mm)

Clean and prime the joint before filling it with a bead of neutral cure silicone and extending it 6mm each side of joint. Apply a 300mm wide band of Ardex WPM 002 equidistantly across the crack along the entire length of the crack. Place a 190mm wide band of Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat.

Construction joints (>6mm)

Use the same procedure as above, but replace the reinforcing mat with 120mm of Ardex Coving Bandage. Note: if tiling, movement joints should be taken to the surface of the tiles. Fill the joints between the tiles immediately above the movement joints with an appropriate joint sealant. (Refer Fig.4)



Corners and coving areas

After priming with Ardex WPM 265 and allowing to dry, apply a generous bead (16mm) of neutral cure silicone sealant in coving areas and corners. (Refer Fig.5) Smooth over the silicone so that it extends 8mm up the wall and 8mm over the floor and allow to touch dry.

Apply a first coat of Ardex WPM 002 to the area and allow the membrane to dry.

Apply a second coat ensuring that excess product is removed from the junction (the final dry film thickness should be around 1.2mm) Alternatively, if a polyester reinforcement mat is used between coats then the second coat can be applied as soon as the mat is fully bedded into the first coat.

WALL/FLOOR JUNCTION

After priming with Ardex Superflex WPM 265 and allowing to dry, apply a generous bead (16mm) of neutral cure silicone sealant to seal all junctions between two substrates. Smooth over the silicone so that it extends 8mm up the wall and 8mm over the floor and allow to touch dry. Place a 190mm wide band of

Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. The Ardex WPM 002 should be applied to at least 150mm up the wall surfaces as per the recommendations for the application of Ardex WPM 002 to floors.

Walls

Two coats of Ardex WPM 002 are required to achieve a minimum total dry film thickness of 0.8mm.

After priming with Ardex Superflex WPM 265 and allowing to dry, apply two coats of Ardex WPM 002 (to achieve a minimum dry film thickness of 0.8mm) in two opposite directions. Wall sheets joints should be treated with a neutral cure silicone, PVC duct tape or base jointing compound. In balcony situations take the membrane up underneath any existing cover flashing or install appropriate flashing. Allow the first coat to dry before applying the second coat.

Floors

Two coats of Ardex WPM 002 are required to achieve a minimum total dry film thickness of 1.2mm. The flooring recommendations should be extended at least 150mm up all perimeter walls.

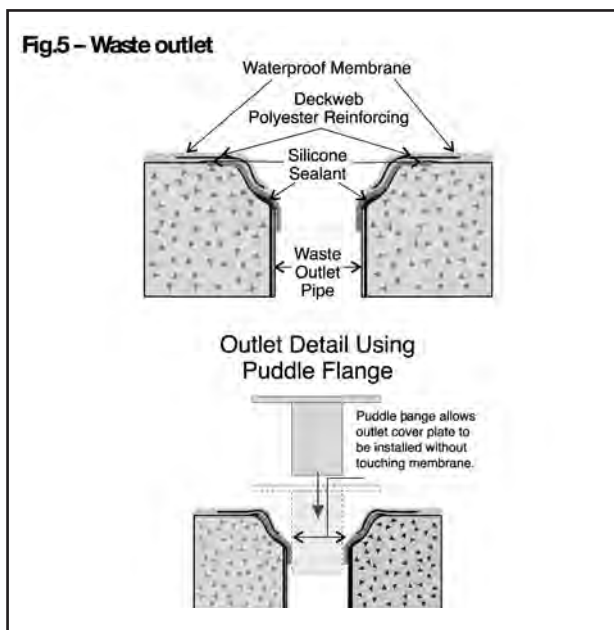
Prime the surface with Ardex WPM 265 water based primer and allow to dry.

Apply the first coat over the primed surface and allow it to dry (1-2 hours at 23°C, 50% RH) before applying a second coat in an opposite direction. In shower recesses a drainage flange must be installed on all timber/sheeted floors, and are strongly recommended on all other substrates. Where possible rebate the flange into the floor. Seal the perimeter of the flange with neutral cure silicone treatment. If a flange is not installed the membrane must be applied down into the pipe. (Refer Fig.5) Allow the membrane to dry completely before tiling. Refer drying times above.

Waste outlet

Prime the surface with Ardex WPM 265 and allow to dry. Surfaces of outlet flange must be primed with an appropriate primer.

Apply Ardex WPM 002 over the adjacent floor surface extending down into the waste outlet pipe overlapping the pipe surfaces by at least 30mm. Place Ardex "Deckweb" polyester woven cloth reinforcement over the applied membrane. Thoroughly wet out the cloth and remove all creases in, or air pockets under the mat. Immediately apply a second coat to completely fill the mat. (Refer Fig. 5).



Tiling systems

It is advisable to conduct a flood test of the shower once the membrane has cured (normally after 48 hours), and before the tiling commences. A broad range of Ardex tile adhesives can be used over Ardex Superflex membranes. Contact Ardex or your nearest Ardex stockist for advice on the most suitable system.

QUALITY PRODUCT

Ardex WPM 002 is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001.

USER NOTES

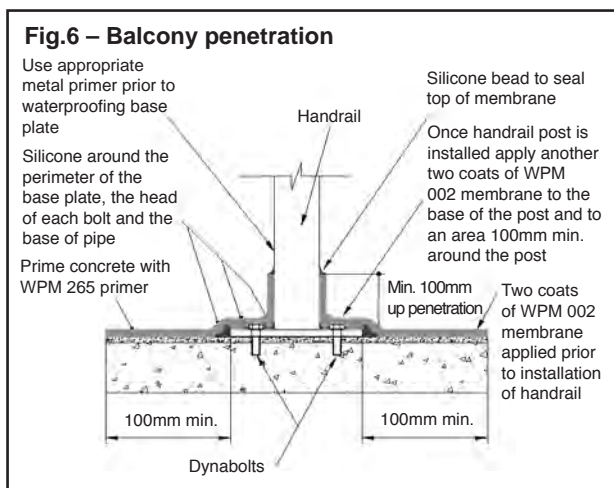
The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is the responsibility of the user to ensure that the product is used in accordance with Ardex instructions and in applications for which they are intended.

Balcony penetrations (Refer Fig.6)

All upstands are to be mechanically fixed through the membrane, which must be fabricated with a base plate flange.

Prime the metal with an appropriate metal primer such as an epoxy polyamide primer and allow to dry. Apply a 10mm bead of neutral cure silicone around the perimeter of the penetration. Apply the first coat of Ardex WPM 002 on the substrate and the flanged metal.

Allow first coat to dry before applying a second coat ensuring a finished dry film thickness of no less than 1.2mm is achieved. Place a suitable flashing collar around the penetration sealing it with a suitable sealant.



TECHNICAL DATA

**Ardex WPM 002
Characteristics of components**

Form & Colour	Liquid: white, medium viscosity Powder: off white
---------------	--

Characteristics of mixed product

Mixing Ratio	1:1 by weight
SG of mixed product	1.44kg/litre
Non Volatile Matter	77±1%
Colour	light grey/green

Characteristics of cured membrane

Shore A hardness ASTM D2240	
- dry film	85 - 90
- wet film	75 - 80
Tensile Strength	
7 days dry AS1145	1.7 MPa
Full Cure 28 days:	2.9 MPa
Elongation at Break	
7 days dry AS1145	332%

NOTE: Most of the tests have been carried out in the Ardex laboratory under standard conditions (23±2°C, 50±5% RH)

ARDEX WPM155 *Rapid*

(Undertile PU Acrylic Hybrid Membrane)

DESCRIPTION

Water-based polyurethane-acrylic waterproofing membrane developed for high performance under-tile waterproofing.

- Tough flexible film.
- Long shelf life.
- Meets Green Building Council of Australia Greenstar requirements IEQ-13, IEQ-11.
- Can be tiled over – good adhesion with ARDEX tile adhesives.
- Excellent adhesion to a wide range of substrates.
- Fast drying.
- Class III Membrane, as per AS/NZS 4858 Wet Area Membranes.

RANGE OF APPLICATIONS

For commercial and residential internal/external wet areas, balconies, decks and other areas that will be tiled or otherwise protected from regular foot traffic. Not suitable for permanent immersed conditions. For conditions of permanent immersion, it is recommended that ARDEX WPM 002 (Superflex Two Part) is used. For further information please call ARDEX Technical Services.

SUBSTRATES

Concrete

Cured for minimum 28 days, wet concrete should be allowed to dry thoroughly or sealed with one coat of ARDEX WPM 300 at coverage rate of 3.0m² per litre.

Renders and screeds

Cured for min 7 days. Wet render should be allowed to dry thoroughly or sealed with one coat of ARDEX WPM 300 at coverage rate of 3.0m² per litre and allowed to cure overnight.

Fibre cement sheets

Wet area grades only.

Plywood

Structural plywood (PAA branded) or marine grade or other wet area grade only. Not recommended for external use (refer ARDEX).

Strandsarking

Strandsarking sheets are 3.60m x 800mm x 16.3mm. Strandsarking sheets shall be laid with staggered joints. (brick bond) The edges of all sheets shall be supported with dwangs or framing. The maximum allowable spacing for supporting roof framing is 400mm.

When a roof has a pitch below 2 degrees it is recommended to use Strandfloor H3.1.

Strandsarking sheets may be butt jointed with an Ardex release tape used over the join.

Fixings.

Shall be 50mm x 4.8mm diameter stainless steel screws fixed at 150mm centres.

If fixings are bought into 100mm centres on the intermediate supports this will allow use in wind zones very high and extra high without any further treatment. Fixings must be positioned no closer than 10mm from the sheet edges.

PRIMERS

ARDEX WPM 155 Rapid is suitable to use over ARDEX P9, ARDEX WPM 300, or WPM 270 or WPM 265 or ARDEX Multiprime and Abaprime.

APPLICATION TYPES

STANDARD APPLICATION

ARDEX WPM 155 Rapid should be thoroughly mixed to a uniform consistency and ensure the coating is applied evenly at recommended coverage rates. Mobile joints should be reinforced using Deckweb and the membrane must be lapped to intrusions such as waste outlets in accordance with AS 3740. Apply ARDEX WPM 155 Rapid by brush or roller. A medium nap (8–12mm pile) or 50mm long bristle paint brush is recommended.

COVERAGE

This will vary with the porosity of the substrates. Two coats are recommended to get optimum performance.

For floors

A minimum dry film thickness of 1.0mm is required. A 20kg unit (15 Litres) will cover approximately 8.6m² (based on two coats). A 5.3kg (4 Litres) will cover approximately 2.3m².

For walls

A minimum dry film thickness of 0.5mm is required. A 20kg unit (15 Litres) will cover approximately 17.2m². A 5.3kg unit (4 Litres) will cover approximately 4.6m².

DRYING TIME

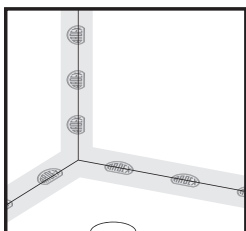
Recoat time is 1–2 hours between first and second coats. Drying time on flat surfaces under standard conditions is 4 hours. However, dry through time will be slowest in areas where ARDEX WPM 155 Rapid is applied over neutral cure silicone bond breaker, or is reinforced. Make sure these areas are dry before tiling, this will generally be 24 hours after the last application at 23 deg and 50% RH. Drying times will vary depending on humidity, surface temperature and porosity of substrates.

RAPID APPLICATION

ARDEX WPM 155 Rapid should be thoroughly mixed to a uniform consistency and ensure the coating is applied evenly at recommended coverage rates.

All junctions and joints should have ARDEX STB Tape applied. See Ardex website for detailed video on application of this tape. www.ardexaustralia.com

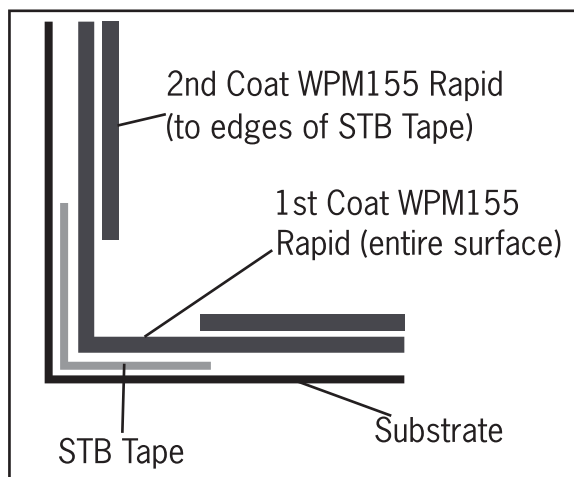
1. Ensure area is free from contaminants and clean making sure to remove all dust and prime fibre cement sheet with an approved primer (listed in the primers section). Apply the tape and use a roller to ensure that a secure bond is made between the tape and substrate and carefully moulded into the corners.



2. Apply a coating of WPM 155 Rapid to the entire area to be waterproofed using a brush or roller, a medium nap (8–12mm pile) or 50mm long bristle paint brush is recommended. This first coat should be applied at 0.5mm (wet film thickness) to provide a 0.25mm dry film thickness. Allow to dry. Dry time is approximately 1-2 hours.

3. Apply a second coat of the WPM155 Rapid membrane at a thickness of 0.5mm (wet film thickness) to provide a dry film thickness of 0.25mm. This will provide in total a dry film thickness of 0.5mm total dry film thickness.

Note: The second coat needs to only be applied up to the edge of the ARDEX STB Tape (as pictured below)



Tiling can begin once the second coat has dried which is generally 3 hours at 23°C in undertile applications. Drying times will vary depending on humidity, surface temperature and porosity of substrates.

The membrane must be lapped to intrusions such as waste outlets in accordance with AS 3740.

COVERAGE

This will vary with the porosity of the substrates. Two coats are recommended to get optimum performance.

A 20kg unit (15 Litres) will cover approximately 17.2m².
A 5.3kg unit (4 Litres) will cover approximately 4.6m².

PACKAGING

ARDEX WPM155 Rapid Liquid Membrane 20kg (approximately 15 litres) and 5.3kg (approximately 4 litres).

ARDEX STB 15-75 Tape roll - 75mm wide x 15 metres in length.

SHELF LIFE

12 months when stored in the original unopened packaging in a dry place at 23°C.

CLEANING

Wash hands, brushes, rollers with water while product is still fresh. For cured material, use mineral turpentine.

PRECAUTIONS

All surfaces must be structurally sound, dry and free from all surface contaminants.

Do not use ARDEX WPM 155 Rapid under the following conditions:

- Areas subject to negative hydrostatic pressure or rising damp, unless treated with ARDEX WPM 300.
- Wet substrates or green screeds/concrete – need to be sealed with one coat ARDEX WPM 300 as described earlier.
- Surface temperatures below 10°C or greater than 35°C.
- Do not expose to prolonged UV conditions.

SAFETY DATA

ARDEX WPM 155 Rapid is a non-hazardous and non-dangerous product. Wear protective clothing when handling.

Wash off splashes with clean water. In case of eye contamination, rinse thoroughly with clean water. If irritation persists, seek medical advice. additional information is listed in the material safety data sheet.

TECHNICAL DATA

Colour: Blue/Grey

Properties of the cured membrane

Tensile strength: 1.2 MPa

MPa AS1145

% Elongation: >350%

Shore A Hardness: 65-75

Water vapor transmission

(AS4858/ASTME96): 1.2g/24hrs/m²

VOC content: 42g/L

Durability (AS4858): Pass

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program. Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific installation recommendations. The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them.

© ARDEX Australia Pty Ltd 2013.

All aforementioned products are the trade marks of ARDEX Australia Pty Ltd, its licensors and affiliates.

May 2013

Shelter Primer

Solvent Based Primer

PRODUCT DESCRIPTION

ARDEX WPM 240 (Shelter Primer) is a solvent based bitumen modified primer to be used to seal and prepare the substrate prior to the installation of the Shelterbit torch-on and Shelterseal self adhesive membranes.

APPLICATION

Ensure that the surface to be primed is dry and free from dust, oil, paint, curing compounds and any other contaminating materials. Stir contents well before use. Apply by brush, roller or airless spray. ARDEX WPM 240 (Shelter Primer) must be dry before applying membrane.

COVERAGE

1 litre of ARDEX WPM 240 (Shelter Primer) will cover approximately 5m².

DRYING TIME

Allow 1-2 hours @ 23°C.

LIMITATIONS

ARDEX WPM 240 (Shelter Primer) should be used with appropriate mask and breathing apparatus in areas with poor ventilation/air flow.

PACKAGING

5L and 20L

STORAGE

12 months in the original unopened packaging stored @ 23°C.

IDENTIFICATION

Black liquid comprising bitumen dissolved in mineral spirits.

CLEAN UP

Wash equipment with ARDEX WA98S.

SAFETY DATA

First Aid:

Swallowed: Give water to clean mouth. Do not induce vomiting.

Skin: Remove contaminated clothing. Wash skin thoroughly with soap and water.

Eyes: Hold open and flood with water for at least 15 minutes.

Inhalation: Remove to fresh air. If breathing is difficult administer oxygen.

If irritation continues seek medical attention promptly.

ARDEX WPM 247

Water Based Shelter Primer

PRODUCT DESCRIPTION

ARDEX WPM 247 (Shelter Primer) is a water based bitumen modified primer to be used to seal and prepare the substrate prior to the installation of the Shelterbit torch-on and Shelterseal self adhesive membranes.

APPLICATION

Ensure that the surface to be primed is dry and free from dust, oil, paint, curing compounds and any other contaminating materials. Stir contents well before use. Apply by brush or roller. ARDEX WPM 247 (Shelter Primer) must be dry before applying membrane.

COVERAGE

1 litre of ARDEX WPM 247 (Shelter Primer) will cover approximately 6m².

DRYING TIME

Allow 1-2 hours @ 23°C.

LIMITATIONS

ARDEX WPM 247 (Shelter Primer) should be used with appropriate mask and breathing apparatus in areas with poor ventilation/air flow.

PACKAGING

5L and 20L containers

STORAGE

12 months in the original unopened packaging stored at @ 23°C.

IDENTIFICATION

Black liquid comprising bitumen suspended in water.

SAFETY DATA

First Aid:

Swallowed: Give water to clean mouth. **Do NOT** induce vomiting. Contact Doctor or Poisons information Centre.

Skin: Remove contaminated clothing. Wash skin thoroughly with soap and water. **Do NOT** use solvents to remove bitumen material from skin. Bitumen may be removed using vegetable or medicinal paraffin oil.

Eyes: Holding eye(s) open, immediately irrigate (s) with water for at least 15 minutes. Seek medical advice.

Inhalation: Not known to be a problem. Remove patient to a well ventilated area. Recovery should be rapid after removal from exposure.

Hair: Solidified bitumen in eyelashes, hair etc. can be removed by gently wiping with lint soaked in medicinal paraffin oil.

ARDEX WPM 179

Single Component Rubber Waterproofing Membrane

PRODUCT DESCRIPTION

ARDEX WPM 179 is a one component liquid applied, latex modified, bituminous elastomeric waterproofing membrane. When cured it forms a permanently flexible waterproof lining to most building surfaces. ARDEX WPM 179 is predominately used as a patching or repair membrane for use in conjunction with ARDEX WPM 172 Rapid Cure Rubber Waterproofing Membrane. ARDEX WPM 179 is water based, has almost no odour and is safe to use.

FEATURES/BENEFITS

- Easily applied: single pack, high build, long pot life.
- Excellent adhesion to substrates
- High elongation – excellent crack bridging capabilities
- Retains flexibility at low temperatures
- Resists ponding water (once fully cured)
- Water based – environmentally friendly and safe to use
- Excellent Chemical Resistance properties
- Conforms to AS4654.2 – 2009 waterproof membranes for exterior use

ACCEPTABLE SUBSTRATES

- Concrete structures and concrete formwork
- Cement/sand screeds/renders – cured for a min 28 days and 14 days respectively. Alternatively apply a barrier coat of ARDEX WPM 300 (HydrEpoxy 300) as a barrier coating to fresh or wet substrates.
- Masonry and concrete blocks – voids filled, sharp edges and protrusions should be removed to give a flush finish.
- Steel

TYPICAL APPLICATIONS

- Below ground tanking, basements and retaining walls (not negative hydrostatic situations)
- Bridge decks and concrete structures
- Planter boxes
- Terraces/Balconies (protected)
- Concrete protection from chemicals and water ingress
- Corrosion protection of metal roofs and structures
- Waterproof liners for sewage and containment ponds, dams and tanks
- Underground Structures / Tunnel lining

BASIC APPLICATION INSTRUCTIONS

Surface preparation

The surface to be coated should be clean, sound and free from oils, greases and flaking paint. New concrete should be cured for 28 days (or a barrier coat of ARDEX WPM 300 (HydrEpoxy 300) applied) prior to application of membrane and the surface pores must be open. All cracks or holes exceeding 2mm are to be repaired before application commences. Surface may be slightly damp but must be free from seeping moisture. Surface to which the coating is to be applied should be smooth with no sharp edges to ensure a uniform film thickness is achieved.

Priming

ARDEX WPM 179 is self-priming on most surfaces and a primer is therefore not necessary. Wet or freshly placed concrete surfaces should be sealed with Ardex WPM 300 (HydrEpoxy 300) in one coat at a coverage rate of 3.0 square metres per litre. Porous substrates such as aerated concrete should be primed with Ardex WPM 179 Single Component Rubber Waterproof Membrane mixed with 50% water.

Application

ARDEX WPM 179 can be applied by brush or trowel to the substrate over the entire area to be repaired or waterproofed. Allow 2-4 hours between coats for ARDEX WPM 179 unless a reinforcement material is used between coats. In this case, the second coat can be applied immediately after the mat has been installed in the first coat. The membrane is fully dry in 24 hours, after which should be protected with ARDEX protection boards or geotextile fabric coated drainage cell.

COVERAGE AND THICKNESS

As a patching/repair membrane one coat of ARDEX WPM 179 will cover approximately 15m² (dry film thickness of 0.6mm). If two coats are required ARDEX WPM 179 will cover approximately 7-8m² (dry film thickness of 1.0mm).

DETAILING OF PETRUSIONS AND EXPANSION JOINTS

ARDEX WPM 179 can be directly applied onto penetrating PVC pipes, re-bars and metal fixings providing a seamless waterproofing layer. Expansion joints and corners should be covered using ARDEX Waterproofing Detail Tape.

DRYING TIME

ARDEX WPM 179 is fully dry in 24-48 hours at 25°C and 50% relative humidity. After which it should be protected with ARDEX protection boards or geotextile coated drainage cell.

SAFETY DATA

ARDEX WPM 179 is non-hazardous and non-dangerous. Do not breathe gas/fumes/vapour/spray. Wear eye/face protection. Use only in well ventilated areas. Keep container tightly closed and in a well ventilated place. In case of contact with eyes, rinse with plenty of water. In event of irritation seek medical advice.

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

STORAGE

ARDEX WPM 179 is sold in 15kg pails. Shelf life is 12 months when stored in the original unopened container, in a dry place at 25°C. Do not store in direct sunlight. Replace lid tightly after use.

CLEAN UP & DISPOSAL

Clean all equipment in fresh water immediately after use. Remove cured material with mineral turpentine or white spirits. Dispose of containers in compliance with all relevant local authorities, state, and federal regulations.

TECHNICAL PERFORMANCE DATA

Appearance and odour:	Thick black fluid, slight odour
Specific gravity:	Approx 1.05kg/L
Application temperature:	10°C – 35°C
Drying Time:	(@23°C, 50% RH)
Recoat	2-4 hours
Hard Dry	24-48 hours
Tensile Strength:	6 days @23°C, 50% RH plus 24 hrs at 70°C, 1.2MPa
Elongation at break:	6 days @23°C, 50% RH plus 24 hours at 70°C, 450%

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations and only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program.

Country specific recommendations, depending on local standards, codes of practice, building regulations or industry guidelines, may effect specific

INSTALLATION RECOMMENDATIONS

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. you should make yourself familiar with them.

ARDEX WPM 265

Sheltercoat/Superflex Water Based Primer

PRODUCT DESCRIPTION

Ardex WPM 265 (Sheltercoat/Superflex Water Based Primer) is a red water based acrylic primer designed to seal the substrate and enhance the adhesion qualities of Ardex Superflex waterproofing membranes. The distinctive colour makes it easy to identify when the primer has been applied. Ardex WPM 265 is fast drying, non-toxic and can be used on a wide variety of substrates.

FEATURES/BENEFITS

- Promotes bonding between membrane & substrate
- Suitable for most substrates
- Easy application and cleaning
- Primed surfaces are easily identified

RANGE OF APPLICATION

A heavy duty water based primer formulated to penetrate and seal absorbent surfaces making them a sound base for waterproofing. For commercial and residential use, both internal and external.

Surfaces

Walls and floors

Substrates

Fibre cement sheets

Plywood (structural PAA and marine)

Particle board (wet area)

Concrete, renders and screeds

Masonry and concrete blocks

Plasterboard surfaces do not require priming

SURFACE PREPARATION

Ensure that the surface to be primed is free from loose materials, dust, oil, paint, curing compounds and any other contaminating materials. Remove laitance and roughen dense concrete by mechanical means.

New concrete should be left a minimum of 28 days and new render a minimum of 7 days before application commences. All cracks or holes exceeding 2mm are to be repaired before application commences.

APPLICATION

Apply one coat of the primer by brush, long nap roller, conventional or airless spray over entire area to be waterproofed including cracks. If the substrate is porous, a second coat may be required. Allow primer to dry before applying Superflex waterproofing membrane.

MIXING

Not required. Do not add water or other materials to the primer.

COVERAGE

One (1) litre will cover approximately 6 square metres. Coverage will vary depending on the porosity of the surface.

DRYING TIME

Touch dry in around 20-30 minutes, at 23°C, 50% RH. Drying time will vary depending on humidity, temperature and surface porosity. Important: Ardex WPM 265 must be dry prior to the application of the Ardex membrane.

CLEANING

Wash brushes and rollers with clean water.

PRECAUTIONS

- Do not apply when surface temperature is outside range 5-30°C.
- Do not use on glazed, impervious or silicone treated surfaces.
- Metal surfaces must be primed with an appropriate metal primer.
- Do not empty excess primer back into original pack as this may cause contamination.
- Highly dense or steel trowelled substrates may require Ardex WPM 270 (Sheltercoat Solvent Based Primer) to achieve optimal adhesion.
- For substrates other than those listed contact Ardex.

PACKAGING

20L plastic pail.

STORAGE

Ardex WPM 265 has a 12 month shelf life when stored in the original unopened packaging, in a dry place above 6°C.

QUALITY PRODUCT

Ardex WPM 265 is manufactured and tested to Ardex procedures which are maintained in accordance with Quality System Standard ISO 9001. Material Safety Data Sheets are available from Ardex upon request.

USER NOTES

The technical details and recommendations contained in this data sheet are given in good faith and represent the best of our knowledge and experience at the time of printing. It is responsibility of the user to ensure that the product is used in accordance with Ardex instructions and in applications for which they are intended.

TECHNICAL DATA

Product Identity

Form:	one part, acrylic based liquid
Dried Colour:	red
Specific Gravity:	approx 1.03
pH:	8 - 9

Application Properties

Drying Time:	20 - 30 minutes @ 23°C, 50% RH
Coverage:	6m ² /litre
Method:	roller, brush, conventional or airless spray

SAFETY DATA

Ardex WPM 265 is non-toxic. However, the contents should not be swallowed or inhaled. In case of eye contamination, rinse thoroughly with clean water. If irritation continues seek medical advice.

ARDEX WPM 300

HydrEpoxy 300

Water Based Epoxy Membrane

PRODUCT DESCRIPTION

Ardex WPM 300 (HydrEpoxy 300) is a two component water based epoxy polyamide membrane/barrier coating.

Approved for use with potable (drinking) water, independent testing confirms conformity with the requirements of AS4020.2000 & BS6920.

FEATURES/BENEFITS

- Non-flammable & negligible odour.
- Can be applied to damp surfaces.
- Can be safely applied to freshly laid hardened (green) concrete.
- Conforms to requirements of the:-
Building Code of Australia
as a waterproofing membrane.
- Conforms to the requirements of:
Australian standard 4020 – 2000
and **British Standard 6920**
for use in contact with potable water.
- When applied directly to the substrate the cured membrane will withstand 250kPa of hydrostatic pressure which is equivalent to a 25 metre head of water.
- When used wet on wet over Ardex WPM 256 (HydrEpoxy 256) the cured membrane will withstand 400kPa of pressure which is equivalent to 40 metre head of water.
- No maximum recoat time provided surface is clean and free from surface contaminants.
- Can be overcoated using almost any decorative or industrial finishing paint.
- Safe to use in sensitive locations (e.g. around food or habitable areas) and environmentally sound.
- Prevents rising damp and the formation of efflorescence when used as a single coat barrier coat.
- Has excellent adhesion to most substrates including brick, masonry, concrete block, concrete, stone and timber.
- Easy clean-up using water.

TYPICAL APPLICATIONS

- As a low water vapour transmission coating in the building and construction industries and as a barrier/seal coating over freshly laid or damp concrete.

- As a hydrostatic pressure resistant waterproofing membrane to prevent water seepage or dampness penetration through to the interior of walls and floors.
- As a waterproofing barrier on the negative side in below grade surfaces such as basements, tunnels, liftwells, retaining walls and car parks.
- As a waterproofing membrane or barrier coating over freshly laid hardened (green) concrete, prior to the application of conventional levelling compounds, carpet and tile adhesives.
- As a waterproofing membrane in tanking applications, including potable water containment.
- As a barrier seal coating over damp, green or efflorescence producing concrete prior to overcoating with conventional building paints.

LIMITATIONS

The product should be applied whilst the surface temperature is between 10–35°C. The product will cease to cure below 10°C, but will recommence curing when the temperature rises above 10°C. Curing time will also be adversely affected in situations where relative humidity is >85%.

In enclosed areas, ventilation must be provided during the curing cycle to enable adequate evaporation of the water.

Care should be taken when sandwiching adhesives between Ardex WPM 300 and floor coverings to ensure the water vapour transmission of the covering is sufficient to allow the solvent to escape.

Ardex WPM 300 is not classified as a trafficable membrane.

BASIC APPLICATION INSTRUCTIONS

Surface Preparation

All surfaces to be treated must be structurally sound; and existing coatings, adhesives, efflorescence should be removed to achieve maximum bond strength and resistance to hydrostatic pressure. Surfaces must be cleaned free of dirt, grease, oil, or other surface contaminants.

Holes, non-structural cracks or other surface deformities should be filled with Ardex WPM 300 epoxy mortar or Ardex concrete repair systems and allowed to cure for 2-3 hours before coating is applied.

Installation

Each component should be individually mixed to form an homogenous component.

Thoroughly mix the two components in the ratio of 1:1 by volume until a homogeneous blend is obtained. Only mix as much as may be used within the pot life and avoid excessive aeration during mixing.

The first coat should be thinned with water, as required depending on the porosity of the surface to be coated (up to 20% for dense surface to 5% for more porous surfaces) to ensure optimum penetration. Thinning of the second coat should be avoided since this increases the difficulty in achieving the required dry film thickness.

When the product is to be applied to dry concrete it is advisable to wet the surface with a fine mist of water before application and allow to just surface dry.

Floors–Spread the material using a squeegee or stiff nylon broom to achieve coverage and finish using a long nap roller.

Walls–Apply the product by roller or spray taking care to achieve required coverage.

Care must be taken to work the material into the surface to fill voids and avoid pinholing. A minimum of two coats is recommended and care should be taken to ensure uniformity of material and the required coverage is maintained. When finishing it is necessary to lay the material onto the surface and lightly finish to achieve the required dry film thickness per coat.

The coverage rate for all surfaces should be a total of 1.5 square metres per litre (3.0 square metres per litre per coat) to achieve optimum properties. In the event that this coverage rate is not achieved in two coats, further coats should be applied to achieve a total uniform coverage rate of 1.5 square metres per litre.

Allow to cure for 24 hours before applying adhesives, mortars, levelling compounds, decorative coatings or other surface treatments. Care is necessary to ensure the waterproofing membrane coating is not damaged in any way during subsequent treatments.

It is recommended that the final coating applied to floor surfaces should be allowed to cure for at least 3 days before further treatment to minimize the risks of mechanical damage.

PACKAGING

- 4L kit
- 20L kit

SAFETY PRECAUTIONS

Ardex WPM 300 Part A and Part B are hazardous goods and may cause sensitization by skin contact. They are harmful by inhalation, in contact with skin and if swallowed. Keep containers tightly closed in a well ventilated place. Avoid contact with skin and eyes. It is strongly recommended that protective clothing is worn at all times during use of epoxy material to prevent contact with skin.

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

CLEAN UP

Wash all equipment in water or water/detergent immediately on completion.

TECHNICAL DATA

Colour	Grey, Black
Finish	Semi-gloss going to matt with aging
Volume solids	44%
Mixing ratio	1:1 (Part A:/Part B) by volume
Coverage	Must be applied at a rate of 1.5 square metres per litre to achieve an effective waterproofing membrane. Minimum two coats are recommended to achieve uniform coverage.
Wet Film Thickness	300 micrometers per coat
Recoat time	4 hours @ 25°C, 50% RH
Full cure	7 days @ 25°C, 50% RH
Pot life	2 hours @ 25°C 1 hour @ 35°C

The recommended wet film thickness specified produces a nominal dry film thickness of 150 micrometers per coat or 300 micrometers for two coats. The apparent dry film thickness will reduce depending on the porosity of the substrate, however the product absorbed by the substrate forms part of the waterproofing function.

ARDEX WPM 368

Single Part Barrier Membrane

DESCRIPTION

ARDEX WPM 368 is a single component acrylic copolymer membrane that will prevent rising damp, efflorescence and will resist negative hydrostatic pressure when used in accordance with the technical data sheet. It has excellent adhesion to most substrates including brick, masonry, concrete block, concrete, stone and is simple to use by brush, roller or airless spray machine.

ARDEX WPM 368 single part damp-proof is safe to use and can be over-coated using almost any decorative paint. ARDEX WPM 368 can be applied to damp surfaces and freshly laid hardened (green) concrete and conforms to the Building Code of Australia as a waterproof membrane.

FEATURES/BENEFITS

- Non-flammable and negligible odour.
- Can be applied to damp surfaces.
- Can be safely applied to freshly laid hardened (green) concrete.
- When applied directly to the substrate (dual coat system) the cured membrane will withstand 250kPa of hydrostatic pressure which is equivalent to a 25 metre head of water.
- Can be over coated using almost any decorative or industrial finishing paint.
- Prevents rising damp and the formation of efflorescence when used as a dual coat system.

TYPICAL APPLICATIONS

- As a low water vapour transmission coating in the building and construction industries and as a barrier/seal coating over freshly laid or damp concrete.
- As a hydrostatic pressure resistant waterproofing membrane to prevent water seepage or dampness penetration through to the interior of walls and floors.
- As a waterproofing barrier on the negative side in below grade surfaces such as basements, tunnels, lift wells, retaining walls and carparks.
- As a waterproofing membrane or barrier coating over freshly laid hardened (green) concrete, prior to the application of conventional levelling compounds, carpet and tile adhesives.
- As a barrier seal coating over damp, green or efflorescence producing concrete prior to over coating with conventional building paints.
- For use as a waterproof barrier prior to applying ARDEX floor levelers and tile adhesives.

BASIC APPLICATION INSTRUCTIONS

Surface preparation

All surfaces to be treated must be structurally sound; and existing coatings, adhesives, efflorescence should be removed to achieve maximum bond strength and resistance to hydrostatic pressure. Surfaces must be cleaned free of dirt, grease, oil, or other surface contaminants.

Holes, non-structural cracks or other surface deformities should be filled with ARDEX WPM 405 (Sheltercrete Additive), sand/cement mortar, or ARDEX concrete repair systems and allowed to cure for 2–3 hours before coating is applied.

Installation

Floors – Apply the material using a roller or spray to achieve coverage and finish using a long nap roller.

Walls – Apply the product by roller or spray taking care to achieve required coverage. When the product is to be applied to dry concrete it is advisable to wet the surface with a fine mist of water before application and allow to just surface dry.

Care must be taken to work the material into the surface to fill voids and avoid pinholing, a minimum of one coat for reducing efflorescence and two coats required for rising damp, waterproofing and waterproofing negative side walls. Care should be taken to ensure uniformity of material and the required coverage is achieved. It is necessary to lay the material onto the surface and lightly finish achieving the required dry film thickness per coat.

TILING APPLICATIONS

Substrates such as screeds and renders should be normally allowed to dry for 7 days prior to the fixing of ceramic tiles. Alternatively ARDEX WPM 368 can be applied in one coat by brush or roller application at a coverage rate of 3m²/L or a WFT of 0.3mm per coat. Broadcast sand is not required.

FLOORING APPLICATIONS

Where concrete subfloors are damp (moisture content exceeds 5.5% or have a relative humidity of above 70%) ARDEX WPM 368 can be applied as a moisture barrier. Two coats are applied at 3m²/L or a WFT of 0.3mm per coat. A single coat of ARDEX WPM 368 applied at 3m²/L per coat acts as a moisture stop for 'green concrete' not subject to rising damp or permanent moisture. Broadcast sand is not required.

LIMITATIONS

Tiling can commence after 24 hours cure of ARDEX WPM 368 although should not exceed a maximum of five days. Installer is to ensure that there is no surface contamination or membrane puncture during this period. If left exposed for longer than five days or contamination has occurred, clean with a damp cloth and apply another coat of ARDEX WPM 368. The product should be applied whilst the surface temperature is between 10–35°C. The product will cease to cure below 10°C. Curing time will also be adversely affected in situations where relative humidity is >85%.

ARDEX WPM 368 is not classified as a trafficable or UV stable membrane. It is not suited for potable water applications.

COVERAGE

One coat of ARDEX WPM 368 is required to reduce efflorescence or as a moisture resistant coating over green concrete. The coverage rate should be 3m²/L, or a WFT of 0.3mm per coat. In areas that are affected by hydrostatic pressure, two coats are applied at 3m²/L or a WFT of 0.3mm per coat. In the event that this coverage rate is not achieved in 2 coats, further coats should be applied to achieve a uniform coverage rate of 3m²/L. Recoat time is 2–4 hours depending on ambient temperatures.

DRYING TIME

Allow ARDEX WPM 368 to cure for 24 hours before applying adhesives, mortars, decorative coatings or other surface treatments. Care is necessary to ensure the waterproofing membrane is not damaged during subsequent treatments.

PACKAGING/SHELF LIFE

ARDEX WPM 368 comes in 20kg pail. Shelf life is 12 months when stored in the original unopened packaging, in a dry place at 23°C. Do not store in direct sunlight. Replace lid tightly after use. Use remaining contents from part used containers within one month.

SAFETY PRECAUTIONS

Wear gloves when working, If the product enters the eyes, wash with clean water for at least 15 minutes and seek medical advice. If swallowed do not induce vomiting, give glass of water and contact a doctor. ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.

THINNING AND CLEAN UP

Wash all equipment in water or water/detergent immediately on completion.

TECHNICAL PERFORMANCE DATA

Colour	Grey
Finish	Semi-gloss going to matt with aging
Volume solids	50%
Coverage	Must be applied at a rate of 3m ² /L, or a WFT of 0.3mm per coat to achieve an effective waterproofing membrane (two coats total)
W.F.T.	300 micrometers (0.3mm) per coat
Recoat time	2–4 hours @ 25°C and 50% R.H.
Full cure	7 days @ 25°C and 50% R.H.

GUARANTEE

ARDEX Australia Pty Ltd (“we” or “us”) guarantees this product (“our goods”) is free from manufacturing defects and will perform to any applicable specification published by us for 10 years from the date of purchase. Our liability under this guarantee is limited at our option to replacement of the product, repair of any damage to the immediate surface or area of application of the product, or compensation, in each case if we are satisfied loss or damage was due to a breach of this guarantee.

This guarantee does not apply if damage or loss is due to failure to follow published instructions or any act or circumstance beyond our control, including shade variations and efflorescence. If you wish to make a claim under this guarantee you must notify us (ARDEX Australia Pty Ltd, 20 Powers Road Seven Hills NSW 2147; Toll Free: 1800 224 070; Email: technicalservices@ardexaustralia.com) and provide evidence of your purchase of the product within 30 days of any alleged loss or damage occurring. We reserve the right to ask you for satisfactory evidence of any alleged loss or damage. Any claim under this guarantee is at your cost. This guarantee is in addition to any rights or remedies you may have as a “consumer” under the Australian Consumer Law and to that extent you need to be aware that: “Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure”.

DISCLAIMER

The technical details, recommendations and other information contained in this data sheet are given in good faith and represent best of our knowledge and experience at the time of printing. It is your responsibility to ensure that our products are used and handled correctly and in accordance with any applicable Australian Standard, our instructions and recommendations are only for the uses they are intended. We also reserve the right to update information without prior notice to you to reflect our ongoing research and development program. Country specific recommendations, depending on local standards, codes of practice building regulations or industry guidelines may affect specific installation recommendations.

The supply of our products and services is also subject to certain terms, warranties and exclusions, which may have already been disclosed to you in prior dealings or are otherwise available to you on request. You should make yourself familiar with them. © ARDEX Australia Pty Ltd 2013. All aforementioned products are the trade marks of ARDEX Australia Pty Ltd, its licensors and affiliates.

ARDEX WPM 163

Sheltercoat DPM 163 Penetrative Sealer Single Component Polyurethane Dispersion Sealer

PRODUCT DESCRIPTION

Ardex WPM 163 (Sheltercoat DPM 163) is a one component water based urethane modified acrylic water resistant protective sealer that penetrates and cures within the pores of the surface being sealed. Ardex WPM 163 is semi permeable allowing the surface to breathe and is not a waterproof membrane that will resist ponding water.

FEATURES/BENEFITS

- Interior or exterior use.
- Used as an Incontinence barrier for concrete floors in health care institutions.
- Water white and is stable to ultra violet exposure.
- Requires only short downtime for application. Four coats can be applied within the same day allowing light trafficking within 24 hours.
- Penetrates and cures within the pores of the surface being sealed to provide extended service life.
- Provides high abrasion resistance since the wear properties are dependent on the base substrate.
- Can be recoated at any time.
- Good flexibility properties to withstand substrate expansion and contraction.
- Non-flammable and very low odour.
- Surface tolerant and flexible.

TYPICAL USES

- As an economical single component sealer and dust suppressant for warehouse and showroom concrete floors to suppress dust formation and dirt collection with minimum down-time.
- As a water resistant sealer for external concrete or masonry walls to prevent water ingress while allowing the substrate to breathe to prevent internal surface condensation.
- As a grease and oil resistant sealer for concrete and masonry paths, paved areas, pool surrounds, etc.
- As an easily applied water resisting sealer for concrete, roof tiles, brick, stone, slate and masonry to inhibit water penetration
- As a protective sealer for sandstone to minimize dirt and atmospheric grime to develop while allowing the sandstone to breathe.
- As a sealer for timber wall paneling.

LIMITATIONS

The product should be applied whilst the surface temperature is between 10- 35°C. Drying time is adversely affected by low temperature and in situations where relative humidity is >85%.

Apply only using multiple thin film application.

Do not apply if rain is imminent.

DO not leave containers open for long period of time.

NOTE: Sealing a surface will decrease slip resistance in wet conditions.

SURFACE PREPARATION

All surfaces must be cleaned free from dust, dirt, grease, oil, previous surface coatings or adhesive and other surface contaminants.

Ardex WPM 163 is a clear sealer and any contamination, surface texture irregularities, or stains existing at the time of coating will be evident, and probably emphasised, in the final finish.

APPLICATION

Thoroughly mix the product before use. Ardex WPM 163 may be applied by brush, roller or low volume spray application techniques and should be applied in multiple thin films only to allow for maximum penetration allowing 30 minutes to 1 hour at 25°C between coats.

Care should be taken not to apply excess material in each coat when using brush or roller. Application of excess material per coat will result in the product bridging the pores preventing penetration.

Ardex WPM 163 should preferably be applied to damp or moist substrates that are surface dry and not wet. Excess water in the substrate will hinder the penetration of the product.

The number of coats required will vary depending on the porosity of the substrate. Apply sufficient material to fill all surface pores. Two coats are normally sufficient on steel trowelled concrete while clay pavers are likely to require four coats.

Allow 24 hours curing before subjecting to light pedestrian traffic, three days for rubber wheeled traffic, seven days for full cure and maximum traffic loading.

CLEANING & THINNING

Ardex WPM 163 normally does not require thinning for application. For very fine grained substrates, thin with up to 10% of fresh clean water.

Wash all equipment in warm water or water/detergent immediately on completion of the work.

TECHNICAL DATA

Colour	Clear/water white
Finish	Semi-gloss going to mat with external exposure aging
Typical coverage	15m ² /ltr per coat depending on the porosity of the substrate
Typical no. of coats	2-4 depending on the substrate porosity & surface finish desired
Recoat time	30 min to 1 hour @ 25°C, 50% R.H.
Full cure	7 days @ 25°C, 50% R.H.
UV Exposure	Resistant

SAFETY PRECAUTIONS

Ardex WPM 163 is non-hazardous; non-dangerous goods.

Avoid contact with skin and eyes and avoid breathing vapour or spray mist. Wear eye protection and protective gloves when mixing and using.

FIRST AID

If poisoning occurs, contact a doctor or the Poisons Information Centre. If swallowed, do NOT induce vomiting. Give a glass of water. If skin contact occurs, remove contaminated clothing and wash skin thoroughly. If in eyes, hold eyes open, flood with water for at least 15 minutes and see a doctor.

ADDITIONAL INFORMATION IS LISTED IN THE MATERIAL SAFETY DATA SHEET.